PROJECT:
Green Meadow Elementary School -
Early Site Package
5 Tiger Drive
Maynard, MA 01754
Project No.

ADDENDUM NO. 2 06/12/2024

Posted: 06/12/2024 at 3:20PM EDT

Awarding Authority/Owner:
Town of Maynard
195 Main Street
Maynard, MA 01754

Reference Contract Documents (drawings and specifications) dated 05/22/2024

The attention of Bidders submitting proposals for the above subject project is called to the following addendum to the specifications and drawings. The items set forth herein, whether of omission, addition, substitution, or clarifications are all to be included in and form a part of the proposal submitted.

THE NUMBER OF THIS ADDENDUM (**2**) MUST BE ENTERED IN THE APPROPRIATE SPACE "B" PROVIDED AFTER THE WORD "NUMBERS" OF THE CONTRACT FORM ENTITLED "FORM FOR GENERAL BID," AND IN SPACE "B" OF THE "FORM FOR SUB-BID."

BID DOCUMENT MODIFICATIONS ARE AS FOLLOWS.

Specifications:

■ Add the following new technical sections. (See attached)
31 09 13.1 DD Phase Geotechnical Report Dated April 27, 2024
31 09 16.1 Soil Sampling Report Green Meadow School April 2024

■ Replace the following technical sections in their entirety. (See attached)
31 20 00 Earth Moving

Clarifications:

GENERAL

RFI #10 - Type: General
Drawing ref: C-02.1
Section ref: 31-20-00
Other ref: N/A
Question:
Does this contract include the preparation of the building site? How do we leave it, with a gravel pad and if so, to what elevation, elevation 216?
Response: (Prime Designer)
Building pad to be structural fill to el. 215 (1' below FFE).

RFI #12 - Type: General
Drawing ref: N/A
Section ref: 31-09-00
Other ref: N/A
Question:
The geotechnical report does not show borings in all areas of the proposed building footprint. Please confirm that all the boings taken have been provided. Without additional borings, it will be difficult to estimate the removal of the existing fill, organics and rock as a lump sum.
Response: (Prime Designer)

See attached addendum 2 documents for latest geotechnical report.

RFI #15 - Type: General
Drawing ref: N/A
Section ref: Geothermal ground Source – 33-61-37
Other ref: N/A
Question:
The plan shows the terminus of the geothermal piping to be inside the building. The plans also called out for the pipe to be installed in the “final build of the project”. Will this contract be ongoing during the construction of the building? If so, will any piping within 10 ft of the building be considered plumber’s work? Will the piping installed under the roadway require any type of casing?
Response: (Prime Designer)
Yes, the geothermal piping from the manifold to the building will be installed during the construction of the building. No, this piping is not considered part of the plumber’s work. No casing is required under the roadway, please refer to Detail A on sheet GT-200.

RFI #19 - Type: General
Drawing ref: C-01.4
Section ref: N/A
Other ref: N/A
Question:
Please identify where the Transformer will be relocated to, so as to estimate the conduit and wiring required for this relocation.
Response: (Prime Designer)
Per addendum #1, the existing transformer will remain operational as is in its current location.

RFI #24 - Type: General
Drawing ref: Form For General Bid
Section ref: 00 41 13
Question:
The Form For General Bid all the lines state they are to be filled online. If you go to the Bid form tabs there are no areas to fill out this information. Please provide additional instruction to clarify.
Response: (Prime Designer)
The Form for General Bid can be filled in online and/or in the forms included in the specification, both should be included in the bid submission.

CIVIL

RFI #22 - Type: Civil
Section ref: 31 20 00
Question:
There will be a large amount of surplus material leaving the site that will require testing prior to disposal. We were not issued an environmental report nor are there unit prices. Who will be responsible for testing of this material?
Response: (Prime Designer)
See attached spec section 31 09 16.1 Soil Sampling Report Green Meadow School dated April 2024 for environmental report. Contractor will be responsible for additional testing of soils to be disposed of as necessary.

RFI #23 - Type: Civil
Drawing ref: 1
Section ref: 1
Other ref: 1
Question:
the documents refer to test wells done on site TB-1 and TB-2. Please provide data for these borings.
Response: (Prime Designer)

The test bore data for TB-1 and TB-2 are included in the Geothermal Test Loop Memo included in addendum #2.

RFI #29 - Type: Civil
Drawing ref: GT-100
Question:
Geothermal subs asking what shall be assumed for the water discharge/management during their work as it can be a big cost. Should bidders carry an allowance?
Response: (Prime Designer)
The geothermal contractor shall be responsible for procuring any necessary permits for the discharge of all water generated by the drilling and circuit trenching operations along with the containment and treatment of said water.

RFI #32 - Type: Civil
Drawing ref: GT-100
Section ref: 336137-3
Question:
Spec pg 336137-3 mentions test well logs for TB-1 AND TB-2 however we can't seem to find this info. Is it available?
Response: (Prime Designer)
The test bore data for TB-1 and TB-2 are included in the Geothermal Test Loop Memo included in addendum #2.

RFI #33 - Type: Civil
Section ref: 01 51 00
Question:
Is the Town of Maynard going to supply the Temporary Facilities? Trailers for OPM/Architect? Site Contractors could be onsite for only the duration of the enabling plan. Who takes over these facilities between phases? Portable toilets etc.
Response: (Prime Designer)
Temporary Facilities requirements is the responsibility of the early site package Contractor for the duration of the early site package scope of work only.

ELECTRICAL
RFI #21 - Type: Electrical
Section ref: 31 21 01
Question:
I have been asked some questions from an electrical contractor regarding relocating/removing the existing transformer: 1. Is there a proposed location for the transformer? 2. Transformer size and nameplate picture? 3. Secondary size how far does it go inside? 4. Who will do the 15KV work? 5. What loads will need to be supported during the shutdown?
Response: (Prime Designer)
Per addendum #1, the existing transformer will remain operational as is in its current location.

Other Modifications / Attachments:

The following attachment includes additional modifications, clarifications and/or provisions not included in the items above in this Addendum.
See document at the end of document.

All other of the portions of the Contract Documents remain **unchanged**. Please be reminded to acknowledge this Addendum on the bid forms.

ATTACHMENTS

31 09 13.1 DD Phase Geotechnical Report Dated April 27, 2024
31 09 16.1 Soil Sampling Report Green Meadow School April 2024
31 20 00 Earth Moving
Addendum 02 Combined Documents.pdf

--- End of Addendum No. **2** ---

ADDENDUM NO. 2

to the Contract Documents Bid Set dated May 22, 2024

GREEN MEADOW ELEMETARY SCHOOL PROJECT
EARLY SITE BID PACKAGE
Maynard, Massachusetts

Mount Vernon Group Architects, Inc.
264 Exchange Street
Suite G4
Chicopee, MA 01013

Addendum Date: **June 12, 2024**

TO ALL BIDDERS AND SUB-BIDDERS

This Addendum modifies, amends, and supplements designated parts of the Contract Documents for – Green Meadow Elementary School Early Site Bid Package, Maynard, Massachusetts bid set dated May 22, 2024, Addendum No. 01 dated June 07, 2024, and is hereby made a part thereof by reference and shall be as binding as though inserted in its entirety in the locations designated hereunder. It shall be the responsibility of each General Bidder to notify all sub-contractors and suppliers he/she proposes to use for the various parts of the works, of any changes or modifications contained in this Addendum. No claims for additional compensation because of the lack of knowledge of the contents of this Addendum will be considered.

THE NUMBER OF THIS ADDENDUM MUST BE INSERTED IN PARAGRAPH B. OF THE “FORM FOR GENERAL BID”

THIS ADDENDUM CONSISTS OF PAGES NUMBERED: **AD2-1 through AD2-2**

NEW SPECIFICATIONS:
31 09 13.1_DD Phase Geotechnical Report Dated April 27, 2024
31 09 16.1_Soil Sampling Report Green Meadow School April 2024
33 61 38_Geothermal Test Loop Memo

NEW DRAWINGS:

GENERAL

CHANGES TO THE BID SET PROJECT MANUAL

TABLE OF CONTENTS

ITEM 01: Added Specification Section 31 09 13.1 DD Phase Geotechnical Report dated April 27, 2024

ITEM 02: Added Specification Section 31 09 16.1 Soil Sampling Report Green Madow School dated April 2024

ITEM 03: Addes Specification Section 33 61 38 Geothermal Test Loop Memo

SECTION 31 20 001 – EARTH MOVING

ITEM 01: Delete Section in its entirety and replace with attached 31 20 00 EARTH MOVING_ADD2.

CHANGES TO THE BID SET DRAWINGS

DRAWING C-00 – OVERALL PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

DRAWING C-01.2 – DEMO PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

DRAWING C-01.3 – DEMO PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

DRAWING C-02.1 – SITE PREPARATION PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

DRAWING C-02.2 – SITE PREPARATION PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

ITEM 02: Adjusted Wall length.

DRAWING C-02.3 – SITE PREPARATION PLAN

ITEM 01: Added Revision triangle to Addendum #1 changes.

DRAWING C-03.1 – DETAILS

ITEM 01: Added Revision triangle to Addendum #1 changes.

END OF ADDENDUM NO. 2

LGCI
Lahlaf Geotechnical Consulting, Inc.

April 27, 2024

Mr. Chris LeBlanc, MCPPO
Mount Vernon Group Architects, Inc.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866
Mobile: (413) 530-0817
E-mail: cleblanc@mvgarchitects.com

Re: **DD Phase Geotechnical Report**
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

Dear Mr. LeBlanc:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed our Design Development (DD) phase geotechnical study for the proposed Green Meadow Elementary School at the existing Green Meadow Elementary School site in Maynard, Massachusetts. We are submitting our geotechnical report electronically.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

Lahlaf Geotechnical Consulting, Inc.

DD PHASE GEOTECHNICAL REPORT
PROPOSED GREEN MEADOW ELEMENTARY SCHOOL
MAYNARD, MASSACHUSETTS

LGCI Project No. 2201
April 27, 2024

Prepared for:

MOUNT VERNON GROUP ARCHITECTS, INC.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866

DD PHASE GEOTECHNICAL REPORT
PROPOSED GREEN MEADOW ELEMENTARY SCHOOL
MAYNARD, MASSACHUSETTS
LGCI Project No. 2201
April 27, 2024

Prepared for:

MOUNT VERNON GROUP ARCHITECTS, INC.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866

Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
100 Chelmsford Road, Suite 2
Billerica, Massachusetts 01862
Phone: (978) 330-5912
Fax: (978) 330-5056

ABDELMADJID
M. LAHLAF
CIVIL
No. 39814

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

LGCI performed services for this project in two phases as follows:

- Preliminary Phase - LGCI previously performed preliminary subsurface explorations at the site and prepared and submitted a preliminary geotechnical report in February 2022 in general accordance with the scope described in our proposal No. 21115-Rev. 1 dated December 22, 2021. Our services were authorized by Mr. Chris LeBlanc of Mount Vernon Group Architects, Inc. (MVG) by signing our proposal on December 22, 2021.

- Design Development (DD) Phase - LGCI performed additional DD Phase subsurface explorations at the site and prepared and submitted this DD Phase geotechnical report in general accordance with our proposal No. 22140-Rev. 1 dated March 9, 2023. Our services were authorized by Mr. Chris LeBlanc of Mount Vernon Group Architects, Inc. (MVG) by signing our proposal on March 30, 2023.

1.2 Purpose and Scope of Services

The purpose of our preliminary and DD phase studies was to perform subsurface explorations at the site for the proposed Green Meadow Elementary School and to provide preliminary foundation and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with MVG and with the Green Meadow Elementary School facilities staff, marked the exploration locations at the site, and contacted Dig Safe Systems, Inc. (Dig Safe) and the Town of Maynard for utility clearance. LGCI also applied for and obtained a trench permit from the Town of Maynard.

- Engaged a drilling subcontractor to advance twenty-nine (29) soil borings at the site, including nine (9) soil borings as part of our preliminary phase services and twenty (20) soil borings as part of our DD phase services.

- Engaged an excavation subcontractor to excavate twenty-two (22) test pits at the site as part of our DD phase services.

- Provided an LGCI geotechnical field representative, full time, at the site to coordinate and observe the explorations, describe the soil samples, and prepare field logs.

- Submitted sixteen (16) soil samples for laboratory testing, including four (4) soil samples during the preliminary phase and twelve (12) soil samples during the DD phase.

- Prepared this geotechnical report containing the results of our preliminary phase and DD phase subsurface explorations and our foundation design and construction recommendations.

Upon completion of our preliminary phase services, LGCI submitted a preliminary geotechnical report dated February 24, 2022. This DD phase geotechnical report includes the results of our preliminary phase services and supersedes the aforementioned report.

Our scope includes attending meetings, reviewing drawings, and performing field services during construction. These services will be performed separately and are not included in this report. Recommendations for unsupported slopes, stormwater management, erosion control, pavement design, slope stability analyses, site specific liquefaction analyses, pile analysis and design, and detailed cost or quantity estimates are not included in our scope of work.

LGCI did not perform environmental services for this project. LGCI did not perform an assessment to evaluate the presence or absence of hazardous or toxic materials above or below the ground surface at or around the site. Any statement about the color, odor, or the presence of suspicious materials included in our exploration logs or report were made by LGCI for information only and to support our geotechnical services. No environmental recommendations and/or opinions are included in this report.

1.3 Reviewed Documents

LGCI reviewed the following documents:

- Drawing L.2 titled: “Site Plan, Green Meadow Elementary School Addition and Renovation, Maynard, MA,” (1987 Site Plan) prepared by DiNisco Kretsch & Associates, Inc., dated February 5, 1987, and provided to LGCI by MVG via e-mail on December 20, 2021.

- Drawing EX-1 titled: “Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School,” (Survey Plan) prepared by Samiotes Construction, Inc., dated September 2, 2022, and provided to LGCI via e-mail on February 1, 2024.

- Drawings C-01.1, 2, C-01.3, C-01.4 titled: “Demo Plan, Town of Maynard, Green Meadow Elementary School Project, 5 Tiger Drive, Maynard, MA 01754,” (Demo Plan) prepared by MVG and provided to LGCI by Brennan Consulting, Inc. via e-mail on April 24, 2024.

- Drawing C-01.5 titled: “Details, Town of Maynard, Green Meadow Elementary School Project, 5 Tiger Drive, Maynard, MA 01754,” (Details) prepared by MVG and provided to LGCI by Brennan Consulting, Inc. via e-mail on April 24, 2024.

1.4 Site Location and Description

Our understanding of the site is based on our field observations, our conversations with MVG, and on the drawings listed in Section 1.3.

The site of the proposed construction is at the site of the existing Green Meadow Elementary School located at 5 Tiger Drive in Maynard, Massachusetts as shown in Figure 1. The site is bordered by Tiger Drive on the eastern side, by Great Road on the northern side, and by wooded land on the western and southern sides. The site is occupied by the existing Green Meadow Elementary School building and associated parking lots, driveways, landscaped areas, and athletic fields. The athletic fields include a baseball field north of the existing school and a practice field on the southern side of the existing school within a clearing in the wooded area. The existing school building has an irregular fan shape. Based on the 1987 Site Plan, additions were made to the original Green Meadow Elementary School and the existing building was also renovated. The 1987 Site Plan indicates that the finished floor elevation (FFE) of the existing building is El. 214 feet.

Based on the Survey Plan, the grades at the site rise from approximately El. 196 feet on the eastern side of the site to a relatively level area between El. 212 and El. 215 feet (in the existing practice field) before rising to about El. 251 feet at a hill near the northwestern corner of the site. The grades around the existing school generally rise from about El. 208 feet on the eastern side of the existing building to about El. 225 feet near the western side of the existing building. The grades within the parking lots, driveways, and landscaped areas located east of the existing school rise from approximately El. 196 feet to El. 208 feet in a westerly direction. The Survey Plan indicates that the FFE of the existing building's ground floor is El. 213.3 feet. This FFE is slightly lower than that shown in the 1987 Site Plan.

A dirt path loops around the existing building and ranges in elevation between El. 212 feet and El. 223 feet.

Based on the 1987 Site Plan and the Survey Plan, there appears to have been cuts near the southwestern corner of the existing building to achieve the existing grades in the existing practice field in the tree clearing.

1.5 Project Description

Our understanding of the proposed construction is based on our field observations, our discussions with MVG, and on the Demo Plan and Details listed in Section 1.3.

We understand that the proposed construction will consist of a somewhat L-shaped building that will have a footprint of about 59,000 square feet. The majority of the proposed building footprint will be located in the generally level area in the existing practice field. Nearly one third of the proposed building footprint (on the northern side of the proposed building) will be located in the wooded hill near the western side of the existing building.

The existing grades within most of the proposed building footprint (on the southern side of the proposed building footprint in the general area of the tree clearing) will range between about El. 207 feet and El. 216 feet; thus, requiring net fills ranging between 0 and 8 feet. The thickest fill will be on the eastern side of the proposed building footprint. The existing grades within the northern portion of the proposed building (located in the wooded hill) range between about El.

208 feet and El. 232 feet; thus, requiring net fills of up 5 feet and cuts of up to 16 feet to achieve the proposed FFE of El. 216 feet.

Based on the Demo Plan, an access road will loop around the proposed building and will have grades that will range between El. 210 feet and El. 219 feet. The existing grades within the proposed access drive range up to El. 236 feet; thus, requiring net cuts of up to 17 feet to achieve the proposed grades. Retaining walls will be constructed on both sides of the western portion of the proposed access drive to reduce the extent of the cuts in the overburden and to conceal the rock cuts. Based on the Details, the proposed retaining walls will consist of Redi-Block MSE walls with fences or guardrails on the tops of the walls. Details about the proposed retaining wall geometry, including length, total height, exposed heights, and length of reinforcing are not available at the time of this report.

We understand that the existing building will be demolished after the new building is completed to allow for the construction of proposed athletic fields and paved parking lots. Information about the layout and grading of the proposed athletic fields and paved areas was not available to us at the time of this report.

A thermal well field will be provided in the wooded area on the western side of the proposed building. Work related to the thermal wells was not the focus of this report and is beyond our scope of services for this project.

1.6 Elevation Datum

The 1987 Site Plan does not include a reference to a datum. We understand that the elevations shown in the Survey Plan are referenced to the North American Vertical Datum of 1988 (NAVD 1988).

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Surficial Materials Map of the Maynard Quadrangle, Massachusetts," (Surficial Geological Map) prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 97 – Maynard.

The Surficial Geological Map indicates that the natural soils on the western side of the site mainly consist of thin till. The thin till is described as non-sorted, non-stratified matrix of sand, some silt, and little clay containing scattered pebbles, cobbles, and boulder clasts. The thin till is generally less than 10 to 15 feet thick.

The Surficial Geological Map also indicates that the natural soils on the eastern side of the site consist of coarse deposits, including gravel deposits, sand and gravel deposits, and sand deposits. The gravel deposits are composed mainly of gravel, cobbles, and boulders. The sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. The sand deposits are composed mainly of very coarse to fine sand. Coarser layers may contain up to 25 percent gravel, and finer layers may contain fine sand, silt, and clay.

The Surficial Geological Map also indicates that bedrock outcrops or shallow bedrock may be present on the western side of the site.

The Surficial Geologic Map of the site is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with MVG and with the Green Meadow Elementary School staff and marked the exploration locations in the field. LGCI notified Dig Safe and the Town of Maynard for utility clearance prior to starting our explorations at the site. An LGCI geotechnical field representative observed and logged the explorations in the field.

Unless notified otherwise, we will dispose of the soil samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Soil Borings

As part of our preliminary phase services, LGCI engaged Northern Drilling Service, Inc. (NDS) of Northborough, Massachusetts to advance nine (9) borings (B-1, B-2, B-4, & B-6 to B-11) at the site between January 28 and February 1, 2022. Borings B-3 and B-5 were not performed. The borings were advanced with a track-mounted B-53 ATV drill rig using drive and wash boring techniques with a 4-inch casing. The borings extended to depths ranging between 13 and 21 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings and gravel.

As part of our DD phase services, LGCI engaged Soil X Corp. (Soil X) to advance twenty (20) borings (B-101 to B-T-120) at the site between February 19 and 27, 2024. The borings were advanced using a Diedrich D-70 Turbo drill rig using a hollow stem auger with 3-inch casing. The borings extended to depths ranging between 11.2 and 21 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings and gravel. Two (2) groundwater observation wells were installed in borings B-104-OW and B-114-OW (one each).

NDS and Soil X performed Standard Penetration Tests (SPT) during drilling and obtained split spoon samples in the borings with an automatic hammer at typical depth intervals of 2-feet or 5-feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical field representative observed and logged the borings in the field.

2.2.3 LGCI's Test Pits

As part of our DD phase services, LGCI observed twenty-two (22) test pits (TP-1 to TP-12, TP-14 to TP-19, TP-21 to TP-23, and TP-26). The test pits were excavated by Saunders Construction between February 6 and 12, 2024. Our excavation subcontractor also cleared trees in the wooded area to provide access to the borings in the wooded hill on February 5 and 6, 2024. The test pits were excavated using a Takeuchi TB-290 excavator and extended to depths ranging between 7 feet and 12 feet beneath the ground surface. Upon completion, the test pits were backfilled with the excavated material in 12-inch to 18-inch lifts and tamped with the excavator bucket.

2.2.4 Exploration Logs and Locations

The exploration locations are shown in Figure 3. Appendix A and Appendix B contain LGCI's boring logs and test pit logs, respectively. Table 1 shows a summary of LGCI's borings, and Table 2 shows a summary of LGCI's test pits.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The boring logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our exploration logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in the explorations were as follows, starting at the ground surface.

<u>Topsoil</u> – A layer of surficial organic topsoil was encountered in all borings except in borings B-117 and B-T-120, and in all test pits. The surficial organic topsoil extended to depths ranging between 0.2 and 2.0 feet beneath the ground surface.

<u>Asphalt</u> – A layer of asphalt was encountered in borings B-118 and B-119. The asphalt extended to a depth of 0.3 feet.

<u>Subsoil</u> – A layer of subsoil was encountered beneath the surficial organic topsoil or asphalt in all borings except in borings B-1, B-4, B-8, B-9, B-11, B-104-OW, B-105, B-107, B-118, and B-119. The subsoil was also encountered beneath the topsoil in test pits TP-1, TP-2, TP-7, TP-8, TP-10, TP-11, TP-14 to TP-17, TP-19, TP-23, and TP-26. The subsoil generally extended to depths ranging between 1 and 4 feet beneath the ground surface. In boring B-117, the subsoil extended to a depth of 8 feet beneath the ground surface. The samples in the subsoil were described as silty sand and poorly graded sand. One (1) sample was described as a silt. The fines content in the subsoil ranged between 0 and 45 percent and the gravel content ranged between 0 and 35 percent. When described as silt, the sand content ranged between 40 and 45 percent. The subsoil contained traces of organic soil and roots. The fines in a few samples were described as slightly plastic.

The standard penetration test (SPT) N-values in the subsoil ranged between 2 blows per foot (bpf) and 84 bpf, with most values lower than 21 bpf, indicating mostly very loose to medium dense soil. The high SPT N-values may be caused by frozen soil or obstructions such as cobbles and boulders in the subsoil.

<u>Fill</u> – A layer of fill was encountered beneath the surficial organic topsoil in borings B-1, B-4, B-8, B-9, B-11, B-103 to B-105, B-117, and B-119 and in test pits TP-3 to TP-6, TP-12, TP-18B, and TP-21 to TP-23. The fill extended to depths ranging between 1.5 and 6.9 feet beneath the ground surface. The samples in the fill were mostly described as silty sand or poorly graded sand. One (1) sample was described as well graded gravel. One (1) sample was described as well graded sand. The fines content in the fill ranged between 5 and 45 percent and the gravel content ranged between 0 and 45 percent. When described as gravel, the sand content in the fill ranged between 20 and 25 percent. The fill contained traces of organic soil, wood, and roots.

The SPT N-values in the fill ranged between 5 bpf and refusal, with most values lower than 38 bpf indicating loose to dense material. The high SPT N-values may be caused by frozen soil or by obstructions such as cobbles and boulders in the fill.

<u>Buried Organic Soil</u> – A layer of buried organic soil was encountered beneath the fill layer in boring B-9 and test pits TP-21 and TP-22. The buried organic soil extended to depths ranging

between 3.5 feet and 9 feet beneath the ground surface. The samples in this layer were described as silty sand. The fines content in the buried organic soil ranged between 25 and 35 percent.

The SPT N-value in the buried organic soil was 9 bpf, indicating loose soil.

Sand and Gravel – A layer of sand and gravel was encountered beneath the subsoil, fill, or buried organic soil in all borings and test pits. The sand and gravel layer extended to depths ranging between 3 feet and 21 feet beneath the ground surface. The samples in this layer were mostly described as silty sand, poorly graded sand, or well graded gravel. Three (3) samples were described as silty gravel. The fines content in this layer ranged between 0 and 35 percent, and the gravel content ranged between 0 and 45 percent. When described as gravel, the sand content ranged between 15 and 45 percent. The sand and gravel contained traces of weathered rock. One (1) sample from this layer contained traces of roots.

The SPT N-values within the sand and gravel layer ranged between 3 bpf and refusal, with most values ranging higher than 10 bpf, indicating mostly medium dense to very dense soil. The high SPT N-values may be caused by obstructions such as cobbles and boulders in this layer.

A layer of silt was encountered within the sand and gravel layer in borings B-2 and B-105 at a depth of 14 feet beneath the ground surface. The silt extended to a depth of 19 feet beneath the ground surface. The sand content in the silt layer ranged between 10 and 15 percent. The silt was described as slightly plastic.

Rock –Borings B-1, B-7, B-8, B-11, and B-108 to B-114-OW, and B-118 were advanced into and terminated in rock. Rock was encountered in these borings at depths ranging between 5 and 17.5 feet beneath the ground surface.

Also, refusal on possible large boulders or on apparent rock was encountered at the bottom of test pits TP-1, TP-5, TP-9, TP-10, and TP-16 to TP-18B at depths ranging between 7 and 10.1 feet beneath the ground surface, and at the bottom of borings B-101 to B-103, B-116, and B-118 at depths ranging between 11.2 and 18.5 feet beneath the ground surface.

Rock cores were obtained in borings B-105, and B-108 to B-114-OW. The rock generally consisted of extremely weathered to fresh, slightly to moderately fractured, hard to very hard, grey, white, orange, and light blue Granite. The rock recoveries ranged between 76.7 and 100 percent and the rock quality designation (RQD) values ranged between 41.6 and 97.5 percent.

2.4 Groundwater

Groundwater was encountered in all borings except in borings B-101, B-103, B-105, B-106, B-113, B-115, B-117, B-119, and B-T-120 at depths ranging between 5 and 18.5 feet beneath the ground surface. Groundwater was also observed in test pits TP-9, TP-10, TP-12 to TP-15, and TP-21 at depths ranging between 2 and 18.5 feet beneath the ground surface.

The groundwater measured in groundwater observation wells B-104-OW and B-114-OW are shown in the table below.

	G.S. El. (ft.)	Date	G.W. Depth (ft.)	G.W. El. (ft.)
B-104-OW	214	2/19/2024	18.5	195.5
		4/27/2024	17.2	196.8
B-114-OW	232	2/21/2024	5.0	227.0
		4/27/2024	17.6	214.4

The groundwater levels reported in our borings and test pit logs are based on observations made during drilling or shortly after the completion of the explorations. Please note that water was introduced into the boreholes to maintain a stable borehole and the groundwater levels noted on the boring logs may not represent the actual groundwater level, as additional time may be required for the groundwater levels to stabilize. The groundwater levels presented in this report only represent the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Double Ring Infiltrometer Tests

LGCI performed two (2) double ring infiltrometer tests in test pits TP-23 and TP-26 (one each). The excavation subcontractor excavated to the test depths of 4.0 and 3.5 feet beneath the ground surface at TP-23 and TP-26, respectively. After the double ring infiltrometer tests were completed, the tests pits were continued to depths of 12 and 11 feet beneath the ground surface, respectively.

The results, shown in Appendix C, indicated estimated permeability values of 8.3 x 10^{-3} cm/sec. at TP-23 and 8.9 x 10^{-3} cm/sec. at TP-26.

2.6 Laboratory Test Data

LGCI submitted sixteen (16) soil samples collected from the borings for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix D and are summarized in the table below.

Grain-Size Analysis Test Results

Boring No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-1	S2	Fill	2 – 4	23.0	53.0	24.0
B-6	S2	Sand	2 – 4	0.1	93.8	6.1
B-7	S2 – Top 13”	Subsoil	2 – 4	3.4	62.5	34.1
B-11	S2	Fill	2 – 4	22.8	68.0	9.2

B-104	S2	Fill	2 – 4	13.0	44.6	42.4
B-105	S1 – Bot. 11”	Fill	1.1 – 2	49.8	39.6	10.6
B-109	S2	Fill	2 – 4	3.8	58.7	37.5
B-109	S3	Sand & Gravel	4 – 6	57.3	31.4	11.3
B-110	S2	Fill	2 – 4	0.0	43.5	56.5
B-110	S3	Sand & Gravel	4 – 6	25.5	68.1	6.4
B-112	S2– Bot. 16”	Sand & Gravel	2.5 – 4	14.7	54.0	31.3
B-116	S2	Sand & Gravel	2 – 4	13.6	45.8	15.3
TP-17	G1	Subsoil	0.3 – 4.7	0.1	55.2	44.7
TP-17	G2	Sand & Gravel	4.7 – 9	15.1	64.0	20.9
TP-23	Infiltrometer Test Depth		4	0.1	90.1	9.8
TP-26	Infiltrometer Test Depth		3.5	28.5	64.3	7.2

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed construction, our observation of our explorations, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

3.1.1 Asphalt, Surficial Organic Soil, Subsoil, Buried Organic Soil, and Existing Fill

- Asphalt, surficial organic soil, subsoil, buried organic soil, and existing fill were observed in the borings and test pits. These materials are not suitable to support shallow foundations.

- The asphalt and the surficial organic soil should be entirely removed from within the proposed construction area.

- The subsoil and the buried organic soil are compressible and should be entirely removed from within the proposed building footprint and should be replaced with Structural Fill.

- The fill contained traces of organic soil, wood, and roots. Existing fill that was not placed with strict moisture, density, and gradation control, and buried organic soil present risk of unpredictable settlement that may result in poor performance of floor slabs and foundations. Due to the risk of excessive settlement, the existing fill should be entirely removed from within the footprint of the proposed building footprint and should be replaced with Structural Fill.

- Based on our borings, we anticipate that the removal will extend to depths of up to about 9 feet. The removal may extend to greater depths at locations not explored by LGCI.

- The removal of the existing fill should extend beyond the limits of the proposed building a minimum distance equal to 5 feet or the distance between the bottom of the proposed footings and the bottom of the fill or buried organic soil, whichever is greater.

- The existing fill and subsoil should be removed to a depth of 18 inches beneath the bottom of the proposed pavement and the bottom of the proposed athletic field subbase layer, and the exposed surface should be improved as described in Section 4.1.

3.1.2 Shallow Bedrock

Apparent rock was encountered at elevations higher than the proposed FFE in many borings and test pits.

Based on the depths to top of apparent bedrock and rock that was confirmed with rock cores, we anticipate that rock removal will be required to reach the bottom of the proposed building foundations and for utilities. We anticipate that most of the rock removal will be in the wooded hill on the northern side of the proposed building. Rock removal will also likely be needed to achieve the proposed grades after the existing building is demolished. The contractor should review the boring and test pit logs and Tables 1 and 2 to assess the need for and extent of rock removal for structures and utilities. We anticipate the rock removal will be achieved by means of rock blasting. Our recommendations for rock blasting and for subgrade preparation in rock are presented in Section 4.5.

The contract documents should include a requirement for a pre-blast condition survey and also vibration monitoring during blasting and earthwork operations as shown in Section 4.5.

3.1.3 Shallow Footings and Slabs-on-Grade

Based on the results of the explorations, the subsurface conditions are suitable to support shallow spread and continuous footings bearing on Structural Fill placed directly on top of the natural sand and gravel or rock after removing the asphalt, the surficial organic soil, the subsoil, the buried organic soil, and the existing fill. Our recommendations for footing design are presented in Section 3.2.2. Our estimates for preliminary settlement are presented in Section 3.2.3. Our concrete slab considerations are presented in Section 3.3. Section 4.1 provides recommendations for preparation of subgrades. Our recommendations for rock removal are provided in Section 4.5.

We anticipate that the major considerations during construction will be associated with the removal of the unsuitable soils, i.e., the surficial organic soil, the subsoil, the buried organic soil and the existing fill, rock blasting, and groundwater control during excavations.

3.1.4 Reuse of Onsite Materials

The existing fill and the natural soil are generally silty and not suitable for reuse as Structural Fill and Ordinary Fill without being amended. Silty soils are very susceptible to disturbance when exposed to moisture. Care should be exercised during construction to maintain a dry working subgrade and to provide working mats, e.g., crushed stone or concrete mud mats, to reduce the potential for disturbance of the foundation subgrade and to improve working conditions.

The contractor may consider mobilizing a rock crusher to the site. Existing cobbles and boulders and blasted rock can be processed by blending them with the existing fill and the natural sand and gravel and crushing them to produce a well graded material.

Additional recommendations about reuse of onsite materials are presented in Section 4.4.

3.2 Foundation Recommendations

3.2.1 General

Based on the results of the borings and test pits, the subsurface conditions appear suitable for support of new structures with grade-supported floor slabs and shallow foundations. Recommendations for footing design and settlement are presented below.

3.2.2 Footing Design

- We recommend entirely removing the asphalt, the surficial organic soil, the subsoil, the buried organic soil, and the existing fill from within the proposed building footprint as described in Section 3.1.1.

- We recommend supporting the proposed building on spread footings bearing on Structural Fill placed directly on the natural sand and gravel or rock.

- We recommend designing the proposed footings using a net allowable bearing pressure of 5 kips per square foot (ksf) for footings bearing directly on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand and gravel or rock.

- Footing subgrades should be prepared in accordance with the recommendations in Section 4.1.

- Foundations should be designed in accordance with The Commonwealth of Massachusetts State Building Code 780 CMR, Ninth Edition (MSBC 9th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4 feet below the final exterior grade to provide adequate frost protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should be engaged to observe that the subgrade has been prepared in accordance with our recommendations.

3.2.3 Settlement Estimates

Based on our experience with similar soils and designs using a net allowable bearing pressure of 5 ksf, we anticipate that the total settlement will be approximately 1 inch, and that the differential settlement of the footings will be 3/4 inch or less over a distance of 25 feet. We believe that total and differential settlements of this magnitude are tolerable for a similar structure. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

3.3.1 Slab-on-Grade

- The proposed floor slab should be constructed as a slab-on-grade bearing on Structural Fill placed directly on top of the natural sand and gravel. We recommend a minimum of 12 inches of Structural Fill beneath the proposed slab-on-grade. The subgrade of the slab should be prepared as described in Section 4.1.

- To reduce the potential for dampness in the proposed floor slabs, the project architect may consider placing a vapor barrier beneath the floor slabs. The vapor barrier should be protected from puncture during the placement of the proposed slab reinforcement.

- For the design of the floor slabs bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\,\mathrm{Re}\,action\,(k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area;
k_{s1} = Coefficient of vertical subgrade reaction for a 1 x 1 square foot area; and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed during the construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- In order for the movement of exterior slabs not to be transmitted to foundations or superstructures, exterior slabs, such as approach slabs and sidewalks, should be isolated from the superstructure.

- The backfill in interior utility trenches should be properly compacted.

3.3.2 Under-slab Drains and Waterproofing

Based on an FFE of El. 216 feet, we believe that an under-slab drainage system is not required on the southern side of the proposed building where fill is required to achieve the proposed FFE. An under-slab drainage system will be required on the northern side of the proposed building in cut areas and should be installed in accordance with the recommendations below.

- We recommend that the under-slab drainage system consist of 1) a minimum of 12 inches of ¾-inch crushed stone placed below the slab, and 2) 6-inch-diameter slotted PVC pipes installed with their inverts at least 15 inches below the bottom of the slab.

- The slotted pipes should be installed in trenches placed at 10 to 15 feet apart. The trenches should be at least 18 inches wide and should extend 9 inches below the bottom of the 12 inches of crushed stone layer to allow placing crushed stone around the PVC pipe.

- The slotted PVC pipes should connect to a 6-inch solid PVC header pipe that collects and channels the collected water out of the building.

- The slots on the PVC pipes should be placed facing downward to allow for entry of water at the bottom of the pipe.

- A non-woven geotextile fabric should be installed between the crushed stone and the underlying soil or weathered rock for separation.

- Clean-outs should be included at the end of the perforated pipes, at changes in directions, and at about 100-foot intervals.

- We recommend channeling the water from the under-slab drainage system to flow by gravity to a discharge area or to an infiltration system. If gravity flow is not possible, the groundwater collected from the under-slab drainage system should be collected in a sump-pump pit and pumped out of the building.

- We recommend that a backup generator and spare pump be provided with the system to use in the event of a power outage or pump failure. The owner should apply for a discharge permit and should perform analytical tests as required by the permits.

If the proposed building includes an elevator pit or other structure that extends beneath the FFE, such elevator pit or other structure should be designed to be waterproof.

3.4 Seismic Design

In accordance with Section 1613 of MSBC 9th Edition, the seismic criteria for the site are as follows:

• Site Class:	D
• Spectral Response Acceleration at short period (Ss):	0.206g
• Spectral Response Acceleration at 1 sec. (S_1):	0.069g
• Site Coefficient Fa (Table 1613.5.3(1)):	1.6
• Site Coefficient Fv (Table 1613.5.3(2):	2.4
• Adjusted spectral response S_{MS}:	0.330g
• Adjusted spectral response S_{M1}:	0.166g

Based on the SPT data from the borings, the site soils are not susceptible to liquefaction during a seismic event.

3.5 Lateral Pressures for Wall Design

3.5.1 Lateral Earth Pressures

Lateral earth pressures for the design of retaining walls (walls of below-grade spaces of the proposed building) and site retaining walls are provided below.

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of At-Rest Earth Pressure, K_o:	0.47
Coefficient of Passive Earth Pressure, K_p:	3.3
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 32 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and on a vertical wall face.

- Exterior walls of below-ground spaces and other retaining walls braced at the top to restrain movement/rotation should be designed using the "at-rest" pressure coefficient.

- Site retaining walls should be designed using the active earth pressure coefficient described above.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent the disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 4 feet.

- Where a permanent vertical uniform load will be applied to the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the natural sand and gravel and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

3.5.2 Seismic Pressures

In accordance with the Massachusetts State Building Code, 9th Edition (MSBC 9th Edition), Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of the walls (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.4), F_a is the site coefficient (defined in Section 3.4), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 should be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time should be included in the total static lateral soil pressure, and their earthquake lateral force should be computed and added to the force determined above.

3.5.3 Perimeter Drains

- We recommend that free-draining material be placed within 3 feet of the exterior of walls of below-ground spaces, if any.

- To reduce the potential for dampness in below-ground spaces, proposed below-ground walls should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below-ground spaces, and behind the walls of the elevator pit and other below ground spaces. The drains should consist of 4-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile for separation and filtration.

- We recommend providing weep holes at the bottom of site retaining walls to promote drainage where possible. Alternatively, a pipe should be placed at the base of the wall to collect the water. The pipe should be encased within 18 inches of crushed stone wrapped in a geotextile fabric.

- Groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible. In any case, the groundwater collected by the wall drains should be discharged in accordance with municipal, state, and other applicable standards.

3.6 Parking Lots, Driveways, Sidewalks, and Exterior Slabs

3.6.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, sidewalks, and exterior slabs after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the existing asphalt and the surficial organic soil from within the footprint of the proposed driveways, parking lots, sidewalks, and exterior slabs.

- The existing fill and the subsoil should be improved in accordance with the recommendations in Section 4.1.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

3.6.2 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

- After the proposed grading in the proposed sidewalk and roadway areas is completed, the proposed grading plan should be submitted to LGCI to assess whether drains should be installed under sidewalks and roadways.

3.6.3 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5" Asphalt "Top Course"
2.0" Asphalt "Base Course"

8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

2.0" Asphalt "Top Course"
2.5" Asphalt "Base Course"
12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the “Standard Specifications for Highways and Bridges,” prepared by the Commonwealth of Massachusetts Department of Transportation dated 2023.

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer’s recommendations. “Cushion” material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill immediately above the utilities should be performed in accordance with the manufacturer’s recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Surficial organic soil, subsoil, asphalt, buried organic soil, existing fill, abandoned utilities, buried foundations, and other below-ground structures should be entirely removed from within the footprint of the proposed building and site structures before the start of foundation work.

- Abandoned/buried foundations should be removed at least 3 feet beneath the bottom of the subbase layer of the proposed paved areas, and 3 feet beneath the topsoil in athletic fields.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Due to the silty nature of the natural sand and gravel, we recommend placing a minimum of 12 inches of Structural Fill or crushed stone below the bottom of the footings to provide a working pad.

- Cobbles and boulders should be removed at least 6 inches from beneath footings, 24 inches beneath the bottom of slabs and paved areas, and 24 inches beneath the base material for the turf in athletic fields. The resulting excavations should be backfilled with compacted Structural Fill under the building, and with Ordinary Fill under the subbase of paved areas and under the base material in athletic fields.

- The base material of athletic fields should conform to the gradation and placement requirements of the landscape architect or the manufacturer/installer of synthetic turf.

- The base of the footing excavations in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade.

- The subgrade of the proposed slabs in the natural soil should be compacted with a dynamic vibratory compactor imparting a minimum of 20 kips of force to the subgrade.

- The surficial organic soil and asphalt should be removed from within the proposed paved areas.

- After the surficial organic soil and asphalt are removed from within the proposed paved areas, the existing fill and subsoil should be improved by compacting the exposed surface of the existing fill and subsoil with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil or organic soil are observed, the soft soil or organic soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the existing fill is observed, the compactor should be switched to static mode. Where the fill contains or overlies organic soil, the organic soil should be removed at least 18 inches beneath the bottom of the subbase layer.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill, shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill, shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- Loose or soft soils identified during the compaction of the footing or floor slab subgrades should be excavated to a suitable bearing stratum, as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill or crushed stone.

- When crushed stone is required in the drawings or is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile fabric promotes sliding. A geotextile fabric should not be placed between the bottoms of the footings and the crushed stone.

- An LGCI representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill, or crushed stone wrapped in a filter fabric.

4.2 Subgrade Protection

The onsite fill and natural soil are frost-susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final 6 inches of soil just before pouring the concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines contents are typically difficult to handle when wet, as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel free from organic matter, clay, surface coatings, and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
3 inches	100
1 ½ inch	80-100
½ inch	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0 – 5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
6 inches	100
1 inch	50-100
No. 4	20-100
No. 20	10-70
No. 60	5-45
No. 200	0-20

=

4.4 Reuse of Onsite Materials

Based on our field observations and the results of the grain-size analyses, the existing fill and natural and gravel are not suitable for reuse as Structural Fill. Some of the existing fill free of organic soil and natural sand and gravel may be reused as Ordinary Fill.

Should the contractor encounter materials suitable for reuse during earthwork operations, the contractor should avoid mixing the reusable soils with fine-grained and/or organic soils. The soils to be reused should be excavated and stockpiled separately for compliance testing.

Soils with 20 percent or greater fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during the compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

Materials to be used as fill should first be tested for compliance with the applicable gradation specifications.

The contractor may mobilize a rock crusher to the site. Boulders and blasted rock can be processed with the existing fill and natural sand and gravel by crushing to produce well graded granular fill that is lower in fines if blended with a sufficient proportion of rock. Processed material obtained by crushing blasted rock, boulders, and soil should meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation should be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction. The site contractor should be prepared to produce batches of material processed using different blending ratios at the start of the earthwork operations. LGCI will review the results of grain-size analyses performed on the processed material and provide an opinion about the blending ratio to maintain throughout construction.

4.5 Rock Blasting Considerations

4.5.1 Rock Removal

Deep rock cuts will be required to achieve the proposed FFE of the proposed building on the northern side of the proposed building footprint and to achieve the proposed grades of the proposed access road and paved areas.

Minor rock cuts (less than 1 foot) over short distances may be achieved using hoe-rams or using other non-blasting techniques. For the majority of the cuts, we anticipate that rock blasting will be required.

- Rock should be cut to at least 12 inches beneath footings and to a minimum of 24 inches beneath the bottom of the proposed slabs. To facilitate rock excavation and backfilling, we recommend that the blasting extend to an elevation corresponding to 12 inches beneath the bottom of the deepest footings under the entire building footprint, i.e., at a minimum to El. 211 feet.

- The rock should be cut laterally at least 1 foot beyond each side of the footing. For retaining wall footings, the rock should be cut laterally at least 3 feet from the outside face of the wall to allow for placement of the formwork. Where utilities are installed around the perimeter of the proposed building, the rock should be cut at least 3 feet from the nearest utility.

- The rock surface should be cut as level as possible. The surface of rock should not be steeper than 12H:1V.

- Structural Fill should not be placed directly on rock surfaces that are fractured. The fractures should be covered with a geotextile fabric for separation before placing Structural Fill on the fractured rock.

- Rock should be cut at least 18 inches beneath the bottom of paved areas and the ground surface of athletic fields.

- Under utility pipes, manholes, and catch basins, rock should be cut a minimum of 12 inches beneath the pipe or structure.

- Laterally, rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.

- To reduce overblasting and the potential for heaved rock, drill holes for blasting should not extend more than 2 feet beneath the minimum depths shown above.

- To reduce the potential for damage to the existing building during blasting operations, rock blasting should be controlled to reduce vibrations and airblast overpressure to below thresholds established in the Earth Moving Specifications.

- Pre-splitting or controlled blasting may be desirable to reduce the amount of over-blast near the existing building.

- To reduce the potential for blasted rock intended for crushing mixing with organic soil, we recommend that the topsoil, roots, tree stumps, and vegetation be removed before blasting. The remainder of the overburden soils and excavatable weathered rock should not be removed before blasting.

- To help obtain information about the top of the rock for rock quantity estimating purposes, we recommend that the Earth Moving Specifications include a requirement for the contractor to perform rock probes at the site in a grid pattern before the start of blasting. The probes should be spaced at 50 feet or less. The results of the probes should include, at a minimum, the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.

4.5.2 Ground Vibration Monitoring

Rock blasting operations will generate ground vibrations that may result in minor cracks and cosmetic damage to nearby structures. To protect the adjacent structures from potential damage, construction blasting should be carefully controlled and monitored. We recommend monitoring vibrations at the ground surface and at nearby structures before and during the rock blasting operations.

We recommend a peak particle velocity (PPV) of 2 inches per second (ips) for concrete foundations and 1 ips for masonry foundations.

4.5.3 Public Notification

The human perception threshold to vibration is very low, i.e., people are far more sensitive to vibrations than are the structures they occupy. Various studies have indicated that the sound effects are noticeable at PPV values of 0.02 ips and complaints and claims of damage are likely at PPV values of 0.2 to 0.3 ips. These vibration intensities are well below the intensities that would cause structural damage to buildings. For these reasons, we recommend that the owner implement a proactive program of public notification and education of neighbors on the physical characteristics of blasting effects before the start of blasting.

4.5.4 Pre-Construction Condition Survey

We recommend that the Owner perform a pre-construction condition survey of structures located within 250 feet of the nearest blasting operation to document the existing conditions of the structures. The Owner may also consider using crack monitoring gauges to monitor large cracks identified during the pre-construction surveys.

The pre-construction survey performed by the Owner should not be a substitute to the pre-blast survey performed by the blasting contractor.

4.6 Groundwater Control Procedures

Based on the groundwater levels measured in our explorations, we anticipate that groundwater control procedures will be needed during the removal of the existing fill and during excavations for deep utilities. We also anticipate that significant quantities of groundwater will be present at the bottom of the rock excavation. Accordingly, we recommend that a groundwater control plan be designed and implemented that disposes of the groundwater by gravity. We anticipate that filtered sump pumps installed in a series of sump pump pits located at least 3 feet below the bottom of planned excavations may be sufficient to handle groundwater and surface runoff that may enter the excavation during wet weather. The contractor should be prepared to use multiple sump pumps to maintain a dry excavation during the removal of the existing fill.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary to maintain the groundwater level below the bottom of the excavation and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1 foot below the bottom of the excavations during construction. The placement of reinforcing steel or concrete in standing water should not be permitted.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use, and the sump pump pit should be restored with suitable backfill.

Proper permits should be obtained from authorities having jurisdiction over the work. At a minimum, the water collected from excavations should be filtered for fines in sedimentation basins before being discharged. The sedimentation basins could be constructed of hay bales wrapped in a geotextile fabric.

The contractor should grade the areas uphill of the proposed construction to direct surface runoff away from the construction area and should be prepared to installed swales as needed to divert the surface runoff.

4.7 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain the stability of the excavation sides and bottom.

5. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Mount Vernon Group Architects, Inc. for the specific application to the proposed Green Meadow Elementary School in Maynard, Massachusetts as conceived at this time.

6. REFERENCES

In addition to the references included in the text of the report, we used the following references:

The Commonwealth of Massachusetts (2017), "The Massachusetts State Building Code, Ninth (9th) Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Maynard MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

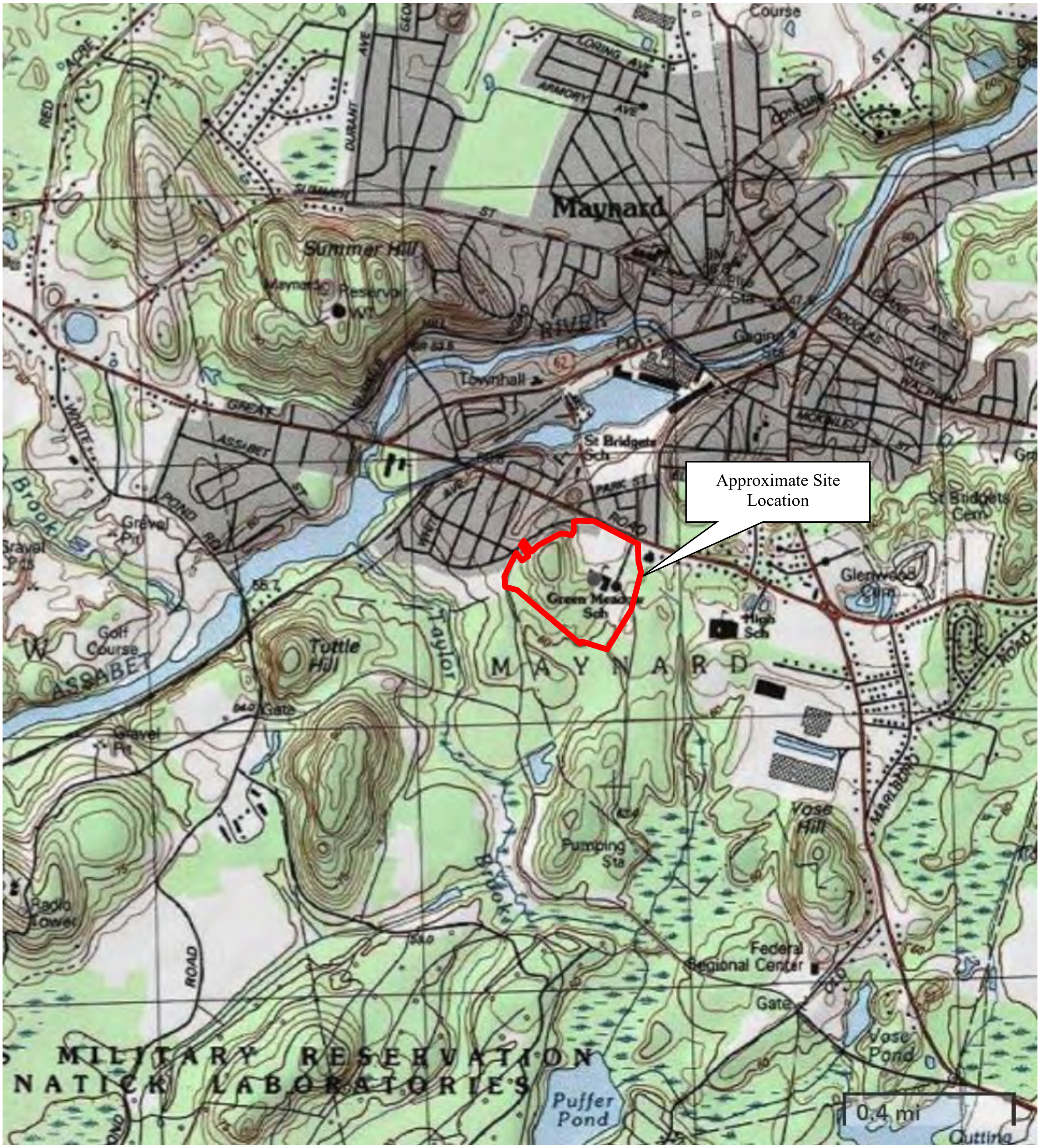
Boring No.[7]	Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Topsoil/ **Asphalt** Depth / El. (ft.)	Bottom of Subsoil Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organic Soil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Depth to Top of Rock/***Inferred Rock*** Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
2022 Explorations									
B-1	206	5.5 / 201	1.0 / 205	- / -	4.0 / 202	- / -	17.5 / 189	17.5 / 189	19.0 [4]/ 187
B-2	203	6.5 / 197	1.0 / 202	4.0 / 199	- / -	- / -	21.0 [3]/ 182	- / -	21.0 / 182
B-4	203	7.5 / 196	0.8 / 202	- / -	4.0 / 199	- / -	21.0 [3]/ 182	- / -	21.0 / 182
B-6	202	8.5 / 194	0.5 / 202	2.0 / 200	- / -	- / -	21.0 [3]/ 181	- / -	21.0 / 181
B-7	214	9.5 / 205	1.0 / 213	4.0 / 210	- / -	- / -	12.0 / 202	12.0 / 202	14.0 [4]/ 200
B-8	214	10.5 / 204	1.3 / 213	- / -	4.0 / 210	- / -	11.0 / 203	11.0 / 203	13.0 [4]/ 201
B-9	214	11.5 / 203	1.0 / 213	- / -	6.6 / 207	9.0 / 205	21.0 [3]/ 193	- / -	21.0 / 193
B-10	214	12.5 / 202	0.6 / 213	4.0 / 210	- / -	- / -	21.0 [3]/ 193	- / -	21.0 / 193
B-11	213	13.5 / 200	0.5 / 213	- / -	6.0 / 207	- / -	14.3 / 199	14.3 / 199	18.0 [4]/ 195
2024 Explorations									
B-101	213	- / -	0.5 / 213	2.0 / 211	- / -	- / -	17.5 [3]/ 196	**17.5** / 196	17.5 [5]/ 196
B-102	209	17.5 / 192	0.2 / 209	2.0 / 207	- / -	- / -	18.5 [3]/ 191	**18.5** / 191	18.5 [5]/ 191
B-103	214	- / -	0.5 / 214	4.0 / 210	2.0 / 212	- / -	16.5 [3]/ 198	**16.5** / 198	16.5 [5]/ 198
B-104-OW	214	18.5 / 196	0.3 / 214	- / -	4.0 / 210	- / -	19.2 [3]/ 195	**19.2** / 195	19.1 [5, 9]/ 195
B-105	213	- / -	0.7 / 212	- / -	2.0 / 211	- / -	12.5 / 201	**12.5** [8]/ 201	14.7 / 198
B-106	213	- / -	0.7 / 212	2.0 / 211	- / -	- / -	12.5 [3]/ 201	- / -	12.5 / 201
B-107	213	14.7 / 198	0.3 / 213	- / -	- / -	- / -	15.2 [3]/ 198	- / -	15.2 / 198
B-108	214	13.0 / 201	0.4 / 214	2.0 / 212	- / -	- / -	14.7 / 199	9.0 [8]/ 205	14.7 [4]/ 199
B-109	222	8.4 / 214	0.5 / 222	4.0 / 218	- / -	- / -	6.5 / 216	6.5 / 216	16.5 [4]/ 206
B-110	223	15.0 / 208	0.3 / 223	4.0 / 219	- / -	- / -	10.0 / 213	10.0 / 213	15.0 [4]/ 208
B-111	224	12.5 / 212	0.5 / 224	2.0 / 222	- / -	- / -	9.0 / 215	9.0 / 215	14.0 [4]/ 210
B-112	230	12.1 / 218	0.2 / 230	2.5 / 228	- / -	- / -	5.5 / 225	5.5 / 225	16.0 [4]/ 214
B-113	217	- / -	0.3 / 217	2.0 / 215	- / -	- / -	6.0 / 211	6.0 / 211	16.0 [4]/ 201
B-114-OW	232	5.0 / 227	0.4 / 232	3.0 / 229	- / -	- / -	3.0 / 229	5.0 [8]/ 227	20.0 [4, 9]/ 212
B-115	216	- / -	0.4 / 216	4.0 / 212	- / -	- / -	12.0 [3]/ 204	- / -	12.0 / 204
B-116	213	10.0 / 203	0.4 / 213	2.0 / 211	- / -	- / -	11.2 [3]/ 202	**11.2** / 202	11.2 [5]/ 202
B-117	211	- / -	- / -	8.0 / 203	6.9 / 204	- / -	12.0 [3]/ 199	- / -	12.0 / 199
B-118	207	11.5 / 196	**0.3** / 207	- / -	- / -	- / -	12.0 [3]/ 195	**12.0** / 195	12.0 [5]/ 195
B-119	209	- / -	**0.3** / 209	- / -	2.0 / 207	- / -	12.0 [3]/ 197	- / -	12.0 / 197
B-T-120	210	- / -	- / -	2.0 / 208	- / -	- / -	12.0 [3]/ 198	- / -	12.0 / 198

1. The ground surface elevation was interpolated from Drawing EX-1 titled: " Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.
2. Groundwater was measured during drilling, at the end of drilling, or based on sample moisture, whichever is shallower.
3. Boring terminated in the sand and gravel layer.
4. Boring terminated in rock.
5. Borings terminal on refusal on possible boulder or rock.
6. Boring terminated in silt layer.
7. Borings B-3 and B-5 were not performed.
8. Boulder (or possible rock) encountered at depths of 12.5 feet, 6 feet, and 3 feet beneath the ground surface in borings B-105, B-108, and B-114, respectively.
9. Groundwater observational well installed in boring.
10. "-" means layer was not encountered.

Table 2 - Summary of LGCI's Test Pits
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

Test Pit No.	Ground-Surface Elevation (ft.)	Groundwater[3] Depth /Elevation (ft.)	Bottom of Topsoil Depth /Elevation (ft.)	Bottom of Subsoil Depth /Elevation (ft.)	Bottom of Fill Depth /Elevation (ft.)	Bottom of Buried Organics Depth /Elevation (ft.)	Bottom of Sand and Gravel Depth /Elevation (ft.)	Bottom of Test Pit Depth /Elevation (ft.)
TP-1	228	- / -	0.5 / 228	2.0 / 226	- / -	- / -	7.5 [4]/ 221	7.5 [6]/ 221
TP-2	214	- / -	0.7 / 213	1.9 / 212	- / -	- / -	10.0 [4]/ 204	10.0 / 204
TP-3	214	- / -	0.5 / 214	- / -	2.5 / 212	- / -	12.0 [4]/ 202	12.0 / 202
TP-4	214	- / -	0.3 / 214	- / -	4.0 / 210	- / -	12.0 [4]/ 202	12.0 / 202
TP-5	213	- / -	0.5 / 213	- / -	1.5 / 212	- / -	10.1 [4]/ 203	10.1 [6]/ 203
TP-6	213	- / -	0.6 / 212	- / -	2.0 / 211	- / -	12.0 [4]/ 201	12.0 / 201
TP-7	234	- / -	0.5 / 234	1.5 / 233	- / -	- / -	7.5 [4]/ 227	7.5 / 227
TP-8	227	- / -	0.6 / 226	3.5 / 224	- / -	- / -	10.0 [4]/ 217	10.0 / 217
TP-9	219	7.0 / 212	0.5 / 219	- / -	- / -	- / -	7.0 [4]/ 212	7.0 [6]/ 212
TP-10	221	8.5 / 213	1.0 / 220	2.7 / 218	- / -	- / -	8.5 [4]/ 213	8.5 [6]/ 213
TP-11	204	- / -	1.0 / 203	3.0 / 201	- / -	- / -	10.8 [4]/ 193	10.8 [7]/ 193
TP-12	203	12.0 / 191	0.3 / 203	- / -	1.5 / 202	- / -	12.0 [4]/ 191	12.0 / 191
TP-14	218	8.0 / 210	0.5 / 218	1.0 / 217	- / -	- / -	12.0 [4]/ 206	12.0 / 206
TP-15	213	2.0 / 211	0.5 / 213	2.5 / 211	- / -	- / -	12.0 [4]/ 201	12.0 / 201
TP-16	212	- / -	0.5 / 212	2.0 / 210	- / -	- / -	8.5 [4]/ 204	8.5 [6]/ 204
TP-17	213	- / -	0.3 / 213	4.7 / 208	- / -	- / -	9.0 [4]/ 204	9.0 [6]/ 204
TP-18B	213	- / -	0.5 / 213	- / -	3.0 / 210	- / -	10.0 [4]/ 203	10.0 [6]/ 203
TP-19	209	- / -	1.0 / 208	2.3 / 207	- / -	- / -	12.0 [4]/ 197	12.0 / 197
TP-21	202	2.5 / 200	0.8 / 201	- / -	3.0 / 199	3.5 / 199	12.0 [4]/ 190	12.0 / 190
TP-22	202	- / -	2.0 / 200	- / -	3.0 / 199	3.5 / 199	12.0 [4]/ 190	12.0 / 190
TP-23 [5]	200	- / -	0.8 / 199	3.0 / 197	1.5 / 199	- / -	12.0 [4]/ 188	12.0 / 188
TP-26 [5]	206	- / -	0.5 / 206	2.3 / 204	- / -	- / -	11.0 [4]/ 195	11.0 / 195

1. The ground surface elevation was interpolated from Drawing EX-1 titled: " Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.
2. "-" means layer was not encountered.
3. Groundwater was measured during excavation, or at the end of excavation, whichever is shallower.
4. Test pit terminated in the sand and gravel layer.
5. Infiltrometer test was performed in test pit.
6. Test pit was terminated due to excavator refusal on possible boulder or rock.
7. Test pit was terminated due to excavation walls caving in.

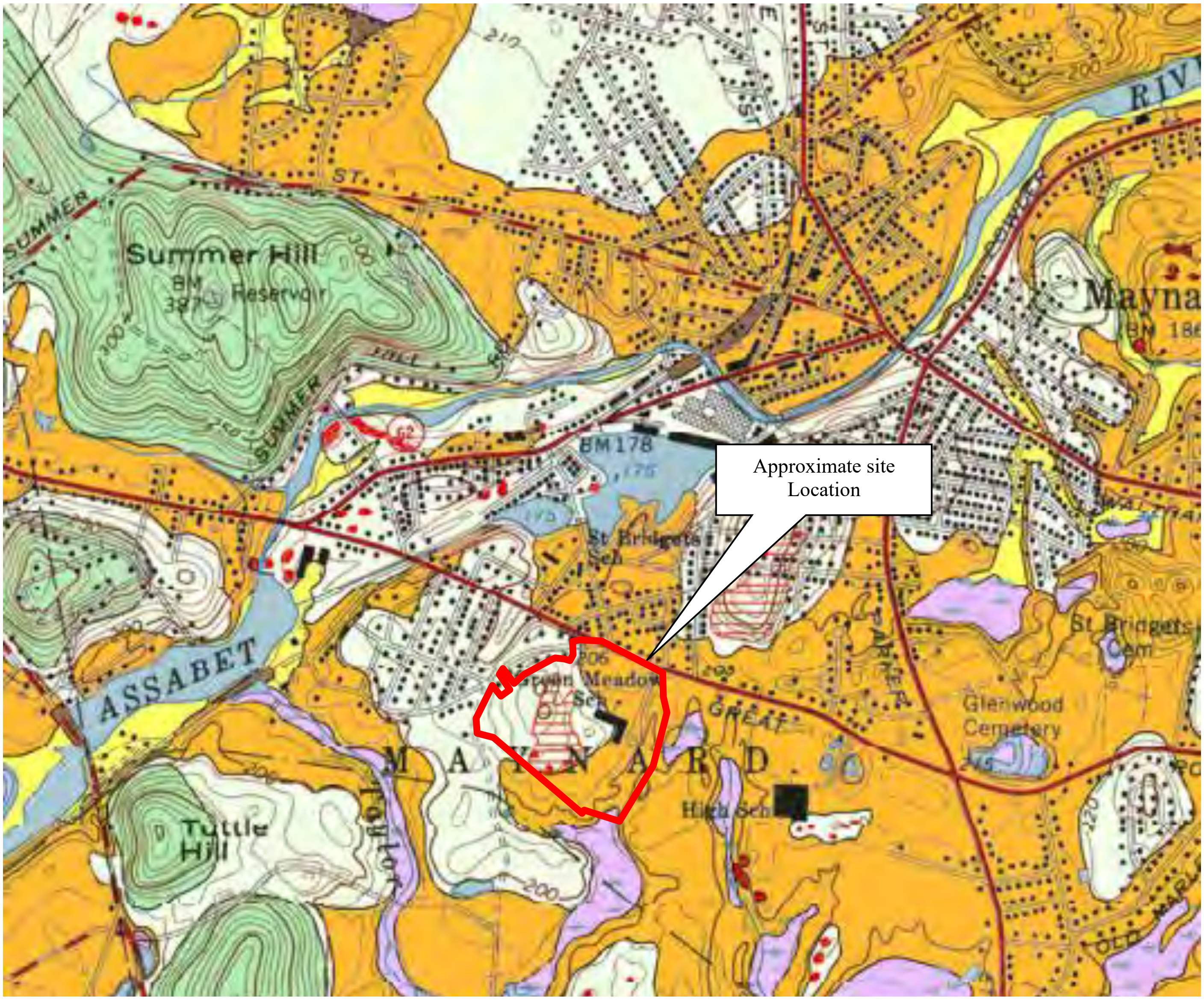


Contour Intervals: 3 meters

0.4 mi

Note: Figure based on USGS topographic map of Maynard, MA obtained from *www.*usgs.gov

Client: Mount Vernon Group Architects, Inc.	Project: Proposed Green Meadow School	Figure 1 – Site Location Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Maynard, MA	LGCI Project No.: 2201	Date: April 2024



Approximate site Location

🟩	**Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts; large surface boulders are common; unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas
🟧	**Coarse deposits** consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay
▤ ●	**Bedrock outcrops and areas of abundant outcrop or shallow bedrock**—Solid color shows extent of individual bedrock outcrops; horizontal-line pattern indicates areas of shallow bedrock or areas where small outcrops are too numerous to map individually; in areas of shallow bedrock, surficial materials are less than 5 to 10 ft thick. These units were not mapped consistently among all quadrangles; see note at beginning of appendix 1 for information on bedrock outcrop mapping by quadrangle

N

Note: Figure based on map titled: "Surficial Materials Map of the Maynard Quadrangle, Massachusetts," prepared by Stone, Byron D., and Stone, Janet R., for U.S. Geological Survey, Scientific Investigations Map 3402, Quadrangle 97 – Maynard.

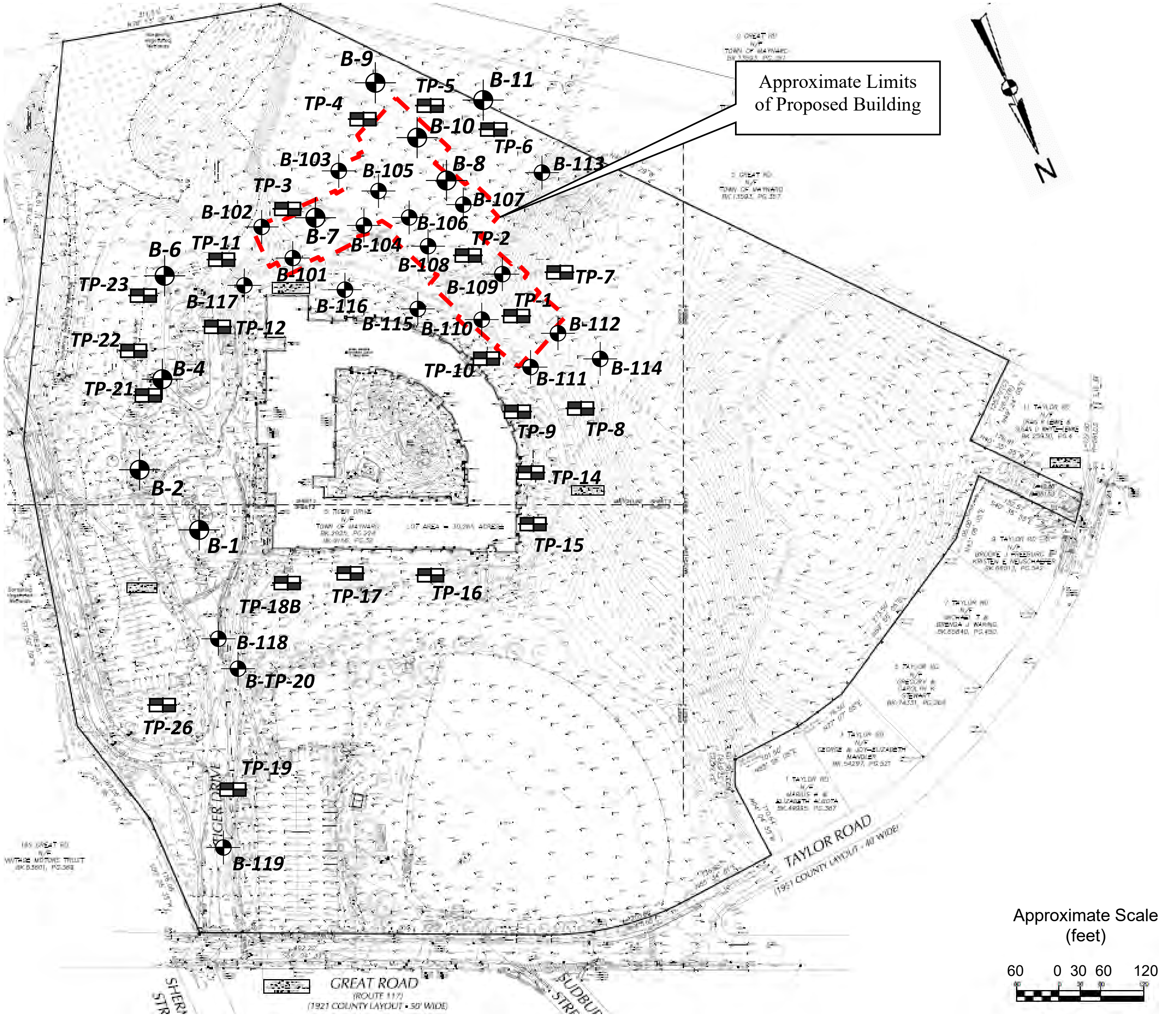
<table>
<tr><td>Client:
Mount Vernon Group Architects, Inc.</td><td>Project:
Proposed Green Meadow School</td><td colspan="2">Figure 2 – Surficial Geologic Map</td></tr>
<tr><td>LGCI
Lahlaf Geotechnical Consulting, Inc.</td><td>Project Location:
Maynard, MA</td><td>LGCI Project No.:
2201</td><td>Date:
April 2024</td></tr>
</table>

Legend

⊕ Approximate location of boring advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA between January 28 and February 1, 2022, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI). Borings B-3 and B-5 were not performed.

⊕ Approximate location of boring advanced by Soil X of Leominster, MA between February19 and 27, 2024, and observed by LGCI.

▦ Approximate location of test pit advanced by Saunders Construction of Wakefield, MA between February 6 and 9, 2024, and observed by LGCI.



Notes

1. Figure based on Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

2. Approximate limits of proposed construction alternatives are based on renderings provided to LGCI by Mount Vernon Group Architects, Inc. (MVG) via e-mail on November 7, 2022.

Client:
Mount Vernon Group Architects, Inc.

Project:
Proposed Green Meadow School

Figure 3 – Boring and Test Pit Location Plan

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Maynard, MA

LGCI Project No.:
2201

Date:
April. 2024

Appendix A – LGCI’s Boring Logs

BORING LOG

B-1
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/1/22 **DATE COMPLETED:** 2/1/22
BORING LOCATION: Near northern edge of proposed addition
COORDINATES: NA
SURFACE El.: 206 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 9.0 ft. / El. 197.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 5.5 ft. / El. 200.5 ft.
▽ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	205.0	0 2	S1	17-40-46-25 (86)	24/22	1	Topsoil	1.0 205.0	REMARK 1: Soil was frozen between depths of 0' and 2'. S1 - Top 12": Topsoil
							Fill		Bot. 10": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 35-40% coarse subangular gravel, trace of organic soil, brown, moist
		2 4	S2	12-11-10-10 (21)	24/9			4.0 202.0	S2 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 20-25% fine to coarse subrounded to subangular gravel, trace of organic soil, brown, moist
5	200.0	4 6	S3	4-4-4-7 (8)	24/9		Sand and Gravel	▼	S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
10	195.0	9 11	S4	12-9-22-25 (31)	24/22			▽	S4 - Silty SAND (SM), fine to medium, 15-20% fines, ~10% fine subrounded gravel, brown with orange mottles, wet
						2			REMARK 2: Drill rig chattering at depth of 12' on possible cobble.
15	190.0	14 16	S5	9-13-28-48 (41)	24/14				S5 - Similar to S4, ~20% fines
						3		17.5 188.5	REMARK 3: Drill rig chattering at depth of 17.5' on possible rock.
						4	Rock	19.0	REMARK 4: Roller bit advanced between depths of 17.5 to 19' to confirm presence of rock.
20	185.0								Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-2

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/1/22 **DATE COMPLETED:** 2/1/22

BORING LOCATION: Near eastern edge of proposed addition

COORDINATES: NA

SURFACE El.: 203 ft. (see note 1) **TOTAL DEPTH:** 21 ft.

WEATHER: 20's / Cloudy

GROUNDWATER LEVELS:

▽ **DURING DRILLING:** 9.0 ft. / El. 194.0 ft. Based on sample moisture

▼ **AT END OF DRILLING:** 7.8 ft. / El. 195.2 ft.

▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.

DRILLING FOREMAN: Tim Tucker

DRILLING METHOD: Drive and wash with 4-inch casing

DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig

HAMMER TYPE: Automatic

HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.

SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.

CORE BARREL SIZE: NA

LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	13-39-45-17 (84)	24/24	1	Topsoil	1.0 202.0	REMARK 1: Soil was frozen between depths of 0' and 2.5'. S1 - Top 12": Topsoil
							Subsoil		Bot. 12": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% coarse subangular gravel, trace of organic soil, light brown, moist
	200.0	2 4	S2	12-13-8-7 (21)	24/15			4.0 199.0	S2 - Similar to S1, 15-20% fine subangular gravel
5		4 6	S3	7-7-7-7 (14)	24/15		Sand and Gravel		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
	195.0							▼ ▽	
10		9 11	S4	6-10-12-13 (22)	24/14				S4 - Similar to S3, wet
	190.0							14.0 189.0	
15		14 16	S5	4-3-6-7 (9)	24/18		Silt		S5 - Silt (ML), slightly plastic, 10-15% fine sand, brown, wet
	185.0							19.0 184.0	
20		19 21	S6	14-20-31-26 (51)	24/8		Sand and Gravel	21.0	S6 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 5-10% fines, 15-20% fine to medium sand, brown, moist
									Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
	180.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22 **DATE COMPLETED:** 2/1/22
BORING LOCATION: Near eastern edge of proposed addition
COORDINATES: NA
SURFACE El.: 203 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 9.0 ft. / El. 194.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 10.0 ft. / El. 193.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 1.5	S1	15-70-30 (100)	18/18	1	Topsoil	0.8 202.2	REMARK 1: Soil was frozen between depths of 0' and 1'. S1 - Top 9": Topsoil
	200.0	2 4	S2	8-9-27-24 (36)	24/8		Fill	4.0 199.0	Bot. 9": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, light brown, moist S2 - Similar to S1 Bot. 9", 20-25% fines, 40-45% fine to coarse subangular gravel
5		4 6	S3	5-4-4-10 (8)	24/12		Sand and Gravel		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, brown, moist
	195.0								
10		9 9.3	S4	100/4"	4/2			∇ ▼	S4 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 40-45% fine to coarse subangular gravel, trace of weathered rock, brown, wet
						2			REMARK 2: Drill rig chattering between depths of 11' and 12' on possible cobbles or boulder.
	190.0								
15		14 16	S5	35-23-25-17 (48)	24/10				S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 10-15% fines, 15-20% fine to coarse sand, trace of weathered rock, brown, wet
	185.0					3			REMARK 3: Drill rig chattering between depths of 17' to 17.5' on possible cobbles or boulder.
20		19 21	S6	12-33-39-41 (72)	24/12			21.0	S6 - Similar to S5, 25-30% fine to coarse sand
									Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
	180.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22
DATE COMPLETED: 1/31/22
BORING LOCATION: Near SE corner of proposed addition
COORDINATES: NA
SURFACE El.: 202 ft. (see note 1)
TOTAL DEPTH: 21 ft.
WEATHER: 20's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 4.0 ft. / El. 198.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 8.9 ft. / El. 193.1 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO
CHECKED BY: NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	200.0	0	S1	22-24-11-8 (35)	24/24	1	Topsoil Subsoil	0.5 201.5 2.0 200.0	REMARK 1: Soil was frozen between depths of 0' and 1'. S1 - Top 6": Topsoil Bot. 18": Silty SAND (SM), mostly fine, ~20% fines, trace of roots, trace of organic soil, dark brown, moist
		2	S2	6-6-5-5 (11)	24/17		Sand and Gravel		S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace gravel, tan, moist
5		4	S3	4-6-7-8 (13)	24/9			▽	S3 - Similar to S2, wet
	195.0	6	S4	9-8-8-8 (16)	24/14				S4 - Similar to S2, wet
		8	S5	4-4-5-7 (9)	24/9			▼	S5 - Similar to S2, wet
10		10	S6	2-4-3-6 (7)	24/14				S6 - Similar to S2, wet
	190.0	12	S7	10-27-39-32 (66)	24/20				S7 - Top 10": Similar to S2, wet Bot 10": Silty SAND with Gravel (SM), mostly fine, 15-20% fines, 30-35% fine to coarse subangular gravel, trace of weathered rock, light brown, wet
15		14	S8	15-21-26-20 (47)	24/8				S8 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded to subangular, 10-15% fines, 15-20% fine to coarse sand, trace of weathered rock, brown, wet
	185.0	16				2			REMARK 2: Drill rig chattering between depths of 17' to 18' on possible cobbles or boulder.
20		19	S9	13-10-7-27 (17)	24/5			21.0	S9 - Similar to S8, subangular, 5-10% fines
	180.0	21							Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 3 bags of gravel.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near NE corner of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.5 ft. / El. 201.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	13-12-5-6 (17)	24/24		Topsoil	1.0 213.0	S1 - Top 12": Topsoil Bot. 12": Silty SAND (SM), fine, 15-20% slightly plastic fines, trace of organic soil, trace of roots, light brown, moist
	210.0	2	S2	7-7-10-9 (17)	24/18		Subsoil	4.0 210.0	S2 - Top 13": Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, light brown, moist Bot. 5": Silty SAND (SM), fine to medium, 20-25% slightly plastic fines, brown, moist
5		4	S3	7-12-17-34 (29)	24/12		Sand and Gravel		S3 - Silty SAND (SM), fine to medium, 15-20% fines, brown, moist
		6	S4	46-48-37-31 (85)	24/16				S4 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 15-20% fine to medium sand, trace of weathered rock, brown, moist
	205.0	8							
10		9	S5	28-28-32-23 (60)	24/10			12.0 202.0	S5 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded, ~15% fines, 40-45% fine to coarse sand, trace of weathered rock, light brown, moist
		11				1	Rock	14.0	▼ REMARK 1: Roller bit advanced between depths of 12' to 14' to confirm presence of rock.
15	200.0								Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings and 2 bags of gravel.
20	195.0								
25	190.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22 **DATE COMPLETED:** 1/31/22

BORING LOCATION: Near NW corner of proposed building

COORDINATES: NA

SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 13 ft.

WEATHER: 20's / Sunny

GROUNDWATER LEVELS:

▽ **DURING DRILLING:** Not Encountered

▼ **AT END OF DRILLING:** Not Encountered

▽ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.

DRILLING FOREMAN: Tim Tucker

DRILLING METHOD: Drive and wash with 4-inch casing

DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig

HAMMER TYPE: Automatic

HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.

SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.

CORE BARREL SIZE: NA

LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	19-15-75-25 (90)	24/24	1	Topsoil	1.3 212.7	REMARK 1: Soil was frozen between depths of 0' and 2'. S1 - Top 16": Topsoil
	210.0	2 4	S2	17-17-11-15 (28)	24/15	2	Fill	4.0 210.0	Bot. 8": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, brown, moist S2 - Similar to S1 Bot. 8", 15-20% fine angular gravel, trace roots REMARK 2: Drill rig chattering between depths of 3' to 4' on possible cobbles or boulder.
5		4 5	S3	78-100	12/6		Sand and Gravel		S3 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, ~10% fines, 15-20% fine to coarse sand, trace of weathered rock, light brown, moist
		6 8	S4	68-62-42-68 (104)	24/18				S4 - Top 12": Similar to S3, 40-45% fine to coarse sand Bot. 6": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace fine subrounded gravel, light brown, moist
10	205.0	9 9.9	S5	61-100/5" (100/5")	11/7	3 4		11.0 203.0	REMARK 3: Drill rig chattering at depth of 8.5' on possible cobbles or boulder. S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse subangular, ~10% fines, ~30% fine to coarse sand, trace of weathered rock, light brown, moist REMARK 4: Drill rig chattering at depth of 11' on rock.
						5	Rock	13.0	REMARK 5: Roller bit advanced between depths of 11' to 13' to confirm presence of rock.
15	200.0								Bottom of borehole at 13.0 feet. Backfilled borehole with drill cuttings.
20	195.0								
25	190.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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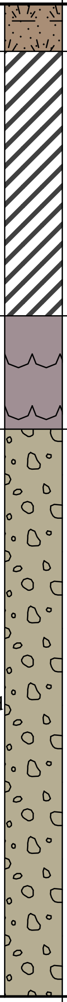
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near SE corner of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 9.0 ft. / El. 205.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 12.5 ft. / El. 201.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0-2	S1	14-19-21-14 (40)	24/18		Topsoil		S1 - Top 12": Topsoil
							Fill	1.0 213.0	Bot. 6": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace of organic soil, trace of roots, light brown, moist
		2-4	S2	10-8-7-3 (15)	24/6				S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 25-30% fine subrounded gravel, light brown, moist
5	210.0	4-6	S3	6-6-5-5 (11)	24/0				S3 - No recovery
		6-8	S4	4-4-5-13 (9)	24/9				S4 - Top 7": Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 20-25% fine to medium sand, trace of organic soil, light brown, moist
							Buried Organic Soil	6.6 207.4	Bot. 2": Silty SAND (SM), fine, 30-35% fines, trace of organic soil, organic odor, black, moist
10	205.0	9-11	S5	18-15-13-17 (28)	24/7		Sand and Gravel	9.0 ▽ 205.0	S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, ~15% fine to coarse sand, trace of weathered rock, brown, wet
								▼	
15	200.0	14-16	S6	4-6-8-8 (14)	24/9				S6 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace of weathered rock, light brown, wet
20	195.0	19-21	S7	7-8-6-6 (14)	24/7				S7 - Silty GRAVEL with Sand (GM), fine to coarse, subangular, 15-20% fines, 30-35% fine to medium sand, trace of weathered rock, light brown, wet
25	190.0							21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 2.5 bags of gravel.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22
DATE COMPLETED: 1/28/22
BORING LOCATION: Near center of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1)
TOTAL DEPTH: 21 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 6.0 ft. / El. 208.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 12.0 ft. / El. 202.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO
CHECKED BY: NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0-2	S1	14-33-26-9 (59)	24/22		Topsoil	0.6 213.4	S1 - Top 7": Topsoil
							Subsoil		Bot. 15": Silty SAND (SM), fine to coarse, 15-20% slightly plastic fines, trace of organic soil, light brown, moist
		2-4	S2	5-2-3-3 (5)	24/14				S2 - Silty SAND (SM), fine, 15-20% slightly plastic fines, trace of organic soil, light brown, moist
	210.0							4.0 210.0	
5		4-6	S3	1-2-1-2 (3)	24/16		Sand and Gravel		S3 - Silty SAND (SM), mostly fine, ~20% slightly plastic fines, trace of roots, light brown, moist
		6-8	S4	13-11-9-14 (20)	24/13			▽	S4 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded, 15-20% fines, 20-25% fine to medium sand, trace of weathered rock, light brown, moist
	205.0								
10		9-11	S5	7-10-13-12 (23)	24/10				S5 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 40-45% fine to coarse subrounded gravel, brown, wet
								▼	
						1			REMARK 1: Drill rig chattering at depth of 13' on possible cobbles or boulder.
	200.0								
15		14-16	S6	6-5-5-7 (10)	24/8				S6 - Silty SAND (SM), fine to medium, 15-20% fines, 5-10% fine subrounded gravel, brown, wet
	195.0								
20		19-21	S7	10-12-31-49 (43)	24/12			21.0	S7 - Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 25-30% fine subrounded gravel, trace of weathered rock, brown, wet
									Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 4 bags of gravel.
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near SW corner of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 18 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 15.7 ft. / El. 197.3 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	31-70-29-32 (99)	24/16		Topsoil	0.5 212.5	S1 - Top 6": Topsoil Bot. 10": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% coarse subrounded gravel, light brown, moist
	210.0	2	S2	23-32-21-23 (53)	24/20		Fill		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded to angular gravel, orange to brown, moist
5		4	S3	7-24-14-14 (38)	24/9			6.0 207.0	S3 - Top 5": Silty SAND (SM), fine, trace medium, ~15% fines, 5-10% fine subrounded gravel, trace of roots, light brown, moist Bot. 4": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, ~20% fine to coarse subangular gravel, brown, moist (appears reworked)
	205.0	6	S4	16-10-9-9 (19)	24/13		Sand and Gravel		S4 - Top 6": Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, 15-20% fine to medium sand, brown, moist Bot. 7": Poorly Graded SAND (SP), fine to medium, 0-5% fines, 5-10% fine subrounded gravel, brown, moist
		8							
10		9	S5	6-8-5-4 (13)	24/6				S5 - Similar to S4 Bot. 7", 10-15% coarse subrounded gravel
	200.0	11							
15		14 14.3	S6	62/3"	3/0	1 2	Rock	14.3 198.7	REMARK 1: Split spoon refusal encountered at depth of 14.3' on rock, tip of split spoon broke into two pieces. S6 - No recovery ▼ REMARK 2: Roller bit advanced between depths of 14.3' to 18' to confirm presence of rock.
	195.0							18.0	Bottom of borehole at 18.0 feet. Backfilled borehole with drill cuttings and 0.5 bag of gravel.
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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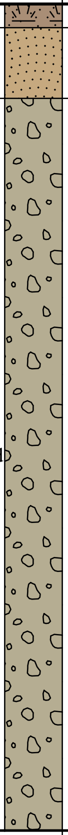
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/19/24
BORING LOCATION: Near NE corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 17.5 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 - 2	S1	1-1-1-2 (2)	24/15		Topsoil	0.5 212.5	S1 - Top 6": Topsoil
							Subsoil	2.0 211.0	Bot. 9": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine to coarse subangular gravel, trace of roots, trace of organic soil, orange
	210.0	2 - 4	S2	9-5-12-11 (17)	24/10		Sand and Gravel		S2 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 10-15% fine to coarse subangular gravel, orange to brown, moist
5		4 - 6	S3	9-11-19-23 (30)	24/19				S3 - Silty SAND with Gravel (SM), fine to medium with trace coarse, 15-20% fines, 15-20% fine to coarse subrounded gravel, light brown to orange, moist
	205.0	6 - 8	S4	22-24-29-28 (53)	24/2				S4 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 10-15% fines, 25-30% fine to coarse sand, trace of roots, grey, moist
10		10 - 12	S5	4-4-4-5 (8)	24/12				S5 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown, moist
	200.0	12 - 14	S6	27-20-11-11 (31)	24/11				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 35-40% fine to coarse subangular gravel, orange to brown, moist
15	195.0					1		17.5	REMARK 1: HSA refusal at depth of 17.5' on possible rock or boulder. Bottom of borehole at 17.5 feet. Backfilled borehole with drill cuttings.
20	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/19/24
BORING LOCATION: Near SE corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 209 ft. (see note 1) **TOTAL DEPTH:** 18.5 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 17.5 ft. / El. 191.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	1-1-2-4 (3)	24/15		Topsoil Subsoil	0.2 208.8 2.0 207.0	S1 - Top 2": Topsoil Bot. 13": Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse subangular gravel, trace of roots, trace of organic soil, trace of wood, orange, moist
	205.0	2 4	S2	7-7-14-12 (21)	24/10		Sand and Gravel		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, light brown to orange, moist
5		4 6	S3	11-10-10-8 (20)	24/10				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, light brown to orange, moist
		6 8	S4	9-8-8-8 (16)	24/7				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, trace of roots, light brown to orange, moist
10	200.0								
		10 12	S5	4-4-5-4 (9)	24/17				S5 - Well Graded SAND (SW), fine to coarse, ~5% fines, ~10% fine to coarse subangular gravel, light brown, moist
15	195.0								
		15 17	S6	22-61-38-23 (99)	24/18				S6 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, light brown to orange, moist ▼
						1		18.5	REMARK 1: HSA refusal at depth of 18.5' on possible rock or boulder. Bottom of borehole at 18.5 feet. Backfilled borehole with drill cuttings.
20	190.0								
25	185.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/20/24 **DATE COMPLETED:** 2/20/24

BORING LOCATION: Near SW corner of eastern wing of proposed building

COORDINATES: NA

SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 16.6 ft.

WEATHER: 30's / Sunny

GROUNDWATER LEVELS:

∇ **DURING DRILLING:** Not Encountered

▼ **AT END OF DRILLING:** -

▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.

DRILLING FOREMAN: Edwin Fajardo

DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)

DRILL RIG TYPE/MODEL: Diedrich D-70 turbo

HAMMER TYPE: Automatic

HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.

SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.

CORE BARREL SIZE: NA

LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	3-6-7-8 (13)	24/13		Topsoil	0.5 213.5	S1 - Top 6": Topsoil
							Fill	2.0 212.0	Bot. 7": Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 0-5% fine subangular gravel, brown to orange, moist
		2	S2	17-12-9-10 (21)	24/16		Subsoil	4.0 210.0	S2 - Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 0-5% fine subangular gravel, orange, moist
	210.0	4	S3	11-14-44-19 (58)	24/10		Sand and Gravel		S3 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 0-5% fines, 35-40% fine to coarse sand, light brown to brown, moist
5									
		6	S4	14-14-15-14 (29)	24/15				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, brown to orange, moist
		8							
	205.0								
10		10	S5	10-11-11-10 (22)	24/3				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, brown to orange, moist
		12							
	200.0								
15		15	S6	28-42-60/2" (102/8")	14/11			16.6	S6 - Silty SAND with Silt (SM), fine to coarse, ~15% fines, 10-15% fine to coarse subangular gravel, brown to grey, moist
		16.2							
		16.5 16.6	S7	100/1"	1/0	1			REMARK 1: Auger and split spoon refusal at depth of 16.5' on possible large boulder or rock. S7 - No Recovery Bottom of borehole at 16.6 feet. Borehole backfilled with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/20/24
BORING LOCATION: Near NW corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 19.2 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 19.0 ft. / El. 195.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 18.5 ft. / El. 195.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.3 213.7	S1 - Top 4": Topsoil
		0–2	S1	4-5-6-11 (11)	24/18		Fill		Bot. 14": Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 0-5% fine subangular gravel, trace of roots, trace of wood, orange, moist
	210.0	2–4	S2	6-7-10-15 (17)	24/15		Fill	4.0 210.0	S2 - Silty SAND (SM), fine to medium with trace coarse, 40-45% fines, 10-15% fine subrounded gravel, trace of weathered rock, orange, moist
5		4–6	S3	12-10-12-13 (22)	24/24		Sand and Gravel		S3 - Silty SAND (SM), fine to medium, ~20% fines, 0-5% fines subangular gravel, brown, moist
		6–8	S4	18-62-36-34 (98)	24/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 40-45% fine to coarse subangular gravel, brown to grey, moist
	205.0	8							
10		10–12	S5	16-25-21-34 (46)	24/12				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown to light brown, moist
	200.0	12							
15		15–17	S6	73-52-32-51 (84)	24/13				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 30-35% fine to coarse subangular gravel, brown to light brown, moist
	195.0	19–19.2	S7	100/2"	2/2	1		19.2 ▼ ∇	REMARK 1: HSA refusal at depth of 19' on possible rock, then attempted split spoon sampling. S7 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 30-35% fine angular gravel, trace of weathered rock, brown, wet
20									Bottom of borehole at 19.2 feet. Groundwater observation well installed to depth of 19.2 ft.
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24 **DATE COMPLETED:** 2/26/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 14.7 ft.
WEATHER: 40's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 1.7	S1	5-33-63-52/2" (96)	20/19		Topsoil	0.7 212.3	S1 - Top 8": Topsoil
							Fill	2.0 211.0	Bot. 11": Poorly Graded GRAVEL with Silt and Sand (GP-GM), mostly fine with coarse, subangular, ~10% fines, ~40% fine to coarse sand, brown to grey, moist (appears to be reworked)
	210.0	2 2.7	S2	30-75/2" (75/2")	8/8		Sand and Gravel		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse gravel, light brown with orange stripes, moist
5		4 6	S3	29-33-68-39 (101)	24/12				S3 - Poorly Graded GRAVEL with Silt and Sand (GP-GM), mostly coarse, subangular to angular, 0-5% fines, 20-25% fine to coarse sand, trace of weathered rock, brown, moist
		6 7	S4	42-63	12/11				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, grey brown, moist
	205.0								
10		10 12	S5	34-51-30-26 (81)	24/14			12.5 200.5	S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, grey to brown, moist
	200.0	12.5 14	C1		18/7.5		Boulder	14.0 199.0	C1 - min/ft: 2.5, .9 Pen.: 18" Rec.: 7.5" Boulder, hard, GRANITE, medium grained, grey to white
15		14 14.7	S6	11-100/2" (100/2")	8/2	1	Silt	14.7	REMARK 1: Advanced roller bit from 14 ft. to 16 ft. S6 - Sandy SILT with Gravel (ML), slightly plastic, 30-35% fine to coarse sand, 15-20% fine to coarse subangular gravel, grey brown, wet Bottom of borehole at 14.7 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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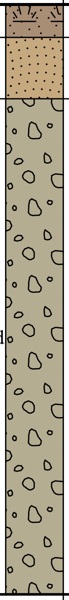
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Near center of western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 12.5 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 - 2	S1	5-7-8-7 (15)	24/16		Topsoil	0.7 212.3	S1 - Top 8": Topsoil
							Subsoil	2.0 211.0	Bot. 8": Silty SAND (SM), fine to medium, 20-25% fines, 10-15% fine to coarse subangular gravel, trace of weathered rock, orange, moist
	210.0	2 - 4	S2	13-15-14-23 (29)	24/14		Sand and Gravel		S2 - Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine subangular gravel, brown, moist
5		4 - 6	S3	23-18-21-53 (39)	24/10				S3 - Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine subangular gravel, brown to orange, moist
	205.0								
10		10 - 11.3	S4	38-51-50/4" (101/10")	16/16			12.5	S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, grey, moist
	200.0								Bottom of borehole at 12.5 feet. Backfilled borehole with drill cuttings.
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24
DATE COMPLETED: 2/26/24
BORING LOCATION: Near center of western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1)
TOTAL DEPTH: 15.2 ft.
WEATHER: 40's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 15.0 ft. / El. 198.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 14.7 ft. / El. 198.3 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
0 - 2	S1	3-6-11-11 (17)	24/20		Topsoil	0.3 212.7	S1 - Top 4": Topsoil Bot. 16": Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 0-5% fine to coarse subangular gravel, light brown, moist
2 - 4	S2	9-16-16-17 (32)	24/18		Sand and Gravel		S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 5-10% fine to coarse subangular gravel, light brown, moist
4 - 6	S3	12-12-23-36 (35)	24/21				S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 5-10% fine to coarse gravel, light brown, moist
6 - 7.5	S4	58-47-79 (126)	18/15				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine to coarse angular gravel, trace of weathered rock, brown to grey, moist
10 - 10.7	S5	38-100/2" (100/2")	8/8				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine to coarse angular gravel, trace of weathered rock, brown to grey, moist
15 - 15.2	S6	105/2"	2/2			15.2 ▼ ▽	S6 - Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, brown, wet

Bottom of borehole at 15.2 feet. Backfilled borehole with drill cuttings.

Depth (ft.)	El. (ft.)
	210.0
5	205.0
10	200.0
15	195.0
20	190.0
25	

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24 **DATE COMPLETED:** 2/27/24

BORING LOCATION: Near center of western wing of proposed building

COORDINATES: NA

SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 14.7 ft.

WEATHER: 40's / Sunny

GROUNDWATER LEVELS:

▽ **DURING DRILLING:** 14.5 ft. / El. 199.5 ft. Based on sample moisture

▼ **AT END OF DRILLING:** 13.0 ft. / El. 201.0 ft.

▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.

DRILLING FOREMAN: Edwin Fajardo

DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)

DRILL RIG TYPE/MODEL: Diedrich D-70 turbo

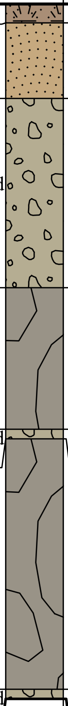
HAMMER TYPE: Automatic

HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.

SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.

CORE BARREL SIZE: NA

LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-2-1-2 (3)	24/18		Topsoil	0.4 213.6	S1 - Top 5": Topsoil
							Subsoil	2.0 212.0	Bot. 13": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine subangular gravel, trace of roots, orange, moist
		2	S2	5-6-7-7 (13)	24/17		Sand and Gravel		S2 - Silty SAND (SM), fine to medium, 15-20% fines, light brown, moist
5	210.0	4	S3	6-8-30-70/3" (38)	21/21			6.0 208.0	S3 - Sandy SILT (ML), slightly plastic, 35-40% fine to coarse sand, ~20% fine to coarse subangular gravel, brown, moist
		5.8				1	Boulder	9.0 205.0	REMARK 1: Advanced roller bit from 6.0 ft. to 9.0 ft.
10	205.0	9 9.3	S4	100/3"	3/3	2	Sand and Gravel	9.2 204.8	S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, light brown, moist REMARK 2: Split spoon refusal at 9.2 feet. Drillers advanced roller bit to 10.5 ft., and then started rock core.
	200.0	10.5	C1		48/37		Boulder	▼ 14.5 ▽ 199.5	C1 - min/ft: 4.4, 3.3, 3.7, 1.8 RQD: 41.6% Hard, slightly to moderately weathered, moderately fractured, grey to orange, coarse grained, GRANITE
15		14.5 14.7	S5	100/2"	2/2	3	Sand and Gravel	14.7	S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~15% fine to coarse subangular gravel, trace of weathered rock, light brown to grey, wet REMARK 3: Split spoon refusal on possible boulders or rocks, boring terminated at depth of 14.7'. Bottom of borehole at 14.7 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/23/24 **DATE COMPLETED:** 2/23/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 222 ft. (see note 1) **TOTAL DEPTH:** 16.5 ft.
WEATHER: 30's / Rainy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 8.4 ft. / El. 213.6 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 0.5	G1		6/6	1	Topsoil	0.5 221.5	G1 - Topsoil REMARK 1: Topsoil removed during tree clearing, estimated .5' of topsoil.
	220.0	0.5 2.5	S1	1-1-1-1 (2)	24/14		Subsoil		S1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
		2.5 4.5	S2	1-2-2-2 (4)	24/17			4.0 218.0	S2 - Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 5-10% fines, trace of roots, light brown, moist
5		4.5 6.2	S3	7-23-22-82/2" (45)	20/19		Sand and Gravel	6.5 215.5	S3 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 10-15% fines, 30-35% fine to coarse sand, brown to dark grey, moist
10	215.0	6.5 11.5	C1		60/52	2	Rock		REMARK 2: HSA Refusal on possible rock at a depth of 6.5 feet. Driller advanced 3-inch casing to perform a rock core. C1 - min/ft: 5.1, 3.9, 4.2, 4.8, 4.9 RQD: 76.7% ▼ Hard to Very Hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
15	210.0	11.5 16.5	C2		60/46			16.5	C2 - min/ft: 4.1, 4.5, 4.2, 3.6, 3.7 RQD: 59.2% Hard to Very Hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
20 25	205.0 200.0								Bottom of borehole at 16.5 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24 **DATE COMPLETED:** 2/22/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 223 ft. (see note 1) **TOTAL DEPTH:** 15 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 15.0 ft. / El. 208.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.3 222.7	S1 - Top 4": Topsoil
			S1	1-1-1-2 (2)	24/14		Subsoil		Bot. 10": Silty SAND with Silt (SM), fine to medium, 15-20% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
	220.0	2	S2	2-2-5-16 (7)	24/16				S2 - Sandy SILT (ML), nonplastic, 40-45% fine sand, trace of roots, orange brown, moist
5		4	S3	22-19-14-12 (33)	24/15		Sand and Gravel	4.0 219.0	S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25% fine subangular gravel, brown, moist
	215.0	6	S4	14-16-16-18 (32)	24/17				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		8							
10		10	C1		60/60	1	Rock	10.0 213.0	REMARK 1: HSA refusal at depth of 10'. 3-inch casing was driven to 10' below ground surface and rock coring advanced. C1 - min/ft: 4.9, 4.4, 4.2, 4.9, 6.2 RQD: 65.8% Hard to very hard, moderately to slightly weathered, moderately fractured, orange to grey, medium grained, GRANITE
	210.0								
15		15						15.0 ▼	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	205.0								
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24 **DATE COMPLETED:** 2/22/24
BORING LOCATION: Near NE corner of western wing of proposed building
COORDINATES: NA
SURFACE El.: 224 ft. (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.5 ft. / El. 211.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-3-2 (6)	24/17		Topsoil	0.5 223.5	S1 - Top 6": Topsoil
							Subsoil	2.0 222.0	Bot. 11": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine subangular gravel, trace of roots, orange brown, moist
		2	S2	7-17-35-21 (52)	24/17		Sand and Gravel		S2 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse subangular gravel, brown, moist
5	220.0	4	S3	19-19-20-16 (39)	24/20				S3 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 5-10% fine subangular gravel, grey to orange, moist
		6 7.5	S4	9-21-108 (129)	18/15				S4 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, ~10% fine to coarse subrounded gravel, trace of roots, grey to orange, moist
	215.0	9	C1		12/12	1	Rock	9.0 215.0	REMARK 1: HSA refusal at depth of 9' on possible rock, advanced 3-inch casing to perform a rock core. C1 - min/ft: 11.9 RQD: 45.8% Hard, slightly weathered, moderately fractured, grey to tan, coarse grained, GRANITE
10		10	C2		48/47.5	2			REMARK 2: Core barrel jamming and terminated C1 at depth of 10'. C2 - min/ft: 5.6, 7.0, 3.9, 4.1 RQD: 73.9% ▼ Top 26": Hard, slightly weathered, moderately to slightly fractured, grey to tan, coarse grained, GRANITE Bot. 22": Hard, slightly weathered, slightly fractured, grey to white, medium grained, GRANITE
	210.0	14				3		14.0	REMARK 3: Core barrel jamming and terminated C2 at depth of 14'. Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings and 1 bag of sand.
15									
	205.0								
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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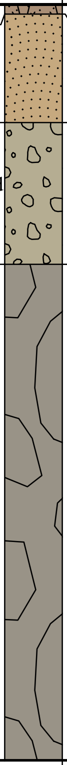
CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/21/24 **DATE COMPLETED:** 2/21/24
BORING LOCATION: Near NW corner of western wing of proposed building
COORDINATES: NA
SURFACE El.: 230 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.1 ft. / El. 217.9 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 - 2	S1	1-1-15-11 (16)	24/4		Topsoil	0.2 229.8	S1 - Top 2": Topsoil
							Subsoil	2.5 227.5	Bot. 2": Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 15-20% fine to coarse angular gravel, trace of organic soil, trace of roots, orange to brown, moist
		2 - 4	S2	8-6-12-19 (18)	24/19				S2 - Top 6": Silty SAND (SM), fine to medium, 15-20% fines, 5-10% fine to coarse angular gravel, trace of organic soil, trace of roots, orange to brown, moist
							Sand and Gravel	5.5 224.5	Bot. 13": Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, ~15% fine subangular gravel, trace of roots, moist
5	225.0	4 - 4.8	S3	21-100/3" (100/3")	9/9				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 25-30% fine to coarse subangular gravel, trace of weatherd rock, brown, moist
10	220.0	6 - 11	C1		60/56		Rock		C1 - min/ft: 3.3, 5.4, 4.5, 5.1, 6.1 Pen.: 60" Rec.: 56" RQD: 52.5% Hard to very hard, slightly to moderately weathered, moderately fractured, grey orange, medium grained, GRANITE
15	215.0	11 - 16	C2		60/50.5			16.0	C2 - min/ft: 5.0, 3.9, 5.2, 6.6, 9.4 Pen.: 60" Rec.: 50.5" RQD: 51.6% ▼ Hard to very hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
									Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	210.0								
25	205.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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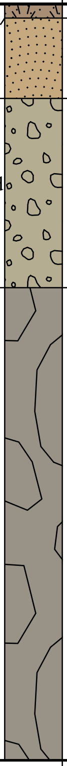
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/23/24 **DATE COMPLETED:** 2/23/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 217 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 30's / Rainy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-1-1 (2)	24/12		Topsoil	0.3 216.7	S1 - Top 4": Topsoil
							Subsoil	2.0 215.0	Bot. 8": Silty SAND (SM), fine to medium, 15-20% fines, trace of organic soil, trace of roots, trace of wood, orange, moist
	215.0	2	S2	2-4-8-15 (12)	24/20		Sand and Gravel		S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, ~15% fine to coarse subangular gravel, light brown, moist
5		4	S3	13-14-87 (101)	18/8			6.0 211.0	S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, brown to light brown, moist
		5.5							
	210.0	6	C1		60/60	1	Rock		REMARK 1: HSA refusal at depth of 6' on possible rock, advanced 3-inch casing to perform a rock core. C1 - min/ft: 3.5, 2.9, 2.8, 2.6, 2.0 Pen.: 60" Rec.: 58.5" RQD: 97.5% Hard, fresh to slightly weathered, sound to slightly fractured, grey to dark grey, medium grained, GRANITE
10	205.0	11	C2		60/58.5			16.0	C2 - min/ft: 3.0, 2.4, 2.4, 2.1, 2.7 Pen.: 60" Rec.: 58.4" RQD: 72.5% Hard, fresh to slightly weathered, sound to slightly fractured, grey to dark grey, medium grained, GRANITE
15	200.0	16							Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	195.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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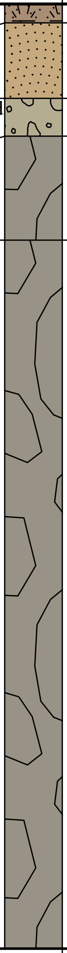
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/20/24
DATE COMPLETED: 2/21/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 232 ft. (see note 1)
TOTAL DEPTH: 20 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 5.0 ft. / El. 227.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH
CHECKED BY: SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.4 231.6	S1 - Top 5": Topsoil
	230.0		S1	1-2-3-5 (5)	24/12		Subsoil	2.0	Bot. 7": Silty SAND (SM), fine to coarse,15-20%% fines, 15-20% fine to coarse subangular gravel, trace of oranic soil, trace of roots, trace of wood, orange to brown, moist
		2	S2	58-100/4" (100/4")	10/9		Sand and Gravel	230.0 2.8 229.2	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25-30% fine to coarse subangular gravel, grey, moist
		2.8				1	Boulder		REMARK 1: Split spoon refusal at 2.8 ft. Drillers advanced roller bit to 5.0 ft., installed 3-inch casing, and started rock core.
5		5	C1		36/29		Rock	5.0 ▼ 227.0	C1 - min/ft: 4.9, 6.4, 4.3 Pen.: 36" Rec.:29" RQD: 53.1% Soft, moderately weathered, moderately fractured, grey, fine grained, GRANITE
	225.0	8	C2		24/22				C2 - min/ft: 5.3, 4.4 Pen.: 24" Rec.: 22" RQD: 52.3% Hard, slightly weathered, slightly to moderately fractured, grey to light blue, coarse grained, GRANITE
10	220.0	10	C3		60/56				C3 - min/ft: 4.5, 8.0, 4.5, 4.1, 4.3 Pen.: 60" Rec.: 56" RQD: 45.8% Top 26": Hard, moderately weathered, moderately to extremely fractured, vertical breaks, medium grained, grey to light blue, GRANITE Bot. 30": Hard, slightly weathered to fresh, slightly fractured, medium grained, grey to light brown, GRANITE
15	215.0	15	C4		60/58.5				C4 - min/ft: 5.1, 3.2, 3.6, 3.2, 3.9 Pen.: 60" Rec.: 58.5" RQD: 85.8% Hard to very hard, fresh to slightly weathered, sound to slightly fractured, grey to light blue, medium grained, GRANITE
20	210.0	20						20.0	Bottom of borehole at 20.0 feet. Groundwater observation well installed to depth of 20 ft.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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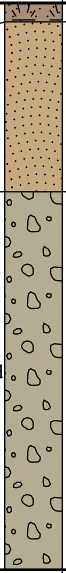
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24 **DATE COMPLETED:** 2/22/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 216 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-2-2-1 (4)	24/18		Topsoil	0.4 215.6	S1 - Top 5": Topsoil
	215.0						Subsoil		Bot. 13": Silty SAND (SM), fine to medium, 20-25% fines, trace of roots, orange, moist
		2	S2	2-2-2-5 (4)	24/21				S2 - Silty SAND (SM), fine to medium, 20-25% fines, trace of roots, orange, moist
		4	S3	6-8-10-13 (18)	24/18		Sand and Gravel	4.0 212.0	S3 - Silty SAND (SM), fine to medium, 20-25% fines, light brown to grey, moist
5	210.0								
		6	S4	12-11-17-38 (28)	24/24				S4 - Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% fine to coarse subangular gravel, grey to brown, moist
		8 8.4	S5	100/5"	5/0				S5 - No Recovery
10	205.0	10	S6	34-45-26-21 (71)	24/18				S6 - Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 15-20% fine to coarse subangular gravel, light brown, to orange, moist
		12						12.0	Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15	200.0								
20	195.0								
25									



GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/19/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 11.2 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 10.0 ft. / El. 203.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 10.5 ft. / El. 202.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-6-8-10 (14)	24/19		Topsoil	0.4 212.6	S1 - Top 5": Topsoil
							Subsoil	2.0 211.0	Bot. 14": Silty SAND (SM), fine to coarse, 15-20% fines, 0-5% fine subangular gravel, orange, moist
	210.0	2	S2	27-28-25-38 (53)	24/20		Sand and Gravel		S2 - Silty SAND (SM), fine to coarse, 15% fines, 10-15% fine subangular gravel, brown to orange, moist
5		4	S3	20-34-29-31 (63)	24/19				S3 - Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, ~20% fine to coarse gravel, brown, moist
		6 6.8	S4	52-101/3" (101/3")	9/9				S4 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 0-5% fines, 25-30% fine to coarse sand, trace of fractured rock, grey, moist
	205.0								
10		10 11.2	S5	16-17-84/2" (101/8")	14/9	1		11.2	▽ ▼ S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, light brown to brown, wet
									REMARK 1: HSA refusal at depth of 11.2' on possible rock. Bottom of borehole at 11.2 feet. Backfilled borehole with drill cuttings.
	200.0								
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24
DATE COMPLETED: 2/19/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 211 ft. (see note 1)
TOTAL DEPTH: 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** Not Encountered
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	210.0	0–2	S1	27-12-12-43 (24)	24/12		Fill		S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, brown, moist
		2–4	S2	25-21-27-28 (48)	24/17		Fill		S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, 5-10% fine to coarse subrounded gravel, trace of roots, trace of organic soil, brown, moist
5	205.0	4–6	S3	14-13-11-14 (24)	24/24		Fill		S3 - Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse gravel, trace of roots, organic odor, dark brown, moist
		6–8	S4	11-10-9-10 (19)	24/19		Fill	6.9 204.1	S4 - Top 11": Silty SAND (SM), fine to medium, 15-20% fines, ~5% fine to coarse gravel, trace of roots, organic odor, dark brown, moist
							Subsoil	8.0 203.0	Bot. 8": Silty SAND with Gravel (SM), fine to medium, ~15% fines, 5-10% fine to coarse subangular gravel, orange, moist
		8–10	S5	5-8-9-9 (17)	24/15		Sand and Gravel		S5 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine to coarse subangular gravel, trace of roots, light brown to orange, moist
10	200.0	10–12	S6	11-10-11-12 (21)	24/8		Sand and Gravel	12.0	S6 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 30-35% fine to coarse subangular gravel, light brown to orange, moist
		12							Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15	195.0								
20	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

BORING LOG

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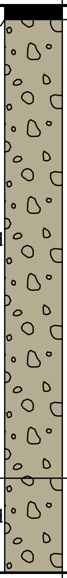
PAGE 1 OF 1

Lahlaf Geotechnical Consulting, Inc.

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Northeast of existing school
COORDINATES: NA
SURFACE El.: 207 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 11.5 ft. / El. 195.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3			3/3		Asphalt	0.3 206.7	Top 3": Asphalt
	205.0	0.3–2.3	S1	12-16-16-11 (32)	24/19		Sand and Gravel		S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist
		2.3–4.3	S2	9-11-11-10 (22)	24/16				S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist
5		4.3–6.3	S3	9-13-21-12 (34)	24/17				S3 - Top 13": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist Bot. 4": Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 20-25% fine to coarse subangular gravel, olive brown, moist
	200.0	6.3–8.3	S4	12-20-17-37 (37)	24/14				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown to orange, moist
10		10–12	S5	29-30-11-29 (41)	24/4		Sand and Gravel	10.0 197.0	S5 - Well Graded GRAVEL (GW), fine to coarse, subangular, 0-5% fines, 0-5% mostly coarse sand, trace of weathered rock, grey, moist
	195.0	12				1		12.0	▼ REMARK 1: Split spoon bent on possible boulders at depth of 12' after sampling. Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15									
	190.0								
20									
	185.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Near existing driveway entrance from Great Road
COORDINATES: NA
SURFACE El.: 209 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** NE
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3					Asphalt	0.3 208.7	Top 3": Asphalt
		0.3–2.3	S1	24-16-15-10 (31)	24/6		Fill	2.0 207.0	S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 25-30% fine to coarse subangular gravel, brown, moist
	205.0	2.3–4.3	S2	9-6-9-11 (15)	24/19		Sand and Gravel		S2 - Sandy SILT (ML), nonplastic, 30-35% fine to medium sand, grey and orange, moist
5		4.3–6.3	S3	9-46-11-10 (57)	24/14				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		6.3–8.3	S4	5-5-6-8 (11)	24/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
	200.0	8–10	S5	9-14-7-8 (21)	24/12				S5 - Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, 5-10% fine to coarse subangular gravel, brown, moist
10		10–12	S6	8-24-45-46 (69)	24/12			12.0	S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		12							Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings and cold patch asphalt to restore the roadway.
	195.0								
15									
	190.0								
20									
	185.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-104-OW**

Project Name: **Prop. Green Meadow Elementary School, Maynard, MA**

LGCI Project Number: **2201**

Client: Mount Vernon Group Architects, Inc.

Drilling Subcontractor: Soil X, Corp.
Drilling Foreman: Edwin Fajardo
LGCI Engineer: MBH

Date Started: 2/19/24
Date Completed: 2/20/24
Location: Near NW corner of eastern wing of proposed building

Ground Surface Elevation: 214 feet (see note 1)
Groundwater Depth: 19 feet (based on sample moisture)
18.5 feet at the end of drilling

Total Depth of Boring: 19.2 feet
Drill Rig Type: Diedrich D-70 Turbo ATV Drill Rig
Drilling Method: Hollow Stem Auger (4-1/4" I.D.)

Riser Stickup ~0.0' above ground surface

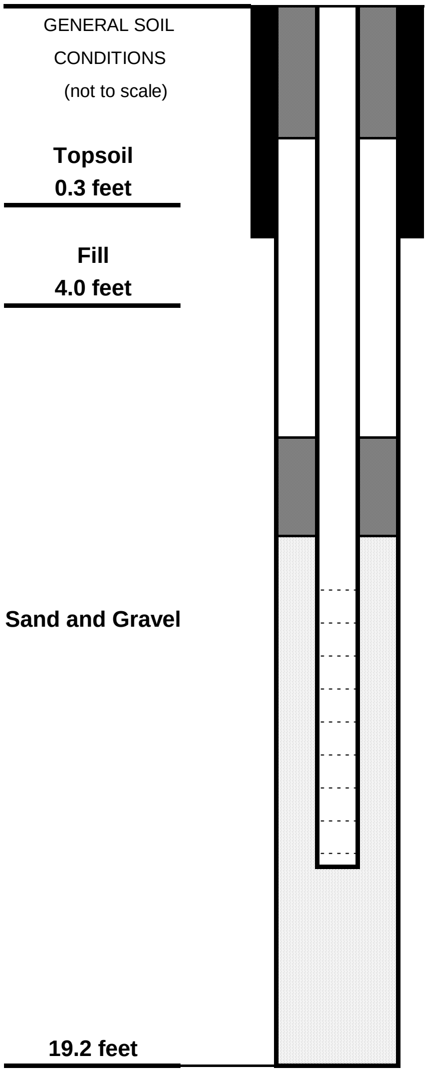
GENERAL SOIL CONDITIONS (not to scale)

Topsoil
0.3 feet

Fill
4.0 feet

Sand and Gravel

19.2 feet



THICKNESS OF SURFACE SEAL	0.8 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Roadway Box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	0.8 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter Sand
DEPTH TO TOP OF SEAL	11 feet
TYPE OF SEAL	Bentonite Chips
DEPTH TO BOTTOM OF SEAL	12 feet
DEPTH TO TOP OF PERVIOUS SECTION	13.5 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	18.5 feet
DEPTH TO BOTTOM OF SAND COLUMN	19 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand
DIAMETER OF BOREHOLE	6 inch
DEPTH TO BOTTOM OF BOREHOLE	19.2 feet

NOTE: The ground surface elevation was interpolated to the nearest foot from a drawing titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022, and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-114-OW**

Project Name: **Prop. Green Meadow Elementary School, Maynard, MA**

LGCI Project Number: **2201**

Client: Mount Vernon Group Architects, Inc.

Drilling Subcontractor: Soil X, Corp.
Drilling Foreman: Edwin Fajardo
LGCI Engineer: MBH

Date Started: 2/20/24
Date Completed: 2/21/24
Location: Within proposed roadway

Ground Surface Elevation: 232 feet (see note 1)
Groundwater Depth: Not encountered
5.0 feet at the end of drilling

Total Depth of Boring: 20 feet
Drill Rig Type: Diedrich D-70 Turbo ATV Drill Rig
Drilling Method: Hollow Stem Auger (4-1/4" I.D.)

Riser Stickup ~3.0' above ground surface

GENERAL SOIL CONDITIONS (not to scale)

Topsoil
0.3 feet

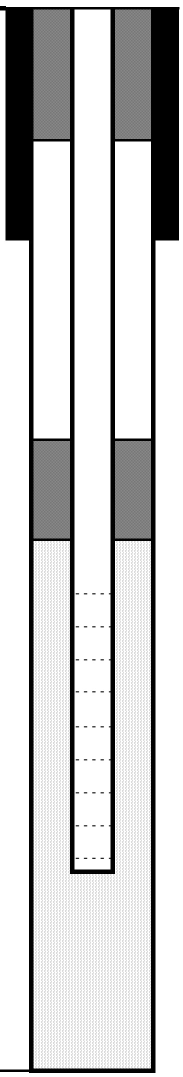
Subsoil
2.0 feet

Sand and Gravel
2.8 feet

Boulder
5.0 feet

Rock

20 feet



THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser Pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	2.5 feet
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter Sand
DEPTH TO TOP OF SEAL	1 foot
TYPE OF SEAL	Bentonite Chips
DEPTH TO BOTTOM OF SEAL	3 feet
DEPTH TO TOP OF PERVIOUS SECTION	4 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	19 feet
DEPTH TO BOTTOM OF SAND COLUMN	19 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand
DIAMETER OF BOREHOLE	6 inch
DEPTH TO BOTTOM OF BOREHOLE	20 feet

NOTE: The ground surface elevation was interpolated to the nearest foot from a drawing titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022, and provided to LGCI by Brennan via e-mail on February 1, 2024.

Appendix B – LGCI's Test Pit Logs

LGCI
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TEST PIT LOG

TP-1
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE EL.: 228 ft. (see note 1) **TOTAL DEPTH:** 7.5 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	227.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Subsoil	227.5 2.0	0.5 ft. - 2 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, trace of roots, moist
2.5	225.0	E		Sand and Gravel	226.0	2 ft. - 7.5 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, 0-5% fine to coarse subrounded gravel, 15-20% cobbles and boulders up to 3' in diameter, light brown, moist
		M				
5.0	222.5	D				
7.5		V	1		7.5	REMARK 1: Excavator refusal at depth of 7.5'.

Bottom of test pit at 7.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

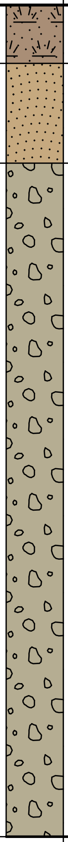
TEST PIT LOG

TP-2
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.7	0 ft. - 0.7 ft.: Topsoil
	212.5	E		Subsoil	213.3 1.9	0.7 ft. - 1.9 ft.: Poorly Graded SAND (SP-SM), fine to medium, 10-15% fines, trace of roots, orange, moist
2.5		E M		Sand and Gravel	212.1	1.9 ft. - 5 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, 15% cobbles and boulders up to 3' in diameter, light brown, moist
5.0	210.0	D				
7.5 10.0	207.5 205.0	V			10.0	5 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, 35% cobbles and boulders
						Bottom of test pit at 10.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-3
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x6.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
2.5	212.5	M		Fill	213.5 2.5	0.5 ft. - 2.5 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine to coarse subrounded gravel, trace of roots, trace of organic soil, dark brown, moist
		M		Sand and Gravel	211.5	2.5 ft. - 7 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, light brown to orange, moist
5.0	210.0	E				
	207.5	M				
7.5	205.0	D				7 ft. - 12 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, 15% cobbles and boulders up to 1.5', light brown, moist
10.0	202.5	V			12.0	

Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-4
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x14.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.3 213.7	0 ft. - 0.3 ft.: Topsoil
2.5	212.5 210.0	E		Fill	4.0 210.0	0.3 ft. - 4 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 5-10% fines, ~20% fine to coarse gravel, trace of roots, orange, moist
5.0		E		Sand and Gravel		4 ft. - 12 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, 10% cobbles, light brown, moist
7.5	207.5 205.0	M				
10.0	202.5	D			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-5
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 10.1 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS:
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E M		Fill	212.5 1.5	0.5 ft. - 1.5 ft.: Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse gravel, trace of organic soil, trace of roots, brown, moist
2.5 5.0 7.5 10.0	210.0 207.5 205.0	M E M D D V	1	Sand and Gravel	211.5 10.1	1.5 ft. - 5.3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse gravel, orange, moist 5.3 ft. - 10.1 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~15% fines, 0-5% fine to coarse gravel, light brown with orange stripes, moist REMARK 1: Excavator refusal at depth of 10.1' on possible large boulders or rock.

Bottom of test pit at 10.1 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-6

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24

TEST PIT LOCATION: Within proposed roadway

COORDINATES: NA

SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 12 ft.

GROUNDWATER LEVELS:

∇ **DURING EXCAVATION:** NE

▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction

EXCAVATION FOREMAN: Paul Meniates

EXCAVATOR TYPE/MODEL: Takeuchi TB-290

WEATHER:

TEST PIT DIMENSIONS: 12.0'x4.0'

LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.6	0 ft. - 0.6 ft.: Topsoil
		E		Fill	212.4 2.0	0.6 ft. - 2 ft.: Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine gravel, trace of organic soil, trace of wood, trace of roots, dark brown, moist
2.5	210.0	E			211.0	2 ft. - 4.7 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown with orange stripes, moist
		M				
5.0	207.5	M				4.7 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse gravel, 5% cobbles, orange, moist
7.5	205.0	D		Sand and Gravel		
10.0	202.5	V			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

TEST PIT LOG

TP-7
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 234 ft. (see note 1) **TOTAL DEPTH:** 7.5 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	232.5	E		Subsoil	233.5 1.5	0.5 ft. - 1.5 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, orange, moist
		E		Sand and Gravel	232.5	1.5 ft. - 7.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, ~10% fines, ~15% fine to coarse subangular gravel, 25-30% cobbles and boulders up to 4.8' in diamter, light brown, moist
2.5		M				
	230.0	D/V				
5.0						
	227.5	V				
7.5					7.5	

Bottom of test pit at 7.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

TEST PIT LOG

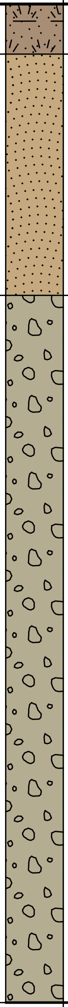
TP-8

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 227 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 9.0'x3.5'
LOGGED BY: MBH **CHECKED BY:** JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.6	0 ft. - 0.6 ft.: Topsoil
		E		Subsoil	226.4	0.6 ft. - 3.5 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, orange, moist
2.5	225.0					
					3.5	
		E		Sand and Gravel	223.5	3.5 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 10-15% fine subrouned gravel, 10% cobbles and boulders, light brown, moist
5.0	222.5	M				
7.5	220.0	D				
10.0	217.5	V				10 ft. - 12 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine subrounded gravel, 15% cobbles and boulders, brown, moist
	215.0				12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 219 ft. (see note 1) **TOTAL DEPTH:** 7 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** 7.0 ft. / El. 212.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 14.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil		0 ft. - 0.5 ft.: Topsoil
		E		Sand and Gravel	0.5 218.5	0.5 ft. - 2.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, orange, moist
	217.5	M				
2.5		D				
		D				2.5 ft. - 5.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse subrounded gravel, light brown, moist
	215.0	M				
5.0						
		M				5.5 ft. - 7 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse gravel, 30% cobbles and boulders up to 3' in diameter, brown, moist
	212.5	V	1		7.0	∇ REMARK 1: Refusal on possible large boulder or rock. Bottom of test pit at 7.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24
DATE COMPLETED: 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 221 ft. (see note 1)
TOTAL DEPTH: 8.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 8.5 ft. / El. 212.5 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x4.5'
LOGGED BY: MBH
CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	220.0	E		Topsoil	1.0 220.0	0 ft. - 1 ft.: Topsoil
2.5		E		Subsoil	2.7 218.3	1 ft. - 2.7 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, orange, moist
5.0	217.5 215.0	E M		Sand and Gravel		2.7 ft. - 7.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse gravel, light brown, moist
7.5	212.5	D D V	1		8.5 ▽	7.5 ft. - 8.5 ft.: Well Graded SAND withSilt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subrounded gravel, 25% cobbles and boulders up to 2.5' in diameter, light brown, moist REMARK 1: Excavator refusal on possible boulder or rock.

Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 204 ft. (see note 1) **TOTAL DEPTH:** 10.8 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x5.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D		Topsoil	1.0	0 ft. - 1 ft.: Topsoil (top 6" frozen)
2.5	202.5	E		Subsoil	203.0 3.0	1 ft. - 3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 0-5% fine subrounded gravel, orange, moist
5.0	200.0	M		Sand and Gravel	201.0	3 ft. - 10.8 ft.: East Face: Poorly Graded SAND with Gravel (SP), medium to coarse with trace fine, 0-5% fines, 15-20% fine to coarse subrouned gravel, orange to red with light brown stripes, moist West Face: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, 15% cobbles and boulders up to 1.5' in diameter, light brown, moist
7.5 10.0	197.5 195.0	D	1		10.8	REMARK 1: Terminated test pit due to its walls caving in.

Bottom of test pit at 10.8 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

TEST PIT LOG

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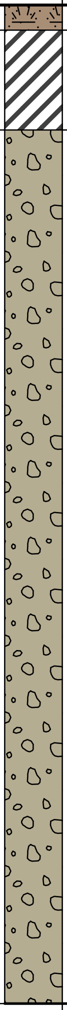
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24
DATE COMPLETED: 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 203 ft. (see note 1)
TOTAL DEPTH: 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 12.0 ft. / El. 191.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 13.0'x4.5'
LOGGED BY: MBH
CHECKED BY: JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	0.3 202.7	0 ft. - 0.3 ft.: Topsoil (frozen)
	202.5	M M		Fill	1.5 201.5	0.3 ft. - 1.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, 20-25% mostly coarse and fine subangular gravel, light brown, moist
2.5 5.0 7.5 10.0	200.0 197.5 195.0 192.5	M M D		Sand and Gravel	12.0 ▽	1.5 ft. - 12 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 20% cobbles and boulders up to 1.7' in diameter, orange to light brown, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-14

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24

DATE COMPLETED: 2/7/24

TEST PIT LOCATION: Within proposed roadway

COORDINATES: NA

SURFACE EL.: 218 ft. (see note 1)

TOTAL DEPTH: 12 ft.

GROUNDWATER LEVELS:

∇ **DURING EXCAVATION:** 8.0 ft. / El. 210.0 ft.

▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction

EXCAVATION FOREMAN: Paul Meniates

EXCAVATOR TYPE/MODEL: Takeuchi TB-290

WEATHER:

TEST PIT DIMENSIONS: 10.0'X3.5'

LOGGED BY: MBH

CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	217.5	E		Topsoil	0.5 217.5	0 ft. - 0.5 ft.: Topsoil
		E		Subsoil	1.0 217.0	0.5 ft. - 1 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse subrounded gravel, trace of roots, trace of organic soil, orange, moist
		E		Sand and Gravel		1 ft. - 2.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, 0-5% fine subrounded gravel, light brown, moist
2.5	215.0	E				2.5 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, 10-15% cobbles and boulders up to 3.5' in diameter
5.0	212.5	M				
7.5	210.0				∇	
10.0	207.5	D				
					12.0	Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-15
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** 2.0 ft. / El. 211.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 13.0'x2.5'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
2.5		E		Subsoil	212.5 ∇ 2.5	0.5 ft. - 2.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, trace of organic soil, trace of roots,
	210.0	E		Sand and Gravel	210.5	2.5 ft. - 6.5 ft.: Poorly Graded SAND (SP), fine to medium with trace coarse, 0-5% fines, light brown, moist
5.0	207.5	M				
		D				6.5 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, light brown, moist
7.5	205.0	D				
10.0	202.5	V			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

TEST PIT LOG

TP-16
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 212 ft. (see note 1) **TOTAL DEPTH:** 8.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x5.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5 211.5	0 ft. - 0.5 ft.: Topsoil
	210.0	E		Subsoil	2.0 210.0	0.5 ft. - 2 ft.: Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 5-10% fine to coarse gravel, trace of roots, orange, moist
2.5 5.0	207.5	M		Sand and Gravel		2 ft. - 5.5 ft.: Silty SAND (SM), fine to medium, ~15% fines, light brown, moist,
		M				5.5 ft. - 8.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, 5-10% cobbles and boulders up to 1.5' in diamter, brown to light brown, moist
7.5	205.0	D				
		V	1		8.5	REMARK 1: Excavator refusal at depth of 8.5' on possible large boulders or rock.

Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

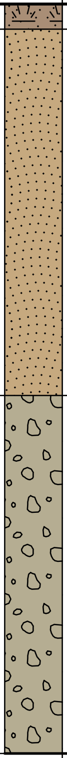
TEST PIT LOG

TP-17
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 9.5'x2.5'
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.3 212.7	0 ft. - 0.3 ft.: Topsoil
	212.5	E		Subsoil		0.3 ft. - 2.5 ft.: Poorly SAND with Silt (SP-SM), mostly fine with trace coarse and medium, 45% fines, trace of organic soil, trace of roots, orange, moist
2.5	210.0	E M			4.7 208.3	2.5 ft. - 4.7 ft.: Silty SAND with Gravel (SM), fine to medium with trace coarse, ~20% fines, ~15% fine to coarse subangular gravel, trace of roots, brown to orange, moist
5.0 7.5	207.5 205.0	M D V	1	Sand and Gravel	9.0	4.7 ft. - 9 ft.: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 20-25% fine to coarse subangular gravel, 25% cobbles and boulders up to 3' in diamter, light brown to orange, moist REMARK 1: Excavator refusal at depth of 9' on possible large boulder or rock.

Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-18B
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Fill	212.5	0.5 ft. - 3 ft.: Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 10-15% fine to coarse subrounded gravel, brown, moist
2.5		M				
	210.0				3.0	
		M		Sand and Gravel	210.0	3 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, 15% cobbles and boulders up to 2.5' in diameter, orange, moist
5.0	207.5	D				
7.5	205.0	V				
10.0			1		10.0	REMARK 1: Excavator refusal at depth of 10' on possible large boulder or rock.

Bottom of test pit at 10.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-19
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 209 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 8.0'x3.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
	207.5	E		Subsoil	208.0 2.3	1 ft. - 2.3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 15-20% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
2.5 5.0 7.5 10.0	205.0 202.5 200.0 197.5	E		Sand and Gravel	206.7 12.0	2.3 ft. - 12 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, light brown, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-21

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24 **DATE COMPLETED:** 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 202 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 2.5 ft. / El. 199.5 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		D		Fill	201.2	0.8 ft. - 3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, grey, moist
	200.0	E				
2.5						▽
		E		Buried Organic Soil	3.0 199.0	3 ft. - 3.5 ft.: Silty SAND (SM), fine to medium, 25-30% fines, 0-5% fine subrounded gravel, trace of organic soil, trace of roots, dark brown to black, moist
		E		Sand and Gravel	3.5 198.5	3.5 ft. - 4 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, light brown, moist
	197.5	E				4 ft. - 9.1 ft.: Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, light brown, moist
5.0						
	195.0	M				
7.5						
	192.5	M				9.1 ft. - 12 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 5-10% fine subrounded gravel, brown to orange, wet
10.0						
	190.0				12.0	

Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-22
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24
DATE COMPLETED: 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 202 ft. (see note 1)
TOTAL DEPTH: 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x4.0'
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil		0 ft. - 2 ft.: Topsoil
	200.0	E			2.0 200.0	
2.5		E		Fill	3.0 199.0	2 ft. - 3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, orange to light brown, moist
		E		Buried Organic Soil	3.5 198.5	3 ft. - 3.5 ft.: Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, dark brown to black, moist
5.0	197.5	E		Sand and Gravel		3.5 ft. - 7 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 0-5% fine to coarse subrounded gravel, light brown, moist
7.5	195.0	M				7 ft. - 12 ft.: Sandy SILT (ML), slightly to moderately plastic, 30-35% fine to medium sand, light brown to grey, moist
10.0	192.5					
	190.0				12.0	

Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-23

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24 **DATE COMPLETED:** 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 200 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		E		Fill	199.2 1.5	0.8 ft. - 1.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, ~15% fine to coarse subangular gravel, trace of organic soil, dark brown
		E		Subsoil	198.5	1.5 ft. - 2 ft.: Poorly Graded SAND with Gravel (SP), coare, 0-5% fines, 30-35% fine subrounded gravel, dark brown, moist
2.5	197.5	E			3.0	2 ft. - 3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 0-5% fine subrounded gravel, light brown, moist
		E	1	Sand and Gravel	197.0	3 ft. - 12 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, light brown, moist REMARK 1: Infiltrometer test performed at depth of 4'.
5.0	195.0					
7.5	192.5	M				
10.0	190.0				12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-26

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.

PROJECT NAME: Proposed Green Meadow Elementary School

LGCI PROJECT NUMBER: 2201

PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24

DATE COMPLETED: 2/8/24

TEST PIT LOCATION: South East of proposed buidling

COORDINATES: NA

SURFACE EL.: 206 ft. (see note 1)

TOTAL DEPTH: 11 ft.

GROUNDWATER LEVELS:

∇ **DURING EXCAVATION:** NE

▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction

EXCAVATION FOREMAN: Paul Meniates

EXCAVATOR TYPE/MODEL: Takeuchi TB-290

WEATHER:

TEST PIT DIMENSIONS:

LOGGED BY: MBH

CHECKED BY: SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	205.0	E M		Subsoil	205.5 2.3	0.5 ft. - 2.3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 5-10% fines, ~15% fine to coarse subangular gravel, trace of roots, orange, moist
2.5 5.0 7.5 10.0	202.5 200.0 197.5 195.0	M M	1	Sand and Gravel	203.7 11.0	2.3 ft. - 4.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subrounded gravel, light brown with orange strips, moist REMARK 1: Infiltrometer test performed at depth of 3.5'. 4.5 ft. - 11 ft.: Poorly Graded SAND with Gravel (SP), medium to coarse, 0-5% fines, 15-20% fine to coarse subangular gravel, orange, moist
						Bottom of test pit at 11.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Appendix C – Results of Double Ring Infiltrometer Tests

Double Ring Infiltrometer Test

Project:
Name: Prop. Green Meadow Elem. School
Location: Maynard, MA
LGCI Project Number: 2201

Test Location: TP-23

Test Procedure: General accordance with ASTM D 3385

Test Date 2/8/2024

LGCI Representative: OIL

Weather Conditions: ___________

Test Depth: 4.0 feet

Groundwater Depth: NE

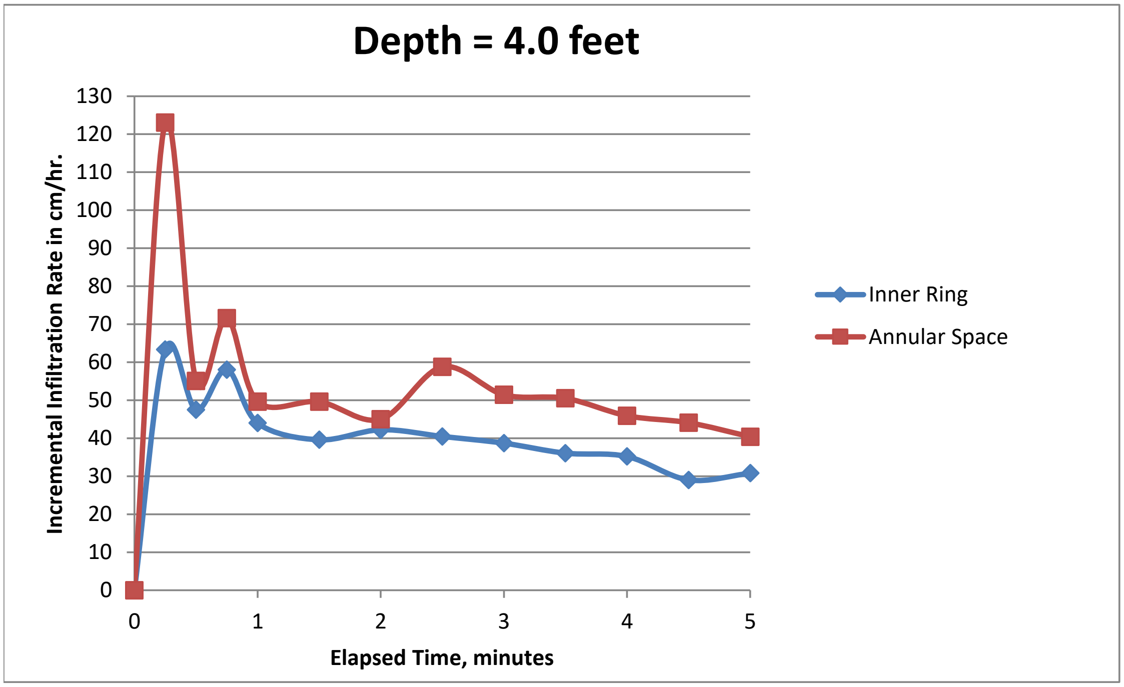
Soil Stratum:

Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 10% fines

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	58.2	0	0	58.3	0	0
0.25	0.25	54.6	193	63.3	51.6	1122	123.1
0.5	0.25	51.9	145	47.5	48.6	503	55.1
0.75	0.25	48.6	177	58.1	44.7	653	71.6
1	0.25	46.1	134	44.0	42.0	452	49.6
1.5	0.5	41.6	241	39.6	36.6	905	49.6
2	0.5	36.8	257	42.2	31.7	821	45.0
2.5	0.5	32.2	246	40.5	25.3	1072	58.8
3	0.5	27.8	235	38.7	19.7	938	51.4
3.5	0.5	23.7	219	36.1	14.2	921	50.5
4	0.5	19.7	214	35.2	9.2	838	45.9
4.5	0.5	16.4	177	29.0	4.4	804	44.1
5	0.5	12.9	187	30.8	0.0	737	40.4

Notes:



K = 8.3E-03 cm/sec.

Double Ring Infiltrometer Test

Project: Name: Prop. Green Meadow Elem. School
Location: Maynard, MA
LGCI Project Number: 2201

Test Location: TP-26

Test Procedure: General accordance with ASTM D 3385

Test Date 2/8/2024

LGCI Representative: OIL

Weather Conditions: ___________

Test Depth: 3.5 feet

Groundwater Depth: NE

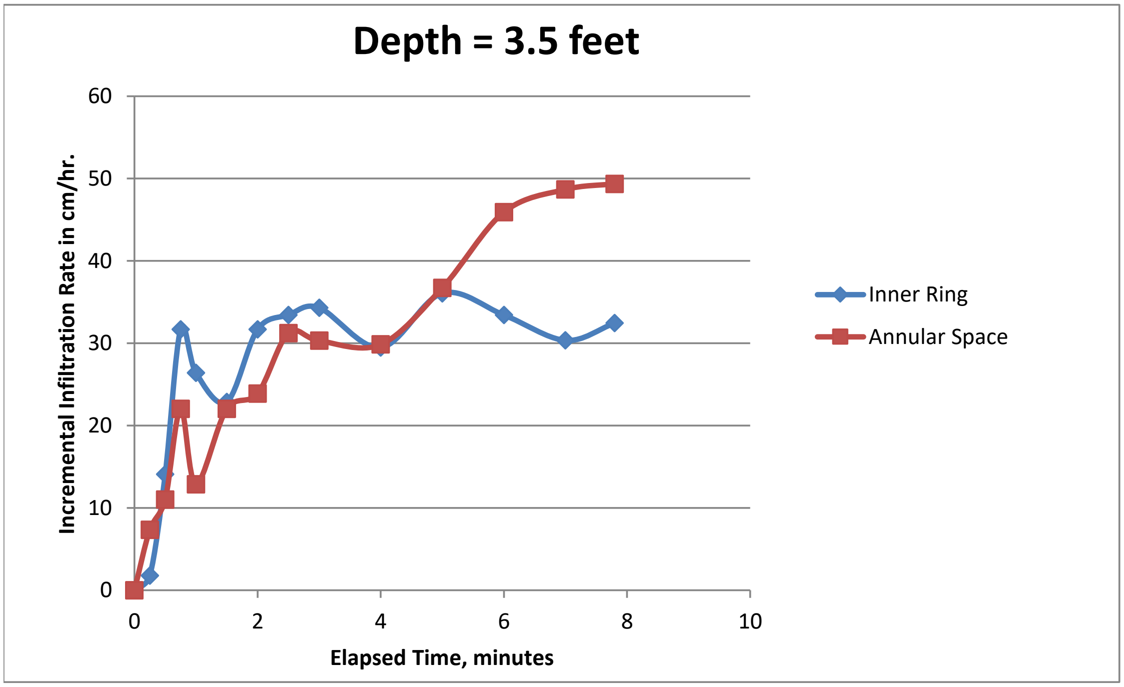
Soil Stratum:

Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 10% fine subangular gravel

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	58.3	0	0	58.3	0	0
0.25	0.25	58.2	5	1.8	57.9	67	7.3
0.5	0.25	57.4	43	14.1	57.3	101	11.0
0.75	0.25	55.6	96	31.7	56.1	201	22.0
1	0.25	54.1	80	26.4	55.4	117	12.9
1.5	0.5	51.5	139	22.9	53.0	402	22.0
2	0.5	47.9	193	31.7	50.4	436	23.9
2.5	0.5	44.1	203	33.4	47.0	570	31.2
3	0.5	40.2	209	34.3	43.7	553	30.3
4	1	33.5	359	29.5	37.2	1089	29.8
5	1	25.3	439	36.1	29.2	1340	36.7
6	1	17.7	407	33.4	19.2	1675	45.9
7	1	10.8	369	30.4	8.6	1776	48.7
7.8	0.8	4.9	316	32.4	0.0	1441	49.4

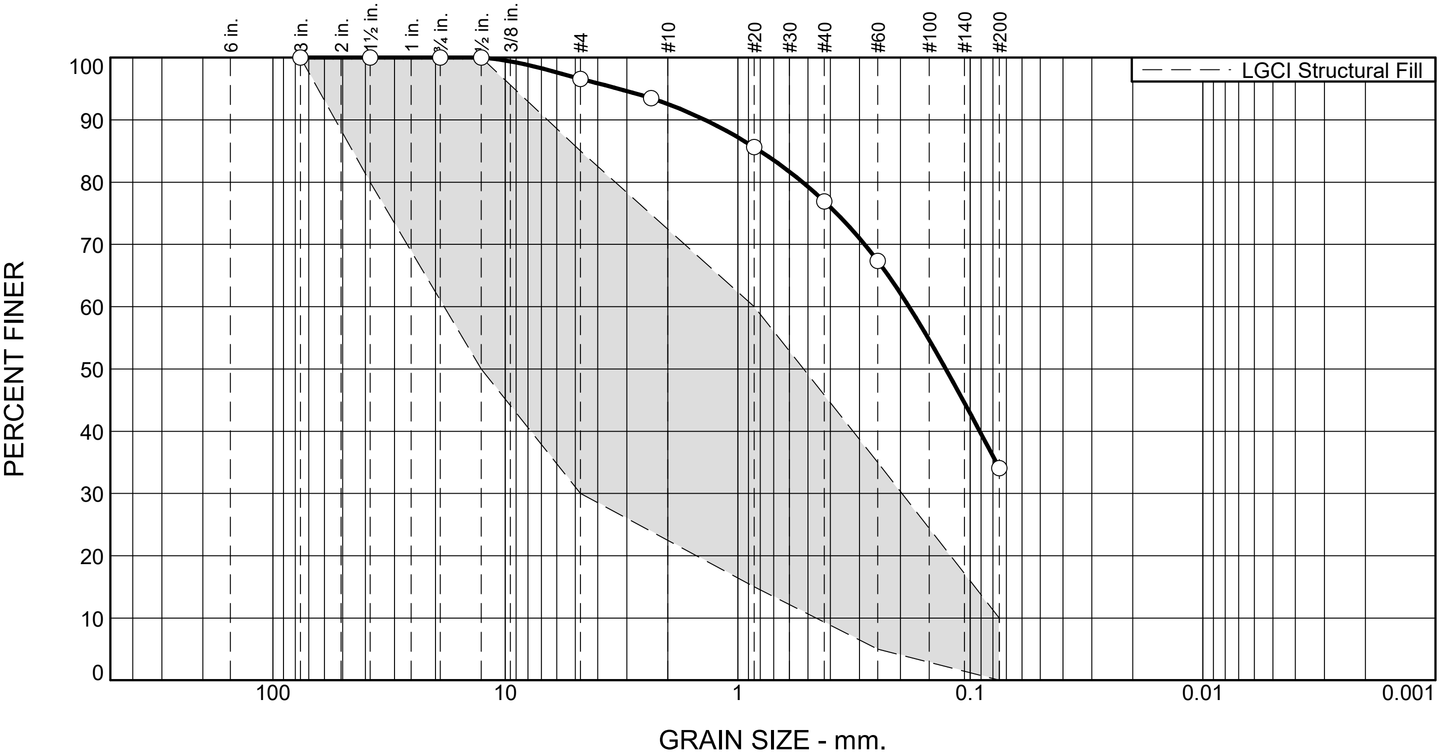
Notes:



K = 8.9E-03 cm/sec.

Appendix D – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	4.1	15.6	42.8	34.1	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	96.6	30.0 - 85.0	X
#8	93.5		
#20	85.6	15.0 - 60.0	X
#40	76.9		
#60	67.4	5.0 - 35.0	X
#200	34.1	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, light brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 1.3826	D_{85}= 0.8015	D_{60}= 0.1833
D_{50}= 0.1273	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Subsoil sample.

Date Received: 01/28/2022 **Date Tested:** 02/01/2022

Tested By: LB

Checked By: OIL

Location: Boring B-7

Sample Number: S2 Top 13" **Depth:** 2'-4'

Date Sampled: 01/28/2022

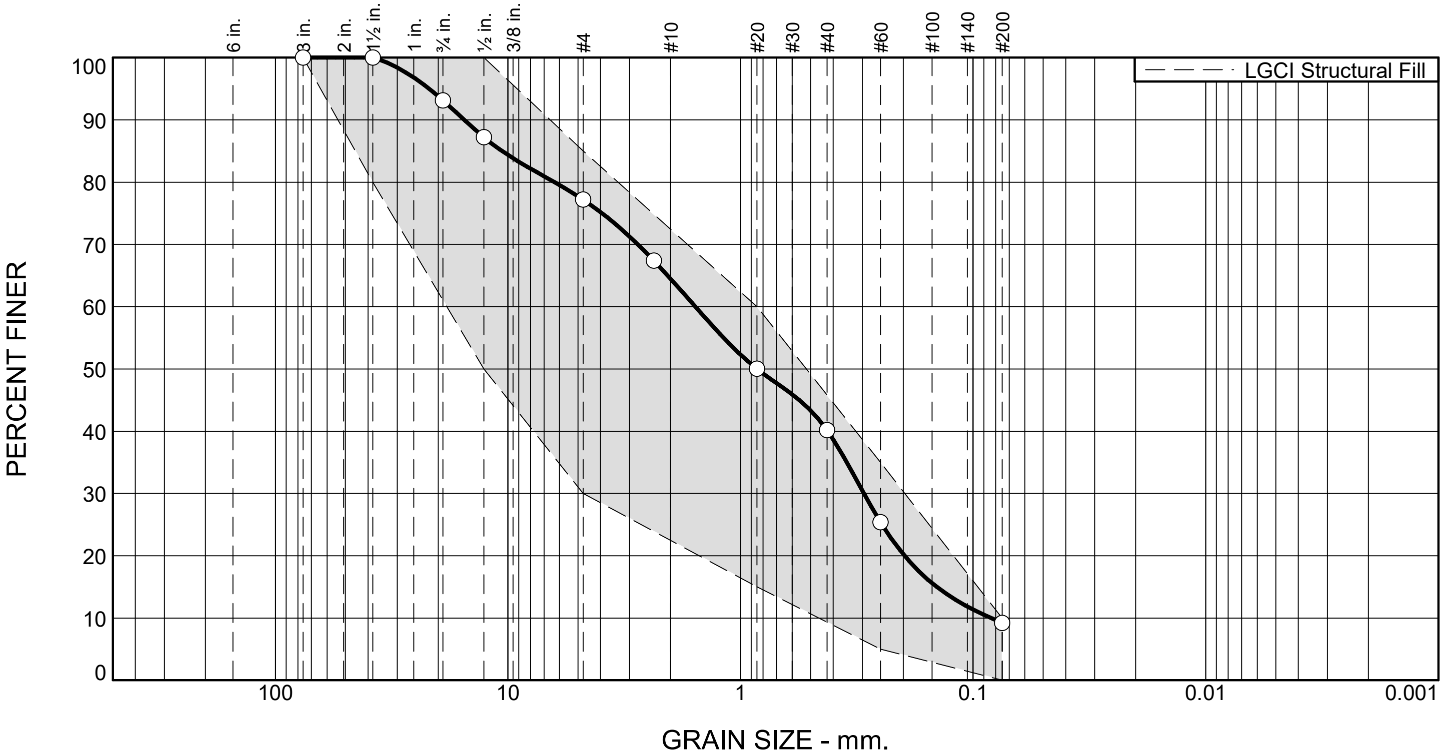
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow Elementary School, Maynard, MA

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.9	15.9	12.7	24.3	31.0	9.2	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	93.1		
0.5"	87.2	50.0 - 100.0	
#4	77.2	30.0 - 85.0	
#8	67.4		
#20	50.0	15.0 - 60.0	
#40	40.2		
#60	25.4	5.0 - 35.0	
#200	9.2	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded to angular gravel, orange to brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 15.4210	D_{85}= 10.5818	D_{60}= 1.5641
D_{50}= 0.8487	D_{30}= 0.2944	D_{15}= 0.1433
D_{10}= 0.0836	C_u= 18.72	C_c= 0.66

Remarks

Fill sample.

Date Received: 01/28/2022 **Date Tested:** 02/01/2022

Tested By: LB

Checked By: OIL

Location: Boring B-11

Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 01/28/2022

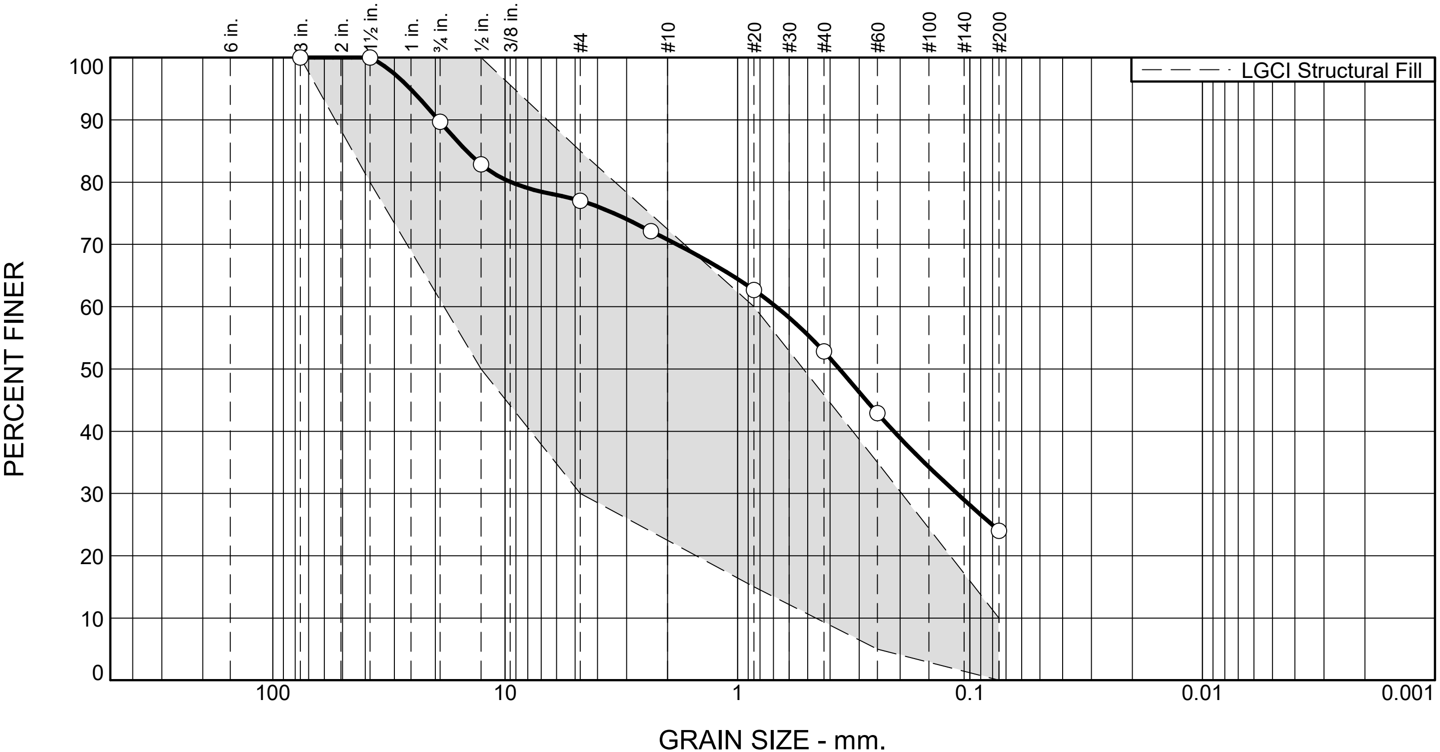
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow Elementary School, Maynard, MA

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.3	12.7	6.2	18.0	28.8	24.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	89.7		
0.5"	82.9	50.0 - 100.0	
#4	77.0	30.0 - 85.0	
#8	72.1		
#20	62.7	15.0 - 60.0	X
#40	52.8		
#60	42.9	5.0 - 35.0	X
#200	24.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 20-25% fine to coarse subrounded to subangular gravel, trace of organic soil, brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 19.3490 D_{85}= 14.6403 D_{60}= 0.6834
D_{50}= 0.3640 D_{30}= 0.1135 D_{15}=
D_{10}= C_u= C_c=

Remarks

Fill sample.

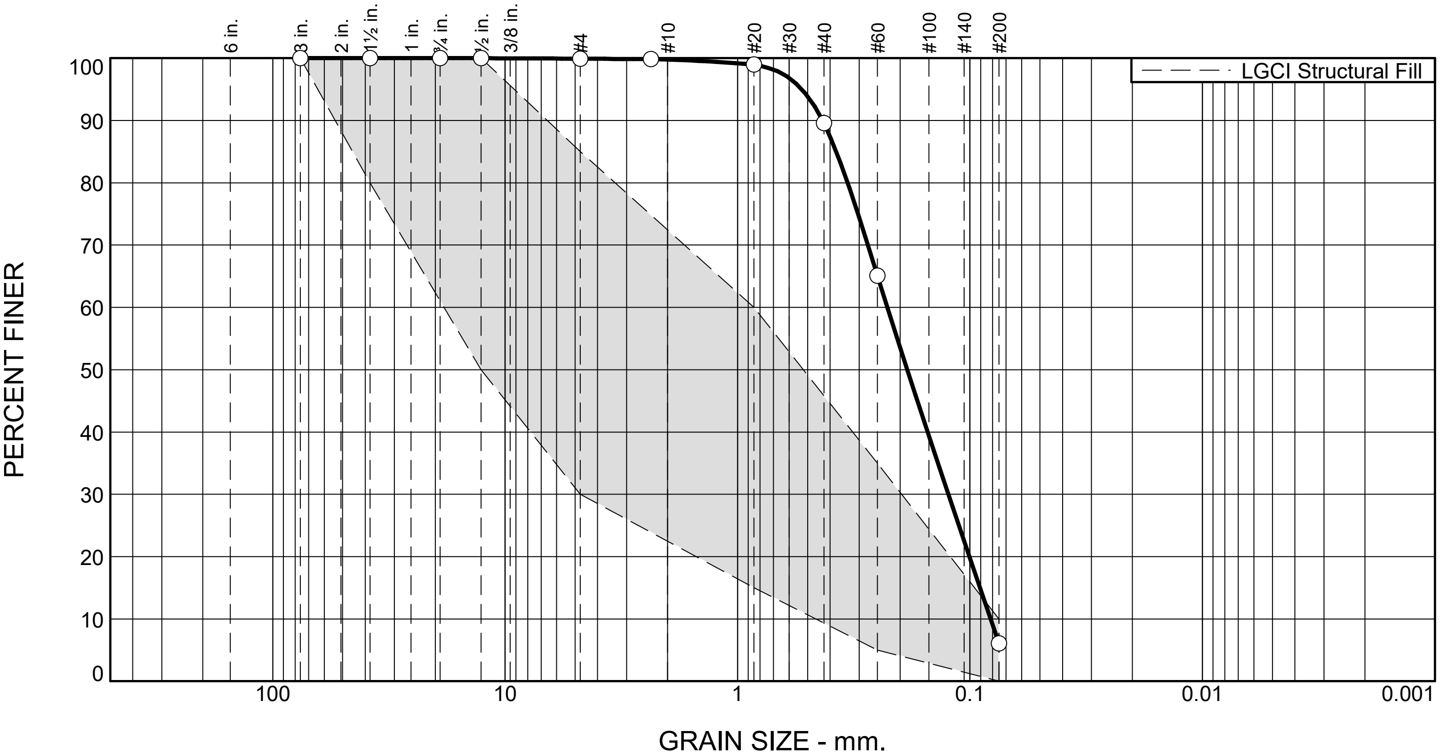
Date Received: 02/01/2022 **Date Tested:** 02/02/2022
Tested By: LB
Checked By: OIL

Location: Boring B-1
Sample Number: S2 **Depth:** 2'-4'
Date Sampled: 02/01/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow Elementary School, Maynard, MA
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	10.2	83.5	6.1	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.9		
#20	99.0	15.0 - 60.0	X
#40	89.6		
#60	65.1	5.0 - 35.0	X
#200	6.1	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace gravel, tan

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.4307	D_{85}= 0.3758	D_{60}= 0.2265
D_{50}= 0.1859	D_{30}= 0.1237	D_{15}= 0.0905
D_{10}= 0.0815	C_u= 2.78	C_c= 0.83

Remarks

Sand sample.

Date Received: 01/31/2022 **Date Tested:** 02/02/2022

Tested By: LB

Checked By: OIL

Location: Boring B-6

Sample Number: S2 **Depth:** 2'-4'

Date Sampled: 01/31/2022

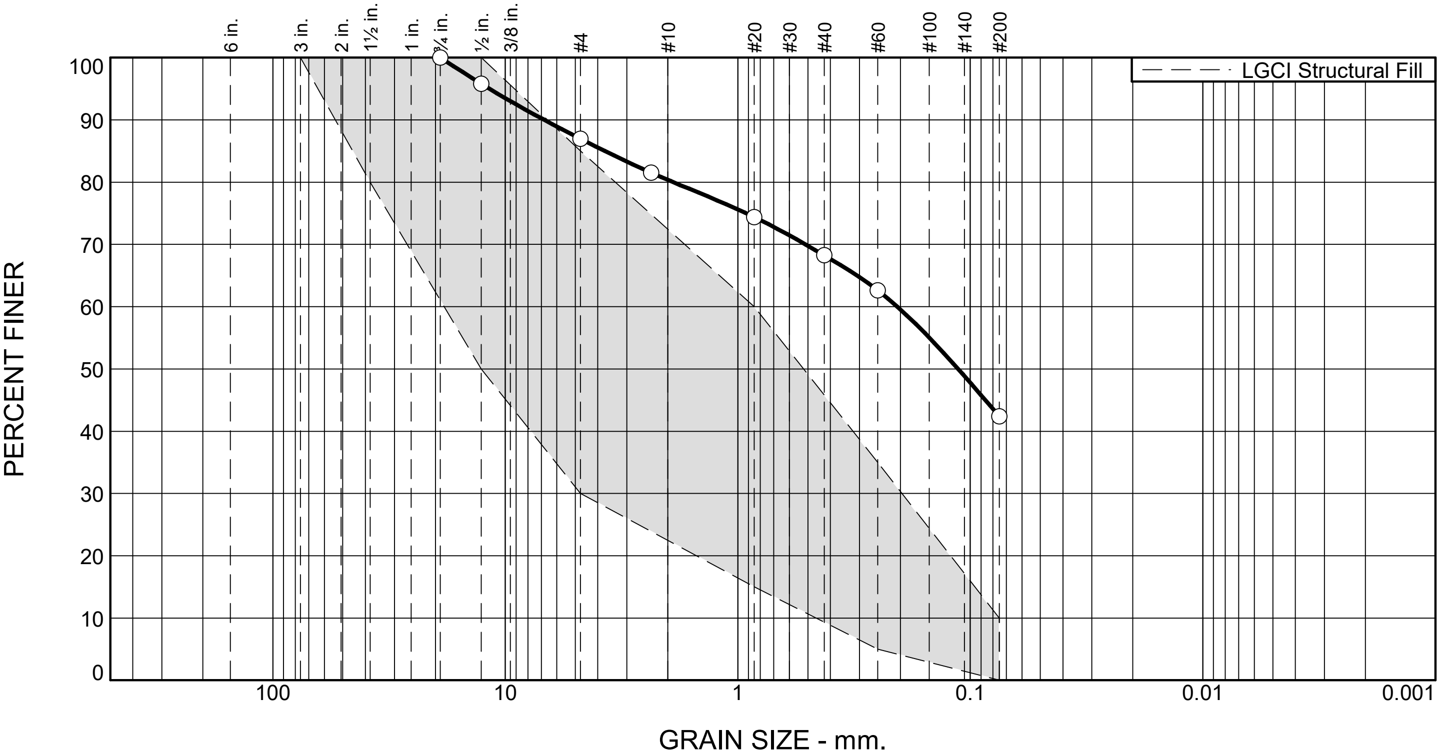
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow Elementary School, Maynard, MA

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.0	6.6	12.1	25.9	42.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	95.8	50.0 - 100.0	
#4	87.0	30.0 - 85.0	X
#8	81.5		
#20	74.4	15.0 - 60.0	X
#40	68.3		
#60	62.6	5.0 - 35.0	X
#200	42.4	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium with trace coarse, 40-45% fines, 10-15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 6.7884	D_{85}= 3.7286	D_{60}= 0.2058
D_{50}= 0.1127	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/20/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: B-104

Sample Number: S2 **Depth:** 2.0'-4.0'

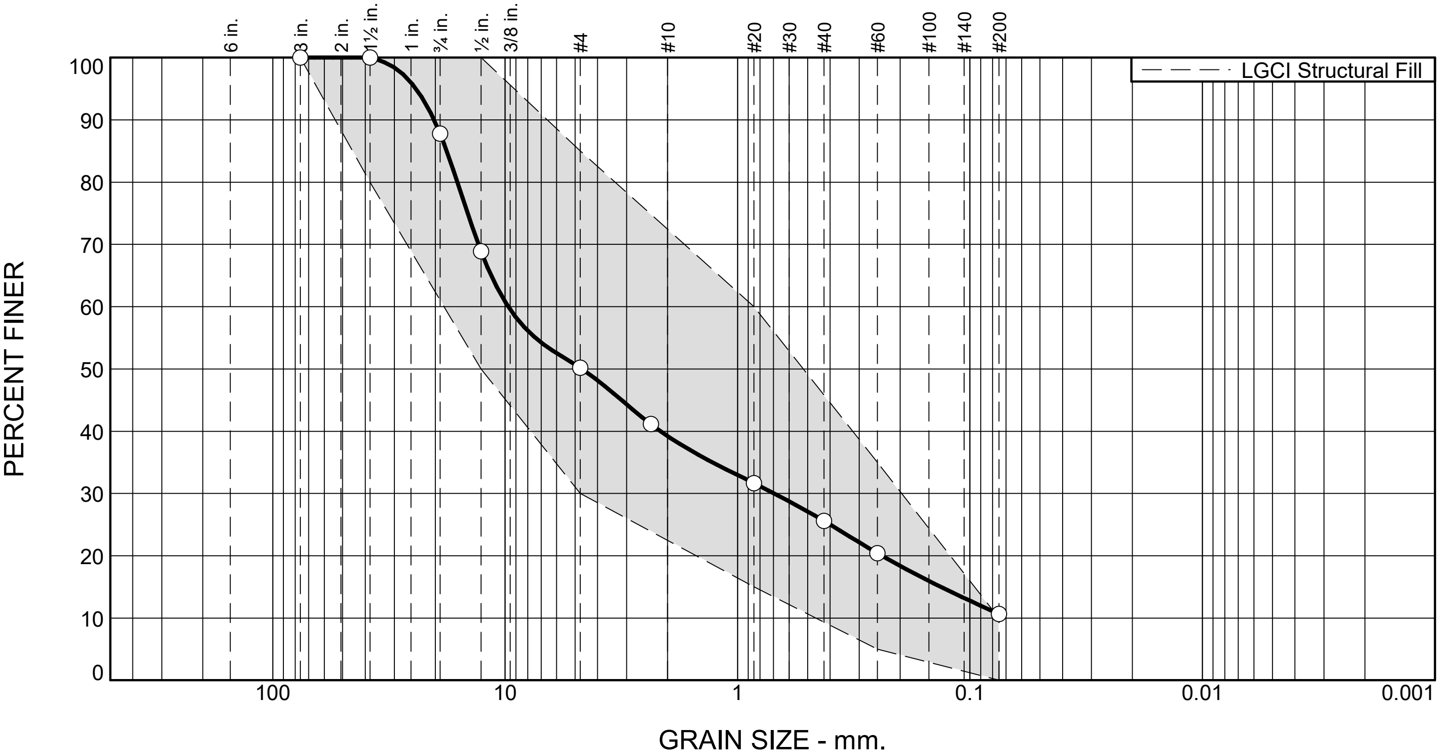
Date Sampled: 2/19/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	37.6	11.0	13.6	15.0	10.6	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	87.8		
0.5"	68.9	50.0 - 100.0	
#4	50.2	30.0 - 85.0	
#8	41.1		
#20	31.7	15.0 - 60.0	
#40	25.6		
#60	20.4	5.0 - 35.0	
#200	10.6	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded Gravel with Silt and Sand (GP-GM), mostly fine with coarse, 10% fines, 40% fine to coarse sand

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	20.2222	D_{85}=	17.8454	D_{60}=	9.6793
D_{50}=	4.6729	D_{30}=	0.6954	D_{15}=	0.1331
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/26/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: B-105

Sample Number: S1 Bot 11 **Depth:** 0'-2.0'

Date Sampled: 2/26/24

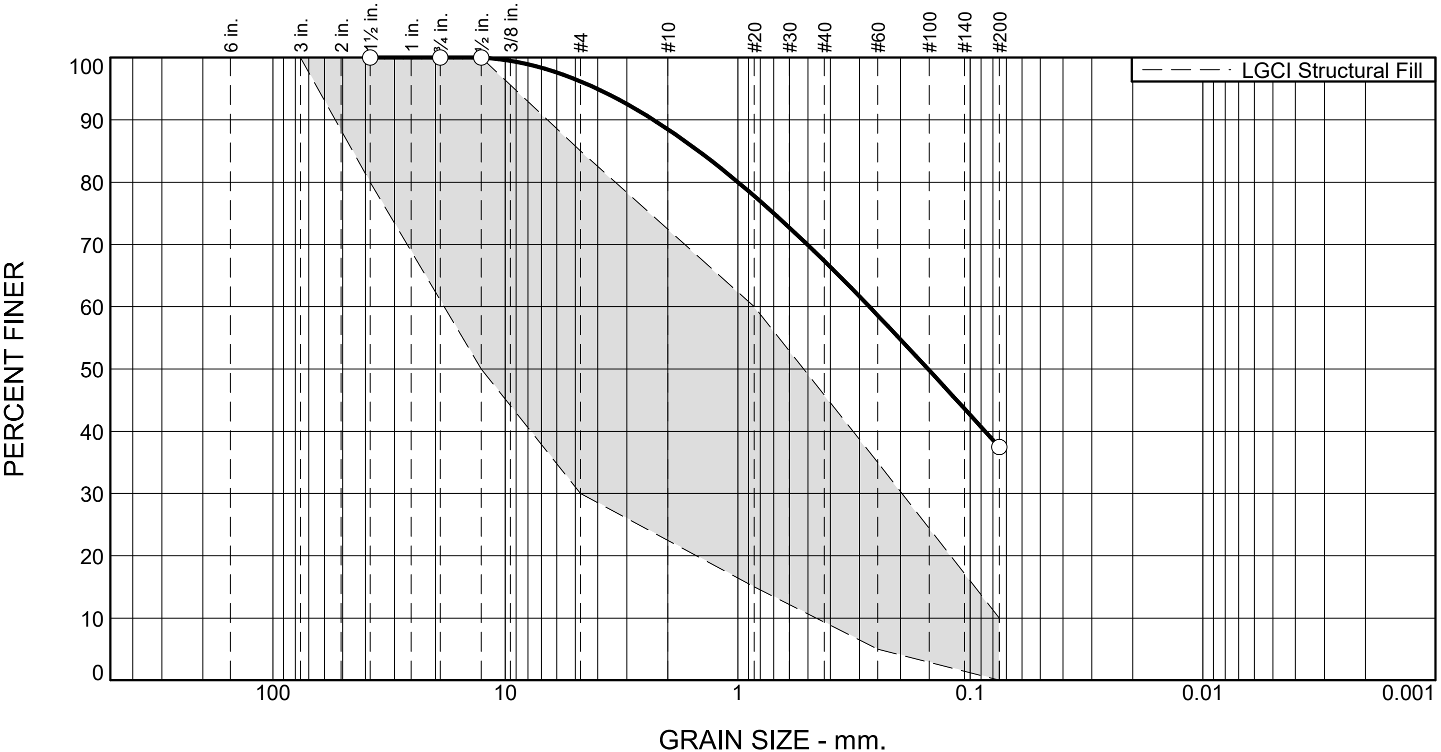
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.8	7.7	21.2	29.8	37.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 35-40% fines, 0-5% fine subangular gravel, brown to grey.

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	2.3045	D_{85}=	1.4758	D_{60}=	0.2716
D_{50}=	0.1519	D_{30}=		D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/23/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By:

Location: B-109

Sample Number: S2 **Depth:** 2.0'-4.0'

Date Sampled: 2/23/24

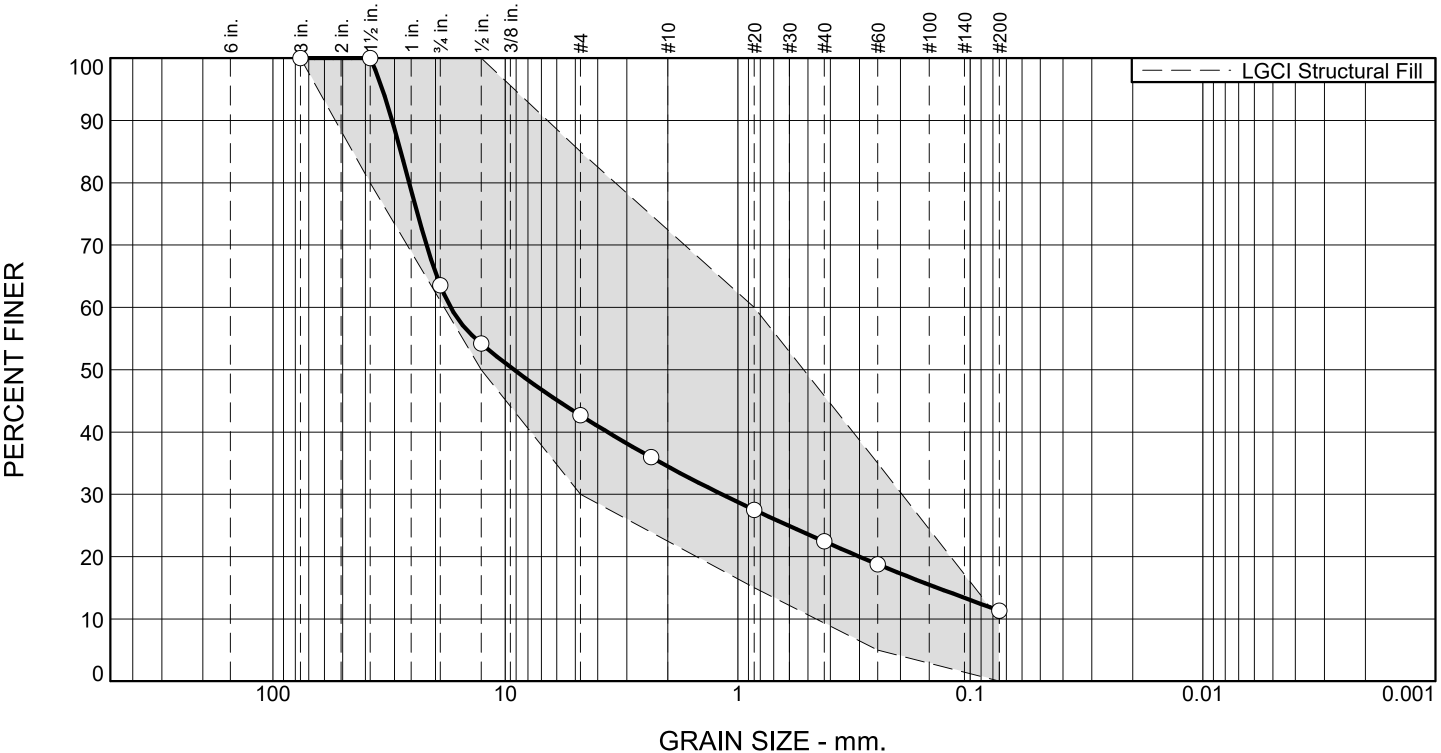
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	36.5	20.8	8.2	12.1	11.1	11.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	63.5		
0.5"	54.2	50.0 - 100.0	
#4	42.7	30.0 - 85.0	
#8	35.9		
#20	27.5	15.0 - 60.0	
#40	22.4		
#60	18.8	5.0 - 35.0	
#200	11.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded Gravel with Sand and Silt (GW-GM), fine to coarse subangular gravel, 30-35% fine to coarse sand, 10-15% fines, brown to grey.

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	30.6883	D_{85}=	28.1524	D_{60}=	17.1867
D_{50}=	9.1729	D_{30}=	1.1709	D_{15}=	0.1385
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/22/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: SL

Location: B-109

Sample Number: S3 **Depth:** 4.0'-6.0'

Date Sampled: 2/21/24

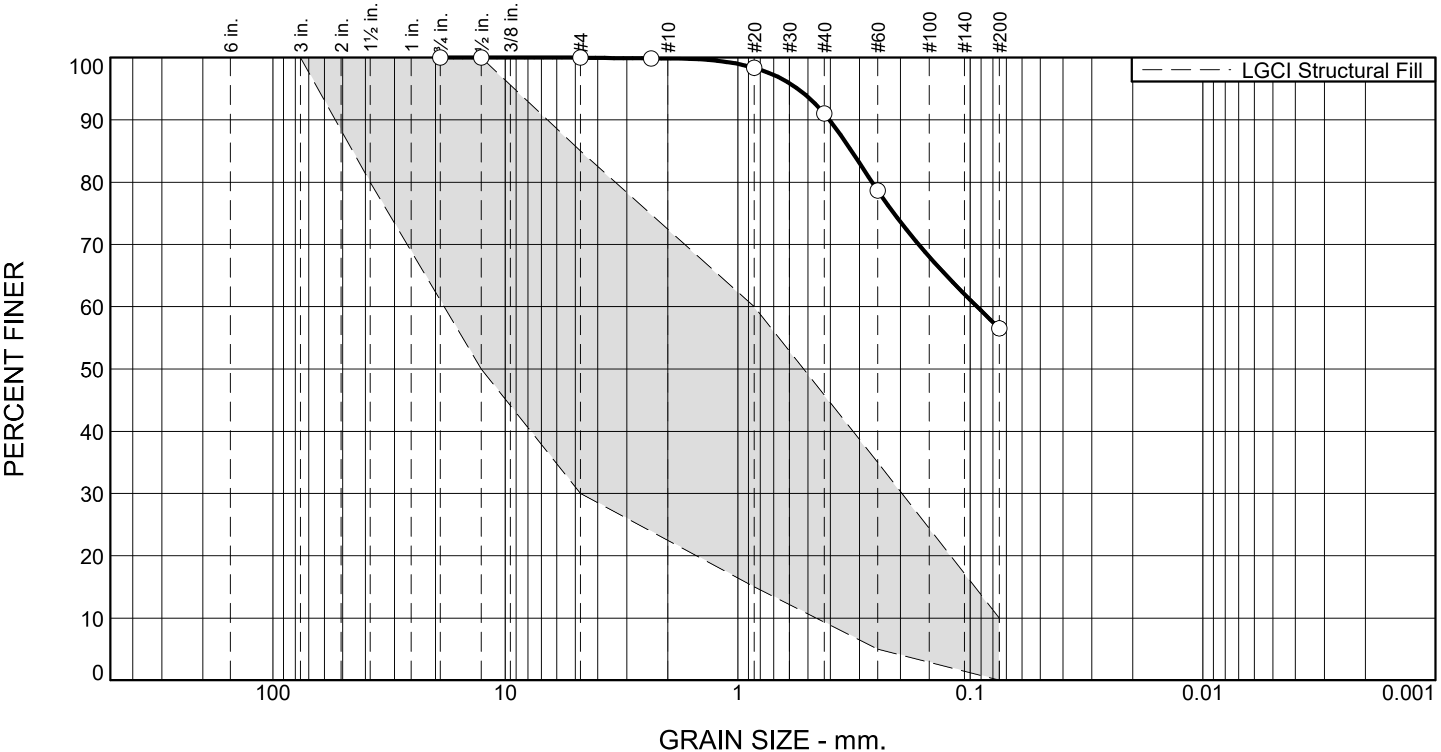
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	8.9	34.5	56.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	100.0	30.0 - 85.0	X
#8	99.9		
#20	98.4	15.0 - 60.0	X
#40	91.0		
#60	78.7	5.0 - 35.0	X
#200	56.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Sandy SILT (ML), 40-45% fine sand

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.4035 D_{85}= 0.3239 D_{60}= 0.0935
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

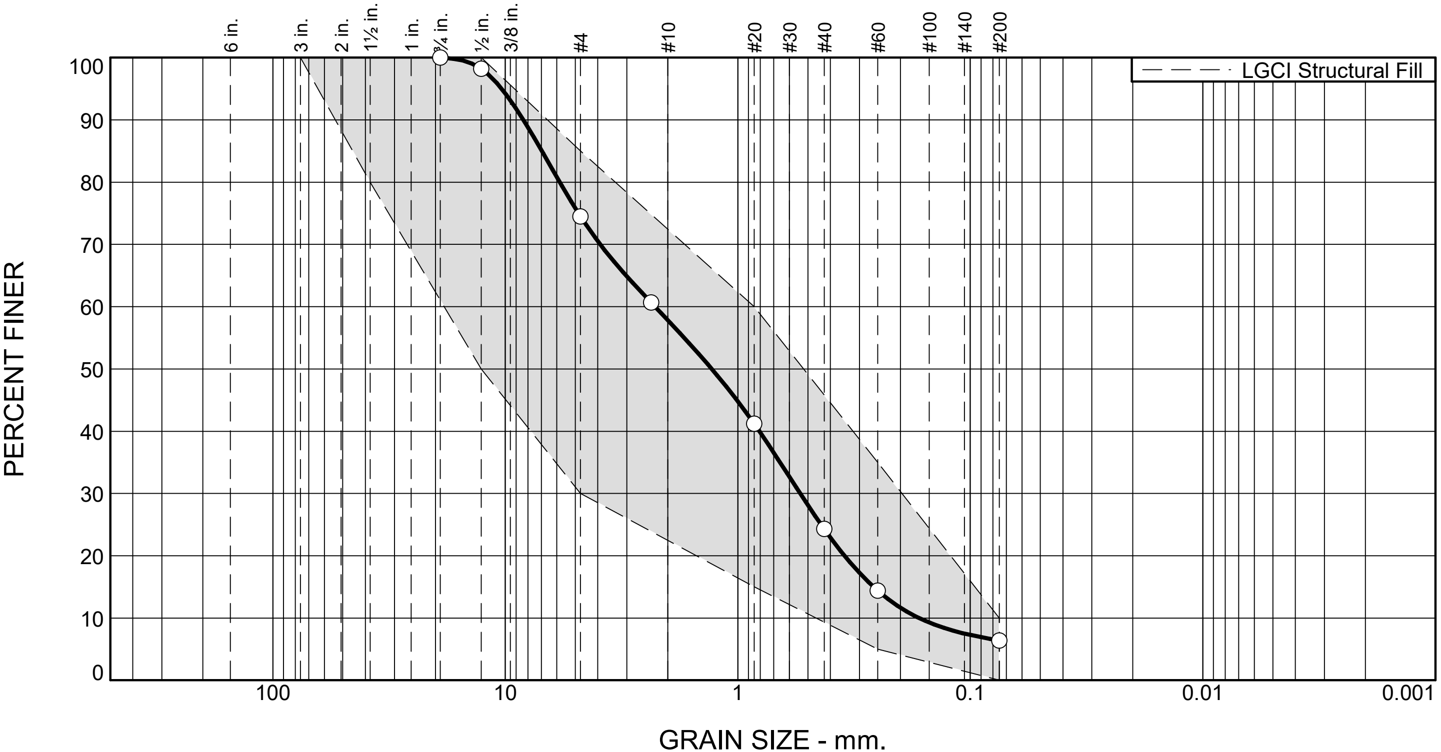
Date Received: 2/22/24 **Date Tested:** 3/22/24
Tested By: AS
Checked By: JKW

Location: B-110
Sample Number: S2 **Depth:** 2.0'-4.0'
Date Sampled: 2/22/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	25.5	16.7	33.5	17.9	6.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	98.2	50.0 - 100.0	
#4	74.5	30.0 - 85.0	
#8	60.7		
#20	41.2	15.0 - 60.0	
#40	24.3		
#60	14.4	5.0 - 35.0	
#200	6.4	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25% fine subangular gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 8.3517	D_{85}= 6.9519	D_{60}= 2.2686
D_{50}= 1.2939	D_{30}= 0.5393	D_{15}= 0.2606
D_{10}= 0.1662	C_u= 13.65	C_c= 0.77

Remarks

Date Received: 2/22/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By:

Location: B-110

Sample Number: S3 **Depth:** 4.0'-6.0'

Date Sampled: 2/22/24

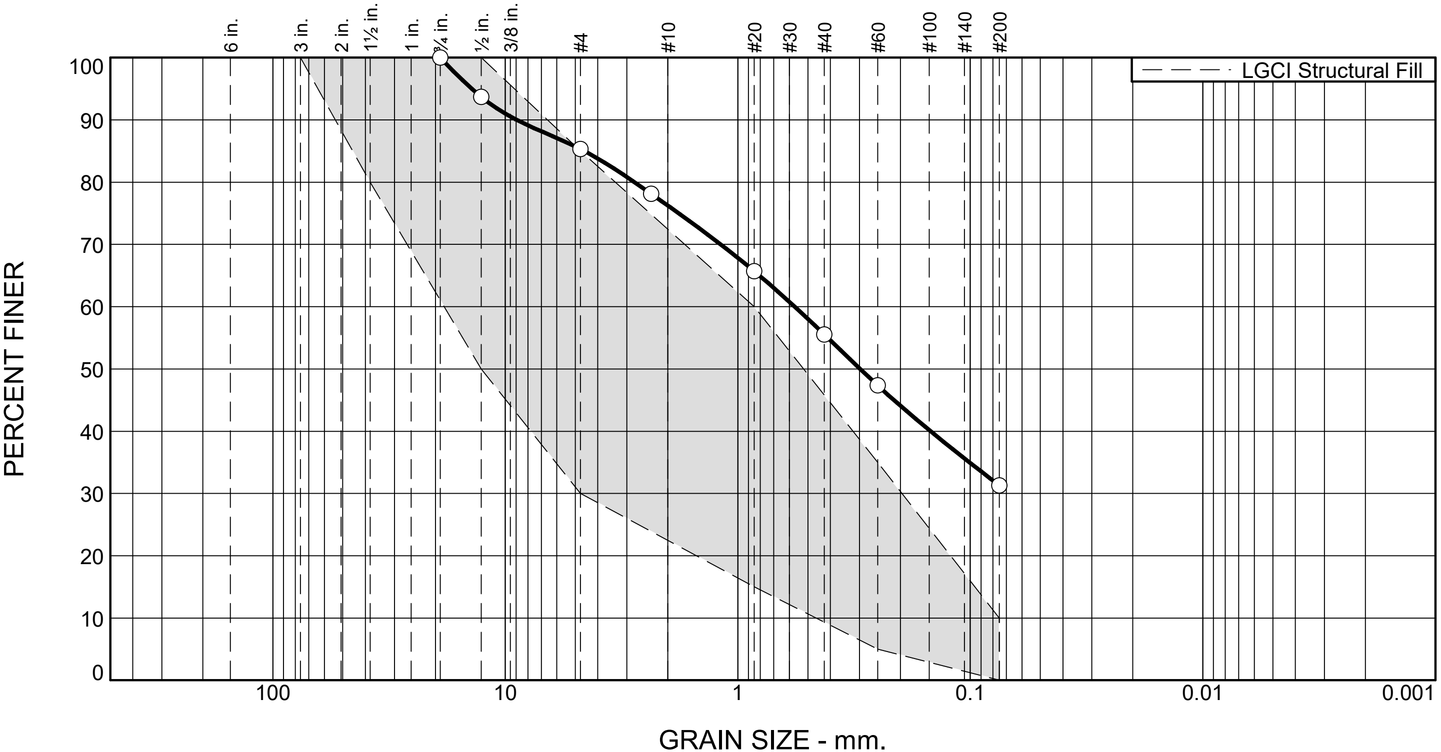
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.7	9.1	20.7	24.2	31.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	93.7	50.0 - 100.0	
#4	85.3	30.0 - 85.0	X
#8	78.1		
#20	65.7	15.0 - 60.0	X
#40	55.5		
#60	47.4	5.0 - 35.0	X
#200	31.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 30-35% fines, 15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 8.9103	D_{85}= 4.5668	D_{60}= 0.5697
D_{50}= 0.2976	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/21/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: B-112

Sample Number: S2 Bot. 13" **Depth:** 2.0'-4.0'

Date Sampled: 2/21/24

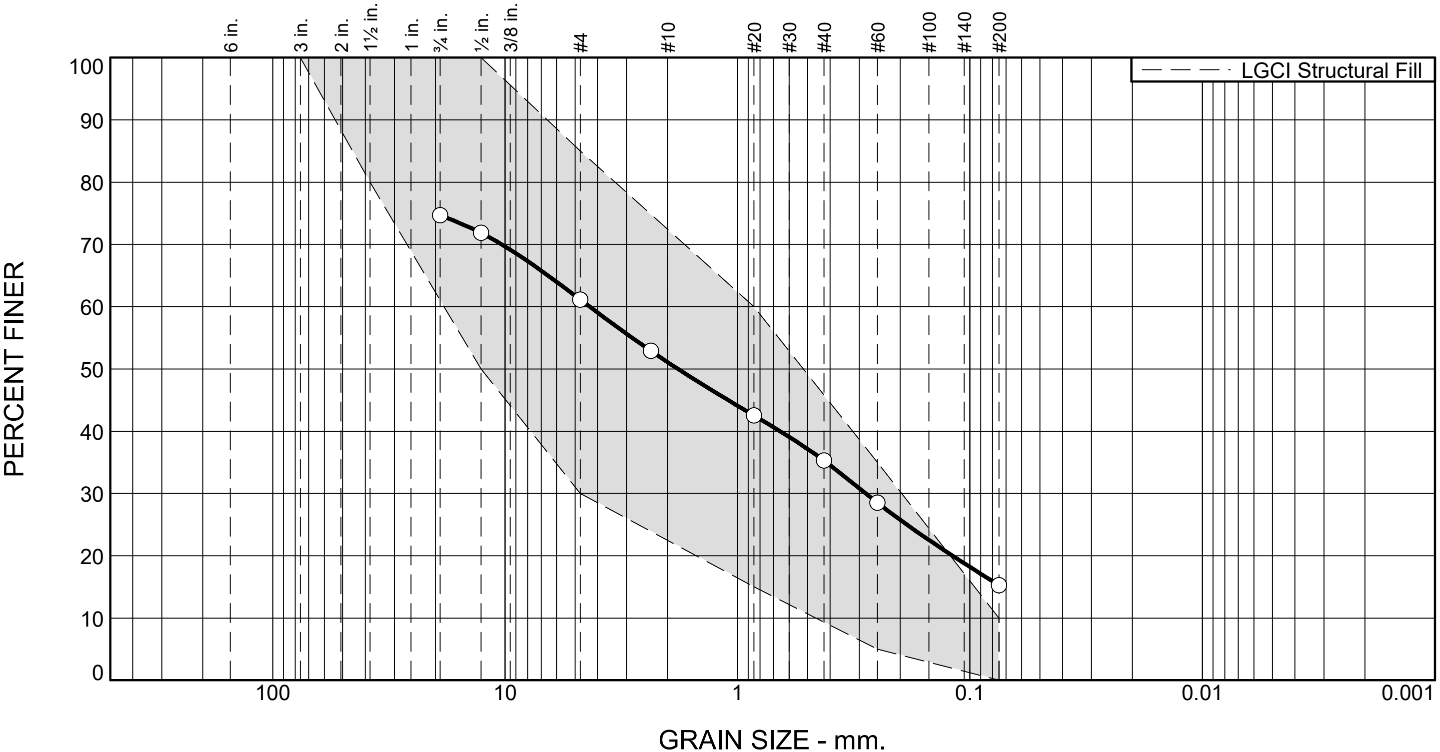
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		13.6	10.0	15.8	20.0	15.3	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	74.7		
0.5"	71.9	50.0 - 100.0	
#4	61.1	30.0 - 85.0	
#8	52.9		
#20	42.5	15.0 - 60.0	
#40	35.3		
#60	28.5	5.0 - 35.0	
#200	15.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 15% fines, 10-15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= **D_{85}=** **D_{60}=** 4.3239
D_{50}= 1.8031 **D_{30}=** 0.2805 **D_{15}=**
D_{10}= **C_u=** **C_c=**

Remarks

Date Received: 2/19/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: B-116
Sample Number: S2 **Depth:** 2.0'-4.0'

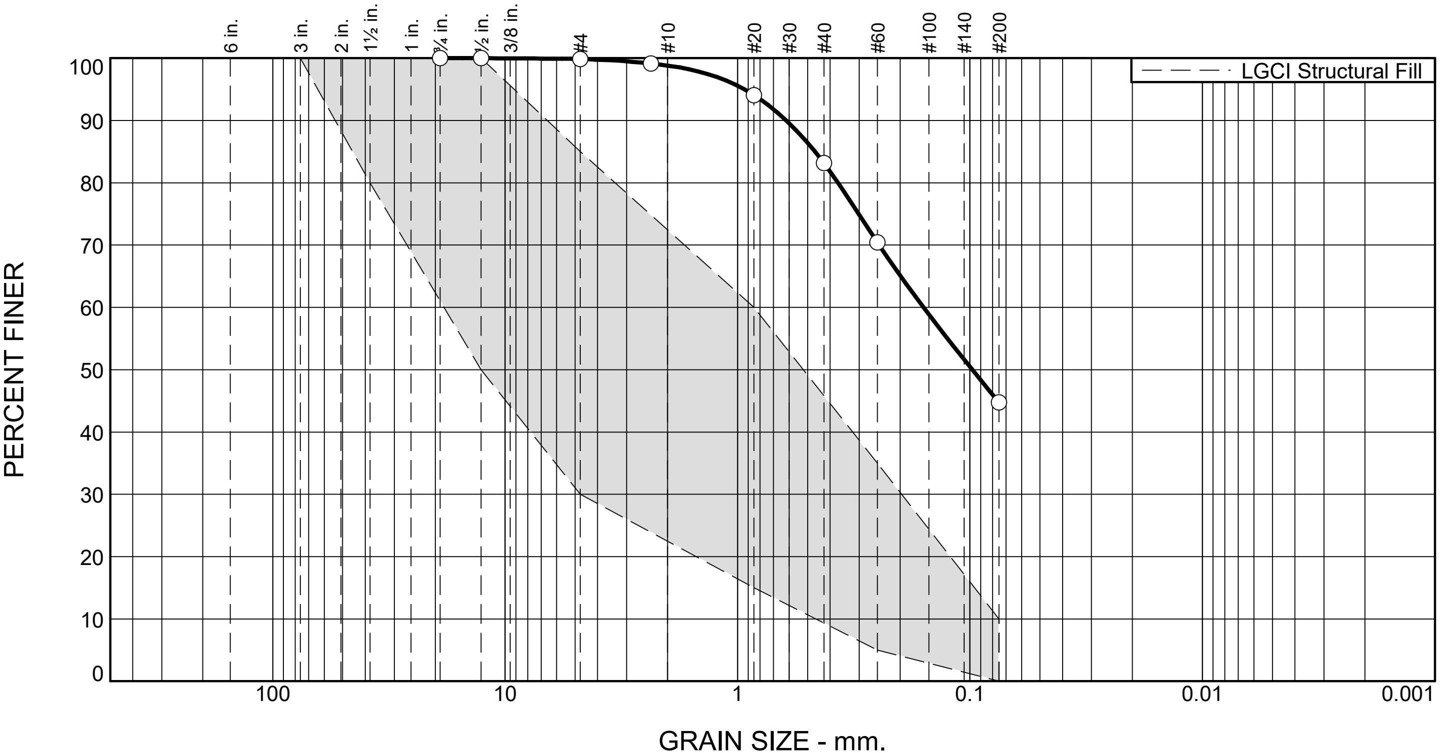
Date Sampled: 2/19/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.1	15.6	38.5	44.7	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.1		
#20	94.1	15.0 - 60.0	X
#40	83.2		
#60	70.4	5.0 - 35.0	X
#200	44.7	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), mostly fine with trace coarse and medium, 45% fines

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.6173	D_{85}= 0.4643	D_{60}= 0.1583
D_{50}= 0.0977	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/9/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-17

Sample Number: G1 **Depth:** 0.3'-2.5'

Date Sampled: 2/9/24

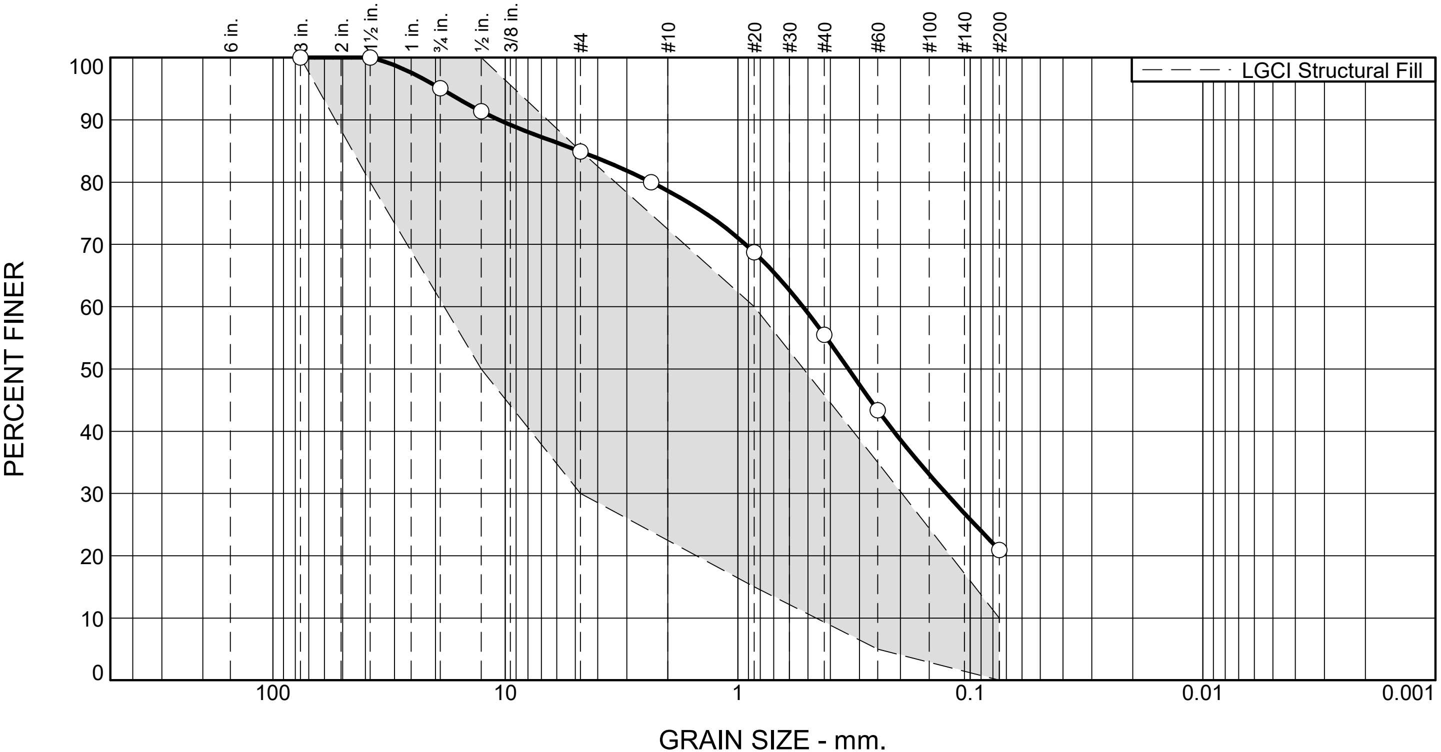
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.9	10.2	6.3	23.1	34.6	20.9	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	95.1		
0.5"	91.4	50.0 - 100.0	
#4	84.9	30.0 - 85.0	
#8	80.0		
#20	68.7	15.0 - 60.0	X
#40	55.5		
#60	43.4	5.0 - 35.0	X
#200	20.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to medium with trace coarse, 20% fines, 15% fine to coarse gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	10.6281	D_{85}=	4.8027	D_{60}=	0.5247
D_{50}=	0.3340	D_{30}=	0.1268	D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/9/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-17
Sample Number: G2 **Depth:** 2.5'-4.7'

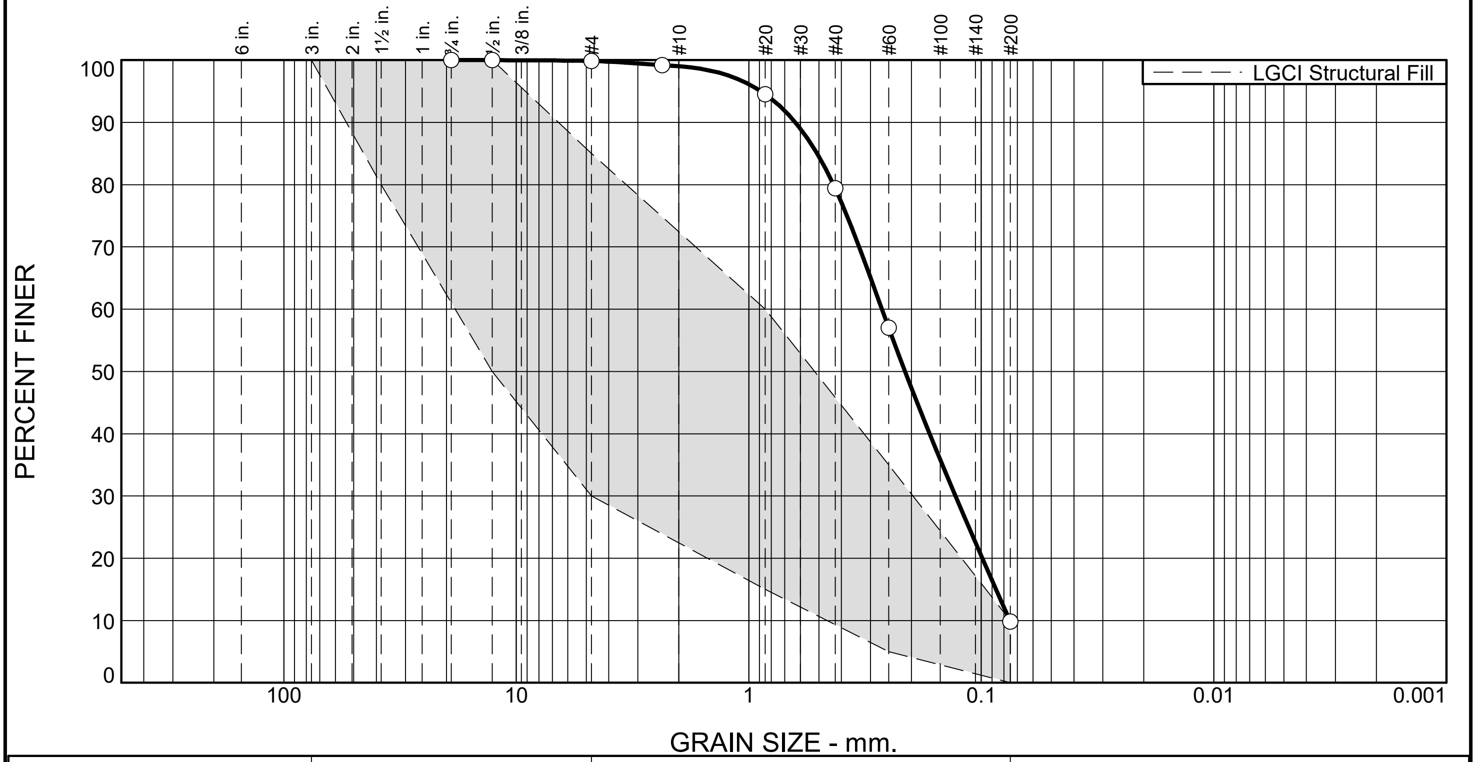
Date Sampled: 2/9/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.9	19.6	69.6	9.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.2		
#20	94.5	15.0 - 60.0	X
#40	79.4		
#60	57.0	5.0 - 35.0	X
#200	9.8	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 10% fines

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.6312	D_{85}= 0.5085	D_{60}= 0.2674
D_{50}= 0.2126	D_{30}= 0.1291	D_{15}= 0.0864
D_{10}= 0.0754	C_u= 3.55	C_c= 0.83

Remarks

Infiltrometer Test

Date Received: 2/8/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-23

Sample Number: 4.0' **Depth:** 4.0'

Date Sampled: 2/8/24

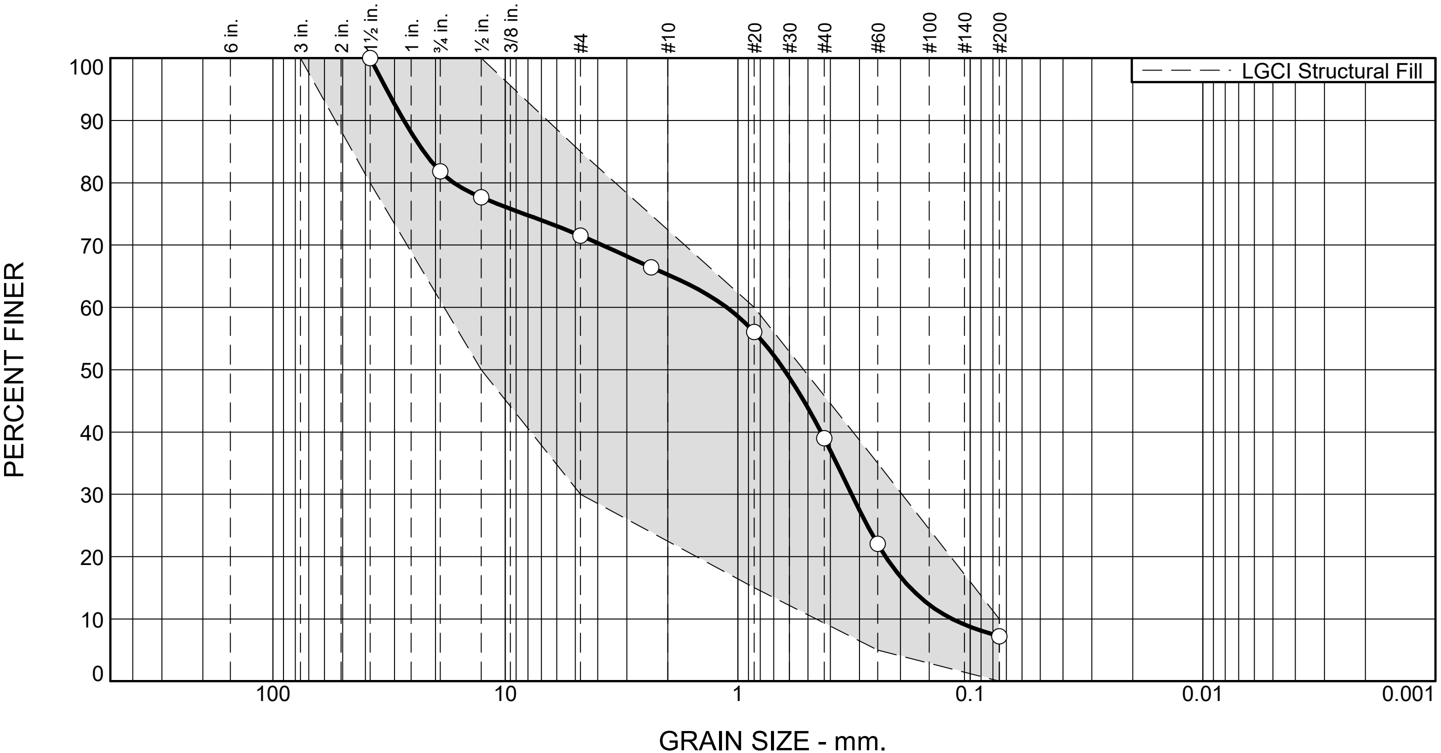
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.2	10.3	6.2	26.3	31.8	7.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100.0	80.0 - 100.0	
0.75"	81.8		
0.5"	77.7	50.0 - 100.0	
#4	71.5	30.0 - 85.0	
#8	66.4		
#20	56.0	15.0 - 60.0	
#40	39.0		
#60	22.0	5.0 - 35.0	
#200	7.2	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 10% fine subangular gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 27.3179	D_{85}= 22.4211	D_{60}= 1.1159
D_{50}= 0.6323	D_{30}= 0.3239	D_{15}= 0.1810
D_{10}= 0.1197	C_u= 9.33	C_c= 0.79

Remarks

Date Received: 2/8/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-26
Sample Number: 3.5' **Depth:** 3.5'
Date Sampled: 2/8/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Lord Environmental, Inc.

Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

April 8, 2024

Christopher LeBlanc
Mount Vernon Group Architects, Inc.
264 Exchange Street, Suite G4
Chicopee, MA 02013

RE: ***Soil Sampling and Analysis:***
Green Meadow Elementary School
5 Tiger Drive
Maynard, Massachusetts

Dear Christopher:

In accordance with the March 27, 2023, proposal, approved by Mount Vernon Group Architects, Inc. (MVG), Lord Environmental, Inc. (LEI) has completed additional soil sampling and analyses at the above-referenced property. The objective of this work was to further evaluate soil at the proposed new building location to determine the extent, if any, of urban fill and submit representative samples to a state-certified laboratory for off-site disposal characterization.

This report supplements our earlier report dated April 5, 2023 that provided the results of samples collected from the north and west perimeter of the playground east of the school where urban fill was identified that contained concentrations of benzo (b) fluoranthene, previously detected on an abutting property as summarized in a report titled "*Response Action Outcome Statement, Maynard Public School Department, Green Meadow School Soccer Field, Off Great Road, Maynard, Massachusetts, Release Tracking Number 2-12298*", dated July 1998. This report indicated contamination on the soccer field located on Parcel 2, Sheet 24 on the Town of Maynard Assessor's Map. A Site Plan is attached as **Figure 1**.

Soil Sampling and Organic Vapor Screening March 2023

A total of seventy-three (73) soil borings, designated B-1 to B-73, were advanced at the Site on March 22 and March 24, 2023 to evaluate shallow soil conditions. Soil borings were advanced with a GeoProbe© 6712DT track-mounted, direct-push drill rig in locations as shown on the attached Site Plan (**Figure 1**). Continuous soil samples were collected in acetate sleeves to a depth of 3 feet below surface grade in all borings. Generally, soil encountered during drilling consisted of a loam topsoil to depths ranging from 2-8 inches with underlying coarse to fine sand and varying amounts of gravel and trace silt. Soil sample descriptions are attached in **Table 1**. No groundwater was detected.

All soil samples were screened in the field for total organic vapors (TOV) using a MiniRAE photoionization detector (PID) capable of detecting organic vapors from petroleum and solvents in soil at concentrations above 0.1 parts per million by volume (ppmv). No organic vapors were detected above the PID detection limit in any of the soil samples.

Laboratory Analyses of Soil March 2023

Twelve soil samples were submitted to a Massachusetts certified laboratory for analyses of extractable petroleum hydrocarbons (EPH) with target polycyclic aromatic hydrocarbons (PAH) via MassDEP Methodologies. As is shown in **Table 2** attached, no PAH compounds were detected above their respective laboratory detection limits.

EPH fractions C_{19}-C_{36} aliphatic hydrocarbons and C_{11}-C_{22} aromatic hydrocarbons were detected. C_{19}-C_{36} aliphatics were detected in two soil samples at concentrations of 17.7 milligram per kilogram (mg/kg) in B-2 and 15.7 mg/kg in B-52. Both detected concentrations of C_{19}-C_{36} aliphatics are slightly above the laboratory detection limit of 15.1 mg/kg and well below the MassDEP S-1 Reportable Concentration of 3,000 mg/kg.

C_{11}-C_{22} aliphatics were detected in two soil samples at concentrations of 21 mg/kg in B-18 and 8.7 mg/kg in B-52. Both detected concentrations of C_{11}-C_{22} aliphatics are slightly above the laboratory detection limit of approximately 7.5 mg/kg and well below the MassDEP S-1 Reportable Concentration of 1,000 mg/kg.

Soil Sampling and Organic Vapor Screening February 2024

Additional soil samples were collected from the school entrance roadway, rear of the existing school and the hillside slope on February 23 and 27, 2024. These samples were collected from the split-spoon soil sampler driven by Lahlaf Geotechnical' s contractor's rig. Generally, soil encountered during drilling consisted of a loam topsoil to depths ranging from 2-8 inches with underlying coarse to fine sand and varying amounts of gravel and trace silt. Detailed soil sample descriptions are provided with the test pit and test boring logs in the geotechnical report. No groundwater was detected.

All soil samples were screened in the field for total organic vapors (TOV) using a MiniRAE photoionization detector (PID) capable of detecting organic vapors from petroleum and solvents in soil at concentrations above 0.1 parts per million by volume (ppmv). No organic vapors were detected above the PID detection limit in any of the soil samples.

Laboratory Analyses of Soil February 2024

Six soil samples were submitted to a Massachusetts certified laboratory for disposal characterization analyses including the Comm-97 landfill parameters, MCP 14 metals and RCRA Hazardous Waste parameters. As is shown in **Table 3** attached, no compounds or parameters were detected above their respective MassDEP S-1 Reportable Concentrations or landfill disposal criteria.

Conclusions

No organic vapors were detected above the field screening instrument detection limit, and no compounds or parameters were detected above their respective MassDEP S-1 Reportable

Concentrations or Massachusetts landfill disposal criteria. Note that not all privately operated landfills utilize these disposal criteria.

Feel free to call with any questions or comments. We appreciate the opportunity to provide our professional environmental consulting and analytical services.

Sincerely,
LORD ENVIRONMENTAL, INC.

Ralph J. Tella

Jonathon D. Puliafico, CPG
Senior Project Manager

Ralph J. Tella, LSP, CHMM
President

Enc: **Limitations**
Site Plan
Tables
Laboratory Analysis Report

Limitations

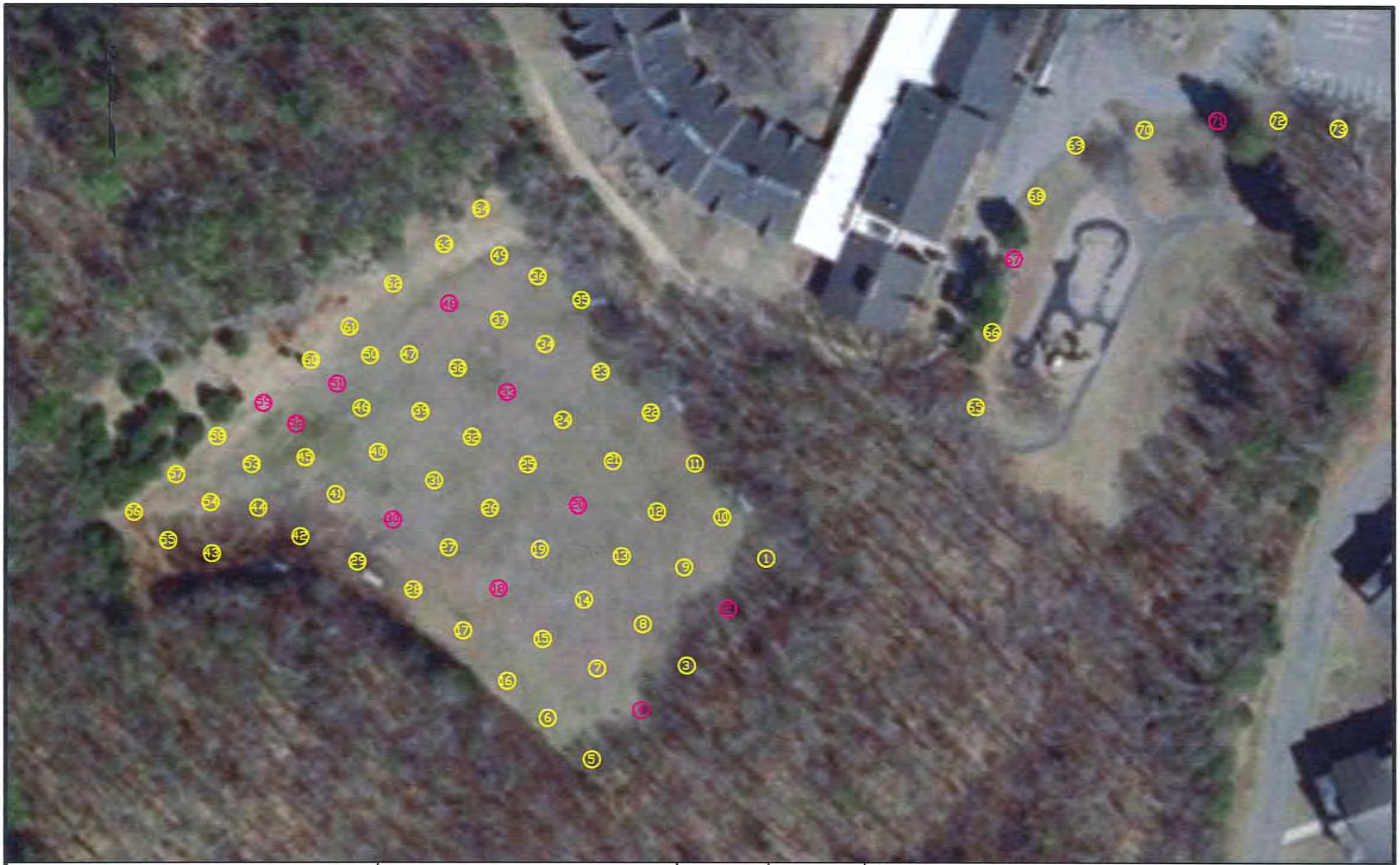
No warranty, whether expressed or implied, is given with respect to this report or any opinions expressed herein. It is expressly understood that this report and the opinions expressed herein are based upon Site conditions as they existed only at the time of assessment.

The data reported and the findings, observations, and opinions expressed in the report are limited by the Scope of Work. The Scope of Work was performed based on budgetary, time, and other constraints imposed by the Client, and the agencies and persons reviewed.
Due to the fact that geological and soil formations are inherently random, variable and indeterminate (heterogeneous) in nature, the professional services and opinions provided by Lord Environmental, Inc. under our agreement are not guaranteed to be a representation of complete Site conditions, which are variable and subject to change with time or the result of natural or man-made processes.

Although our services are extensive, opinions, findings and conclusions presented are limited to and by the data supplied, reported and obtained. Lord Environmental, Inc. makes no expressed or implied representations, warranties or guarantees regarding any changes in the condition of the premises after the date of the on-site inspection(s).

In preparing this report, Lord Environmental, Inc. has relied upon and presumed accurate certain information about the Site and adjacent properties provided by governmental agencies, the client and others identified in the report. Except as otherwise stated in the report, Lord Environmental, Inc. has not attempted to verify the accuracy or completeness of any such information.

FIGURES



LORD ENVIRONMENTAL, INC.
1506 PROVIDENCE HWY #30 (781) 255-5554
NORWOOD, MA FAX (781) 255-5535

SITE:
GREEN MEADOW ELEMENTARY SCHOOL
5 TIGER DRIVE
MAYNARD, MA

TITLE:
SAMPLING PLAN

FILE:
Soil Sampling Plan

DRAWN BY:	FIGURE:
JDP	1
SHEET:	DATE/REV:
1 of 1	4/4/2023

LEGEND:

④ SOIL SAMPLING LOCATION w/LAB ANALYSIS

NOTES:

Scale: 1" = 100' (approx)

TABLES

Table 1

SOIL BORING LOGS - FIELD SCREENING

5 TIGER DRIVE, MAYNARD, MA

BORING METHOD: Geoprobe 6712DT Track Rig DATEs: March 22 and 24, 2023

Boring	Depth (ft)	PID Reading (ppm)	Soil Description
B-1	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-2	0-3	ND	6" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-3	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand, little coarse sand, trace silt
B-4	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-5	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-6	0-3	ND	7" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-7	0-3	ND	2" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace gravel, silt
B-8	0-3	ND	7" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-9	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand and gravel
B-10	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand and gravel
B-11	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand and gravel
B-12	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-13	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-14	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-15	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-16	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-17	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-18	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-19	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-20	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-21	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-22	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-23	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-24	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-25	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-26	0-3	ND	2" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-27	0-3	ND	2" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-28	0-3	ND	Brown, coarse to fine sand, some gravel, trace silt
B-29	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-30	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-31	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-32	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-33	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-34	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-35	0-3	ND	Red brown, coarse to fine sand, some gravel, trace silt
B-36	0-3	ND	Red brown, coarse to fine sand, some gravel, trace silt
B-37	0-3	ND	6" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-38	0-3	ND	6" Loam topsoil. Brown, coarse to fine sand and gravel. One 1' boulder
B-39	0-3	ND	3" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-40	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-41	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-42	0-3	ND	3" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-43	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt

Table 1

SOIL BORING LOGS - FIELD SCREENING

5 TIGER DRIVE, MAYNARD, MA

BORING METHOD: Geoprobe 6712DT Track Rig DATEs: March 22 and 24, 2023

Boring	Depth (ft)	PID Reading (ppm)	Soil Description
B-44	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-45	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-46	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-47	0-3	ND	8” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-48	0-3	ND	3” Loam topsoil. Brown, medium to fine sand, some silt
B-49	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-50	0-3	ND	10” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-51	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, trace gravel, silt
B-52	0-3	ND	Brown and grey, coarse to fine sand, little gravel, silt
B-53	0-3	ND	Brown, coarse to fine sand, little gravel, trace
B-54	0-3	ND	Brown and grey, coarse to fine sand, little gravel, silt
B-55	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-56	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-57	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-58	0-3	ND	3” Loam topsoil. Brown, medium to fine sand, little gravel, coarse sand, trace silt
B-59	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-60	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-61	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-62	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-63	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-64	0-3	ND	8” Loam topsoil. Brown, coarse to fine sand, little cobbles, gravel, trace silt
B-65	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-66	0-3	ND	4” Loam topsoil. Brown, medium to fine sand, trace gravel, coarse sand, silt
B-67	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-68	0-3	ND	6” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-69	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-70	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-71	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-72	0-3	ND	Brown, medium to fine sand, trace gravel, coarse sand, silt
B-73	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt

Notes:
ND – Not Detected

Table 2
Soil Analysis Results (mg/kg), 3/24/2023
5 Tiger Drive, Maynard, MA

Sample	**B-2**		**B-4**		**B-18**		**B-20**		**B-30**		**B-33**		**B-48**		**B-51**		**B-52**		**B-59**		**B-67**		**B-71**		**MADEP Standards**	
Date Sampled:	3/22/23		3/22/23		3/22/23		3/22/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23			
Parameter	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	**RC-S1**	**RC-S2**
EPH and PAH																										
Unadjusted C11-C22 Aromatic Hydrocarbons	ND	7.59	ND	7.48	**21**	8.46	ND	6.99	ND	7.04	ND	7.47	ND	7.57	ND	7.57	**8.7**	7.53	ND	7.63	ND	7.26	ND	7.33		
Naphthalene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	4	20
2-Methylnaphthalene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	0.7	80
Phenanthrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	10	1000
Acenaphthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	4	3000
Acenaphthylene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1	10
Fluorene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Benzo(a)anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Chrysene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	70	400
Benzo(b)fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Benzo(k)fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	70	400
Benzo(a)pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	2	7
Indeno(1,2,3-cd)pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Dibenz(a,h)anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	0.7	4
Benzo(g,h,i)perylene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
C9-C18 Aliphatic Hydrocarbons	ND	15.1	ND	14.9	ND	16.9	ND	13.9	ND	14	ND	14.9	ND	15.1	ND	15.1	ND	15	ND	15.2	ND	14.5	ND	14.6	1000	3000
C19-C36 Aliphatic Hydrocarbons	**17.7**	15.1	ND	14.9	ND	16.9	ND	13.9	ND	14	ND	14.9	ND	15.1	ND	15.1	**15.7**	15	ND	15.2	ND	14.5	ND	14.6	3000	5000
C11-C22 Aromatic Hydrocarbons	ND	7.59	ND	7.48	**21**	8.46	ND	6.99	ND	7.04	ND	7.47	ND	7.57	ND	7.57	**8.7**	7.53	ND	7.63	ND	7.26	ND	7.33	1000	3000

Notes
mg/kg: Milligrams per kilogram
EPH: Extractable Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
RL: Reporting Limit
RC-S1: MassDEP Reportable Concentration S-1
RC-S2: MassDEP Reportable Concentration S-2
Detected analytes are highlighted blue 🟦
No analytes were detected above their MADEP S-1 Reportable Concentrations

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
General Chemistry																	
Flashpoint	> 200	70	> 200	70	> 200	70	> 200	70	> 200	70	> 200	70	degrees F				
Specific Conductance	**13.7**	2	**296**	2	**56.3**	2	**15.9**	2	**9.4**	2	**17.4**	2	uS/cm			8000	4000
pH	**8.1**		**7.1**		**7**		**6**		**5.1**		**5.2**		SU				
Polychlorinated Biphenyls (PCBs)																	
Aroclor-1016	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1221	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1232	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1242	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1248	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1254	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1260	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1262	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg			see PCBs (Total)	see PCBs (Total)
Aroclor-1268	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg			see PCBs (Total)	see PCBs (Total)
PCBs (Total)	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	2000	2000
Reactivity																	
Cyanide	ND	0.2	ND	0.2	ND	0.3	ND	0.2	ND	0.2	ND	0.2	mg/kg	30	100		
Sulfide	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	mg/kg				
Semivolatile organic compounds																	
1,2,4-Trichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	6000		
1,2-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	9000	100000		
1,3-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	3000	200000		
1,4-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	1000		
Phenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	900	10000		
2,4,5-Trichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	600000		
2,4,6-Trichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	20000		
2,4-Dichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	40000		
2,4-Dimethylphenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	700	100000		
2,4-Dinitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	50000		
2,4-Dinitrotoluene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	10000		
2,6-Dinitrotoluene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
2-Chloronaphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
2-Chlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	100000		
2-Methylnaphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	80000		
Nitrobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
2-Methylphenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
2-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
2-Nitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	100000	1000000		
3,3’-Dichlorobenzidine	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	20000		
3-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
4,6-Dinitro-2-methylphenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	50000	500000		
4-Bromophenyl phenyl ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
4-Chloro-3-methylphenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
4-Chloroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000	3000		
4-Chlorophenyl phenyl ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
4-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
4-Nitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	100000	1000000		
Acenaphthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	3000000		
Acenaphthylene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	10000		
Aniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
Anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Benzo(a)anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Benzo(a)pyrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	30000		
Benzo(b)fluoranthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Benzo(g,h,i)perylene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Benzo(k)fluoranthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	200000	3000000		
Benzoic acid	ND	1080	ND	1050	ND	1250	ND	1150	ND	1180	ND	1100	ug/kg	1000000	1.00E+07		
Biphenyl	ND	22	ND	21	ND	25	ND	23	ND	24	ND	22	ug/kg	50	6000		
Bis(2-chloroethoxy)methane	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
Bis(2-chloroethyl)ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	700		
Bis(2-chloroisopropyl)ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	700		
Bis(2-ethylhexyl)phthalate	ND	433	ND	422	ND	501	ND	460	ND	474	ND	440	ug/kg	100000	700000		
Butyl benzyl phthalate	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Chrysene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	200000	3000000		
Di-n-octyl phthalate	ND	217	ND	211	ND	250	ND	230	ND	237	ND	220	ug/kg	1000000	1.00E+07		
Dibenz(a,h)anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	30000		
Dibenzofuran	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Diethyl phthalate	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	10000	200000		
Dimethyl phthalate	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	700	50000		
Di-n-butyl phthalate	ND	217	ND	211	ND	250	ND	230	ND	237	ND	220	ug/kg	50000	500000		

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
Fluoranthene	ND	141	ND	137	**208**	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Fluorene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Hexachlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	900		
Hexachlorobutadiene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	30000	100000		
Hexachlorocyclopentadiene	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	50000	500000		
Hexachloroethane	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	3000		
Indeno(1,2,3-cd)pyrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Isophorone	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Naphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	20000		
N-Nitrosodimethylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	50000	500000		
N-Nitrosodi-n-propylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	50000	500000		
N-Nitrosodiphenylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Pentachlorophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	10000		
Phenanthrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	10000	1000000		
Pyrene	ND	141	ND	137	**240**	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
m&p-Cresol	ND	282	ND	274	ND	326	ND	299	ND	308	ND	286	ug/kg	500000	5000000		
Pyridine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
Azobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
Total Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	4000		
Total Metals																	
Antimony	ND	0.81	ND	0.77	**1.09**	0.86	ND	0.88	ND	0.95	ND	0.88	mg/kg	20	40		
Arsenic	**8.77**	1.22	**6.64**	1.17	**10.5**	1.3	**5.92**	1.33	**9.73**	1.44	**6.4**	1.33	mg/kg	20	20	40	40
Barium	**29.1**	0.4	**55.4**	0.39	**32.5**	0.43	**38**	0.44	**13.6**	0.48	**65.3**	0.44	mg/kg	1000	3000		
Beryllium	ND	0.4	ND	0.39	ND	0.43	ND	0.44	ND	0.48	ND	0.44	mg/kg	100	200		
Cadmium	**2.43**	0.61	**4.49**	0.58	**3.42**	0.65	**4.33**	0.66	**2.54**	0.72	**5.34**	0.66	mg/kg	80	80	80	30
Chromium	**10.6**	0.61	**22.8**	0.58	**13.7**	0.65	**19.5**	0.66	**13**	0.72	**21.8**	0.66	mg/kg	100	200	1000	1000
Lead	**3.35**	0.61	**5.7**	0.58	**38.7**	0.65	**5.29**	0.66	**3.91**	0.72	**5.94**	0.66	mg/kg	200	600	2000	1000
Nickel	**6.35**	0.61	**13.7**	0.58	**9.11**	0.65	**9.06**	0.66	**8.94**	0.72	**9.97**	0.66	mg/kg	700	1000		
Selenium	ND	1.22	ND	1.17	ND	1.3	ND	1.33	ND	1.44	ND	1.33	mg/kg	400	800		
Silver	ND	1.22	ND	1.17	ND	1.3	ND	1.33	ND	1.44	ND	1.33	mg/kg	100	200		
Vanadium	**12.4**	0.4	**26.1**	0.39	**21.4**	0.43	**24.4**	0.44	**14.4**	0.48	**36.7**	0.44	mg/kg	500	800		
Zinc	**16.7**	2.4	**24.6**	2.3	**48.6**	2.6	**22.9**	2.7	**18**	2.9	**26.3**	2.7	mg/kg	1000	3000		
Thallium	ND	0.4	ND	0.39	ND	0.43	ND	0.44	ND	0.48	ND	0.44	mg/kg	8	70		
Mercury	ND	0.104	ND	0.09	**0.129**	0.118	**0.184**	0.111	ND	0.11	ND	0.097	mg/kg	20	40	10	10
Total Petroleum Hydrocarbons																	
Total Petroleum Hydrocarbons	ND	29	ND	28	ND	33	ND	30	ND	31	ND	28	mg/kg	1000	3000	5000	2500
Volatile Organic Compounds 8260C (5035-LL)																	
Acetone	ND	93	ND	92	ND	103	ND	106	ND	823	ND	137	ug/kg	6000	50000		
Benzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	2000	200000		
Bromobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Bromochloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
Bromodichloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Bromoform	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	1000		
Bromomethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500	500		
2-Butanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	4000	50000		
tert-Butyl alcohol	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
sec-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
n-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
tert-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Methyl t-butyl ether (MTBE)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100000		
Carbon Disulfide	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Carbon Tetrachloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	5000	5000		
Chlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	3000		
Chloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Chloroform	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	200	200		
Chloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
4-Chlorotoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
2-Chlorotoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,2-Dibromo-3-chloropropane (DBCP)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10000	100000		
Dibromochloromethane	ND	5	ND	5	ND	5	ND	5	ND	*6*	ND	7	ug/kg	5	30		
1,2-Dibromoethane (EDB)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Dibromomethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
1,2-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	9000	100000		
1,3-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	200000		
1,4-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	700	1000		
1,1-Dichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	400	9000		
1,2-Dichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
1,2 Dichloroethene, Total	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	400		
trans-1,2-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	1000		
cis-1,2-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
1,1-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	40000		
1,2-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
2,2-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
cis-1,3-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	100	,3-Dichloropropene (cis +	,3-Dichloropropene (cis +
trans-1,3-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	100	,3-Dichloropropene (cis +	,3-Dichloropropene (cis +
1,1-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,3-Dichloropropene (cis + trans)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	400		
Diethyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,4-Dioxane	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	200	5000		
Ethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	40000	1000000		
Hexachlorobutadiene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	100000		
2-Hexanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	100000	1000000		
Isopropylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
p-Isopropyltoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Methylene Chloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	3000		
4-Methyl-2-pentanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	400	50000		
Naphthalene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	4000	20000		
n-Propylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Styrene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	4000		
1,1,1,2-Tetrachloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Tetrachloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	4000		
Tetrahydrofuran	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
Toluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	1000000		
1,2,4-Trichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	2000	6000		
1,2,3-Trichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,1,2-Trichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	2000		
1,1,1-Trichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	600000		
Trichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	300		
1,2,3-Trichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,3,5-Trimethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10000	100000		
1,2,4-Trimethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
Vinyl Chloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	700		
o-Xylene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	see Total xylenes	see Total xylenes	see Total xylenes	see Total xylenes
m&p-Xylene	ND	9	ND	9	ND	10	ND	11	ND	12	ND	14	ug/kg	see Total xylenes	see Total xylenes	see Total xylenes	see Total xylenes
Total xylenes	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	100000		
1,1,2,2-Tetrachloroethane	ND	5	ND	5	ND	5	ND	5	ND	*6*	ND	7	ug/kg	5	20		
tert-Amyl methyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,3-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
Ethyl tert-butyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
Diisopropyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Trichlorofluoromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
Dichlorodifluoromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		

LABORATORY REPORTS

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 3C27022
Client Project: 3096 - MVG Green

Report Date: 04-April-2023

Prepared for:

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Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 03/27/23. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 3C27022. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
3C27022-01	B-2	Soil	03/22/2023	03/27/2023
3C27022-02	B-4	Soil	03/22/2023	03/27/2023
3C27022-03	B-18	Soil	03/22/2023	03/27/2023
3C27022-04	B-20	Soil	03/22/2023	03/27/2023
3C27022-05	B-30	Soil	03/24/2023	03/27/2023
3C27022-06	B-33	Soil	03/24/2023	03/27/2023
3C27022-07	B-48	Soil	03/24/2023	03/27/2023
3C27022-08	B-51	Soil	03/24/2023	03/27/2023
3C27022-09	B-52	Soil	03/24/2023	03/27/2023
3C27022-10	B-59	Soil	03/24/2023	03/27/2023
3C27022-11	B-67	Soil	03/24/2023	03/27/2023
3C27022-12	B-71	Soil	03/24/2023	03/27/2023

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-18 (Lab Number: 3C27022-03)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-2 (Lab Number: 3C27022-01)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-20 (Lab Number: 3C27022-04)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-30 (Lab Number: 3C27022-05)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-33 (Lab Number: 3C27022-06)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-4 (Lab Number: 3C27022-02)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-48 (Lab Number: 3C27022-07)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-51 (Lab Number: 3C27022-08)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-52 (Lab Number: 3C27022-09)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-59 (Lab Number: 3C27022-10)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-67 (Lab Number: 3C27022-11)

Analysis	**Method**
MADEP EPH	MADEP EPH

B-71 (Lab Number: 3C27022-12)

Analysis	**Method**
MADEP EPH	MADEP EPH

Method References

Method for the Determination of Extractable Petroleum Hydrocarbons, Rev. 2.1, Massachusetts Department of Environmental Protection, 2004

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Extractable Petroleum Hydrocarbons
Sample: B-2 (3C27022-01)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-2
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-01
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.70

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.59	mg/kg	<7.59	04/03/23 17:27
Diesel PAH Analytes	Naphthalene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	2-Methylnaphthalene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Phenanthrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Acenaphthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
Other Target PAH Analytes	Acenaphthylene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Fluorene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(a)anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Chrysene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(b)fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(k)fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(a)pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Indeno(1,2,3-cd)pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Dibenz(a,h)anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(g,h,i)perylene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/03/23 23:00
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	**17.7**	04/03/23 23:00
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.59	mg/kg	<7.59	04/03/23 17:27
Chlorooctadecane (Sample Surrogate)				%	90.3	04/03/23 23:00
o-Terphenyl (Sample Surrogate)				%	76.0	04/03/23 17:27
2-Fluorobiphenyl (Fractionation Surrogate)				%	99.8	04/03/23 17:27
2-Bromonaphthalene (Fractionation Surrogate)				%	97.6	04/03/23 17:27
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-4 (3C27022-02)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-4
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-02
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	11.40

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.48	mg/kg	<7.48	04/03/23 17:04
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Fluorene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Chrysene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/03/23 23:24
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/03/23 23:24
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.48	mg/kg	<7.48	04/03/23 17:04
Chlorooctadecane (Sample Surrogate)				%	71.3	04/03/23 23:24
o-Terphenyl (Sample Surrogate)				%	68.3	04/03/23 17:04
2-Fluorobiphenyl (Fractionation Surrogate)				%	92.2	04/03/23 17:04
2-Bromonaphthalene (Fractionation Surrogate)				%	89.8	04/03/23 17:04
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-18 (3C27022-03)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-18
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-03
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	21.70

RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	8.46	mg/kg	**21.0**	04/03/23 17:50
Diesel PAH Analytes	Naphthalene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	2-Methylnaphthalene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Phenanthrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Acenaphthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
Other Target PAH Analytes	Acenaphthylene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Fluorene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(a)anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Chrysene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(b)fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(k)fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(a)pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Indeno(1,2,3-cd)pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Dibenz(a,h)anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(g,h,i)perylene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
C9-C18 Aliphatic Hydrocarbons [1]		1X	16.9	mg/kg	<16.9	04/03/23 23:49
C19-C36 Aliphatic Hydrocarbons [1]		1X	16.9	mg/kg	<16.9	04/03/23 23:49
C11-C22 Aromatic Hydrocarbons [1,2]		1X	8.46	mg/kg	**21.0**	04/03/23 17:50
Chlorooctadecane (Sample Surrogate)				%	74.2	04/03/23 23:49
o-Terphenyl (Sample Surrogate)				%	62.8	04/03/23 17:50
2-Fluorobiphenyl (Fractionation Surrogate)				%	89.2	04/03/23 17:50
2-Bromonaphthalene (Fractionation Surrogate)				%	85.6	04/03/23 17:50
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-20 (3C27022-04)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-20
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-04
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	5.10

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	6.99	mg/kg	<6.99	04/03/23 16:42
Diesel PAH Analytes	Naphthalene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	2-Methylnaphthalene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Phenanthrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Acenaphthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
Other Target PAH Analytes	Acenaphthylene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Fluorene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(a)anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Chrysene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(b)fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(k)fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(a)pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Indeno(1,2,3-cd)pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Dibenz(a,h)anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(g,h,i)perylene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
C9-C18 Aliphatic Hydrocarbons [1]		1X	13.9	mg/kg	<13.9	04/04/23 00:14
C19-C36 Aliphatic Hydrocarbons [1]		1X	13.9	mg/kg	<13.9	04/04/23 00:14
C11-C22 Aromatic Hydrocarbons [1,2]		1X	6.99	mg/kg	<6.99	04/03/23 16:42
Chlorooctadecane (Sample Surrogate)				%	98.5	04/04/23 00:14
o-Terphenyl (Sample Surrogate)				%	80.3	04/03/23 16:42
2-Fluorobiphenyl (Fractionation Surrogate)				%	99.5	04/03/23 16:42
2-Bromonaphthalene (Fractionation Surrogate)				%	96.1	04/03/23 16:42
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-30 (3C27022-05)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-30
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-05
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	5.90

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.04	mg/kg	<7.04	04/04/23 01:52
Diesel PAH Analytes	Naphthalene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	2-Methylnaphthalene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Phenanthrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Acenaphthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
Other Target PAH Analytes	Acenaphthylene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Fluorene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(a)anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Chrysene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(b)fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(k)fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(a)pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Indeno(1,2,3-cd)pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Dibenz(a,h)anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(g,h,i)perylene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.0	mg/kg	<14.0	04/04/23 03:56
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.0	mg/kg	<14.0	04/04/23 03:56
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.04	mg/kg	<7.04	04/04/23 01:52
Chlorooctadecane (Sample Surrogate)				%	109	04/04/23 03:56
o-Terphenyl (Sample Surrogate)				%	94.6	04/04/23 01:52
2-Fluorobiphenyl (Fractionation Surrogate)				%	111	04/04/23 01:52
2-Bromonaphthalene (Fractionation Surrogate)				%	107	04/04/23 01:52
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-33 (3C27022-06)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-33
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-06
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	11.30

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.47	mg/kg	<7.47	04/04/23 13:14
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/04/23 04:20
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/04/23 04:20
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.47	mg/kg	<7.47	04/04/23 13:14
Chlorooctadecane (Sample Surrogate)				%	103	04/04/23 04:20
o-Terphenyl (Sample Surrogate)				%	80.9	04/04/23 13:14
2-Fluorobiphenyl (Fractionation Surrogate)				%	97.7	04/04/23 13:14
2-Bromonaphthalene (Fractionation Surrogate)				%	91.3	04/04/23 13:14
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-48 (3C27022-07)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-48
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-07
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.50

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.57	mg/kg	<7.57	04/04/23 13:37
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 04:45
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 04:45
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.57	mg/kg	<7.57	04/04/23 13:37
Chlorooctadecane (Sample Surrogate)				%	98.6	04/04/23 04:45
o-Terphenyl (Sample Surrogate)				%	83.4	04/04/23 13:37
2-Fluorobiphenyl (Fractionation Surrogate)				%	104	04/04/23 13:37
2-Bromonaphthalene (Fractionation Surrogate)				%	99.7	04/04/23 13:37
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-51 (3C27022-08)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-51
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-08
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.40

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.57	mg/kg	<7.57	04/04/23 03:45
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 05:09
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 05:09
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.57	mg/kg	<7.57	04/04/23 03:45
Chlorooctadecane (Sample Surrogate)				%	115	04/04/23 05:09
o-Terphenyl (Sample Surrogate)				%	102	04/04/23 03:45
2-Fluorobiphenyl (Fractionation Surrogate)				%	113	04/04/23 03:45
2-Bromonaphthalene (Fractionation Surrogate)				%	108	04/04/23 03:45
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-52 (3C27022-09)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-52
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-09
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.00

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.53	mg/kg	**8.70**	04/04/23 02:37
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.0	mg/kg	<15.0	04/04/23 05:34
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.0	mg/kg	**15.7**	04/04/23 05:34
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.53	mg/kg	**8.70**	04/04/23 02:37
Chlorooctadecane (Sample Surrogate)				%	89.2	04/04/23 05:34
o-Terphenyl (Sample Surrogate)				%	70.4	04/04/23 02:37
2-Fluorobiphenyl (Fractionation Surrogate)				%	98.7	04/04/23 02:37
2-Bromonaphthalene (Fractionation Surrogate)				%	96.4	04/04/23 02:37
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-59 (3C27022-10)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-59
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-10
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	13.20

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.63	mg/kg	<7.63	04/04/23 02:15
Diesel PAH Analytes	Naphthalene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	2-Methylnaphthalene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Phenanthrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Acenaphthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
Other Target PAH Analytes	Acenaphthylene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Fluorene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(a)anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Chrysene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(b)fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(k)fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(a)pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Indeno(1,2,3-cd)pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Dibenz(a,h)anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(g,h,i)perylene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.2	mg/kg	<15.2	04/04/23 05:58
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.2	mg/kg	<15.2	04/04/23 05:58
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.63	mg/kg	<7.63	04/04/23 02:15
Chlorooctadecane (Sample Surrogate)				%	96.2	04/04/23 05:58
o-Terphenyl (Sample Surrogate)				%	54.3	04/04/23 02:15
2-Fluorobiphenyl (Fractionation Surrogate)				%	65.9	04/04/23 02:15
2-Bromonaphthalene (Fractionation Surrogate)				%	63.1	04/04/23 02:15
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-67 (3C27022-11)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-67
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-11
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	8.80

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.26	mg/kg	<7.26	04/04/23 13:59
Diesel PAH Analytes	Naphthalene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	2-Methylnaphthalene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Phenanthrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Acenaphthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
Other Target PAH Analytes	Acenaphthylene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Fluorene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(a)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Chrysene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(b)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(k)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(a)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Indeno(1,2,3-cd)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Dibenz(a,h)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(g,h,i)perylene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.5	mg/kg	<14.5	04/04/23 06:23
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.5	mg/kg	<14.5	04/04/23 06:23
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.26	mg/kg	<7.26	04/04/23 13:59
Chlorooctadecane (Sample Surrogate)				%	112	04/04/23 06:23
o-Terphenyl (Sample Surrogate)				%	71.3	04/04/23 13:59
2-Fluorobiphenyl (Fractionation Surrogate)				%	78.9	04/04/23 13:59
2-Bromonaphthalene (Fractionation Surrogate)				%	75.1	04/04/23 13:59
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-71 (3C27022-12)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-71
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-12
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	9.70

RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.33	mg/kg	<7.33	04/04/23 03:22
Diesel PAH Analytes	Naphthalene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	2-Methylnaphthalene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Phenanthrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Acenaphthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
Other Target PAH Analytes	Acenaphthylene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Fluorene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(a)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Chrysene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(b)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(k)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(a)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Indeno(1,2,3-cd)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Dibenz(a,h)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(g,h,i)perylene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.6	mg/kg	<14.6	04/04/23 06:47
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.6	mg/kg	<14.6	04/04/23 06:47
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.33	mg/kg	<7.33	04/04/23 03:22
Chlorooctadecane (Sample Surrogate)				%	100	04/04/23 06:47
o-Terphenyl (Sample Surrogate)				%	82.6	04/04/23 03:22
2-Fluorobiphenyl (Fractionation Surrogate)				%	96.6	04/04/23 03:22
2-Bromonaphthalene (Fractionation Surrogate)				%	93.2	04/04/23 03:22
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Quality Control

Extractable Petroleum Hydrocarbons (MADEP-EPH)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3C1293 - EPA 3546										
Blank (B3C1293-BLK1)					Prepared: 03/30/23 Analyzed: 04/03/23					
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Naphthalene	ND		0.33	mg/kg						
2-Methylnaphthalene	ND		0.33	mg/kg						
Phenanthrene	ND		0.33	mg/kg						
Acenaphthene	ND		0.33	mg/kg						
Acenaphthylene	ND		0.33	mg/kg						
Fluorene	ND		0.33	mg/kg						
Anthracene	ND		0.33	mg/kg						
Fluoranthene	ND		0.33	mg/kg						
Pyrene	ND		0.33	mg/kg						
Benzo(a)anthracene	ND		0.33	mg/kg						
Chrysene	ND		0.33	mg/kg						
Benzo(b)fluoranthene	ND		0.33	mg/kg						
Benzo(k)fluoranthene	ND		0.33	mg/kg						
Benzo(a)pyrene	ND		0.33	mg/kg						
Indeno(1,2,3-cd)pyrene	ND		0.33	mg/kg						
Dibenz(a,h)anthracene	ND		0.33	mg/kg						
Benzo(g,h,i)perylene	ND		0.33	mg/kg						
C9-C18 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C19-C36 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Surrogate: Chlorooctadecane			*7.41*	mg/kg	*8.28*		*89.5*	*40-140*		
Surrogate: o-Terphenyl			*5.29*	mg/kg	*8.28*		*63.9*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.95*	mg/kg	*3.31*		*89.2*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.78*	mg/kg	*3.31*		*83.8*	*40-140*		
LCS (B3C1293-BS1)					Prepared: 03/30/23 Analyzed: 04/04/23					
Naphthalene	1.66		0.33	mg/kg	2.65		62.8	40-140		
2-Methylnaphthalene	1.66		0.33	mg/kg	2.65		62.5	40-140		
Phenanthrene	1.83		0.33	mg/kg	2.65		69.1	40-140		
Acenaphthene	1.81		0.33	mg/kg	2.65		68.2	40-140		
Acenaphthylene	1.71		0.33	mg/kg	2.65		64.5	40-140		
Fluorene	1.73		0.33	mg/kg	2.65		65.5	40-140		
Anthracene	1.78		0.33	mg/kg	2.65		67.0	40-140		
Fluoranthene	1.93		0.33	mg/kg	2.65		72.7	40-140		
Pyrene	1.93		0.33	mg/kg	2.65		72.7	40-140		
Benzo(a)anthracene	1.92		0.33	mg/kg	2.65		72.6	40-140		
Chrysene	2.03		0.33	mg/kg	2.65		76.8	40-140		
Benzo(b)fluoranthene	1.88		0.33	mg/kg	2.65		71.0	40-140		
Benzo(k)fluoranthene	1.98		0.33	mg/kg	2.65		74.8	40-140		
Benzo(a)pyrene	1.86		0.33	mg/kg	2.65		70.1	40-140		
Indeno(1,2,3-cd)pyrene	1.84		0.33	mg/kg	2.65		69.4	40-140		
Dibenz(a,h)anthracene	1.91		0.33	mg/kg	2.65		72.0	40-140		
Benzo(g,h,i)perylene	1.85		0.33	mg/kg	2.65		69.9	40-140		
EPH_LCS_Aliphatic_C19-C36	14.6		0.00	mg/kg	21.2		68.8	40-140		
EPH_LCS_Aliphatic_C9-C18	8.48		0.00	mg/kg	15.9		53.4	40-140		
EPH_LCS_Aromatic_C11-C22	31.3		0.00	mg/kg	45.0		69.5	40-140		
Nonane	0.88		0.33	mg/kg	2.65		33.2	30-140		
Decane	1.25		0.33	mg/kg	2.65		47.4	40-140		
Dodecane	1.50		0.33	mg/kg	2.65		56.8	40-140		
Tetradecane	1.55		0.33	mg/kg	2.65		58.6	40-140		
Hexadecane	1.60		0.33	mg/kg	2.65		60.2	40-140		
Octadecane	1.70		0.33	mg/kg	2.65		64.0	40-140		
Nonadecane	1.76		0.33	mg/kg	2.65		66.3	40-140		

Quality Control

(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3C1293 - EPA 3546 (Continued)										
LCS (B3C1293-BS1)					Prepared: 03/30/23 Analyzed: 04/03/23					
Eicosane	1.81		0.33	mg/kg	2.65		68.5	40-140		
Docosane	1.88		0.33	mg/kg	2.65		71.0	40-140		
Tetracosane	1.91		0.33	mg/kg	2.65		72.2	40-140		
Hexacosane	1.91		0.33	mg/kg	2.65		71.9	40-140		
Octacosane	1.89		0.33	mg/kg	2.65		71.3	40-140		
Triacontane	1.85		0.33	mg/kg	2.65		69.9	40-140		
Hexatriacontane	1.57		0.33	mg/kg	2.65		59.4	40-140		
Surrogate: Chlorooctadecane			*6.48*	mg/kg	*8.28*		*78.3*	*40-140*		
Surrogate: o-Terphenyl			*6.31*	mg/kg	*8.28*		*76.2*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.15*	mg/kg	*3.31*		*95.1*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.05*	mg/kg	*3.31*		*92.1*	*40-140*		
LCS Dup (B3C1293-BSD1)					Prepared: 03/30/23 Analyzed: 04/03/23					
Naphthalene	1.66		0.33	mg/kg	2.65		62.5	40-140	0.439	25
2-Methylnaphthalene	1.63		0.33	mg/kg	2.65		61.6	40-140	1.57	25
Phenanthrene	1.81		0.33	mg/kg	2.65		68.2	40-140	1.35	25
Acenaphthene	1.79		0.33	mg/kg	2.65		67.6	40-140	0.847	25
Acenaphthylene	1.72		0.33	mg/kg	2.65		65.1	40-140	0.926	25
Fluorene	1.75		0.33	mg/kg	2.65		66.1	40-140	1.03	25
Anthracene	1.84		0.33	mg/kg	2.65		69.4	40-140	3.52	25
Fluoranthene	1.87		0.33	mg/kg	2.65		70.7	40-140	2.82	25
Pyrene	1.90		0.33	mg/kg	2.65		71.7	40-140	1.42	25
Benzo(a)anthracene	1.79		0.33	mg/kg	2.65		67.6	40-140	7.02	25
Chrysene	2.01		0.33	mg/kg	2.65		75.7	40-140	1.38	25
Benzo(b)fluoranthene	1.79		0.33	mg/kg	2.65		67.4	40-140	5.27	25
Benzo(k)fluoranthene	1.92		0.33	mg/kg	2.65		72.3	40-140	3.40	25
Benzo(a)pyrene	1.73		0.33	mg/kg	2.65		65.2	40-140	7.13	25
Indeno(1,2,3-cd)pyrene	1.53		0.33	mg/kg	2.65		57.9	40-140	18.1	25
Dibenz(a,h)anthracene	1.75		0.33	mg/kg	2.65		66.1	40-140	8.62	25
Benzo(g,h,i)perylene	1.77		0.33	mg/kg	2.65		66.7	40-140	4.65	25
EPH_LCS_Aliphatic_C19-C36	13.5		0.00	mg/kg	21.2		63.7	40-140	7.71	25
EPH_LCS_Aliphatic_C9-C18	7.46		0.00	mg/kg	15.9		46.9	40-140	12.8	25
EPH_LCS_Aromatic_C11-C22	30.2		0.00	mg/kg	45.0		67.2	40-140	3.42	25
Nonane	0.81		0.33	mg/kg	2.65		30.4	30-140	8.72	25
Decane	1.10		0.33	mg/kg	2.65		41.4	40-140	13.3	25
Dodecane	1.30		0.33	mg/kg	2.65		49.2	40-140	14.3	25
Tetradecane	1.30		0.33	mg/kg	2.65		49.1	40-140	17.6	25
Hexadecane	1.42		0.33	mg/kg	2.65		53.4	40-140	12.0	25
Octadecane	1.54		0.33	mg/kg	2.65		58.0	40-140	9.83	25
Nonadecane	1.62		0.33	mg/kg	2.65		61.0	40-140	8.29	25
Eicosane	1.68		0.33	mg/kg	2.65		63.2	40-140	7.93	25
Docosane	1.75		0.33	mg/kg	2.65		66.1	40-140	7.26	25
Tetracosane	1.79		0.33	mg/kg	2.65		67.4	40-140	6.95	25
Hexacosane	1.78		0.33	mg/kg	2.65		67.1	40-140	7.01	25
Octacosane	1.75		0.33	mg/kg	2.65		66.1	40-140	7.53	25
Triacontane	1.71		0.33	mg/kg	2.65		64.7	40-140	7.80	25
Hexatriacontane	1.43		0.33	mg/kg	2.65		54.1	40-140	9.29	25
Surrogate: Chlorooctadecane			*5.94*	mg/kg	*8.28*		*71.8*	*40-140*		
Surrogate: o-Terphenyl			*6.53*	mg/kg	*8.28*		*78.9*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.27*	mg/kg	*3.31*		*98.8*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.11*	mg/kg	*3.31*		*93.8*	*40-140*		

Quality Control

(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3C1325 - EPA 3546										
Blank (B3C1325-BLK1)					Prepared: 03/30/23 Analyzed: 04/04/23					
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Naphthalene	ND		0.33	mg/kg						
2-Methylnaphthalene	ND		0.33	mg/kg						
Phenanthrene	ND		0.33	mg/kg						
Acenaphthene	ND		0.33	mg/kg						
Acenaphthylene	ND		0.33	mg/kg						
Fluorene	ND		0.33	mg/kg						
Anthracene	ND		0.33	mg/kg						
Fluoranthene	ND		0.33	mg/kg						
Pyrene	ND		0.33	mg/kg						
Benzo(a)anthracene	ND		0.33	mg/kg						
Chrysene	ND		0.33	mg/kg						
Benzo(b)fluoranthene	ND		0.33	mg/kg						
Benzo(k)fluoranthene	ND		0.33	mg/kg						
Benzo(a)pyrene	ND		0.33	mg/kg						
Indeno(1,2,3-cd)pyrene	ND		0.33	mg/kg						
Dibenz(a,h)anthracene	ND		0.33	mg/kg						
Benzo(g,h,i)perylene	ND		0.33	mg/kg						
C9-C18 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C19-C36 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Surrogate: Chlorooctadecane			*9.65*	mg/kg	*8.28*		*117*	*40-140*		
Surrogate: o-Terphenyl			*6.57*	mg/kg	*8.28*		*79.4*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.78*	mg/kg	*3.31*		*83.9*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.63*	mg/kg	*3.31*		*79.4*	*40-140*		
LCS (B3C1325-BS1)					Prepared: 03/30/23 Analyzed: 04/04/23					
Naphthalene	2.15		0.33	mg/kg	2.65		81.2	40-140		
2-Methylnaphthalene	2.09		0.33	mg/kg	2.65		78.9	40-140		
Phenanthrene	2.22		0.33	mg/kg	2.65		83.6	40-140		
Acenaphthene	2.17		0.33	mg/kg	2.65		82.0	40-140		
Acenaphthylene	2.14		0.33	mg/kg	2.65		80.9	40-140		
Fluorene	2.14		0.33	mg/kg	2.65		80.9	40-140		
Anthracene	2.25		0.33	mg/kg	2.65		85.0	40-140		
Fluoranthene	2.35		0.33	mg/kg	2.65		88.6	40-140		
Pyrene	2.34		0.33	mg/kg	2.65		88.4	40-140		
Benzo(a)anthracene	2.30		0.33	mg/kg	2.65		87.0	40-140		
Chrysene	2.44		0.33	mg/kg	2.65		92.0	40-140		
Benzo(b)fluoranthene	2.26		0.33	mg/kg	2.65		85.4	40-140		
Benzo(k)fluoranthene	2.31		0.33	mg/kg	2.65		87.3	40-140		
Benzo(a)pyrene	2.15		0.33	mg/kg	2.65		81.1	40-140		
Indeno(1,2,3-cd)pyrene	2.05		0.33	mg/kg	2.65		77.3	40-140		
Dibenz(a,h)anthracene	2.05		0.33	mg/kg	2.65		77.2	40-140		
Benzo(g,h,i)perylene	2.13		0.33	mg/kg	2.65		80.5	40-140		
EPH_LCS_Aliphatic_C19-C36	18.7		0.00	mg/kg	21.2		88.0	40-140		
EPH_LCS_Aliphatic_C9-C18	10.3		0.00	mg/kg	15.9		65.0	40-140		
EPH_LCS_Aromatic_C11-C22	37.5		0.00	mg/kg	45.0		83.4	40-140		
Nonane	1.04		0.33	mg/kg	2.65		39.1	30-140		
Decane	1.50		0.33	mg/kg	2.65		56.8	40-140		
Dodecane	1.84		0.33	mg/kg	2.65		69.3	40-140		
Tetradecane	1.86		0.33	mg/kg	2.65		70.2	40-140		
Hexadecane	1.96		0.33	mg/kg	2.65		74.0	40-140		
Octadecane	2.14		0.33	mg/kg	2.65		80.9	40-140		
Nonadecane	2.25		0.33	mg/kg	2.65		85.1	40-140		
Eicosane	2.31		0.33	mg/kg	2.65		87.3	40-140		
Docosane	2.37		0.33	mg/kg	2.65		89.6	40-140		
Tetracosane	2.41		0.33	mg/kg	2.65		90.9	40-140		

Quality Control

(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Batch: B3C1325 - EPA 3546 (Continued)

LCS (B3C1325-BS1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Hexacosane	2.42		0.33	mg/kg	2.65		91.2	40-140		
Octacosane	2.40		0.33	mg/kg	2.65		90.7	40-140		
Triacontane	2.38		0.33	mg/kg	2.65		90.0	40-140		
Hexatriacontane	2.11		0.33	mg/kg	2.65		79.5	40-140		
Surrogate: Chlorooctadecane			*8.41*	mg/kg	*8.28*		*102*	*40-140*		
Surrogate: o-Terphenyl			*7.92*	mg/kg	*8.28*		*95.7*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.61*	mg/kg	*3.31*		*109*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.49*	mg/kg	*3.31*		*105*	*40-140*		

LCS Dup (B3C1325-BSD1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Naphthalene	2.24		0.33	mg/kg	2.65		84.4	40-140	3.90	25
2-Methylnaphthalene	2.16		0.33	mg/kg	2.65		81.7	40-140	3.49	25
Phenanthrene	2.20		0.33	mg/kg	2.65		83.1	40-140	0.630	25
Acenaphthene	2.23		0.33	mg/kg	2.65		84.0	40-140	2.44	25
Acenaphthylene	2.20		0.33	mg/kg	2.65		83.1	40-140	2.71	25
Fluorene	2.17		0.33	mg/kg	2.65		81.9	40-140	1.29	25
Anthracene	2.23		0.33	mg/kg	2.65		84.2	40-140	0.886	25
Fluoranthene	2.28		0.33	mg/kg	2.65		86.0	40-140	3.01	25
Pyrene	2.28		0.33	mg/kg	2.65		86.0	40-140	2.72	25
Benzo(a)anthracene	2.24		0.33	mg/kg	2.65		84.7	40-140	2.71	25
Chrysene	2.38		0.33	mg/kg	2.65		89.8	40-140	2.47	25
Benzo(b)fluoranthene	2.23		0.33	mg/kg	2.65		84.2	40-140	1.36	25
Benzo(k)fluoranthene	2.32		0.33	mg/kg	2.65		87.4	40-140	0.172	25
Benzo(a)pyrene	2.14		0.33	mg/kg	2.65		80.8	40-140	0.402	25
Indeno(1,2,3-cd)pyrene	2.02		0.33	mg/kg	2.65		76.3	40-140	1.37	25
Dibenz(a,h)anthracene	2.03		0.33	mg/kg	2.65		76.7	40-140	0.617	25
Benzo(g,h,i)perylene	2.19		0.33	mg/kg	2.65		82.5	40-140	2.45	25
EPH_LCS_Aliphatic_C19-C36	20.4		0.00	mg/kg	21.2		96.2	40-140	8.84	25
EPH_LCS_Aliphatic_C9-C18	11.9		0.00	mg/kg	15.9		74.6	40-140	13.7	25
EPH_LCS_Aromatic_C11-C22	37.5		0.00	mg/kg	45.0		83.4	40-140	0.0265	25
Nonane	1.34		0.33	mg/kg	2.65		50.5	30-140	25.6	25
Decane	1.83		0.33	mg/kg	2.65		68.9	40-140	19.3	25
Dodecane	2.11		0.33	mg/kg	2.65		79.5	40-140	13.7	25
Tetradecane	2.10		0.33	mg/kg	2.65		79.3	40-140	12.1	25
Hexadecane	2.17		0.33	mg/kg	2.65		81.8	40-140	9.98	25
Octadecane	2.31		0.33	mg/kg	2.65		87.4	40-140	7.63	25
Nonadecane	2.42		0.33	mg/kg	2.65		91.2	40-140	7.00	25
Eicosane	2.50		0.33	mg/kg	2.65		94.4	40-140	7.84	25
Docosane	2.60		0.33	mg/kg	2.65		98.1	40-140	9.06	25
Tetracosane	2.65		0.33	mg/kg	2.65		99.9	40-140	9.41	25
Hexacosane	2.65		0.33	mg/kg	2.65		100	40-140	9.38	25
Octacosane	2.64		0.33	mg/kg	2.65		99.7	40-140	9.45	25
Triacontane	2.61		0.33	mg/kg	2.65		98.4	40-140	8.92	25
Hexatriacontane	2.32		0.33	mg/kg	2.65		87.5	40-140	9.61	25
Surrogate: Chlorooctadecane			*8.87*	mg/kg	*8.28*		*107*	*40-140*		
Surrogate: o-Terphenyl			*7.65*	mg/kg	*8.28*		*92.4*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.30*	mg/kg	*3.31*		*99.5*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.12*	mg/kg	*3.31*		*94.3*	*40-140*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

NEW ENGLAND TESTING LABORATO
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

3 C 2 7022

PROJ. NO.: 3096
PROJECT NAME/LOCATION: MVG Green
CLIENT: Lord Environmental
REPORT TO:
INVOICE TO:

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** MADEP EPH with Targets					REMARKS
3/22/23	9:00		X	B-2		X		1		X					PID = 0
	10:00		X	B-4		X		1		X					
	11:00		X	B-18		X		1		X					
	12:00		X	B-20		X		1		X					
3/24/23	9:00		X	B-30		X		1		X					
	9:30		X	B-33		X		1		X					
	10:00		X	B-48		X		1		X					
	10:30		X	B-51		X		1		X					
	11:00		X	B-52		X		1		X					
	11:30		X	B-59		X		1		X					
	12:30		X	B-67		X		1		X					
	1:00		X	B-71		X		1		X					

Sampled by: (Signature) — Date/Time: 3/24/23 3:00pm — Received by: (Signature) — Date/Time:

Relinquished by: (Signature) Pam Glidwell — Date/Time: 3/27/23 12:20 pm — Received by: (Signature) — Date/Time: 3/27/23 1230

Relinquished by: (Signature) — Date/Time: 3/27/23 1500 — Received for Laboratory by: (Signature) Ghyrmi Terungo — Date/Time: 3/27/23 1500

Laboratory Remarks:
Temp. received: 5
Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:
MADEP
S-1

Turnaround (Business Days) 5

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc. Project #: 3096

Project Location: MVG Green RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
3C27022

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☐	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☒	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☒ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

***Data User Note**: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:

Position: Laboratory Director

Printed Name: Richard Warila

Date: 4/4/2023

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 4B26010
Client Project: 3096 - Maynard

Report Date: 06-March-2024

Prepared for:

Ralph Tella
Lord Environmental, Inc.
1506 Providence Highway, Suite 30
Norwood, MA 02062

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 02/26/24. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client’s designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 4B26010. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
4B26010-01	TP-6	Soil	02/23/2024	02/26/2024
4B26010-02	B-103 0-6'	Soil	02/23/2024	02/26/2024
4B26010-03	B-113 2-4'	Soil	02/23/2024	02/26/2024
4B26010-04	B-112 2-6'	Soil	02/23/2024	02/26/2024

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-103 0-6' (Lab Number: 4B26010-02)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

B-112 2-6' (Lab Number: 4B26010-04)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Request for Analysis (continued)

B-113 2-4' (Lab Number: 4B26010-03)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

TP-6 (Lab Number: 4B26010-01)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Method References

Reactive Cyanide, Standard Operating Procedure 407, New England Testing Laboratory Inc.

Reactive Sulfide, Standard Operating Procedure 426, New England Testing Laboratory Inc.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

VOA 8260: Sample 'TP-6' and 'B-113 2-4" were prepared and analyzed utilizing bulk material provided by the client due to matrix interference.

Results: General Chemistry

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**7.0**			SU	02/28/24	02/28/24
Specific Conductance	**56.3**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**6.0**			SU	02/28/24	02/28/24
Specific Conductance	**15.9**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**5.1**			SU	02/28/24	02/28/24
Specific Conductance	**9.4**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-112 2-6'
Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**5.2**			SU	02/28/24	02/28/24
Specific Conductance	**17.4**		2.0	uS/cm	02/28/24	02/28/24

Results: Reactivity

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.3	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Total Metals

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	**1.09**		0.86	mg/kg	02/27/24	03/01/24
Arsenic	**10.5**		1.30	mg/kg	02/27/24	03/01/24
Barium	**32.5**		0.43	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.43	mg/kg	02/27/24	03/01/24
Cadmium	**3.42**		0.65	mg/kg	02/27/24	03/01/24
Chromium	**13.7**		0.65	mg/kg	02/27/24	03/01/24
Lead	**38.7**		0.65	mg/kg	02/27/24	03/01/24
Mercury	**0.129**		0.118	mg/kg	02/28/24	02/28/24
Nickel	**9.11**		0.65	mg/kg	02/27/24	03/01/24
Selenium	ND		1.30	mg/kg	02/27/24	03/01/24
Silver	ND		1.30	mg/kg	02/27/24	03/01/24
Vanadium	**21.4**		0.43	mg/kg	02/27/24	03/01/24
Zinc	**48.6**		2.6	mg/kg	02/27/24	03/01/24
Thallium	ND		0.43	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.88	mg/kg	02/27/24	03/01/24
Arsenic	**5.92**		1.33	mg/kg	02/27/24	03/01/24
Barium	**38.0**		0.44	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.44	mg/kg	02/27/24	03/01/24
Cadmium	**4.33**		0.66	mg/kg	02/27/24	03/01/24
Chromium	**19.5**		0.66	mg/kg	02/27/24	03/01/24
Lead	**5.29**		0.66	mg/kg	02/27/24	03/01/24
Mercury	**0.184**		0.111	mg/kg	02/28/24	02/28/24
Nickel	**9.06**		0.66	mg/kg	02/27/24	03/01/24
Selenium	ND		1.33	mg/kg	02/27/24	03/01/24
Silver	ND		1.33	mg/kg	02/27/24	03/01/24
Vanadium	**24.4**		0.44	mg/kg	02/27/24	03/01/24
Zinc	**22.9**		2.7	mg/kg	02/27/24	03/01/24
Thallium	ND		0.44	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.95	mg/kg	02/27/24	03/01/24
Arsenic	**9.73**		1.44	mg/kg	02/27/24	03/01/24
Barium	**13.6**		0.48	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.48	mg/kg	02/27/24	03/01/24
Cadmium	**2.54**		0.72	mg/kg	02/27/24	03/01/24
Chromium	**13.0**		0.72	mg/kg	02/27/24	03/01/24
Lead	**3.91**		0.72	mg/kg	02/27/24	03/01/24
Mercury	ND		0.110	mg/kg	02/28/24	02/28/24
Nickel	**8.94**		0.72	mg/kg	02/27/24	03/01/24
Selenium	ND		1.44	mg/kg	02/27/24	03/01/24
Silver	ND		1.44	mg/kg	02/27/24	03/01/24
Vanadium	**14.4**		0.48	mg/kg	02/27/24	03/01/24
Zinc	**18.0**		2.9	mg/kg	02/27/24	03/01/24
Thallium	ND		0.48	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.88	mg/kg	02/27/24	03/01/24
Arsenic	**6.40**		1.33	mg/kg	02/27/24	03/01/24
Barium	**65.3**		0.44	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.44	mg/kg	02/27/24	03/01/24
Cadmium	**5.34**		0.66	mg/kg	02/27/24	03/01/24
Chromium	**21.8**		0.66	mg/kg	02/27/24	03/01/24
Lead	**5.94**		0.66	mg/kg	02/27/24	03/01/24
Mercury	ND		0.097	mg/kg	02/28/24	02/28/24
Nickel	**9.97**		0.66	mg/kg	02/27/24	03/01/24
Selenium	ND		1.33	mg/kg	02/27/24	03/01/24
Silver	ND		1.33	mg/kg	02/27/24	03/01/24
Vanadium	**36.7**		0.44	mg/kg	02/27/24	03/01/24
Zinc	**26.3**		2.7	mg/kg	02/27/24	03/01/24
Thallium	ND		0.44	mg/kg	02/27/24	03/01/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		103	ug/kg	03/05/24	03/05/24
Benzene	ND		5	ug/kg	03/05/24	03/05/24
Bromobenzene	ND		5	ug/kg	03/05/24	03/05/24
Bromochloromethane	ND		5	ug/kg	03/05/24	03/05/24
Bromodichloromethane	ND		5	ug/kg	03/05/24	03/05/24
Bromoform	ND		5	ug/kg	03/05/24	03/05/24
Bromomethane	ND		5	ug/kg	03/05/24	03/05/24
2-Butanone	ND		103	ug/kg	03/05/24	03/05/24
tert-Butyl alcohol	ND		5	ug/kg	03/05/24	03/05/24
sec-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
n-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
tert-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	03/05/24	03/05/24
Carbon Disulfide	ND		5	ug/kg	03/05/24	03/05/24
Carbon Tetrachloride	ND		5	ug/kg	03/05/24	03/05/24
Chlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
Chloroethane	ND		5	ug/kg	03/05/24	03/05/24
Chloroform	ND		5	ug/kg	03/05/24	03/05/24
Chloromethane	ND		5	ug/kg	03/05/24	03/05/24
4-Chlorotoluene	ND		5	ug/kg	03/05/24	03/05/24
2-Chlorotoluene	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	03/05/24	03/05/24
Dibromochloromethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	03/05/24	03/05/24
Dibromomethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,4-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,2 Dichloroethene, Total	ND		5	ug/kg	03/05/24	03/05/24
trans-1,2-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
cis-1,2-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
2,2-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
cis-1,3-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
trans-1,3-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	03/05/24	03/05/24
Diethyl ether	ND		5	ug/kg	03/05/24	03/05/24
1,4-Dioxane	ND		103	ug/kg	03/05/24	03/05/24
Ethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Hexachlorobutadiene	ND		5	ug/kg	03/05/24	03/05/24
2-Hexanone	ND		103	ug/kg	03/05/24	03/05/24
Isopropylbenzene	ND		5	ug/kg	03/05/24	03/05/24
p-Isopropyltoluene	ND		5	ug/kg	03/05/24	03/05

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-6 (Continued)

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	03/05/24	03/05/24
4-Methyl-2-pentanone	ND		103	ug/kg	03/05/24	03/05/24
Naphthalene	ND		5	ug/kg	03/05/24	03/05/24
n-Propylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Styrene	ND		5	ug/kg	03/05/24	03/05/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	03/05/24	03/05/24
Tetrachloroethene	ND		5	ug/kg	03/05/24	03/05/24
Tetrahydrofuran	ND		5	ug/kg	03/05/24	03/05/24
Toluene	ND		5	ug/kg	03/05/24	03/05/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,1,2-Trichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,1,1-Trichloroethane	ND		5	ug/kg	03/05/24	03/05/24
Trichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,2,3-Trichloropropane	ND		5	ug/kg	03/05/24	03/05/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Vinyl Chloride	ND		5	ug/kg	03/05/24	03/05/24
o-Xylene	ND		5	ug/kg	03/05/24	03/05/24
m&p-Xylene	ND		10	ug/kg	03/05/24	03/05/24
Total xylenes	ND		5	ug/kg	03/05/24	03/05/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	03/05/24	03/05/24
tert-Amyl methyl ether	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
Ethyl tert-butyl ether	ND		5	ug/kg	03/05/24	03/05/24
Diisopropyl ether	ND		5	ug/kg	03/05/24	03/05/24
Trichlorofluoromethane	ND		5	ug/kg	03/05/24	03/05/24
Dichlorodifluoromethane	ND		5	ug/kg	03/05/24	03/05/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*81.1%*	*70-130*	03/05/24	03/05/24
1,2-Dichloroethane-d4	*103%*	*70-130*	03/05/24	03/05/24
Toluene-d8	*92.5%*	*70-130*	03/05/24	03/05/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		106	ug/kg	03/04/24	03/04/24
Benzene	ND		5	ug/kg	03/04/24	03/04/24
Bromobenzene	ND		5	ug/kg	03/04/24	03/04/24
Bromochloromethane	ND		5	ug/kg	03/04/24	03/04/24
Bromodichloromethane	ND		5	ug/kg	03/04/24	03/04/24
Bromoform	ND		5	ug/kg	03/04/24	03/04/24
Bromomethane	ND		5	ug/kg	03/04/24	03/04/24
2-Butanone	ND		106	ug/kg	03/04/24	03/04/24
tert-Butyl alcohol	ND		5	ug/kg	03/04/24	03/04/24
sec-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
n-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
tert-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	03/04/24	03/04/24
Carbon Disulfide	ND		5	ug/kg	03/04/24	03/04/24
Carbon Tetrachloride	ND		5	ug/kg	03/04/24	03/04/24
Chlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
Chloroethane	ND		5	ug/kg	03/04/24	03/04/24
Chloroform	ND		5	ug/kg	03/04/24	03/04/24
Chloromethane	ND		5	ug/kg	03/04/24	03/04/24
4-Chlorotoluene	ND		5	ug/kg	03/04/24	03/04/24
2-Chlorotoluene	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	03/04/24	03/04/24
Dibromochloromethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	03/04/24	03/04/24
Dibromomethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,4-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,2 Dichloroethene, Total	ND		5	ug/kg	03/04/24	03/04/24
trans-1,2-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
cis-1,2-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
2,2-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
cis-1,3-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
trans-1,3-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	03/04/24	03/04/24
Diethyl ether	ND		5	ug/kg	03/04/24	03/04/24
1,4-Dioxane	ND		106	ug/kg	03/04/24	03/04/24
Ethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Hexachlorobutadiene	ND		5	ug/kg	03/04/24	03/04/24
2-Hexanone	ND		106	ug/kg	03/04/24	03/04/24
Isopropylbenzene	ND		5	ug/kg	03/04/24	03/04/24
p-Isopropyltoluene	ND		5	ug/kg	03/04/24	03/04

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-103 0-6' (Continued)

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	03/04/24	03/04/24
4-Methyl-2-pentanone	ND		106	ug/kg	03/04/24	03/04/24
Naphthalene	ND		5	ug/kg	03/04/24	03/04/24
n-Propylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Styrene	ND		5	ug/kg	03/04/24	03/04/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	03/04/24	03/04/24
Tetrachloroethene	ND		5	ug/kg	03/04/24	03/04/24
Tetrahydrofuran	ND		5	ug/kg	03/04/24	03/04/24
Toluene	ND		5	ug/kg	03/04/24	03/04/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,1,2-Trichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,1,1-Trichloroethane	ND		5	ug/kg	03/04/24	03/04/24
Trichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,2,3-Trichloropropane	ND		5	ug/kg	03/04/24	03/04/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Vinyl Chloride	ND		5	ug/kg	03/04/24	03/04/24
o-Xylene	ND		5	ug/kg	03/04/24	03/04/24
m&p-Xylene	ND		11	ug/kg	03/04/24	03/04/24
Total xylenes	ND		5	ug/kg	03/04/24	03/04/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	03/04/24	03/04/24
tert-Amyl methyl ether	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
Ethyl tert-butyl ether	ND		5	ug/kg	03/04/24	03/04/24
Diisopropyl ether	ND		5	ug/kg	03/04/24	03/04/24
Trichlorofluoromethane	ND		5	ug/kg	03/04/24	03/04/24
Dichlorodifluoromethane	ND		5	ug/kg	03/04/24	03/04/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.1%*	*70-130*	03/04/24	03/04/24
1,2-Dichloroethane-d4	*106%*	*70-130*	03/04/24	03/04/24
Toluene-d8	*98.5%*	*70-130*	03/04/24	03/04/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		823	ug/kg	03/05/24	03/05/24
Benzene	ND		6	ug/kg	03/05/24	03/05/24
Bromobenzene	ND		6	ug/kg	03/05/24	03/05/24
Bromochloromethane	ND		6	ug/kg	03/05/24	03/05/24
Bromodichloromethane	ND		6	ug/kg	03/05/24	03/05/24
Bromoform	ND		6	ug/kg	03/05/24	03/05/24
Bromomethane	ND		6	ug/kg	03/05/24	03/05/24
2-Butanone	ND		118	ug/kg	03/05/24	03/05/24
tert-Butyl alcohol	ND		6	ug/kg	03/05/24	03/05/24
sec-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
n-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
tert-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Methyl t-butyl ether (MTBE)	ND		6	ug/kg	03/05/24	03/05/24
Carbon Disulfide	ND		6	ug/kg	03/05/24	03/05/24
Carbon Tetrachloride	ND		6	ug/kg	03/05/24	03/05/24
Chlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
Chloroethane	ND		6	ug/kg	03/05/24	03/05/24
Chloroform	ND		6	ug/kg	03/05/24	03/05/24
Chloromethane	ND		6	ug/kg	03/05/24	03/05/24
4-Chlorotoluene	ND		6	ug/kg	03/05/24	03/05/24
2-Chlorotoluene	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		6	ug/kg	03/05/24	03/05/24
Dibromochloromethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dibromoethane (EDB)	ND		6	ug/kg	03/05/24	03/05/24
Dibromomethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,4-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,2 Dichloroethene, Total	ND		6	ug/kg	03/05/24	03/05/24
trans-1,2-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
cis-1,2-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
2,2-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
cis-1,3-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
trans-1,3-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichloropropene (cis + trans)	ND		6	ug/kg	03/05/24	03/05/24
Diethyl ether	ND		6	ug/kg	03/05/24	03/05/24
1,4-Dioxane	ND		118	ug/kg	03/05/24	03/05/24
Ethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Hexachlorobutadiene	ND		6	ug/kg	03/05/24	03/05/24
2-Hexanone	ND		118	ug/kg	03/05/24	03/05/24
Isopropylbenzene	ND		6	ug/kg	03/05/24	03/05/24
p-Isopropyltoluene	ND		6	ug/kg	03/05/24	03/05

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-113 2-4' (Continued)

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		6	ug/kg	03/05/24	03/05/24
4-Methyl-2-pentanone	ND		118	ug/kg	03/05/24	03/05/24
Naphthalene	ND		6	ug/kg	03/05/24	03/05/24
n-Propylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Styrene	ND		6	ug/kg	03/05/24	03/05/24
1,1,1,2-Tetrachloroethane	ND		6	ug/kg	03/05/24	03/05/24
Tetrachloroethene	ND		6	ug/kg	03/05/24	03/05/24
Tetrahydrofuran	ND		6	ug/kg	03/05/24	03/05/24
Toluene	ND		6	ug/kg	03/05/24	03/05/24
1,2,4-Trichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,2,3-Trichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,1,2-Trichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,1,1-Trichloroethane	ND		6	ug/kg	03/05/24	03/05/24
Trichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,2,3-Trichloropropane	ND		6	ug/kg	03/05/24	03/05/24
1,3,5-Trimethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
1,2,4-Trimethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Vinyl Chloride	ND		6	ug/kg	03/05/24	03/05/24
o-Xylene	ND		6	ug/kg	03/05/24	03/05/24
m&p-Xylene	ND		12	ug/kg	03/05/24	03/05/24
Total xylenes	ND		6	ug/kg	03/05/24	03/05/24
1,1,2,2-Tetrachloroethane	ND		6	ug/kg	03/05/24	03/05/24
tert-Amyl methyl ether	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
Ethyl tert-butyl ether	ND		6	ug/kg	03/05/24	03/05/24
Diisopropyl ether	ND		6	ug/kg	03/05/24	03/05/24
Trichlorofluoromethane	ND		6	ug/kg	03/05/24	03/05/24
Dichlorodifluoromethane	ND		6	ug/kg	03/05/24	03/05/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.7%*	*70-130*	03/05/24	03/05/24
1,2-Dichloroethane-d4	*101%*	*70-130*	03/05/24	03/05/24
Toluene-d8	*96.0%*	*70-130*	03/05/24	03/05/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		137	ug/kg	03/04/24	03/04/24
Benzene	ND		7	ug/kg	03/04/24	03/04/24
Bromobenzene	ND		7	ug/kg	03/04/24	03/04/24
Bromochloromethane	ND		7	ug/kg	03/04/24	03/04/24
Bromodichloromethane	ND		7	ug/kg	03/04/24	03/04/24
Bromoform	ND		7	ug/kg	03/04/24	03/04/24
Bromomethane	ND		7	ug/kg	03/04/24	03/04/24
2-Butanone	ND		137	ug/kg	03/04/24	03/04/24
tert-Butyl alcohol	ND		7	ug/kg	03/04/24	03/04/24
sec-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
n-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
tert-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Methyl t-butyl ether (MTBE)	ND		7	ug/kg	03/04/24	03/04/24
Carbon Disulfide	ND		7	ug/kg	03/04/24	03/04/24
Carbon Tetrachloride	ND		7	ug/kg	03/04/24	03/04/24
Chlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
Chloroethane	ND		7	ug/kg	03/04/24	03/04/24
Chloroform	ND		7	ug/kg	03/04/24	03/04/24
Chloromethane	ND		7	ug/kg	03/04/24	03/04/24
4-Chlorotoluene	ND		7	ug/kg	03/04/24	03/04/24
2-Chlorotoluene	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		7	ug/kg	03/04/24	03/04/24
Dibromochloromethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dibromoethane (EDB)	ND		7	ug/kg	03/04/24	03/04/24
Dibromomethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,4-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,2 Dichloroethene, Total	ND		7	ug/kg	03/04/24	03/04/24
trans-1,2-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
cis-1,2-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
2,2-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
cis-1,3-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
trans-1,3-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichloropropene (cis + trans)	ND		7	ug/kg	03/04/24	03/04/24
Diethyl ether	ND		7	ug/kg	03/04/24	03/04/24
1,4-Dioxane	ND		137	ug/kg	03/04/24	03/04/24
Ethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Hexachlorobutadiene	ND		7	ug/kg	03/04/24	03/04/24
2-Hexanone	ND		137	ug/kg	03/04/24	03/04/24
Isopropylbenzene	ND		7	ug/kg	03/04/24	03/04/24
p-Isopropyltoluene	ND		7	ug/kg	03/04/24	03/0

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-112 2-6' (Continued)

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		7	ug/kg	03/04/24	03/04/24
4-Methyl-2-pentanone	ND		137	ug/kg	03/04/24	03/04/24
Naphthalene	ND		7	ug/kg	03/04/24	03/04/24
n-Propylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Styrene	ND		7	ug/kg	03/04/24	03/04/24
1,1,1,2-Tetrachloroethane	ND		7	ug/kg	03/04/24	03/04/24
Tetrachloroethene	ND		7	ug/kg	03/04/24	03/04/24
Tetrahydrofuran	ND		7	ug/kg	03/04/24	03/04/24
Toluene	ND		7	ug/kg	03/04/24	03/04/24
1,2,4-Trichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,2,3-Trichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,1,2-Trichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,1,1-Trichloroethane	ND		7	ug/kg	03/04/24	03/04/24
Trichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,2,3-Trichloropropane	ND		7	ug/kg	03/04/24	03/04/24
1,3,5-Trimethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
1,2,4-Trimethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Vinyl Chloride	ND		7	ug/kg	03/04/24	03/04/24
o-Xylene	ND		7	ug/kg	03/04/24	03/04/24
m&p-Xylene	ND		14	ug/kg	03/04/24	03/04/24
Total xylenes	ND		7	ug/kg	03/04/24	03/04/24
1,1,2,2-Tetrachloroethane	ND		7	ug/kg	03/04/24	03/04/24
tert-Amyl methyl ether	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
Ethyl tert-butyl ether	ND		7	ug/kg	03/04/24	03/04/24
Diisopropyl ether	ND		7	ug/kg	03/04/24	03/04/24
Trichlorofluoromethane	ND		7	ug/kg	03/04/24	03/04/24
Dichlorodifluoromethane	ND		7	ug/kg	03/04/24	03/04/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.4%*	*70-130*	03/04/24	03/04/24
1,2-Dichloroethane-d4	*105%*	*70-130*	03/04/24	03/04/24
Toluene-d8	*97.8%*	*70-130*	03/04/24	03/04/24

Results: Semivolatile organic compounds

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
Phenol	ND		163	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		413	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		413	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		163	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		163	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		163	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		163	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		163	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		163	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		413	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		413	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		413	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		163	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		163	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		163	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		163	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		413	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		163	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		163	ug/kg	02/28/24	02/29/24
Aniline	ND		163	ug/kg	02/28/24	02/29/24
Anthracene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		163	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1250	ug/kg	02/28/24	02/29/24
Biphenyl	ND		25	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		501	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		163	ug/kg	02/28/24	02/29/24
Chrysene	ND		163	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		250	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		163	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: TP-6 (Continued)

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		163	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		163	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		413	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		250	ug/kg	02/28/24	02/29/24
Fluoranthene	**208**		163	ug/kg	02/28/24	02/29/24
Fluorene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		413	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		163	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		163	ug/kg	02/28/24	02/29/24
Isophorone	ND		163	ug/kg	02/28/24	02/29/24
Naphthalene	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		163	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		413	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		163	ug/kg	02/28/24	02/29/24
Pyrene	**240**		163	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		326	ug/kg	02/28/24	02/29/24
Pyridine	ND		163	ug/kg	02/28/24	02/29/24
Azobenzene	ND		163	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.7%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*90.1%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*50.1%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*53.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*52.1%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*60.9%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
Phenol	ND		150	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		380	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		380	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		150	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		150	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		150	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		150	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		150	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		150	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		380	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		380	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		380	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		150	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		150	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		150	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		150	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		380	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		150	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		150	ug/kg	02/28/24	02/29/24
Aniline	ND		150	ug/kg	02/28/24	02/29/24
Anthracene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1150	ug/kg	02/28/24	02/29/24
Biphenyl	ND		23	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		460	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		150	ug/kg	02/28/24	02/29/24
Chrysene	ND		150	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		230	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		150	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-103 0-6' (Continued)

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		150	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		150	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		380	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		230	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Fluorene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		380	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		150	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		150	ug/kg	02/28/24	02/29/24
Isophorone	ND		150	ug/kg	02/28/24	02/29/24
Naphthalene	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		150	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		380	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		150	ug/kg	02/28/24	02/29/24
Pyrene	ND		150	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		299	ug/kg	02/28/24	02/29/24
Pyridine	ND		150	ug/kg	02/28/24	02/29/24
Azobenzene	ND		150	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.0%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*80.8%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*50.9%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*53.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*51.6%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*61.9%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
Phenol	ND		154	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		391	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		391	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		154	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		154	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		154	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		154	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		154	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		154	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		391	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		391	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		391	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		154	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		154	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		154	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		154	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		391	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		154	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		154	ug/kg	02/28/24	02/29/24
Aniline	ND		154	ug/kg	02/28/24	02/29/24
Anthracene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1180	ug/kg	02/28/24	02/29/24
Biphenyl	ND		24	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		474	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		154	ug/kg	02/28/24	02/29/24
Chrysene	ND		154	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		237	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		154	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-113 2-4' (Continued)

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		154	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		154	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		391	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		237	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Fluorene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		391	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		154	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		154	ug/kg	02/28/24	02/29/24
Isophorone	ND		154	ug/kg	02/28/24	02/29/24
Naphthalene	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		154	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		391	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		154	ug/kg	02/28/24	02/29/24
Pyrene	ND		154	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		308	ug/kg	02/28/24	02/29/24
Pyridine	ND		154	ug/kg	02/28/24	02/29/24
Azobenzene	ND		154	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.6%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*76.7%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*48.1%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*47.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*51.8%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*56.6%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
Phenol	ND		143	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		363	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		363	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		143	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		143	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		143	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		143	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		143	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		143	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		363	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		363	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		363	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		143	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		143	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		143	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		143	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		363	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		143	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		143	ug/kg	02/28/24	02/29/24
Aniline	ND		143	ug/kg	02/28/24	02/29/24
Anthracene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1100	ug/kg	02/28/24	02/29/24
Biphenyl	ND		22	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		440	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		143	ug/kg	02/28/24	02/29/24
Chrysene	ND		143	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		220	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		143	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-112 2-6' (Continued)

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		143	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		143	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		363	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		220	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Fluorene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		363	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		143	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		143	ug/kg	02/28/24	02/29/24
Isophorone	ND		143	ug/kg	02/28/24	02/29/24
Naphthalene	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		143	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		363	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		143	ug/kg	02/28/24	02/29/24
Pyrene	ND		143	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		286	ug/kg	02/28/24	02/29/24
Pyridine	ND		143	ug/kg	02/28/24	02/29/24
Azobenzene	ND		143	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*61.5%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*86.8%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*53.5%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*57.5%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*56.2%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*64.5%*	*30-130*	02/28/24	02/29/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		82	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		82	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*61.6%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*52.0%*	*43.3-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		75	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		75	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*61.9%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*50.3%*	*43.3-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1221	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1232	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1242	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1248	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1254	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1260	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1262	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1268	ND		76	ug/kg	02/28/24	03/02/24
PCBs (Total)	ND		76	ug/kg	02/28/24	03/02/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*56.4%*	*36.2-130*	02/28/24	03/02/24
Decachlorobiphenyl (DCBP)	*48.0%*	*43.3-130*	02/28/24	03/02/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		72	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		72	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*65.0%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*58.9%*	*43.3-130*	02/28/24	03/01/24

Results: Total Petroleum Hydrocarbons

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		33	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*96.4%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		30	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*107%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		31	mg/kg	02/28/24	02/28/24

Surrogate(s)	Recovery%	Limits	Date Prepared	Date Analyzed
Chlorooctadecane	*81.0%*	*50-130*	02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		28	mg/kg	02/28/24	02/28/24

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*84.7%*	*50-130*	02/28/24	02/28/24

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1194 - Flashpoint-EPA 1010A-Mod										
LCS (B4B1194-BS1)					Prepared & Analyzed: 02/28/24					
Flashpoint	80		70	degrees F	80.0		100	90-110		
Duplicate (B4B1194-DUP1)		Source: 4B22012-01			Prepared & Analyzed: 02/28/24					
Flashpoint	> 200		70	degrees F		ND				20
Batch: B4B1197 - Conductivity										
Blank (B4B1197-BLK1)					Prepared & Analyzed: 02/28/24					
Specific Conductance	ND		2.0	uS/cm						
Duplicate (B4B1197-DUP1)		Source: 4B23014-01			Prepared & Analyzed: 02/28/24					
Specific Conductance	258		2.0	uS/cm		258			0.00	200
Batch: B4B1200 - pH										
LCS (B4B1200-BS1)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
LCS (B4B1200-BS2)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
Duplicate (B4B1200-DUP1)		Source: 4B23046-06			Prepared & Analyzed: 02/28/24					
pH	6.8			SU		6.8			0.587	200
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod										
LCS (B4C0033-BS1)					Prepared & Analyzed: 03/01/24					
Flashpoint	83		70	degrees F	80.0		104	90-110		

Quality Control

(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod (Continued)										
Duplicate (B4C0033-DUP1)		Source: 4B26010-04			Prepared & Analyzed: 03/01/24					
Flashpoint	> 200		70	degrees F		> 200				20

Quality Control
(Continued)

Reactivity

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1244 - Reactivity										
Blank (B4B1244-BLK1)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
Blank (B4B1244-BLK2)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
LCS (B4B1244-BS1)					Prepared & Analyzed: 02/29/24					
Sulfide	3.6		0.1	mg/kg	4.00		90.0	90-110		
LCS (B4B1244-BS2)					Prepared & Analyzed: 02/29/24					
Sulfide	3.7		0.1	mg/kg	4.00		91.5	90-110		
Duplicate (B4B1244-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg dry		ND				20
Matrix Spike (B4B1244-MS1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	4.5		0.1	mg/kg dry	4.59	ND	98.5	80-120		
Batch: B4B1245 - Reactivity										
Blank (B4B1245-BLK1)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Blank (B4B1245-BLK2)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Duplicate (B4B1245-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg dry		ND				20

Quality Control

(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1103 - Metals Digestion Soils										
Blank (B4B1103-BLK1)					Prepared: 02/27/24 Analyzed: 03/01/24					
Antimony	ND		0.66	mg/kg						
Beryllium	ND		0.33	mg/kg						
Arsenic	ND		1.00	mg/kg						
Cadmium	ND		0.50	mg/kg						
Chromium	ND		0.50	mg/kg						
Nickel	ND		0.50	mg/kg						
Lead	ND		0.50	mg/kg						
Silver	ND		1.00	mg/kg						
Zinc	ND		2.0	mg/kg						
Barium	ND		0.33	mg/kg						
Vanadium	ND		0.33	mg/kg						
Selenium	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						
Blank (B4B1103-BLK2)					Prepared: 02/27/24 Analyzed: 03/04/24					
Antimony	ND		0.66	mg/kg						
Beryllium	ND		0.33	mg/kg						
Lead	ND		0.50	mg/kg						
Silver	ND		1.00	mg/kg						
Cadmium	ND		0.50	mg/kg						
Nickel	ND		0.50	mg/kg						
Zinc	ND		2.0	mg/kg						
Chromium	ND		0.50	mg/kg						
Arsenic	ND		1.00	mg/kg						
Selenium	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						
LCS (B4B1103-BS1)					Prepared: 02/27/24 Analyzed: 03/01/24					
Beryllium	20.1		0.33	mg/kg	20.0		101	85-115		
Zinc	93.9		2.0	mg/kg	100		93.9	85-115		
Cadmium	93.4		0.50	mg/kg	100		93.4	85-115		
Chromium	94.5		0.50	mg/kg	100		94.5	85-115		
Nickel	93.9		0.50	mg/kg	100		93.9	85-112		
Lead	97.3		0.50	mg/kg	100		97.3	85-115		
Antimony	91.8		0.66	mg/kg	100		91.8	85-115		
Selenium	19.9		1.00	mg/kg	20.0		99.4	85-115		
Vanadium	101		0.33	mg/kg	100		101	85-115		
Barium	94.2		0.33	mg/kg	100		94.2	85-115		
Arsenic	21.1		1.00	mg/kg	20.0		105	85-115		
Silver	37.7		1.00	mg/kg	40.0		94.2	85-115		
Thallium	90.9		0.33	mg/kg	100		90.9	85-115		

Quality Control

(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1103 - Metals Digestion Soils (Continued)										
Matrix Spike (B4B1103-MS1)	Source: 4B26010-01			Prepared: 02/27/24 Analyzed: 03/01/24						
Beryllium	30.1		0.50	mg/kg dry	30.0	ND	100	75-125		
Arsenic	40.7		1.50	mg/kg dry	30.0	10.5	100	75-125		
Barium	159		0.50	mg/kg dry	150	32.5	84.2	75-125		
Cadmium	134		0.75	mg/kg dry	150	3.42	86.8	75-125		
Chromium	146		0.75	mg/kg dry	150	13.7	88.5	75-125		
Nickel	142		0.75	mg/kg dry	150	9.11	88.4	75-125		
Silver	54.1		1.50	mg/kg dry	60.0	ND	90.2	75-125		
Lead	169		0.75	mg/kg dry	150	38.7	86.9	75-125		
Selenium	23.6		1.50	mg/kg dry	30.0	ND	78.7	75-125		
Vanadium	163		0.50	mg/kg dry	150	21.4	94.3	75-125		
Zinc	179		3.0	mg/kg dry	150	48.6	86.7	75-125		
Thallium	123		0.50	mg/kg dry	150	ND	81.9	75-125		
Matrix Spike Dup (B4B1103-MSD1)	Source: 4B26010-01			Prepared: 02/27/24 Analyzed: 03/01/24						
Arsenic	38.6		1.40	mg/kg dry	28.0	10.5	100	75-125	0.0916	20
Chromium	139		0.70	mg/kg dry	140	13.7	89.1	75-125	5.54	20
Vanadium	155		0.46	mg/kg dry	140	21.4	95.6	75-125	4.76	20
Silver	48.3		1.40	mg/kg dry	56.0	ND	86.3	75-125	4.41	20
Lead	164		0.70	mg/kg dry	140	38.7	89.3	75-125	3.24	20
Barium	153		0.46	mg/kg dry	140	32.5	85.9	75-125	3.91	20
Nickel	133		0.70	mg/kg dry	140	9.11	88.6	75-125	6.22	20
Cadmium	126		0.70	mg/kg dry	140	3.42	87.7	75-125	5.68	20
Selenium	21.2		1.40	mg/kg dry	28.0	ND	75.8	75-125	3.75	20
Beryllium	28.7		0.46	mg/kg dry	28.0	ND	102	75-125	4.82	20
Zinc	171		2.8	mg/kg dry	140	48.6	87.1	75-125	4.59	20
Thallium	117		0.46	mg/kg dry	140	ND	83.3	75-125	5.15	20

Quality Control

(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury										
Blank (B4B1185-BLK1)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
Blank (B4B1185-BLK2)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
LCS (B4B1185-BS1)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS (B4B1185-BS2)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS Dup (B4B1185-BSD1)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
LCS Dup (B4B1185-BSD2)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
Matrix Spike (B4B1185-MS1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.716		0.126	mg/kg dry	0.630	0.129	93.1	80-120		
Matrix Spike (B4B1185-MS2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.564		0.094	mg/kg dry	0.469	0.135	91.3	80-120		
Matrix Spike (B4B1185-MS3)		Source: 4B27003-01			Prepared & Analyzed: 02/28/24					
Mercury	0.649		0.098	mg/kg dry	0.489	0.125	107	80-120		
Matrix Spike Dup (B4B1185-MSD1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.688		0.115	mg/kg dry	0.577	0.129	96.8	80-120	4.01	20

Quality Control

(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury (Continued)										
Matrix Spike Dup (B4B1185-MSD2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.576		0.093	mg/kg dry	0.465	0.135	94.7	80-120	2.10	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0126 - EPA 5035										
Blank (B4C0126-BLK1)					Prepared & Analyzed: 03/04/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0126 - EPA 5035 (Continued)										
Blank (B4C0126-BLK1)					Prepared & Analyzed: 03/04/24					
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*49.0*	ug/kg	*50.0*		*98.0*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.8*	ug/kg	*50.0*		*99.6*	*70-130*		
Surrogate: Toluene-d8			*47.7*	ug/kg	*50.0*		*95.4*	*70-130*		
LCS (B4C0126-BS1)					Prepared & Analyzed: 03/04/24					
Acetone	42		5	ug/kg	50.0		83.1	50-150		
Benzene	46		5	ug/kg	50.0		91.8	70-130		
Bromobenzene	43		5	ug/kg	50.0		86.4	70-130		
Bromochloromethane	45		5	ug/kg	50.0		90.1	70-130		
Bromodichloromethane	44		5	ug/kg	50.0		87.4	70-130		
Bromoform	47		5	ug/kg	50.0		93.3	70-130		
Bromomethane	48		5	ug/kg	50.0		95.0	50-150		
2-Butanone	43		5	ug/kg	50.0		85.6	50-150		
tert-Butyl alcohol	41		5	ug/kg	50.0		82.5	70-130		
sec-Butylbenzene	45		5	ug/kg	50.0		89.8	70-130		
n-Butylbenzene	46		5	ug/kg	50.0		92.4	70-130		
tert-Butylbenzene	45		5	ug/kg	50.0		90.1	70-130		
Methyl t-butyl ether (MTBE)	39		5	ug/kg	50.0		77.2	70-130		
Carbon Disulfide	32		5	ug/kg	50.0		64.0	50-150		
Carbon Tetrachloride	46		5	ug/kg	50.0		93.0	70-130		
Chlorobenzene	41		5	ug/kg	50.0		82.2	70-130		
Chloroethane	37		5	ug/kg	50.0		74.5	50-150		
Chloroform	43		5	ug/kg	50.0		86.8	70-130		
Chloromethane	37		5	ug/kg	50.0		74.1	50-150		
4-Chlorotoluene	44		5	ug/kg	50.0		87.4	70-130		
2-Chlorotoluene	40		5	ug/kg	50.0		80.6	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		92.5	70-130		
Dibromochloromethane	45		5	ug/kg	50.0		90.8	70-130		
1,2-Dibromoethane (EDB)	45		5	ug/kg	50.0		90.1	70-130		
Dibromomethane	46		5	ug/kg	50.0		92.1	60-140		
1,2-Dichlorobenzene	43		5	ug/kg	50.0		85.1	70-130		
1,3-Dichlorobenzene	44		5	ug/kg	50.0		87.2	70-130		
1,4-Dichlorobenzene	43		5	ug/kg	50.0		85.7	70-130		
1,1-Dichloroethane	43		5	ug/kg	50.0		86.1	70-130		
1,2-Dichloroethane	46		5	ug/kg	50.0		92.3	70-130		
trans-1,2-Dichloroethene	44		5	ug/kg	50.0		87.4	70-130		
cis-1,2-Dichloroethene	44		5	ug/kg	50.0		87.7	70-130		
1,1-Dichloroethene	33		5	ug/kg	50.0		65.7	70-130		
1,2-Dichloropropane	43		5	ug/kg	50.0		86.5	70-130		

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0126 - EPA 5035 (Continued)										
LCS (B4C0126-BS1)					Prepared & Analyzed: 03/04/24					
2,2-Dichloropropane	48		5	ug/kg	50.0		95.1	70-130		
cis-1,3-Dichloropropene	44		5	ug/kg	50.0		87.5	70-130		
trans-1,3-Dichloropropene	48		5	ug/kg	50.0		95.2	70-130		
1,1-Dichloropropene	45		5	ug/kg	50.0		89.5	70-130		
Diethyl ether	35		5	ug/kg	50.0		70.4	60-140		
1,4-Dioxane	222		100	ug/kg	250		88.7	0-200		
Ethylbenzene	45		5	ug/kg	50.0		90.0	70-130		
Hexachlorobutadiene	52		5	ug/kg	50.0		103	70-130		
2-Hexanone	42		5	ug/kg	50.0		83.3	50-150		
Isopropylbenzene	45		5	ug/kg	50.0		89.0	70-130		
p-Isopropyltoluene	45		5	ug/kg	50.0		90.6	70-130		
Methylene Chloride	42		5	ug/kg	50.0		84.8	60-140		
4-Methyl-2-pentanone	45		5	ug/kg	50.0		89.5	50-150		
Naphthalene	50		5	ug/kg	50.0		100	70-130		
n-Propylbenzene	45		5	ug/kg	50.0		90.5	70-130		
Styrene	43		5	ug/kg	50.0		86.1	70-130		
1,1,1,2-Tetrachloroethane	44		5	ug/kg	50.0		87.5	70-130		
Tetrachloroethene	47		5	ug/kg	50.0		93.1	70-130		
Tetrahydrofuran	47		5	ug/kg	50.0		93.2	50-150		
Toluene	49		5	ug/kg	50.0		98.4	70-130		
1,2,4-Trichlorobenzene	49		5	ug/kg	50.0		97.0	70-130		
1,2,3-Trichlorobenzene	50		5	ug/kg	50.0		99.1	70-130		
1,1,2-Trichloroethane	42		5	ug/kg	50.0		84.8	70-130		
1,1,1-Trichloroethane	44		5	ug/kg	50.0		88.8	70-130		
Trichloroethene	44		5	ug/kg	50.0		88.6	70-130		
1,2,3-Trichloropropane	42		5	ug/kg	50.0		83.6	70-130		
1,3,5-Trimethylbenzene	45		5	ug/kg	50.0		90.3	70-130		
1,2,4-Trimethylbenzene	48		5	ug/kg	50.0		96.8	70-130		
Vinyl Chloride	39		5	ug/kg	50.0		78.7	50-150		
o-Xylene	46		5	ug/kg	50.0		91.5	70-130		
m&p-Xylene	90		10	ug/kg	100		89.8	70-130		
1,1,2,2-Tetrachloroethane	42		5	ug/kg	50.0		84.7	70-130		
tert-Amyl methyl ether	41		5	ug/kg	50.0		83.0	70-130		
1,3-Dichloropropane	45		5	ug/kg	50.0		89.2	70-130		
Ethyl tert-butyl ether	41		5	ug/kg	50.0		81.5	70-130		
Trichlorofluoromethane	43		5	ug/kg	50.0		86.8	50-150		
Dichlorodifluoromethane	50		5	ug/kg	50.0		100	50-150		
Surrogate: 4-Bromofluorobenzene			*51.6*	ug/kg	*50.0*		*103*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*54.6*	ug/kg	*50.0*		*109*	*70-130*		
Surrogate: Toluene-d8			*53.5*	ug/kg	*50.0*		*107*	*70-130*		

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0126 - EPA 5035 (Continued)

LCS Dup (B4C0126-BSD1)

Prepared & Analyzed: 03/04/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	29		5	ug/kg	50.0		58.9	50-150	34.2	30
Benzene	53		5	ug/kg	50.0		106	70-130	14.4	20
Bromobenzene	49		5	ug/kg	50.0		98.4	70-130	13.0	20
Bromochloromethane	52		5	ug/kg	50.0		104	70-130	14.3	20
Bromodichloromethane	51		5	ug/kg	50.0		102	70-130	15.0	20
Bromoform	53		5	ug/kg	50.0		107	70-130	13.3	20
Bromomethane	60		5	ug/kg	50.0		120	50-150	23.0	30
2-Butanone	35		5	ug/kg	50.0		70.0	50-150	19.9	30
tert-Butyl alcohol	39		5	ug/kg	50.0		78.2	70-130	5.35	20
sec-Butylbenzene	51		5	ug/kg	50.0		101	70-130	12.2	20
n-Butylbenzene	53		5	ug/kg	50.0		106	70-130	14.0	20
tert-Butylbenzene	52		5	ug/kg	50.0		104	70-130	14.1	20
Methyl t-butyl ether (MTBE)	43		5	ug/kg	50.0		86.0	70-130	10.7	20
Carbon Disulfide	37		5	ug/kg	50.0		73.9	50-150	14.3	40
Carbon Tetrachloride	54		5	ug/kg	50.0		108	70-130	14.6	20
Chlorobenzene	48		5	ug/kg	50.0		95.5	70-130	15.0	20
Chloroethane	43		5	ug/kg	50.0		86.9	50-150	15.3	30
Chloroform	50		5	ug/kg	50.0		100	70-130	14.3	20
Chloromethane	44		5	ug/kg	50.0		87.1	50-150	16.2	30
4-Chlorotoluene	44		5	ug/kg	50.0		88.5	70-130	1.25	20
2-Chlorotoluene	46		5	ug/kg	50.0		91.3	70-130	12.5	20
1,2-Dibromo-3-chloropropane (DBCP)	52		5	ug/kg	50.0		104	70-130	12.2	20
Dibromochloromethane	52		5	ug/kg	50.0		104	70-130	13.4	20
1,2-Dibromoethane (EDB)	51		5	ug/kg	50.0		101	70-130	11.7	20
Dibromomethane	51		5	ug/kg	50.0		102	60-140	10.3	30
1,2-Dichlorobenzene	49		5	ug/kg	50.0		98.7	70-130	14.8	20
1,3-Dichlorobenzene	49		5	ug/kg	50.0		98.2	70-130	11.9	20
1,4-Dichlorobenzene	49		5	ug/kg	50.0		99.0	70-130	14.3	20
1,1-Dichloroethane	50		5	ug/kg	50.0		100	70-130	14.9	20
1,2-Dichloroethane	52		5	ug/kg	50.0		105	70-130	12.8	20
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		101	70-130	14.2	20
cis-1,2-Dichloroethene	49		5	ug/kg	50.0		97.9	70-130	11.0	20
1,1-Dichloroethene	38		5	ug/kg	50.0		76.2	70-130	14.8	20
1,2-Dichloropropane	49		5	ug/kg	50.0		98.8	70-130	13.3	20
2,2-Dichloropropane	54		5	ug/kg	50.0		109	70-130	13.2	20
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		102	70-130	15.0	20
trans-1,3-Dichloropropene	54		5	ug/kg	50.0		108	70-130	13.0	20
1,1-Dichloropropene	52		5	ug/kg	50.0		104	70-130	15.1	20
Diethyl ether	39		5	ug/kg	50.0		77.5	60-140	9.68	30
1,4-Dioxane	240		100	ug/kg	250		95.8	0-200	7.69	50
Ethylbenzene	53		5	ug/kg	50.0		105	70-130	15.8	20
Hexachlorobutadiene	59		5	ug/kg	50.0		117	70-130	12.8	20
2-Hexanone	36		5	ug/kg	50.0		71.0	50-150	15.9	20
Isopropylbenzene	51		5	ug/kg	50.0		101	70-130	13.0	20
p-Isopropyltoluene	52		5	ug/kg	50.0		103	70-130	13.2	20
Methylene Chloride	48		5	ug/kg	50.0		96.6	60-140	13.1	30
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.0	50-150	3.83	20
Naphthalene	57		5	ug/kg	50.0		115	70-130	13.2	20
n-Propylbenzene	51		5	ug/kg	50.0		102	70-130	12.2	20
Styrene	50		5	ug/kg	50.0		99.4	70-130	14.4	20
1,1,1,2-Tetrachloroethane	51		5	ug/kg	50.0		102	70-130	15.1	20
Tetrachloroethene	53		5	ug/kg	50.0		106	70-130	12.7	20
Tetrahydrofuran	50		5	ug/kg	50.0		100	50-150	7.34	40
Toluene	56		5	ug/kg	50.0		111	70-130	12.1	20
1,2,4-Trichlorobenzene	56		5	ug/kg	50.0		112	70-130	14.3	20
1,2,3-Trichlorobenzene	57		5	ug/kg	50.0		114	70-130	14.1	20
1,1,2-Trichloroethane	52		5	ug/kg	50.0		104	70-130	20.3	20

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0126 - EPA 5035 (Continued)										
LCS Dup (B4C0126-BSD1)					Prepared & Analyzed: 03/04/24					
1,1,1-Trichloroethane	51		5	ug/kg	50.0		101	70-130	13.0	20
Trichloroethene	49		5	ug/kg	50.0		98.7	70-130	10.7	20
1,2,3-Trichloropropane	46		5	ug/kg	50.0		92.0	70-130	9.54	20
1,3,5-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130	12.2	20
1,2,4-Trimethylbenzene	55		5	ug/kg	50.0		110	70-130	12.5	20
Vinyl Chloride	46		5	ug/kg	50.0		92.3	50-150	16.0	30
o-Xylene	53		5	ug/kg	50.0		106	70-130	14.7	20
m&p-Xylene	103		10	ug/kg	100		103	70-130	14.2	20
1,1,2,2-Tetrachloroethane	48		5	ug/kg	50.0		95.2	70-130	11.6	20
tert-Amyl methyl ether	47		5	ug/kg	50.0		93.6	70-130	12.1	20
1,3-Dichloropropane	51		5	ug/kg	50.0		102	70-130	13.4	20
Ethyl tert-butyl ether	46		5	ug/kg	50.0		92.8	70-130	13.0	20
Trichlorofluoromethane	50		5	ug/kg	50.0		100	50-150	14.3	20
Dichlorodifluoromethane	59		5	ug/kg	50.0		118	50-150	16.3	30
Surrogate: 4-Bromofluorobenzene			*51.2*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*52.5*	ug/kg	*50.0*		*105*	*70-130*		
Surrogate: Toluene-d8			*53.0*	ug/kg	*50.0*		*106*	*70-130*		
Batch: B4C0189 - EPA 5035										
Blank (B4C0189-BLK1)					Prepared & Analyzed: 03/05/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
Blank (B4C0189-BLK1)					Prepared & Analyzed: 03/05/24					
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*50.8*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.8*	*70-130*		
Surrogate: Toluene-d8			*48.4*	ug/kg	*50.0*		*96.8*	*70-130*		

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0189 - EPA 5035 (Continued)

LCS (B4C0189-BS1) Prepared & Analyzed: 03/05/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	49		5	ug/kg	50.0		97.2	50-150		
Benzene	52		5	ug/kg	50.0		104	70-130		
Bromobenzene	54		5	ug/kg	50.0		108	70-130		
Bromochloromethane	51		5	ug/kg	50.0		103	70-130		
Bromodichloromethane	54		5	ug/kg	50.0		107	70-130		
Bromoform	49		5	ug/kg	50.0		98.7	70-130		
Bromomethane	26		5	ug/kg	50.0		52.4	50-150		
2-Butanone	47		5	ug/kg	50.0		93.0	50-150		
tert-Butyl alcohol	53		5	ug/kg	50.0		105	70-130		
sec-Butylbenzene	56		5	ug/kg	50.0		112	70-130		
n-Butylbenzene	60		5	ug/kg	50.0		119	70-130		
tert-Butylbenzene	56		5	ug/kg	50.0		113	70-130		
Methyl t-butyl ether (MTBE)	49		5	ug/kg	50.0		97.2	70-130		
Carbon Disulfide	46		5	ug/kg	50.0		92.8	50-150		
Carbon Tetrachloride	54		5	ug/kg	50.0		108	70-130		
Chlorobenzene	53		5	ug/kg	50.0		105	70-130		
Chloroethane	38		5	ug/kg	50.0		76.5	50-150		
Chloroform	51		5	ug/kg	50.0		102	70-130		
Chloromethane	42		5	ug/kg	50.0		84.9	50-150		
4-Chlorotoluene	54		5	ug/kg	50.0		108	70-130		
2-Chlorotoluene	50		5	ug/kg	50.0		101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	47		5	ug/kg	50.0		93.9	70-130		
Dibromochloromethane	49		5	ug/kg	50.0		97.3	70-130		
1,2-Dibromoethane (EDB)	47		5	ug/kg	50.0		93.8	70-130		
Dibromomethane	51		5	ug/kg	50.0		103	60-140		
1,2-Dichlorobenzene	51		5	ug/kg	50.0		102	70-130		
1,3-Dichlorobenzene	55		5	ug/kg	50.0		109	70-130		
1,4-Dichlorobenzene	50		5	ug/kg	50.0		99.1	70-130		
1,1-Dichloroethane	50		5	ug/kg	50.0		99.0	70-130		
1,2-Dichloroethane	55		5	ug/kg	50.0		109	70-130		
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		99.8	70-130		
cis-1,2-Dichloroethene	52		5	ug/kg	50.0		104	70-130		
1,1-Dichloroethene	46		5	ug/kg	50.0		92.6	70-130		
1,2-Dichloropropane	55		5	ug/kg	50.0		109	70-130		
2,2-Dichloropropane	55		5	ug/kg	50.0		109	70-130		
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		103	70-130		
trans-1,3-Dichloropropene	50		5	ug/kg	50.0		99.1	70-130		
1,1-Dichloropropene	47		5	ug/kg	50.0		93.7	70-130		
Diethyl ether	46		5	ug/kg	50.0		92.2	60-140		
1,4-Dioxane	238		100	ug/kg	250		95.3	0-200		
Ethylbenzene	57		5	ug/kg	50.0		113	70-130		
Hexachlorobutadiene	59		5	ug/kg	50.0		118	70-130		
2-Hexanone	44		5	ug/kg	50.0		87.9	50-150		
Isopropylbenzene	55		5	ug/kg	50.0		110	70-130		
p-Isopropyltoluene	58		5	ug/kg	50.0		115	70-130		
Methylene Chloride	56		5	ug/kg	50.0		111	60-140		
4-Methyl-2-pentanone	45		5	ug/kg	50.0		90.3	50-150		
Naphthalene	42		5	ug/kg	50.0		83.1	70-130		
n-Propylbenzene	57		5	ug/kg	50.0		115	70-130		
Styrene	56		5	ug/kg	50.0		112	70-130		
1,1,1,2-Tetrachloroethane	56		5	ug/kg	50.0		113	70-130		
Tetrachloroethene	52		5	ug/kg	50.0		104	70-130		
Tetrahydrofuran	46		5	ug/kg	50.0		91.9	50-150		
Toluene	51		5	ug/kg	50.0		102	70-130		
1,2,4-Trichlorobenzene	47		5	ug/kg	50.0		94.4	70-130		
1,2,3-Trichlorobenzene	41		5	ug/kg	50.0		81.4	70-130		
1,1,2-Trichloroethane	50		5	ug/kg	50.0		99.8	70-130		

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0189 - EPA 5035 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (B4C0189-BS1)					Prepared & Analyzed: 03/05/24					
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130		
Trichloroethene	51		5	ug/kg	50.0		102	70-130		
1,2,3-Trichloropropane	51		5	ug/kg	50.0		102	70-130		
1,3,5-Trimethylbenzene	56		5	ug/kg	50.0		113	70-130		
1,2,4-Trimethylbenzene	60		5	ug/kg	50.0		120	70-130		
Vinyl Chloride	38		5	ug/kg	50.0		76.1	50-150		
o-Xylene	58		5	ug/kg	50.0		116	70-130		
m&p-Xylene	113		10	ug/kg	100		113	70-130		
1,1,2,2-Tetrachloroethane	51		5	ug/kg	50.0		102	70-130		
tert-Amyl methyl ether	48		5	ug/kg	50.0		95.3	70-130		
1,3-Dichloropropane	51		5	ug/kg	50.0		103	70-130		
Ethyl tert-butyl ether	47		5	ug/kg	50.0		94.2	70-130		
Trichlorofluoromethane	45		5	ug/kg	50.0		90.0	50-150		
Dichlorodifluoromethane	49		5	ug/kg	50.0		97.2	50-150		
Surrogate: 4-Bromofluorobenzene			*53.9*	ug/kg	*50.0*		*108*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*50.6*	ug/kg	*50.0*		*101*	*70-130*		
Surrogate: Toluene-d8			*49.7*	ug/kg	*50.0*		*99.4*	*70-130*		
LCS Dup (B4C0189-BSD1)					Prepared & Analyzed: 03/05/24					
Acetone	48		5	ug/kg	50.0		95.8	50-150	1.41	30
Benzene	52		5	ug/kg	50.0		105	70-130	1.15	20
Bromobenzene	55		5	ug/kg	50.0		109	70-130	0.810	20
Bromochloromethane	52		5	ug/kg	50.0		104	70-130	1.29	20
Bromodichloromethane	55		5	ug/kg	50.0		109	70-130	1.87	20
Bromoform	50		5	ug/kg	50.0		100	70-130	1.61	20
Bromomethane	34		5	ug/kg	50.0		68.9	50-150	27.2	30
2-Butanone	46		5	ug/kg	50.0		91.5	50-150	1.63	30
tert-Butyl alcohol	48		5	ug/kg	50.0		95.7	70-130	9.44	20
sec-Butylbenzene	56		5	ug/kg	50.0		112	70-130	0.571	20
n-Butylbenzene	60		5	ug/kg	50.0		119	70-130	0.218	20
tert-Butylbenzene	57		5	ug/kg	50.0		113	70-130	0.530	20
Methyl t-butyl ether (MTBE)	50		5	ug/kg	50.0		99.6	70-130	2.50	20
Carbon Disulfide	46		5	ug/kg	50.0		92.4	50-150	0.389	40
Carbon Tetrachloride	56		5	ug/kg	50.0		111	70-130	2.84	20
Chlorobenzene	53		5	ug/kg	50.0		107	70-130	1.46	20
Chloroethane	40		5	ug/kg	50.0		79.3	50-150	3.52	30
Chloroform	52		5	ug/kg	50.0		105	70-130	3.08	20
Chloromethane	43		5	ug/kg	50.0		85.6	50-150	0.845	30
4-Chlorotoluene	54		5	ug/kg	50.0		108	70-130	0.185	20
2-Chlorotoluene	50		5	ug/kg	50.0		101	70-130	0.00	20
1,2-Dibromo-3-chloropropane (DBCP)	50		5	ug/kg	50.0		99.6	70-130	5.81	20
Dibromochloromethane	50		5	ug/kg	50.0		99.9	70-130	2.62	20
1,2-Dibromoethane (EDB)	48		5	ug/kg	50.0		95.8	70-130	2.17	20
Dibromomethane	51		5	ug/kg	50.0		103	60-140	0.0585	30
1,2-Dichlorobenzene	53		5	ug/kg	50.0		105	70-130	2.74	20
1,3-Dichlorobenzene	55		5	ug/kg	50.0		110	70-130	0.639	20
1,4-Dichlorobenzene	51		5	ug/kg	50.0		102	70-130	3.37	20
1,1-Dichloroethane	51		5	ug/kg	50.0		102	70-130	2.61	20
1,2-Dichloroethane	55		5	ug/kg	50.0		110	70-130	0.384	20
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		99.8	70-130	0.0601	20
cis-1,2-Dichloroethene	52		5	ug/kg	50.0		105	70-130	1.07	20
1,1-Dichloroethene	47		5	ug/kg	50.0		94.5	70-130	2.05	20
1,2-Dichloropropane	55		5	ug/kg	50.0		110	70-130	1.13	20
2,2-Dichloropropane	55		5	ug/kg	50.0		110	70-130	1.02	20
cis-1,3-Dichloropropene	52		5	ug/kg	50.0		105	70-130	1.99	20
trans-1,3-Dichloropropene	50		5	ug/kg	50.0		101	70-130	1.84	20
1,1-Dichloropropene	49		5	ug/kg	50.0		97.3	70-130	3.79	20

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
LCS Dup (B4C0189-BSD1)					Prepared & Analyzed: 03/05/24					
Diethyl ether	46		5	ug/kg	50.0		92.9	60-140	0.735	30
1,4-Dioxane	246		100	ug/kg	250		98.6	0-200	3.43	50
Ethylbenzene	57		5	ug/kg	50.0		114	70-130	0.475	20
Hexachlorobutadiene	60		5	ug/kg	50.0		120	70-130	1.84	20
2-Hexanone	43		5	ug/kg	50.0		86.6	50-150	1.51	20
Isopropylbenzene	55		5	ug/kg	50.0		110	70-130	0.00	20
p-Isopropyltoluene	58		5	ug/kg	50.0		117	70-130	1.29	20
Methylene Chloride	56		5	ug/kg	50.0		112	60-140	0.682	30
4-Methyl-2-pentanone	46		5	ug/kg	50.0		91.6	50-150	1.41	20
Naphthalene	45		5	ug/kg	50.0		91.0	70-130	9.03	20
n-Propylbenzene	57		5	ug/kg	50.0		114	70-130	0.0699	20
Styrene	55		5	ug/kg	50.0		111	70-130	0.503	20
1,1,1,2-Tetrachloroethane	57		5	ug/kg	50.0		114	70-130	1.48	20
Tetrachloroethene	54		5	ug/kg	50.0		107	70-130	3.30	20
Tetrahydrofuran	49		5	ug/kg	50.0		98.7	50-150	7.13	40
Toluene	51		5	ug/kg	50.0		103	70-130	0.800	20
1,2,4-Trichlorobenzene	53		5	ug/kg	50.0		106	70-130	11.8	20
1,2,3-Trichlorobenzene	52		5	ug/kg	50.0		105	70-130	24.9	20
1,1,2-Trichloroethane	45		5	ug/kg	50.0		90.4	70-130	9.93	20
1,1,1-Trichloroethane	53		5	ug/kg	50.0		106	70-130	2.00	20
Trichloroethene	53		5	ug/kg	50.0		107	70-130	4.50	20
1,2,3-Trichloropropane	52		5	ug/kg	50.0		104	70-130	1.48	20
1,3,5-Trimethylbenzene	57		5	ug/kg	50.0		113	70-130	0.655	20
1,2,4-Trimethylbenzene	60		5	ug/kg	50.0		120	70-130	0.0501	20
Vinyl Chloride	40		5	ug/kg	50.0		79.2	50-150	4.07	30
o-Xylene	58		5	ug/kg	50.0		115	70-130	0.467	20
m&p-Xylene	113		10	ug/kg	100		113	70-130	0.0265	20
1,1,2,2-Tetrachloroethane	50		5	ug/kg	50.0		100	70-130	2.29	20
tert-Amyl methyl ether	48		5	ug/kg	50.0		96.3	70-130	1.00	20
1,3-Dichloropropane	52		5	ug/kg	50.0		104	70-130	1.14	20
Ethyl tert-butyl ether	49		5	ug/kg	50.0		98.2	70-130	4.16	20
Trichlorofluoromethane	45		5	ug/kg	50.0		90.8	50-150	0.863	20
Dichlorodifluoromethane	50		5	ug/kg	50.0		99.1	50-150	2.00	30
Surrogate: 4-Bromofluorobenzene			*52.3*	ug/kg	*50.0*		*105*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.8*	*70-130*		
Surrogate: Toluene-d8			*49.7*	ug/kg	*50.0*		*99.4*	*70-130*		

Quality Control

(Continued)

Semivolatile organic compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Batch: B4B1213 - 1_Semivolatiles Extractions

Blank (B4B1213-BLK1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	ND		129	ug/kg						
1,2-Dichlorobenzene	ND		129	ug/kg						
1,3-Dichlorobenzene	ND		129	ug/kg						
1,4-Dichlorobenzene	ND		129	ug/kg						
Phenol	ND		129	ug/kg						
2,4,5-Trichlorophenol	ND		129	ug/kg						
2,4,6-Trichlorophenol	ND		129	ug/kg						
2,4-Dichlorophenol	ND		129	ug/kg						
2,4-Dimethylphenol	ND		328	ug/kg						
2,4-Dinitrophenol	ND		328	ug/kg						
2,4-Dinitrotoluene	ND		129	ug/kg						
2,6-Dinitrotoluene	ND		129	ug/kg						
2-Chloronaphthalene	ND		129	ug/kg						
2-Chlorophenol	ND		129	ug/kg						
2-Methylnaphthalene	ND		129	ug/kg						
Nitrobenzene	ND		129	ug/kg						
2-Methylphenol	ND		129	ug/kg						
2-Nitroaniline	ND		129	ug/kg						
2-Nitrophenol	ND		328	ug/kg						
3,3′-Dichlorobenzidine	ND		328	ug/kg						
3-Nitroaniline	ND		129	ug/kg						
4,6-Dinitro-2-methylphenol	ND		328	ug/kg						
4-Bromophenyl phenyl ether	ND		129	ug/kg						
4-Chloro-3-methylphenol	ND		129	ug/kg						
4-Chloroaniline	ND		129	ug/kg						
4-Chlorophenyl phenyl ether	ND		129	ug/kg						
4-Nitroaniline	ND		129	ug/kg						
4-Nitrophenol	ND		328	ug/kg						
Acenaphthene	ND		129	ug/kg						
Acenaphthylene	ND		129	ug/kg						
Aniline	ND		129	ug/kg						
Anthracene	ND		129	ug/kg						
Benzo(a)anthracene	ND		129	ug/kg						
Benzo(a)pyrene	ND		129	ug/kg						
Benzo(b)fluoranthene	ND		129	ug/kg						
Benzo(g,h,i)perylene	ND		129	ug/kg						
Benzo(k)fluoranthene	ND		129	ug/kg						
Benzoic acid	ND		993	ug/kg						
Biphenyl	ND		20	ug/kg						
Bis(2-chloroethoxy)methane	ND		129	ug/kg						
Bis(2-chloroethyl)ether	ND		129	ug/kg						
Bis(2-chloroisopropyl)ether	ND		129	ug/kg						
Bis(2-ethylhexyl)phthalate	ND		397	ug/kg						
Butyl benzyl phthalate	ND		129	ug/kg						
Chrysene	ND		129	ug/kg						
Di-n-octyl phthalate	ND		199	ug/kg						
Dibenz(a,h)anthracene	ND		129	ug/kg						
Dibenzofuran	ND		129	ug/kg						
Diethyl phthalate	ND		129	ug/kg						
Dimethyl phthalate	ND		328	ug/kg						
Di-n-butyl phthalate	ND		199	ug/kg						
Fluoranthene	ND		129	ug/kg						
Fluorene	ND		129	ug/kg						
Hexachlorobenzene	ND		129	ug/kg						
Hexachlorobutadiene	ND		129	ug/kg						
Hexachlorocyclopentadiene	ND		328	ug/kg						
Hexachloroethane	ND		129	ug/kg						

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
Blank (B4B1213-BLK1)					Prepared: 02/28/24 Analyzed: 02/29/24					
Indeno(1,2,3-cd)pyrene	ND		129	ug/kg						
Isophorone	ND		129	ug/kg						
Naphthalene	ND		129	ug/kg						
N-Nitrosodimethylamine	ND		129	ug/kg						
N-Nitrosodi-n-propylamine	ND		129	ug/kg						
N-Nitrosodiphenylamine	ND		129	ug/kg						
Pentachlorophenol	ND		328	ug/kg						
Phenanthrene	ND		129	ug/kg						
Pyrene	ND		129	ug/kg						
m&p-Cresol	ND		258	ug/kg						
Pyridine	ND		129	ug/kg						
Azobenzene	ND		129	ug/kg						
Total Dichlorobenzene	ND		129	ug/kg						
Surrogate: Nitrobenzene-d5			*3910*	ug/kg	*6620*		*59.0*	*30-126*		
Surrogate: p-Terphenyl-d14			*5220*	ug/kg	*6620*		*78.8*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3410*	ug/kg	*6620*		*51.5*	*34-130*		
Surrogate: Phenol-d6			*3720*	ug/kg	*6620*		*56.2*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3230*	ug/kg	*6620*		*48.8*	*30-130*		
Surrogate: 2-Fluorophenol			*3980*	ug/kg	*6620*		*60.1*	*30-130*		
LCS (B4B1213-BS1)					Prepared: 02/28/24 Analyzed: 02/29/24					
1,2,4-Trichlorobenzene	2280		129	ug/kg	3310		68.7	40-130		
1,2-Dichlorobenzene	3110		129	ug/kg	3310		94.0	40-130		
1,3-Dichlorobenzene	2990		129	ug/kg	3310		90.2	40-130		
1,4-Dichlorobenzene	2650		129	ug/kg	3310		79.9	40-130		
Phenol	3350		129	ug/kg	3310		101	40-130		
2,4,5-Trichlorophenol	2470		129	ug/kg	3310		74.5	40-130		
2,4,6-Trichlorophenol	2660		129	ug/kg	3310		80.3	40-130		
2,4-Dichlorophenol	2670		129	ug/kg	3310		80.7	40-130		
2,4-Dimethylphenol	2640		328	ug/kg	3310		79.8	40-130		
2,4-Dinitrophenol	2190		328	ug/kg	3310		66.3	15-140		
2,4-Dinitrotoluene	2580		129	ug/kg	3310		78.0	40-130		
2,6-Dinitrotoluene	2680		129	ug/kg	3310		80.9	40-130		
2-Chloronaphthalene	2640		129	ug/kg	3310		79.7	40-130		
2-Chlorophenol	3130		129	ug/kg	3310		94.5	40-130		
2-Methylnaphthalene	2310		129	ug/kg	3310		69.6	40-130		
Nitrobenzene	2840		129	ug/kg	3310		85.7	40-130		
2-Methylphenol	2560		129	ug/kg	3310		77.2	40-130		
2-Nitroaniline	2570		129	ug/kg	3310		77.8	40-130		
2-Nitrophenol	2700		328	ug/kg	3310		81.4	40-130		
3-Nitroaniline	2530		129	ug/kg	3310		76.3	40-130		
4,6-Dinitro-2-methylphenol	2240		328	ug/kg	3310		67.7	30-130		
4-Bromophenyl phenyl ether	2050		129	ug/kg	3310		61.9	40-130		
4-Chloro-3-methylphenol	2280		129	ug/kg	3310		68.8	40-130		
4-Chlorophenyl phenyl ether	2220		129	ug/kg	3310		67.1	40-130		
4-Nitroaniline	2680		129	ug/kg	3310		80.9	40-130		
4-Nitrophenol	2360		328	ug/kg	3310		71.4	40-130		
Acenaphthene	2210		129	ug/kg	3310		66.6	40-130		
Acenaphthylene	2610		129	ug/kg	3310		78.8	40-130		
Anthracene	2940		129	ug/kg	3310		88.8	40-130		
Benzo(a)anthracene	2650		129	ug/kg	3310		79.9	40-130		
Benzo(a)pyrene	2770		129	ug/kg	3310		83.5	40-130		
Benzo(b)fluoranthene	2950		129	ug/kg	3310		89.0	40-130		
Benzo(g,h,i)perylene	2500		129	ug/kg	3310		75.4	40-130		
Benzo(k)fluoranthene	3090		129	ug/kg	3310		93.2	40-130		
Biphenyl	626		20	ug/kg	828		75.7	40-130		
Bis(2-chloroethoxy)methane	2870		129	ug/kg	3310		86.8	40-130		

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS (B4B1213-BS1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bis(2-chloroethyl)ether	3100		129	ug/kg	3310		93.5	40-130		
Bis(2-chloroisopropyl)ether	3600		129	ug/kg	3310		109	40-130		
Bis(2-ethylhexyl)phthalate	2960		397	ug/kg	3310		89.3	40-130		
Butyl benzyl phthalate	2870		129	ug/kg	3310		86.8	40-130		
Chrysene	2860		129	ug/kg	3310		86.3	40-130		
Di-n-octyl phthalate	2150		199	ug/kg	3310		64.9	40-130		
Dibenz(a,h)anthracene	2490		129	ug/kg	3310		75.3	40-130		
Dibenzofuran	2570		129	ug/kg	3310		77.6	40-130		
Diethyl phthalate	2730		129	ug/kg	3310		82.5	40-130		
Dimethyl phthalate	2500		328	ug/kg	3310		75.5	40-130		
Di-n-butyl phthalate	3200		199	ug/kg	3310		96.6	40-130		
Fluoranthene	2990		129	ug/kg	3310		90.3	40-130		
Fluorene	2510		129	ug/kg	3310		75.7	40-130		
Hexachlorobenzene	2570		129	ug/kg	3310		77.7	40-130		
Hexachlorobutadiene	2580		129	ug/kg	3310		78.0	40-130		
Hexachlorocyclopentadiene	2530		328	ug/kg	3310		76.3	40-130		
Hexachloroethane	2970		129	ug/kg	3310		89.7	40-130		
Indeno(1,2,3-cd)pyrene	2600		129	ug/kg	3310		78.5	40-130		
Isophorone	3010		129	ug/kg	3310		90.8	40-130		
Naphthalene	2360		129	ug/kg	3310		71.2	40-130		
N-Nitrosodimethylamine	2890		129	ug/kg	3310		87.4	40-130		
N-Nitrosodi-n-propylamine	2830		129	ug/kg	3310		85.5	40-130		
N-Nitrosodiphenylamine	2750		129	ug/kg	3310		82.9	40-130		
Pentachlorophenol	2410		328	ug/kg	3310		72.8	15-140		
Phenanthrene	3070		129	ug/kg	3310		92.6	40-130		
Pyrene	3010		129	ug/kg	3310		91.0	40-130		
m&p-Cresol	2500		258	ug/kg	3310		75.5	40-130		
Surrogate: Nitrobenzene-d5			*4160*	ug/kg	*6620*		*62.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5200*	ug/kg	*6620*		*78.6*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3730*	ug/kg	*6620*		*56.3*	*34-130*		
Surrogate: Phenol-d6			*4630*	ug/kg	*6620*		*70.0*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3910*	ug/kg	*6620*		*59.0*	*30-130*		
Surrogate: 2-Fluorophenol			*5100*	ug/kg	*6620*		*77.0*	*30-130*		

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS Dup (B4B1213-BSD1) Prepared: 02/28/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	2270		129	ug/kg	3310		68.7	40-130	0.0874	30
1,2-Dichlorobenzene	2550		129	ug/kg	3310		77.0	40-130	19.9	30
1,3-Dichlorobenzene	2480		129	ug/kg	3310		75.0	40-130	18.4	30
1,4-Dichlorobenzene	2260		129	ug/kg	3310		68.4	40-130	15.5	30
Phenol	2680		129	ug/kg	3310		81.0	40-130	22.3	30
2,4,5-Trichlorophenol	2640		129	ug/kg	3310		79.6	40-130	6.67	30
2,4,6-Trichlorophenol	2540		129	ug/kg	3310		76.6	40-130	4.71	30
2,4-Dichlorophenol	2640		129	ug/kg	3310		79.8	40-130	1.07	30
2,4-Dimethylphenol	2420		328	ug/kg	3310		73.1	40-130	8.87	30
2,4-Dinitrophenol	2130		328	ug/kg	3310		64.2	15-140	3.13	30
2,4-Dinitrotoluene	2740		129	ug/kg	3310		82.7	40-130	5.87	30
2,6-Dinitrotoluene	2730		129	ug/kg	3310		82.3	40-130	1.76	30
2-Chloronaphthalene	2740		129	ug/kg	3310		82.8	40-130	3.82	30
2-Chlorophenol	2630		129	ug/kg	3310		79.3	40-130	17.4	30
2-Methylnaphthalene	2250		129	ug/kg	3310		67.9	40-130	2.50	30
Nitrobenzene	2800		129	ug/kg	3310		84.5	40-130	1.41	30
2-Methylphenol	2170		129	ug/kg	3310		65.6	40-130	16.3	30
2-Nitroaniline	2600		129	ug/kg	3310		78.5	40-130	0.973	30
2-Nitrophenol	2540		328	ug/kg	3310		76.8	40-130	5.89	30
3-Nitroaniline	2660		129	ug/kg	3310		80.5	40-130	5.31	30
4,6-Dinitro-2-methylphenol	2700		328	ug/kg	3310		81.5	30-130	18.5	30
4-Bromophenyl phenyl ether	2240		129	ug/kg	3310		67.6	40-130	8.81	30
4-Chloro-3-methylphenol	2220		129	ug/kg	3310		66.9	40-130	2.80	30
4-Chlorophenyl phenyl ether	2260		129	ug/kg	3310		68.4	40-130	1.92	30
4-Nitroaniline	1970		129	ug/kg	3310		59.5	40-130	30.5	30
4-Nitrophenol	2680		328	ug/kg	3310		80.9	40-130	12.4	30
Acenaphthene	2220		129	ug/kg	3310		67.1	40-130	0.688	30
Acenaphthylene	2690		129	ug/kg	3310		81.3	40-130	3.10	30
Anthracene	3050		129	ug/kg	3310		92.1	40-130	3.58	30
Benzo(a)anthracene	2670		129	ug/kg	3310		80.5	40-130	0.773	30
Benzo(a)pyrene	2920		129	ug/kg	3310		88.2	40-130	5.43	30
Benzo(b)fluoranthene	3050		129	ug/kg	3310		92.0	40-130	3.27	30
Benzo(g,h,i)perylene	2800		129	ug/kg	3310		84.5	40-130	11.4	30
Benzo(k)fluoranthene	3270		129	ug/kg	3310		98.8	40-130	5.83	30
Biphenyl	663		20	ug/kg	828		80.1	40-130	5.65	30
Bis(2-chloroethoxy)methane	2890		129	ug/kg	3310		87.3	40-130	0.643	30
Bis(2-chloroethyl)ether	2740		129	ug/kg	3310		82.8	40-130	12.1	30
Bis(2-chloroisopropyl)ether	3070		129	ug/kg	3310		92.8	40-130	15.9	30
Bis(2-ethylhexyl)phthalate	3030		397	ug/kg	3310		91.4	40-130	2.30	30
Butyl benzyl phthalate	2900		129	ug/kg	3310		87.5	40-130	0.895	30
Chrysene	2930		129	ug/kg	3310		88.6	40-130	2.63	30
Di-n-octyl phthalate	3290		199	ug/kg	3310		99.4	40-130	42.1	30
Dibenz(a,h)anthracene	2610		129	ug/kg	3310		78.8	40-130	4.46	30
Dibenzofuran	2720		129	ug/kg	3310		82.1	40-130	5.66	30
Diethyl phthalate	2830		129	ug/kg	3310		85.6	40-130	3.64	30
Dimethyl phthalate	2580		328	ug/kg	3310		78.0	40-130	3.23	30
Di-n-butyl phthalate	3310		199	ug/kg	3310		99.9	40-130	3.38	30
Fluoranthene	3080		129	ug/kg	3310		93.0	40-130	2.92	30
Fluorene	2640		129	ug/kg	3310		79.8	40-130	5.28	30
Hexachlorobenzene	2790		129	ug/kg	3310		84.1	40-130	8.01	30
Hexachlorobutadiene	2510		129	ug/kg	3310		75.8	40-130	2.76	30
Hexachlorocyclopentadiene	2640		328	ug/kg	3310		79.8	40-130	4.46	30
Hexachloroethane	2460		129	ug/kg	3310		74.3	40-130	18.8	30
Indeno(1,2,3-cd)pyrene	2730		129	ug/kg	3310		82.3	40-130	4.68	30
Isophorone	2960		129	ug/kg	3310		89.3	40-130	1.75	30
Naphthalene	2400		129	ug/kg	3310		72.5	40-130	1.84	30
N-Nitrosodimethylamine	2060		129	ug/kg	3310		62.3	40-130	33.5	30

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4B1213-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
N-Nitrosodi-n-propylamine	2530		129	ug/kg	3310		76.3	40-130	11.4	30
N-Nitrosodiphenylamine	2890		129	ug/kg	3310		87.4	40-130	5.24	30
Pentachlorophenol	2620		328	ug/kg	3310		79.3	15-140	8.44	30
Phenanthrene	3230		129	ug/kg	3310		97.5	40-130	5.11	30
Pyrene	3050		129	ug/kg	3310		92.1	40-130	1.20	30
m&p-Cresol	2270		258	ug/kg	3310		68.5	40-130	9.73	30
Surrogate: Nitrobenzene-d5			*4090*	ug/kg	*6620*		*61.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5160*	ug/kg	*6620*		*77.9*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3750*	ug/kg	*6620*		*56.7*	*34-130*		
Surrogate: Phenol-d6			*3870*	ug/kg	*6620*		*58.5*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*4140*	ug/kg	*6620*		*62.6*	*30-130*		
Surrogate: 2-Fluorophenol			*4220*	ug/kg	*6620*		*63.8*	*30-130*		

Quality Control

(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1201 - 1_Semivolatiles Extractions										
Blank (B4B1201-BLK1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	ND		66	ug/kg						
Aroclor-1221	ND		66	ug/kg						
Aroclor-1232	ND		66	ug/kg						
Aroclor-1242	ND		66	ug/kg						
Aroclor-1248	ND		66	ug/kg						
Aroclor-1254	ND		66	ug/kg						
Aroclor-1260	ND		66	ug/kg						
Aroclor-1262	ND		66	ug/kg						
Aroclor-1268	ND		66	ug/kg						
PCBs (Total)	ND		66	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*8.58*	ug/kg	*13.3*		*64.4*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*7.12*	ug/kg	*13.3*		*53.4*	*43.3-130*		
LCS (B4B1201-BS1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	156		66	ug/kg	167		93.8	58.2-125		
Aroclor-1260	170		66	ug/kg	167		102	65.5-130		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*9.00*	ug/kg	*13.3*		*67.5*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.98*	ug/kg	*13.3*		*52.4*	*43.3-130*		
LCS Dup (B4B1201-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	170		66	ug/kg	167		102	58.2-125	8.40	20
Aroclor-1260	193		66	ug/kg	167		116	65.5-130	12.9	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*9.58*	ug/kg	*13.3*		*71.9*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*7.76*	ug/kg	*13.3*		*58.2*	*43.3-130*		

Quality Control
(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1186 - 1_Semivolatiles Extractions										
Blank (B4B1186-BLK1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*9.08*	mg/kg	*8.33*		*109*	*50-130*		
LCS (B4B1186-BS1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	583		27	mg/kg	667		87.5	44.7-125		
Surrogate: Chlorooctadecane			*9.39*	mg/kg	*8.33*		*113*	*50-130*		
LCS Dup (B4B1186-BSD1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	551		27	mg/kg	667		82.6	44.7-125	5.71	30
Surrogate: Chlorooctadecane			*9.05*	mg/kg	*8.33*		*109*	*50-130*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

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NEW ENGLAND TESTING LABORATORY, IN
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

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PROJ. NO. 3096

PROJECT NAME/LOCATION MAYNARD

CLIENT LORD ENV. INC

REPORT TO: RTella @ LORDENV.COM

INVOICE TO: " " " "

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** COM-97 plus MCP14	HAZ CHARACTERISTICS						REMARKS
2-23-24	10:30		X	TP-6 ● ● ●		X		3	Asm CONTAINER	X	X						PID <0.1 ppmv
2-23-24	10:00	X		B-103; 0-6' ● ● ●		↓		3		↓	↓						↓
2/23/24	10:45	X		~~B-113~~ B-113; 2-4' ● ● ●		↓		3		↓	↓						↓
2/23/24	~~10:00~~ 11:00	X		B-112; 2-6' ● ● ●		↓		3		↓	↓						↓

Sampled by: (Signature) RJ Tella

Date/Time 2/23/24 2pm

Received by: (Signature)

Date/Time 2/26 1030

Laboratory Remarks:

Temp. received: 3

Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:

Relinquished by: (Signature)

Date/Time 2/26 1525

Received by: (Signature)

Date/Time

Relinquished by: (Signature)

Date/Time

Received for Laboratory by: (Signature)

Date/Time 2/26 1525

Turnaround (Business Days)______

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.
Project #: 3096

Project Location: Maynard
RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
4B26010

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

<u>Data User Note</u>: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:
Position: Laboratory Director

Printed Name: Richard Warila
Date: 3/6/2024

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 4B27035
Client Project: 3096 - Maynard

Report Date: 05-March-2024

Prepared for:

Ralph Tella
Lord Environmental, Inc.
1506 Providence Highway, Suite 30
Norwood, MA 02062

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 02/27/24. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 4B27035. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
4B27035-01	B-108 2-4'	Soil	02/27/2024	02/27/2024
4B27035-02	B-118 2-4'	Soil	02/27/2024	02/27/2024

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-108 2-4' (Lab Number: 4B27035-01)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

B-118 2-4' (Lab Number: 4B27035-02)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Method References

Reactive Cyanide, Standard Operating Procedure 407, New England Testing Laboratory Inc.

Reactive Sulfide, Standard Operating Procedure 426, New England Testing Laboratory Inc.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**8.1**			SU	02/28/24	02/28/24
Specific Conductance	**13.7**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**7.1**			SU	02/28/24	02/28/24
Specific Conductance	**296**		2.0	uS/cm	02/28/24	02/28/24

Results: Reactivity

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-118 2-4'
Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Total Metals

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.81	mg/kg	02/28/24	03/04/24
Arsenic	**8.77**		1.22	mg/kg	02/28/24	03/04/24
Barium	**29.1**		0.40	mg/kg	02/28/24	03/04/24
Beryllium	ND		0.40	mg/kg	02/28/24	03/04/24
Cadmium	**2.43**		0.61	mg/kg	02/28/24	03/04/24
Chromium	**10.6**		0.61	mg/kg	02/28/24	03/04/24
Lead	**3.35**		0.61	mg/kg	02/28/24	03/04/24
Mercury	ND		0.104	mg/kg	02/28/24	02/28/24
Nickel	**6.35**		0.61	mg/kg	02/28/24	03/04/24
Selenium	ND		1.22	mg/kg	02/28/24	03/04/24
Silver	ND		1.22	mg/kg	02/28/24	03/04/24
Vanadium	**12.4**		0.40	mg/kg	02/28/24	03/04/24
Zinc	**16.7**		2.4	mg/kg	02/28/24	03/04/24
Thallium	ND		0.40	mg/kg	02/28/24	03/04/24

Results: Total Metals

Sample: B-118 2-4'
Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.77	mg/kg	02/28/24	03/04/24
Arsenic	**6.64**		1.17	mg/kg	02/28/24	03/04/24
Barium	**55.4**		0.39	mg/kg	02/28/24	03/04/24
Beryllium	ND		0.39	mg/kg	02/28/24	03/04/24
Cadmium	**4.49**		0.58	mg/kg	02/28/24	03/04/24
Chromium	**22.8**		0.58	mg/kg	02/28/24	03/04/24
Lead	**5.70**		0.58	mg/kg	02/28/24	03/04/24
Mercury	ND		0.090	mg/kg	02/28/24	02/28/24
Nickel	**13.7**		0.58	mg/kg	02/28/24	03/04/24
Selenium	ND		1.17	mg/kg	02/28/24	03/04/24
Silver	ND		1.17	mg/kg	02/28/24	03/04/24
Vanadium	**26.1**		0.39	mg/kg	02/28/24	03/04/24
Zinc	**24.6**		2.3	mg/kg	02/28/24	03/04/24
Thallium	ND		0.39	mg/kg	02/28/24	03/04/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		93	ug/kg	02/29/24	02/29/24
Benzene	ND		5	ug/kg	02/29/24	02/29/24
Bromobenzene	ND		5	ug/kg	02/29/24	02/29/24
Bromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromodichloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromoform	ND		5	ug/kg	02/29/24	02/29/24
Bromomethane	ND		5	ug/kg	02/29/24	02/29/24
2-Butanone	ND		93	ug/kg	02/29/24	02/29/24
tert-Butyl alcohol	ND		5	ug/kg	02/29/24	02/29/24
sec-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
n-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
tert-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	02/29/24	02/29/24
Carbon Disulfide	ND		5	ug/kg	02/29/24	02/29/24
Carbon Tetrachloride	ND		5	ug/kg	02/29/24	02/29/24
Chlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
Chloroethane	ND		5	ug/kg	02/29/24	02/29/24
Chloroform	ND		5	ug/kg	02/29/24	02/29/24
Chloromethane	ND		5	ug/kg	02/29/24	02/29/24
4-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
2-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	02/29/24	02/29/24
Dibromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	02/29/24	02/29/24
Dibromomethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2 Dichloroethene, Total	ND		5	ug/kg	02/29/24	02/29/24
trans-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
cis-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
2,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
cis-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
trans-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	02/29/24	02/29/24
Diethyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dioxane	ND		93	ug/kg	02/29/24	02/29/24
Ethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Hexachlorobutadiene	ND		5	ug/kg	02/29/24	02/29/24
2-Hexanone	ND		93	ug/kg	02/29/24	02/29/24
Isopropylbenzene	ND		5	ug/kg	02/29/24	02/29/24
p-Isopropyltoluene	ND		5	ug/kg	02/29/24	02/29

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-108 2-4' (Continued)

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	02/29/24	02/29/24
4-Methyl-2-pentanone	ND		93	ug/kg	02/29/24	02/29/24
Naphthalene	ND		5	ug/kg	02/29/24	02/29/24
n-Propylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Styrene	ND		5	ug/kg	02/29/24	02/29/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
Tetrachloroethene	ND		5	ug/kg	02/29/24	02/29/24
Tetrahydrofuran	ND		5	ug/kg	02/29/24	02/29/24
Toluene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1,2-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,1,1-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
Trichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichloropropane	ND		5	ug/kg	02/29/24	02/29/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Vinyl Chloride	ND		5	ug/kg	02/29/24	02/29/24
o-Xylene	ND		5	ug/kg	02/29/24	02/29/24
m&p-Xylene	ND		9	ug/kg	02/29/24	02/29/24
Total xylenes	ND		5	ug/kg	02/29/24	02/29/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
tert-Amyl methyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
Ethyl tert-butyl ether	ND		5	ug/kg	02/29/24	02/29/24
Diisopropyl ether	ND		5	ug/kg	02/29/24	02/29/24
Trichlorofluoromethane	ND		5	ug/kg	02/29/24	02/29/24
Dichlorodifluoromethane	ND		5	ug/kg	02/29/24	02/29/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*96.3%*	*70-130*	02/29/24	02/29/24
1,2-Dichloroethane-d4	*104%*	*70-130*	02/29/24	02/29/24
Toluene-d8	*103%*	*70-130*	02/29/24	02/29/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		92	ug/kg	02/29/24	02/29/24
Benzene	ND		5	ug/kg	02/29/24	02/29/24
Bromobenzene	ND		5	ug/kg	02/29/24	02/29/24
Bromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromodichloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromoform	ND		5	ug/kg	02/29/24	02/29/24
Bromomethane	ND		5	ug/kg	02/29/24	02/29/24
2-Butanone	ND		92	ug/kg	02/29/24	02/29/24
tert-Butyl alcohol	ND		5	ug/kg	02/29/24	02/29/24
sec-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
n-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
tert-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	02/29/24	02/29/24
Carbon Disulfide	ND		5	ug/kg	02/29/24	02/29/24
Carbon Tetrachloride	ND		5	ug/kg	02/29/24	02/29/24
Chlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
Chloroethane	ND		5	ug/kg	02/29/24	02/29/24
Chloroform	ND		5	ug/kg	02/29/24	02/29/24
Chloromethane	ND		5	ug/kg	02/29/24	02/29/24
4-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
2-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	02/29/24	02/29/24
Dibromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	02/29/24	02/29/24
Dibromomethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2 Dichloroethene, Total	ND		5	ug/kg	02/29/24	02/29/24
trans-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
cis-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
2,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
cis-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
trans-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	02/29/24	02/29/24
Diethyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dioxane	ND		92	ug/kg	02/29/24	02/29/24
Ethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Hexachlorobutadiene	ND		5	ug/kg	02/29/24	02/29/24
2-Hexanone	ND		92	ug/kg	02/29/24	02/29/24
Isopropylbenzene	ND		5	ug/kg	02/29/24	02/29/24
p-Isopropyltoluene	ND		5	ug/kg	02/29/24	02/29

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-118 2-4' (Continued)

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	02/29/24	02/29/24
4-Methyl-2-pentanone	ND		92	ug/kg	02/29/24	02/29/24
Naphthalene	ND		5	ug/kg	02/29/24	02/29/24
n-Propylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Styrene	ND		5	ug/kg	02/29/24	02/29/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
Tetrachloroethene	ND		5	ug/kg	02/29/24	02/29/24
Tetrahydrofuran	ND		5	ug/kg	02/29/24	02/29/24
Toluene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1,2-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,1,1-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
Trichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichloropropane	ND		5	ug/kg	02/29/24	02/29/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Vinyl Chloride	ND		5	ug/kg	02/29/24	02/29/24
o-Xylene	ND		5	ug/kg	02/29/24	02/29/24
m&p-Xylene	ND		9	ug/kg	02/29/24	02/29/24
Total xylenes	ND		5	ug/kg	02/29/24	02/29/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
tert-Amyl methyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
Ethyl tert-butyl ether	ND		5	ug/kg	02/29/24	02/29/24
Diisopropyl ether	ND		5	ug/kg	02/29/24	02/29/24
Trichlorofluoromethane	ND		5	ug/kg	02/29/24	02/29/24
Dichlorodifluoromethane	ND		5	ug/kg	02/29/24	02/29/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*96.5%*	*70-130*	02/29/24	02/29/24
1,2-Dichloroethane-d4	*104%*	*70-130*	02/29/24	02/29/24
Toluene-d8	*102%*	*70-130*	02/29/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,2-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,3-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,4-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
Phenol	ND		141	ug/kg	02/28/24	03/01/24
2,4,5-Trichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4,6-Trichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4-Dichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4-Dimethylphenol	ND		357	ug/kg	02/28/24	03/01/24
2,4-Dinitrophenol	ND		357	ug/kg	02/28/24	03/01/24
2,4-Dinitrotoluene	ND		141	ug/kg	02/28/24	03/01/24
2,6-Dinitrotoluene	ND		141	ug/kg	02/28/24	03/01/24
2-Chloronaphthalene	ND		141	ug/kg	02/28/24	03/01/24
2-Chlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2-Methylnaphthalene	ND		141	ug/kg	02/28/24	03/01/24
Nitrobenzene	ND		141	ug/kg	02/28/24	03/01/24
2-Methylphenol	ND		141	ug/kg	02/28/24	03/01/24
2-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
2-Nitrophenol	ND		357	ug/kg	02/28/24	03/01/24
3,3′-Dichlorobenzidine	ND		357	ug/kg	02/28/24	03/01/24
3-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
4,6-Dinitro-2-methylphenol	ND		357	ug/kg	02/28/24	03/01/24
4-Bromophenyl phenyl ether	ND		141	ug/kg	02/28/24	03/01/24
4-Chloro-3-methylphenol	ND		141	ug/kg	02/28/24	03/01/24
4-Chloroaniline	ND		141	ug/kg	02/28/24	03/01/24
4-Chlorophenyl phenyl ether	ND		141	ug/kg	02/28/24	03/01/24
4-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
4-Nitrophenol	ND		357	ug/kg	02/28/24	03/01/24
Acenaphthene	ND		141	ug/kg	02/28/24	03/01/24
Acenaphthylene	ND		141	ug/kg	02/28/24	03/01/24
Aniline	ND		141	ug/kg	02/28/24	03/01/24
Anthracene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(a)anthracene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(a)pyrene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(b)fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(g,h,i)perylene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(k)fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Benzoic acid	ND		1080	ug/kg	02/28/24	03/01/24
Biphenyl	ND		22	ug/kg	02/28/24	03/01/24
Bis(2-chloroethoxy)methane	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-chloroethyl)ether	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-chloroisopropyl)ether	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-ethylhexyl)phthalate	ND		433	ug/kg	02/28/24	03/01/24
Butyl benzyl phthalate	ND		141	ug/kg	02/28/24	03/01/24
Chrysene	ND		141	ug/kg	02/28/24	03/01/24
Di-n-octyl phthalate	ND		217	ug/kg	02/28/24	03/01/24
Dibenz(a,h)anthracene	ND		141	ug/kg	02/28/24	03/01

Results: Semivolatile organic compounds (Continued)

Sample: B-108 2-4' (Continued)

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		141	ug/kg	02/28/24	03/01/24
Diethyl phthalate	ND		141	ug/kg	02/28/24	03/01/24
Dimethyl phthalate	ND		357	ug/kg	02/28/24	03/01/24
Di-n-butyl phthalate	ND		217	ug/kg	02/28/24	03/01/24
Fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Fluorene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorobutadiene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorocyclopentadiene	ND		357	ug/kg	02/28/24	03/01/24
Hexachloroethane	ND		141	ug/kg	02/28/24	03/01/24
Indeno(1,2,3-cd)pyrene	ND		141	ug/kg	02/28/24	03/01/24
Isophorone	ND		141	ug/kg	02/28/24	03/01/24
Naphthalene	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodimethylamine	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodi-n-propylamine	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodiphenylamine	ND		141	ug/kg	02/28/24	03/01/24
Pentachlorophenol	ND		357	ug/kg	02/28/24	03/01/24
Phenanthrene	ND		141	ug/kg	02/28/24	03/01/24
Pyrene	ND		141	ug/kg	02/28/24	03/01/24
m&p-Cresol	ND		282	ug/kg	02/28/24	03/01/24
Pyridine	ND		141	ug/kg	02/28/24	03/01/24
Azobenzene	ND		141	ug/kg	02/28/24	03/01/24
Total Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*65.2%*	*30-126*	02/28/24	03/01/24
p-Terphenyl-d14	*93.4%*	*47-130*	02/28/24	03/01/24
2-Fluorobiphenyl	*58.2%*	*34-130*	02/28/24	03/01/24
Phenol-d6	*59.7%*	*30-130*	02/28/24	03/01/24
2,4,6-Tribromophenol	*55.4%*	*30-130*	02/28/24	03/01/24
2-Fluorophenol	*68.8%*	*30-130*	02/28/24	03/01/24

Results: Semivolatile organic compounds

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,2-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,3-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,4-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
Phenol	ND		137	ug/kg	02/28/24	03/01/24
2,4,5-Trichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4,6-Trichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4-Dichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4-Dimethylphenol	ND		348	ug/kg	02/28/24	03/01/24
2,4-Dinitrophenol	ND		348	ug/kg	02/28/24	03/01/24
2,4-Dinitrotoluene	ND		137	ug/kg	02/28/24	03/01/24
2,6-Dinitrotoluene	ND		137	ug/kg	02/28/24	03/01/24
2-Chloronaphthalene	ND		137	ug/kg	02/28/24	03/01/24
2-Chlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2-Methylnaphthalene	ND		137	ug/kg	02/28/24	03/01/24
Nitrobenzene	ND		137	ug/kg	02/28/24	03/01/24
2-Methylphenol	ND		137	ug/kg	02/28/24	03/01/24
2-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
2-Nitrophenol	ND		348	ug/kg	02/28/24	03/01/24
3,3′-Dichlorobenzidine	ND		348	ug/kg	02/28/24	03/01/24
3-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
4,6-Dinitro-2-methylphenol	ND		348	ug/kg	02/28/24	03/01/24
4-Bromophenyl phenyl ether	ND		137	ug/kg	02/28/24	03/01/24
4-Chloro-3-methylphenol	ND		137	ug/kg	02/28/24	03/01/24
4-Chloroaniline	ND		137	ug/kg	02/28/24	03/01/24
4-Chlorophenyl phenyl ether	ND		137	ug/kg	02/28/24	03/01/24
4-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
4-Nitrophenol	ND		348	ug/kg	02/28/24	03/01/24
Acenaphthene	ND		137	ug/kg	02/28/24	03/01/24
Acenaphthylene	ND		137	ug/kg	02/28/24	03/01/24
Aniline	ND		137	ug/kg	02/28/24	03/01/24
Anthracene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(a)anthracene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(a)pyrene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(b)fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(g,h,i)perylene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(k)fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Benzoic acid	ND		1050	ug/kg	02/28/24	03/01/24
Biphenyl	ND		21	ug/kg	02/28/24	03/01/24
Bis(2-chloroethoxy)methane	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-chloroethyl)ether	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-chloroisopropyl)ether	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-ethylhexyl)phthalate	ND		422	ug/kg	02/28/24	03/01/24
Butyl benzyl phthalate	ND		137	ug/kg	02/28/24	03/01/24
Chrysene	ND		137	ug/kg	02/28/24	03/01/24
Di-n-octyl phthalate	ND		211	ug/kg	02/28/24	03/01/24
Dibenz(a,h)anthracene	ND		137	ug/kg	02/28/24	03/0

Results: Semivolatile organic compounds (Continued)

Sample: B-118 2-4' (Continued)

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		137	ug/kg	02/28/24	03/01/24
Diethyl phthalate	ND		137	ug/kg	02/28/24	03/01/24
Dimethyl phthalate	ND		348	ug/kg	02/28/24	03/01/24
Di-n-butyl phthalate	ND		211	ug/kg	02/28/24	03/01/24
Fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Fluorene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorobutadiene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorocyclopentadiene	ND		348	ug/kg	02/28/24	03/01/24
Hexachloroethane	ND		137	ug/kg	02/28/24	03/01/24
Indeno(1,2,3-cd)pyrene	ND		137	ug/kg	02/28/24	03/01/24
Isophorone	ND		137	ug/kg	02/28/24	03/01/24
Naphthalene	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodimethylamine	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodi-n-propylamine	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodiphenylamine	ND		137	ug/kg	02/28/24	03/01/24
Pentachlorophenol	ND		348	ug/kg	02/28/24	03/01/24
Phenanthrene	ND		137	ug/kg	02/28/24	03/01/24
Pyrene	ND		137	ug/kg	02/28/24	03/01/24
m&p-Cresol	ND		274	ug/kg	02/28/24	03/01/24
Pyridine	ND		137	ug/kg	02/28/24	03/01/24
Azobenzene	ND		137	ug/kg	02/28/24	03/01/24
Total Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits	Date Prepared	Date Analyzed
Nitrobenzene-d5	*65.2%*	*30-126*	02/28/24	03/01/24
p-Terphenyl-d14	*101%*	*47-130*	02/28/24	03/01/24
2-Fluorobiphenyl	*61.6%*	*34-130*	02/28/24	03/01/24
Phenol-d6	*68.4%*	*30-130*	02/28/24	03/01/24
2,4,6-Tribromophenol	*62.5%*	*30-130*	02/28/24	03/01/24
2-Fluorophenol	*75.7%*	*30-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1221	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1232	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1242	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1248	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1254	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1260	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1262	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1268	ND		71	ug/kg	02/29/24	03/05/24
PCBs (Total)	ND		71	ug/kg	02/29/24	03/05/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*39.5%*	*36.2-130*	02/29/24	03/05/24
Decachlorobiphenyl (DCBP)	*45.1%*	*43.3-130*	02/29/24	03/05/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-118 2-4'
Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1221	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1232	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1242	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1248	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1254	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1260	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1262	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1268	ND		69	ug/kg	02/29/24	03/05/24
PCBs (Total)	ND		69	ug/kg	02/29/24	03/05/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*69.6%*	*36.2-130*	02/29/24	03/05/24
Decachlorobiphenyl (DCBP)	*49.0%*	*43.3-130*	02/29/24	03/05/24

Results: Total Petroleum Hydrocarbons

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		29	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*95.2%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		28	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*57.1%*		*50-130*		02/28/24	02/28/24

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1197 - Conductivity										
Blank (B4B1197-BLK1)					Prepared & Analyzed: 02/28/24					
Specific Conductance	ND		2.0	uS/cm						
Duplicate (B4B1197-DUP1)		Source: 4B23014-01			Prepared & Analyzed: 02/28/24					
Specific Conductance	258		2.0	uS/cm		258			0.00	200
Batch: B4B1200 - pH										
LCS (B4B1200-BS1)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
LCS (B4B1200-BS2)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
Duplicate (B4B1200-DUP1)		Source: 4B23046-06			Prepared & Analyzed: 02/28/24					
pH	6.8			SU		6.8			0.587	200
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod										
LCS (B4C0033-BS1)					Prepared & Analyzed: 03/01/24					
Flashpoint	83		70	degrees F	80.0		104	90-110		
Duplicate (B4C0033-DUP1)		Source: 4B26010-04			Prepared & Analyzed: 03/01/24					
Flashpoint	> 200		70	degrees F		ND				20

Quality Control

(Continued)

Reactivity

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1244 - Reactivity										
Blank (B4B1244-BLK1)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
Blank (B4B1244-BLK2)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
LCS (B4B1244-BS1)					Prepared & Analyzed: 02/29/24					
Sulfide	3.6		0.1	mg/kg	4.00		90.0	90-110		
LCS (B4B1244-BS2)					Prepared & Analyzed: 02/29/24					
Sulfide	3.7		0.1	mg/kg	4.00		91.5	90-110		
Duplicate (B4B1244-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg dry		ND				20
Matrix Spike (B4B1244-MS1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	4.5		0.1	mg/kg dry	4.59	ND	98.5	80-120		
Batch: B4B1245 - Reactivity										
Blank (B4B1245-BLK1)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Blank (B4B1245-BLK2)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Duplicate (B4B1245-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg dry		ND				20

Quality Control

(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1180 - Metals Digestion Soils										
Blank (B4B1180-BLK1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Beryllium	ND		0.33	mg/kg						
Chromium	ND		0.50	mg/kg						
Antimony	ND		0.66	mg/kg						
Cadmium	ND		0.50	mg/kg						
Selenium	ND		1.00	mg/kg						
Nickel	ND		0.50	mg/kg						
Lead	ND		0.50	mg/kg						
Vanadium	ND		0.33	mg/kg						
Silver	ND		1.00	mg/kg						
Barium	ND		0.33	mg/kg						
Zinc	ND		2.0	mg/kg						
Arsenic	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						
LCS (B4B1180-BS1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Barium	86.2		0.33	mg/kg	100		86.2	85-115		
Arsenic	18.7		1.00	mg/kg	20.0		93.5	85-115		
Cadmium	85.7		0.50	mg/kg	100		85.7	85-115		
Chromium	86.8		0.50	mg/kg	100		86.8	85-115		
Beryllium	18.1		0.33	mg/kg	20.0		90.7	85-115		
Lead	93.7		0.50	mg/kg	100		93.7	85-115		
Antimony	97.4		0.66	mg/kg	100		97.4	85-115		
Selenium	18.4		1.00	mg/kg	20.0		92.2	85-115		
Silver	43.3		1.00	mg/kg	40.0		108	85-115		
Vanadium	95.1		0.33	mg/kg	100		95.1	85-115		
Zinc	85.3		2.0	mg/kg	100		85.3	85-115		
Nickel	86.3		0.50	mg/kg	100		86.3	85-112		
Thallium	90.9		0.33	mg/kg	100		90.9	85-115		

Quality Control

(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury										
Blank (B4B1185-BLK1)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
Blank (B4B1185-BLK2)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
LCS (B4B1185-BS1)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS (B4B1185-BS2)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS Dup (B4B1185-BSD1)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
LCS Dup (B4B1185-BSD2)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
Matrix Spike (B4B1185-MS1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.716		0.126	mg/kg dry	0.630	0.129	93.1	80-120		
Matrix Spike (B4B1185-MS2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.564		0.094	mg/kg dry	0.469	0.135	91.3	80-120		
Matrix Spike (B4B1185-MS3)		Source: 4B27003-01			Prepared & Analyzed: 02/28/24					
Mercury	0.649		0.098	mg/kg dry	0.489	0.125	107	80-120		
Matrix Spike Dup (B4B1185-MSD1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.688		0.115	mg/kg dry	0.577	0.129	96.8	80-120	4.01	20

Quality Control

(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury (Continued)										
Matrix Spike Dup (B4B1185-MSD2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.576		0.093	mg/kg dry	0.465	0.135	94.7	80-120	2.10	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035										
Blank (B4C0015-BLK1)					Prepared & Analyzed: 02/29/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035 (Continued)										
Blank (B4C0015-BLK1)					Prepared & Analyzed: 02/29/24					
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*48.9*	ug/kg	*50.0*		*97.8*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.7*	*70-130*		
Surrogate: Toluene-d8			*60.6*	ug/kg	*50.0*		*121*	*70-130*		
LCS (B4C0015-BS1)					Prepared & Analyzed: 02/29/24					
Acetone	38		5	ug/kg	50.0		76.4	50-150		
Benzene	50		5	ug/kg	50.0		100	70-130		
Bromobenzene	48		5	ug/kg	50.0		95.7	70-130		
Bromochloromethane	53		5	ug/kg	50.0		105	70-130		
Bromodichloromethane	52		5	ug/kg	50.0		105	70-130		
Bromoform	49		5	ug/kg	50.0		98.9	70-130		
Bromomethane	51		5	ug/kg	50.0		102	50-150		
2-Butanone	41		5	ug/kg	50.0		82.3	50-150		
tert-Butyl alcohol	42		5	ug/kg	50.0		84.0	70-130		
sec-Butylbenzene	51		5	ug/kg	50.0		102	70-130		
n-Butylbenzene	49		5	ug/kg	50.0		98.5	70-130		
tert-Butylbenzene	51		5	ug/kg	50.0		102	70-130		
Methyl t-butyl ether (MTBE)	41		5	ug/kg	50.0		81.6	70-130		
Carbon Disulfide	40		5	ug/kg	50.0		79.5	50-150		
Carbon Tetrachloride	53		5	ug/kg	50.0		105	70-130		
Chlorobenzene	46		5	ug/kg	50.0		93.0	70-130		
Chloroethane	38		5	ug/kg	50.0		77.0	50-150		
Chloroform	52		5	ug/kg	50.0		103	70-130		
Chloromethane	53		5	ug/kg	50.0		106	50-150		
4-Chlorotoluene	49		5	ug/kg	50.0		97.1	70-130		
2-Chlorotoluene	47		5	ug/kg	50.0		93.0	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		92.9	70-130		
Dibromochloromethane	53		5	ug/kg	50.0		106	70-130		
1,2-Dibromoethane (EDB)	53		5	ug/kg	50.0		107	70-130		
Dibromomethane	54		5	ug/kg	50.0		107	60-140		
1,2-Dichlorobenzene	47		5	ug/kg	50.0		93.8	70-130		
1,3-Dichlorobenzene	50		5	ug/kg	50.0		99.2	70-130		
1,4-Dichlorobenzene	47		5	ug/kg	50.0		94.0	70-130		
1,1-Dichloroethane	51		5	ug/kg	50.0		101	70-130		
1,2-Dichloroethane	54		5	ug/kg	50.0		107	70-130		
trans-1,2-Dichloroethene	52		5	ug/kg	50.0		103	70-130		
cis-1,2-Dichloroethene	51		5	ug/kg	50.0		103	70-130		
1,1-Dichloroethene	40		5	ug/kg	50.0		80.5	70-130		
1,2-Dichloropropane	51		5	ug/kg	50.0		101	70-130		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035 (Continued)										
LCS (B4C0015-BS1)					Prepared & Analyzed: 02/29/24					
2,2-Dichloropropane	53		5	ug/kg	50.0		106	70-130		
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		102	70-130		
trans-1,3-Dichloropropene	53		5	ug/kg	50.0		106	70-130		
1,1-Dichloropropene	53		5	ug/kg	50.0		106	70-130		
Diethyl ether	38		5	ug/kg	50.0		75.9	60-140		
1,4-Dioxane	265		100	ug/kg	250		106	0-200		
Ethylbenzene	48		5	ug/kg	50.0		95.9	70-130		
Hexachlorobutadiene	49		5	ug/kg	50.0		98.8	70-130		
2-Hexanone	42		5	ug/kg	50.0		84.1	50-150		
Isopropylbenzene	50		5	ug/kg	50.0		100	70-130		
p-Isopropyltoluene	51		5	ug/kg	50.0		102	70-130		
Methylene Chloride	50		5	ug/kg	50.0		101	60-140		
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.7	50-150		
Naphthalene	50		5	ug/kg	50.0		100	70-130		
n-Propylbenzene	51		5	ug/kg	50.0		102	70-130		
Styrene	50		5	ug/kg	50.0		99.9	70-130		
1,1,1,2-Tetrachloroethane	49		5	ug/kg	50.0		97.9	70-130		
Tetrachloroethene	52		5	ug/kg	50.0		103	70-130		
Tetrahydrofuran	51		5	ug/kg	50.0		101	50-150		
Toluene	54		5	ug/kg	50.0		108	70-130		
1,2,4-Trichlorobenzene	48		5	ug/kg	50.0		96.7	70-130		
1,2,3-Trichlorobenzene	49		5	ug/kg	50.0		98.4	70-130		
1,1,2-Trichloroethane	53		5	ug/kg	50.0		107	70-130		
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130		
Trichloroethene	51		5	ug/kg	50.0		101	70-130		
1,2,3-Trichloropropane	43		5	ug/kg	50.0		86.9	70-130		
1,3,5-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130		
1,2,4-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130		
Vinyl Chloride	56		5	ug/kg	50.0		112	50-150		
o-Xylene	49		5	ug/kg	50.0		97.9	70-130		
m&p-Xylene	96		10	ug/kg	100		96.2	70-130		
1,1,2,2-Tetrachloroethane	48		5	ug/kg	50.0		95.1	70-130		
tert-Amyl methyl ether	47		5	ug/kg	50.0		94.2	70-130		
1,3-Dichloropropane	51		5	ug/kg	50.0		102	70-130		
Ethyl tert-butyl ether	48		5	ug/kg	50.0		95.3	70-130		
Trichlorofluoromethane	41		5	ug/kg	50.0		82.1	50-150		
Dichlorodifluoromethane	59		5	ug/kg	50.0		118	50-150		
Surrogate: 4-Bromofluorobenzene			*51.0*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*51.0*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8			*51.9*	ug/kg	*50.0*		*104*	*70-130*		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035 (Continued)										
LCS Dup (B4C0015-BSD1)					Prepared & Analyzed: 02/29/24					
Acetone	41		5	ug/kg	50.0		81.1	50-150	5.94	30
Benzene	51		5	ug/kg	50.0		102	70-130	1.98	20
Bromobenzene	47		5	ug/kg	50.0		94.2	70-130	1.64	20
Bromochloromethane	54		5	ug/kg	50.0		109	70-130	3.07	20
Bromodichloromethane	54		5	ug/kg	50.0		109	70-130	3.71	20
Bromoform	49		5	ug/kg	50.0		97.2	70-130	1.65	20
Bromomethane	59		5	ug/kg	50.0		117	50-150	14.5	30
2-Butanone	42		5	ug/kg	50.0		84.3	50-150	2.40	30
tert-Butyl alcohol	47		5	ug/kg	50.0		94.7	70-130	12.0	20
sec-Butylbenzene	48		5	ug/kg	50.0		95.7	70-130	5.96	20
n-Butylbenzene	47		5	ug/kg	50.0		94.5	70-130	4.06	20
tert-Butylbenzene	48		5	ug/kg	50.0		95.6	70-130	6.22	20
Methyl t-butyl ether (MTBE)	33		5	ug/kg	50.0		65.7	70-130	21.6	20
Carbon Disulfide	30		5	ug/kg	50.0		60.6	50-150	26.9	40
Carbon Tetrachloride	53		5	ug/kg	50.0		106	70-130	0.341	20
Chlorobenzene	46		5	ug/kg	50.0		91.3	70-130	1.82	20
Chloroethane	51		5	ug/kg	50.0		102	50-150	28.0	30
Chloroform	53		5	ug/kg	50.0		106	70-130	2.43	20
Chloromethane	53		5	ug/kg	50.0		105	50-150	0.946	30
4-Chlorotoluene	46		5	ug/kg	50.0		92.8	70-130	4.57	20
2-Chlorotoluene	45		5	ug/kg	50.0		89.2	70-130	4.17	20
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		91.7	70-130	1.28	20
Dibromochloromethane	55		5	ug/kg	50.0		110	70-130	3.87	20
1,2-Dibromoethane (EDB)	55		5	ug/kg	50.0		110	70-130	3.29	20
Dibromomethane	56		5	ug/kg	50.0		111	60-140	3.70	30
1,2-Dichlorobenzene	46		5	ug/kg	50.0		92.0	70-130	1.87	20
1,3-Dichlorobenzene	48		5	ug/kg	50.0		95.1	70-130	4.20	20
1,4-Dichlorobenzene	46		5	ug/kg	50.0		91.4	70-130	2.80	20
1,1-Dichloroethane	42		5	ug/kg	50.0		83.6	70-130	19.1	20
1,2-Dichloroethane	53		5	ug/kg	50.0		107	70-130	0.411	20
trans-1,2-Dichloroethene	41		5	ug/kg	50.0		82.3	70-130	22.5	20
cis-1,2-Dichloroethene	54		5	ug/kg	50.0		107	70-130	4.59	20
1,1-Dichloroethene	44		5	ug/kg	50.0		87.3	70-130	8.08	20
1,2-Dichloropropane	52		5	ug/kg	50.0		104	70-130	3.29	20
2,2-Dichloropropane	52		5	ug/kg	50.0		104	70-130	1.85	20
cis-1,3-Dichloropropene	53		5	ug/kg	50.0		106	70-130	3.79	20
trans-1,3-Dichloropropene	55		5	ug/kg	50.0		111	70-130	4.42	20
1,1-Dichloropropene	53		5	ug/kg	50.0		105	70-130	0.454	20
Diethyl ether	41		5	ug/kg	50.0		81.4	60-140	6.97	30
1,4-Dioxane	268		100	ug/kg	250		107	0-200	1.21	50
Ethylbenzene	46		5	ug/kg	50.0		91.5	70-130	4.78	20
Hexachlorobutadiene	48		5	ug/kg	50.0		96.5	70-130	2.38	20
2-Hexanone	43		5	ug/kg	50.0		86.6	50-150	2.93	20
Isopropylbenzene	47		5	ug/kg	50.0		93.9	70-130	6.39	20
p-Isopropyltoluene	48		5	ug/kg	50.0		96.3	70-130	5.73	20
Methylene Chloride	38		5	ug/kg	50.0		75.7	60-140	28.4	30
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.6	50-150	0.128	20
Naphthalene	49		5	ug/kg	50.0		97.3	70-130	3.24	20
n-Propylbenzene	48		5	ug/kg	50.0		96.7	70-130	5.32	20
Styrene	48		5	ug/kg	50.0		96.1	70-130	3.94	20
1,1,1,2-Tetrachloroethane	48		5	ug/kg	50.0		95.4	70-130	2.57	20
Tetrachloroethene	52		5	ug/kg	50.0		104	70-130	1.02	20
Tetrahydrofuran	53		5	ug/kg	50.0		105	50-150	3.85	40
Toluene	55		5	ug/kg	50.0		110	70-130	1.98	20
1,2,4-Trichlorobenzene	47		5	ug/kg	50.0		94.3	70-130	2.45	20
1,2,3-Trichlorobenzene	49		5	ug/kg	50.0		98.1	70-130	0.285	20
1,1,2-Trichloroethane	50		5	ug/kg	50.0		100	70-130	6.17	20

Quality Control

(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0015 - EPA 5035 (Continued)

LCS Dup (B4C0015-BSD1) Prepared & Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130	0.269	20
Trichloroethene	51		5	ug/kg	50.0		103	70-130	1.47	20
1,2,3-Trichloropropane	42		5	ug/kg	50.0		84.1	70-130	3.27	20
1,3,5-Trimethylbenzene	49		5	ug/kg	50.0		97.7	70-130	4.70	20
1,2,4-Trimethylbenzene	48		5	ug/kg	50.0		95.8	70-130	5.88	20
Vinyl Chloride	53		5	ug/kg	50.0		106	50-150	4.88	30
o-Xylene	47		5	ug/kg	50.0		93.5	70-130	4.58	20
m&p-Xylene	92		10	ug/kg	100		92.1	70-130	4.36	20
1,1,2,2-Tetrachloroethane	46		5	ug/kg	50.0		92.4	70-130	2.88	20
tert-Amyl methyl ether	49		5	ug/kg	50.0		97.0	70-130	2.93	20
1,3-Dichloropropane	54		5	ug/kg	50.0		108	70-130	5.15	20
Ethyl tert-butyl ether	45		5	ug/kg	50.0		89.5	70-130	6.34	20
Trichlorofluoromethane	47		5	ug/kg	50.0		94.4	50-150	13.9	20
Dichlorodifluoromethane	60		5	ug/kg	50.0		119	50-150	1.40	30
Surrogate: 4-Bromofluorobenzene			*49.9*	ug/kg	*50.0*		*99.7*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*53.1*	ug/kg	*50.0*		*106*	*70-130*		
Surrogate: Toluene-d8			*54.1*	ug/kg	*50.0*		*108*	*70-130*		

Quality Control
(Continued)

Semivolatile organic compounds

Batch: B4B1213 - 1_Semivolatiles Extractions

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (B4B1213-BLK1)					Prepared: 02/28/24	Analyzed: 02/29/24				
1,2,4-Trichlorobenzene	ND		129	ug/kg						
1,2-Dichlorobenzene	ND		129	ug/kg						
1,3-Dichlorobenzene	ND		129	ug/kg						
1,4-Dichlorobenzene	ND		129	ug/kg						
Phenol	ND		129	ug/kg						
2,4,5-Trichlorophenol	ND		129	ug/kg						
2,4,6-Trichlorophenol	ND		129	ug/kg						
2,4-Dichlorophenol	ND		129	ug/kg						
2,4-Dimethylphenol	ND		328	ug/kg						
2,4-Dinitrophenol	ND		328	ug/kg						
2,4-Dinitrotoluene	ND		129	ug/kg						
2,6-Dinitrotoluene	ND		129	ug/kg						
2-Chloronaphthalene	ND		129	ug/kg						
2-Chlorophenol	ND		129	ug/kg						
2-Methylnaphthalene	ND		129	ug/kg						
Nitrobenzene	ND		129	ug/kg						
2-Methylphenol	ND		129	ug/kg						
2-Nitroaniline	ND		129	ug/kg						
2-Nitrophenol	ND		328	ug/kg						
3,3′-Dichlorobenzidine	ND		328	ug/kg						
3-Nitroaniline	ND		129	ug/kg						
4,6-Dinitro-2-methylphenol	ND		328	ug/kg						
4-Bromophenyl phenyl ether	ND		129	ug/kg						
4-Chloro-3-methylphenol	ND		129	ug/kg						
4-Chloroaniline	ND		129	ug/kg						
4-Chlorophenyl phenyl ether	ND		129	ug/kg						
4-Nitroaniline	ND		129	ug/kg						
4-Nitrophenol	ND		328	ug/kg						
Acenaphthene	ND		129	ug/kg						
Acenaphthylene	ND		129	ug/kg						
Aniline	ND		129	ug/kg						
Anthracene	ND		129	ug/kg						
Benzo(a)anthracene	ND		129	ug/kg						
Benzo(a)pyrene	ND		129	ug/kg						
Benzo(b)fluoranthene	ND		129	ug/kg						
Benzo(g,h,i)perylene	ND		129	ug/kg						
Benzo(k)fluoranthene	ND		129	ug/kg						
Benzoic acid	ND		993	ug/kg						
Biphenyl	ND		20	ug/kg						
Bis(2-chloroethoxy)methane	ND		129	ug/kg						
Bis(2-chloroethyl)ether	ND		129	ug/kg						
Bis(2-chloroisopropyl)ether	ND		129	ug/kg						
Bis(2-ethylhexyl)phthalate	ND		397	ug/kg						
Butyl benzyl phthalate	ND		129	ug/kg						
Chrysene	ND		129	ug/kg						
Di-n-octyl phthalate	ND		199	ug/kg						
Dibenz(a,h)anthracene	ND		129	ug/kg						
Dibenzofuran	ND		129	ug/kg						
Diethyl phthalate	ND		129	ug/kg						
Dimethyl phthalate	ND		328	ug/kg						
Di-n-butyl phthalate	ND		199	ug/kg						
Fluoranthene	ND		129	ug/kg						
Fluorene	ND		129	ug/kg						
Hexachlorobenzene	ND		129	ug/kg						
Hexachlorobutadiene	ND		129	ug/kg						
Hexachlorocyclopentadiene	ND		328	ug/kg						
Hexachloroethane	ND		129	ug/kg						

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (B4B1213-BLK1)					Prepared: 02/28/24	Analyzed: 02/29/24				
Indeno(1,2,3-cd)pyrene	ND		129	ug/kg						
Isophorone	ND		129	ug/kg						
Naphthalene	ND		129	ug/kg						
N-Nitrosodimethylamine	ND		129	ug/kg						
N-Nitrosodi-n-propylamine	ND		129	ug/kg						
N-Nitrosodiphenylamine	ND		129	ug/kg						
Pentachlorophenol	ND		328	ug/kg						
Phenanthrene	ND		129	ug/kg						
Pyrene	ND		129	ug/kg						
m&p-Cresol	ND		258	ug/kg						
Pyridine	ND		129	ug/kg						
Azobenzene	ND		129	ug/kg						
Total Dichlorobenzene	ND		129	ug/kg						
Surrogate: Nitrobenzene-d5			*3910*	ug/kg	*6620*		*59.0*	*30-126*		
Surrogate: p-Terphenyl-d14			*5220*	ug/kg	*6620*		*78.8*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3410*	ug/kg	*6620*		*51.5*	*34-130*		
Surrogate: Phenol-d6			*3720*	ug/kg	*6620*		*56.2*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3230*	ug/kg	*6620*		*48.8*	*30-130*		
Surrogate: 2-Fluorophenol			*3980*	ug/kg	*6620*		*60.1*	*30-130*		
LCS (B4B1213-BS1)					Prepared: 02/28/24	Analyzed: 02/29/24				
1,2,4-Trichlorobenzene	2280		129	ug/kg	3310		68.7	40-130		
1,2-Dichlorobenzene	3110		129	ug/kg	3310		94.0	40-130		
1,3-Dichlorobenzene	2990		129	ug/kg	3310		90.2	40-130		
1,4-Dichlorobenzene	2650		129	ug/kg	3310		79.9	40-130		
Phenol	3350		129	ug/kg	3310		101	40-130		
2,4,5-Trichlorophenol	2470		129	ug/kg	3310		74.5	40-130		
2,4,6-Trichlorophenol	2660		129	ug/kg	3310		80.3	40-130		
2,4-Dichlorophenol	2670		129	ug/kg	3310		80.7	40-130		
2,4-Dimethylphenol	2640		328	ug/kg	3310		79.8	40-130		
2,4-Dinitrophenol	2190		328	ug/kg	3310		66.3	15-140		
2,4-Dinitrotoluene	2580		129	ug/kg	3310		78.0	40-130		
2,6-Dinitrotoluene	2680		129	ug/kg	3310		80.9	40-130		
2-Chloronaphthalene	2640		129	ug/kg	3310		79.7	40-130		
2-Chlorophenol	3130		129	ug/kg	3310		94.5	40-130		
2-Methylnaphthalene	2310		129	ug/kg	3310		69.6	40-130		
Nitrobenzene	2840		129	ug/kg	3310		85.7	40-130		
2-Methylphenol	2560		129	ug/kg	3310		77.2	40-130		
2-Nitroaniline	2570		129	ug/kg	3310		77.8	40-130		
2-Nitrophenol	2700		328	ug/kg	3310		81.4	40-130		
3-Nitroaniline	2530		129	ug/kg	3310		76.3	40-130		
4,6-Dinitro-2-methylphenol	2240		328	ug/kg	3310		67.7	30-130		
4-Bromophenyl phenyl ether	2050		129	ug/kg	3310		61.9	40-130		
4-Chloro-3-methylphenol	2280		129	ug/kg	3310		68.8	40-130		
4-Chlorophenyl phenyl ether	2220		129	ug/kg	3310		67.1	40-130		
4-Nitroaniline	2680		129	ug/kg	3310		80.9	40-130		
4-Nitrophenol	2360		328	ug/kg	3310		71.4	40-130		
Acenaphthene	2210		129	ug/kg	3310		66.6	40-130		
Acenaphthylene	2610		129	ug/kg	3310		78.8	40-130		
Anthracene	2940		129	ug/kg	3310		88.8	40-130		
Benzo(a)anthracene	2650		129	ug/kg	3310		79.9	40-130		
Benzo(a)pyrene	2770		129	ug/kg	3310		83.5	40-130		
Benzo(b)fluoranthene	2950		129	ug/kg	3310		89.0	40-130		
Benzo(g,h,i)perylene	2500		129	ug/kg	3310		75.4	40-130		
Benzo(k)fluoranthene	3090		129	ug/kg	3310		93.2	40-130		
Biphenyl	626		20	ug/kg	828		75.7	40-130		
Bis(2-chloroethoxy)methane	2870		129	ug/kg	3310		86.8	40-130		

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS (B4B1213-BS1)					Prepared: 02/28/24 Analyzed: 02/29/24					
Bis(2-chloroethyl)ether	3100		129	ug/kg	3310		93.5	40-130		
Bis(2-chloroisopropyl)ether	3600		129	ug/kg	3310		109	40-130		
Bis(2-ethylhexyl)phthalate	2960		397	ug/kg	3310		89.3	40-130		
Butyl benzyl phthalate	2870		129	ug/kg	3310		86.8	40-130		
Chrysene	2860		129	ug/kg	3310		86.3	40-130		
Di-n-octyl phthalate	2150		199	ug/kg	3310		64.9	40-130		
Dibenz(a,h)anthracene	2490		129	ug/kg	3310		75.3	40-130		
Dibenzofuran	2570		129	ug/kg	3310		77.6	40-130		
Diethyl phthalate	2730		129	ug/kg	3310		82.5	40-130		
Dimethyl phthalate	2500		328	ug/kg	3310		75.5	40-130		
Di-n-butyl phthalate	3200		199	ug/kg	3310		96.6	40-130		
Fluoranthene	2990		129	ug/kg	3310		90.3	40-130		
Fluorene	2510		129	ug/kg	3310		75.7	40-130		
Hexachlorobenzene	2570		129	ug/kg	3310		77.7	40-130		
Hexachlorobutadiene	2580		129	ug/kg	3310		78.0	40-130		
Hexachlorocyclopentadiene	2530		328	ug/kg	3310		76.3	40-130		
Hexachloroethane	2970		129	ug/kg	3310		89.7	40-130		
Indeno(1,2,3-cd)pyrene	2600		129	ug/kg	3310		78.5	40-130		
Isophorone	3010		129	ug/kg	3310		90.8	40-130		
Naphthalene	2360		129	ug/kg	3310		71.2	40-130		
N-Nitrosodimethylamine	2890		129	ug/kg	3310		87.4	40-130		
N-Nitrosodi-n-propylamine	2830		129	ug/kg	3310		85.5	40-130		
N-Nitrosodiphenylamine	2750		129	ug/kg	3310		82.9	40-130		
Pentachlorophenol	2410		328	ug/kg	3310		72.8	15-140		
Phenanthrene	3070		129	ug/kg	3310		92.6	40-130		
Pyrene	3010		129	ug/kg	3310		91.0	40-130		
m&p-Cresol	2500		258	ug/kg	3310		75.5	40-130		
Surrogate: Nitrobenzene-d5			*4160*	ug/kg	*6620*		*62.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5200*	ug/kg	*6620*		*78.6*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3730*	ug/kg	*6620*		*56.3*	*34-130*		
Surrogate: Phenol-d6			*4630*	ug/kg	*6620*		*70.0*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3910*	ug/kg	*6620*		*59.0*	*30-130*		
Surrogate: 2-Fluorophenol			*5100*	ug/kg	*6620*		*77.0*	*30-130*		

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS Dup (B4B1213-BSD1) Prepared: 02/28/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	2270		129	ug/kg	3310		68.7	40-130	0.0874	30
1,2-Dichlorobenzene	2550		129	ug/kg	3310		77.0	40-130	19.9	30
1,3-Dichlorobenzene	2480		129	ug/kg	3310		75.0	40-130	18.4	30
1,4-Dichlorobenzene	2260		129	ug/kg	3310		68.4	40-130	15.5	30
Phenol	2680		129	ug/kg	3310		81.0	40-130	22.3	30
2,4,5-Trichlorophenol	2640		129	ug/kg	3310		79.6	40-130	6.67	30
2,4,6-Trichlorophenol	2540		129	ug/kg	3310		76.6	40-130	4.71	30
2,4-Dichlorophenol	2640		129	ug/kg	3310		79.8	40-130	1.07	30
2,4-Dimethylphenol	2420		328	ug/kg	3310		73.1	40-130	8.87	30
2,4-Dinitrophenol	2130		328	ug/kg	3310		64.2	15-140	3.13	30
2,4-Dinitrotoluene	2740		129	ug/kg	3310		82.7	40-130	5.87	30
2,6-Dinitrotoluene	2730		129	ug/kg	3310		82.3	40-130	1.76	30
2-Chloronaphthalene	2740		129	ug/kg	3310		82.8	40-130	3.82	30
2-Chlorophenol	2630		129	ug/kg	3310		79.3	40-130	17.4	30
2-Methylnaphthalene	2250		129	ug/kg	3310		67.9	40-130	2.50	30
Nitrobenzene	2800		129	ug/kg	3310		84.5	40-130	1.41	30
2-Methylphenol	2170		129	ug/kg	3310		65.6	40-130	16.3	30
2-Nitroaniline	2600		129	ug/kg	3310		78.5	40-130	0.973	30
2-Nitrophenol	2540		328	ug/kg	3310		76.8	40-130	5.89	30
3-Nitroaniline	2660		129	ug/kg	3310		80.5	40-130	5.31	30
4,6-Dinitro-2-methylphenol	2700		328	ug/kg	3310		81.5	30-130	18.5	30
4-Bromophenyl phenyl ether	2240		129	ug/kg	3310		67.6	40-130	8.81	30
4-Chloro-3-methylphenol	2220		129	ug/kg	3310		66.9	40-130	2.80	30
4-Chlorophenyl phenyl ether	2260		129	ug/kg	3310		68.4	40-130	1.92	30
4-Nitroaniline	1970		129	ug/kg	3310		59.5	40-130	30.5	30
4-Nitrophenol	2680		328	ug/kg	3310		80.9	40-130	12.4	30
Acenaphthene	2220		129	ug/kg	3310		67.1	40-130	0.688	30
Acenaphthylene	2690		129	ug/kg	3310		81.3	40-130	3.10	30
Anthracene	3050		129	ug/kg	3310		92.1	40-130	3.58	30
Benzo(a)anthracene	2670		129	ug/kg	3310		80.5	40-130	0.773	30
Benzo(a)pyrene	2920		129	ug/kg	3310		88.2	40-130	5.43	30
Benzo(b)fluoranthene	3050		129	ug/kg	3310		92.0	40-130	3.27	30
Benzo(g,h,i)perylene	2800		129	ug/kg	3310		84.5	40-130	11.4	30
Benzo(k)fluoranthene	3270		129	ug/kg	3310		98.8	40-130	5.83	30
Biphenyl	663		20	ug/kg	828		80.1	40-130	5.65	30
Bis(2-chloroethoxy)methane	2890		129	ug/kg	3310		87.3	40-130	0.643	30
Bis(2-chloroethyl)ether	2740		129	ug/kg	3310		82.8	40-130	12.1	30
Bis(2-chloroisopropyl)ether	3070		129	ug/kg	3310		92.8	40-130	15.9	30
Bis(2-ethylhexyl)phthalate	3030		397	ug/kg	3310		91.4	40-130	2.30	30
Butyl benzyl phthalate	2900		129	ug/kg	3310		87.5	40-130	0.895	30
Chrysene	2930		129	ug/kg	3310		88.6	40-130	2.63	30
Di-n-octyl phthalate	3290		199	ug/kg	3310		99.4	40-130	42.1	30
Dibenz(a,h)anthracene	2610		129	ug/kg	3310		78.8	40-130	4.46	30
Dibenzofuran	2720		129	ug/kg	3310		82.1	40-130	5.66	30
Diethyl phthalate	2830		129	ug/kg	3310		85.6	40-130	3.64	30
Dimethyl phthalate	2580		328	ug/kg	3310		78.0	40-130	3.23	30
Di-n-butyl phthalate	3310		199	ug/kg	3310		99.9	40-130	3.38	30
Fluoranthene	3080		129	ug/kg	3310		93.0	40-130	2.92	30
Fluorene	2640		129	ug/kg	3310		79.8	40-130	5.28	30
Hexachlorobenzene	2790		129	ug/kg	3310		84.1	40-130	8.01	30
Hexachlorobutadiene	2510		129	ug/kg	3310		75.8	40-130	2.76	30
Hexachlorocyclopentadiene	2640		328	ug/kg	3310		79.8	40-130	4.46	30
Hexachloroethane	2460		129	ug/kg	3310		74.3	40-130	18.8	30
Indeno(1,2,3-cd)pyrene	2730		129	ug/kg	3310		82.3	40-130	4.68	30
Isophorone	2960		129	ug/kg	3310		89.3	40-130	1.75	30
Naphthalene	2400		129	ug/kg	3310		72.5	40-130	1.84	30
N-Nitrosodimethylamine	2060		129	ug/kg	3310		62.3	40-130	33.5	30

Quality Control

(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4B1213-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
N-Nitrosodi-n-propylamine	2530		129	ug/kg	3310		76.3	40-130	11.4	30
N-Nitrosodiphenylamine	2890		129	ug/kg	3310		87.4	40-130	5.24	30
Pentachlorophenol	2620		328	ug/kg	3310		79.3	15-140	8.44	30
Phenanthrene	3230		129	ug/kg	3310		97.5	40-130	5.11	30
Pyrene	3050		129	ug/kg	3310		92.1	40-130	1.20	30
m&p-Cresol	2270		258	ug/kg	3310		68.5	40-130	9.73	30
Surrogate: Nitrobenzene-d5			*4090*	ug/kg	*6620*		*61.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5160*	ug/kg	*6620*		*77.9*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3750*	ug/kg	*6620*		*56.7*	*34-130*		
Surrogate: Phenol-d6			*3870*	ug/kg	*6620*		*58.5*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*4140*	ug/kg	*6620*		*62.6*	*30-130*		
Surrogate: 2-Fluorophenol			*4220*	ug/kg	*6620*		*63.8*	*30-130*		

Quality Control

(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1223 - 1_Semivolatiles Extractions										
Blank (B4B1223-BLK1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	ND		66	ug/kg						
Aroclor-1221	ND		66	ug/kg						
Aroclor-1232	ND		66	ug/kg						
Aroclor-1242	ND		66	ug/kg						
Aroclor-1248	ND		66	ug/kg						
Aroclor-1254	ND		66	ug/kg						
Aroclor-1260	ND		66	ug/kg						
Aroclor-1262	ND		66	ug/kg						
Aroclor-1268	ND		66	ug/kg						
PCBs (Total)	ND		66	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*8.34*	ug/kg	*13.3*		*62.6*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.03*	ug/kg	*13.3*		*45.2*	*43.3-130*		
LCS (B4B1223-BS1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	199		66	ug/kg	167		119	58.2-125		
Aroclor-1260	195		66	ug/kg	167		117	65.5-130		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*10.2*	ug/kg	*13.3*		*76.4*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.50*	ug/kg	*13.3*		*48.8*	*43.3-130*		
LCS Dup (B4B1223-BSD1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	206		66	ug/kg	167		124	58.2-125	3.68	20
Aroclor-1260	203		66	ug/kg	167		122	65.5-130	3.91	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*10.0*	ug/kg	*13.3*		*75.2*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.34*	ug/kg	*13.3*		*47.5*	*43.3-130*		

Quality Control

(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1186 - 1_Semivolatiles Extractions										
Blank (B4B1186-BLK1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*9.08*	mg/kg	*8.33*		*109*	*50-130*		
LCS (B4B1186-BS1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	583		27	mg/kg	667		87.5	44.7-125		
Surrogate: Chlorooctadecane			*9.39*	mg/kg	*8.33*		*113*	*50-130*		
LCS Dup (B4B1186-BSD1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	551		27	mg/kg	667		82.6	44.7-125	5.71	30
Surrogate: Chlorooctadecane			*9.05*	mg/kg	*8.33*		*109*	*50-130*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

NEW ENGLAND TESTING LABORATORY, IN
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

4B2 7035e

PROJ. NO. 3096

PROJECT NAME/LOCATION MAYNARD

CLIENT

REPORT TO:

INVOICE TO:

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** COM-97 + MCP 14	+HAZ Characteristics					REMARKS
2/27/24		X		B-108, 2-4' ●●●		X		3		X	X					PID <0.1 ppmV
2/27/24		X		B-118, 2-4' ●●●		X		3		X	X					" "

Sampled by: (Signature)	Date/Time 2/27/24	Received by: (Signature)	Date/Time 2/27/24 12:36
Relinquished by: (Signature)	Date/Time 2/27/24 1:22	Received by: (Signature)	Date/Time 2/27 1320
Relinquished by: (Signature)	Date/Time 2/27 1745	Received for Laboratory by: (Signature)	Date/Time 2/27 1245

Laboratory Remarks:
Temp. received: 3
Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:

Turnaround (Business Days)

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc. Project #: 3096

Project Location: Maynard RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
4B27035

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

<u>Data User Note</u>: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:

Position: Laboratory Director

Printed Name: Richard Warila

Date: 3/5/2024

SECTION 31 20 00

EARTH MOVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. All the Contract Documents, including Drawings, General and Supplementary Conditions and Division 1 – General Requirements, apply to the Work of this Section.

1.02 SPECIAL INSTRUCTIONS

A. The General Contractor shall become familiar with other Sections of the Specifications to determine the type and extent of work there under which affects the work of this section whether or not such work is specifically mentioned.

B. Examine all drawings and all other Sections of the Specifications for the requirements therein affecting the work of this trade. Plans, surveys, measurements, and dimensions, under which the work is to be performed are believed to be correct to the best of the Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein. The contractor shall reconcile all drawings.

C. Where there is a conflict between drawings and these specifications, the stricter requirement and the interpretation that is most in favor of the owner shall be adopted at no additional cost to the owner.

D. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

E. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure a steady progress of work under this Contract.

1.03 DESCRIPTION OF WORK

A. The Base Bid shall include but is not limited to the following:
   1. Removing and stacking topsoil within the limits noted in the drawings.
   2. Excavation of earth, and rock excavating to the elevations noted on the drawings or specified herein, whichever is deeper. Disposing of excavated material generated within the limit of excavation and installing structural fill within the footprint of the proposed building and within the influence zone starting from the natural sand and gravel or rock up to finish grade as shown on drawings.
   3. Removal and disposal of existing utilities as shown in the drawings.
   4. Removal and disposal of asphalt and concrete pavement, retaining walls, fences, curbing, brush, trees and tree stumps to the limits as shown on drawings. [ADD2]
   5. Improving the existing fill within proposed paved areas.

B. The Work of this Section includes, but is not limited to, furnishing and installation of the following:
   1. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.
   2. All materials, equipment, labor, and services required for all Earth Moving work, including all items incidental thereto, as specified herein and as shown on the Drawings:
   3. All excavated soil shall be removed from the site and disposed of.
   4. No burning on the site shall be permitted.

5. Removing unsuitable materials from within the proposed building footprint and the clearing limits noted on the drawings, including asphalt, existing fill, and organic matter, construction debris, remnants of existing foundations, and other deleterious matter.
6. Improving the subgrade of the proposed paved areas in the existing fill as described in these specifications.
7. Dewatering
8. Proof-rolling of exposed subgrade for fill, footings, foundations, slabs, walks, pavements, lawns and grasses, and exterior plants.
9. Performing test pits before the start of and during excavation as required by the Geotechnical Engineer;
10. Removing and/or improving the existing fill in accordance with the requirements of Section 3.02 of these specifications.
11. Amending the existing fill to meet the gradation requirements of Structural Fill and/or Ordinary Fill.
12. Fill slopes and site retaining walls.
13. Installing excavation support, shoring or bracing as necessary.
14. Protecting existing utilities during the different phases of the earthwork operations.
15. Disposing off-site of excess or unsuitable materials.
16. Placing bedding, sub-base and base course layers.
17. Stabilizing/mitigating saturated or otherwise disturbed materials.
18. Excavating and backfilling required for the installation of the building slab and footings, pavements, underground utilities including storm drainage, sanitary, electrical and water.
19. Pumping and/or bailing necessary to maintain excavated spaces free from water from any source whatsoever.
20. Preparation, submission of, and compliance with an approved, phased erosion control plan in accordance with DEP requirements for a SWPPP (Stormwater Pollution Prevention Plan) to include materials and measures required to control soil erosion resulting from construction operations for the duration of the project.
21. All temporary stormwater management controls shall be in accordance with the Town of Maynard Stormwater Drain System By-Laws Chapter 33, Stormwater Management By-Laws Chapter 34 latest addition and the Town of Maynard MS-4 permit. As enforced by the Town of Maynard (DPW) Department of Public Works or a DPW duly authorized representative.
22. Designation of an Erosion Control Supervisor and submission of weekly erosion control reports.
23. Coordination with Archaeological Monitor.
24. Sediment removal and disposal.
25. Maintenance of erosion control devices.
26. Removal of erosion control devices as directed.
27. Install temporary construction fencing and safety devices or controls as specified and as necessary.
28. Dust control and clean-up.
29. Performing material testing, and field density testing as needed.
30. Groundwater Control, dewatering, pumping, bailing, filtering, and control of groundwater and surface water for all work under this contract in accordance with item 1.13 of these specifications.
31. Refer to specification Section 31 21 01 Site Utilities Preparation for additional dewatering requirements.
32. Installing fencing and safety devices or controls as specified and as necessary.
33. Notifying all affected utility companies and Dig Safe before the start of work.
34. Processing and improving onsite marginal soil, as needed, including by crushing and blending, to meet the specifications herein.
35. Installing seismographs and monitoring vibration at the nearby existing buildings during construction. The cost of vibration monitoring shall be included in the base bid.

1.04 GENERAL REQUIREMENTS

A. The Contractor shall furnish all labor, material, tools, and equipment necessary to excavate materials; segregate, track, handle, sample, analyze, and test excavated materials, backfill, and re-grade as indicated on the Drawings.

B. The Contractor shall use suitable, amended on-site soils and fill, and soil from off-site sources, as needed. Please note that most of the on-site materials will likely not be suitable for reuse without amendment, nor will all required material gradations be present on the site. The contractor shall avoid mixing the reusable soils with fine-grained and/or organic soils.

C. Rock blasted or excavated from the excavation area shall not be used directly for backfill below footings or retaining walls unless the rock is processed to meet the gradations of the individual fill materials as noted herein.

D. The Contractor shall make excavations in such a manner and to such widths that will provide suitable room for performing the Work and shall furnish and place all sheeting, bracing, and supports, if necessary. Excavation support is anticipated for this project.

E. The Contractor shall provide labor and material for all pumping and draining, as necessary; and shall render the bottom of excavation firm and unyielding, and dry and in all respects acceptable. The Contractor shall collect and properly dispose of all discharge water from dewatering systems in accordance with Town of Maynard Bylaws noted herein and all State requirements, regulations and permits.

F. The contractor shall provide a dewatering system for the discharge water used during the installation of the geothermal wells. Refer to Section 31 21 00 Site Utilities Preparation for requirements.

G. The Contractor shall raise the Site to final grades and compact the subgrade and intermediate layers to the required criteria set forth within this Section.

H. The contractor shall provide routine monitoring of in-place excavation support system.

I. Contractor shall protect and moisture condition all onsite and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture in order to maintain suitable workability of the soil materials. Failure by the Contractor to follow this requirement shall not be cause for additional cost to the Owner.

1.05 LAWS AND REGULATIONS

A. Work shall be accomplished in accordance with regulations of local, county, state and national agencies or utility company standards as they apply.

B. Comply with the rules, regulations, laws and ordinances of the Town of Maynard, of the State of Massachusetts, appropriate agencies of the State of Massachusetts and all other authorities having jurisdiction. Coordinate all work done within Town and State rights of way with the appropriate agencies. Provide all required traffic control and safety measures, including uniformed police officers per Town and State requirements. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

C. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc., the Commonwealth of Massachusetts Rules and Regulations For the Prevention of Accidents in Construction Operations, and the requirements of the Occupational Safety and Health Administration (OSHA), United States Department of Labor.

D. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

1.06 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all the Contract Documents for requirements that affect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this section include, but are not limited to, the following Sections:
  1. Section 31 09 00 – Subsurface Investigation
  2. Section 31 10 00 - Site Clearing
  3. Section 31 21 00 - Site Preparation
  4. Section 31 21 01 - Site Utilities Preparation
  5. Section 32 25 00 - Erosion & Sedimentation Controls
  6. Section 32 16 00 – Wood Guard Rail
  7. Section 32-31 70 – Chain Link Fences and Gates
  8. Section 33 32 23 – Segmental Retaining Walls
  9. Section 33 61 37 – Geothermal Ground -Source Heat Exchange System

1.07 REFERENCE SPECIFICATIONS [ADD2]

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements govern.
  1. American Society for Testing and Materials (ASTM):
    a. ASTM C136, Sieve Analysis of Fine and Coarse Aggregates.
    b. ASTM D1556, Density of Soil In Place by the Sand-Cone Method
    c. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbs/ft.^{3} (2,700 kN-m/m^3)).
    d. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
    e. ASTM D6913, Particle Size Analysis of Soils.
    f. ASTM D2487, Standard Test Method for Classification of Soils for Engineering Purposes.
  2. Commonwealth of Massachusetts:
    a. Massachusetts Department of Transportation (MassDOT), “Standard Specifications for Highways and Bridges” latest edition.
    b. Commonwealth of Massachusetts State Building Code.
  3. American Association of State Highway and Transportation Officials (AASHTO):
    a. AASHTO T-11, Standard Method of Test for amount of material finer than 0.075 mm sieve in aggregate.
    b. AASHTO T-27, Standard Method of Test for sieve analysis of fine and coarse aggregates.
  4. Occupational Safety and Health Act (OSHA) of 1970 (Public Law 91-596 of the United States, 29 USC Section 651 et seq.).
  5. Deleted [ADD2]
  6. DD Phase Geotechnical Report, Proposed Green Meadow Elementary School dated April 24, 2024 [ADD2]

1.08 BENCH MARKS AND ENGINEERING

A. Employ, with the Contract Price, a competent Civil Engineer or Land Surveyor, registered in Massachusetts, who shall perform the following work:
  1. All lines and grade work not presently established at the site shall be laid out by the Engineer/Surveyor in accordance with the Drawings and Specifications. Establish permanent benchmarks necessary for the work under this Contract. Maintain all established bounds and bench marks and replace as directed at no expense to the Owner any that are destroyed or disturbed.
  2. Establish all lines and grades for the work and verify all locations, property lines, work lines, and other dimensioned points indicated on the Contract Drawings for the existing site.

3. Submit to the Architect, a written confirmation of locations of all lines, and any discrepancies between conditions and locations as they actually exist and those indicated on the Contract Drawings. Such confirmation shall bear the registration stamp of the Engineer/Surveyor.

B. The General Contractor shall use GPS (Global Positioning System) to locate all horizontal and vertical data shown on the CAD drawings for all proposed site work.

C. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.

D. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.

1.09 SOIL REPORT

A. DD Phase Geotechnical Report, Proposed Green Meadows Elementary School Maynard Massachusetts dated: April 27, 2024 prepared by Lahlaf Geotechnical Consulting, Inc. is attached hereto, and hereby made part of the Contract Documents. [ADD2]

B. The Owner assumes no responsibility for the General Contractor's failure to make his own site investigation and makes no representation other than the soils reports regarding the character of the soil or subsurface conditions which may be encountered during the performance of the work. The General Contractor shall refer to Section 31 09 00 - Subsurface Investigation, and attached soil Reports. Failure by the General Contractor to be aware of existing site conditions shall not be cause for additional cost to the Owner.

C. The subsurface explorations and geotechnical report were performed primarily for use in preparing the foundation design and are included for the convenience of the contractor. Use and interpretation of these data for purposes of the work shall be the responsibility of the Contractor. Subsurface conditions and groundwater levels are not considered as accurate for any times or locations other than the specific time and location of each of the explorations.

D. Interpretation of this data for purposes of construction is the responsibility of the Contractor. It is the Contractor's responsibility to make interpretations and draw conclusions with respect to the character of materials to be encountered and groundwater conditions at the site and their impact upon Contractor's work based on his expert knowledge of the area, construction dewatering methods, and support of excavation methods. Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

E. Information on subsurface conditions is made available for the convenience of the Bidders. The Owner does not represent to the General Contractor that the information is either an accurate or a comprehensive indication of subsurface conditions. Bidders are invited to review the information to apprise themselves of the information available, and also to make additional investigations at their own expense.

F. Test boring location as depicted on the Drawings are located by tape measurements from existing site features and structures and shall only be considered as accurate as the procedure utilized.

G. The Contractor shall be aware that the ground surface elevation was interpolated to the nearest foot and are approximate.

H. No claim for extra cost or extension of time resulting from reliance by the General Contractor on information presented herein shall be allowed, except as provided in the Contract Documents.

1.10 EXISTING UTILITIES

A. Locate and mark underground utilities to remain in service before beginning the work. Active utilities existing on the site and work areas shall be carefully protected from damage and relocated or removed as necessitated by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

B. Active utilities existing at the site and work areas shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

C. Inactive or abandoned utilities encountered during construction shall be removed if within the building area or grouted, plugged, or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect.

1.11 SAMPLING AND TESTING

A. The contractor shall submit two (2) 50-lbs samples of each type of fill material, in air-tight containers, proposed for use on-site in accordance with PART 2 - PRODUCTS, to the Owner's testing agency for preliminary compliance testing at least two (2) weeks prior to use. No fill material shall be delivered to the site or placed until the material has been preliminarily approved. The final review of the material will be based on a sample tested by the owner's testing agency upon delivery of the material to the site. The gradation curves shall fit entirely within the envelopes defined by the limits specified herein for the material to be approved for use at the site.

1. Samples shall be delivered to the office of the Architect or as directed.
2. Samples required in connection with compaction tests will be taken and transported by the Soils Representative.
3. Additional tests, including grain-size analyses and laboratory compaction tests shall be performed on the material after it is delivered to the site.
4. For on-site materials, submit representative samples, collected from each stockpile of excavated on-site material to be used, directly to the Owner's Geotechnical Consultant's office or as directed at least two (2) weeks in advance of use of these materials.

B. Product Data: Submit location of pits for borrow material. Samples shall include name of source, name of material, sampling date, and intended use.

C. Samples shall be representative of the source pit. If materials are found to vary once construction begins, the Contractor will be required to submit additional representative samples, for compliance testing, at his own cost.

D. Compaction (Field Density) tests:

1. Field density tests shall be performed at all bench and other site fixture pads.
2. Compaction tests shall be performed on each lift of placed and compacted material and at every 100 feet within the same lift. Accordingly, it is the responsibility of the Contractor to provide ample notice to the testing agency to provide a field representative to perform field density tests.

E. Materials imported to the site by the Contractor for on-site use shall not contain oil, hazardous waste, or deleterious materials.

1. The Contractor shall be responsible for all costs incurred by the Owner as a result of the Contractor's action to import materials containing concentrations of oil and/or hazardous materials to the site, including the cost of removing the contaminated soil, the cost of remediation of onsite soils affected by the contamination, and the cost of replacement..
2. In the event that site characterization of off-site borrow sources indicates that soils are acceptable to the Architect or Engineer for use, then chemical testing will not be required. It is anticipated that chemical testing would not normally be required for material from customarily utilized commercial borrow sources.

   No fill material from "urban areas" will be accepted for fill at the site, even if chemical testing indicates no exceedances of "Reportable Concentrations".

   If requested by the Owner or Engineer, based on review of the borrow site characterization, the Contractor shall conduct testing on proposed fill material and submit results prior to delivery to the site, at no additional cost to the Owner. Testing shall be conducted by a DEP-certified testing laboratory and shall include, at a minimum, the following analytical test data.

   a. Total Petroleum Hydrocarbons (EPA Method 418.1) every 100 yards
   b. Volatile Organic Compounds (EPA Method 8420) every 500 yards

c. PCB and Pesticides (EPA Method 8080) every 500 yards

d. Total RCRA Metals (EPA Method 6000-7000 series) every 500 yards

e. Polynuclear Aromatic Hydrocarbons (EPA Method 8270) every 500 yards

f. TCLP for those total parameters which exceed twenty times the TCP criteria every 500 yards.

g. Total cyanide (EPA 9020)

3. All off-site material submitted for use on the project site shall conform to the S-1 Soils Standards contained in the Massachusetts Contingency Plan, dated October 1, 1993, Section 310 CMR 40.0975 or site soil background levels, whichever is lower. Samples will be chemically tested to determine their conformance with the S-1 Soils Standards and site soil background levels.

4. Testing parameters and testing frequencies may be reduced, as directed by the Soils Representative.

5. All sieve analyses for conformance of on-site and off-site fill materials to be used in the work shall be done by means of a mechanical wet sieve analysis and in accordance with ASTM D 6913 using the sieves listed in Sections 2.01, A. plus the following sieves: #40, #10, and 1 inch. [ADD2]

1.12 QUALITY ASSURANCE

A. The Owner may retain and pay for the services of an independent testing agency (Soils Representative) to monitor backfill operations, perform laboratory tests on soil samples, and to perform field density tests; and a Geotechnical Engineer to periodically observe the earthwork operations, observe the preparation of the subgrade for footings, slabs, and paved areas, and to review laboratory and field test data. The geotechnical engineer may from time to time request that the contractor excavate tests pits ahead of excavation to confirm subsurface conditions. Test pits shall be performed at no additional cost to the Owner.

B. The Engineer's duties do not include the supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the contractor from defects discovered in his Work at that time or subsequent to the testing.

C. The services of the Soils representative may include but are not limited to monitoring and performing observations of the backfill operations and testing during placement of fills and backfills within the proposed building, parking area, underneath structures in general, and controlled fill areas.

D. Subgrades shall be observed and approved by the geotechnical engineer before placing fill. The compaction and material composition shall be approved by the geotechnical engineer before placement. The by the Architect, and/or Geotechnical Engineer prior to placing subsequent lifts. If inspections indicate subgrade does not meet specified requirements, the unsuitable subgrade shall be excavated, the unsuitable material shall be removed, and replaced with approved structural backfill material and compacted at no additional cost to the owner or architect. The work shall be done in accordance with this specification.

E. Costs related to retesting due to unacceptable quality of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

   1. The Soils Representative's presence or the Geotechnical Engineer does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Soils Representative, nor any observations and testing performed by him, nor any notice or failure to give notice shall excuse the Contractor from defects discovered in his work.
   2. The Owner reserves the right to modify the services of the Soils Representative or Geotechnical engineer.

F. The contractor shall make provisions for allowing safe and timely observations and testing of Contractor's Work by the Geotechnical Engineer and by the Soils Representative. The presence of the independent testing agency and/or the Geotechnical Engineer does not include supervision or direction of the actual work of the Contractor, his employees or agents. Neither the presence of the Soils Representative and/or the Geotechnical Engineer, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

G. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, Soils Representative, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

H. Testing: Compaction tests will be required by the Owner and will be paid for by the owner. No specific testing schedule has been established at this time. If tests indicate that density requirement have not been achieved, the contractor continue compacting the tested material. All retesting is these areas shall be paid for by the contractor.

I. The Owner's Testing Agency will perform water content, gradation tests on onsite and processed materials, and compaction tests at a frequency and at locations as required. The results of these tests will be submitted to the Architect, and a copy submitted to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy the indicated deficiencies.

J. Contractor shall notify Architect when excavations have reached required subgrade and provide a minimum notice of 24 hours prior to placement of backfill on exposed subgrade. Density and Compaction Testing: The contractor is responsible to schedule compaction tests and allow adequate time for the proper execution of said tests. **This section also applies to instances when the General Contractor resumes earthwork operations after a period of pause in earthwork operations that require observations by the Geotechnical Engineer.**

K. Testing frequency shall be as follows:

Material	**Responsible Party**	**Situation**	**Test**	**Minimum Frequency**
Structural Fill/ Ordinary Fill/ Processed Gravel for Subbase/ Common Borrow/ Bedding Material/ Crushed Stone / Pea Gravel	Contractor	Source Investigation	Grain Size Moisture Density Relationship	1 per source 1 per source
	Owner	During Placement	Grain Size t Moisture Density Relationship	1 per source 1 per 100 tons
	Owner	As-Placed	Dry Density and As-Placed Moisture	2 per lift per location or activity and no less than 1 every 500 sf
Loam Borrow	Contractor	During Placement	PH, Nitrogen, Phosphorous, Potassium, and USDA Classification	2 per Acre
Riprap	Contractor	Source Investigation	Source Material Certification Specific Gravity	1 per source 1 per source
	Contractor	During Placement	Source Material Certification Specific Gravity	1 per 500 tons 1 per 500 tons

The Owner reserves the right to modify the services of the Soils Representative or Geotechnical engineer.

1.13 PROTECTION

A. All rules and regulations governing the respective utilities shall be observed in executing all work under this Section.

B. All work shall be executed in such a manner as to prevent any damage to existing streets, curbs, paving, service utility lines, structures and adjoining property. Monuments and benchmarks shall be carefully maintained and, if disturbed or destroyed and replaced.

C. The work of this Section shall be performed in such a manner as to cause no interference with access by the abutters, Subcontractors or other Contractors to all portions of the site as is necessary for the normal conduct of their work.

1.14 DEFINITIONS

A. MassDOT specifications shall mean “The Standard Specification for Highways and Bridges”, Commonwealth of Massachusetts, Massachusetts Department of Transportation, latest edition, including supplements.

B. The words "finished grades" as used herein mean the required final grade elevations indicated on the Drawings and defined in this specification section. Where not otherwise indicated, areas outside of buildings shall be given uniform slopes between points, for which finished grades are shown, or between such points and existing grade except that vertical curves or rounding shall be provided at abrupt changes in slope.

C. Excavation: Removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed. See EXECUTION section for directions for treatment of excavations in rock.

D. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense. See EXECUTION section for instructions for treatment of unauthorized excavation.

E. Additional Excavation: Excavation required beyond anticipated subgrade elevation. See EXECUTION section for procedures.

F. Natural Subgrade: The undisturbed, inorganic native soil exposed below site fill and disturbed native soils at footing and/or structural fill bearing elevations; or Rock at least 12" below the footing bearing elevation, slabs on grade, or utilities.

G. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

H. Structure: Buildings, foundations, slabs, tanks, curbs, or other man made stationary features occurring above or below ground surface.

I. Structural Fill: Imported or approved on site aggregate or select soil meeting the physical properties described in Section 2.1 MATERIALS, and compacted in place to form a supportive bearing surface.

J. Unsuitable material: On-site materials which are of improper gradation to allow adequate compaction, and/or defined as organically contaminated (including roots), uncontrolled fill material, disturbed native material, or otherwise identified as improper for the intended use by the Architect. Refer to the Supplemental info section of the Geotechnical Engineering Report.

K. Rock: All materials which, in the opinion of the Architect, require blasting or special impact tools such as jack hammers, sledges, chisels or devices similar in purpose which are designed for use in cutting or breaking materials that have compressive strengths in excess of 300 pounds per square inch in their natural states. Boulders larger than 3 cubic yards in volume in open excavations and larger than 1 cubic yard in trenches are classified as Rock.

L. Zone of Influence: The area bounded by a one horizontal to one vertical (1H:1V) line sloping downward and outward from the bottom, outer edge of the footings and foundations.

M. The words "invert" or "invert elevation" as used herein shall be defined as the elevation at the inside bottom surface of the pipe or channel.

N. The words "bottom of the pipe" as used herein shall be defined as the base of the pipe at its outer surface

O. Trench shall be defined as an excavation of any length where the width is less than twice the depth and where the shortest distance between payment lines does not exceed ten (10') feet. All other excavations shall be defined as open excavations.

P. Rock (Mass & Rock): Excavated material in beds, ledges, unstratified masses, and conglomerate deposits that cannot be removed by rock excavating equipment equivalent to the following size and performance ratings (Caterpillar 340), without systematic drilling, ram hammering, ripping, or blasting, when permitted.

Q. Heaved Rock shall be understood to be rock that heaves as a result of blasting and shall include blasted rock and rock disturbed by blasting operations. [ADD2]

R. Common Borrow: See MATERIALS Section.

S. Structural Fill: See MATERIALS Section.

T. Bedding Fill for Pipe and Other Utility Structures: See MATERIALS Section.

U. Bedding Fill for geothermal pipe trenches: See MATERIALS Section.

V. Gravel Base Course for Paved Areas: See MATERIALS Section.

W. Trenching Fill: See MATERIALS Section.

X. Loam Borrow: See MATERIALS Section.

Y. Filter Fabric: See MATERIALS Section.

Z. Vapor Retarder: See MATERIALS Section.

1.15 SUBMITTALS

A. Submit a detailed construction sequence plan for project excavation indicating temporary stockpile areas, side slopes of excavations, limits of required temporary excavation support and sequence and procedures for subgrade protection, excavation, concrete placement, moisture conditioning of on-site excavated soils used as fill, filling, backfill, and compaction.

B. Submit Rock blasting plan shall be submitted at least 10 days before the start of blasting operations. This submittal shall include description of blasting operations, handling procedure and storage of explosives, blasting limits and depths, blasting sequence, measures to limit vibrations, as needed, measures to lo limit over-blast and rock heave to less than 2 feet, and measures to protect the existing building during blasting operations.

C. Grain-size distribution analysis test data shall be delivered with the samples. The analysis shall be performed in accordance with ASTM D 6913 and shall at the minimum include the sieve sizes listed for the respective material in Part 2. The data shall include a plot of the gradation and the envelope of the specified material. A material shall be considered meeting the specifications when its gradation curve fits entirely within the specified envelope. Borrow materials with grain-size distribution curves that do not fall entirely within the specified envelope shall be deemed unacceptable.

D. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures in accordance with requirements of the Contract Documents.
   1. Submit a detailed earthwork sequence plan for project excavation indicating temporary stockpile areas and procedures for subgrade protection.

E. Submit a dewatering plan for review by the Architect at least two weeks before the start of construction. Dewatering and groundwater control systems shall be designed to keep excavations free of water and to avoid disturbance of the subgrade.

F. Excavation and Excavation Support Plan: Submit at least 10 calendar days prior to the start of the work a detailed plan for the sequence of excavation, and methods to be used to shore roadways, sidewalks and other structures.

G. Obtain required permits for discharge of dewatering effluent. Submit two copies of all permits obtained at least one week prior to system installation.

H. Submit soil samples in accordance with Section 1.12 of these specifications.

I. Submit representative samples of approved equivalent materials, such as Filter Fabric, for approval prior to delivery to the site.

J. Submit gradations from suppliers of crushed stone for pipe bedding, structure bedding, and infiltration system encasement and bedding.

K. Submit shop drawings and calculations for proprietary site retaining walls.

1.16 EXAMINATION OF SITE AND DOCUMENTS

A. It is hereby understood that the General Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs shall be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the site.

B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the General Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

1.17 PROJECT COORDINATION

A. Prior to start of earthwork, the General Contractor shall arrange an onsite meeting with the Architect and the Geotechnical Engineer for the purpose of establishing the General Contractor’s schedule of operations, and scheduling observation and requirements. The Geotechnical Engineer may from time-to-time request that the General Contractor excavate test pits ahead of excavation to confirm subsurface conditions at no additional cost to the Owner.

B. Protect all benchmarks, monuments, and property boundary pins. Replace if destroyed by General Contractor’s operation.

C. As construction proceeds, the Contractor shall be responsible for notifying the Geotechnical Engineer and the independent testing firm prior to the start of earthwork operations requiring observation and/or testing.

1.18 PROJECT CONDITIONS

A. “GEOTECHNICAL ENGINEERING REPORT”

1. The geotechnical engineering report prepared for this site (which includes subsurface exploration data and an exploration location plan) referenced in this section is included in the Supplemental information section and is made available for the convenience and information to the Contractor only. It is expressly understood that the Owner will not be responsible for any interpretation, conclusions or generalizations made by the contractor based on the contractor’s review of the report.

B. Do not proceed with utility interruptions without Architect's written permission. Notify Architect not less than two days in advance of proposed utility interruptions.

C. Contact utility-locator service for area where Project is located before excavating.

D. Protect nearby structures from damage. All construction induced damage shall be repaired by the General Contractor at no additional expense to the Owner.

E. The General Contractor shall obtain and pay for all permits and licenses required to complete the work of this Section.

F. In case of conflict between regulations or between regulations and Specifications, the General Contractor shall comply with the strictest applicable codes, regulations, or Specifications at no additional cost to the owner.

G. The General Contractor may perform additional test borings and other explorations at no cost to the Owner.

H. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies and Town of New Bedford to shut off services if lines are active.

1.19 SEQUENCING AND SCHEDULING

A. As construction proceeds, notify the Architect prior to the start of earthwork operations which require observations and testing. A minimum of 72 hours notification shall be provided for work that requires observation or testing

1.20 AS BUILT SURVEY

A. At the completion of the specified work, a field survey shall be performed by a surveyor registered in Massachusetts of the as built building, ground elevations (spot elevations 50’ on center and at edges of pavement and or curbing, top and bottom of walls and utility structures, floor elevations, utilities, fencing, walls and all site improvements, limit-of-work line, property lines, and tree line within the limit of work. The surveyed information shall be presented in a AutoCAD electronic file format (latest version) and submitted to the Architect in the form of a CD with PDF’S at a scale of 1”=30’.

B. All field survey work and presentative of the surveyed information shall be completed and submitted to the Architect within four weeks of completion of the construction as specified and as shown on the drawings.

1.21 MEASUREMENTS

A. Measurement of Unsuitable Soil over-excavation:

1. Strip vegetation, topsoil, buried organic material and fill in accordance with drawings. Remove existing asphalt, curbing, cobbles, boulders, concrete, metal, woods, and above and below ground structures.

2. Remove unsuitable soils to top of natural soil as shown on the Contract Documents or as directed in the field by the Owner’s Geotechnical Engineer.

3. Quantity of blasted rock shall be measured by calculating the volume between the pay lines for excavated rock and the top of the rock surface as defined by rock probes performed before the start of blasting. The probes shall be performed in a grid with a maximum spacing of 50 feet. The probes shall extend at least 10 feet in rock. The probes shall be observed by the Geotechnical Engineer.

4. Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils throughout the building footprint. Excavations shall be surveyed at the corners, high and low points, and a maximum spacing for survey points of 20 feet in each direction on a grid.

5. Quantities shall be measured in their original position to the limits of clearly defined vertical construction lines and to the depth required for the defined construction. Payment will be at the Contract Unit Rates.

1.22 UNIT PRICES

A. The base bid shall include the excavating and disposing of excavated material generated within the limit of work and specified subgrades grades shown on the drawings or specified herein.

B. Unit prices shall be provided for all items listed in Part 2- PRODUCTS. The unit rates shall include furnishing/processing, stockpiling, placing, and compacting the material).

C. Provide unit rate for rock excavation in trenches and in open excavations, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.

D. Provide unit rate for rock excavation as open excavation, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.

PART 2 – PRODUCTS

2.01 FILL MATERIAL

A. Structural fill for support of Building foundations, floor slabs and base course for concrete sidewalks and pads shall be widely graded sand and gravel, free of clay, organic material, snow, ice, frozen soil or other deleterious materials, and conforming to the following graduation requirements. Soil finer than the No. 200 sieve shall be non-plastic. Structural Fill shall have a plastic index of less than 6 and shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within +- 2 percentage points of the optimum moisture content.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
3- inches	100 percent	
1-1/2 inch	80 percent	100 percent
1/2 inch	50 percent	100 percent
No.4	30 percent	85 percent
No.20	15 percent	60 percent
No.60	5 percent	35 percent
No.200	0 percent	*10 percent

* 0–5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

2. Material falling within the above Specifications, encountered during the excavation, shall be stored in segregated stockpiles for reuse as Compacted Structural Fill. All material shall be subject to approval by the Architect.

B. Processed gravel for base course for bituminous concrete pavement shall be a processed material with angular particles meeting the requirements conforming to MassDOT Specifications Section M1.03.1.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
3-inches	100 percent	----
1-1/2 inch	70 percent	100 percent
No.3/4	50 percent	85 percent
No.4	30 percent	60 percent
No.200	3 percent	10 percent

C. Ordinary Fill - Well-graded, natural inorganic soil approved by the Architect and meeting the following requirements to be used for general filling to subgrades in lawn areas and to the bottom of the subbase beneath pavements, sidewalks and other than specified above, and conforming to the following graduation requirements. Soil finer than the No. 200 sieve shall be non-plastic. Ordinary Fill shall have a plastic index of less than 6 and shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within +- 2 percentage points of the optimum moisture content.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
6-inches	100 percent	----
1 inch	50 percent	100 percent
No.4	20 percent	100 percent
No. 20	10 percent	70 percent
No.60	5 percent	45 percent
No.200	0 percent	20

1. It shall be free of organic or other weak or compressible materials, of frozen materials, trash or other deleterious materials and of stones larger than six (6) inches maximum dimension.

2. It shall be of such nature and character that it can be compacted to the specified densities in a reasonable length of time.
3. It shall be free of highly plastic clays, of all materials subject to decay, decomposition or dissolution and of cinders or other materials which shall corrode piping or other metal.
4. It shall have a maximum dry density of not less than one hundred (100) pounds per cubic foot.
5. Material from excavation on the site may be used as ordinary fill if it meets the above requirements.

D. COMMON BORROW

a. Common Borrow material shall be soil containing no stone larger than 8 inches and shall be substantially free of organic loam, wood, trash, or other objectionable materials which may be decomposable, compressible or which cannot be properly compacted. Onsite and offsite Common Borrow materials shall not contain more than 30 and 20% percent by weight of silt and clay, respectively.
    1 No Common Borrow shall be imported until available onsite Ordinary Fill has been used or with prior written approval from the Architect.
    2 Common Borrow material from off-site borrow sources shall contain no detectable concentrations of asbestos.
    3 Crushed concrete can be used as Common Borrow provided it meet the requirements of these specifications.
    4 Common Borrow can be used beneath the topsoil in landscaped areas, and at depths greater than 3 feet in paved areas.

E. PROCESSED GRAVEL FOR SUBBASE

1. Processed Gravel for Subbase shall be onsite or imported material conforming to Item M1.03.1 of the MassDOT Standard Specifications. This material can be used as subbase in the top 12 inches beneath paved area.

2. Processed Gravel for Subbase may be anticipated to be onsite in limited quantities.

3. Crushed concrete shall not be used as Processed Gravel for Subbase.

F. DENSE GRADED CRUSHED STONE FOR SUBBASE

1. Dense graded Crushed Stone for subbase shall be imported material conforming to Item M2.01.7 of the MassDOT Standard Specifications. This material shall be used as an alternate to Processed Gravel for Subbase in the top 12 inches immediately beneath paved areas.
2. Crushed concrete shall not be used as Dense Graded Crushed Stone for Subbase.
3. Dense graded Crushed Stone for subbase are not anticipated to be present onsite.

G. CRUSHED STONE

1. Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious material, conforming to MassDOT specifications, Section M2.01.0 through M2.01.6 size as indicated on Drawings. Dense graded crushed stone shall be uniformly blended and conform to the following gradation requirements.
2. The crushed stone shall be reasonably free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone. Where crushed stone is to be used for surfacing, this requirement shall be not more than 0.5% of satisfactory material passing a No. 200 sieve.

	Percent Passing By Weight		
Sieve Size	1/2-Inch Stone	3/4-Inch Stone	1.5-Inch Stone
2 inches	100	100	100

1 ½ inch	100	100	95-100
1 inch	100	100	35-70
3/4 inch	100	90-100	0-25
5/8 inch	100	---	---
1/2 inch	85-100	10-50	---
3/8 inch	15-45	0-20	---
No. 4	0-15	0-5	---
No. 8	0-5	---	---

H. SAND

Sand shall consist of clean inert, hard, durable grains of quartz or other hard durable rock, free from clay, organics, surface coatings or other deleterious material, confirming to the MassDOT Specifications Section M1.04.1. Sand shall conform to the following gradation:

Sieve Size	**Percent Passing by Weight**
1/2-inch	100
3/8-inch	85-100
No. 4	60-100
No. 16	35-80
No. 50	10-55
No. 100	2-10

I. LOAM BORROW

Loam borrow shall meet the requirements of MassDOT Specifications for M1.05.0. Existing topsoil may also be excavated, stockpiled, screened and reused as loam on the project provided that the resultant material is consistent with the requirements of the MassDOT Specifications. All topsoil shall be screened free of roots, rocks and vegetative matter. The contractor shall amend and rehandle topsoil as needed to meet the standard specifications.

J. FILTER FABRIC

1. Conform to MassDOT Specifications for Type III Fabric Embankment or Subgrade Stabilization, Section M9.50.0, Mirafi 140 Filter Fabric, or approved equivalent.

K. VAPOR BARRIER

Vapor Retarder must have the following qualities:

1. WVTR less than or equal to 0.006 gr/ft2/hr as tested by ASTM E 96
2. ASTM E 1745 Class A (Plastics)
3. Vapor Retarder Products:
1. Stego Wrap (15-mil) Vapor Barrier by Stego Industries, LLC, San Juan Capistrano, CA (877) 464-7834 www.stegoindustries.com, or approved equivalent.

Accessories:

1. Vapor Retarding Seam Tape must have the following qualities:
   - a. Water Vapor Transmission Rate of 0.3 perms or lower by ASTM E 96
2. Vapor Proofing Mastic have the following qualities:
   - a. Water Vapor Transmission Rate of 0.3 perms or lower by ASTM E 96
3. Pipe Boots:
   - a. Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer’s instructions.

L. ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric
2. Yellow: Gas
3. Orange: Telephone and other communications.
4. Blue: Water System
5. Green: Sewer

L. UNDER-DRAINS

Under-slab drain pipes shall consist of 4” diameter Schedule 40 PVC with perforations in ¼ of the diameter and placed with the perforations down.

PART 3 - EXECUTION

3.01 EXCAVATION

B. Excavation of Subgrades

1. Topographic survey has been made of the project site following completion of the earthwork and this survey is included in the Bid Documents.

B. General

1. Excavate all materials to the elevations, dimensions and form as shown on the Drawings and as specified for the construction of the building, site walls, utility structures, utilities, paving, site improvements and other structures necessary for the completion of the building, utilities, and site work. All unsuitable materials within the indicated

and specified limits shall be excavated and removed from the site. Unsuitable materials shall include the following:

   a. Pavements, utility structures, building foundations and other man-made structures.
   b. Peat, organic silts, and other organic materials subject to decomposition, consolidation, or decay.
   c. Miscellaneous fill including sand, gravel, cinders, ash, glass, wood, and metal.
   d. Ledge or boulders except as specified for fills herein.
   e. Material that contains more than 3 percent organic matter by weight.

2. All unsuitable materials within the indicated and specified limits shall be excavated and removed from the site. The removal shall vertically extend to the elevations of the bottom of existing fill and buried organic soil shown in the boring and test pit logs included in the Geotechnical Report or to the limits shown in the drawings, whichever is deeper. The excavation resulting from the removal of the unsuitable soils shall extend to the natural/native undisturbed soil. Horizontally, the removal shall extend to the limits of ZOI or 5 feet beyond the limits of the building and 2 feet outside the limits of footings of retaining walls, stairs, and ramps, whichever is greater. The excavations shall be carried to the bottom of the unsuitable materials but in case less than 12 inches beneath the bottom of footings and 12 inches beneath the bottom of slabs. The grades within the building and all footings shall be restored to the grades provided on the contract plans using compacted Structural Fill. [ADD2]
3. Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils throughout the building footprint. Excavations shall be surveyed at the corners, high and low points, and a maximum spacing for survey points of 20 feet in each direction on a grid.
4. Control the grading so that ground is pitched to prevent water from running into excavated areas, damaging other structures, or adjacent properties.
5. Where soil has been softened or eroded by flooding, equipment, traffic, or placement during unfavorable weather, or such other conditions, it shall be removed and replaced by the Contractor with suitable material at no cost to the Owner.
6. The topsoil/subsoil layer, root balls, where encountered, organic soil, the existing fill, and other deleterious matter shall be entirely removed from within the proposed building footprint.
7. Topsoil/subsoil, organic material, root balls, where encountered, and other deleterious material shall be entirely removed from within the gravel road and paved road limits, geothermal field limits and retaining wall installation limits.
8. Cobbles and boulders shall be removed at least 6 inches from beneath footings and 18 inches from beneath the bottom of slabs within the entire building footprint, and 2 feet beneath the bottom of paved areas. The resulting excavations shall be backfilled with compacted Structural Fill under the building and with ordinary Fill under the subbase of paved areas.
9. The contractor is cautioned that some of the natural sand at the site has silt contents higher than 20 percent. Such soils can be compacted at moisture contents within 2 percent of the optimum moisture content determined from the laboratory compaction test. Soils with more than 20 percent fine contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control shall be implemented during stockpiling, placement, and compaction of the onsite soils.
10. Maintain all subgrades for site improvements in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. In areas to receive pavement or other surface materials, at top and bottom of embankments, along swales and elsewhere, place sufficient grade stakes to facilitate checking the subgrade levels. Correct all irregularities, compacting thoroughly any fill materials.
11. Minimum depth of excavation in rock shall be performed in accordance with the requirements in Section 3.04 E.
12. The base of the footing excavations in the natural soil shall be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade. All compaction shall be to specified levels.
13. The subgrades of slabs and paved areas in the natural soil shall be compacted with a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft materials are encountered, they shall be removed and

replaced with Structural Fill within the footprint of the proposed building and with Ordinary Fill within the proposed paved areas.

14. Where paved areas are located in existing fill areas, the existing fill shall be improved after the surficial topsoil and subsoil are removed by compacting the exposed subgrade in the fill using at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic oil shall be removed and replaced with Ordinary Fill to the bottom of the subbase layer.
15. The Contractor shall obtain from the proper authority locations of all utilities within the scope of this work so that there will be no damage done to such utilities. Neither the Owner nor the Architect will be responsible for any such damage, and the Contractor shall restore any structure or utility so damaged without additional compensation. Written notifications to the appropriate utility agencies shall be made at least ten (10) days prior to the commencement of any work.
16. Excess Material - Suitable excavated material which is required for fill and backfill shall be separately stockpiled as directed by the Architect. All surplus fill other than that required to complete the intent of the Contract shall become the property of the Contractor and shall be disposed of off the property by the Contractor. All excavated materials which, in the opinion of the Architect, are not suitable for fill or backfill shall be removed and disposed of off the property.
17. Any unsanitary conditions encountered, such as broken sewer mains or uncovered garbage shall be corrected or removed entirely as directed by the Architect.
18. The Contractor shall remove materials beneath the existing building to 12 inches beneath bottom of proposed footings, 12 inches beneath bottom of proposed slab, or to the bottom of the unsuitable material, whichever is deeper. In proposed paved areas, the Contractor shall remove a minimum of 18 inches beneath the existing grades. Refer to quantities in item. Should quantities of certain materials or classes of work be increased or decreased from what is shown in the drawings and specified herein, the Contract Unit Rates listed below shall be the basis of payment to the Contractor, or credit to the Owner, for such increase or decrease in the work. The Contract Unit Rates shall represent the exact net amount, per unit, to be paid to the Contractor in the case of increase in the quantities, and the exact amount to be refunded to the Owner in the case of decreases in the quantities. No additional adjustment shall be allowed for overhead, profit, insurance, or other direct or indirect expenses by the Contractor. Contract Unit Rates of materials shall include hauling, storing, stockpiling, moving, importing, spreading, and compacting. Increases or decrease in the quantities shall be approved by the Owner.
19. Amending the existing fill free of organic matter by adding and blending with crushed stone shall be allowed. Blending shall produce a uniform, homogeneous mixture. Blending by pushing with a dozer shall not be allowed.
20. To reduce the potential for mixing of organic soil with blasted rock intended for crushing, the topsoil, roots, tree stumps, and vegetation shall be removed before blasting. The remainder of the overburden soils and excavatable weathered rock shall not be removed before blasting.

C. Excavation for Site Improvements

1. Excavate to the lines and grades shown on the Drawings and as specified to obtain the subgrades for the following items of work:
    a. Concrete slabs on grade
    b. Bituminous concrete road and parking pavement
    c. Gravel road limits
    d. Concrete paving
    e. Curbing Seeded areas
    f. Retaining Walls
    g. Unspecified improvements – to elevations noted on the drawings.

D. Utilities and Utility Structures

1. Construct surface subgrades including filling prior to excavation for utilities and utility structures. Excavate to the lines and grades shown on the Drawings and as specified herein to obtain the subgrade for the following items of work:

a. Utility structures - to grades shown on the Drawings in the building and outside the building. Remove by excavating all unsuitable materials; including buried organics, from under drainage structures and backfill with specified fills compacted in place to subgrades.
b. Excavation for structures and other accessories shall have twelve (12) inch minimum and twenty-four (24)
c. inch maximum clearance on all sides.
d. All utility lines - to 12 inches below bottom of utility lines or structures.
e. Trench for water pipe to provide a minimum of five feet of cover above top of pipe.
f. Unless otherwise shown, provide separate trenches for each utility. Lay all piping in open trenches except where tunneling is required. Excavation for structures and other accessories shall have 12 in. minimum and 24 in. maximum clearance on all sides.
g. Grade the bottom of trenches evenly to have a constant pitch in the direction of flow and to insure a uniform compacted thickness of selected material as called for.

E. Existing services and utilities encountered shall be immediately repaired, protected, and maintained in use until relocation of same has been completed or be cut and capped were directed or be prepared for connections when so required.

F. Excavation Classification

1. Unclassified Excavation - For the purposes of payment, materials shall be unclassified except for those materials beyond the limits specified in Section item 3.01.F.2, as described in item 3.1-B of these specifications. pavement Excavation shall comprise and include the satisfactory excavation, removal, and disposal of all materials encountered within the lines and grades shown in the Drawings or limits specified herein, whichever is deeper, regardless of the nature of the materials, and shall be understood to include, but not be limited to, earth, topsoil, subsoil, hardpan, fill, foundations, pavements, curbs, piping, railroad track and ties, cobblestones, footings, bricks, concrete, abandoned drainage and utility structures, debris, and materials classified as unsuitable materials. All excavation and replacement, if applicable, with suitable material within the lines and grades shown in the Drawings or the limits specified herein, whichever is deeper, will be considered and bid as unclassified and shall be included in the Contractor's lump sum (i.e., shall not be paid for using Unit Rates). [ADD2]

2. For bidding purposes, the limits of unclassified excavation (i.e., excavations included as part of the base bid and for which there will be no payment using Contract Unit Rates) to remove the existing fill and organic soil within the building, paved areas, and athletic fields shall be as follows:[ADD2]
   a. 32,000 cubic yards of cut, this includes:
      i. 20,000 cubic yards of blasted rock (Assume blasting within building footprint and 5 feet beyond to El. 210 feet.)
      ii. 8,000 cubic yards of topsoil removal
      iii. 4,000 cubic yards of unsuitable material[ADD2]
   b. 16,000 cubic yards of fill, this includes:
      i. 10,000 cubic yards from on-site materials
      ii. 6,000 cubic yards of imported fill

   (Assume Fill placed within proposed building and within zone of influence to El. 215 feet, and Ordinary Fill placed within proposed paved areas to 12 inches beneath the bottom of the pavement.)[ADD2]

3. All excavation and replacement, if applicable, with suitable material within the lines and grades shown in the drawings and in these specifications that are within the quantities listed in item 3.01.F.2 shall be considered and bid as unclassified and shall be included in the Contractor's lump sum (i.e., shall not be paid for using Contract Unit Rates). Excavations beyond these lines described herein and beyond the quantities listed in item 3.01.F.2in the item shall be measured and paid for after approval of the measurements by the Architects as Classified Excavation using the Contract Unit Rates for respective classification in accordance with the allowance included in the contract documents. All quantities shall be measured in place. There shall be no swell, fluff, of expansion factor allowed. Measurements using truck loads shall not be allowed. Should quantities be less than those listed in item 3.01.F.2, the Contractor shall provide a credit to the Owner using the contract unit rates.

A. Petroleum Contaminated Soil Allowance: The Contractor shall carry in the base bid an allowance of 100 cubic yards for removal of unanticipated as directed in Section 01 22 00 Unit prices, petroleum contaminated soil materials. Allowance shall cover removal and disposal of petroleum contaminated soil and furnishing imported suitable backfill materials compacted in place as directed herein. The base bid shall cover all costs related to such excavation, removal off site, disposal, and replacement with compacted fill of approved material, overhead, and profit. No amount other than that herein specified will be paid by the Owner for the work defined herein.

1. If the total void volume of unanticipated petroleum contaminated material excavation, and its replacement with compacted fill exceeds the amount included in the Contract as listed above, the Owner shall pay the excess excavation and replacement at the Unit Rate submitted in the Bid Attachment – Unit Rates Schedule.
2. If the total quantity of unanticipated petroleum contaminated materials, and its replacement with compacted fill is less than the amount included in the Contract as listed above, the contract sum will be decreased by the difference in excavation and its replacement multiplied by the Unit Rate submitted in the Bid Attachment – Unit Rates Schedule.

3.02 FROST PROTECTION

A. Protect excavation bottoms and sides against freezing. Provide protective insulating materials as necessary, including by means of heat blankets, and heating plant.

B. A layer of fill shall not be left in an uncompacted state at the close of a day’s operation when there is the potential for that layer to freeze.

C. The Contractor shall not place any material on snow, ice, frozen soil, or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be at the Contractor’s expense.

D. Do not excavate to full indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade, the materials installed, and the excavation backfilled the same day. Protect the excavation from frost if placing of materials or backfilling is delayed.

E. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as necessary to carry out the work.

F. Frozen materials shall be installed on frozen ground. Fill materials shall be free of frost.

G. The subgrade of footings and slabs shall be protected from frost before placing concrete. The subgrade on the sides of the footings shall be protected from frost after the footings are constructed until sufficient fill is placed to protect the bottom of footings from frost induced heave. Uninsulated slabs shall be covered with heat blankets until the slab areas are heated. The cover shall extend at least 4 feet beyond the limits of the slabs.

3.03 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

A. The Contractor shall take the necessary steps to avoid disturbance of subgrade and underlying natural soils/compacted fill during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade and underlying natural soils/compacted fill, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials. The Contractor shall coordinate with the Architect or Soils Representative to modify his operations as necessary to minimize disturbance and protect bearing soils, based on the Architect’s or Soils Representative’s observations.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with compacted approved material in accordance with these Specifications. Fill that cannot be compacted within 48 hours because of its saturated condition shall be removed and replaced with compacted approved material in accordance with these Specifications. Costs of removal of disturbed material and replacement with approved material shall be borne by the Contractor.

C. If requested by the Architect or Geotechnical Engineer, the Contractor shall place a six-inch layer of Crushed Stone or 12-inch layer of Granular Fill/Structural Fill over natural underlying soil to stabilize areas disturbed during construction.

D. The placement of the Crushed Stone layer or Granular Fill/Structural Fill as well as material costs shall be borne by the Contractor. A geotextile fabric shall be used to separate the crushed stone from the natural soil and from the overlying fill when directed by the Geotechnical Engineer at no additional cost to the owner at no extra cost to the owner.

E. Material that is above or below optimum moisture for compaction of the particular material in place as determined by the Architect or the Soils Representative and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall be classified as unsuitable bearing materials. This material shall be removed and replaced with lean concrete, suitable/approved backfill material, or crushed stone as directed by the Geotechnical Engineer or Soils Representative at no additional cost to the Owner.

3.04 FILLS, BACKFILLS AND COMPACTION

A. Samples and Testing

1. All fill material and its placement shall be subject to quality control testing. A qualified laboratory will be selected by the Owner to perform tests on materials. All costs of testing will be paid for by the Owner. Test results and laboratory recommendations shall be available to the Architect.

B. Provide samples of each fill material from the proposed source of supply including on-site sources. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate source if required.

C. Architect will be sole and final judge of suitability of all material.

D. The laboratory will determine maximum dry density and optimum water content in accordance with A.S.T.M.

E. D-1557, Method D and the in-place density in accordance with A.S.T.M. D-1556.

F. Tests of material as delivered shall be made from time to time. Materials in question shall not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace with approved material.

G. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests.

H. Placing Fills and Compacting

1. Fill material shall be placed in horizontal layers not exceeding the maximum loose lift thickness with the minimum number of passes of compaction equipment as summarized on the table below. Each layer shall be compacted to the percentage of maximum dry density specified for the particular type of fill and at a water content equal to optimum water content plus or minus two (2) percent. The maximum dry density and optimum water content shall be as specified herein:

		Max. Loose Lift Thickness		**Min, Number of Passes**	
	Max Stone Size	Below Structures & Pavements	Less Critical Areas	Below Structures & Pavements	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4 in.	8 in.	8 in.	6	4
Hand-operated Vibratory drum rollers weighing at least 1,000# in confined areas	6 in.	8 in.	10 in.	6	4
Light vibratory drum Roller, minimum weight at drum 5,000#, minimum Dynamic force 10,000#	6 in.	10 in.	12 in.	6	4
Medium to heavy Vibratory drum roller, Minimum weight at Drum 10,000#, minimum Dynamic Force 20,000#	8 in.	12 in.	12 in.	6	4

I. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when fill materials or layers below it are frozen.

J. Notify the Architect when excavation is ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Architect.

K. Before backfilling against walls, the permanent structures must be completed and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect. When filling on both sides of a wall or pier, place fill simultaneously on each side. Correct any damage to the structure caused by backfilling operations at no cost to the Owner. Place no stones closer than 18 inches to wall surfaces.

L. In confined areas adjacent to footings and foundation walls and in utility trenches beneath floor slab, the fill shall be compacted with hand operated vibration tampers. The maximum lift thickness shall be four inches. The degree of compaction attained shall be equivalent to that attained in the adjacent open areas where heavy rolling equipment is used.

M. After the subgrade under concrete slabs and paved areas has been shaped to line, grade and cross-sections, it shall be rolled with an approved power roller weighing not less than six tons until thoroughly compacted. This operation shall include any reshaping, refilling or wetting required to obtain proper compaction. Any areas that subsequently settle shall be refilled to true subgrade and properly compacted.

N. In freezing weather, a layer of fill shall not be left in an un-compacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

O. Placing Fills
   1. In the building footprint Structural Fill shall be placed under the concrete footings and slabs. Ordinary Fill shall be placed under Processed Gravel for Subbase in paved areas. The material shall be placed and compacted in layers as described in the above table and compacted to at least 95 percent of maximum dry density as determined by A.S.T.M. Test D1557.with moisture contents within +- 2 percentage points of optimal moisture content. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum coverages.

P. Placement of structural fill should not be conducted when air temperatures are low enough to cause freezing of the moisture in the fill during or before placement, approximately 32 degrees F., or below. Fill materials should not be placed on snow, ice or un-compacted frozen soil. Structural fill should not be placed on frozen soil. No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of un-compacted soil and protected from freezing.

Q. Deficiency of Fill Materials
   1. Provide required additional fill materials as specified if a sufficient quantity of suitable materials is not available from the required excavation on the project site at no additional cost to the Owner.

R. Where water content of the fill must be adjusted to meet this Specification, the fill shall be thoroughly disked to ensure uniform distribution of any water added.

S. Fill and Backfill for Utilities
   1. Backfill trenches only after pipe and leaching chambers have been inspected, tested and locations of pipes and appurtenances have been recorded.

T. Each pipe section shall be laid on a 12 inches minimum bed of crushed stone as specified herein above. In addition, all underground utilities in the building and on the site including water lines, sanitary waste, vent piping, electrical conduit, mechanical piping, gas piping and storm drainage piping serving the roof drains and downspouts shall be set in a six inches bed of sand. Bed shall be shaped by means of hand shovels to give full and continuous support to the lower 1/3 of each pipe. Backfill by hand around pipe, until the crown of the pipe if covered by at least two (2) feet of sand for which there is a sieve analysis chart on page 8, paragraph 2.01D. Use sand or crushed stone and tamp firmly in layers not exceeding six inches in thickness. Take care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper to achieve compaction of 95 percent as specified.

U. Trenches and utility structures shall be backfilled with greatest care; fill materials required for backfilling to subgrades shall be Structural Fill or Ordinary Fill as specified. Backfill shall be compacted to 95 percent as specified. No mud, frozen earth or stone more than six inches in greatest diameter or other objectionable material shall be used for refilling. Any selected material required for filling shall be furnished and placed by the Contractor

3.05 ROCK EXCAVATION

A. Bedrock and boulders be encountered during excavation, the following shall apply:

  1. When rock is encountered within the building footprint and its zone of influence and site improvements it shall be excavated or ripped with a hydraulic excavator. When it is demonstrated to the satisfaction of the Architect and the Geotechnical Engineer that this material can no longer be removed with a hydraulic excavator and requires drilling and blasting, this material shall be classified as Rock Excavation.

B. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material.

C. Measurements:

  1. When, during the process of excavation, rock is encountered, it shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Architect shall be notified by the General Contractor, before proceeding further. The areas in question shall then be cross-sectioned as hereinafter specified.

D. The General Contractor shall perform rock probes at the site in a grid pattern before the start of excavations. At a minimum, the results of the probes should include the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.

E. Failure on the part of the General Contractor to perform the probes and identify the depth to top of the rock surface and to notify the Architect and proceeding by the General Contractor with the rock excavation before cross-sections are taken, shall forfeit the General Contractor right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.

F. The General Contractor shall employ and pay for a licensed Registered Civil Engineer or Land Surveyor to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Geotechnical Engineer and the computations approved by the Architect. The Owner has the option to perform independent cross-sections and computations of rock quantities.

G. Where removal of boulder or ledge is required the extent of this removal and basis of payment shall be determined by the Architect with payment made as stated in Unit Prices.

H. Blasting

  1. Blasting: Obtain written permission and approval of method from local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention of Construction" of the Associated General Contractors of America, Inc.

I. Notify the Architect at least 48 hours before any intended blasting and do no blasting without his specific approval of each blasting operation.

  1. General Contractor shall present evidence that his insurance includes coverage for blasting operations before doing any blasting work. A pre and post survey shall be performed for all buildings and utilities within 250 feet of the nearest blasting operations, conforming to the Municipal ordinance governing blasting and the Municipal Fire Department regulations.

J. All rock blasting shall be well covered with heavy mats or timbers chained together and the General Contractor shall take great care to do no damage to existing structures, utility lines and trees to remain.

K. Any damage caused by the work of this General Contractor shall be repaired to the full satisfaction of the Architect at no additional cost to the Owner.

L. Any rock fragments or loose material from blasting operations shall be removed. All voids shall be filled with a leveling layer of Structural Fill

M. Additional blasting requirements:

   a. Comply fully with National and Town of Maynard Regulations.
   b. All documentation submitted with application for "Use and Handling' PERMIT. 527 CMR 13:04 (11) E-1 states "A Use and Handling" Permit may be suspended or revoked by the head of the Fire Department or the Marshal or their designees for any violation of 527 CMR 13:00, or MGL c. 148"
   c. Meet all requirements of 527 CMR 13;00
   d. Perform Pre-Blast Surveys completed per 527 CMR 13:00
   e. No Blasting Saturdays, Sundays or Holidays.[ADD2]
   f. All shots to be double matted unless approved in advance by the Town of Maynard Fire Chief.
   g. Shot size limited to 500 lbs. unless approved in advance by the Town of Maynard Fire Chief.
   h. Blast warning signals to be sounded in accordance with 527 CMR 13:00
   i. 24 hours notification to the fire department of intent to blast.
   j. The contractor shall schedule and pay for detail officers to block traffic on Tiger Drive at Great Road and at Fowler High School during the blast.
   k. In or near residential areas, written notification must be distributed to homes advising of intent to blast at least three (3) days prior to blasting operations. Such written notification to include time frame of blasting operations and description of warning signals. The area of distribution shall be determined by the Fire Chief during pre-blast conference. A Fire Department detail shall be required unless waived by the Fire Chief.
   l. Provide at least three (3) or more seismographs throughout construction.
   m. All seismographs to be calibrated and certified according to manufactures specifications and 527 CMR 13:00

N. Rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.[ADD2]

O. Rock surfaces that heave due to blasting should be compacted with a vibratory roller that imparts a minimum of 40 kips to the rock surface. To reduce the magnitude of rock heave, drilling for blast holes should extend no more than 2 feet beneath proposed subgrades. Where the thickness of heaved rock is more than 2 feet, the heaved rock shall be removed and replaced with approved backfill material. Where the heaved rock thickness is less than 2 feet, the rock surface shall be compacted with at least 6 passes of vibratory roller compactor imparting a minimum effort of at least 40 kips. The thickness of the heaved rock shall be assessed by means of test pits performed during blasted rock excavation. [ADD2]

P. Complaints:

Q. Report all blasting complaints to the Architect within 24 hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.

R. Submit a summary report to the Architect each week which indicates the date, time and name of person investigating the complaint, and the amount of damage, if any.

S. When settlement of a claim is made, furnish the Architect with a copy of the release of claim by the claimant.

T. Immediately notify the Architect, throughout the statutory period of liability, of any formal claim or demands made by attorneys on behalf of claimants, or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of-court settlement or court verdict resulting from litigation.

U. Immediately notify the Architect of any investigations, hearings, or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

V. Basis of Payment: The total amount of rock excavation shall be based upon the volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment, and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

W. Rock blasting if needed, shall be controlled to reduce vibrations and airblast overpressure to below thresholds established in the Contract Documents. The peak particle velocity shall be maintained at less than 2 inches per second (ips) for concrete foundations, 1ips for stone foundations, and 0.5 ips for rubble foundations at the nearest structure. [ADD2]

X. Perform rock pre-splitting along the lines separating the blasting for the Early Site Package and the blasting slated to occur during the next phase so as to reduce the potential damage to the existing building during blasting operations. [ADD2]

Payment Lines for Rock Excavation:

1. Payment shall be made for volume between El. 210 and the top rock defined by the rock probes.[ADD2]

Y. Allowance for Rock Excavation: . The Base Bid shall cover all costs relating to such rock excavation, including blasting, removal and placement of the excavated material, overhead and profit. No amount other than that herein specified will be paid by the Owner for excavation herein defined.[ADD2]

1. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed Unit Rate shall be applicable to variations in excess of the allowance quantity up to 100% of the allowance quantity.
2. If the total quantity of Rock Excavation, open and/or trench, is less than the amount of Rock Excavation included in the Contract as listed above, the Contract sum will be decreased by the difference in Rock Excavation multiplied at the fixed Unit Rate. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed Unit Rate shall be applicable to variations of the allowance quantity by decreases of 100% of the allowance quantity.
3. Hoe ramming rock shall be paid for as rock excavation and shall not be paid for as time and material (T&M).

3.5 REUSE OF ONSITE MATERIALS AND PROCESSING OF ONSITE MATERIALS

A. Based on the borings and test pits, the existing fill contains up to 45 percent fines and the natural soil layer contains up to 45 percent fines. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The Contractor shall keep exposed subgrades properly drained and free of ponded water. Subgrades shall be protected from machine and foot traffic to reduce disturbance. Placed onsite material that becomes soft and unsuitable to support additional lifts of fill shall be removed and replaced at no additional cost to the owner. The contractor shall not make claims due to difficulty handling the onsite material. The Fill and natural soil layer also contained up to 30 percent of cobbles and boulders ranging up to about 7 feet in diameter.

B. Organic soils shall not be reused for backfill except as directed by the landscape architect in slopes of 4H:1V or flatter.[ADD2]

C. Should onsite materials be encountered that are suitable for reuse in accordance with the requirements for these specifications, the Owner shall receive a credit from the contractor for the quantity of reused onsite material. The credit shall be based on the difference in unit rates between imported and onsite material for the particular soil designation. The contractor shall provide Unit Rates for these materials in his base bid.

D. Excavated onsite soils which are suitable for re-use at the time of excavation but become frozen or too wet for re-use due to poor material handling practices shall be disposed of off-site and replaced as necessary at no additional cost to the Owner.

E. The processing of the existing building concrete and brick materials into Ordinary Fill shall be allowed.

F. The Contractor must inspect all existing stockpiles on site including soil testing for each stockpiled material.

G. The Contractor must amend the existing stockpiles if testing determines that the stockpiles do not meet the specifications for their intended use. The Contractor shall provide third party sampling and testing for all soils amended on-site.

H. The Contractor shall be allowed to mobilize a rock crusher to the site to process cobbles, boulders, blasted rock, and imported rock by blending these materials with the existing fill and natural soil and crushing them to produce a well graded materials, provided that these materials are maintained at suitable moisture contents for proper compaction processed material obtained by crushing blasted rock, boulders, and soil shall meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation shall be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction. Honeycombing is defined as material placed with visible voids between particles. Crushed material shall have a gradation curve that falls entirely within the specified envelope when tested for gradation using the sieves listed in item 1.12-E.5. [ADD2] The Contractor shall be allowed to transport the material offsite to perform the operations described in this item offsite and bring back the processed material provided that the processing offsite does is separate from other operations and provided that the work is approved by the project environmental professional.

I. The Contractor shall protect, and moisture condition all onsite and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture in order to maintain suitable workability of the soil materials. The contractor shall protect stockpiled unprocessed and processed materials from exposure to moisture using tarps. The tarps shall be secured so as not to be moved by wind or other action. No claim shall be made by the contractor, due to failure to comply with this requirement.

J. When processing the blasted rock, the Contractor shall mix the blasted rock with onsite soil free of organic soil to produce a well graded processed material meeting the specification of the material for which it is intended for use.

K. Before blasted rock, cobbles, and boulders that are crushed and processed onsite are reused, they shall be observed and approved by the geotechnical engineer. At the start of the crushing operations, the soil to rock proportions placed into the crusher shall be varied until the processed material meets the appropriate gradation requirements. The soil to rock proportion thus achieved shall be maintained throughout the duration of the project.

L. The material placed into the crusher shall be free of organics, wood, and other deleterious matter.

M. The jaws of the crusher shall be adjusted daily to maintain the crushing gradation.

N. Excess blasted rock, processed or unprocessed, not used on site shall be the property of the Contractor and shall be removed offsite at no additional cost to the Owner.

3.06 OFF-SITE DISPOSAL OF SOILS

A. All off-site disposal of soils shall meet the minimum requirements of the following as applicable:

   1. DEP Policy #Comm-97-001: Reuse and Disposal of Contaminated Soil at Massachusetts Landfills.

B. DEP Policy #WSC-13-500: Similar Soils Provision Guidance

C. The Contractor is responsible for any and all disposal characterization sampling and analysis and preparation of disposal applications as required by the facility to be used. Copies of all applications and approvals.

3.07 TEMPORARY STEEL SHEETING

A. An excavation support system will be required to construct the proposed foundations near roadways and sidewalks as referenced in the Drawings. The contractor is responsible for the adequacy of the excavation support system and shall retain the services of a Professional Engineer registered in the Commonwealth of Massachusetts to design the required excavation support systems. The contractor’s Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support system and shall design in conformance with OSHA requirements. The contractor’s Professional Engineer shall provide sufficient on-site inspection and supervision to assure that the excavation support system is installed and functions in accordance with his design. Criteria listed here in defining the responsibilities of the construction manager’s Professional Engineer are minimum requirements.

B. The contractor shall submit the attached Certificate of Design completed and signed by the contractor and the Professional Engineer, identifying the Contractor's Professional Engineer who will be responsible for design of the excavation support system, and including, for record purposes only:

  1. An overall time schedule for construction of the braced excavation system.

C. A description of the anticipated sequence of construction.

D. Submit three (3) copies to the Architect of:

  a. Complete details of braced excavation methods, equipment and sizes and lengths of materials proposed to be used.

  b. Details of vibration monitoring devices and reports.

  c. Details of the means and methods that will be used in monitoring the integrity of the support system during its entire period of use to insure the safety of the excavation.

  d. Complete computations of the design of the braced excavation system bearing the seal of the responsible Registered Professional Engineer duly registered licensed to practice within a discipline applicable to excavation work, in the state where the project is located.

  e. Any other pertinent data required for record purposes by the Engineer.

E. Receipt of the information by the Architect will not relieve the contractor of the sole responsibility for the adequacy of the braces excavation system, and for assuring that there will be no resulting damage to adjacent existing pavement, utilities, or structures, and for providing safe conditions within the sheeted areas.

F. Further for the record, upon completion of the work of this section, the contractor shall submit three copies of all records of survey, vibration monitoring and inspection of existing structures to the Architect.

G. Work shall not be started until all materials and equipment necessary for construction are either on the site of the work or satisfactorily available for immediate use as required.

H. The sheeting shall be sufficiently tight to minimize any resulting lowering of the groundwater level outside the excavation.

I. The sheeting shall be driven by approved means to the design elevation. No ends or edges of sheeting shall be left exposed in a manner, which could create a possible had to safety of the public or a hindrance to traffic of any kind.

J. The satisfactory construction and maintenance of the excavation support system, complete in place, shall be the responsibility of the contractor.

3.08 SUBGRADE PREPARATION

A. Bring all areas to required subgrade levels as specified and as determined from the Drawings.

B. Maintain all subgrades for site improvements in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. In areas to receive pavement or other surface materials, at top and bottom of embankments, along swales and elsewhere, place sufficient grade stakes to facilitate checking the subgrade levels. Correct all irregularities, compacting thoroughly any fill materials.

C. Check all manhole covers, grates, valve boxes and similar structures for correct elevation and position and make, or have made any necessary adjustments in such structures.

D. All subgrades must be inspected and approved by the Architect before site improvements are made.

E. The asphalt, topsoil/subsoil, root balls, organic soil, existing fill, and other deleterious matter shall be entirely removed from within the proposed building footprint.

F. Topsoil/subsoil, asphalt, organic material, root balls, and other deleterious material shall be entirely removed from within the paved areas.

G. Tree stumps, root balls, and roots larger than ½ inch in diameter shall be removed and the cavities shall be filled with Structural Fill within the building footprint and Ordinary Fill beneath the subbase layer within paved areas.

H. The base of the footing excavations in the natural soil shall be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.

I. The subgrades of slabs and paved areas in the natural soil shall be compacted with a heavy vibratory roller compactor imparting a dynamic effort of at least 40 kips.

J. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic soil should be removed and replaced with Structural Fill within the building and with Ordinary Fill beneath the subbase of paved areas

K. Due to the high susceptibility of the natural soil for disturbance under foot and vehicular traffic, a minimum of 12 inches of Structural Fill shall be placed under footings on top of the natural soil to provide a firm working surface during placement of formwork and rebar.

L. Fill placed within the footprint of the proposed building shall meet the gradation and compaction requirements of Structural Fill.

M. Fill placed under the subbase of paved areas, shall meet the gradation and compaction requirements of Ordinary Fill.

N. Fill placed in the top 12 inches beneath sidewalks shall consist of Structural Fill with less than 5 percent fines.

O. When crushed stone is required in the drawings or it is used for the convenience of the contractor, it shall be wrapped in a geotextile fabric for separation.

P. The bottom of footings bearing in bedrock shall be prepared as level as possible and shall not be sloped steeper than 12H:1V. [ADD2]

Q. Granular fill shall not be placed directly on rock surfaces containing voids. Suitably sized crushed stone or a geotextile for separation shall be placed on the fractured surface prior to placing the fill to limit migration of smaller particles into the voids. [ADD2]

3.09 PROTECTION, SHORING AND DEWATERING

A. Protect open excavations with steel plates, fencing, warning lights and other suitable safeguards.

B. Provide all pumps and pumping facilities to keep all excavations free from water from whatever source at all times, when work is in progress.

C. The contractor shall comply with the Town of Maynard Stormwater Management Bylaws, Drainage System Bylaws and MS-4 General Permit requirements as enforced by the Maynard Department of Public Works.

D. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of groundwater and surface water in excavated areas and adjacent properties.

E. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. The flows of all water resulting from pumping shall be managed so as not to cause erosion, siltation of drainage systems, or damage to adjacent property.

F. The groundwater level shall me maintained at 12 inches beneath the bottom of excavation or deeper until the excavation is backfilled to at least 2 feet above the groundwater level.

G. Damage resulting from the failure of the dewatering operations of the Contractor, and damage resulting from the failure of the Contractor to maintain all the areas of work in a suitable dry condition, shall be repaired by the Contractor, as directed by the Engineer, at no additional expense to the Owner. The Contractor's pumping and dewatering operations shall be carried out in such a manner as to prevent damage to the Contract work and so that no loss of ground will result from these operations. Precautions shall be taken to protect new work from flooding during storms or from other causes. Pumping shall be continuous to protect the work and/or to maintain satisfactory progress.

H. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water from the trenches, excavations, and stormwater management operations shall be disposed of in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

I. The Contractor shall excavate interceptor swales and ditches, as necessary, prior to the start of major earthmoving operations to reduce the potential for erosion and to keep areas as free from surface and ponded water as possible. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

J. Should surface, rain or groundwater be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties for such water. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

K. The presence of groundwater or stormwater in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation

3.10 DUST CONTROL

A. Comply with 310 CMR 7.09 “Dust, Odor, Construction and Demolition” of the Commonwealth of Massachusetts.

B. Maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas free from dust which would cause the standards of air pollution to be exceed or case a hazard or nuisance to others.

C. Take necessary measures to control dust resulting from construction operations and do prevent spillage of material on public roads and streets.

D. Provide wet machine sweeping of street surfaces after each workday or as needed to minimize dust and sediment.

3.11 MAINTENANCE

A. Protection of graded areas: protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning compacted areas: where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add fill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

E. Unless directed otherwise by the Town of Maynard Department of Public Works, erosion control measures shall be maintained, inspected, repaired as required by the Architect or Department of Public Works representative and left in place.

3.12 RUBBISH REMOVAL

A. The General General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION

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Memorandum

To: *Chris LeBlanc*

From: *Christopher Treiling*

Reviewed By: *Jagrut Jathal, P.E.*

Date: *February 01, 2024*

Subject: *Geothermal Test Loop Installations and Formation Thermal Properties Testing*
Green Meadow Elementary School
Maynard, Massachusetts
CDM Smith Project No. 292999

Introduction

This memorandum presents the results of the Geothermal Test Loop Installation and Formation Thermal Properties Testing that were performed at the site of the proposed Green Meadows Elementary School Project, located in Maynard, Massachusetts.

Vertical closed-loop geothermal ground heat exchangers (test loops) were installed and thermally tested at one location to characterize the subsurface conditions and to generate data for the system design. The test loops are located within a field behind the current Green Meadow Elementary School. The field behind the school is currently owned by the town of Maynard Department of Public Works. The ground surface elevation rises gradually from the Southeast corner of the lot at about El. 213 to the Northwest corner of the lot at about El. 215.

CDM Smith Inc. coordinated with a drilling subcontractor and observed the installation of the test loops and formation thermal testing in accordance with our statement of work, and subsequently authorized by Mount Vernon Group Architects on December 18, 2023.

This memorandum presents the geothermal test loop program and the results and conclusions of the formation thermal properties testing relative to the ongoing system design.

Unless otherwise indicated, elevations (El.) noted herein are in feet and referenced to the North American Vertical Datum of 1988 (NAVD 88).

Purpose and Scope of Work

The purpose of installing test loops are to establish the geologic profile, thermal properties, and drilling conditions of the subsurface materials in which the full production borefield(s) will be constructed. Useful constructability information to be gathered includes depth to bedrock, rock fractures, groundwater production, and borehole stability. The depth to bedrock is critical for accurate construction cost estimating as it determines how much steel casing is needed per borehole/loop.

The thermal testing is necessary to obtain the aggregate thermal properties of the earth materials that are input to the borefield modeling and used to determine the borefield size (i.e., total length of loop piping needed) thus cost. The volume of groundwater produced that needs to be managed and disposed is a key cost consideration for drilling geothermal borefields.

The characteristics and depths of the geologic materials inferred to exist beneath the borefield area, and groundwater-producing conditions, were unknown prior to implementing this program. Additionally, subsurface conditions could vary substantially from one area to another, even between individual drilling locations within a borefield. Therefore, a test loop was installed at opposite corners of the proposed borefield to address these unknowns. Through this process, Mount Vernon Group will be able to obtain more competitive, accurate construction bids and with a lower risk of change orders. Finally, the test loops will be converted into final system production loops during full borefield development.

CDM Smith's scope of work included the following tasks:

- Developed specifications for the drilling and installation of the geothermal test loops and formation thermal testing (for thermal conductivity, thermal diffusivity and borehole thermal resistance),
- Engaged a geothermal drilling subcontractor and coordinated with the project team to execute the test loop program,
- Provided oversight during the geothermal test loop installations and the formation thermal testing,
- Prepared test loop logs, including data and field observation of the overburden and rock formations encountered, estimate of groundwater production rate, rate of penetration, grouting information, etc. for future loop field construction as part of Contract Documents, and
- Prepared this memorandum summarizing the geothermal test loop program and results of the formation thermal testing.

Attachments A, B and C accompanying this memorandum contain the following information, respectively, the test loop logs, grout thermal conductivity testing results, and the formation thermal properties testing reports prepared by Geothermal Resources Technologies, Inc. (GRTI).

Geothermal Test Loop Program

CDM Smith engaged Skillings and Sons, Inc. (Skillings) geothermal drilling contractor of Amherst, New Hampshire, to install two (2) geothermal test loops and conduct formation thermal testing of each completed loop. The drilling and loop installation work was performed between December 20, 2023, and December 27, 2023, and the thermal testing between January 2, 2024, and January 4, 2024. The test loop locations are shown on **Figure 1** and the loops are identified as:

- TB-1 – Located at the Southeast corner of the field behind the school.
- TB-2 – Located at the Northwest corner of the field behind the school.

General Procedures

This subsection outlines the general procedures used at each of the two test loop locations. Data specific to each test loop installation are presented separately in the following two subsections.

Skillings utilized two different drilling methods during this program. Air rotary casing hammer (ARCH) drilling was used to penetrate the full thickness of the unconsolidated geologic materials ("overburden") and a short distance into the underlying bedrock. Skillings used a 6-½" wing bit attached to nominal 3" diameter threaded steel drill rods in 20-foot sections. The wing bit was inserted into the 6-¼" permeant steel casing prior to the initiation of drilling to allow for a simultaneous installation of the casing. Skillings drilled into the top of the bedrock formation until reaching bedrock that was competent enough to support the permanent steel casing from the bottom of the bedrock "socket" up to the surface.

Following installation of the casing, Skillings advanced the borehole deeper in the bedrock using the air rotary drilling method. The drill tooling included a 5.6" diameter carbide button bit with downhole percussion hammer attached to drill rods. Compressed air is blown down the drill rods, reverses flow at the bottom and is used as a medium to carry bedrock cuttings and groundwater infiltrating into the borehole from fractures in the bedrock from the bottom of the borehole out of the top of the casing. Steel casing is not needed to support the borehole as long as the rock is competent, i.e., can remain self-supporting for as long as needed to install and grout in the test loop, which was the case for both test holes.

The groundwater volume produced from the bedrock during drilling was recorded on the test loop log as an estimate of the rate of water exiting the borehole at various depths. Both information on groundwater level and water production rate during drilling are reported in the test loop logs included in **Attachment A**.

TB-1 and TB-2 were each drilled to a depths of 605 feet below ground surface (bgs) respectively. In each borehole, Skillings installed a high-density polyethylene (HDPE) 1.25-inch diameter DR11 U-Bend to drill depth and backfilled the borehole with thermally-enhanced bentonite grout with a target thermal conductivity (TC) of 1.4 Btu/hr-ft-°F. The test loop logs showing construction at each location are included in **Attachment A.** Skillings collected a test specimen of the grout used for test borehole TB-1 and sent the sample to the product manufacturer (GeoPro, Inc.) for TC testing to confirm compliance with the test loop specifications.

A pressure test was conducted on each test loop to assess the integrity of the U-Bend assembly after installation. All pressure test results complied with project specifications. In addition, after flushing each loop with 35 GPM for approximately 15 minutes, flow tests were conducted on each installed test loop at various flow rates ranging from 5 to 15 gallons per minute (GPM) to ensure the U-Bends were free of obstructions or kinks. All flow tests showed the loops to be in compliance with specifications. Supply and return pressures were determined using a liquid filled pressure gauge with precision to nearest 2 psi.

Test Loop TB-1 Installation

Skillings advanced TB-1 through the overburden and into bedrock to a depth of 40 feet bgs using the ARCH drilling method and installed the steel casing into bedrock socket to a depth of 40 feet bgs. Weathered rock was encountered at approximately 5 ft bgs and competent bedrock was encountered at approximately 18 ft bgs at this location. Skillings then advanced TB-1 through the rock from 40 feet bgs to 605 feet bgs using air rotary drilling. During the drilling operation penetration rates varied from 1.6 – 3.2 ft/min. The TB-1 test loop log is in **Attachment A.**

Skillings encountered challenging grouting conditions at TB-1, stemming from formation loss. After initiating the grouting operation and pumping the designated number of batches into the borehole without any discernible grout return, Skillings took proactive measures. To address the issue of excessive grout loss, 2 bags of ¾-inch bentonite chips were introduced with the intention of effectively sealing the problematic zone. After a brief waiting period, Skillings resumed the grouting operation, resulting in the visible emergence of grout at the surface. However due to continued grout settlement, Skillings topped off TB-1 with additional ¾-inch bentonite chips. The grout test results showed a TC of 1.510 Btu/hr-ft-°F, which complied with project specifications. GeoPro's test results are included in **Attachment B.**

The pressure test was conducted at 100 pounds per square inch (psi) and held for a duration of 1 hour. The final pressure was 103 psi at the end of the test, with a pressure increase of 3.0% over a duration of 1 hour which complies with the project specifications. A leak testing typically requires no more than 5% pressure drop over a 60-minute testing period to pass the test. The flow test results on TB-1 are summarized in **Table 1**.

Table 1 TB-1 Flow Test Data

Flow Rate (GPM)	Pressure Supply (psi)	Pressure Return (psi)	Δ Pressure Measured (psi)	Δ Pressure Calculated (psi)
5	48.0	44.0	4.0	3.0
10	46.0	35.0	11.0	9.9
15	41.0	19.0	22.0	20.1

Test Loop TB-2 Installation

Skillings advanced TB-2 through the overburden and into bedrock to a depth of 40 feet bgs using the ARCH drilling method and installed the steel casing into the bedrock socket to a depth of 40 feet bgs. Weathered rock was encountered at approximately 5 ft bgs and bedrock was encountered at approximately 18 ft bgs at this location. Skillings then advanced TB-2 through the rock from 40 feet bgs to 605 feet bgs using air rotary drilling. During the drilling operation penetration rates varied from 1.6 – 3.9 ft/min. The TB-2 test loop log is in **Attachment A.** Similar to TB-1, Skillings encountered challenging grouting conditions at TB-2, stemming from formation loss.

The pressure test was conducted at 100 pounds per square inch (psi) and held for a duration of 1 hour. The final pressure was 101 psi at the end of the test, with a pressure increase of 1.0% over a duration of 1 hour, which complies with the project specifications. The flow test results on TB-2 are summarized below in **Table 2**.

Table 2 TB-2 Flow Test Data

Flow Rate (GPM)	Pressure Supply (psi)	Pressure Return (psi)	Δ Pressure Measured (psi)	Δ Pressure Calculated (psi)
5	20.2	16.5	3.5	3.0
10	32.0	22.0	10.0	9.9
15	42.0	22.0	20.0	20.1

Subsurface Conditions

CDM Smith previously conducted geologic due diligence in planning for the test loops. The following references were reviewed for the surficial geology (i.e., overburden) and bedrock geology:

- U.S. Geological Survey "Surficial Materials Map of the Maynard Quadrangle, Massachusetts," compiled by Stone, J.R. and Stone, B.D., 2018, Scientific Investigation Map 3402, Quadrangle 97 - Maynard (Surficial Geologic Map).
- U.S. Geological Survey "Bedrock Geologic Map of Massachusetts," compiled by Zen, E., Goldsmith, R., Ratcliffe, N.M., Robinson, P., Stanley, R.S., Hatch, N.L., Shride, A.F., Weed, E.G.A., and Wones, D.R. (Bedrock Geologic Map).

We also consulted with our drilling contractor, Skillings, regarding their prior well drilling experience within the project site area.

Surficial Geology

The Surficial Geologic Map, shown in **Figure 2,** indicates that the mapped surficial geologic materials in the vicinity of the test site consist of coarse deposits and thin glacial outwash deposits. A summary of each geologic material and its respective drillability is as follows:

- Coarse Deposits - Predominantly gravel, sand and gravel, and sand deposits and may also include some silt and clay, generally easy to drill..
- Thin Glacial Outwash Deposits - Predominantly nonsorted and nonstratified matric of sand, some silt and clay. May also contain cobbles, boulders, and gravel. outwash deposited by the melting glacier, generally easy to drill.

Based on the material excavated during the soft digging effort, a 0.5- to 1-foot-thick layer of Topsoil may be encountered at the ground surface. Coarse or thin glacial outwash deposits underlie the Topsoil stratum.

Bedrock Geology

The Bedrock Geologic Map, shown in **Figure 3,** indicates that the rock formation in the general vicinity of the test loops is the Andover Granite which consists of light to medium gray, medium to coarse grained, muscovite-biotite Granite. This formation is known to intrude the nearby Nashoba Formation. These intrusions are generally small features and are not well mapped.

Formation Thermal Properties Testing

Procedures

Skillings conducted formation thermal conductivity testing at TB-2 during the period from January 02 to January 04, 2024. Skillings performed the testing using a formation thermal conductivity (FTC) unit provided by Geothermal Resources Technologies, Inc. (GRTI), the firm that analyzed the data. GRTI's testing procedures meet or exceed the standards of the American Society of Heat, Refrigeration, and Air-Conditioning Engineers, Inc. (ASHRAE) and the International Ground Source Heat Pump Association (IGSPHA).

The test loop assemblies were topped off with water before the start of the test, which was circulated to remove air. The test loop assemblies were then connected to the FTC unit and insulation was installed on the exposed well pipes. The heating elements and data acquisition device were activated and ran continuously for approximately 48 hours using a generator. Upon completion of the testing, the FTC unit was removed and returned to GRTI for analysis.

GRTI used the line source method of analysis to determine the formation thermal conductivity. The average temperature of the water entering and exiting the test loop was recorded for the analysis. Information regarding the calculation of the different thermal properties can be found within GRTI's reports included in **Attachment C.**

Results

The results of the formation thermal conductivity, formation thermal diffusivity and undisturbed formation temperature range are summarized in **Table 4** below and can be found in the GRTI reports included in **Attachment C**.

Table 4 Summary of Formation Thermal Properties Test Results

Parameter	Test Borehole Number
	TB-2
Formation Thermal Conductivity	1.93 Btu/hr-ft-°F
Formation Thermal Diffusivity	1.34 ft^2/day
Average Heat Capacity	34.6 Btu/ ft^3-°F
Undisturbed Formation Temperature Range	50.3 – 52.6 °F

Conclusions

Observations made during drilling of the two test loops indicate that the geological conditions are consistent with what was inferred from CDM Smith's previous due diligence. The overburden which extended to depths of 18 feet and consisted of topsoil underlain by silty sand and gravel underlain by weathered rock. Competent granite bedrock was encountered beneath the weathered rock and extended to the test loop termination depth at each test loop location.

Other conclusions relevant to the system design and full-scale borefield construction are as follow:

- Fractures within the bedrock at TB-1 and TB-2 produced moderate but manageable groundwater volumes.
- Bedrock fracture across the project site is assumed variable leading to different grout loss in formations and can lead to increased grout costs.
- The depth to bedrock across the site is shallow and generally consistent which will help to reduce the steel casing installation costs.
- Bedrock fracture patterns across the project site is assumed variable leading to different groundwater volumes across the site.
- A moderate number of boulders were encountered within the overburden during the drilling operation, however, did not create issues or delays during drilling.

This memorandum has been prepared exclusively for Mount Vernon Group Architects for the Green Meadow Elementary School project as understood at the time of the geothermal test loop program. The drilling conditions are only known at the test loop locations and may vary significantly at other locations. These variations will not become evident until drilling during construction.

This memorandum has been prepared in accordance with generally accepted engineering practices. No other warranty, express or implied, is made.

Attachments

Figure 1 – Test Loop Location Plan
Figure 2 – Surficial Geologic Map
Figure 3 – Bedrock Geologic Map

Attachment A – Test Loop Logs
Attachment B – Grout Thermal Conductivity Reports
Attachment C – GRTI Reports

Cc: Vincent Salvaggio, Robert Button

Figures

Legend:

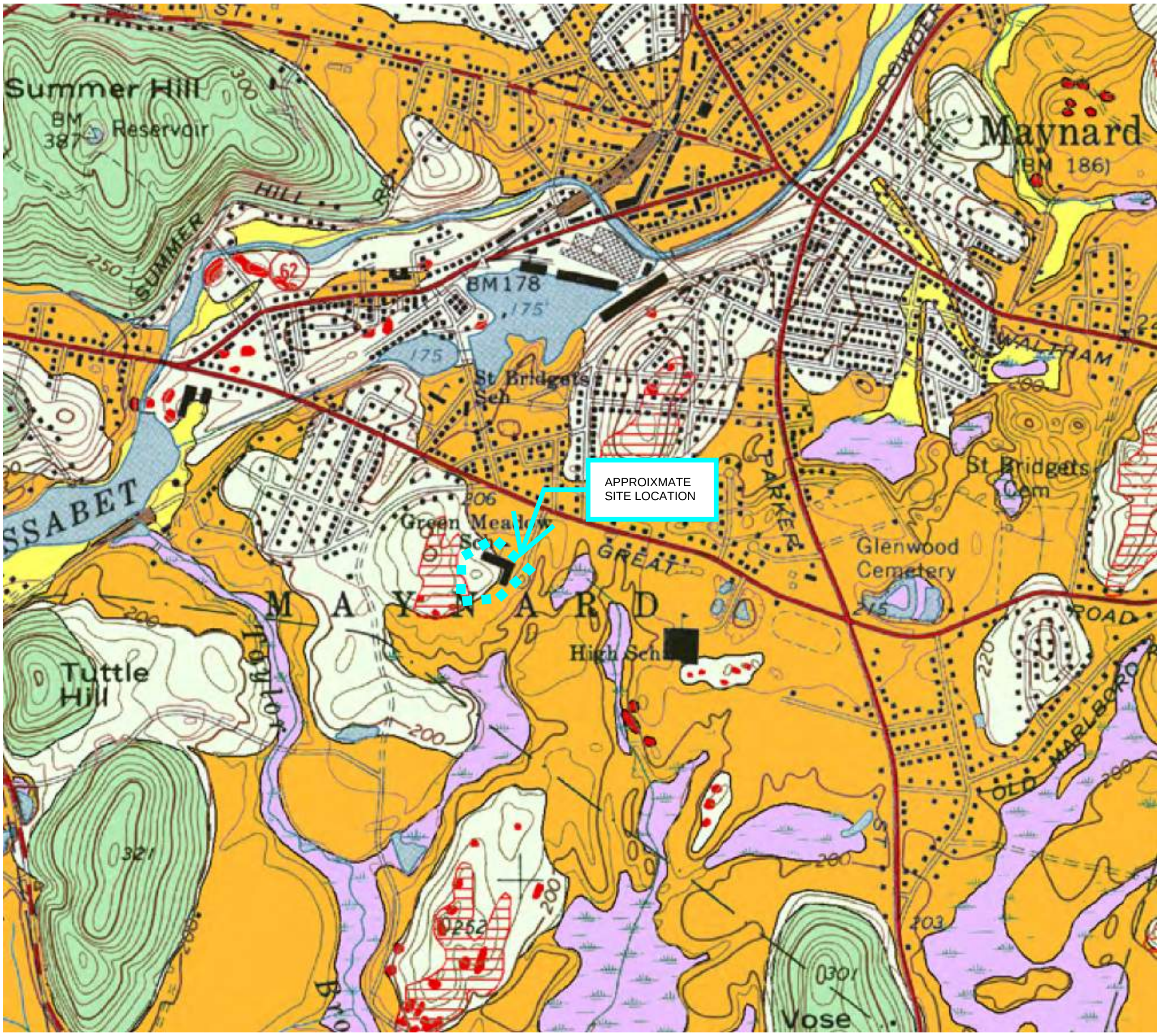
⊕ DESIGNATION AND APPROXIMATE LOCATION OF TEST BOREHOLE DRILLED BY SKILLINGS & SONS BETWEEN DECEMBER 20, 2023 AND DECEMBER 22, 2023.

REFRENCE: GOOGLE EARTH PRO.

CDM Smith®

Geothermal Test Loop Installations and Formation
Thermal Properties Testing,
Green Meadow Elementary School,
Maynard, Massachusetts

FIGURE 1
TEST BOREHOLE LOCATION PLAN



APPROIXMATE
SITE LOCATION

Legend:

🟧 **Coarse deposits** consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

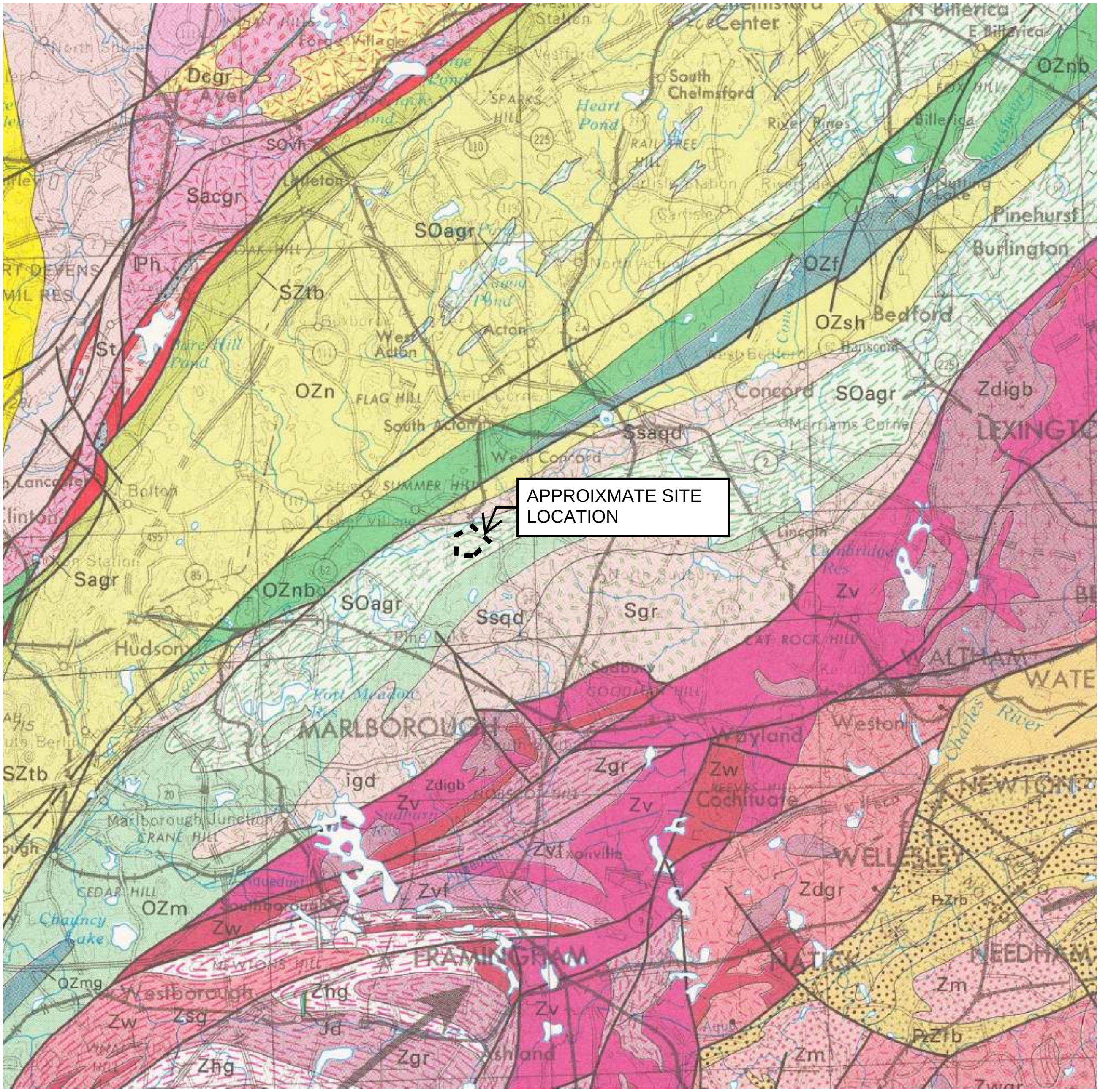
🟩 **Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts; large surface boulders are common; unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas

REFRENCE: FIGURE BASED ON A DRAWING TITLED: "SURFICIAL MATERIALS MAP OF THE MAYNARD QUADRANGLE, MASSACHUSETTS," COMPILED BY STONE, J.R. AND STONE, B.D. FOR U.S. GEOLOGICAL SURVEY, 2018, SCIENTIFIC INVESTIGATION MAP 3402, QUADRANGLE 97-MAYNARD

CDM Smith®

Geothermal Test Loop Installations and Formation
Thermal Properties Testing,
Green Meadow Elementary School,
Maynard, Massachusetts

FIGURE 2
SURFICIAL GEOLOGIC MAP



Legend:

SOagr	Andover Granite (Silurian or Ordovican - Light- to medium-gray, foliated, medium- to coarse-grained muscovite-biotite granite; pegmatite masses common. Includes Acton Granite (Silurian Ordovican). Intrudes OZn

REFRENCE: FIGURE BASED ON A DRAWING TITLED: ""BEDROCK GEOLOGIC MAP OF MASSACHUSETTS," COMPILED BY ZEN, E., GOLDSMITH, R., RATCLIFFE, N.M., ROBINSON, P., STANLEY, R.S., HATCH, N.L., SHRIDE, A.F., WEED, E.G.A., AND WONES, D.R. FOR THE DEPARTMENT OF THE INTERIOR, UNITED STATES GEOLOGIC SURVEY

CDM Smith®	Geothermal Test Loop Installations and Formation Thermal Properties Testing, Green Meadow Elementary School, Maynard, Massachusetts	FIGURE 3 BEDROCK GEOLOGIC MAP

Attachment A

Test Loop Logs

CDM Smith

Geologic/Geothermal Test Loop Installation Log

Client	Mount Vernon Group Architects	**Drilling Contractor**	Skillings & Sons	**Loop No.**
Project Name	Green Meadow Elementary Schools	**Driller/Crew**	Justin Skillings & helper	TB-1
Project Location	Maynard, Massachusetts	**Drill Rig Make/Model**	Reichdrill RTD69TW	
Project Number	292999	**Drilling Method(s)**	Air Hammer	

Depth (ft-bgs)	Strata Depth (ft-bgs)	Strata	Groundwater Produced (GPM)	Drilling Method - Drill Rate (ft/min)
	5	Overburden	<5	0-20': AH - 3.2
	18	Weathered Rock	<5	20-40': AH - 1.8
		Granite	<5	40-60': AH - 2.3
			<5	60-80': AH - 2.5
100			10	80-100': AH - 2.1
			10	100-120': AH - 2.3
			10	120-140': AH - 2.5
			15	140-160': AH - 2.8
			15	160-180': AH - 2.8
200			15	180-200': AH - 2.4
			15	200-220': AH - 2.4
			20	220-240': AH - 2.1
			20	240-260': AH - 2.0
			20	260-280': AH - 1.9
300			20	280-300': AH - 1.9
			20	300-320': AH - 2.0
			20	320-340': AH - 2.2
			25	340-360': AH - 1.8
			25	360-380': AH - 1.8
400			25	380-400': AH - 1.6
			25	400-420': AH - 1.7
			30	420-440': AH - 1.6
			30	440-460': AH - 1.7
			30	460-480': AH - 1.8
500			30	480-500': AH - 1.7
			30	500-520': AH - 1.6
			30	520-540': AH - 1.7
			30	540-560': AH - 1.7
			30	560-580': AH - 1.8
600	605		30	580-600': AH - 1.9
	Bottom of Borehole at 605 ft bgs			
700				

Borehole Drilling

Ground Surface Elevation	+210.0		ft
Borehole Drill Depth	600 /	-390	ft-bgs/Elev
Top of Bedrock	18 /	192	ft-bgs/Elev
Casing Diameter / Installed Depth	6.25 in./	40 / 170.0	ft-bgs/Elev
Casing Left in Ground	☑ Yes		☐ No
Depth to Groundwater	NR /	NR	ft-bgs/Elev
Date(s) Drilled/Observed By	12/20/2023 /		CRT

Loop Installation

Loop Type, DR	U-Bend DR 11 HDPE	
Loop Diameter	1.25	in
Installed Loop Depth	600	ft-bgs
Borehole Diameter	5.625	in
Borehole Volume	105 / 787	cf/gal
Date Installed / Observed By	12/21/2023 /	CRT

Grouting

Water	49.5	gal/batch
GeoPro TG Select	150	lbs/batch
PowerTec	64	lbs/batch
Sand	NA	lbs/batch
Batch Yield	59.7	gal/batch
Total No. Batches	23	
Target Thermal Conductivity	1.4	Btu/hr-ft-°F
Tremie Tube Diameter	1	(in)
Tremie Tube Embedment	550	(ft-bgs)
Grout Return at Surface	☑ Yes	☐ No
Grout Sample Collected	☑ Yes	☐ No
Date Grouted / Observed By	12/27/2023 /	HAQ

Additional Remarks

1) ARCH denotes air rotary casing hammer. AH denotes air hammer drilling methods.

2) 5.625" button bit used for AH bedrock drilling

3) Overburden material generally consisted of Redish-Brown Silty Sand with cobbles and boulders.

4) Ground surface elevation approximate obtained from google earth pro

5) Due to grout loss in formation, 3 bags of bentonite used to seal zone and top off test well.

CDM Smith

Geologic/Geothermal Test Loop Installation Log

Client	Mount Vernon Group Architects	**Drilling Contractor**	Skillings & Sons	**Loop No.**
Project Name	Green Meadow Elementary Schools	**Driller/Crew**	Justin Skillings & helper	TB-2
Project Location	Maynard, Massachusetts	**Drill Rig Make/Model**	Reichdrill RTD69TW	
Project Number	292999	**Drilling Method(s)**	Air Hammer	

Depth (ft-bgs)	Strata Depth (ft-bgs)	Strata	Groundwater Produced (GPM)	Drilling Method - Drill Rate (ft/min)
	5	Overburden	<5	0-20': ARCH - 3.9
	18	Weathered Rock	<5	20-40': ARCH - 1.6
		Granite	<5	40-60': ARCH - 2.4
			<5	60-80': ARCH - 2.6
100			10	80-100': ARCH - 2.3
			10	100-120': AH - 2.2
			10	120-140': AH - 2.6
			15	140-160': AH - 2.6
			15	160-180': AH - 2.5
200			15	180-200': AH - 2.4
			15	200-220': AH - 2.4
			20	220-240': AH - 2.2
			20	240-260': AH - 2.1
			20	260-280': AH - 2.1
300			20	280-300': AH - 2.4
			20	300-320': AH - 2.2
			20	320-340': AH - 2.0
			25	340-360': AH - 2.4
			25	360-380': AH - 1.9
400			25	380-400': AH - 2.3
			25	400-420': AH - 1.9
			30	420-440': AH - 1.8
			30	440-460': AH - 1.9
			30	460-480': AH - 2.0
500			30	480-500': AH - 2.1
			30	500-520': AH - 2.4
			30	520-540': AH - 1.9
			30	540-560': AH - 1.8
			30	560-580': AH - 1.6
600	605		30	580-600': AH - 1.6
	Bottom of Borehole at 605 ft bgs			
700				

Borehole Drilling

Ground Surface Elevation	+215.0		ft
Borehole Drill Depth	600 / -385		ft-bgs/Elev
Top of Bedrock	18 / 197		ft-bgs/Elev
Casing Diameter / Installed Depth	6.25 in./ 40 / 175.0		ft-bgs/Elev
Casing Left in Ground	☑ Yes	☐ No	
Depth to Groundwater	NR / NR		ft-bgs/Elev
Date(s) Drilled/Observed By	12/21/2023 / CRT		

Loop Installation

Loop Type, DR	U-Bend DR 11 HDPE	
Loop Diameter	1.25	in
Installed Loop Depth	600	ft-bgs
Borehole Diameter	5.625	in
Borehole Volume	105 / 787	cf/gal
Date Installed / Observed By	12/23/2023 / CRT	

Grouting

Water	49.5	gal/batch
GeoPro TG Select	150	lbs/batch
PowerTec	64	lbs/batch
Sand	NA	lbs/batch
Batch Yield	59.7	gal/batch
Total No. Batches	27	
Target Thermal Conductivity	1.4	Btu/hr-ft-°F
Tremie Tube Diameter	1	(in)
Tremie Tube Embedment	550	(ft-bgs)
Grout Return at Surface	☑ Yes	☐ No
Grout Sample Collected	☐ Yes	☑ No
Date Grouted / Observed By	12/27/2023 / HAQ	

Additional Remarks

1) ARCH denotes air rotary casing hammer. AH denotes air hammer drilling methods.

2) 5.625" button bit used for AH bedrock drilling

3) Overburden material generally consisted of Redish-Brown Silty Sand with cobbles and boulders.

4) Ground surface elevation approximate obtained from google earth pro

5) Due to grout loss in formation, 3 bags of bentonite used to seal zone and top off test well.

Attachment B

Grout Thermal Conductivity Reports

GeoPro, Inc.
PO Box 136 | Elkton, SD 57026
Phone: 877.580.9348 | Fax: 877.580.9371

January 31, 2024

Skillings and Sons
Attn: Jared Mullen
9 Columbia Drive
Amherst, NH 03031
Phone: 603-235-4533
Fax:

RE: Thermal Grout Thermal Conductivity Analysis Report

Thank you for participating in this "field quality control" program for the various Thermal Grout products. The objective of this analysis is to offer an unbiased verification of the thermal conductivity of the field mixed material. This analysis is intended to help ensure proper performance of the grouting material and that proper mixing procedures are consistently being followed throughout the project. It is recommended that, at a minimum, three separate analyses be performed on each commercial project.

Based on information supplied on the "Test Information Form" that accompanied the sample container, the tested specimen was collected on the following date from the following project:

Sample Received by Lab: January 9, 2024
Sample Collection Date: December 27, 2023
Project Name: Green Meadow: TB-1
City, State: Maynard, MA

GeoPro, Inc. tests in accordance to ASTM D-5334 to determine thermal conductivity of fully hydrated grout specimens. Our analysis indicated that the thermal conductivity value of the specimen supplied from the project referenced above was as follows:

Thermal Conductivity: **1.510** Btu/hr-ft-°F = 2.613 W/m-°K

If this value is lower than expected, please contact GeoPro, Inc. immediately at (605) 542-7391 to discuss possible reasons for a discrepancy and possible remedies.

We at GeoPro, Inc. believe that our combined efforts to provide this project with a high quality, high performance grouting material helps to build confidence in ground-source heat pump applications. We believe that increased confidence by all parties involved will help this industry achieve its objective of becoming a "main-stream" technology. Again, thank you for your participation in this program.

If you have any questions regarding this analysis, please contact me at (877) 580-9348 ext 106.

Sincerely,

Tyler Harbeck
GeoPro, Inc.

Attachment C

GRTI Reports

FORMATION THERMAL CONDUCTIVITY

TEST & DATA ANALYSIS

TEST LOCATION **Green Meadow Elementary School**
TB-2
Maynard, MA

TEST DATE January 2-4, 2024

ANALYSIS FOR Skillings & Sons, LLC
9 Columbia Drive
Amherst, NH 03031
Phone: (603) 459-2600

TEST PERFORMED BY Skillings & Sons, LLC

EXECUTIVE SUMMARY

A formation thermal conductivity test was performed on test borehole TB-2 at Green Meadow Elementary School at a GPS location of N 42° 25.347' (latitude), W 71° 27.608' (longitude) in Maynard, Massachusetts. The vertical bore was installed on December 22, 2023 by Skillings & Sons, LLC. Geothermal Resource Technologies' (GRTI) test unit was attached to the vertical bore on the morning of January 2, 2024.

This report provides an overview of the test procedures and analysis process, along with plots of the loop temperature and input heat rate data. The collected data was analyzed using the "line source" method and the following average formation thermal conductivity was determined.

Formation Thermal Conductivity = 1.93 Btu/hr-ft-°F

Due to the necessity of a thermal diffusivity value in the design calculation process, an estimate of the average thermal diffusivity was made for the encountered formation.

Formation Thermal Diffusivity ≈ 1.34 ft^2/day

Bore thermal resistance calculations were made on the test data using the method outlined in the Gehlin Doctoral Thesis[1]. Since the average value listed below was empirically determined from the test data it may not directly correlate with values found in loopfield design programs.

Bore Thermal Resistance = 0.220 hr-ft-°F/Btu

The undisturbed formation temperature for the tested bore was determined from the initial loop temperature data collected at startup.

Undisturbed Formation Temperature ≈ 50.3-52.6°F

The formation thermal properties determined by this test do not directly translate into a loop length requirement (i.e. feet of bore per ton). These parameters, along with many others, are inputs to commercially available loop-field design software to determine the required loop length. Additional questions concerning the use of these results are discussed in the frequently asked question (FAQ) section at www.grti.com.

---

[1] Signhild Gehlin. "Thermal Response Test - Method Development and Evaluation," (Doctoral Thesis, Lulea University of Technology, 2002).

TEST PROCEDURES

The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) has published recommended procedures for performing formation thermal conductivity tests in the ASHRAE HVAC Applications Handbook, Geothermal Energy Chapter. The International Ground Source Heat Pump Association (IGSHPA) also lists test procedures in their Design and Installation Standards. GRTI's test procedures meet or exceed those recommended by ASHRAE and IGSHPA, with the specific procedures described below:

Grouting Procedure for Test Loops – To ensure against bridging and voids, it is recommended that the bore annulus is uniformly grouted from the bottom to the top via tremie pipe.

Time Between Loop Installation and Testing – A minimum delay of five days between loop installation and test startup is recommended for bores that are air drilled, and a minimum waiting period of two days for mud rotary drilling.

Undisturbed Formation Temperature Measurement – The undisturbed formation temperature should be determined by recording the loop temperature as the water returns from the u-bend at test startup.

Required Test Duration – A minimum test duration of 36 hours is recommended, with a preference toward 48 hours**.**

Data Acquisition Frequency - Test data is recorded at five minute intervals.

Equipment Calibration/Accuracy – Transducers and datalogger are calibrated per manufacturer recommendations. Manufacturer stated accuracy of power transducers is less than ±2%. Temperature sensor accuracy is periodically checked via ice water bath.

Power Quality – The standard deviation of the power should be less than or equal to 1.5% of the average power, with maximum power variation of less than or equal to 10% of the average power.

Input Heat Rate – The heat flux rate should be 51 Btu/hr (15 W) to 85 Btu/hr (25 W) per foot of installed bore depth to best simulate the expected peak loads on the u-bend.

Insulation – GRTI's equipment has 1 inch of foam insulation on the FTC unit and 1/2 inch of insulation on the hose kit connection. An additional 2 inches of insulation is provided for both the FTC unit and loop connections by insulating blankets.

Retesting in the Event of Failure – In the event that a test fails prematurely, a retest may not be performed until the bore temperature is within 0.5°F of the original undisturbed formation temperature or until a period of 14 days has elapsed.

DATA ANALYSIS

Geothermal Resource Technologies, Inc. (GRTI) uses the "line source" method of data analysis to determine the thermal conductivity of the formation. The line source method assumes an infinitely thin line source of heat in a continuous medium. A plot of the late-time temperature rise of the line source temperature versus the natural log of elapsed time will follow a linear trend. The linear slope is inversely proportional to the thermal conductivity of the medium. Applying the line source method to a u-bend grouted in a borehole, the test must be run long enough to allow the finite dimensions of the u-bend pipes and the grout to become insignificant. Experience has shown that approximately ten hours is required to allow the error of early test times and the effects of finite borehole dimensions to become insignificant.

In order to analyze real data from a formation thermal conductivity test, the average temperature of the water entering and exiting the u-bend heat exchanger is plotted versus the natural log of elapsed testing time. Using the Method of Least Squares, linear coefficients are then calculated to produce a line that fits the data. This procedure is repeated for various time intervals to ensure that variations in the power or other effects are not producing inaccurate results.

Bore thermal resistance was determined using the formula outlined in Gehlin's Doctoral Thesis[2]. A serial development was used to approximate the exponential integral. The calculated bore resistance applies only to the test conditions, a bore in an operating loopfield could have a significantly different resistance due to changes in the loop fluid temperature, flow rate and presence of antifreeze.

The calculated results are based on test bore information submitted by the driller/testing agency. GRTI is not responsible for inaccuracies in the results due to erroneous bore information. All data analysis is performed by personnel that have an engineering degree from an accredited university with a background in heat transfer and experience with line source theory. The test results apply specifically to the tested bore. Additional bores at the site may have significantly different results depending upon variations in geology and hydrology.

Through the analysis process, the collected raw data is converted to spreadsheet format (Microsoft Excel®) for final analysis. If desired, please contact GRTI and a copy of the data will be made available in either a hard copy or electronic format.

CONTACT: Chad Martin
Regional Managing Engineer
Asheville, NC
(828) 275-7113
cmartin@grti.com

[2] Gehlin, 12-13

TEST BORE DETAILS

(AS PROVIDED BY SKILLINGS & SONS, LLC)

Site Name	Green Meadow Elementary School, TB-2
Location	Maynard, MA
Driller	Skillings & Sons, LLC
Installed Date	December 22, 2023
Borehole Diameter	6-1/4 inches
Casing	Permanent 6 inch steel casing from 0-45 ft
U-Bend Size	1-1/4 inch DR11 HDPE
U-Bend Depth Below Grade	605 ft
Grout Type	GeoPro TG Select/PowerTEC 1.4
Grout Mixture	150 lb TG Select, 64 lb PowerTEC, 48 gal water
Grouted Portion	Entire bore

DRILL LOG

FORMATION DESCRIPTION	DEPTH (FT)
Gravel, light grey and brown, medium and coarse texture	0'-17'
Granite, brown/light grey, coarse texture	17'-605'

Note: Bore produced 10-12 gpm water from 0-100 ft; 35+ gpm from 100-605 ft.

.

THERMAL CONDUCTIVITY TEST DATA

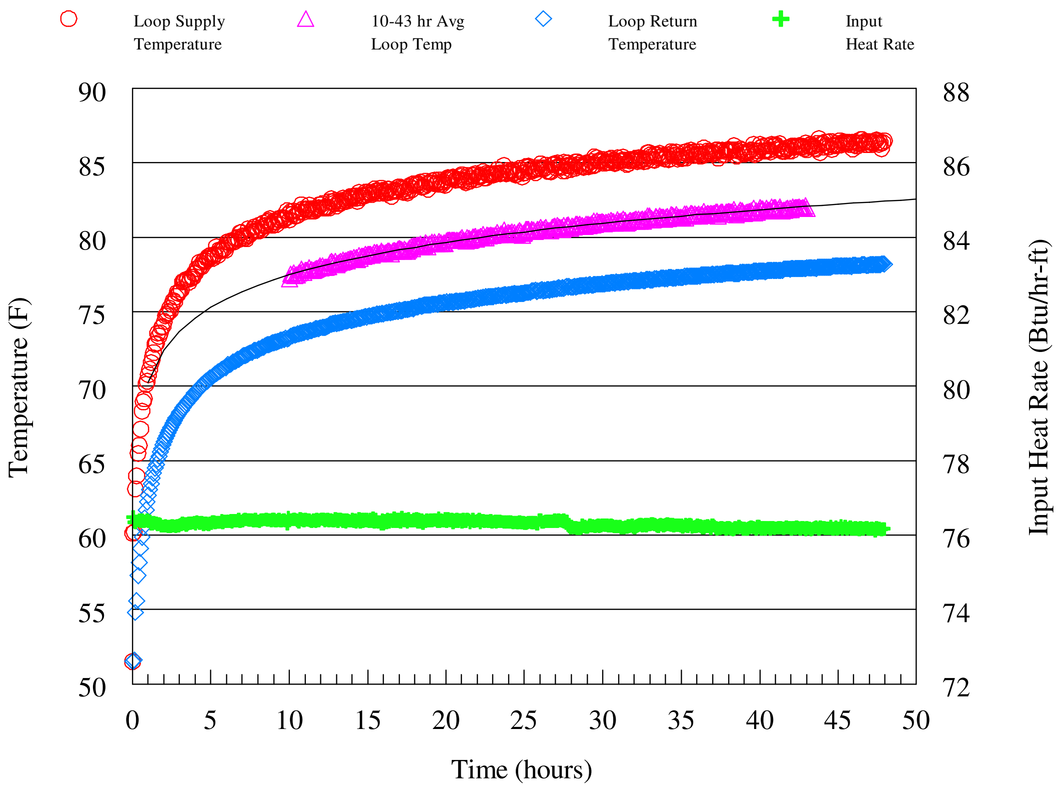


FIG. 1: TEMPERATURE & HEAT RATE DATA VS TIME

Figure 1 above shows the loop temperature and heat input rate data versus the elapsed time of the test. The temperature of the fluid supplied to and returning from the U-bend are plotted on the left axis, while the amount of heat supplied to the fluid is plotted on the right axis on a per foot of bore basis. In the test statistics below, calculations on the power data were performed over the analysis time period listed in the Line Source Data Analysis section.

SUMMARY TEST STATISTICS

Test Date	December 2-4, 2023
Undisturbed Formation Temperature	Approx. 50.3-52.6°F
Duration	47.9 hr
Average Voltage	239.4 V
Average Heat Input Rate	46,169 Btu/hr (13,527 W)
Avg Heat Input Rate per Foot of Bore	76.3 Btu/hr-ft (22.4 W/ft)
Circulator Flow Rate	11.4 gpm
Standard Deviation of Power	0.11%
Maximum Variation in Power	0.22%

LINE SOURCE DATA ANALYSIS

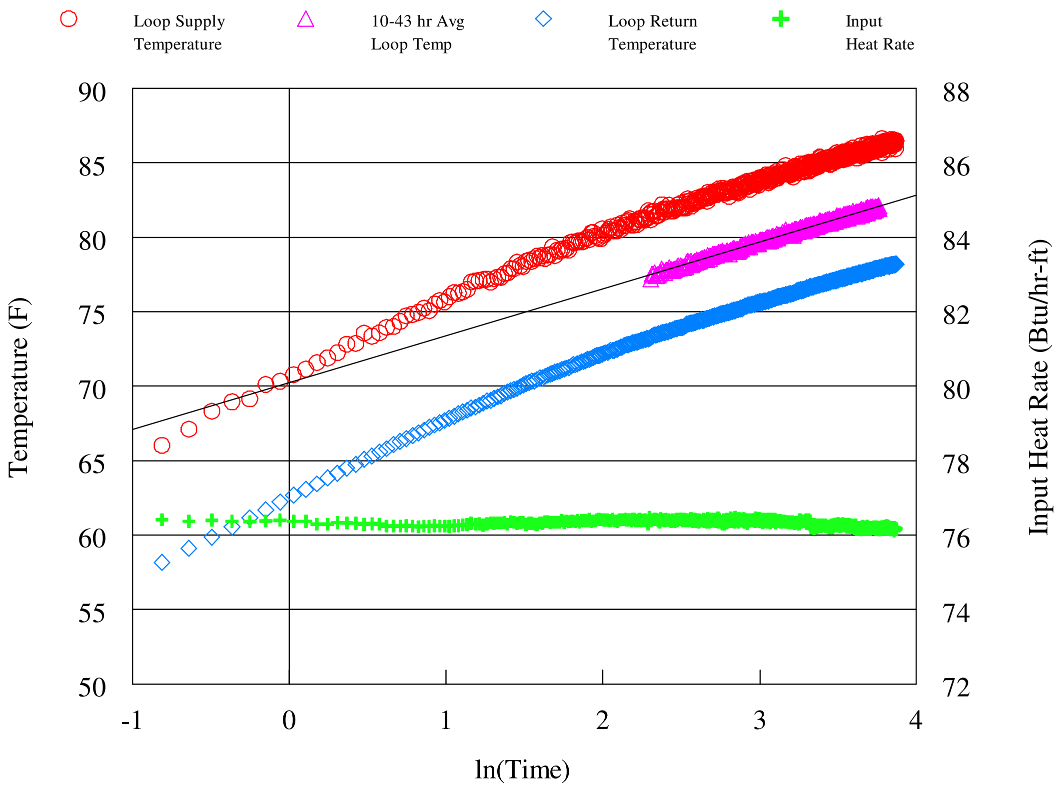


FIG. 2: TEMPERATURE & HEAT RATE VS NATURAL LOG OF TIME

The loop temperature and input heat rate data versus the natural log of elapsed time are shown above in Figure 2. The temperature versus time data was analyzed using the line source method (see page 3) in conformity with ASHRAE and IGSHPA guidelines. A linear curve fit was applied to the average of the supply and return loop temperature data between 10 and 43.0 hours. The slope of the curve fit was found to be 3.15. The resulting thermal conductivity was found to be **1.93 Btu/hr-ft-°F**.

THERMAL DIFFUSIVITY

The reported drilling log for this test borehole indicated that the formation consisted of gravel overburden and granite. An average heat capacity value for granite was calculated from specific heat and density values listed by Kavanaugh and Rafferty[3]. A weighted average of heat capacity values based on the indicated formation was used to determine an average heat capacity of 34.6 Btu/ft^3-°F for the formation. A diffusivity value was then found using the calculated formation thermal conductivity and the estimated heat capacity. The thermal diffusivity for this formation was estimated to be **1.34 ft^2/day**.

---

[3] Stephen P. Kavanaugh and Kevin Rafferty, Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems (Atlanta: ASHRAE, 2014), 75.

BORE THERMAL RESISTANCE

Resistance to heat transfer from a geothermal bore can be viewed as consisting of two components, bore resistance and ground resistance. This relationship is diagrammed in Figure 3, where t_f is the loop fluid temperature, t_b is the bore wall temperature and t_g is the ground temperature. The ground resistance is dependent upon the formation thermal conductivity and diffusivity. Factors that affect bore thermal resistance include the resistance of the pipe material, diameter of the heat exchanger, position of the heat exchanger in the bore, the bore diameter, casing length and type, and the thermal conductivity of the grout/backfill in the bore annulus. A detailed examination of bore resistance is discussed by Kavanaugh and Rafferty[4].

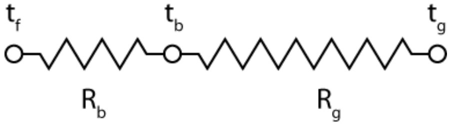


FIG. 3: RESISTANCE DIAGRAM FOR A GEOTHERMAL BORE

Bore thermal resistance calculations were made on the test data according to the formula below as outlined in the Gehlin Doctoral Thesis[5]. The calculated formation thermal conductivity and thermal diffusivity from the Line Source Analysis were used in the formula. The average undisturbed formation temperature of 51.5°F was used and the average bore thermal resistance from 10-43.0 hrs was found to be **0.220 hr-ft-°F/Btu**.

The calculated bore resistances apply only to the test conditions, and a bore in an operating loopfield could have a significantly different resistance due to changes in the loop fluid temperature, flow rate, and presence of antifreeze. Additional information on bore resistance may be found in the study by Oklahoma State University and Oklahoma Gas & Electric where various vertical bore heat exchanger configurations were tested[6].

$$R_b = \frac{H}{Q} * \left\{ T(t) - T_g - \frac{Q}{4\pi\lambda_g H} * \left[Ei\left(\frac{r_b^2}{4\alpha_g t}\right)\right]\right\}$$

Where:	R_b	Borehole thermal resistance (hr-ft-°F/Btu)
	H	Active U-bend depth (ft)
	Q	Average heat injected (Btu/hr)
	$T(t)$	Temperature dependent on time t (°F)
	T_g	Undisturbed ground temperature
	λ_g	Formation thermal conductivity (Btu/hr-ft-°F)
	r_b	Average borehole radius (in)
	α_g	Formation thermal diffusivity (ft^2/hr)

---

[4] Stephen P. Kavanaugh and Kevin Rafferty, Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems (Atlanta: ASHRAE, 2014), pages 58-67.

[5] Gehlin, 12-13.

[6] Beier, R. and Ewbank, G. (2012, August). *In-Situ Test Thermal Response Tests Interpretations, OG&E Ground Source Heat Exchange Study*. Retrieved from http://ghpok.org/

CERTIFICATE OF CALIBRATION

GRTI maintains calibration of the datalogger, current transducer and voltage transducer on a regular schedule. The components are calibrated by the manufacturer using recognized national or international measurement standards such as those maintained by the National Institute of Standards and Technology (NIST).

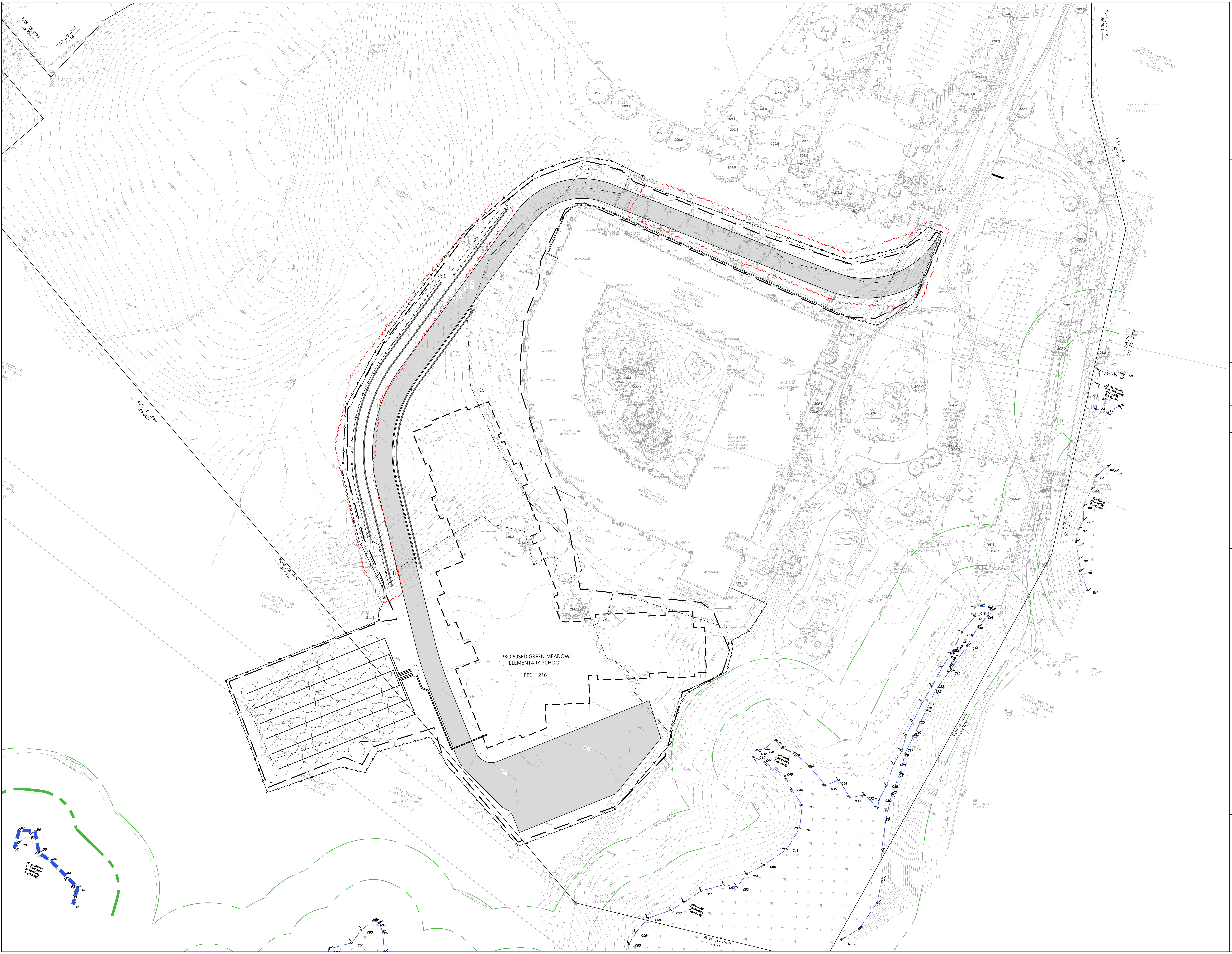
FTC Unit 231

DA Unit 82

Primary Equipment		
Component	Calibration Date	Calibration Due Date
Datalogger	6/2/2023	6/2/2026
Current Transducer	3/15/2023	3/15/2026
Voltage Transducer	3/15/2023	3/15/2026

GRTI periodically verifies the combined temperature sensor/datalogger accuracy via a water bath. Temperature readings are simultaneously taken with a digital thermometer that has been calibrated using instruments traceable to NIST.

Date	11/8/2023	7/5/2023		
Thermocouple 1 (°F)	52.1 52.1 52.2	55.4 55.5 55.6		
Thermocouple 2 (°F)	52.1 52.2 52.3	55.4 55.5 55.6		
Thermocouple 3 (°F)	52.2 52.2 52.3	55.5 55.6 55.7		
Thermocouple 4 (°F)	52.2 52.3 52.4	55.6 55.7 55.8		
Digital Thermometer (°F)	52.3 52.3 52.4	55.6 55.6 55.7		



REVISIONS

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION

TOWN OF MAYNARD

GREEN MEADOW
ELEMENTARY SCHOOL
EARLY SITE
PREPARATION
PACKAGE

5 TIGER DRIVE
MAYNARD, MA 01754

DRAWING TITLE
OVERALL PLAN

264 Exchange Street,
Suite G7
Chicopee, Massachusetts 01013

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413 592 9750 F
info@mvgarchitects.com E

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CIVIL
No. 37458

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C-00

ORIGINAL SHEET IS 30" x 42"

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GENERAL EROSION & SEDIMENTATION CONTROL PLAN NOTES:

1. APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY MARKING THE LIMITS OF CONSTRUCTION ON THE SITE WITH TAPE, SIGNS, OR ORANGE CONSTRUCTION FENCE, SO THAT WORKERS UNDERSTAND THE AREAS TO BE PROTECTED. THE PHYSICAL MARKERS SHALL BE INSPECTED DAILY AND REPAIRED AS NECESSARY THROUGHOUT THE DURATION OF THE PROJECT.
2. PERIMETER SEDIMENT CONTROL SYSTEM SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE AND MAINTAINED TO CONTAIN SOILS ON-SITE. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST NOT BE DISTURBED UNLESS THE APPLICANT HAS OBTAINED PRIOR APPROVAL FROM THE CITY.
3. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA AND STREET SWEEPING OF ADJACENT STREETS AND ROADS SHALL BE INCLUDED WHERE NECESSARY.
4. ALL AREAS OUTSIDE THE SITE SHALL BE PROTECTED FROM SEDIMENT.
5. MONITORING AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE COURSE OF CONSTRUCTION SHALL BE REQUIRED. SEDIMENT SHALL BE REMOVED ONCE THE VOLUME REACHES $\frac{1}{4}$ TO $\frac{1}{2}$ THE HEIGHT OF THE EROSION CONTROL.
6. DIVERT RUNOFF FROM OFFSITE AND UNDISTURBED AREAS AWAY FROM CONSTRUCTION TO MINIMIZE SOIL EROSION AND SEDIMENTATION ON AND OFF-SITE. TEMPORARILY STABILIZE ALL HIGHLY ERODIBLE SOILS AND SLOPES IMMEDIATELY.
7. LAND DISTURBANCE ACTIVITIES EXCEEDING TWO ACRES IN SIZE SHALL NOT BE DISTURBED WITHOUT A SEQUENCING PLAN THAT REQUIRES STORMWATER CONTROLS TO BE INSTALLED AND EXPOSED SOILS STABILIZED, AS DISTURBANCE BEYOND THE TWO ACRES CONTINUES. A CONSTRUCTION PHASING PLAN, INCLUDING EROSION AND SEDIMENT CONTROL PLAN FOR EACH PHASE, SHALL BE SUBMITTED TO THE CITY PRIOR TO ANY CONSTRUCTION ON THE SITE. MASS CLEARINGS AND GRADING OF THE ENTIRE SITE SHALL BE AVOIDED.
8. SOIL STOCKPILES MUST BE STABILIZED OR COVERED AT THE END OF EACH WORKDAY. STOCKPILE SIDE SLOPES SHALL NOT BE GREATER THAN 2:1. ALL STOCKPILES SHALL BE SURROUNDED BY SEDIMENT CONTROLS.
9. DISTURBED AREAS REMAINING IDLE FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED.
10. PERMANENT SEEDING SHALL BE UNDERTAKEN IN THE SPRING FROM MARCH THROUGH MAY, AND IN LATE SUMMER AND EARLY FALL FROM AUGUST TO OCTOBER 15. DURING THE PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15, WHEN SEEDING IS FOUND TO BE IMPRACTICAL, AN APPROPRIATE TEMPORARY MULCH AND/OR NON-ASPHALTIC SOIL TACKIFIER WITH WINTER RYE SHALL BE APPLIED. PERMANENT SEEDING MAY BE UNDERTAKEN DURING THE SUMMER IF PLANS PROVIDE FOR ADEQUATE MULCHING AND WATERING.
11. TEMPORARY CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL ENTRANCE/EXIST POINTS OF THE SITE TO REDUCE THE AMOUNT OF SOIL CARRIED ONTO ROADWAYS AND OFF THE SITE. DUST SHALL ALSO BE CONTROLLED AT THE SITE.
12. ALL SLOPES STEEPER THAN 3:1 (H:V, 33.3%), AS WELL AS PERIMETER DIKES, SEDIMENT BASINS OR TRAPS, AND EMBANKMENTS MUST, UPON COMPLETION, BE IMMEDIATELY STABILIZED WITH SOD, SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES.
13. TEMPORARY SEDIMENT TRAPPING DEVICES MUST NOT BE REMOVED UNTIL PERMANENT STABILIZATION IS ESTABLISHED IN ALL CONSTRUCTION AREAS ASSOCIATED WITH THE PROJECT. SIMILARLY, STABILIZATION MUST BE ESTABLISHED PRIOR TO CONVERTING TEMPORARY SEDIMENT TRAPS/BASINS INTO PERMANENT (POST-CONSTRUCTION) STORMWATER MANAGEMENT FACILITIES. ALL FACILITIES USED FOR TEMPORARY MEASURES SHALL BE CLEANED AND RE-STABILIZED PRIOR TO BEING PUT INTO FINAL OPERATION.
14. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF REMOVAL.

SITE DUST CONTROL REQUIREMENTS

1. THE CONTRACTOR SHALL MITIGATE ALL DEMOLITION AND CONSTRUCTION DUST GENERATED ON THE PROJECT SITE REGARDLESS OF THE ACTIVITY BEING PERFORMED.
2. THE CONTRACTOR SHALL PROVIDE WATER FOR DUST CONTROL AND PUMPS AND HOSES ON SITE AT ALL TIMES TO MANAGE DUST DURING AND AFTER DEMOLITION.
3. THE CONTRACTOR SHALL EMPLOY TECHNIQUES SUCH AS WET SWEEPING, WATERING DOWN WITH HOSES AND PREEMPTIVE CLEANING TO MITIGATE DUST GENERATION FROM ALL OPERATIONS.
4. SAW CUTTING SHALL BE DONE USING SAWS THAT ARE EQUIPPED WITH SPRAY ATTACHMENTS THAT WILL ADEQUATELY WET DEBRIS GENERATED FROM CUTTING FROM BECOMING AIR-BORN.

REVISIONS

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION
TOWN OF MAYNARD

GREEN MEADOW
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5 TIGER DRIVE
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REVISIONS

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1	ADDENDUM 1	6/7/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION

TOWN OF MAYNARD

GREEN MEADOW
ELEMENTARY SCHOOL
EARLY SITE
PREPARATION
PACKAGE

5 TIGER DRIVE
MAYNARD, MA 01754

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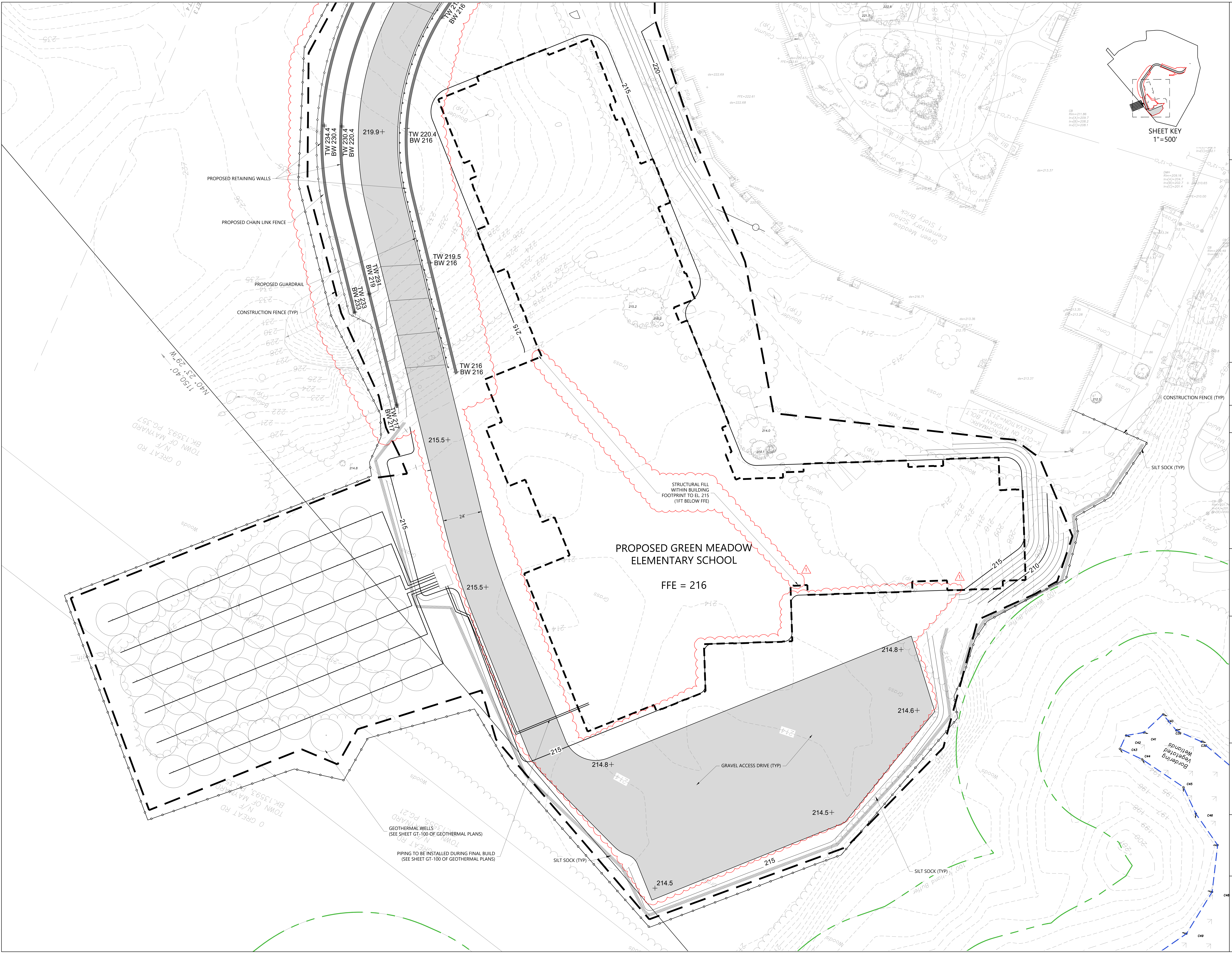

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REVISIONS

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION
TOWN OF MAYNARD

GREEN MEADOW
ELEMENTARY SCHOOL
EARLY SITE
PREPARATION
PACKAGE

5 TIGER DRIVE
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SITE PREPARATION PLAN

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No. 37458

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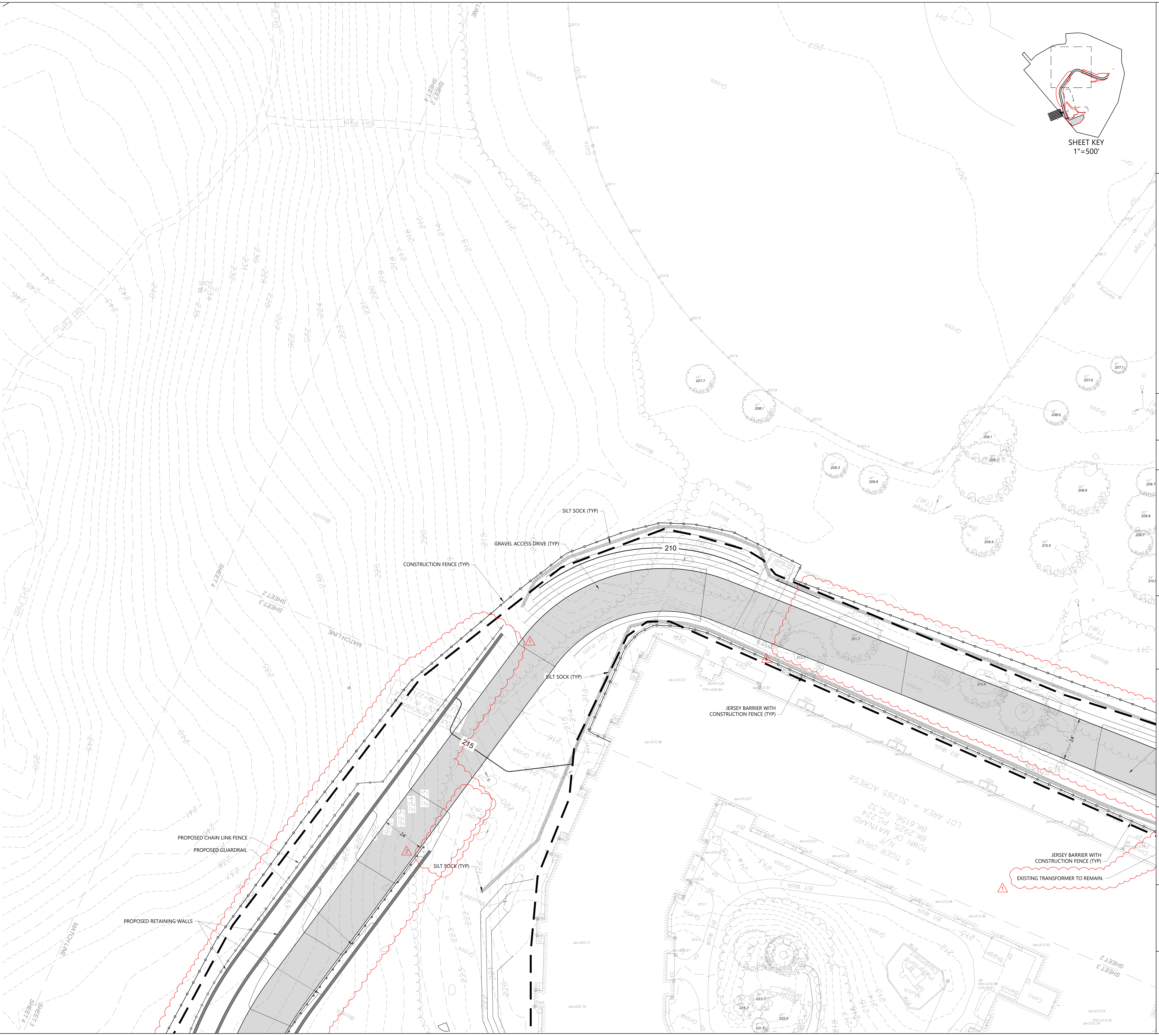
C-02.1

GENERAL NOTES:

1. REFER TO DRAWING C-01 FOR EROSION CONTROL NOTES. THESE NOTES SHALL APPLY TO THE FINAL SITE CONDITION.
2. APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY MARKING THE LIMITS OF CONSTRUCTION ON THE SITE WITH TAPE, SIGNS, OR ORANGE CONSTRUCTION FENCE, SO THAT WORKERS UNDERSTAND THE AREAS TO BE PROTECTED. THE PHYSICAL MARKERS SHALL BE INSPECTED DAILY AND REPAIRED AS NECESSARY THROUGHOUT THE DURATION OF THE PROJECT.
3. PERIMETER SEDIMENT CONTROL SYSTEM AS SHOWN ON THIS DRAWING AND ON THE DEMOLITION PLAN SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE AND MAINTAINED TO CONTAIN SOILS ON-SITE. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST NOT BE DISTURBED UNLESS THE APPLICANT HAS OBTAINED PRIOR APPROVAL FROM THE CITY.
4. ADDED MEASURES TO CONTROL EROSION ARE ADDED TO THIS DRAWING TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA AND TO CONTROL SEDIMENT TO THE PROPOSED LOWER POND AND THE OUTFALL PIPING BEING INSTALLED DURING THIS PROJECT AND TO BE MAINTAINED AS PART OF THE FINAL SITE.
5. ALL OFF SITE AREAS AND DRAIN INLETS SHALL BE PROTECTED FROM SEDIMENT DURING AND AFTER DEMOLITION AND CONSTRUCTION WORK.
6. ALL SEDIMENT COLLECTION SYSTEMS INCLUDING BUT NOT LIMITED TO: SILT FENCES, SILT FENCE CHECKS,CATCH BASIN SILT SACKS, STRAW WATTLES, LOWER POND FORE-BAY, POND BOTTOM AND OUTLET STRUCTURE, AND UPPER POND INLET STRUCTURE AND ALL DRAINAGE PIPING AND STRUCTURES SHALL BE CLEANED.
7. ALL BROKEN, DAMAGED OR CLOGGED SEDIMENT CONTROL DEVICES SHALL REPLACED AS REQUIRED BY THE OWNER'S REPRESENTATIVE ONCE BUILDING AND SITE DEMOLITION AND ALL PROPOSED CONSTRUCTION IS COMPLETED.

SITE DUST CONTROL REQUIREMENTS

1. THE CONTRACTOR SHALL MITIGATE ALL DEMOLITION AND CONSTRUCTION DUST GENERATED ON THE PROJECT SITE REGARDLESS OF THE ACTIVITY BEING PERFORMED.
2. THE CONTRACTOR SHALL PROVIDE WATER FOR DEMOLITION AND CONSTRUCTION PURPOSES BY EITHER SUPPLYING WATER OR COORDINATING A TEMPORARY WATER CONNECTION WITH THE CITY WATER DEPARTMENT.
3. ALL COSTS ASSOCIATED WITH PROVIDING WATER OR PROVIDING A TEMPORARY WATER SERVICE AND DISCONNECTION SHALL BE INCLUDED IN THE BASE PRICE FOR THE CONTRACT, INCLUDING ANY COSTS ASSOCIATED WITH WATER METERS AND BACK FLOW DEVICES REQUIRED BY THE CITY WATER DEPARTMENT.
4. THE CONTRACTOR SHALL EMPLOY TECHNIQUES SUCH AS WET SWEEPING, WATERING DOWN WITH HOSES AND PREEMPTIVE CLEANING TO MITIGATE DUST GENERATION FROM ALL OPERATIONS.
5. SAW CUTTING SHALL BE DONE USING SAWS THAT ARE EQUIPPED WITH SPRAY ATTACHMENTS THAT WILL ADEQUATELY WET DEBRIS GENERATED FROM CUTTING FROM BECOMING AIR-BORN.



REVISIONS

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024
2	ADDENDUM 2	6/12/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION
TOWN OF MAYNARD

GREEN MEADOW
ELEMENTARY SCHOOL
EARLY SITE
PREPARATION
PACKAGE

5 TIGER DRIVE
MAYNARD, MA 01754

DRAWING TITLE
SITE PREPARATION PLAN

264 Exchange Street,
Suite G7
Chicopee, Massachusetts 01013

413 592 9700 T
413 592 9750 F
info@mvgarchitects.com E

STAMP
CHRISTOPHER EMILIUS
CIVIL
No. 37458

DRAWING INFORMATION

SCALE	1" = 20'
DRAWN BY	CG
CHECKED	CE
DATE	MAY 22, 2024

DRAWING NUMBER
C-02.2

ORIGINAL SHEET IS 30" x 42"

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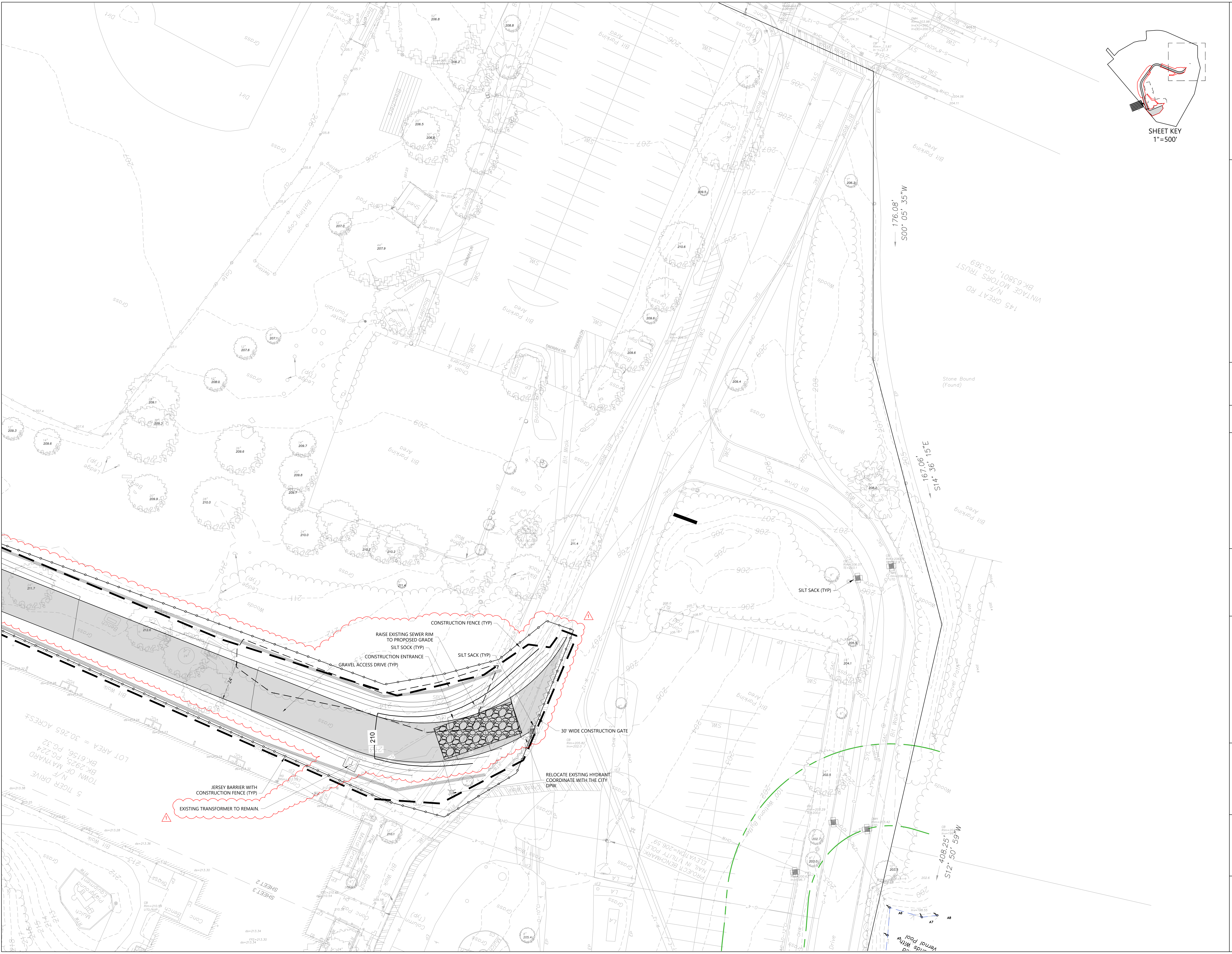

REVISIONS		
NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024

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PROJECT NUMBER

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CHECKED	CE
DATE	MAY 22, 2024

DRAWING NUMBER

C-02.3

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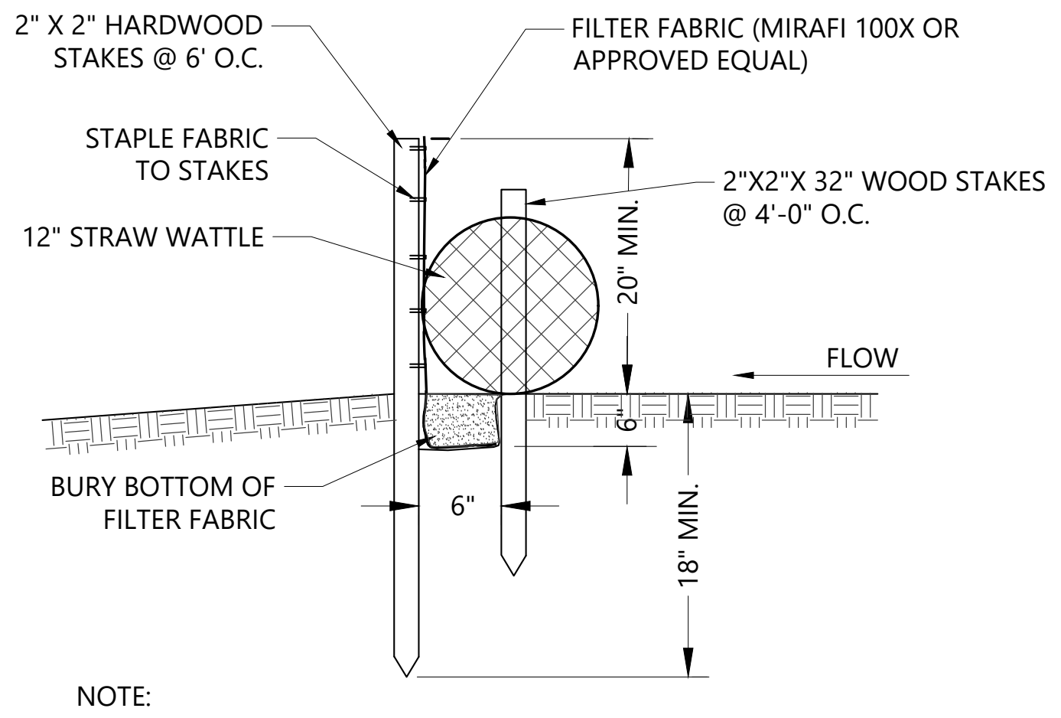
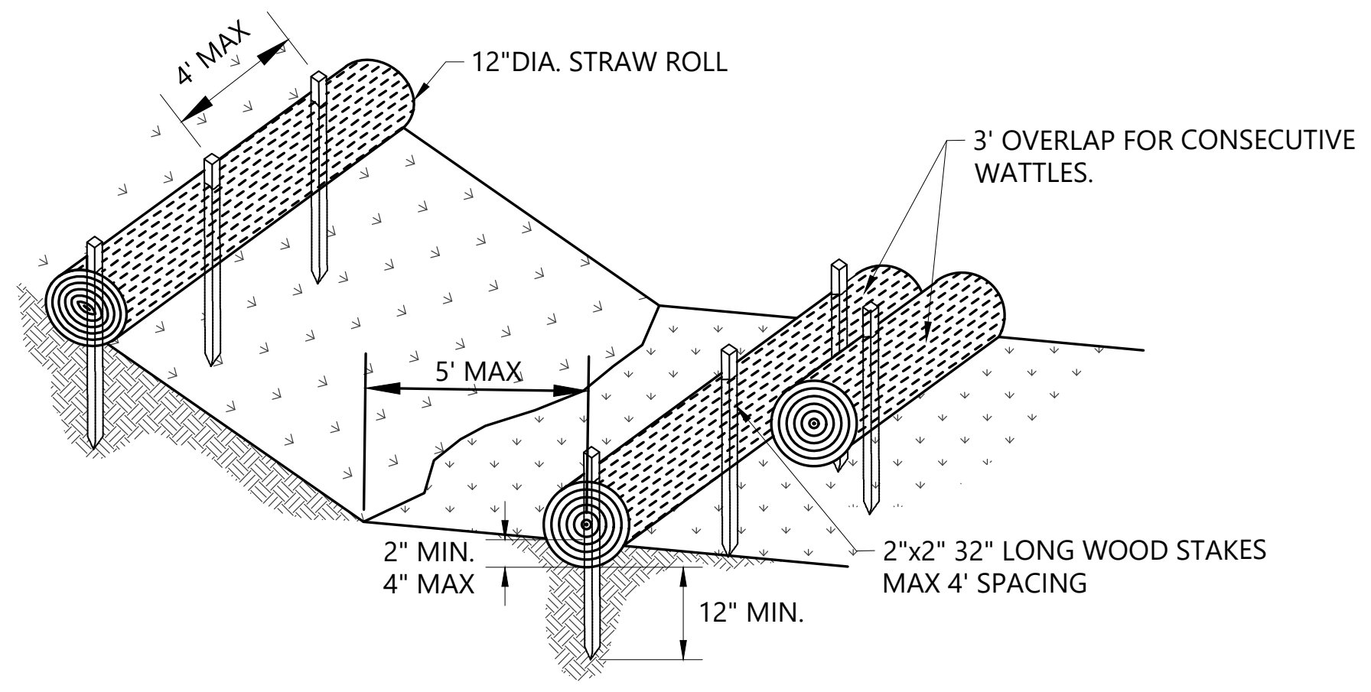


NOTE:
AN EROSION BARRIER CONSISTING OF A CONTINUOUS ROW OF STRAW WATTLES SHALL BE INSTALLED IN LOCATIONS NOTED ON THE PLANS.

STRAW WATTLE AND SILT FENCE DETAIL

NOT TO SCALE



STRAW WATTLE DETAIL

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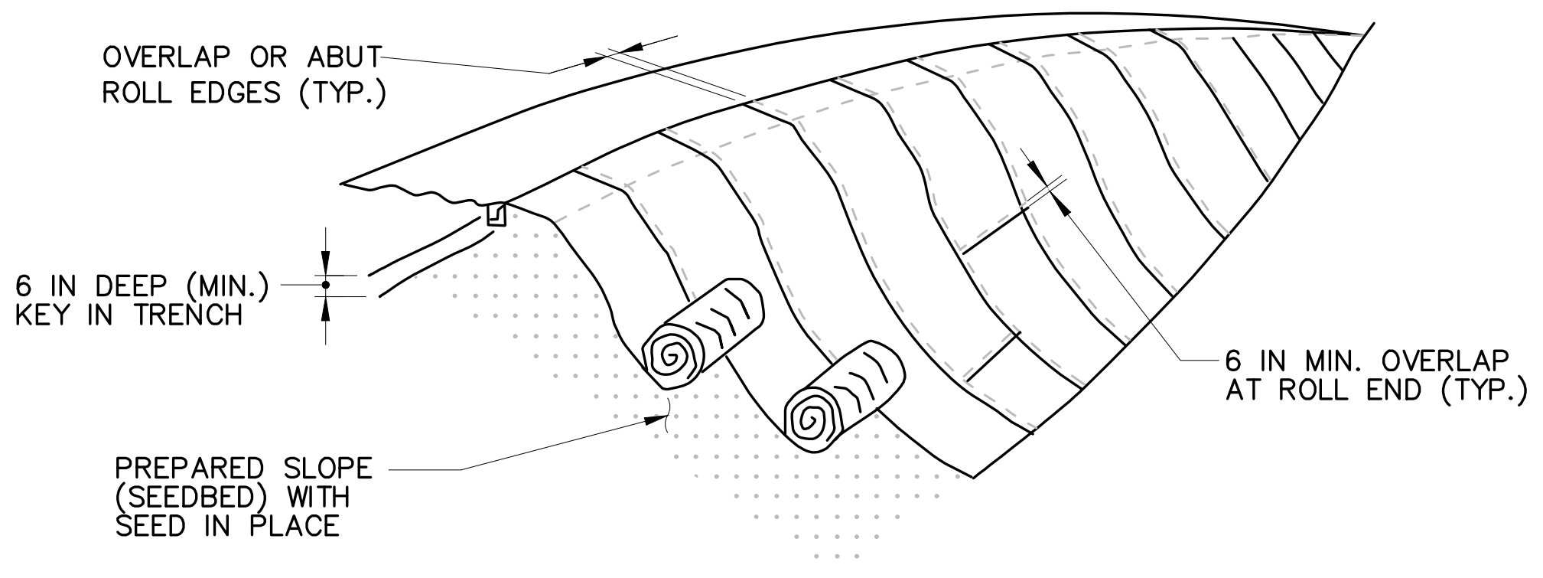


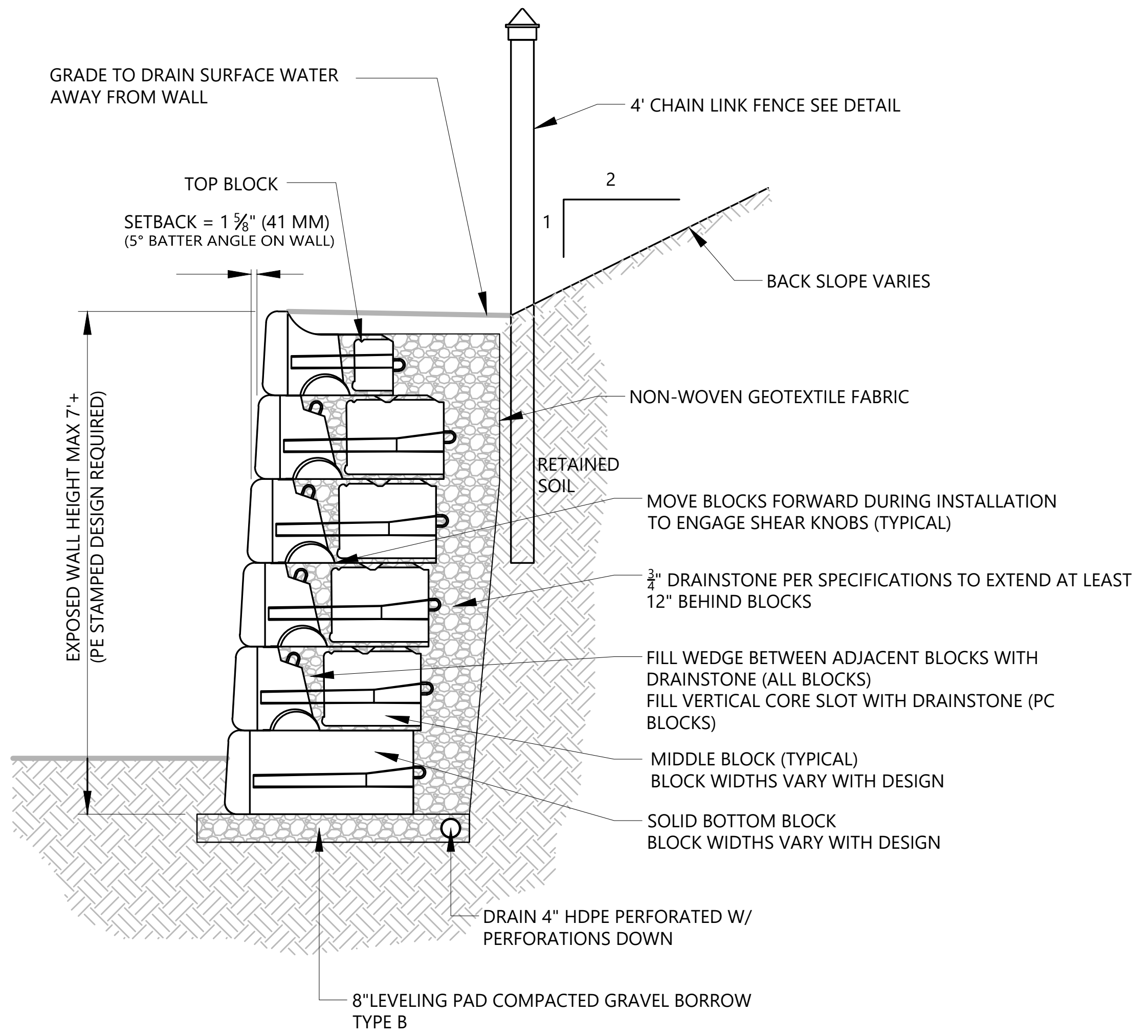
ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. JUTE MESH FOR POND SIDE SLOPES AND PERMANENT SLOPES SHALL BE 100% JUTE 15 O.Z./SQ.YD. LOOSELY WOVEN AND BIODEGRADABLE.
2. JUTE MESH SHALL BE MADE OF DEGRADABLE (LASTS 6 MONTHS MAX.) NATURAL FIBERS. MESH STRANDS MUST HAVE UNIFORM THICKNESS AND STRANDS SHALL BE EVENLY SPACED IN BOTH DIRECTIONS.
3. SECURE MATTING USING STEEL OR BIODEGRADABLE STAPLES, SPACED AT LEAST 12 INCHES ON CENTER.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWN-SLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UP-SLOPE MAT OVERLAPPING ON TOP OF THE DOWN-SLOPE MAT.
7. KEY IN THE UP-SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 1 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE LANDSCAPE PLANS AND SPECIFICATIONS.

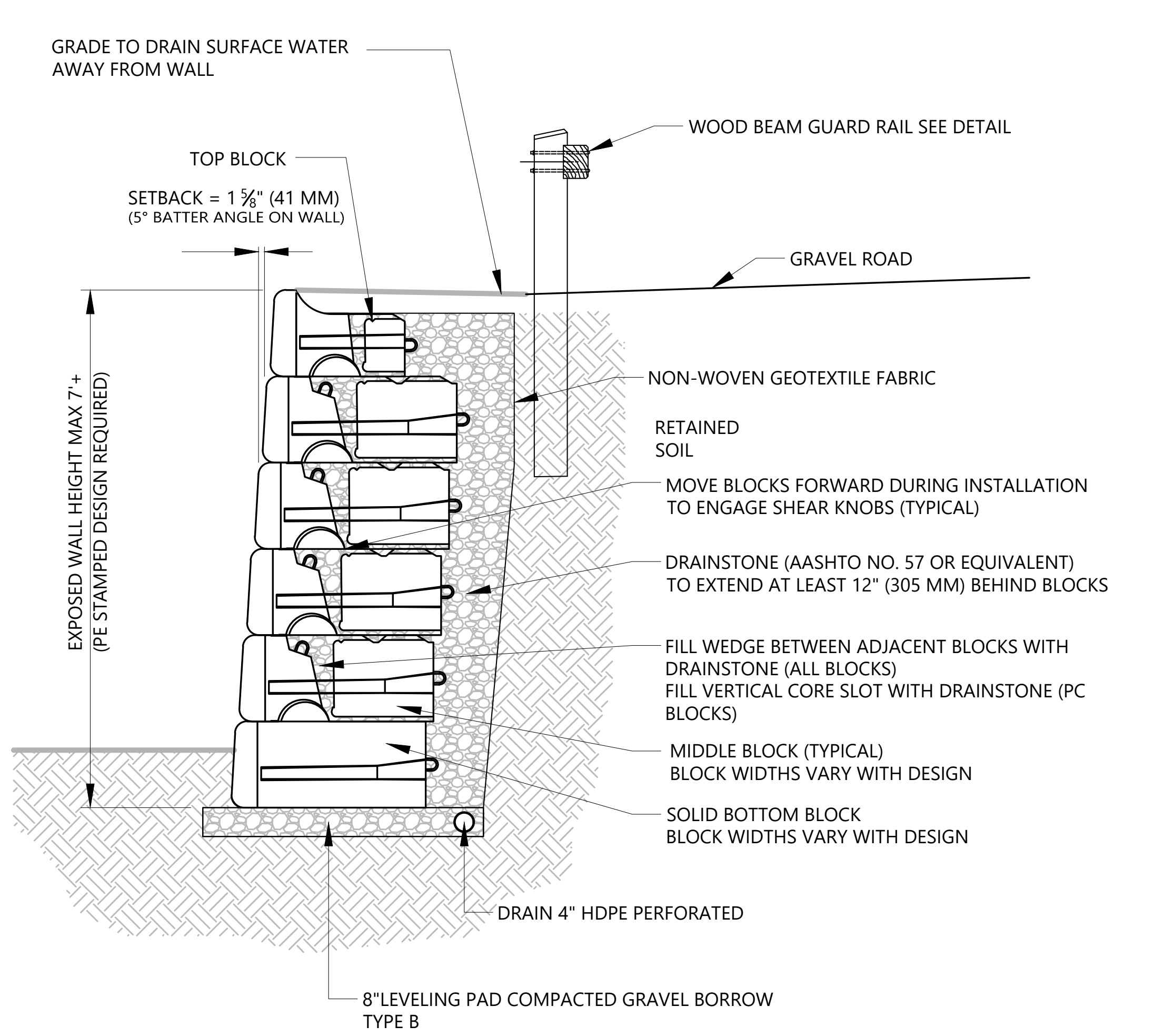
TEMPORARY SOIL STABILIZATION JUTE MESH SLOPE APPLICATION

NOT TO SCALE



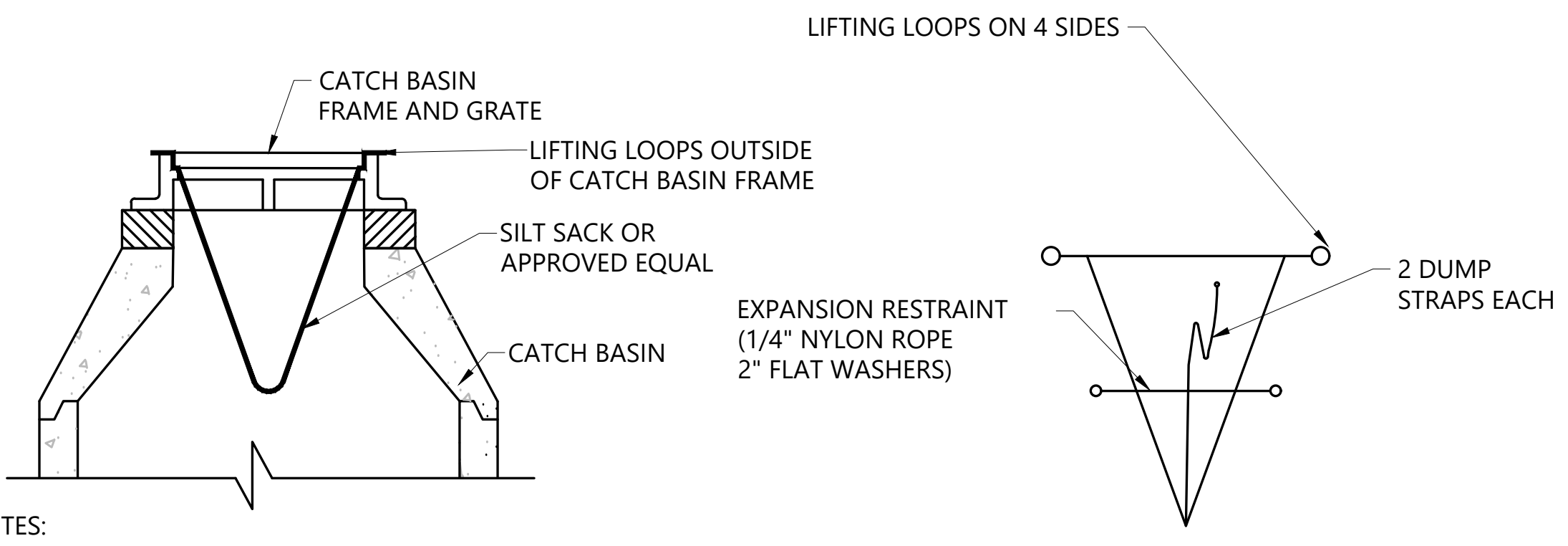
TYPICAL REDI-ROCK GRAVITY RETAINING WALL W/ FENCE

NOT TO SCALE



TYPICAL REDI-ROCK GRAVITY RETAINING WALL W/ GUARD RAIL

NOT TO SCALE

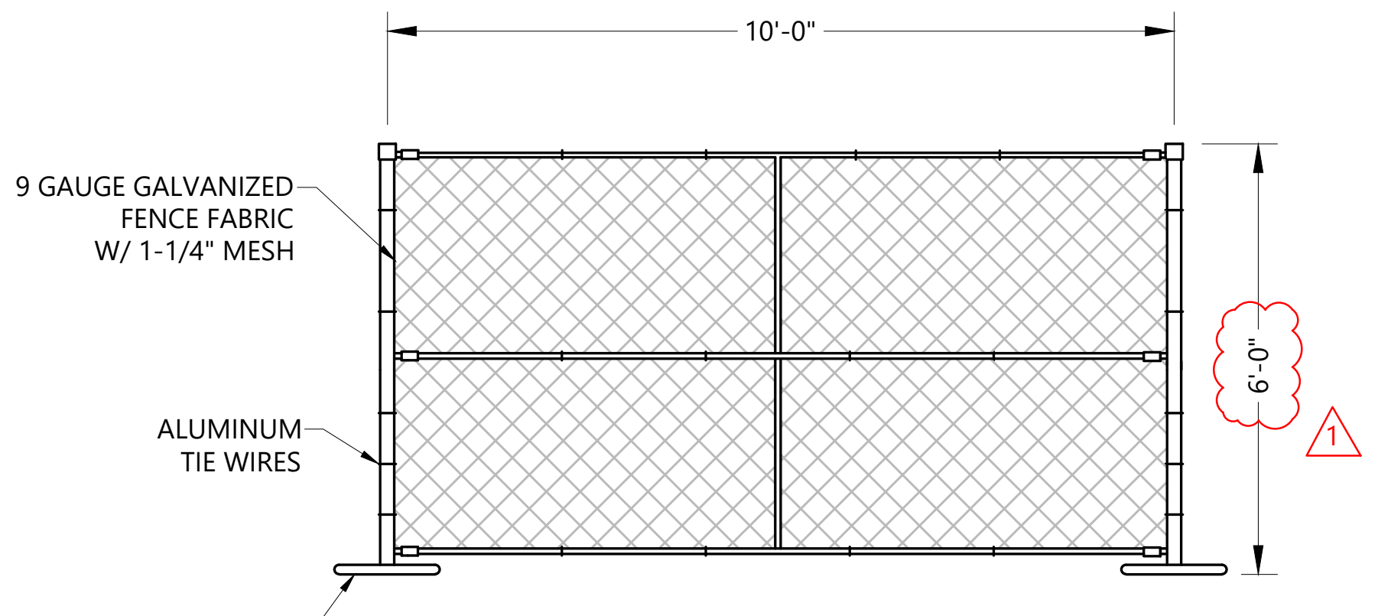


BAG DETAIL

NOTES:
1. TO BE INSTALLED IN ALL CATCH BASINS THAT COULD RECEIVE RUNOFF FROM DISTURBED AREAS UNTIL COMPLETION OF CONSTRUCTION.

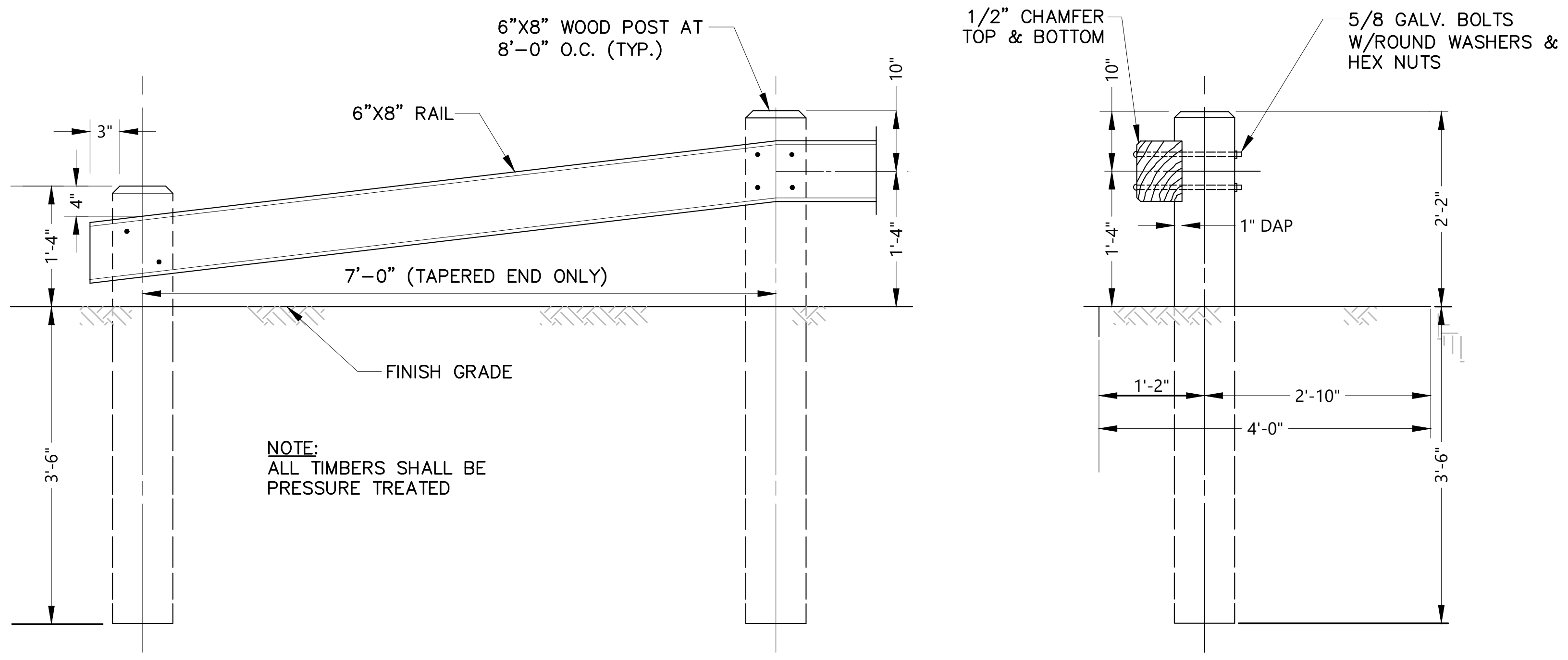
SILT SACK DETAIL

NOT TO SCALE



CONSTRUCTION CHAIN LINK FENCE

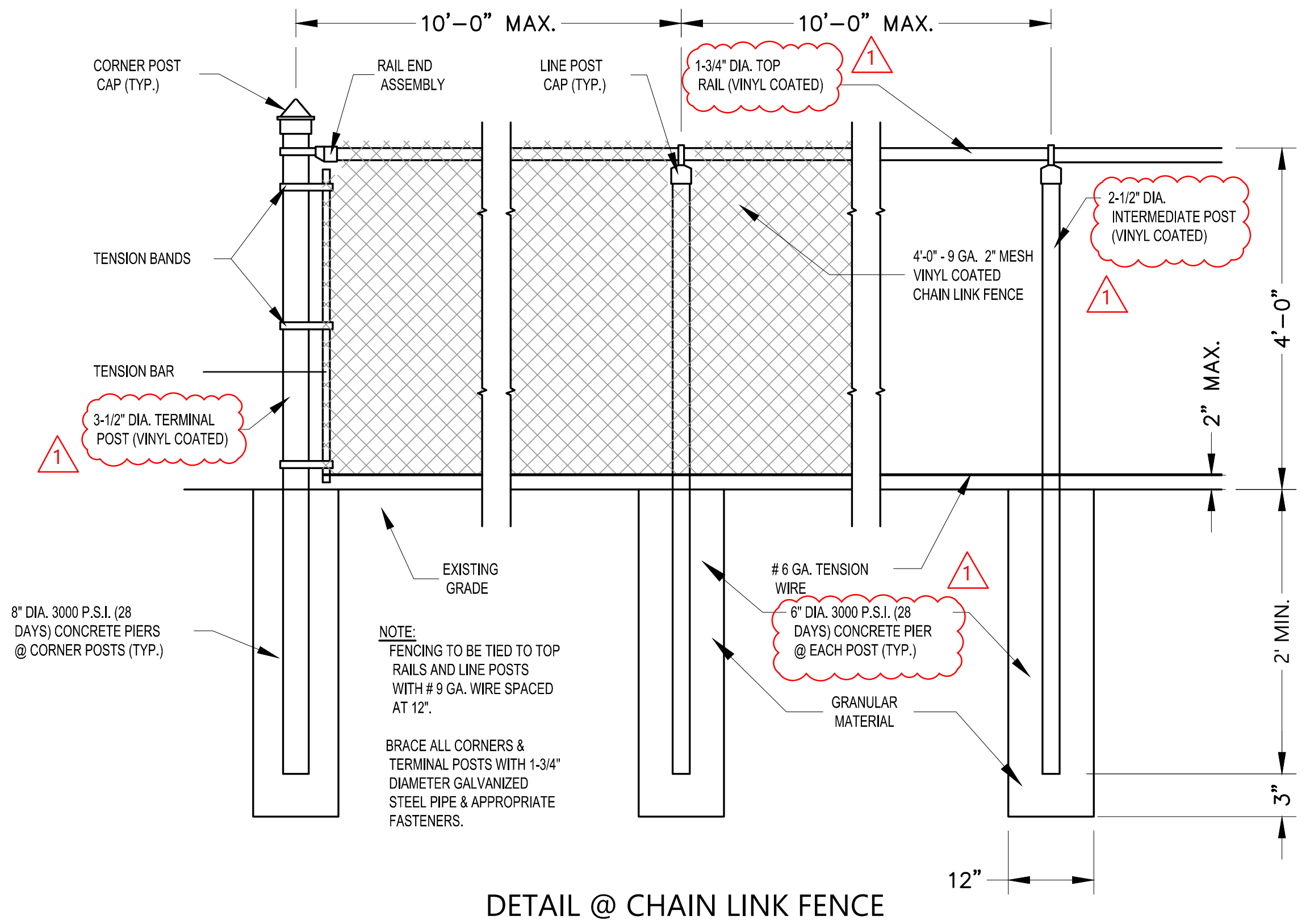
NOT TO SCALE



NOTE:
ALL TIMBERS SHALL BE PRESSURE TREATED

WOOD BEAM GUARD RAIL DETAIL

NOT TO SCALE



NOTE:
FENCING TO BE TIED TO TOP RAILS AND LINE POSTS WITH # 9 GA. WIRE SPACED AT 12".

BRACE ALL CORNERS & TERMINAL POSTS WITH 1-3/4" DIAMETER GALVANIZED STEEL PIPE & APPROPRIATE FASTENERS.

DETAIL @ CHAIN LINK FENCE

NOT TO SCALE

REVISIONS

NUMBER	DESCRIPTION	DATE
1	ADDENDUM 1	6/7/2024

PROJECT PHASE
BID SET

PROJECT NUMBER

OWNER / PROJECT NAME / LOCATION

TOWN OF MAYNARD

GREEN MEADOW
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info@mvgarchitects.com E

STAMP
COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER
EMILIUS
CIVIL
No. 37458
REGISTERED
PROFESSIONAL ENGINEER

DRAWING INFORMATION

SCALE	As indicated
DRAWN BY	CG
CHECKED	CE
DATE	MAY 22, 2024

DRAWING NUMBER

C-03.1

2/20/2024 9:50:38 AM

LGCI
Lahlaf Geotechnical Consulting, Inc.

April 27, 2024

Mr. Chris LeBlanc, MCPPO
Mount Vernon Group Architects, Inc.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866
Mobile: (413) 530-0817
E-mail: cleblanc@mvgarchitects.com

Re: **DD Phase Geotechnical Report**
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

Dear Mr. LeBlanc:

Lahlaf Geotechnical Consulting, Inc. (LGCI) has completed our Design Development (DD) phase geotechnical study for the proposed Green Meadow Elementary School at the existing Green Meadow Elementary School site in Maynard, Massachusetts. We are submitting our geotechnical report electronically.

The soil samples from our explorations are currently stored at LGCI for further analysis, if requested. Unless notified otherwise, we will dispose of the soil samples after three (3) months.

Thank you for choosing LGCI as your geotechnical engineer.

Very truly yours,

Lahlaf Geotechnical Consulting, Inc.

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

100 Chelmsford Road, Suite 2, Billerica, MA 01862 Tel: (978) 330-5912 Fax: (978) 330-5056 www.lgcinc.net

Lahlaf Geotechnical Consulting, Inc.

DD PHASE GEOTECHNICAL REPORT
PROPOSED GREEN MEADOW ELEMENTARY SCHOOL
MAYNARD, MASSACHUSETTS

LGCI Project No. 2201
April 27, 2024

Prepared for:

MOUNT VERNON GROUP ARCHITECTS, INC.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866

DD PHASE GEOTECHNICAL REPORT
PROPOSED GREEN MEADOW ELEMENTARY SCHOOL
MAYNARD, MASSACHUSETTS

LGCI Project No. 2201
April 27, 2024

Prepared for:

MOUNT VERNON GROUP ARCHITECTS, INC.
200 Harvard Mill Square
Suite 140
Wakefield, MA 01880
Tel: (413) 377-2866

Prepared by:

LAHLAF GEOTECHNICAL CONSULTING, INC.
100 Chelmsford Road, Suite 2
Billerica, Massachusetts 01862
Phone: (978) 330-5912
Fax: (978) 330-5056

ABDELMADJID
M. LAHLAF
CIVIL
No. 39814

Abdelmadjid M. Lahlaf, Ph.D., P.E.
Principal Engineer

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1. PROJECT INFORMATION

1.1 Project Authorization

LGCI performed services for this project in two phases as follows:

- Preliminary Phase - LGCI previously performed preliminary subsurface explorations at the site and prepared and submitted a preliminary geotechnical report in February 2022 in general accordance with the scope described in our proposal No. 21115-Rev. 1 dated December 22, 2021. Our services were authorized by Mr. Chris LeBlanc of Mount Vernon Group Architects, Inc. (MVG) by signing our proposal on December 22, 2021.

- Design Development (DD) Phase - LGCI performed additional DD Phase subsurface explorations at the site and prepared and submitted this DD Phase geotechnical report in general accordance with our proposal No. 22140-Rev. 1 dated March 9, 2023. Our services were authorized by Mr. Chris LeBlanc of Mount Vernon Group Architects, Inc. (MVG) by signing our proposal on March 30, 2023.

1.2 Purpose and Scope of Services

The purpose of our preliminary and DD phase studies was to perform subsurface explorations at the site for the proposed Green Meadow Elementary School and to provide preliminary foundation and construction recommendations. LGCI performed the following services:

- Coordinated our exploration locations with MVG and with the Green Meadow Elementary School facilities staff, marked the exploration locations at the site, and contacted Dig Safe Systems, Inc. (Dig Safe) and the Town of Maynard for utility clearance. LGCI also applied for and obtained a trench permit from the Town of Maynard.

- Engaged a drilling subcontractor to advance twenty-nine (29) soil borings at the site, including nine (9) soil borings as part of our preliminary phase services and twenty (20) soil borings as part of our DD phase services.

- Engaged an excavation subcontractor to excavate twenty-two (22) test pits at the site as part of our DD phase services.

- Provided an LGCI geotechnical field representative, full time, at the site to coordinate and observe the explorations, describe the soil samples, and prepare field logs.

- Submitted sixteen (16) soil samples for laboratory testing, including four (4) soil samples during the preliminary phase and twelve (12) soil samples during the DD phase.

- Prepared this geotechnical report containing the results of our preliminary phase and DD phase subsurface explorations and our foundation design and construction recommendations.

Upon completion of our preliminary phase services, LGCI submitted a preliminary geotechnical report dated February 24, 2022. This DD phase geotechnical report includes the results of our preliminary phase services and supersedes the aforementioned report.

Our scope includes attending meetings, reviewing drawings, and performing field services during construction. These services will be performed separately and are not included in this report. Recommendations for unsupported slopes, stormwater management, erosion control, pavement design, slope stability analyses, site specific liquefaction analyses, pile analysis and design, and detailed cost or quantity estimates are not included in our scope of work.

LGCI did not perform environmental services for this project. LGCI did not perform an assessment to evaluate the presence or absence of hazardous or toxic materials above or below the ground surface at or around the site. Any statement about the color, odor, or the presence of suspicious materials included in our exploration logs or report were made by LGCI for information only and to support our geotechnical services. No environmental recommendations and/or opinions are included in this report.

1.3 Reviewed Documents

LGCI reviewed the following documents:

- Drawing L.2 titled: “Site Plan, Green Meadow Elementary School Addition and Renovation, Maynard, MA,” (1987 Site Plan) prepared by DiNisco Kretsch & Associates, Inc., dated February 5, 1987, and provided to LGCI by MVG via e-mail on December 20, 2021.

- Drawing EX-1 titled: “Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School,” (Survey Plan) prepared by Samiotes Construction, Inc., dated September 2, 2022, and provided to LGCI via e-mail on February 1, 2024.

- Drawings C-01.1, 2, C-01.3, C-01.4 titled: “Demo Plan, Town of Maynard, Green Meadow Elementary School Project, 5 Tiger Drive, Maynard, MA 01754,” (Demo Plan) prepared by MVG and provided to LGCI by Brennan Consulting, Inc. via e-mail on April 24, 2024.

- Drawing C-01.5 titled: “Details, Town of Maynard, Green Meadow Elementary School Project, 5 Tiger Drive, Maynard, MA 01754,” (Details) prepared by MVG and provided to LGCI by Brennan Consulting, Inc. via e-mail on April 24, 2024.

1.4 Site Location and Description

Our understanding of the site is based on our field observations, our conversations with MVG, and on the drawings listed in Section 1.3.

The site of the proposed construction is at the site of the existing Green Meadow Elementary School located at 5 Tiger Drive in Maynard, Massachusetts as shown in Figure 1. The site is bordered by Tiger Drive on the eastern side, by Great Road on the northern side, and by wooded land on the western and southern sides. The site is occupied by the existing Green Meadow Elementary School building and associated parking lots, driveways, landscaped areas, and athletic fields. The athletic fields include a baseball field north of the existing school and a practice field on the southern side of the existing school within a clearing in the wooded area. The existing school building has an irregular fan shape. Based on the 1987 Site Plan, additions were made to the original Green Meadow Elementary School and the existing building was also renovated. The 1987 Site Plan indicates that the finished floor elevation (FFE) of the existing building is El. 214 feet.

Based on the Survey Plan, the grades at the site rise from approximately El. 196 feet on the eastern side of the site to a relatively level area between El. 212 and El. 215 feet (in the existing practice field) before rising to about El. 251 feet at a hill near the northwestern corner of the site. The grades around the existing school generally rise from about El. 208 feet on the eastern side of the existing building to about El. 225 feet near the western side of the existing building. The grades within the parking lots, driveways, and landscaped areas located east of the existing school rise from approximately El. 196 feet to El. 208 feet in a westerly direction. The Survey Plan indicates that the FFE of the existing building's ground floor is El. 213.3 feet. This FFE is slightly lower than that shown in the 1987 Site Plan.

A dirt path loops around the existing building and ranges in elevation between El. 212 feet and El. 223 feet.

Based on the 1987 Site Plan and the Survey Plan, there appears to have been cuts near the southwestern corner of the existing building to achieve the existing grades in the existing practice field in the tree clearing.

1.5 Project Description

Our understanding of the proposed construction is based on our field observations, our discussions with MVG, and on the Demo Plan and Details listed in Section 1.3.

We understand that the proposed construction will consist of a somewhat L-shaped building that will have a footprint of about 59,000 square feet. The majority of the proposed building footprint will be located in the generally level area in the existing practice field. Nearly one third of the proposed building footprint (on the northern side of the proposed building) will be located in the wooded hill near the western side of the existing building.

The existing grades within most of the proposed building footprint (on the southern side of the proposed building footprint in the general area of the tree clearing) will range between about El. 207 feet and El. 216 feet; thus, requiring net fills ranging between 0 and 8 feet. The thickest fill will be on the eastern side of the proposed building footprint. The existing grades within the northern portion of the proposed building (located in the wooded hill) range between about El.

208 feet and El. 232 feet; thus, requiring net fills of up 5 feet and cuts of up to 16 feet to achieve the proposed FFE of El. 216 feet.

Based on the Demo Plan, an access road will loop around the proposed building and will have grades that will range between El. 210 feet and El. 219 feet. The existing grades within the proposed access drive range up to El. 236 feet; thus, requiring net cuts of up to 17 feet to achieve the proposed grades. Retaining walls will be constructed on both sides of the western portion of the proposed access drive to reduce the extent of the cuts in the overburden and to conceal the rock cuts. Based on the Details, the proposed retaining walls will consist of Redi-Block MSE walls with fences or guardrails on the tops of the walls. Details about the proposed retaining wall geometry, including length, total height, exposed heights, and length of reinforcing are not available at the time of this report.

We understand that the existing building will be demolished after the new building is completed to allow for the construction of proposed athletic fields and paved parking lots. Information about the layout and grading of the proposed athletic fields and paved areas was not available to us at the time of this report.

A thermal well field will be provided in the wooded area on the western side of the proposed building. Work related to the thermal wells was not the focus of this report and is beyond our scope of services for this project.

1.6 Elevation Datum

The 1987 Site Plan does not include a reference to a datum. We understand that the elevations shown in the Survey Plan are referenced to the North American Vertical Datum of 1988 (NAVD 1988).

2. SITE AND SUBSURFACE CONDITIONS

2.1 Surficial Geology

LGCI reviewed a surficial geologic map titled: "Surficial Materials Map of the Maynard Quadrangle, Massachusetts," (Surficial Geological Map) prepared by Stone, J.R. and Stone, B.D. for U.S. Geological Survey, 2018, Scientific Investigation Map 3402, Quadrangle 97 – Maynard.

The Surficial Geological Map indicates that the natural soils on the western side of the site mainly consist of thin till. The thin till is described as non-sorted, non-stratified matrix of sand, some silt, and little clay containing scattered pebbles, cobbles, and boulder clasts. The thin till is generally less than 10 to 15 feet thick.

The Surficial Geological Map also indicates that the natural soils on the eastern side of the site consist of coarse deposits, including gravel deposits, sand and gravel deposits, and sand deposits. The gravel deposits are composed mainly of gravel, cobbles, and boulders. The sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. The sand deposits are composed mainly of very coarse to fine sand. Coarser layers may contain up to 25 percent gravel, and finer layers may contain fine sand, silt, and clay.

The Surficial Geological Map also indicates that bedrock outcrops or shallow bedrock may be present on the western side of the site.

The Surficial Geologic Map of the site is shown in Figure 2.

2.2 LGCI's Explorations

2.2.1 General

LGCI coordinated our exploration locations with MVG and with the Green Meadow Elementary School staff and marked the exploration locations in the field. LGCI notified Dig Safe and the Town of Maynard for utility clearance prior to starting our explorations at the site. An LGCI geotechnical field representative observed and logged the explorations in the field.

Unless notified otherwise, we will dispose of the soil samples obtained during our explorations after three (3) months.

2.2.2 LGCI's Soil Borings

As part of our preliminary phase services, LGCI engaged Northern Drilling Service, Inc. (NDS) of Northborough, Massachusetts to advance nine (9) borings (B-1, B-2, B-4, & B-6 to B-11) at the site between January 28 and February 1, 2022. Borings B-3 and B-5 were not performed. The borings were advanced with a track-mounted B-53 ATV drill rig using drive and wash boring techniques with a 4-inch casing. The borings extended to depths ranging between 13 and 21 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings and gravel.

As part of our DD phase services, LGCI engaged Soil X Corp. (Soil X) to advance twenty (20) borings (B-101 to B-T-120) at the site between February 19 and 27, 2024. The borings were advanced using a Diedrich D-70 Turbo drill rig using a hollow stem auger with 3-inch casing. The borings extended to depths ranging between 11.2 and 21 feet beneath the ground surface. Upon completion, the boreholes were backfilled with the soil cuttings and gravel. Two (2) groundwater observation wells were installed in borings B-104-OW and B-114-OW (one each).

NDS and Soil X performed Standard Penetration Tests (SPT) during drilling and obtained split spoon samples in the borings with an automatic hammer at typical depth intervals of 2-feet or 5-feet as noted on the boring logs in general accordance with ASTM D-1586.

An LGCI geotechnical field representative observed and logged the borings in the field.

2.2.3 LGCI's Test Pits

As part of our DD phase services, LGCI observed twenty-two (22) test pits (TP-1 to TP-12, TP-14 to TP-19, TP-21 to TP-23, and TP-26). The test pits were excavated by Saunders Construction between February 6 and 12, 2024. Our excavation subcontractor also cleared trees in the wooded area to provide access to the borings in the wooded hill on February 5 and 6, 2024. The test pits were excavated using a Takeuchi TB-290 excavator and extended to depths ranging between 7 feet and 12 feet beneath the ground surface. Upon completion, the test pits were backfilled with the excavated material in 12-inch to 18-inch lifts and tamped with the excavator bucket.

2.2.4 Exploration Logs and Locations

The exploration locations are shown in Figure 3. Appendix A and Appendix B contain LGCI's boring logs and test pit logs, respectively. Table 1 shows a summary of LGCI's borings, and Table 2 shows a summary of LGCI's test pits.

2.3 Subsurface Conditions

The subsurface description in this report is based on a limited number of explorations and is intended to highlight the major soil strata encountered during our explorations. The subsurface conditions are known only at the actual exploration locations. Variations may occur and should be expected between exploration locations. The boring logs represent conditions that we observed at the time of our explorations and were edited, as appropriate, based on the results of the laboratory test data and inspection of the soil samples in the laboratory. The strata boundaries shown in our exploration logs are based on our interpretations and the actual transitions may be gradual. Graphic soil symbols are for illustration only.

The soil strata encountered in the explorations were as follows, starting at the ground surface.

Topsoil – A layer of surficial organic topsoil was encountered in all borings except in borings B-117 and B-T-120, and in all test pits. The surficial organic topsoil extended to depths ranging between 0.2 and 2.0 feet beneath the ground surface.

Asphalt – A layer of asphalt was encountered in borings B-118 and B-119. The asphalt extended to a depth of 0.3 feet.

Subsoil – A layer of subsoil was encountered beneath the surficial organic topsoil or asphalt in all borings except in borings B-1, B-4, B-8, B-9, B-11, B-104-OW, B-105, B-107, B-118, and B-119. The subsoil was also encountered beneath the topsoil in test pits TP-1, TP-2, TP-7, TP-8, TP-10, TP-11, TP-14 to TP-17, TP-19, TP-23, and TP-26. The subsoil generally extended to depths ranging between 1 and 4 feet beneath the ground surface. In boring B-117, the subsoil extended to a depth of 8 feet beneath the ground surface. The samples in the subsoil were described as silty sand and poorly graded sand. One (1) sample was described as a silt. The fines content in the subsoil ranged between 0 and 45 percent and the gravel content ranged between 0 and 35 percent. When described as silt, the sand content ranged between 40 and 45 percent. The subsoil contained traces of organic soil and roots. The fines in a few samples were described as slightly plastic.

The standard penetration test (SPT) N-values in the subsoil ranged between 2 blows per foot (bpf) and 84 bpf, with most values lower than 21 bpf, indicating mostly very loose to medium dense soil. The high SPT N-values may be caused by frozen soil or obstructions such as cobbles and boulders in the subsoil.

Fill – A layer of fill was encountered beneath the surficial organic topsoil in borings B-1, B-4, B-8, B-9, B-11, B-103 to B-105, B-117, and B-119 and in test pits TP-3 to TP-6, TP-12, TP-18B, and TP-21 to TP-23. The fill extended to depths ranging between 1.5 and 6.9 feet beneath the ground surface. The samples in the fill were mostly described as silty sand or poorly graded sand. One (1) sample was described as well graded gravel. One (1) sample was described as well graded sand. The fines content in the fill ranged between 5 and 45 percent and the gravel content ranged between 0 and 45 percent. When described as gravel, the sand content in the fill ranged between 20 and 25 percent. The fill contained traces of organic soil, wood, and roots.

The SPT N-values in the fill ranged between 5 bpf and refusal, with most values lower than 38 bpf indicating loose to dense material. The high SPT N-values may be caused by frozen soil or by obstructions such as cobbles and boulders in the fill.

Buried Organic Soil – A layer of buried organic soil was encountered beneath the fill layer in boring B-9 and test pits TP-21 and TP-22. The buried organic soil extended to depths ranging between 3.5 feet and 9 feet beneath the ground surface. The samples in this layer were described as silty sand. The fines content in the buried organic soil ranged between 25 and 35 percent.

The SPT N-value in the buried organic soil was 9 bpf, indicating loose soil.

Sand and Gravel – A layer of sand and gravel was encountered beneath the subsoil, fill, or buried organic soil in all borings and test pits. The sand and gravel layer extended to depths ranging between 3 feet and 21 feet beneath the ground surface. The samples in this layer were mostly described as silty sand, poorly graded sand, or well graded gravel. Three (3) samples were described as silty gravel. The fines content in this layer ranged between 0 and 35 percent, and the gravel content ranged between 0 and 45 percent. When described as gravel, the sand content ranged between 15 and 45 percent. The sand and gravel contained traces of weathered rock. One (1) sample from this layer contained traces of roots.

The SPT N-values within the sand and gravel layer ranged between 3 bpf and refusal, with most values ranging higher than 10 bpf, indicating mostly medium dense to very dense soil. The high SPT N-values may be caused by obstructions such as cobbles and boulders in this layer.

A layer of silt was encountered within the sand and gravel layer in borings B-2 and B-105 at a depth of 14 feet beneath the ground surface. The silt extended to a depth of 19 feet beneath the ground surface. The sand content in the silt layer ranged between 10 and 15 percent. The silt was described as slightly plastic.

Rock –Borings B-1, B-7, B-8, B-11, and B-108 to B-114-OW, and B-118 were advanced into and terminated in rock. Rock was encountered in these borings at depths ranging between 5 and 17.5 feet beneath the ground surface.

Also, refusal on possible large boulders or on apparent rock was encountered at the bottom of test pits TP-1, TP-5, TP-9, TP-10, and TP-16 to TP-18B at depths ranging between 7 and 10.1 feet beneath the ground surface, and at the bottom of borings B-101 to B-103, B-116, and B-118 at depths ranging between 11.2 and 18.5 feet beneath the ground surface.

Rock cores were obtained in borings B-105, and B-108 to B-114-OW. The rock generally consisted of extremely weathered to fresh, slightly to moderately fractured, hard to very hard, grey, white, orange, and light blue Granite. The rock recoveries ranged between 76.7 and 100 percent and the rock quality designation (RQD) values ranged between 41.6 and 97.5 percent.

2.4 Groundwater

Groundwater was encountered in all borings except in borings B-101, B-103, B-105, B-106, B-113, B-115, B-117, B-119, and B-T-120 at depths ranging between 5 and 18.5 feet beneath the ground surface. Groundwater was also observed in test pits TP-9, TP-10, TP-12 to TP-15, and TP-21 at depths ranging between 2 and 18.5 feet beneath the ground surface.

The groundwater measured in groundwater observation wells B-104-OW and B-114-OW are shown in the table below.

	G.S. El. (ft.)	Date	G.W. Depth (ft.)	G.W. El. (ft.)
B-104-OW	214	2/19/2024	18.5	195.5
		4/27/2024	17.2	196.8
B-114-OW	232	2/21/2024	5.0	227.0
		4/27/2024	17.6	214.4

The groundwater levels reported in our borings and test pit logs are based on observations made during drilling or shortly after the completion of the explorations. Please note that water was introduced into the boreholes to maintain a stable borehole and the groundwater levels noted on the boring logs may not represent the actual groundwater level, as additional time may be required for the groundwater levels to stabilize. The groundwater levels presented in this report only represent the conditions encountered at the time and location of the explorations. Seasonal fluctuation should be anticipated.

2.5 Double Ring Infiltrometer Tests

LGCI performed two (2) double ring infiltrometer tests in test pits TP-23 and TP-26 (one each). The excavation subcontractor excavated to the test depths of 4.0 and 3.5 feet beneath the ground surface at TP-23 and TP-26, respectively. After the double ring infiltrometer tests were completed, the tests pits were continued to depths of 12 and 11 feet beneath the ground surface, respectively.

The results, shown in Appendix C, indicated estimated permeability values of 8.3 x 10^{-3} cm/sec. at TP-23 and 8.9 x 10^{-3} cm/sec. at TP-26.

2.6 Laboratory Test Data

LGCI submitted sixteen (16) soil samples collected from the borings for grain-size analysis. The results of the grain-size analyses are provided in the test data sheets included in Appendix D and are summarized in the table below.

Grain-Size Analysis Test Results

Boring No.	Sample No.	Stratum	Sample Depth (ft.)	Percent Gravel	Percent Sand	Percent Fines
B-1	S2	Fill	2 – 4	23.0	53.0	24.0
B-6	S2	Sand	2 – 4	0.1	93.8	6.1
B-7	S2 – Top 13”	Subsoil	2 – 4	3.4	62.5	34.1
B-11	S2	Fill	2 – 4	22.8	68.0	9.2

B-104	S2	Fill	2 – 4	13.0	44.6	42.4
B-105	S1 – Bot. 11"	Fill	1.1 – 2	49.8	39.6	10.6
B-109	S2	Fill	2 – 4	3.8	58.7	37.5
B-109	S3	Sand & Gravel	4 – 6	57.3	31.4	11.3
B-110	S2	Fill	2 – 4	0.0	43.5	56.5
B-110	S3	Sand & Gravel	4 – 6	25.5	68.1	6.4
B-112	S2– Bot. 16"	Sand & Gravel	2.5 – 4	14.7	54.0	31.3
B-116	S2	Sand & Gravel	2 – 4	13.6	45.8	15.3
TP-17	G1	Subsoil	0.3 – 4.7	0.1	55.2	44.7
TP-17	G2	Sand & Gravel	4.7 – 9	15.1	64.0	20.9
TP-23	Infiltrometer Test Depth		4	0.1	90.1	9.8
TP-26	Infiltrometer Test Depth		3.5	28.5	64.3	7.2

3. EVALUATION AND RECOMMENDATIONS

3.1 General

Based on our understanding of the proposed construction, our observation of our explorations, and the results of our laboratory testing, there are a few issues that we would like to highlight for consideration and discussion.

3.1.1 Asphalt, Surficial Organic Soil, Subsoil, Buried Organic Soil, and Existing Fill

- Asphalt, surficial organic soil, subsoil, buried organic soil, and existing fill were observed in the borings and test pits. These materials are not suitable to support shallow foundations.

- The asphalt and the surficial organic soil should be entirely removed from within the proposed construction area.

- The subsoil and the buried organic soil are compressible and should be entirely removed from within the proposed building footprint and should be replaced with Structural Fill.

- The fill contained traces of organic soil, wood, and roots. Existing fill that was not placed with strict moisture, density, and gradation control, and buried organic soil present risk of unpredictable settlement that may result in poor performance of floor slabs and foundations. Due to the risk of excessive settlement, the existing fill should be entirely removed from within the footprint of the proposed building footprint and should be replaced with Structural Fill.

- Based on our borings, we anticipate that the removal will extend to depths of up to about 9 feet. The removal may extend to greater depths at locations not explored by LGCI.

- The removal of the existing fill should extend beyond the limits of the proposed building a minimum distance equal to 5 feet or the distance between the bottom of the proposed footings and the bottom of the fill or buried organic soil, whichever is greater.

- The existing fill and subsoil should be removed to a depth of 18 inches beneath the bottom of the proposed pavement and the bottom of the proposed athletic field subbase layer, and the exposed surface should be improved as described in Section 4.1.

3.1.2 Shallow Bedrock

Apparent rock was encountered at elevations higher than the proposed FFE in many borings and test pits.

Based on the depths to top of apparent bedrock and rock that was confirmed with rock cores, we anticipate that rock removal will be required to reach the bottom of the proposed building foundations and for utilities. We anticipate that most of the rock removal will be in the wooded hill on the northern side of the proposed building. Rock removal will also likely be needed to achieve the proposed grades after the existing building is demolished. The contractor should review the boring and test pit logs and Tables 1 and 2 to assess the need for and extent of rock removal for structures and utilities. We anticipate the rock removal will be achieved by means of rock blasting. Our recommendations for rock blasting and for subgrade preparation in rock are presented in Section 4.5.

The contract documents should include a requirement for a pre-blast condition survey and also vibration monitoring during blasting and earthwork operations as shown in Section 4.5.

3.1.3 Shallow Footings and Slabs-on-Grade

Based on the results of the explorations, the subsurface conditions are suitable to support shallow spread and continuous footings bearing on Structural Fill placed directly on top of the natural sand and gravel or rock after removing the asphalt, the surficial organic soil, the subsoil, the buried organic soil, and the existing fill. Our recommendations for footing design are presented in Section 3.2.2. Our estimates for preliminary settlement are presented in Section 3.2.3. Our concrete slab considerations are presented in Section 3.3. Section 4.1 provides recommendations for preparation of subgrades. Our recommendations for rock removal are provided in Section 4.5.

We anticipate that the major considerations during construction will be associated with the removal of the unsuitable soils, i.e., the surficial organic soil, the subsoil, the buried organic soil and the existing fill, rock blasting, and groundwater control during excavations.

3.1.4 Reuse of Onsite Materials

The existing fill and the natural soil are generally silty and not suitable for reuse as Structural Fill and Ordinary Fill without being amended. Silty soils are very susceptible to disturbance when exposed to moisture. Care should be exercised during construction to maintain a dry working subgrade and to provide working mats, e.g., crushed stone or concrete mud mats, to reduce the potential for disturbance of the foundation subgrade and to improve working conditions.

The contractor may consider mobilizing a rock crusher to the site. Existing cobbles and boulders and blasted rock can be processed by blending them with the existing fill and the natural sand and gravel and crushing them to produce a well graded material.

Additional recommendations about reuse of onsite materials are presented in Section 4.4.

3.2 Foundation Recommendations

3.2.1 General

Based on the results of the borings and test pits, the subsurface conditions appear suitable for support of new structures with grade-supported floor slabs and shallow foundations. Recommendations for footing design and settlement are presented below.

3.2.2 Footing Design

- We recommend entirely removing the asphalt, the surficial organic soil, the subsoil, the buried organic soil, and the existing fill from within the proposed building footprint as described in Section 3.1.1.

- We recommend supporting the proposed building on spread footings bearing on Structural Fill placed directly on the natural sand and gravel or rock.

- We recommend designing the proposed footings using a net allowable bearing pressure of 5 kips per square foot (ksf) for footings bearing directly on a minimum of 12 inches of Structural Fill placed directly on top of the natural sand and gravel or rock.

- Footing subgrades should be prepared in accordance with the recommendations in Section 4.1.

- Foundations should be designed in accordance with The Commonwealth of Massachusetts State Building Code 780 CMR, Ninth Edition (MSBC 9th Edition).

- Exterior footings and footings in unheated areas should be placed at a minimum depth of 4 feet below the final exterior grade to provide adequate frost protection. Interior footings in heated areas may be designed and constructed at a minimum depth of 2 feet below finished floor grades.

- Wall footings should be designed and constructed with continuous, longitudinal steel reinforcement for greater bending strength to span across small areas of loose or soft soils that may go undetected during construction.

- A representative of LGCI should be engaged to observe that the subgrade has been prepared in accordance with our recommendations.

3.2.3 Settlement Estimates

Based on our experience with similar soils and designs using a net allowable bearing pressure of 5 ksf, we anticipate that the total settlement will be approximately 1 inch, and that the differential settlement of the footings will be 3/4 inch or less over a distance of 25 feet. We believe that total and differential settlements of this magnitude are tolerable for a similar structure. However, the tolerance of the proposed structure to the predicted total and differential settlements should be assessed by the structural engineer.

3.3 Concrete Slab Considerations

3.3.1 Slab-on-Grade

- The proposed floor slab should be constructed as a slab-on-grade bearing on Structural Fill placed directly on top of the natural sand and gravel. We recommend a minimum of 12 inches of Structural Fill beneath the proposed slab-on-grade. The subgrade of the slab should be prepared as described in Section 4.1.

- To reduce the potential for dampness in the proposed floor slabs, the project architect may consider placing a vapor barrier beneath the floor slabs. The vapor barrier should be protected from puncture during the placement of the proposed slab reinforcement.

- For the design of the floor slabs bearing on the materials described above, we recommend using a modulus of subgrade reaction, k_{s1}, of 100 tons per cubic foot (tcf). Please note that the values of k_{s1} are for a 1 x 1 square foot area. These values should be adjusted for larger areas using the following expression:

$$Modulus\ of\ Subgrade\ \mathrm{Re}\,action\,(k_s) = k_{s1} * \left(\frac{B+1}{2B}\right)^2$$

where:

k_s = Coefficient of vertical subgrade reaction for loaded area;
k_{s1} = Coefficient of vertical subgrade reaction for a 1 x 1 square foot area; and
B = Width of area loaded, in feet.

Please note that cracking of slabs-on-grade can occur as a result of heaving or compression of the underlying soil, but also as a result of concrete curing stresses. To reduce the potential for cracking, the precautions listed below should be closely followed during the construction of all slabs-on-grade:

- Construction joints should be provided between the floor slab and the walls and columns in accordance with the American Concrete Institute (ACI) requirements, or other applicable code.

- In order for the movement of exterior slabs not to be transmitted to foundations or superstructures, exterior slabs, such as approach slabs and sidewalks, should be isolated from the superstructure.

- The backfill in interior utility trenches should be properly compacted.

3.3.2 Under-slab Drains and Waterproofing

Based on an FFE of El. 216 feet, we believe that an under-slab drainage system is not required on the southern side of the proposed building where fill is required to achieve the proposed FFE. An under-slab drainage system will be required on the northern side of the proposed building in cut areas and should be installed in accordance with the recommendations below.

- We recommend that the under-slab drainage system consist of 1) a minimum of 12 inches of ¾-inch crushed stone placed below the slab, and 2) 6-inch-diameter slotted PVC pipes installed with their inverts at least 15 inches below the bottom of the slab.

- The slotted pipes should be installed in trenches placed at 10 to 15 feet apart. The trenches should be at least 18 inches wide and should extend 9 inches below the bottom of the 12 inches of crushed stone layer to allow placing crushed stone around the PVC pipe.

- The slotted PVC pipes should connect to a 6-inch solid PVC header pipe that collects and channels the collected water out of the building.

- The slots on the PVC pipes should be placed facing downward to allow for entry of water at the bottom of the pipe.

- A non-woven geotextile fabric should be installed between the crushed stone and the underlying soil or weathered rock for separation.

- Clean-outs should be included at the end of the perforated pipes, at changes in directions, and at about 100-foot intervals.

- We recommend channeling the water from the under-slab drainage system to flow by gravity to a discharge area or to an infiltration system. If gravity flow is not possible, the groundwater collected from the under-slab drainage system should be collected in a sump-pump pit and pumped out of the building.

- We recommend that a backup generator and spare pump be provided with the system to use in the event of a power outage or pump failure. The owner should apply for a discharge permit and should perform analytical tests as required by the permits.

If the proposed building includes an elevator pit or other structure that extends beneath the FFE, such elevator pit or other structure should be designed to be waterproof.

3.4 Seismic Design

In accordance with Section 1613 of MSBC 9th Edition, the seismic criteria for the site are as follows:

- Site Class: D
- Spectral Response Acceleration at short period (Ss): 0.206g
- Spectral Response Acceleration at 1 sec. (S_1): 0.069g
- Site Coefficient Fa (Table 1613.5.3(1)): 1.6
- Site Coefficient Fv (Table 1613.5.3(2): 2.4
- Adjusted spectral response S_{MS}: 0.330g
- Adjusted spectral response S_{M1}: 0.166g

Based on the SPT data from the borings, the site soils are not susceptible to liquefaction during a seismic event.

3.5 Lateral Pressures for Wall Design

3.5.1 Lateral Earth Pressures

Lateral earth pressures for the design of retaining walls (walls of below-grade spaces of the proposed building) and site retaining walls are provided below.

Coefficient of Active Earth Pressure, K_A:	0.31
Coefficient of At-Rest Earth Pressure, K_o:	0.47
Coefficient of Passive Earth Pressure, K_p:	3.3
Total Unit Weight γ:	125 pcf

Note: The values in the table are based on a friction angle for the backfill of 32 degrees and neglecting friction between the backfill and the wall. The design active and passive coefficients are based on horizontal surfaces (non-sloping backfill) on both the active and passive sides, and on a vertical wall face.

- Exterior walls of below-ground spaces and other retaining walls braced at the top to restrain movement/rotation should be designed using the “at-rest” pressure coefficient.

- Site retaining walls should be designed using the active earth pressure coefficient described above.

- Passive earth pressures should only be used at the toe of the wall where special measures or provisions are taken to prevent the disturbance or future removal of the soil on the passive side of the wall, or in areas where the wall design includes a key. In any case, the passive pressures should be neglected in the top 4 feet.

- Where a permanent vertical uniform load will be applied to the active side immediately adjacent to the wall, a horizontal surcharge load equal to half of the uniform vertical load should be applied over the height of the wall. At a minimum, a temporary construction surcharge of 100 psf should be applied uniformly over the height of the wall.

- We recommend using an ultimate friction factor of 0.5 between the natural sand and gravel and the bottom of the wall. Below-grade walls should be designed for minimum factors of safety of 1.5 for sliding and 2.0 for overturning.

3.5.2 Seismic Pressures

In accordance with the Massachusetts State Building Code, 9th Edition (MSBC 9th Edition), Section 1610, a lateral earthquake force equal to $0.100*(S_s)*(F_a)*\gamma*H^2$ should be included in the design of the walls (for horizontal backfill), where S_s is the maximum considered earthquake spectral response acceleration (defined in Section 3.4), F_a is the site coefficient (defined in Section 3.4), γ is the total unit weight of the soil backfill, and H is the height of the wall.

The earthquake force should be distributed as an inverted triangle over the height of the wall. In accordance with MSBC 9th Edition, Section 1610.2, a load factor of 1.43 should be applied to the earthquake force for wall strength design.

Temporary surcharges should not be included when designing for earthquake loads. Surcharge loads applied for extended periods of time should be included in the total static lateral soil pressure, and their earthquake lateral force should be computed and added to the force determined above.

3.5.3 Perimeter Drains

- We recommend that free-draining material be placed within 3 feet of the exterior of walls of below-ground spaces, if any.

- To reduce the potential for dampness in below-ground spaces, proposed below-ground walls should be damp-proofed.

- We recommend that drains be provided behind the exterior of walls of below-ground spaces, and behind the walls of the elevator pit and other below ground spaces. The drains should consist of 4-inch perforated PVC pipes installed with the slots facing down. Perimeter drains should be installed at the bottom of the wall in 18 inches of crushed stone wrapped in a geotextile for separation and filtration.

- We recommend providing weep holes at the bottom of site retaining walls to promote drainage where possible. Alternatively, a pipe should be placed at the base of the wall to collect the water. The pipe should be encased within 18 inches of crushed stone wrapped in a geotextile fabric.

- Groundwater collected by the wall drains should be discharged in a lower area if gravity flow is possible. In any case, the groundwater collected by the wall drains should be discharged in accordance with municipal, state, and other applicable standards.

3.6 Parking Lots, Driveways, Sidewalks, and Exterior Slabs

3.6.1 General

The subsurface conditions encountered at the site are generally suitable to support the proposed driveways, parking lots, sidewalks, and exterior slabs after preparation of the subgrade as described in Section 4.1.

- We recommend entirely removing the existing asphalt and the surficial organic soil from within the footprint of the proposed driveways, parking lots, sidewalks, and exterior slabs.

- The existing fill and the subsoil should be improved in accordance with the recommendations in Section 4.1.

- Cobbles and boulders should be removed to at least 18 inches below the bottom of the pavement.

3.6.2 Sidewalks

- Sidewalks should be placed on a minimum of 12 inches of Structural Fill with less than 5 percent fines.

- To reduce the potential for heave caused by surface water penetrating under the sidewalk, the joints between sidewalk concrete sections should be sealed with a waterproof compound. The sidewalks should be sloped away from the building or other vertical surfaces to promote flow of water. To the extent possible, roof leaders should not discharge onto sidewalk surfaces.

- After the proposed grading in the proposed sidewalk and roadway areas is completed, the proposed grading plan should be submitted to LGCI to assess whether drains should be installed under sidewalks and roadways.

3.6.3 Pavement Sections

A typical, minimum, standard-duty pavement section that could be used for parking areas is as follows:

1.5" Asphalt "Top Course"
2.0" Asphalt "Base Course"

8" Processed Gravel for Sub-Base (MassDOT M1.03.1)

A typical, minimum, heavy-duty pavement section that could be used for areas of heavy truck traffic is as follows:

2.0" Asphalt "Top Course"
2.5" Asphalt "Base Course"
12" Processed Gravel for Sub-Base (MassDOT M1.03.1)

The pavement sections shown above represent minimum thicknesses representative of typical local construction practices for similar use. Periodic maintenance should be anticipated.

Pavement material types and construction procedures should conform to specifications of the “Standard Specifications for Highways and Bridges,” prepared by the Commonwealth of Massachusetts Department of Transportation dated 2023.

Areas to receive relatively highly concentrated, sustained loads such as dumpsters, loading areas, and storage bins are typically installed over a rigid pavement section to distribute concentrated loads and reduce the possibility of high stress concentrations on the subgrade. Typical rigid pavement sections consist of 6 inches of concrete placed over a minimum of 12 inches of subbase material.

3.7 Underground Utilities

Boulders at the bottom of utility trenches should be removed to at least 12 inches below the pipe invert and the resulting excavation should be backfilled with suitable backfill. Utilities should be placed on suitable bedding material in accordance with the manufacturer’s recommendations. “Cushion” material should be placed, by hand, above the utility pipe in maximum 6-inch lifts. The lift should be compacted by hand to avoid damage to the utility. Where the bedding/cushion material consists of crushed stone, it should be wrapped in a geotextile fabric.

Compaction of fill in utility trenches should be in accordance with our recommendations in Section 4.3. To reduce the potential for damage to utilities, placement and compaction of fill immediately above the utilities should be performed in accordance with the manufacturer’s recommendations.

4. CONSTRUCTION CONSIDERATIONS

4.1 Subgrade Preparation

- Surficial organic soil, subsoil, asphalt, buried organic soil, existing fill, abandoned utilities, buried foundations, and other below-ground structures should be entirely removed from within the footprint of the proposed building and site structures before the start of foundation work.

- Abandoned/buried foundations should be removed at least 3 feet beneath the bottom of the subbase layer of the proposed paved areas, and 3 feet beneath the topsoil in athletic fields.

- Tree stumps, root balls, and roots larger than ½ inch in diameter should be removed and the cavities filled with suitable material and compacted per Section 4.3 of this report.

- Due to the silty nature of the natural sand and gravel, we recommend placing a minimum of 12 inches of Structural Fill or crushed stone below the bottom of the footings to provide a working pad.

- Cobbles and boulders should be removed at least 6 inches from beneath footings, 24 inches beneath the bottom of slabs and paved areas, and 24 inches beneath the base material for the turf in athletic fields. The resulting excavations should be backfilled with compacted Structural Fill under the building, and with Ordinary Fill under the subbase of paved areas and under the base material in athletic fields.

- The base material of athletic fields should conform to the gradation and placement requirements of the landscape architect or the manufacturer/installer of synthetic turf.

- The base of the footing excavations in granular soil should be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade.

- The subgrade of the proposed slabs in the natural soil should be compacted with a dynamic vibratory compactor imparting a minimum of 20 kips of force to the subgrade.

- The surficial organic soil and asphalt should be removed from within the proposed paved areas.

- After the surficial organic soil and asphalt are removed from within the proposed paved areas, the existing fill and subsoil should be improved by compacting the exposed surface of the existing fill and subsoil with at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones of soil or organic soil are observed, the soft soil or organic soil should be removed, and the grade should be restored using Ordinary Fill to the bottom of the proposed subbase layer. If pumping of the existing fill is observed, the compactor should be switched to static mode. Where the fill contains or overlies organic soil, the organic soil should be removed at least 18 inches beneath the bottom of the subbase layer.

- Fill placed within the footprint of the proposed building should meet the gradation and compaction requirements of Structural Fill, shown in Section 4.3.1.

- Fill placed under the subbase of paved areas should meet the gradation and compaction requirements of Ordinary Fill, shown in Section 4.3.2.

- Fill placed in the top 12 inches beneath sidewalks should consist of Structural Fill with less than 5 percent fines.

- Loose or soft soils identified during the compaction of the footing or floor slab subgrades should be excavated to a suitable bearing stratum, as determined by the representative of LGCI. Grades should be restored by backfilling with Structural Fill or crushed stone.

- When crushed stone is required in the drawings or is used for the convenience of the contractor, it should be wrapped in a geotextile fabric for separation except where introduction of the geotextile fabric promotes sliding. A geotextile fabric should not be placed between the bottoms of the footings and the crushed stone.

- An LGCI representative should observe the exposed subgrades prior to fill and concrete placement to verify that the exposed bearing materials are suitable for the design soil bearing pressure. If soft or loose pockets are encountered in the footing excavations, the soft or loose materials should be removed and the bottom of the footing should be placed at a lower elevation on firm soil, or the resulting excavation should be backfilled with Structural Fill, or crushed stone wrapped in a filter fabric.

4.2 Subgrade Protection

The onsite fill and natural soil are frost-susceptible. If construction takes place during freezing weather, special measures should be taken to prevent the subgrade from freezing. Such measures should include the use of heat blankets or excavating the final 6 inches of soil just before pouring the concrete. Footings should be backfilled as soon as possible after footing construction. Soil used as backfill should be free of frozen material, as should the ground on which it is placed. Filling operations should be halted during freezing weather.

Materials with high fines contents are typically difficult to handle when wet, as they are sensitive to moisture content variations. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The contractor should keep exposed subgrades properly drained and free of ponded water. Subgrades should be protected from machine and foot traffic to reduce disturbance.

4.3 Fill Materials

Structural Fill and Ordinary Fill should consist of inert, hard, durable sand and gravel free from organic matter, clay, surface coatings, and deleterious materials, and should conform to the gradation requirements shown below.

4.3.1 Structural Fill

The Structural Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Structural Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
3 inches	100
1 ½ inch	80-100
½ inch	50-100
No. 4	30-85
No. 20	15-60
No. 60	5-35
No. 200*	0-10

* 0 – 5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

4.3.2 Ordinary Fill

Ordinary Fill should have a plasticity index of less than 6 and should meet the gradation requirements shown below. Ordinary Fill should be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within ±2 percentage points of the optimum moisture content.

Sieve Size Percent	Passing by Weight
6 inches	100
1 inch	50-100
No. 4	20-100
No. 20	10-70
No. 60	5-45
No. 200	0-20

=

4.4 Reuse of Onsite Materials

Based on our field observations and the results of the grain-size analyses, the existing fill and natural and gravel are not suitable for reuse as Structural Fill. Some of the existing fill free of organic soil and natural sand and gravel may be reused as Ordinary Fill.

Should the contractor encounter materials suitable for reuse during earthwork operations, the contractor should avoid mixing the reusable soils with fine-grained and/or organic soils. The soils to be reused should be excavated and stockpiled separately for compliance testing.

Soils with 20 percent or greater fines contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control should be implemented during the compaction of onsite soils with fines contents of 20 percent or greater. The contractor should be prepared to remove and replace such soils if pumping occurs.

Materials to be used as fill should first be tested for compliance with the applicable gradation specifications.

The contractor may mobilize a rock crusher to the site. Boulders and blasted rock can be processed with the existing fill and natural sand and gravel by crushing to produce well graded granular fill that is lower in fines if blended with a sufficient proportion of rock. Processed material obtained by crushing blasted rock, boulders, and soil should meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation should be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction. The site contractor should be prepared to produce batches of material processed using different blending ratios at the start of the earthwork operations. LGCI will review the results of grain-size analyses performed on the processed material and provide an opinion about the blending ratio to maintain throughout construction.

4.5 Rock Blasting Considerations

4.5.1 Rock Removal

Deep rock cuts will be required to achieve the proposed FFE of the proposed building on the northern side of the proposed building footprint and to achieve the proposed grades of the proposed access road and paved areas.

Minor rock cuts (less than 1 foot) over short distances may be achieved using hoe-rams or using other non-blasting techniques. For the majority of the cuts, we anticipate that rock blasting will be required.

- Rock should be cut to at least 12 inches beneath footings and to a minimum of 24 inches beneath the bottom of the proposed slabs. To facilitate rock excavation and backfilling, we recommend that the blasting extend to an elevation corresponding to 12 inches beneath the bottom of the deepest footings under the entire building footprint, i.e., at a minimum to El. 211 feet.

- The rock should be cut laterally at least 1 foot beyond each side of the footing. For retaining wall footings, the rock should be cut laterally at least 3 feet from the outside face of the wall to allow for placement of the formwork. Where utilities are installed around the perimeter of the proposed building, the rock should be cut at least 3 feet from the nearest utility.

- The rock surface should be cut as level as possible. The surface of rock should not be steeper than 12H:1V.

- Structural Fill should not be placed directly on rock surfaces that are fractured. The fractures should be covered with a geotextile fabric for separation before placing Structural Fill on the fractured rock.

- Rock should be cut at least 18 inches beneath the bottom of paved areas and the ground surface of athletic fields.

- Under utility pipes, manholes, and catch basins, rock should be cut a minimum of 12 inches beneath the pipe or structure.

- Laterally, rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.

- To reduce overblasting and the potential for heaved rock, drill holes for blasting should not extend more than 2 feet beneath the minimum depths shown above.

- To reduce the potential for damage to the existing building during blasting operations, rock blasting should be controlled to reduce vibrations and airblast overpressure to below thresholds established in the Earth Moving Specifications.

- Pre-splitting or controlled blasting may be desirable to reduce the amount of over-blast near the existing building.

- To reduce the potential for blasted rock intended for crushing mixing with organic soil, we recommend that the topsoil, roots, tree stumps, and vegetation be removed before blasting. The remainder of the overburden soils and excavatable weathered rock should not be removed before blasting.

- To help obtain information about the top of the rock for rock quantity estimating purposes, we recommend that the Earth Moving Specifications include a requirement for the contractor to perform rock probes at the site in a grid pattern before the start of blasting. The probes should be spaced at 50 feet or less. The results of the probes should include, at a minimum, the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.

4.5.2 Ground Vibration Monitoring

Rock blasting operations will generate ground vibrations that may result in minor cracks and cosmetic damage to nearby structures. To protect the adjacent structures from potential damage, construction blasting should be carefully controlled and monitored. We recommend monitoring vibrations at the ground surface and at nearby structures before and during the rock blasting operations.

We recommend a peak particle velocity (PPV) of 2 inches per second (ips) for concrete foundations and 1 ips for masonry foundations.

4.5.3 Public Notification

The human perception threshold to vibration is very low, i.e., people are far more sensitive to vibrations than are the structures they occupy. Various studies have indicated that the sound effects are noticeable at PPV values of 0.02 ips and complaints and claims of damage are likely at PPV values of 0.2 to 0.3 ips. These vibration intensities are well below the intensities that would cause structural damage to buildings. For these reasons, we recommend that the owner implement a proactive program of public notification and education of neighbors on the physical characteristics of blasting effects before the start of blasting.

4.5.4 Pre-Construction Condition Survey

We recommend that the Owner perform a pre-construction condition survey of structures located within 250 feet of the nearest blasting operation to document the existing conditions of the structures. The Owner may also consider using crack monitoring gauges to monitor large cracks identified during the pre-construction surveys.

The pre-construction survey performed by the Owner should not be a substitute to the pre-blast survey performed by the blasting contractor.

4.6 Groundwater Control Procedures

Based on the groundwater levels measured in our explorations, we anticipate that groundwater control procedures will be needed during the removal of the existing fill and during excavations for deep utilities. We also anticipate that significant quantities of groundwater will be present at the bottom of the rock excavation. Accordingly, we recommend that a groundwater control plan be designed and implemented that disposes of the groundwater by gravity. We anticipate that filtered sump pumps installed in a series of sump pump pits located at least 3 feet below the bottom of planned excavations may be sufficient to handle groundwater and surface runoff that may enter the excavation during wet weather. The contractor should be prepared to use multiple sump pumps to maintain a dry excavation during the removal of the existing fill.

The contractor should be permitted to employ whatever commonly accepted means and practices are necessary to maintain the groundwater level below the bottom of the excavation and to maintain a dry excavation during wet weather. Groundwater levels should be maintained at a minimum of 1 foot below the bottom of the excavations during construction. The placement of reinforcing steel or concrete in standing water should not be permitted.

To reduce the potential for sinkholes developing over sump pump pits after the sump pumps are removed, the crushed stone placed in the sump pump pits should be wrapped in a geotextile fabric. Alternatively, the crushed stone should be entirely removed after the sump pump is no longer in use, and the sump pump pit should be restored with suitable backfill.

Proper permits should be obtained from authorities having jurisdiction over the work. At a minimum, the water collected from excavations should be filtered for fines in sedimentation basins before being discharged. The sedimentation basins could be constructed of hay bales wrapped in a geotextile fabric.

The contractor should grade the areas uphill of the proposed construction to direct surface runoff away from the construction area and should be prepared to installed swales as needed to divert the surface runoff.

4.7 Temporary Excavations

All excavations to receive human traffic should be constructed in accordance with OSHA guidelines.

The site soils should generally be considered Type “C” and should have a maximum allowable slope of 1.5 Horizontal to 1 Vertical (1.5H:1V) for excavations less than 20 feet deep. Deeper excavations, if needed, should have shoring designed by a professional engineer.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain the stability of the excavation sides and bottom.

5. REPORT LIMITATIONS

Our analyses and recommendations are based on project information provided to us at the time of this report. If changes to the type, size, and location of the proposed structures or to the site grading are made, the recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions and recommendations modified in writing by LGCI. LGCI cannot accept responsibility for designs based on our recommendations unless we are engaged to review the final plans and specifications to determine whether any changes in the project affect the validity of our recommendations, and whether our recommendations have been properly implemented in the design.

It is not part of our scope to perform a more detailed site history; therefore, we have not explored for or researched the locations of buried utilities or other structures in the area of the proposed construction. Our scope did not include environmental services or services related to moisture, mold, or other biological contaminants in or around the site.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from anticipated conditions are encountered, it may be necessary to revise the recommendations in this report. We cannot accept responsibility for designs based on recommendations in this report unless we are engaged to 1) make site visits during construction to check that the subsurface conditions exposed during construction are in general conformance with our design assumptions and 2) ascertain that, in general, the work is being performed in compliance with the contract documents.

Our report has been prepared in accordance with generally accepted engineering practices and in accordance with the terms and conditions set forth in our agreement. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Mount Vernon Group Architects, Inc. for the specific application to the proposed Green Meadow Elementary School in Maynard, Massachusetts as conceived at this time.

6. REFERENCES

In addition to the references included in the text of the report, we used the following references:

The Commonwealth of Massachusetts (2017), "The Massachusetts State Building Code, Ninth (9th) Edition."

The Department of Labor, Occupational Safety and Health Administration (1989), "Occupational Safety and Health Standards - Excavations; Final Rule," 20 CFR Part 1926, Subpart P.

USGS Maynard MA topographic map from http://mapserver.mytopo.com.

Table 1 - Summary of LGCI's Borings
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

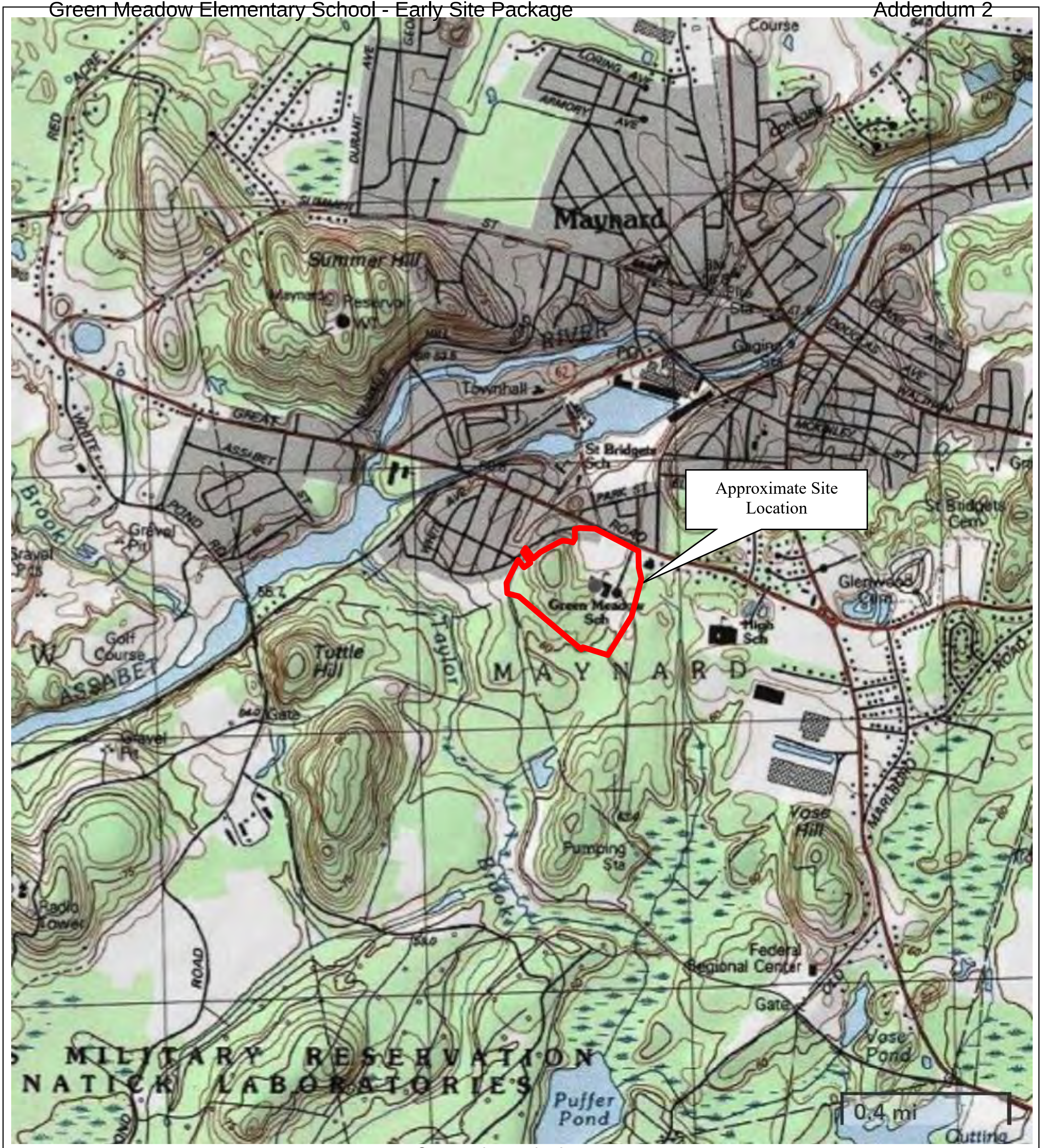
Boring No.[7]	Elevation (ft.)[1]	Groundwater[2] Depth / El. (ft.)	Bottom of Topsoil/ **Asphalt** Depth / El. (ft.)	Bottom of Subsoil Depth / El. (ft.)	Bottom of Fill Depth / El. (ft.)	Bottom of Buried Organic Soil Depth / El. (ft.)	Bottom of Sand and Gravel Depth / El. (ft.)	Depth to Top of Rock/***Inferred Rock*** Depth / El. (ft.)	Bottom of Boring Depth / El. (ft.)
2022 Explorations									
B-1	206	5.5 / 201	1.0 / 205	- / -	4.0 / 202	- / -	17.5 / 189	17.5 / 189	19.0 [4]/ 187
B-2	203	6.5 / 197	1.0 / 202	4.0 / 199	- / -	- / -	21.0 [3]/ 182	- / -	21.0 / 182
B-4	203	7.5 / 196	0.8 / 202	- / -	4.0 / 199	- / -	21.0 [3]/ 182	- / -	21.0 / 182
B-6	202	8.5 / 194	0.5 / 202	2.0 / 200	- / -	- / -	21.0 [3]/ 181	- / -	21.0 / 181
B-7	214	9.5 / 205	1.0 / 213	4.0 / 210	- / -	- / -	12.0 / 202	12.0 / 202	14.0 [4]/ 200
B-8	214	10.5 / 204	1.3 / 213	- / -	4.0 / 210	- / -	11.0 / 203	11.0 / 203	13.0 [4]/ 201
B-9	214	11.5 / 203	1.0 / 213	- / -	6.6 / 207	9.0 / 205	21.0 [3]/ 193	- / -	21.0 / 193
B-10	214	12.5 / 202	0.6 / 213	4.0 / 210	- / -	- / -	21.0 [3]/ 193	- / -	21.0 / 193
B-11	213	13.5 / 200	0.5 / 213	- / -	6.0 / 207	- / -	14.3 / 199	14.3 / 199	18.0 [4]/ 195
2024 Explorations									
B-101	213	- / -	0.5 / 213	2.0 / 211	- / -	- / -	17.5 [3]/ 196	**17.5** / 196	17.5 [5]/ 196
B-102	209	17.5 / 192	0.2 / 209	2.0 / 207	- / -	- / -	18.5 [3]/ 191	**18.5** / 191	18.5 [5]/ 191
B-103	214	- / -	0.5 / 214	4.0 / 210	2.0 / 212	- / -	16.5 [3]/ 198	**16.5** / 198	16.5 [5]/ 198
B-104-OW	214	18.5 / 196	0.3 / 214	- / -	4.0 / 210	- / -	19.2 [3]/ 195	**19.2** / 195	19.1 [5, 9]/ 195
B-105	213	- / -	0.7 / 212	- / -	2.0 / 211	- / -	12.5 / 201	**12.5** [8]/ 201	14.7 / 198
B-106	213	- / -	0.7 / 212	2.0 / 211	- / -	- / -	12.5 [3]/ 201	- / -	12.5 / 201
B-107	213	14.7 / 198	0.3 / 213	- / -	- / -	- / -	15.2 [3]/ 198	- / -	15.2 / 198
B-108	214	13.0 / 201	0.4 / 214	2.0 / 212	- / -	- / -	14.7 / 199	9.0 [8]/ 205	14.7 [4]/ 199
B-109	222	8.4 / 214	0.5 / 222	4.0 / 218	- / -	- / -	6.5 / 216	6.5 / 216	16.5 [4]/ 206
B-110	223	15.0 / 208	0.3 / 223	4.0 / 219	- / -	- / -	10.0 / 213	10.0 / 213	15.0 [4]/ 208
B-111	224	12.5 / 212	0.5 / 224	2.0 / 222	- / -	- / -	9.0 / 215	9.0 / 215	14.0 [4]/ 210
B-112	230	12.1 / 218	0.2 / 230	2.5 / 228	- / -	- / -	5.5 / 225	5.5 / 225	16.0 [4]/ 214
B-113	217	- / -	0.3 / 217	2.0 / 215	- / -	- / -	6.0 / 211	6.0 / 211	16.0 [4]/ 201
B-114-OW	232	5.0 / 227	0.4 / 232	3.0 / 229	- / -	- / -	3.0 / 229	5.0 [8]/ 227	20.0 [4, 9]/ 212
B-115	216	- / -	0.4 / 216	4.0 / 212	- / -	- / -	12.0 [3]/ 204	- / -	12.0 / 204
B-116	213	10.0 / 203	0.4 / 213	2.0 / 211	- / -	- / -	11.2 [3]/ 202	**11.2** / 202	11.2 [5]/ 202
B-117	211	- / -	- / -	8.0 / 203	6.9 / 204	- / -	12.0 [3]/ 199	- / -	12.0 / 199
B-118	207	11.5 / 196	**0.3** / 207	- / -	- / -	- / -	12.0 [3]/ 195	**12.0** / 195	12.0 [5]/ 195
B-119	209	- / -	**0.3** / 209	- / -	2.0 / 207	- / -	12.0 [3]/ 197	- / -	12.0 / 197
B-T-120	210	- / -	- / -	2.0 / 208	- / -	- / -	12.0 [3]/ 198	- / -	12.0 / 198

1. The ground surface elevation was interpolated from Drawing EX-1 titled: " Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.
2. Groundwater was measured during drilling, at the end of drilling, or based on sample moisture, whichever is shallower.
3. Boring terminated in the sand and gravel layer.
4. Boring terminated in rock.
5. Borings terminal on refusal on possible boulder or rock.
6. Boring terminated in silt layer.
7. Borings B-3 and B-5 were not performed.
8. Boulder (or possible rock) encountered at depths of 12.5 feet, 6 feet, and 3 feet beneath the ground surface in borings B-105, B-108, and B-114, respectively.
9. Groundwater observational well installed in boring.
10. "-" means layer was not encountered.

Table 2 - Summary of LGCI's Test Pits
Proposed Green Meadow Elementary School
Maynard, Massachusetts
LGCI Project No. 2201

Test Pit No.	Ground-Surface Elevation (ft.)	Groundwater[3] Depth /Elevation (ft.)	Bottom of Topsoil Depth /Elevation (ft.)	Bottom of Subsoil Depth /Elevation (ft.)	Bottom of Fill Depth /Elevation (ft.)	Bottom of Buried Organics Depth /Elevation (ft.)	Bottom of Sand and Gravel Depth /Elevation (ft.)	Bottom of Test Pit Depth /Elevation (ft.)
TP-1	228	- / -	0.5 / 228	2.0 / 226	- / -	- / -	7.5 [4]/ 221	7.5 [6]/ 221
TP-2	214	- / -	0.7 / 213	1.9 / 212	- / -	- / -	10.0 [4]/ 204	10.0 / 204
TP-3	214	- / -	0.5 / 214	- / -	2.5 / 212	- / -	12.0 [4]/ 202	12.0 / 202
TP-4	214	- / -	0.3 / 214	- / -	4.0 / 210	- / -	12.0 [4]/ 202	12.0 / 202
TP-5	213	- / -	0.5 / 213	- / -	1.5 / 212	- / -	10.1 [4]/ 203	10.1 [6]/ 203
TP-6	213	- / -	0.6 / 212	- / -	2.0 / 211	- / -	12.0 [4]/ 201	12.0 / 201
TP-7	234	- / -	0.5 / 234	1.5 / 233	- / -	- / -	7.5 [4]/ 227	7.5 / 227
TP-8	227	- / -	0.6 / 226	3.5 / 224	- / -	- / -	10.0 [4]/ 217	10.0 / 217
TP-9	219	7.0 / 212	0.5 / 219	- / -	- / -	- / -	7.0 [4]/ 212	7.0 [6]/ 212
TP-10	221	8.5 / 213	1.0 / 220	2.7 / 218	- / -	- / -	8.5 [4]/ 213	8.5 [6]/ 213
TP-11	204	- / -	1.0 / 203	3.0 / 201	- / -	- / -	10.8 [4]/ 193	10.8 [7]/ 193
TP-12	203	12.0 / 191	0.3 / 203	- / -	1.5 / 202	- / -	12.0 [4]/ 191	12.0 / 191
TP-14	218	8.0 / 210	0.5 / 218	1.0 / 217	- / -	- / -	12.0 [4]/ 206	12.0 / 206
TP-15	213	2.0 / 211	0.5 / 213	2.5 / 211	- / -	- / -	12.0 [4]/ 201	12.0 / 201
TP-16	212	- / -	0.5 / 212	2.0 / 210	- / -	- / -	8.5 [4]/ 204	8.5 [6]/ 204
TP-17	213	- / -	0.3 / 213	4.7 / 208	- / -	- / -	9.0 [4]/ 204	9.0 [6]/ 204
TP-18B	213	- / -	0.5 / 213	- / -	3.0 / 210	- / -	10.0 [4]/ 203	10.0 [6]/ 203
TP-19	209	- / -	1.0 / 208	2.3 / 207	- / -	- / -	12.0 [4]/ 197	12.0 / 197
TP-21	202	2.5 / 200	0.8 / 201	- / -	3.0 / 199	3.5 / 199	12.0 [4]/ 190	12.0 / 190
TP-22	202	- / -	2.0 / 200	- / -	3.0 / 199	3.5 / 199	12.0 [4]/ 190	12.0 / 190
TP-23 [5]	200	- / -	0.8 / 199	3.0 / 197	1.5 / 199	- / -	12.0 [4]/ 188	12.0 / 188
TP-26 [5]	206	- / -	0.5 / 206	2.3 / 204	- / -	- / -	11.0 [4]/ 195	11.0 / 195

1. The ground surface elevation was interpolated from Drawing EX-1 titled: " Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.
2. "-" means layer was not encountered.
3. Groundwater was measured during excavation, or at the end of excavation, whichever is shallower.
4. Test pit terminated in the sand and gravel layer.
5. Infiltrometer test was performed in test pit.
6. Test pit was terminated due to excavator refusal on possible boulder or rock.
7. Test pit was terminated due to excavation walls caving in.

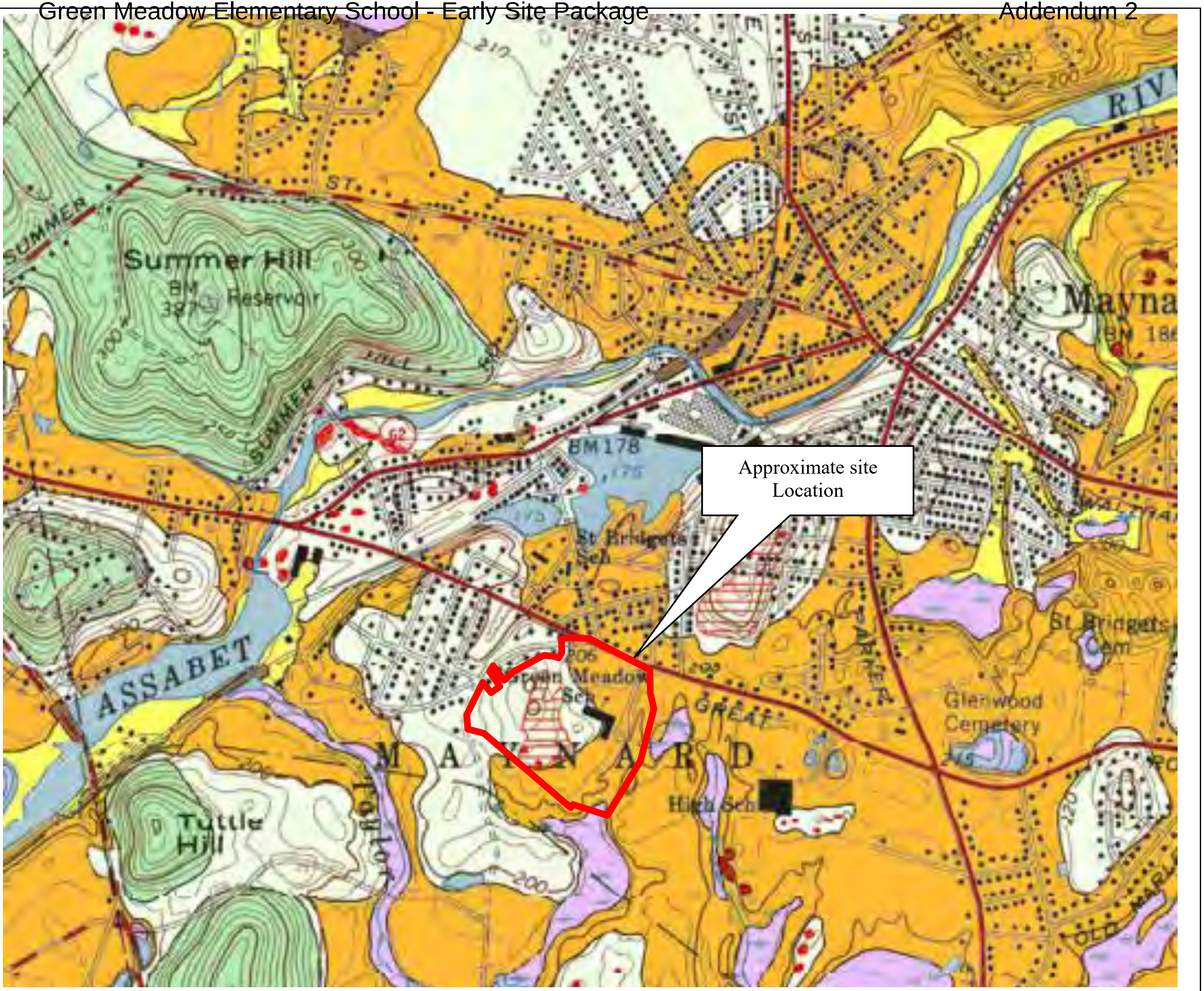


Contour Intervals: 3 meters

0.4 mi

Note: Figure based on USGS topographic map of Maynard, MA obtained from *www.*usgs.gov

Client: Mount Vernon Group Architects, Inc.	Project: Proposed Green Meadow School	Figure 1 – Site Location Map	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Maynard, MA	LGCI Project No.: 2201	Date: April 2024



Approximate site Location

🟩 **Thin till**—Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts; large surface boulders are common; unit was mapped where till is generally less than 10 to 15 ft thick including areas of shallow bedrock. Predominantly consists of upper till of the last glaciation; loose to moderately compact, generally sandy, commonly stony. Two facies are present in some places: a looser, coarser grained ablation facies, melted out from supraglacial position; and an underlying more compact, finer grained lodgement facies deposited subglacially. In general, both ablation and lodgement facies of upper till derived from fine-grained bedrock are finer grained, more compact, less stony and have fewer surface boulders than upper till derived from coarse-grained crystalline rocks. Across Massachusetts, fine-grained bedrock sources include the red Mesozoic sedimentary rocks of the Connecticut Valley lowland, marble in the western river valleys, and fine-grained schists in upland areas

🟧 **Coarse deposits** consist of *gravel deposits*, *sand and gravel deposits*, and *sand deposits*, not differentiated in this report. *Gravel deposits* are composed of at least 50 percent gravel-size clasts; cobbles and boulders predominate; minor amounts of sand occur within gravel beds, and sand comprises a few separate layers. Gravel layers generally are poorly sorted, and bedding commonly is distorted and faulted due to postdepositional collapse related to melting of ice. *Sand and gravel deposits* occur as mixtures of gravel and sand within individual layers and as layers of sand alternating with layers of gravel. Sand and gravel layers generally range between 25 and 50 percent gravel particles and between 50 and 75 percent sand particles. Layers are well sorted to poorly sorted; bedding may be distorted and faulted due to postdepositional collapse. *Sand deposits* are composed mainly of very coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25 percent gravel particles, generally granules and pebbles; finer layers may contain some very fine sand, silt, and clay

▤ **Bedrock outcrops and areas of abundant outcrop or shallow bedrock**—Solid color shows extent of individual bedrock outcrops; horizontal-line pattern indicates areas of shallow bedrock or areas where small outcrops are too numerous to map individually; in areas of shallow bedrock, surficial materials are less than 5 to 10 ft thick. These units were not mapped consistently among all quadrangles; see note at beginning of appendix 1 for information on bedrock outcrop mapping by quadrangle

Note: Figure based on map titled: "Surficial Materials Map of the Maynard Quadrangle, Massachusetts," prepared by Stone, Byron D., and Stone, Janet R., for U.S. Geological Survey, Scientific Investigations Map 3402, Quadrangle 97 – Maynard.

Client:
Mount Vernon Group Architects, Inc.

Project:
Proposed Green Meadow School

Figure 2 – Surficial Geologic Map

LGCI
Lahlaf Geotechnical Consulting, Inc.

Project Location:
Maynard, MA

LGCI Project No.:
2201

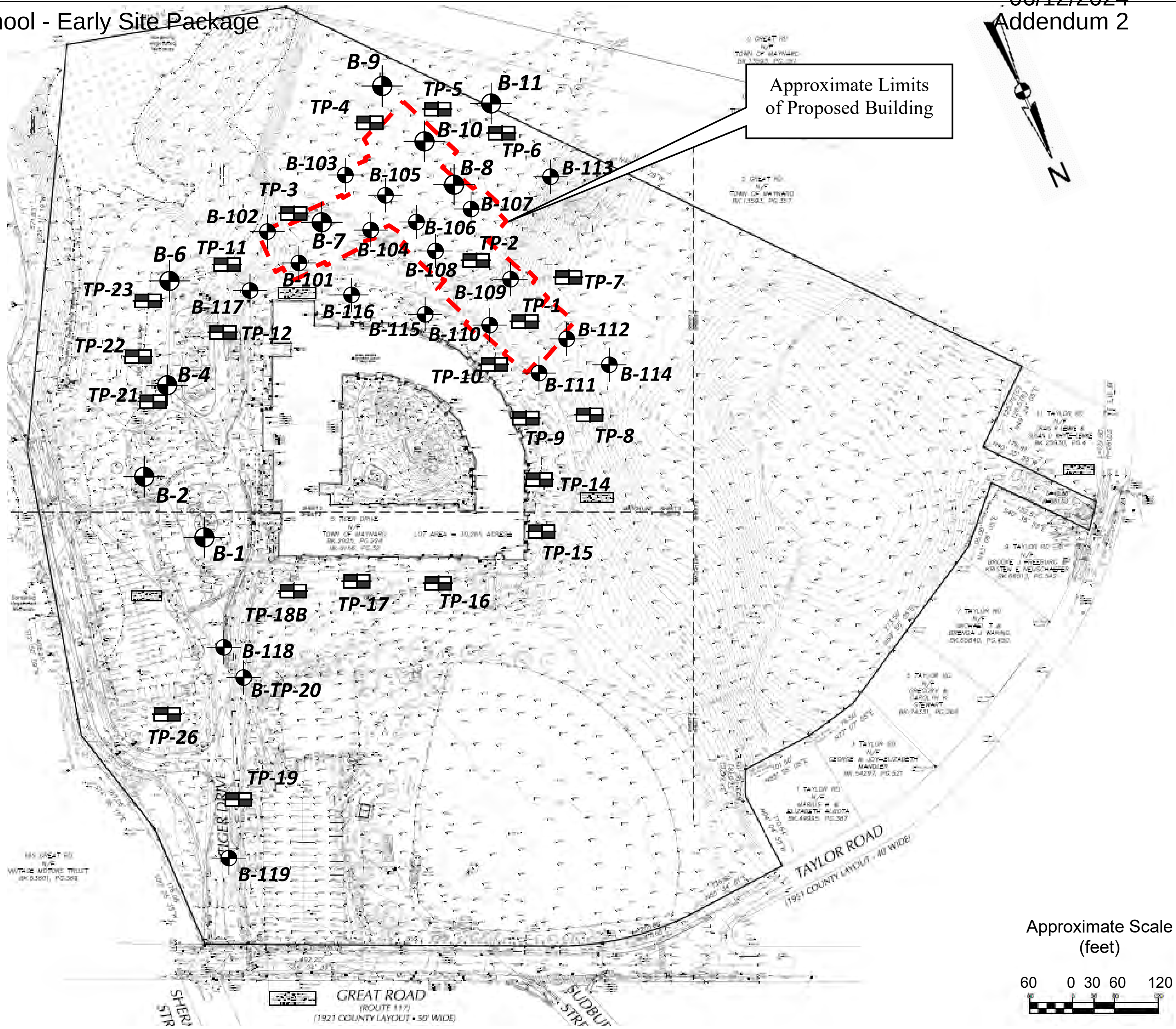
Date:
April 2024

Legend

⊕ Approximate location of boring advanced by Northern Drill Service, Inc. (NDS) of Northborough, MA between January 28 and February 1, 2022, and observed by Lahlaf Geotechnical Consulting, Inc. (LGCI). Borings B-3 and B-5 were not performed.

⊕ Approximate location of boring advanced by Soil X of Leominster, MA between February19 and 27, 2024, and observed by LGCI.

▬ Approximate location of test pit advanced by Saunders Construction of Wakefield, MA between February 6 and 9, 2024, and observed by LGCI.



Notes

1. Figure based on Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

2. Approximate limits of proposed construction alternatives are based on renderings provided to LGCI by Mount Vernon Group Architects, Inc. (MVG) via e-mail on November 7, 2022.

Client: Mount Vernon Group Architects, Inc.	Project: Proposed Green Meadow School	Figure 3 – Boring and Test Pit Location Plan	
LGCI Lahlaf Geotechnical Consulting, Inc.	Project Location: Maynard, MA	LGCI Project No.: 2201	Date: April. 2024

Appendix A – LGCI's Boring Logs

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

B-1
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/1/22 **DATE COMPLETED:** 2/1/22
BORING LOCATION: Near northern edge of proposed addition
COORDINATES: NA
SURFACE El.: 206 ft. (see note 1) **TOTAL DEPTH:** 19 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 9.0 ft. / El. 197.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 5.5 ft. / El. 200.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	205.0	0 - 2	S1	17-40-46-25 (86)	24/22	1	Topsoil	1.0 205.0	REMARK 1: Soil was frozen between depths of 0' and 2'. S1 - Top 12": Topsoil
							Fill		Bot. 10": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 35-40% coarse subangular gravel, trace of organic soil, brown, moist
		2 - 4	S2	12-11-10-10 (21)	24/9			4.0 202.0	S2 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 20-25% fine to coarse subrounded to subangular gravel, trace of organic soil, brown, moist
5	200.0	4 - 6	S3	4-4-4-7 (8)	24/9		Sand and Gravel		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist ▼
10	195.0	9 - 11	S4	12-9-22-25 (31)	24/22				∇ S4 - Silty SAND (SM), fine to medium, 15-20% fines, ~10% fine subrounded gravel, brown with orange mottles, wet
						2			REMARK 2: Drill rig chattering at depth of 12' on possible cobble.
15	190.0	14 - 16	S5	9-13-28-48 (41)	24/14				S5 - Similar to S4, ~20% fines
						3		17.5 188.5	REMARK 3: Drill rig chattering at depth of 17.5' on possible rock.
						4	Rock	19.0	REMARK 4: Roller bit advanced between depths of 17.5 to 19' to confirm presence of rock.
20	185.0								Bottom of borehole at 19.0 feet. Backfilled borehole with drill cuttings.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/1/22 **DATE COMPLETED:** 2/1/22
BORING LOCATION: Near eastern edge of proposed addition
COORDINATES: NA
SURFACE El.: 203 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 9.0 ft. / El. 194.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 7.8 ft. / El. 195.2 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 - 2	S1	13-39-45-17 (84)	24/24	1	Topsoil	1.0 202.0	REMARK 1: Soil was frozen between depths of 0' and 2.5'. S1 - Top 12": Topsoil
							Subsoil		Bot. 12": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% coarse subangular gravel, trace of organic soil, light brown, moist
	200.0	2 - 4	S2	12-13-8-7 (21)	24/15			4.0 199.0	S2 - Similar to S1, 15-20% fine subangular gravel
5		4 - 6	S3	7-7-7-7 (14)	24/15		Sand and Gravel		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, light brown, moist
	195.0							▼ ▽	
10		9 - 11	S4	6-10-12-13 (22)	24/14			14.0 189.0	S4 - Similar to S3, wet
	190.0								
15		14 - 16	S5	4-3-6-7 (9)	24/18		Silt	19.0 184.0	S5 - Silt (ML), slightly plastic, 10-15% fine sand, brown, wet
	185.0								
20		19 - 21	S6	14-20-31-26 (51)	24/8		Sand and Gravel	21.0	S6 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 5-10% fines, 15-20% fine to medium sand, brown, moist
									Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.
	180.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22
DATE COMPLETED: 2/1/22
BORING LOCATION: Near eastern edge of proposed addition
COORDINATES: NA
SURFACE El.: 203 ft. (see note 1)
TOTAL DEPTH: 21 ft.
WEATHER: 20's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 9.0 ft. / El. 194.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 10.0 ft. / El. 193.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO
CHECKED BY: NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 1.5	S1	15-70-30 (100)	18/18	1	Topsoil	0.8 202.2	REMARK 1: Soil was frozen between depths of 0' and 1'. S1 - Top 9": Topsoil
	200.0	2 4	S2	8-9-27-24 (36)	24/8		Fill	4.0 199.0	Bot. 9": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, light brown, moist S2 - Similar to S1 Bot. 9", 20-25% fines, 40-45% fine to coarse subangular gravel
5		4 6	S3	5-4-4-10 (8)	24/12		Sand and Gravel		S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 5-10% fines, brown, moist
10	195.0	9 9.3	S4	100/4"	4/2				▽ S4 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 40-45% fine to coarse subangular gravel, trace of weathered rock, brown, wet ▼
						2			REMARK 2: Drill rig chattering between depths of 11' and 12' on possible cobbles or boulder.
15	190.0	14 16	S5	35-23-25-17 (48)	24/10				S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, angular, 10-15% fines, 15-20% fine to coarse sand, trace of weathered rock, brown, wet
	185.0					3			REMARK 3: Drill rig chattering between depths of 17' to 17.5' on possible cobbles or boulder.
20		19 21	S6	12-33-39-41 (72)	24/12			21.0	S6 - Similar to S5, 25-30% fine to coarse sand
25	180.0								Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22 **DATE COMPLETED:** 1/31/22
BORING LOCATION: Near SE corner of proposed addition
COORDINATES: NA
SURFACE El.: 202 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 4.0 ft. / El. 198.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 8.9 ft. / El. 193.1 ft.
∇ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	200.0	0	S1	22-24-11-8 (35)	24/24	1	Topsoil Subsoil	0.5 201.5 2.0	REMARK 1: Soil was frozen between depths of 0' and 1'. S1 - Top 6": Topsoil Bot. 18": Silty SAND (SM), mostly fine, ~20% fines, trace of roots, trace of organic soil, dark brown, moist
		2	S2	6-6-5-5 (11)	24/17		Sand and Gravel	200.0	S2 - Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace gravel, tan, moist
5		4	S3	4-6-7-8 (13)	24/9			∇	S3 - Similar to S2, wet
	195.0	6	S4	9-8-8-8 (16)	24/14				S4 - Similar to S2, wet
		8	S5	4-4-5-7 (9)	24/9			▼	S5 - Similar to S2, wet
10		10	S6	2-4-3-6 (7)	24/14				S6 - Similar to S2, wet
	190.0	12	S7	10-27-39-32 (66)	24/20				S7 - Top 10": Similar to S2, wet Bot 10": Silty SAND with Gravel (SM), mostly fine, 15-20% fines, 30-35% fine to coarse subangular gravel, trace of weathered rock, light brown, wet
15		14	S8	15-21-26-20 (47)	24/8				S8 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded to subangular, 10-15% fines, 15-20% fine to coarse sand, trace of weathered rock, brown, wet
	185.0	16				2			REMARK 2: Drill rig chattering between depths of 17' to 18' on possible cobbles or boulder.
20		19	S9	13-10-7-27 (17)	24/5				S9 - Similar to S8, subangular, 5-10% fines
	180.0	21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 3 bags of gravel.
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near NE corner of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.5 ft. / El. 201.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0–2	S1	13-12-5-6 (17)	24/24		Topsoil	1.0 213.0	S1 - Top 12": Topsoil
	210.0	2–4	S2	7-7-10-9 (17)	24/18		Subsoil	4.0 210.0	Bot. 12": Silty SAND (SM), fine, 15-20% slightly plastic fines, trace of organic soil, trace of roots, light brown, moist S2 - Top 13": Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, light brown, moist Bot. 5": Silty SAND (SM), fine to medium, 20-25% slightly plastic fines, brown, moist
5		4–6	S3	7-12-17-34 (29)	24/12		Sand and Gravel	12.0 202.0	S3 - Silty SAND (SM), fine to medium, 15-20% fines, brown, moist
		6–8	S4	46-48-37-31 (85)	24/16				S4 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 15-20% fine to medium sand, trace of weathered rock, brown, moist
	205.0								
10		9–11	S5	28-28-32-23 (60)	24/10				S5 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded, ~15% fines, 40-45% fine to coarse sand, trace of weathered rock, light brown, moist
	200.0					1	Rock	14.0	▼ REMARK 1: Roller bit advanced between depths of 12' to 14' to confirm presence of rock.
15									Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings and 2 bags of gravel.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/31/22
DATE COMPLETED: 1/31/22
BORING LOCATION: Near NW corner of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1)
TOTAL DEPTH: 13 ft.
WEATHER: 20's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** Not Encountered
▽ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO
CHECKED BY: NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	19-15-75-25 (90)	24/24	1	Topsoil	1.3 212.7	REMARK 1: Soil was frozen between depths of 0' and 2'. S1 - Top 16": Topsoil
	210.0	2 4	S2	17-17-11-15 (28)	24/15	2	Fill	4.0 210.0	Bot. 8": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 15-20% fine to coarse subangular gravel, trace of organic soil, brown, moist S2 - Similar to S1 Bot. 8", 15-20% fine angular gravel, trace roots REMARK 2: Drill rig chattering between depths of 3' to 4' on possible cobbles or boulder.
5		4 5	S3	78-100	12/6		Sand and Gravel		S3 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, ~10% fines, 15-20% fine to coarse sand, trace of weathered rock, light brown, moist
		6 8	S4	68-62-42-68 (104)	24/18				S4 - Top 12": Similar to S3, 40-45% fine to coarse sand Bot. 6": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace fine subrounded gravel, light brown, moist
10	205.0	9 9.9	S5	61-100/5" (100/5")	11/7	3			REMARK 3: Drill rig chattering at depth of 8.5' on possible cobbles or boulder. S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse subangular, ~10% fines, ~30% fine to coarse sand, trace of weathered rock, light brown, moist
						4		11.0 203.0	REMARK 4: Drill rig chattering at depth of 11' on rock.
						5	Rock	13.0	REMARK 5: Roller bit advanced between depths of 11' to 13' to confirm presence of rock.
									Bottom of borehole at 13.0 feet. Backfilled borehole with drill cuttings.
15	200.0								
20	195.0								
25	190.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near SE corner of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 9.0 ft. / El. 205.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 12.5 ft. / El. 201.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	14-19-21-14 (40)	24/18		Topsoil Fill	1.0 213.0	S1 - Top 12": Topsoil Bot. 6": Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, trace of organic soil, trace of roots, light brown, moist
		2 4	S2	10-8-7-3 (15)	24/6				S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 25-30% fine subrounded gravel, light brown, moist
5	210.0	4 6	S3	6-6-5-5 (11)	24/0				S3 - No recovery
		6 8	S4	4-4-5-13 (9)	24/9		Buried Organic Soil	6.6 207.4	S4 - Top 7": Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded, 5-10% fines, 20-25% fine to medium sand, trace of organic soil, light brown, moist Bot. 2": Silty SAND (SM), fine, 30-35% fines, trace of organic soil, organic odor, black, moist
		8 9							
10	205.0	9 11	S5	18-15-13-17 (28)	24/7		Sand and Gravel	9.0 ▽ 205.0	S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, ~15% fine to coarse sand, trace of weathered rock, brown, wet
		11 14						▼	
15	200.0	14 16	S6	4-6-8-8 (14)	24/9				S6 - Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace of weathered rock, light brown, wet
		16 19							
20	195.0	19 21	S7	7-8-6-6 (14)	24/7			21.0	S7 - Silty GRAVEL with Sand (GM), fine to coarse, subangular, 15-20% fines, 30-35% fine to medium sand, trace of weathered rock, light brown, wet
25	190.0								Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 2.5 bags of gravel.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near center of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 21 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 6.0 ft. / El. 208.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 12.0 ft. / El. 202.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.6 213.4	S1 - Top 7": Topsoil
		0-2	S1	14-33-26-9 (59)	24/22		Subsoil		Bot. 15": Silty SAND (SM), fine to coarse, 15-20% slightly plastic fines, trace of organic soil, light brown, moist
		2-4	S2	5-2-3-3 (5)	24/14				S2 - Silty SAND (SM), fine, 15-20% slightly plastic fines, trace of organic soil, light brown, moist
	210.0	4					Sand and Gravel	4.0 210.0	
5		4-6	S3	1-2-1-2 (3)	24/16				S3 - Silty SAND (SM), mostly fine, ~20% slightly plastic fines, trace of roots, light brown, moist
		6-8	S4	13-11-9-14 (20)	24/13			∇	S4 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded, 15-20% fines, 20-25% fine to medium sand, trace of weathered rock, light brown, moist
	205.0	9							
10		9-11	S5	7-10-13-12 (23)	24/10				S5 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 40-45% fine to coarse subrounded gravel, brown, wet
								▼	
						1			REMARK 1: Drill rig chattering at depth of 13' on possible cobbles or boulder.
	200.0	14							
15		14-16	S6	6-5-5-7 (10)	24/8				S6 - Silty SAND (SM), fine to medium, 15-20% fines, 5-10% fine subrounded gravel, brown, wet
	195.0	19							
20		19-21	S7	10-12-31-49 (43)	24/12				S7 - Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 25-30% fine subrounded gravel, trace of weathered rock, brown, wet
		21						21.0	Bottom of borehole at 21.0 feet. Backfilled borehole with drill cuttings and 4 bags of gravel.
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 1/28/22 **DATE COMPLETED:** 1/28/22
BORING LOCATION: Near SW corner of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 18 ft.
WEATHER: 20's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 15.7 ft. / El. 197.3 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
DRILLING FOREMAN: Tim Tucker
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Mobile B-53 ATV Rig
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: HO **CHECKED BY:** NP

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	31-70-29-32 (99)	24/16		Topsoil	0.5 212.5	S1 - Top 6": Topsoil Bot. 10": Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% coarse subrounded gravel, light brown, moist
	210.0	2 4	S2	23-32-21-23 (53)	24/20		Fill		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded to angular gravel, orange to brown, moist
5		4 6	S3	7-24-14-14 (38)	24/9			6.0 207.0	S3 - Top 5": Silty SAND (SM), fine, trace medium, ~15% fines, 5-10% fine subrounded gravel, trace of roots, light brown, moist Bot. 4": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, ~20% fine to coarse subangular gravel, brown, moist (appears reworked)
	205.0	6 8	S4	16-10-9-9 (19)	24/13		Sand and Gravel		S4 - Top 6": Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 5-10% fines, 15-20% fine to medium sand, brown, moist Bot. 7": Poorly Graded SAND (SP), fine to medium, 0-5% fines, 5-10% fine subrounded gravel, brown, moist
10		9 11	S5	6-8-5-4 (13)	24/6				S5 - Similar to S4 Bot. 7", 10-15% coarse subrounded gravel
	200.0								
15		14 14.3	S6	62/3"	3/0	1 2	Rock	14.3 198.7	REMARK 1: Split spoon refusal encountered at depth of 14.3' on rock, tip of split spoon broke into two pieces. S6 - No recovery ▼ REMARK 2: Roller bit advanced between depths of 14.3' to 18' to confirm presence of rock.
	195.0							18.0	Bottom of borehole at 18.0 feet. Backfilled borehole with drill cuttings and 0.5 bag of gravel.
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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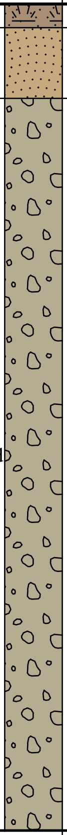
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/19/24
BORING LOCATION: Near NE corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 17.5 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-1-2 (2)	24/15		Topsoil	0.5 212.5	S1 - Top 6": Topsoil
							Subsoil	2.0 211.0	Bot. 9": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine to coarse subangular gravel, trace of roots, trace of organic soil, orange
	210.0	2	S2	9-5-12-11 (17)	24/10		Sand and Gravel		S2 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 10-15% fine to coarse subangular gravel, orange to brown, moist
5		4	S3	9-11-19-23 (30)	24/19				S3 - Silty SAND with Gravel (SM), fine to medium with trace coarse, 15-20% fines, 15-20% fine to coarse subrounded gravel, light brown to orange, moist
	205.0	6	S4	22-24-29-28 (53)	24/2				S4 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 10-15% fines, 25-30% fine to coarse sand, trace of roots, grey, moist
		8							
10		10	S5	4-4-4-5 (8)	24/12				S5 - Well Graded SAND (SW), fine to coarse, 0-5% fines, 0-5% fine subangular gravel, light brown, moist
	200.0	12	S6	27-20-11-11 (31)	24/11				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 35-40% fine to coarse subangular gravel, orange to brown, moist
15		14							
	195.0					1		17.5	REMARK 1: HSA refusal at depth of 17.5' on possible rock or boulder. Bottom of borehole at 17.5 feet. Backfilled borehole with drill cuttings.
20	190.0								
25									



GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24
DATE COMPLETED: 2/19/24
BORING LOCATION: Near SE corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 209 ft. (see note 1)
TOTAL DEPTH: 18.5 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 17.5 ft. / El. 191.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0–2	S1	1-1-2-4 (3)	24/15		Topsoil	0.2 208.8	S1 - Top 2": Topsoil
							Subsoil	2.0 207.0	Bot. 13": Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse subangular gravel, trace of roots, trace of organic soil, trace of wood, orange, moist
		2–4	S2	7-7-14-12 (21)	24/10		Sand and Gravel		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, light brown to orange, moist
5	205.0	4–6	S3	11-10-10-8 (20)	24/10				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, light brown to orange, moist
		6–8	S4	9-8-8-8 (16)	24/7				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, trace of roots, light brown to orange, moist
10	200.0	10–12	S5	4-4-5-4 (9)	24/17				S5 - Well Graded SAND (SW), fine to coarse, ~5% fines, ~10% fine to coarse subangular gravel, light brown, moist
15	195.0	15–17	S6	22-61-38-23 (99)	24/18				S6 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, light brown to orange, moist
								▼	
						1		18.5	REMARK 1: HSA refusal at depth of 18.5' on possible rock or boulder. Bottom of borehole at 18.5 feet. Backfilled borehole with drill cuttings.
20	190.0								
25	185.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/20/24 **DATE COMPLETED:** 2/20/24
BORING LOCATION: Near SW corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 16.6 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.5 213.5	S1 - Top 6": Topsoil
			S1	3-6-7-8 (13)	24/13		Fill	2.0 212.0	Bot. 7": Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 0-5% fine subangular gravel, brown to orange, moist
	210.0	2	S2	17-12-9-10 (21)	24/16		Subsoil	4.0 210.0	S2 - Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 0-5% fine subangular gravel, orange, moist
5		4	S3	11-14-44-19 (58)	24/10		Sand and Gravel		S3 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 0-5% fines, 35-40% fine to coarse sand, light brown to brown, moist
		6	S4	14-14-15-14 (29)	24/15				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subangular gravel, brown to orange, moist
	205.0	8							
10		10	S5	10-11-11-10 (22)	24/3				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 35-40% fine to coarse subangular gravel, brown to orange, moist
	200.0	12							
15		15	S6	28-42-60/2" (102/8")	14/11				S6 - Silty SAND with Silt (SM), fine to coarse, ~15% fines, 10-15% fine to coarse subangular gravel, brown to grey, moist
		16.2 16.5 16.6	S7	100/1"	1/0	1		16.6	REMARK 1: Auger and split spoon refusal at depth of 16.5' on possible large boulder or rock. S7 - No Recovery Bottom of borehole at 16.6 feet. Borehole backfilled with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/20/24
BORING LOCATION: Near NW corner of eastern wing of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 19.2 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 19.0 ft. / El. 195.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 18.5 ft. / El. 195.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-5-6-11 (11)	24/18		Topsoil	0.3 213.7	S1 - Top 4": Topsoil
							Fill		Bot. 14": Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 0-5% fine subangular gravel, trace of roots, trace of wood, orange, moist
		2	S2	6-7-10-15 (17)	24/15				S2 - Silty SAND (SM), fine to medium with trace coarse, 40-45% fines, 10-15% fine subrounded gravel, trace of weathered rock, orange, moist
	210.0	4	S3	12-10-12-13 (22)	24/24		Sand and Gravel	4.0 210.0	S3 - Silty SAND (SM), fine to medium, ~20% fines, 0-5% fines subangular gravel, brown, moist
5									
		6	S4	18-62-36-34 (98)	24/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 40-45% fine to coarse subangular gravel, brown to grey, moist
		8							
	205.0								
10		10	S5	16-25-21-34 (46)	24/12				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown to light brown, moist
		12							
	200.0								
15		15	S6	73-52-32-51 (84)	24/13				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 30-35% fine to coarse subangular gravel, brown to light brown, moist
		17							
	195.0	19	S7	100/2"	2/2	1		19.2 ▼ ▽	REMARK 1: HSA refusal at depth of 19' on possible rock, then attempted split spoon sampling. S7 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 30-35% fine angular gravel, trace of weathered rock, brown, wet
20		19.2							Bottom of borehole at 19.2 feet. Groundwater observation well installed to depth of 19.2 ft.
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24 **DATE COMPLETED:** 2/26/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 14.7 ft.
WEATHER: 40's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.7 212.3	S1 - Top 8": Topsoil
		0 - 1.7	S1	5-33-63-52/2" (96)	20/19		Fill	2.0 211.0	Bot. 11": Poorly Graded GRAVEL with Silt and Sand (GP-GM), mostly fine with coarse, subangular, ~10% fines, ~40% fine to coarse sand, brown to grey, moist (appears to be reworked)
	210.0	2 - 2.7	S2	30-75/2" (75/2")	8/8		Sand and Gravel		S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse gravel, light brown with orange stripes, moist
5		4 - 6	S3	29-33-68-39 (101)	24/12				S3 - Poorly Graded GRAVEL with Silt and Sand (GP-GM), mostly coarse, subangular to angular, 0-5% fines, 20-25% fine to coarse sand, trace of weathered rock, brown, moist
		6 - 7	S4	42-63	12/11				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, grey brown, moist
	205.0								
10		10 - 12	S5	34-51-30-26 (81)	24/14			12.5 200.5	S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, grey to brown, moist
	200.0	12.5 - 14	C1		18/7.5		Boulder	14.0 199.0	C1 - min/ft: 2.5, .9 Pen.: 18" Rec.: 7.5" Boulder, hard, GRANITE, medium grained, grey to white
		14 - 14.7	S6	11-100/2" (100/2")	8/2	1	Silt	14.7	REMARK 1: Advanced roller bit from 14 ft. to 16 ft. S6 - Sandy SILT with Gravel (ML), slightly plastic, 30-35% fine to coarse sand, 15-20% fine to coarse subangular gravel, grey brown, wet Bottom of borehole at 14.7 feet. Backfilled borehole with drill cuttings.
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Near center of western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 12.5 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.7 212.3	S1 - Top 8": Topsoil
			S1	5-7-8-7 (15)	24/16		Subsoil	2.0 211.0	Bot. 8": Silty SAND (SM), fine to medium, 20-25% fines, 10-15% fine to coarse subangular gravel, trace of weathered rock, orange, moist
		2							
	210.0		S2	13-15-14-23 (29)	24/14		Sand and Gravel		S2 - Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine subangular gravel, brown, moist
		4							
5			S3	23-18-21-53 (39)	24/10				S3 - Silty SAND (SM), fine to coarse, 15-20% fines, 5-10% fine subangular gravel, brown to orange, moist
		6							
	205.0								
10		10							
			S4	38-51-50/4" (101/10")	16/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, grey, moist
		11.3							
								12.5	Bottom of borehole at 12.5 feet. Backfilled borehole with drill cuttings.
	200.0								
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/26/24 **DATE COMPLETED:** 2/26/24
BORING LOCATION: Near center of western wing of proposed building
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 15.2 ft.
WEATHER: 40's / Cloudy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 15.0 ft. / El. 198.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 14.7 ft. / El. 198.3 ft.
▽ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	3-6-11-11 (17)	24/20		Topsoil	0.3 212.7	S1 - Top 4": Topsoil Bot. 16": Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 0-5% fine to coarse subangular gravel, light brown, moist
	210.0	2 4	S2	9-16-16-17 (32)	24/18		Sand and Gravel		S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 5-10% fine to coarse subangular gravel, light brown, moist
5		4 6	S3	12-12-23-36 (35)	24/21				S3 - Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 5-10% fine to coarse gravel, light brown, moist
	205.0	6 7.5	S4	58-47-79 (126)	18/15				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine to coarse angular gravel, trace of weathered rock, brown to grey, moist
10		10 10.7	S5	38-100/2" (100/2")	8/8				S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 35-40% fine to coarse angular gravel, trace of weathered rock, brown to grey, moist
	200.0								
15		15 15.2	S6	105/2"	2/2			▼ 15.2 ▽	S6 - Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, brown, wet Bottom of borehole at 15.2 feet. Backfilled borehole with drill cuttings.
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Near center of western wing of proposed building
COORDINATES: NA
SURFACE El.: 214 ft. (see note 1) **TOTAL DEPTH:** 14.7 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** 14.5 ft. / El. 199.5 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 13.0 ft. / El. 201.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 2	S1	1-2-1-2 (3)	24/18		Topsoil	0.4 213.6	S1 - Top 5": Topsoil
							Subsoil	2.0 212.0	Bot. 13": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine subangular gravel, trace of roots, orange, moist
		2 4	S2	5-6-7-7 (13)	24/17		Sand and Gravel		S2 - Silty SAND (SM), fine to medium, 15-20% fines, light brown, moist
5	210.0	4 5.8	S3	6-8-30-70/3" (38)	21/21			6.0 208.0	S3 - Sandy SILT (ML), slightly plastic, 35-40% fine to coarse sand, ~20% fine to coarse subangular gravel, brown, moist
	205.0					1	Boulder	9.0 205.0	REMARK 1: Advanced roller bit from 6.0 ft. to 9.0 ft.
10		9 9.3	S4	100/3"	3/3	2	Sand and Gravel	9.2 204.8	S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, light brown, moist REMARK 2: Split spoon refusal at 9.2 feet. Drillers advanced roller bit to 10.5 ft., and then started rock core.
	200.0	10.5 14.5	C1		48/37		Boulder	14.5 ▽ 199.5	C1 - min/ft: 4.4, 3.3, 3.7, 1.8 RQD: 41.6% Hard, slightly to moderately weathered, moderately fractured, grey to orange, coarse grained, GRANITE ▼
15		14.5 14.7	S5	100/2"	2/2	3	Sand and Gravel	14.7	S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, ~15% fine to coarse subangular gravel, trace of weathered rock, light brown to grey, wet REMARK 3: Split spoon refusal on possible boulders or rocks, boring terminated at depth of 14.7'. Bottom of borehole at 14.7 feet. Backfilled borehole with drill cuttings.
20 25	195.0 190.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/23/24 **DATE COMPLETED:** 2/23/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 222 ft. (see note 1) **TOTAL DEPTH:** 16.5 ft.
WEATHER: 30's / Rainy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 8.4 ft. / El. 213.6 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0 0.5	G1		6/6	1	Topsoil	0.5 221.5	G1 - Topsoil REMARK 1: Topsoil removed during tree clearing, estimated .5' of topsoil.
	220.0	0.5 2.5	S1	1-1-1-1 (2)	24/14		Subsoil		S1 - Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
		2.5 4.5	S2	1-2-2-2 (4)	24/17			4.0 218.0	S2 - Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 5-10% fines, trace of roots, light brown, moist
5		4.5 6.2	S3	7-23-22-82/2" (45)	20/19		Sand and Gravel	6.5 215.5	S3 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subangular, 10-15% fines, 30-35% fine to coarse sand, brown to dark grey, moist
10	215.0	6.5 11.5	C1		60/52	2	Rock		REMARK 2: HSA Refusal on possible rock at a depth of 6.5 feet. Driller advanced 3-inch casing to perform a rock core. C1 - min/ft: 5.1, 3.9, 4.2, 4.8, 4.9 RQD: 76.7% ▼ Hard to Very Hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
15	210.0	11.5 16.5	C2		60/46			16.5	C2 - min/ft: 4.1, 4.5, 4.2, 3.6, 3.7 RQD: 59.2% Hard to Very Hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
20 25	205.0 200.0								Bottom of borehole at 16.5 feet. Backfilled borehole with drill cuttings.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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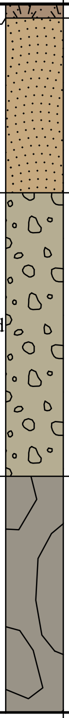
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24
DATE COMPLETED: 2/22/24
BORING LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE El.: 223 ft. (see note 1)
TOTAL DEPTH: 15 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 15.0 ft. / El. 208.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0					Topsoil	0.3 222.7	S1 - Top 4": Topsoil
		0–2	S1	1-1-1-2 (2)	24/14		Subsoil		Bot. 10": Silty SAND with Silt (SM), fine to medium, 15-20% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
	220.0	2–4	S2	2-2-5-16 (7)	24/16				S2 - Sandy SILT (ML), nonplastic, 40-45% fine sand, trace of roots, orange brown, moist
5		4–6	S3	22-19-14-12 (33)	24/15		Sand and Gravel	4.0 219.0	S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25% fine subangular gravel, brown, moist
	215.0	6–8	S4	14-16-16-18 (32)	24/17				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, brown, moist
10		10				1	Rock	10.0 213.0	REMARK 1: HSA refusal at depth of 10'. 3-inch casing was driven to 10' below ground surface and rock coring advanced.
	210.0	10–15	C1		60/60				C1 - min/ft: 4.9, 4.4, 4.2, 4.9, 6.2 RQD: 65.8% Hard to very hard, moderately to slightly weathered, moderately fractured, orange to grey, medium grained, GRANITE
15		15						15.0 ▼	Bottom of borehole at 15.0 feet. Backfilled borehole with drill cuttings.
	205.0								
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24 **DATE COMPLETED:** 2/22/24
BORING LOCATION: Near NE corner of western wing of proposed building
COORDINATES: NA
SURFACE El.: 224 ft. (see note 1) **TOTAL DEPTH:** 14 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.5 ft. / El. 211.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	2-3-3-2 (6)	24/17		Topsoil Subsoil	0.5 223.5 2.0 222.0	S1 - Top 6": Topsoil Bot. 11": Silty SAND (SM), fine to medium, 20-25% fines, 0-5% fine subangular gravel, trace of roots, orange brown, moist
	220.0	2	S2	7-17-35-21 (52)	24/17		Sand and Gravel		S2 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse subangular gravel, brown, moist
5		4	S3	19-19-20-16 (39)	24/20				S3 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, 5-10% fine subangular gravel, grey to orange, moist
		6	S4	9-21-108 (129)	18/15				S4 - Silty SAND (SM), fine to medium with trace coarse, 15-20% fines, ~10% fine to coarse subrounded gravel, trace of roots, grey to orange, moist
	215.0	7.5						9.0 215.0	
		9	C1		12/12	1	Rock		REMARK 1: HSA refusal at depth of 9' on possible rock, advanced 3-inch casing to perform a rock core. C1 - min/ft: 11.9 RQD: 45.8% Hard, slightly weathered, moderately fractured, grey to tan, coarse grained, GRANITE
10		10	C2		48/47.5	2			REMARK 2: Core barrel jamming and terminated C1 at depth of 10'. C2 - min/ft: 5.6, 7.0, 3.9, 4.1 RQD: 73.9% ▼ Top 26": Hard, slightly weathered, moderately to slightly fractured, grey to tan, coarse grained, GRANITE Bot. 22": Hard, slightly weathered, slightly fractured, grey to white, medium grained, GRANITE
	210.0	14				3		14.0	REMARK 3: Core barrel jamming and terminated C2 at depth of 14'. Bottom of borehole at 14.0 feet. Backfilled borehole with drill cuttings and 1 bag of sand.
15									
	205.0								
20									
	200.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/21/24
DATE COMPLETED: 2/21/24
BORING LOCATION: Near NW corner of western wing of proposed building
COORDINATES: NA
SURFACE El.: 230 ft. (see note 1)
TOTAL DEPTH: 16 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 12.1 ft. / El. 217.9 ft.
∇ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-15-11 (16)	24/4		Topsoil	0.2 229.8	S1 - Top 2": Topsoil
							Subsoil	2.5 227.5	Bot. 2": Silty SAND with Gravel (SM), fine to medium, 20-25% fines, 15-20% fine to coarse angular gravel, trace of organic soil, trace of roots, orange to brown, moist
		2	S2	8-6-12-19 (18)	24/19		Sand and Gravel		S2 - Top 6": Silty SAND (SM), fine to medium, 15-20% fines, 5-10% fine to coarse angular gravel, trace of organic soil, trace of roots, orange to brown, moist Bot. 13": Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, ~15% fine subangular gravel, trace of roots, moist
		4	S3	21-100/3" (100/3")	9/9				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 25-30% fine to coarse subangular gravel, trace of weatherd rock, brown, moist
5	225.0	4.8						5.5 224.5	
		6	C1		60/56		Rock		C1 - min/ft: 3.3, 5.4, 4.5, 5.1, 6.1 Pen.: 60" Rec.: 56" RQD: 52.5% Hard to very hard, slightly to moderately weathered, moderately fractured, grey orange, medium grained, GRANITE
10	220.0								
		11	C2		60/50.5			▼	C2 - min/ft: 5.0, 3.9, 5.2, 6.6, 9.4 Pen.: 60" Rec.: 50.5" RQD: 51.6% Hard to very hard, slightly weathered, slightly fractured, orange to grey, medium grained, GRANITE
15	215.0								
		16						16.0	Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	210.0								
25	205.0								

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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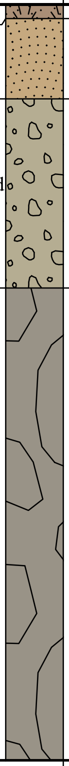
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/23/24 **DATE COMPLETED:** 2/23/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 217 ft. (see note 1) **TOTAL DEPTH:** 16 ft.
WEATHER: 30's / Rainy
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: HSA (4-1/4" I.D.) then 3-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-1-1-1 (2)	24/12		Topsoil	0.3 216.7	S1 - Top 4": Topsoil
	215.0						Subsoil	2.0 215.0	Bot. 8": Silty SAND (SM), fine to medium, 15-20% fines, trace of organic soil, trace of roots, trace of wood, orange, moist
		2	S2	2-4-8-15 (12)	24/20		Sand and Gravel		S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, ~15% fine to coarse subangular gravel, light brown, moist
5		4 5.5	S3	13-14-87 (101)	18/8			6.0 211.0	S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 25-30% fine to coarse subangular gravel, brown to light brown, moist
		6				1	Rock		REMARK 1: HSA refusal at depth of 6' on possible rock, advanced 3-inch casing to perform a rock core.
10	210.0		C1		60/60				C1 - min/ft: 3.5, 2.9, 2.8, 2.6, 2.0 Pen.: 60" Rec.: 58.5" RQD: 97.5% Hard, fresh to slightly weathered, sound to slightly fractured, grey to dark grey, medium grained, GRANITE
15	205.0	11	C2		60/58.5			16.0	C2 - min/ft: 3.0, 2.4, 2.4, 2.1, 2.7 Pen.: 60" Rec.: 58.4" RQD: 72.5% Hard, fresh to slightly weathered, sound to slightly fractured, grey to dark grey, medium grained, GRANITE
	200.0	16							Bottom of borehole at 16.0 feet. Backfilled borehole with drill cuttings.
20	195.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/20/24
DATE COMPLETED: 2/21/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 232 ft. (see note 1)
TOTAL DEPTH: 20 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** 5.0 ft. / El. 227.0 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Drive and wash with 4-inch casing
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: 2 in. I.D., 2.875 in. O.D.
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	1-2-3-5 (5)	24/12		Topsoil	0.4 231.6	S1 - Top 5": Topsoil
	230.0						Subsoil	2.0 230.0	Bot. 7": Silty SAND (SM), fine to coarse,15-20%% fines, 15-20% fine to coarse subangular gravel, trace of oranic soil, trace of roots, trace of wood, orange to brown, moist
		2 2.8	S2	58-100/4" (100/4")	10/9	1	Sand and Gravel	2.8 229.2	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25-30% fine to coarse subangular gravel, grey, moist REMARK 1: Split spoon refusal at 2.8 ft. Drillers advanced roller bit to 5.0 ft., installed 3-inch casing, and started rock core.
5							Boulder	5.0 ▼ 227.0	
	225.0	5	C1		36/29		Rock		C1 - min/ft: 4.9, 6.4, 4.3 Pen.: 36" Rec.:29" RQD: 53.1% Soft, moderately weathered, moderately fractured, grey, fine grained, GRANITE
10		8	C2		24/22				C2 - min/ft: 5.3, 4.4 Pen.: 24" Rec.: 22" RQD: 52.3% Hard, slightly weathered, slightly to moderately fractured, grey to light blue, coarse grained, GRANITE
	220.0	10	C3		60/56				C3 - min/ft: 4.5, 8.0, 4.5, 4.1, 4.3 Pen.: 60" Rec.: 56" RQD: 45.8% Top 26": Hard, moderately weathered, moderately to extremely fractured, vertical breaks, medium grained, grey to light blue, GRANITE Bot. 30": Hard, slightly weathered to fresh, slightly fractured, medium grained, grey to light brown, GRANITE
15	215.0	15	C4		60/58.5			20.0	C4 - min/ft: 5.1, 3.2, 3.6, 3.2, 3.9 Pen.: 60" Rec.: 58.5" RQD: 85.8% Hard to very hard, fresh to slightly weathered, sound to slightly fractured, grey to light blue, medium grained, GRANITE
20 25	210.0	20							Bottom of borehole at 20.0 feet. Groundwater observation well installed to depth of 20 ft.

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/22/24
DATE COMPLETED: 2/22/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 216 ft. (see note 1)
TOTAL DEPTH: 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	215.0	0	S1	1-2-2-1 (4)	24/18		Topsoil	0.4 215.6	S1 - Top 5": Topsoil Bot. 13": Silty SAND (SM), fine to medium, 20-25% fines, trace of roots, orange, moist
		2	S2	2-2-2-5 (4)	24/21		Subsoil	4.0 212.0	S2 - Silty SAND (SM), fine to medium, 20-25% fines, trace of roots, orange, moist
5		4	S3	6-8-10-13 (18)	24/18		Sand and Gravel		S3 - Silty SAND (SM), fine to medium, 20-25% fines, light brown to grey, moist
	210.0	6	S4	12-11-17-38 (28)	24/24				S4 - Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 20-25% fine to coarse subangular gravel, grey to brown, moist
		8 8.4	S5	100/5"	5/0				S5 - No Recovery
10	205.0	10 12	S6	34-45-26-21 (71)	24/18			12.0	S6 - Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 15-20% fine to coarse subangular gravel, light brown, to orange, moist
									Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15	200.0								
20	195.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24 **DATE COMPLETED:** 2/19/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 213 ft. (see note 1) **TOTAL DEPTH:** 11.2 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** 10.0 ft. / El. 203.0 ft. Based on sample moisture
▼ **AT END OF DRILLING:** 10.5 ft. / El. 202.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0	S1	4-6-8-10 (14)	24/19		Topsoil Subsoil	0.4 212.6 2.0 211.0	S1 - Top 5": Topsoil Bot. 14": Silty SAND (SM), fine to coarse, 15-20% fines, 0-5% fine subangular gravel, orange, moist
	210.0	2	S2	27-28-25-38 (53)	24/20		Sand and Gravel		S2 - Silty SAND (SM), fine to coarse, 15% fines, 10-15% fine subangular gravel, brown to orange, moist
5		4	S3	20-34-29-31 (63)	24/19				S3 - Silty SAND with Gravel (SM), fine to coarse, 25-30% fines, ~20% fine to coarse gravel, brown, moist
		6 6.8	S4	52-101/3" (101/3")	9/9				S4 - Well Graded GRAVEL with Sand (GW), fine to coarse, subangular, 0-5% fines, 25-30% fine to coarse sand, trace of fractured rock, grey, moist
	205.0								
10		10 11.2	S5	16-17-84/2" (101/8")	14/9	1		∇ ▼ 11.2	S5 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 15-20% fine to coarse subangular gravel, trace of weathered rock, light brown to brown, wet REMARK 1: HSA refusal at depth of 11.2' on possible rock. Bottom of borehole at 11.2 feet. Backfilled borehole with drill cuttings.
	200.0								
15									
	195.0								
20									
	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
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BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/19/24
DATE COMPLETED: 2/19/24
BORING LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE El.: 211 ft. (see note 1)
TOTAL DEPTH: 12 ft.
WEATHER: 30's / Sunny
GROUNDWATER LEVELS:
∇ **DURING DRILLING:** Not Encountered
▼ **AT END OF DRILLING:** Not Encountered
⊻ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
	210.0	0	S1	27-12-12-43 (24)	24/12		Fill		S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, trace of organic soil, trace of roots, brown, moist
		2	S2	25-21-27-28 (48)	24/17				S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, 5-10% fine to coarse subrounded gravel, trace of roots, trace of organic soil, brown, moist
5	205.0	4	S3	14-13-11-14 (24)	24/24				S3 - Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse gravel, trace of roots, organic odor, dark brown, moist
		6	S4	11-10-9-10 (19)	24/19			6.9 204.1	S4 - Top 11": Silty SAND (SM), fine to medium, 15-20% fines, ~5% fine to coarse gravel, trace of roots, organic odor, dark brown, moist
							Subsoil	8.0 203.0	Bot. 8": Silty SAND with Gravel (SM), fine to medium, ~15% fines, 5-10% fine to coarse subangular gravel, orange, moist
		8	S5	5-8-9-9 (17)	24/15		Sand and Gravel		S5 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, ~15% fine to coarse subangular gravel, trace of roots, light brown to orange, moist
10	200.0	10	S6	11-10-11-12 (21)	24/8			12.0	S6 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 30-35% fine to coarse subangular gravel, light brown to orange, moist
		12							Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15	195.0								
20	190.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

BORING LOG

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PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24
DATE COMPLETED: 2/27/24
BORING LOCATION: Northeast of existing school
COORDINATES: NA
SURFACE El.: 207 ft. (see note 1)
TOTAL DEPTH: 12 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** -
▼ **AT END OF DRILLING:** 11.5 ft. / El. 195.5 ft.
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb.
HAMMER DROP: 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3			3/3		Asphalt	0.3 206.7	Top 3": Asphalt
	205.0	0.3–2.3	S1	12-16-16-11 (32)	24/19		Sand and Gravel		S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist
		2.3–4.3	S2	9-11-11-10 (22)	24/16				S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist
5		4.3–6.3	S3	9-13-21-12 (34)	24/17				S3 - Top 13": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subangular gravel, light brown with orange stripes, moist Bot. 4": Silty SAND with Gravel (SM), fine to coarse, 30-35% fines, 20-25% fine to coarse subangular gravel, olive brown, moist
	200.0	6.3–8.3	S4	12-20-17-37 (37)	24/14				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown to orange, moist
10		10–12	S5	29-30-11-29 (41)	24/4		Sand and Gravel	10.0 197.0	S5 - Well Graded GRAVEL (GW), fine to coarse, subangular, 0-5% fines, 0-5% mostly coarse sand, trace of weathered rock, grey, moist ▼
	195.0	12				1		12.0	REMARK 1: Split spoon bent on possible boulders at depth of 12' after sampling. Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings.
15									
	190.0								
20									
	185.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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BORING LOG

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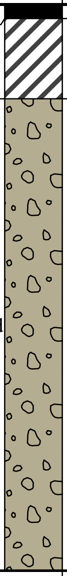
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/27/24 **DATE COMPLETED:** 2/27/24
BORING LOCATION: Near existing driveway entrance from Great Road
COORDINATES: NA
SURFACE El.: 209 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER: 40's / Sunny
GROUNDWATER LEVELS:
▽ **DURING DRILLING:** NE
▼ **AT END OF DRILLING:** -
▼ **OTHER:** -

DRILLING SUBCONTRACTOR: Soil X, Corp.
DRILLING FOREMAN: Edwin Fajardo
DRILLING METHOD: Hollow Stem Auger (4-1/4" I.D.)
DRILL RIG TYPE/MODEL: Diedrich D-70 turbo
HAMMER TYPE: Automatic
HAMMER WEIGHT: 140 lb. **HAMMER DROP:** 30 in.
SPLIT SPOON DIA.: 1.375 in. I.D., 2 in. O.D.
CORE BARREL SIZE: NA
LOGGED BY: MBH **CHECKED BY:** SG



Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.3					Asphalt	0.3 208.7	Top 3": Asphalt
		0.3 - 2.3	S1	24-16-15-10 (31)	24/6		Fill	2.0 207.0	S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 25-30% fine to coarse subangular gravel, brown, moist
	205.0	2.3 - 4.3	S2	9-6-9-11 (15)	24/19		Sand and Gravel		S2 - Sandy SILT (ML), nonplastic, 30-35% fine to medium sand, grey and orange, moist
5		4.3 - 6.3	S3	9-46-11-10 (57)	24/14				S3 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		6.3 - 8.3	S4	5-5-6-8 (11)	24/16				S4 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
	200.0	8 - 10	S5	9-14-7-8 (21)	24/12				S5 - Well Graded SAND with Silt (SW-SM), fine to coarse, 10-15% fines, 5-10% fine to coarse subangular gravel, brown, moist
10		10 - 12	S6	8-24-45-46 (69)	24/12			12.0	S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subangular gravel, brown, moist
		12							Bottom of borehole at 12.0 feet. Backfilled borehole with drill cuttings and cold patch asphalt to restore the roadway.
	195.0								
15									
	190.0								
20									
	185.0								
25									

GENERAL NOTES:

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-104-OW**

Project Name: **Prop. Green Meadow Elementary School, Maynard, MA**

LGCI Project Number: **2201**

Client: Mount Vernon Group Architects, Inc.

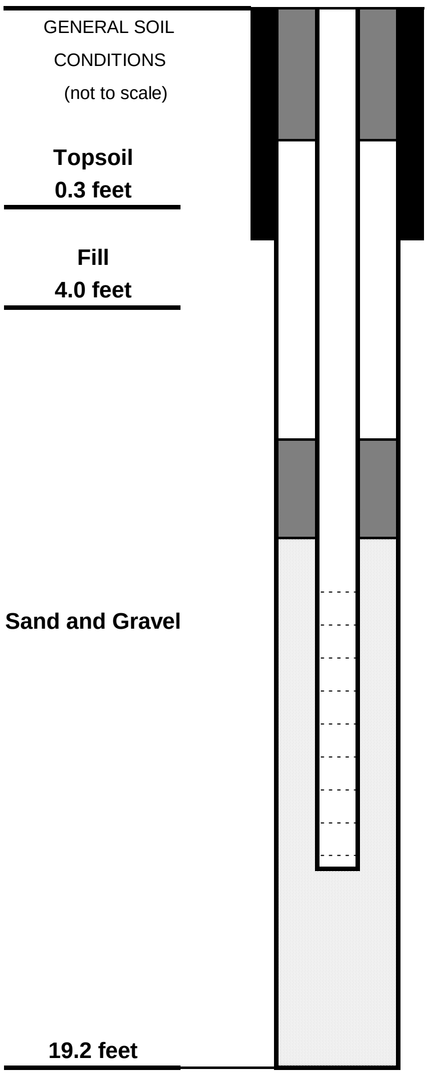
Drilling Subcontractor: Soil X, Corp.
Drilling Foreman: Edwin Fajardo
LGCI Engineer: MBH

Date Started: 2/19/24
Date Completed: 2/20/24
Location: Near NW corner of eastern wing of proposed building

Ground Surface Elevation: 214 feet (see note 1)
Groundwater Depth: 19 feet (based on sample moisture)
18.5 feet at the end of drilling

Total Depth of Boring: 19.2 feet
Drill Rig Type: Diedrich D-70 Turbo ATV Drill Rig
Drilling Method: Hollow Stem Auger (4-1/4" I.D.)

Riser Stickup ~0.0' above ground surface



THICKNESS OF SURFACE SEAL	0.8 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Roadway Box
ID OF SURFACE CASING	6 inch
DEPTH TO BOTTOM OF CASING	0.8 foot
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter Sand
DEPTH TO TOP OF SEAL	11 feet
TYPE OF SEAL	Bentonite Chips
DEPTH TO BOTTOM OF SEAL	12 feet
DEPTH TO TOP OF PERVIOUS SECTION	13.5 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	18.5 feet
DEPTH TO BOTTOM OF SAND COLUMN	19 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand
DIAMETER OF BOREHOLE	6 inch
DEPTH TO BOTTOM OF BOREHOLE	19.2 feet

NOTE: The ground surface elevation was interpolated to the nearest foot from a drawing titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022, and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Boring No. : **B-114-OW**

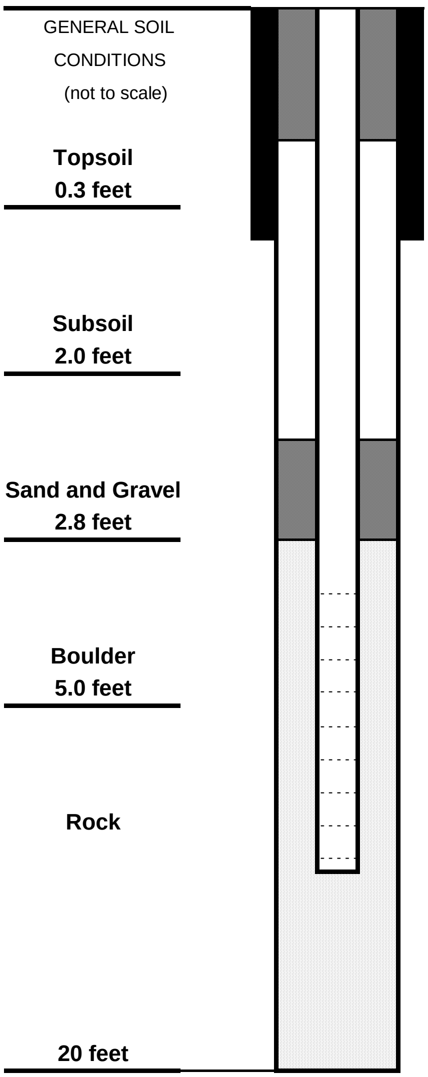
Project Name: **Prop. Green Meadow Elementary School, Maynard, MA**

LGCI Project Number: **2201**

Client: Mount Vernon Group Architects, Inc.

Drilling Subcontractor:	Soil X, Corp.	Date Started:	2/20/24
Drilling Foreman:	Edwin Fajardo	Date Completed:	2/21/24
LGCI Engineer:	MBH	Location: Within proposed roadway	
Ground Surface Elevation:	232 feet (see note 1)	Total Depth of Boring: 20 feet	
Groundwater Depth:	Not encountered	Drill Rig Type: Diedrich D-70 Turbo ATV Drill Rig	
	5.0 feet at the end of drilling	Drilling Method: Hollow Stem Auger (4-1/4" I.D.)	

Riser Stickup ~3.0' above ground surface



THICKNESS OF SURFACE SEAL	1 foot
TYPE OF SURFACE SEAL	Concrete
TYPE OF SURFACE CASING	Riser Pipe
ID OF SURFACE CASING	4 inch
DEPTH TO BOTTOM OF CASING	2.5 feet
ID OF RISER PIPE	2 inch
TYPE OF RISER PIPE	Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Filter Sand
DEPTH TO TOP OF SEAL	1 foot
TYPE OF SEAL	Bentonite Chips
DEPTH TO BOTTOM OF SEAL	3 feet
DEPTH TO TOP OF PERVIOUS SECTION	4 feet
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
DESCRIBE OPENINGS	0.01 inch slots
ID OF PERVIOUS SECTION	2 inch
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Filter sand
DEPTH TO BOTTOM OF PERVIOUS SECTION	19 feet
DEPTH TO BOTTOM OF SAND COLUMN	19 feet
TYPE OF BACKFILL BELOW PERVIOUS SECTION	Filter sand
DIAMETER OF BOREHOLE	6 inch
DEPTH TO BOTTOM OF BOREHOLE	20 feet

NOTE: The ground surface elevation was interpolated to the nearest foot from a drawing titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants Inc., dated September 2, 2022, and provided to LGCI by Brennan via e-mail on February 1, 2024.

Appendix B – LGCI's Test Pit Logs

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-1
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE EL.: 228 ft. (see note 1) **TOTAL DEPTH:** 7.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	227.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Subsoil	227.5 2.0	0.5 ft. - 2 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, trace of roots, moist
2.5	225.0	E		Sand and Gravel	226.0	2 ft. - 7.5 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, 0-5% fine to coarse subrounded gravel, 15-20% cobbles and boulders up to 3' in diameter, light brown, moist
		M				
5.0	222.5	D				
7.5		V	1		7.5	REMARK 1: Excavator refusal at depth of 7.5'.

Bottom of test pit at 7.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-2

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24
DATE COMPLETED: 2/6/24
TEST PIT LOCATION: Within western wing of proposed building
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1)
TOTAL DEPTH: 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH
CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.7 213.3	0 ft. - 0.7 ft.: Topsoil
	212.5	E		Subsoil	1.9 212.1	0.7 ft. - 1.9 ft.: Poorly Graded SAND (SP-SM), fine to medium, 10-15% fines, trace of roots, orange, moist
2.5 5.0	210.0	E M D		Sand and Gravel		1.9 ft. - 5 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, 15% cobbles and boulders up to 3' in diameter, light brown, moist
7.5 10.0	207.5 205.0	V			10.0	5 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, 35% cobbles and boulders
						Bottom of test pit at 10.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-3

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x6.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	212.5	M		Fill	213.5 2.5	0.5 ft. - 2.5 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine to coarse subrounded gravel, trace of roots, trace of organic soil, dark brown, moist
2.5		M		Sand and Gravel	211.5	2.5 ft. - 7 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, light brown to orange, moist
5.0	210.0	E				
	207.5	M				
7.5		D				7 ft. - 12 ft.: Well Graded SAND (SW), fine to coarse, 5-10% fines, 15% cobbles and boulders up to 1.5', light brown, moist
10.0	205.0 202.5	V			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-4

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24
DATE COMPLETED: 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 214 ft. (see note 1)
TOTAL DEPTH: 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x14.0'
LOGGED BY: MBH
CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.3 213.7	0 ft. - 0.3 ft.: Topsoil
2.5	212.5 210.0	E		Fill	4.0 210.0	0.3 ft. - 4 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 5-10% fines, ~20% fine to coarse gravel, trace of roots, orange, moist
5.0 7.5 10.0	207.5 205.0 202.5	E M D		Sand and Gravel	12.0	4 ft. - 12 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, 10% cobbles, light brown, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

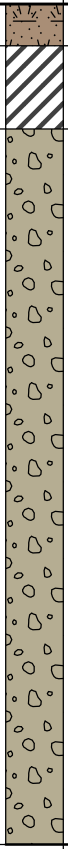
TP-5

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24
DATE COMPLETED: 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1)
TOTAL DEPTH: 10.1 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS:
LOGGED BY: MBH
CHECKED BY: JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Fill	212.5	0.5 ft. - 1.5 ft.: Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine to coarse gravel, trace of organic soil, trace of roots, brown, moist
		M			1.5	
2.5		M		Sand and Gravel	211.5	1.5 ft. - 5.3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 20-25% fine to coarse gravel, orange, moist
	210.0	E				
5.0		M				
	207.5	D				
		D				5.3 ft. - 10.1 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~15% fines, 0-5% fine to coarse gravel, light brown with orange stripes, moist
7.5	205.0	V				
10.0			1		10.1	REMARK 1: Excavator refusal at depth of 10.1' on possible large boulders or rock.

Bottom of test pit at 10.1 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-6

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.6	0 ft. - 0.6 ft.: Topsoil
		E		Fill	212.4 2.0	0.6 ft. - 2 ft.: Silty SAND (SM), fine to medium, 15-20% fines, 0-5% fine gravel, trace of organic soil, trace of wood, trace of roots, dark brown, moist
2.5	210.0	E		Sand and Gravel	211.0	2 ft. - 4.7 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, light brown with orange stripes, moist
		M				
5.0	207.5	M				4.7 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse gravel, 5% cobbles, orange, moist
7.5	205.0	D				
10.0	202.5	V			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

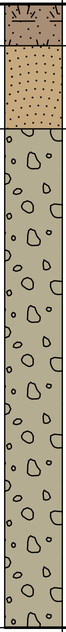
TP-7

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 234 ft. (see note 1) **TOTAL DEPTH:** 7.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	232.5	E		Subsoil	233.5 1.5	0.5 ft. - 1.5 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, orange, moist
		E		Sand and Gravel	232.5	1.5 ft. - 7.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, ~10% fines, ~15% fine to coarse subangular gravel, 25-30% cobbles and boulders up to 4.8' in diamter, light brown, moist
2.5		M				
5.0	230.0	D/V				
7.5	227.5	V			7.5	
						Bottom of test pit at 7.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-8

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/6/24 **DATE COMPLETED:** 2/6/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 227 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 9.0'x3.5'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.6 226.4	0 ft. - 0.6 ft.: Topsoil
2.5	225.0	E		Subsoil	3.5 223.5	0.6 ft. - 3.5 ft.: Poorly Graded SAND (SP), fine to medium, 5-10% fines, orange, moist
		E		Sand and Gravel		3.5 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 10-15% fine subrouned gravel, 10% cobbles and boulders, light brown, moist
5.0	222.5	M				
7.5	220.0	D				
10.0	217.5	V				10 ft. - 12 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 20-25% fine subrounded gravel, 15% cobbles and boulders, brown, moist
	215.0				12.0	

Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-9
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 219 ft. (see note 1) **TOTAL DEPTH:** 7 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 7.0 ft. / El. 212.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 14.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Sand and Gravel	218.5	0.5 ft. - 2.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, orange, moist
	217.5	M				
2.5		D				
		D				2.5 ft. - 5.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse subrounded gravel, light brown, moist
	215.0	M				
5.0						
		M				5.5 ft. - 7 ft.: Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 15-20% fine to coarse gravel, 30% cobbles and boulders up to 3' in diameter, brown, moist
	212.5	V	1		7.0 ▽	REMARK 1: Refusal on possible large boulder or rock.

Bottom of test pit at 7.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-10

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24
DATE COMPLETED: 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 221 ft. (see note 1)
TOTAL DEPTH: 8.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 8.5 ft. / El. 212.5 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x4.5'
LOGGED BY: MBH
CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	220.0	E		Topsoil	1.0 220.0	0 ft. - 1 ft.: Topsoil
2.5		E		Subsoil	2.7 218.3	1 ft. - 2.7 ft.: Poorly Graded SAND (SP), fine to medium, 0-5% fines, orange, moist
	217.5	E		Sand and Gravel		2.7 ft. - 7.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse gravel, light brown, moist
5.0	215.0	M				
7.5		D				
		D				7.5 ft. - 8.5 ft.: Well Graded SAND withSilt and Gravel (SW-SM), fine to coarse, 10-15% fines, 20-25% fine to coarse subrounded gravel, 25% cobbles and boulders up to 2.5' in diameter, light brown, moist
	212.5	V	1		8.5 ▽	REMARK 1: Excavator refusal on possible boulder or rock.

Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-11

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 204 ft. (see note 1) **TOTAL DEPTH:** 10.8 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x5.0'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D		Topsoil	1.0 203.0	0 ft. - 1 ft.: Topsoil (top 6" frozen)
2.5	202.5	E		Subsoil	3.0 201.0	1 ft. - 3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 0-5% fine subrounded gravel, orange, moist
5.0	200.0	M		Sand and Gravel		3 ft. - 10.8 ft.: East Face: Poorly Graded SAND with Gravel (SP), medium to coarse with trace fine, 0-5% fines, 15-20% fine to coarse subrouned gravel, orange to red with light brown stripes, moist West Face: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, 15% cobbles and boulders up to 1.5' in diameter, light brown, moist
7.5 10.0	197.5 195.0	D	1		10.8	REMARK 1: Terminated test pit due to its walls caving in.

Bottom of test pit at 10.8 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-12

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
EXCAVATION SUBCONTRACTOR: Saunders Construction
TEST PIT LOCATION: Within proposed roadway
EXCAVATION FOREMAN: Paul Meniates
COORDINATES: NA
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
SURFACE EL.: 203 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
WEATHER:
GROUNDWATER LEVELS:
TEST PIT DIMENSIONS: 13.0'x4.5'
▽ **DURING EXCAVATION:** 12.0 ft. / El. 191.0 ft.
LOGGED BY: MBH **CHECKED BY:** JKW
▼ **AT END OF EXCAVATION:** -

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	0.3 202.7	0 ft. - 0.3 ft.: Topsoil (frozen)
	202.5	M M		Fill	1.5 201.5	0.3 ft. - 1.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, 20-25% mostly coarse and fine subangular gravel, light brown, moist
2.5 5.0 7.5 10.0	200.0 197.5 195.0 192.5	M M D		Sand and Gravel	12.0 ▽	1.5 ft. - 12 ft.: Well Graded SAND with Gravel (SW), fine to coarse, 0-5% fines, 20% cobbles and boulders up to 1.7' in diameter, orange to light brown, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-14

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24
DATE COMPLETED: 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 218 ft. (see note 1)
TOTAL DEPTH: 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** 8.0 ft. / El. 210.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'X3.5'
LOGGED BY: MBH
CHECKED BY: JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	217.5	E		Topsoil	0.5 217.5	0 ft. - 0.5 ft.: Topsoil
		E		Subsoil	1.0 217.0	0.5 ft. - 1 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 10-15% fines, 0-5% fine to coarse subrounded gravel, trace of roots, trace of organic soil, orange, moist
		E		Sand and Gravel		1 ft. - 2.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, 0-5% fine subrounded gravel, light brown, moist
2.5	215.0	E				2.5 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, 10-15% cobbles and boulders up to 3.5' in diameter
5.0	212.5	M				
7.5	210.0					∇
10.0	207.5	D			12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-15

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24 **DATE COMPLETED:** 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 2.0 ft. / El. 211.0 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 13.0'x2.5'
LOGGED BY: MBH **CHECKED BY:** JKW

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
2.5		E		Subsoil	212.5 2.5	0.5 ft. - 2.5 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, trace of organic soil, trace of roots, ▽
	210.0	E		Sand and Gravel	210.5	2.5 ft. - 6.5 ft.: Poorly Graded SAND (SP), fine to medium with trace coarse, 0-5% fines, light brown, moist
5.0	207.5	M				
		D				
7.5	205.0	D				6.5 ft. - 12 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 15-20% fine to coarse subrounded gravel, light brown, moist
10.0	202.5	V			12.0	

Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

LGCI
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TEST PIT LOG

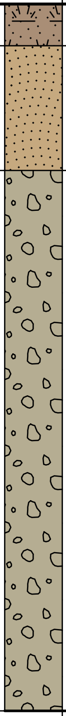
TP-16

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/7/24
DATE COMPLETED: 2/7/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 212 ft. (see note 1)
TOTAL DEPTH: 8.5 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x5.0'
LOGGED BY: MBH
CHECKED BY: JKW



Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5 211.5	0 ft. - 0.5 ft.: Topsoil
	210.0	E		Subsoil	2.0 210.0	0.5 ft. - 2 ft.: Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, 5-10% fine to coarse gravel, trace of roots, orange, moist
2.5 5.0	207.5	M		Sand and Gravel		2 ft. - 5.5 ft.: Silty SAND (SM), fine to medium, ~15% fines, light brown, moist,
		M				5.5 ft. - 8.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded gravel, 5-10% cobbles and boulders up to 1.5' in diamter, brown to light brown, moist
7.5	205.0	D				
		V	1		8.5	REMARK 1: Excavator refusal at depth of 8.5' on possible large boulders or rock.

Bottom of test pit at 8.5 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-17

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1) **TOTAL DEPTH:** 9 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 9.5'x2.5'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.3 212.7	0 ft. - 0.3 ft.: Topsoil
	212.5	E		Subsoil		0.3 ft. - 2.5 ft.: Poorly SAND with Silt (SP-SM), mostly fine with trace coarse and medium, 45% fines, trace of organic soil, trace of roots, orange, moist
2.5	210.0	E M			4.7 208.3	2.5 ft. - 4.7 ft.: Silty SAND with Gravel (SM), fine to medium with trace coarse, ~20% fines, ~15% fine to coarse subangular gravel, trace of roots, brown to orange, moist
5.0	207.5	M D		Sand and Gravel		4.7 ft. - 9 ft.: Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 20-25% fine to coarse subangular gravel, 25% cobbles and boulders up to 3' in diamter, light brown to orange, moist
7.5	205.0	V	1		9.0	REMARK 1: Excavator refusal at depth of 9' on possible large boulder or rock.
						Bottom of test pit at 9.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-18B

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24
DATE COMPLETED: 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 213 ft. (see note 1)
TOTAL DEPTH: 10 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 10.0'x4.0'
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	212.5	E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
		E		Fill	212.5 3.0	0.5 ft. - 3 ft.: Silty SAND with Gravel (SM), fine to medium, 15-20% fines, 10-15% fine to coarse subrounded gravel, brown, moist
2.5	210.0	M				
		M		Sand and Gravel	210.0	3 ft. - 10 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 15-20% fine to coarse subrounded gravel, 15% cobbles and boulders up to 2.5' in diameter, orange, moist
5.0	207.5	D				
7.5	205.0	V				
10.0			1		10.0	REMARK 1: Excavator refusal at depth of 10' on possible large boulder or rock.

Bottom of test pit at 10.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

TEST PIT LOG

TP-19

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/9/24 **DATE COMPLETED:** 2/9/24
TEST PIT LOCATION: Within proposed roadway
COORDINATES: NA
SURFACE EL.: 209 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 8.0'x3.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		M		Topsoil	1.0	0 ft. - 1 ft.: Topsoil
	207.5	E		Subsoil	208.0 2.3	1 ft. - 2.3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 15-20% fines, 0-5% fine subangular gravel, trace of organic soil, trace of roots, orange, moist
2.5 5.0 7.5 10.0	205.0 202.5 200.0 197.5	E		Sand and Gravel	206.7 12.0	2.3 ft. - 12 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, light brown, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-21
PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24 **DATE COMPLETED:** 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 202 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** 2.5 ft. / El. 199.5 ft.
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		D		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		D		Fill	201.2	0.8 ft. - 3 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, ~10% fines, 15-20% fine to coarse subrounded gravel, grey, moist
	200.0	E				
2.5					▽	
					3.0	
		E		Buried Organic Soil	199.0 3.5	3 ft. - 3.5 ft.: Silty SAND (SM), fine to medium, 25-30% fines, 0-5% fine subrounded gravel, trace of organic soil, trace of roots, dark brown to black, moist
		E		Sand and Gravel	198.5	3.5 ft. - 4 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 10-15% fines, light brown, moist 4 ft. - 9.1 ft.: Silty SAND (SM), fine to medium with trace coarse, 20-25% fines, light brown, moist
	197.5	E				
5.0						
	195.0	M				
7.5						
	192.5					9.1 ft. - 12 ft.: Well Graded SAND (SW), fine to coarse, 0-5% fines, 5-10% fine subrounded gravel, brown to orange, wet
10.0		M				
	190.0				12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-22

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24
DATE COMPLETED: 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 202 ft. (see note 1)
TOTAL DEPTH: 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** -
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 11.0'x4.0'
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
	200.0	E E		Topsoil	2.0 200.0	0 ft. - 2 ft.: Topsoil
2.5		E		Fill	3.0 199.0	2 ft. - 3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, 10-15% fines, orange to light brown, moist
		E		Buried Organic Soil	3.5 198.5	3 ft. - 3.5 ft.: Silty SAND (SM), fine to medium, 25-30% fines, trace of organic soil, dark brown to black, moist
5.0	197.5 195.0	E		Sand and Gravel		3.5 ft. - 7 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, ~10% fines, 0-5% fine to coarse subrounded gravel, light brown, moist
7.5 10.0	192.5 190.0	M			12.0	7 ft. - 12 ft.: Sandy SILT (ML), slightly to moderately plastic, 30-35% fine to medium sand, light brown to grey, moist
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

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TEST PIT LOG

TP-23

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24 **DATE COMPLETED:** 2/8/24
TEST PIT LOCATION: East of proposed building
COORDINATES: NA
SURFACE EL.: 200 ft. (see note 1) **TOTAL DEPTH:** 12 ft.
GROUNDWATER LEVELS:
▽ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS: 12.0'x4.0'
LOGGED BY: MBH **CHECKED BY:** SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.8	0 ft. - 0.8 ft.: Topsoil
		E		Fill	199.2 1.5	0.8 ft. - 1.5 ft.: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, ~15% fine to coarse subangular gravel, trace of organic soil, dark brown
		E		Subsoil	198.5	1.5 ft. - 2 ft.: Poorly Graded SAND with Gravel (SP), coare, 0-5% fines, 30-35% fine subrounded gravel, dark brown, moist
2.5	197.5	E			3.0	2 ft. - 3 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 0-5% fine subrounded gravel, light brown, moist
		E	1	Sand and Gravel	197.0	3 ft. - 12 ft.: Poorly Graded SAND with Silt (SP-SM), fine to medium, ~10% fines, light brown, moist REMARK 1: Infiltrometer test performed at depth of 4'.
5.0	195.0					
7.5	192.5	M				
10.0	190.0				12.0	
						Bottom of test pit at 12.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Lahlaf Geotechnical Consulting, Inc.

TEST PIT LOG

TP-26

PAGE 1 OF 1

CLIENT: Mount Vernon Group Architects, Inc.
PROJECT NAME: Proposed Green Meadow Elementary School
LGCI PROJECT NUMBER: 2201
PROJECT LOCATION: Maynard, MA

DATE STARTED: 2/8/24
DATE COMPLETED: 2/8/24
TEST PIT LOCATION: South East of proposed buidling
COORDINATES: NA
SURFACE EL.: 206 ft. (see note 1)
TOTAL DEPTH: 11 ft.
GROUNDWATER LEVELS:
∇ **DURING EXCAVATION:** NE
▼ **AT END OF EXCAVATION:** -

EXCAVATION SUBCONTRACTOR: Saunders Construction
EXCAVATION FOREMAN: Paul Meniates
EXCAVATOR TYPE/MODEL: Takeuchi TB-290
WEATHER:
TEST PIT DIMENSIONS:
LOGGED BY: MBH
CHECKED BY: SG

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth El.(ft.)	Material Description
		E		Topsoil	0.5	0 ft. - 0.5 ft.: Topsoil
	205.0	E M		Subsoil	205.5 2.3	0.5 ft. - 2.3 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium with trace coarse, 5-10% fines, ~15% fine to coarse subangular gravel, trace of roots, orange, moist
2.5 5.0 7.5 10.0	202.5 200.0 197.5 195.0	M M	1	Sand and Gravel	203.7 11.0	2.3 ft. - 4.5 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, 10-15% fines, 15-20% fine to coarse subrounded gravel, light brown with orange strips, moist REMARK 1: Infiltrometer test performed at depth of 3.5'. 4.5 ft. - 11 ft.: Poorly Graded SAND with Gravel (SP), medium to coarse, 0-5% fines, 15-20% fine to coarse subangular gravel, orange, moist
						Bottom of test pit at 11.0 feet. Backfilled test pit with excavated material and tamped in 12" lifts.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**

1. The ground surface elevation was interpolated to the nearest foot from Drawing EX-1 titled: "Site Survey Plan, Schematic Design, Maynard Public Schools, Green Meadow Elementary School," prepared by Samiotes Consultants, Inc., dated September 2, 2022 and provided to LGCI by Brennan via e-mail on February 1, 2024.

Appendix C – Results of Double Ring Infiltrometer Tests

LGCI
Lahlaf Geotechnical Consulting, Inc.

Double Ring Infiltrometer Test

Project:	Name: Prop. Green Meadow Elem. School
	Location: Maynard, MA
	LGCI Project Number: 2201
Test Location:	TP-23
Test Procedure:	General accordance with ASTM D 3385
Test Date	2/8/2024
LGCI Representative:	OIL
Weather Conditions:	__________
Test Depth:	4.0 feet
Groundwater Depth:	NE

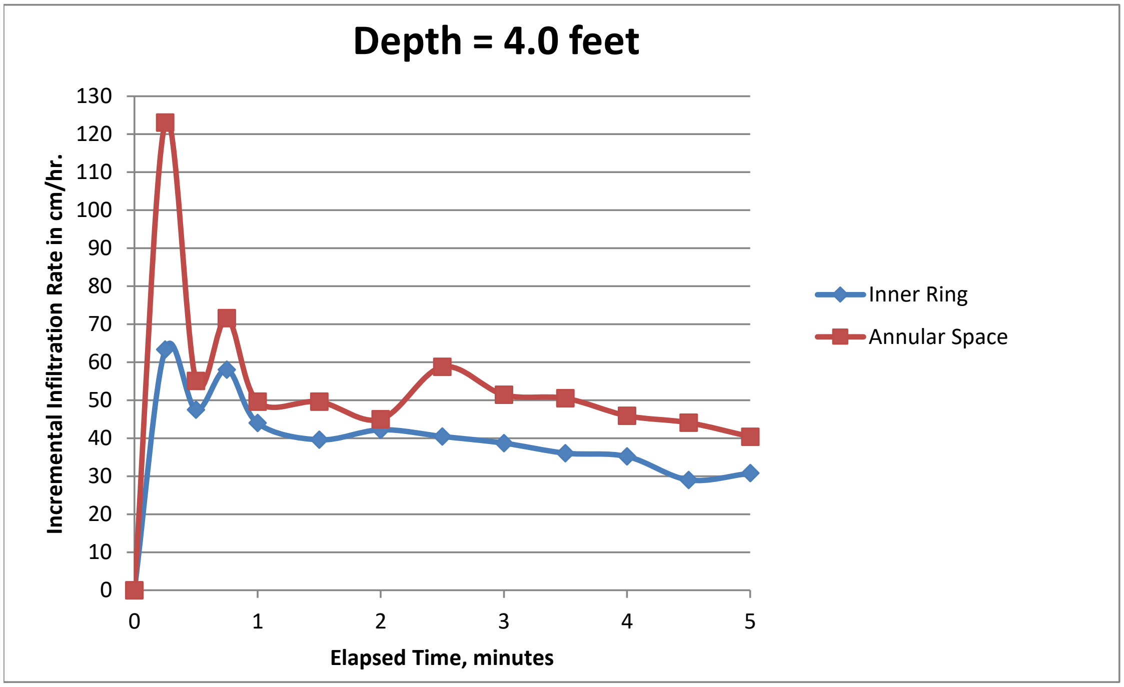
Soil Stratum:

Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 10% fines

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	58.2	0	0	58.3	0	0
0.25	0.25	54.6	193	63.3	51.6	1122	123.1
0.5	0.25	51.9	145	47.5	48.6	503	55.1
0.75	0.25	48.6	177	58.1	44.7	653	71.6
1	0.25	46.1	134	44.0	42.0	452	49.6
1.5	0.5	41.6	241	39.6	36.6	905	49.6
2	0.5	36.8	257	42.2	31.7	821	45.0
2.5	0.5	32.2	246	40.5	25.3	1072	58.8
3	0.5	27.8	235	38.7	19.7	938	51.4
3.5	0.5	23.7	219	36.1	14.2	921	50.5
4	0.5	19.7	214	35.2	9.2	838	45.9
4.5	0.5	16.4	177	29.0	4.4	804	44.1
5	0.5	12.9	187	30.8	0.0	737	40.4

Notes:



K = 8.3E-03 cm/sec.

Double Ring Infiltrometer Test

Project: Name: Prop. Green Meadow Elem. School
Location: Maynard, MA
LGCI Project Number: 2201

Test Location: TP-26

Test Procedure: General accordance with ASTM D 3385

Test Date 2/8/2024

LGCI Representative: OIL

Weather Conditions: ___________

Test Depth: 3.5 feet

Groundwater Depth: NE

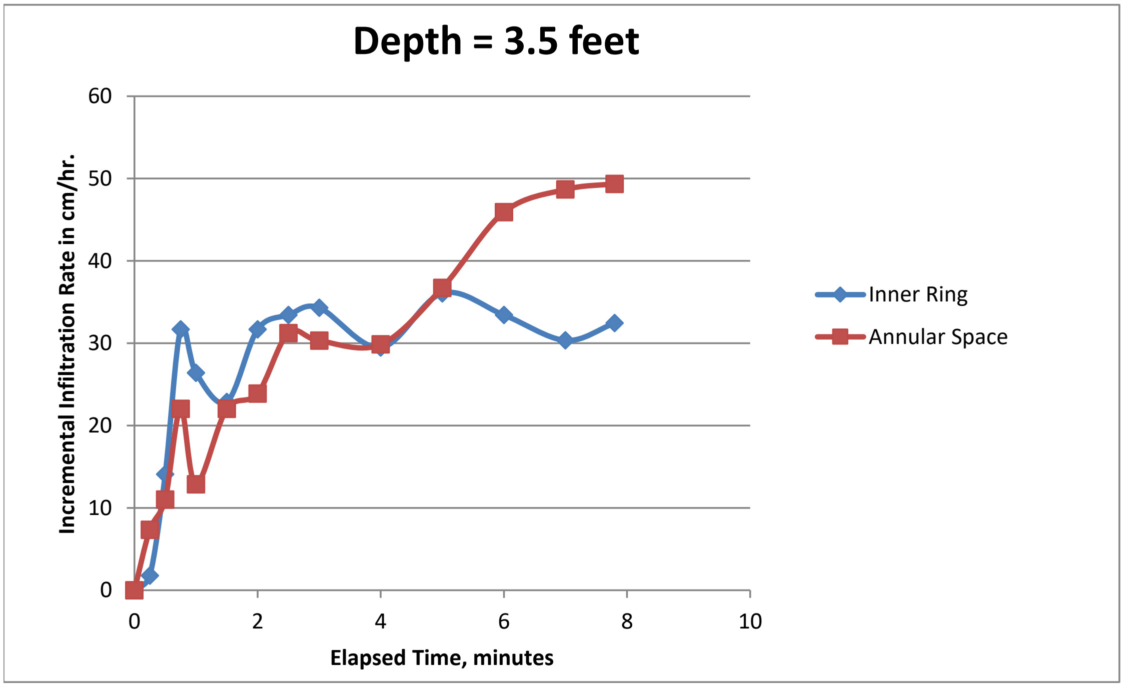
Soil Stratum:

Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 10% fine subangular gravel

	Inner Ring	Annular Space
Area (sq. cm)	730	2189
Depth Driven (in)	3	3
Water Depth (in)	3	3
Mariotte tube (cc/div.)	53.52	167.53

Elapsed Time	Time Increment	Inner Ring			Annular Space		
		Reading	Volume	Infiltration Rate	Reading	Volume	Infiltration Rate
(min)	(min)	(div)	(cc)	(cm/hr.)	(div)	(cc)	(cm/hr.)
0	0	58.3	0	0	58.3	0	0
0.25	0.25	58.2	5	1.8	57.9	67	7.3
0.5	0.25	57.4	43	14.1	57.3	101	11.0
0.75	0.25	55.6	96	31.7	56.1	201	22.0
1	0.25	54.1	80	26.4	55.4	117	12.9
1.5	0.5	51.5	139	22.9	53.0	402	22.0
2	0.5	47.9	193	31.7	50.4	436	23.9
2.5	0.5	44.1	203	33.4	47.0	570	31.2
3	0.5	40.2	209	34.3	43.7	553	30.3
4	1	33.5	359	29.5	37.2	1089	29.8
5	1	25.3	439	36.1	29.2	1340	36.7
6	1	17.7	407	33.4	19.2	1675	45.9
7	1	10.8	369	30.4	8.6	1776	48.7
7.8	0.8	4.9	316	32.4	0.0	1441	49.4

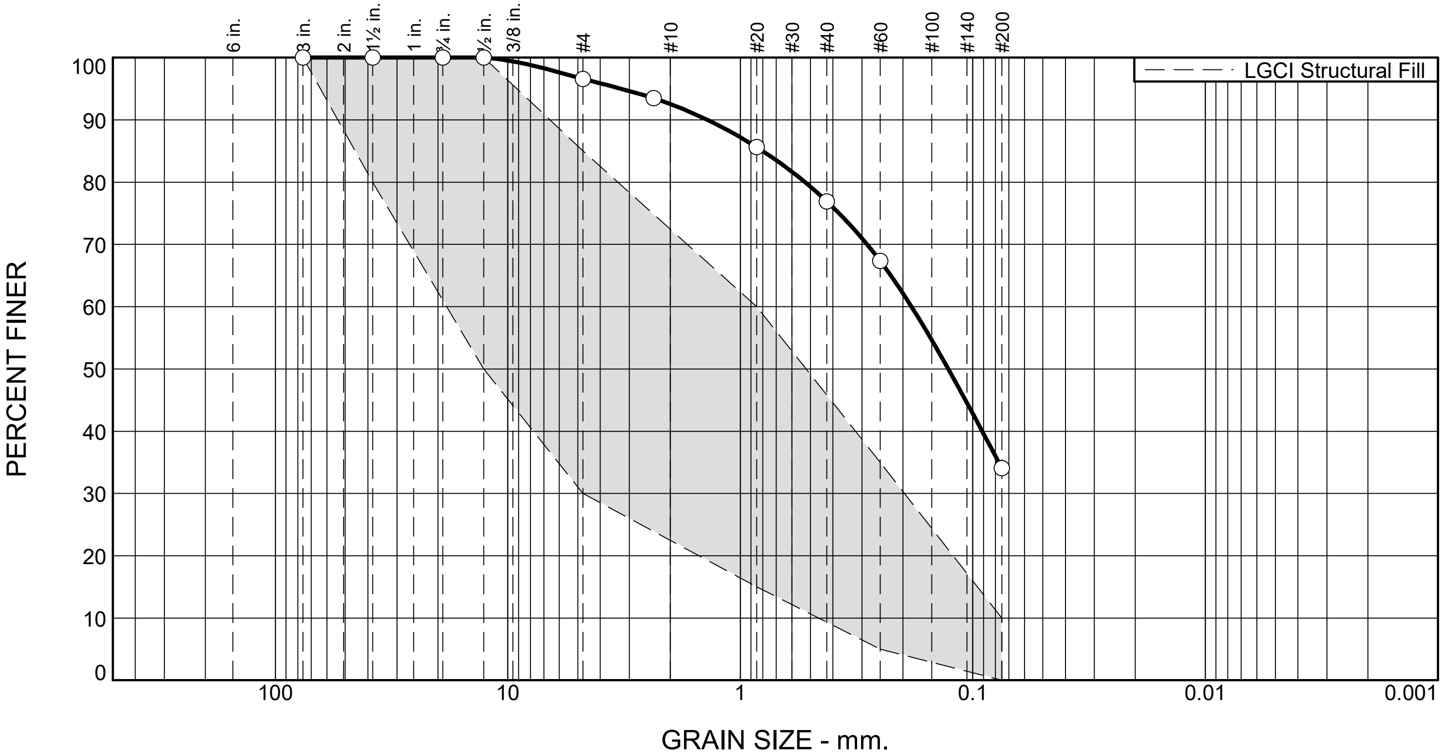
Notes:



K = 8.9E-03 cm/sec.

Appendix D – Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	4.1	15.6	42.8	34.1	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	96.6	30.0 - 85.0	X
#8	93.5		
#20	85.6	15.0 - 60.0	X
#40	76.9		
#60	67.4	5.0 - 35.0	X
#200	34.1	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium, 30-35% fines, 0-5% fine subangular gravel, trace of organic soil, light brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 1.3826 **D_{85}=** 0.8015 **D_{60}=** 0.1833
D_{50}= 0.1273 **D_{30}=** **D_{15}=**
D_{10}= **C_u=** **C_c=**

Remarks

Subsoil sample.

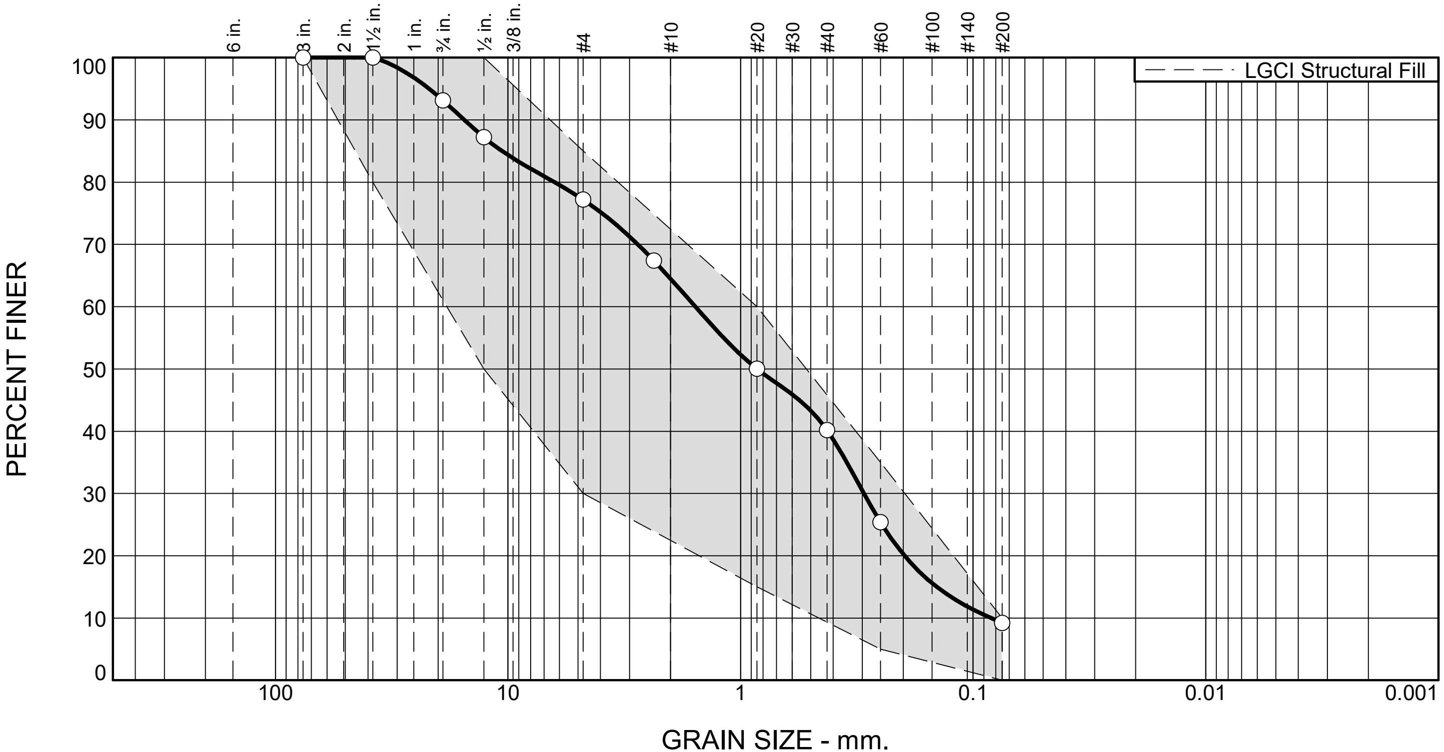
Date Received: 01/28/2022 **Date Tested:** 02/01/2022
Tested By: LB
Checked By: OIL

Location: Boring B-7
Sample Number: S2 Top 13" **Depth:** 2'-4'
Date Sampled: 01/28/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow Elementary School, Maynard, MA
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.9	15.9	12.7	24.3	31.0	9.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	93.1		
0.5"	87.2	50.0 - 100.0	
#4	77.2	30.0 - 85.0	
#8	67.4		
#20	50.0	15.0 - 60.0	
#40	40.2		
#60	25.4	5.0 - 35.0	
#200	9.2	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 20-25% fine to coarse subrounded to angular gravel, orange to brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 15.4210	D_{85}= 10.5818	D_{60}= 1.5641
D_{50}= 0.8487	D_{30}= 0.2944	D_{15}= 0.1433
D_{10}= 0.0836	C_u= 18.72	C_c= 0.66

Remarks

Fill sample.

Date Received: 01/28/2022 **Date Tested:** 02/01/2022

Tested By: LB

Checked By: OIL

Location: Boring B-11
Sample Number: S2 **Depth:** 2'-4'

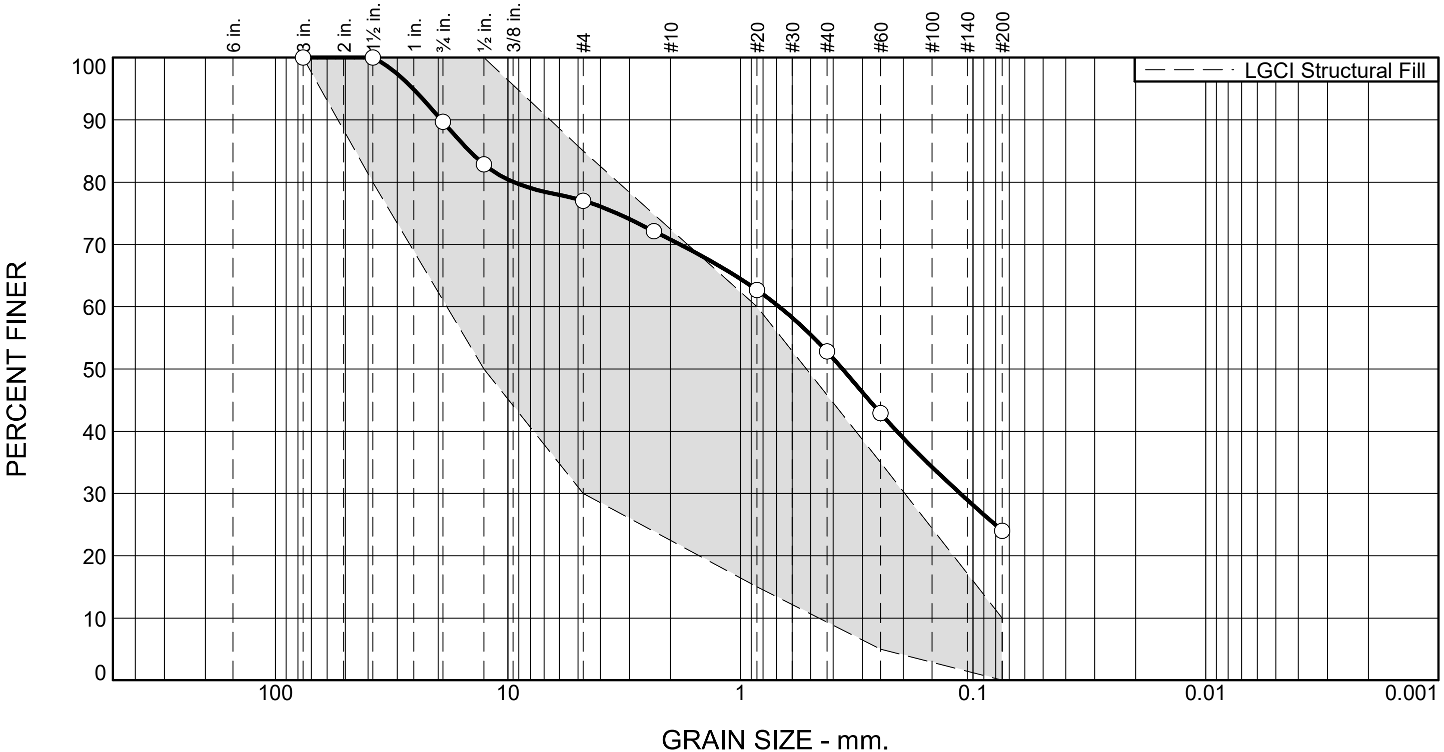
Date Sampled: 01/28/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow Elementary School, Maynard, MA

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.3	12.7	6.2	18.0	28.8	24.0	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	89.7		
0.5"	82.9	50.0 - 100.0	
#4	77.0	30.0 - 85.0	
#8	72.1		
#20	62.7	15.0 - 60.0	X
#40	52.8		
#60	42.9	5.0 - 35.0	X
#200	24.0	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 20-25% fine to coarse subrounded to subangular gravel, trace of organic soil, brown

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	19.3490	D_{85}=	14.6403	D_{60}=	0.6834
D_{50}=	0.3640	D_{30}=	0.1135	D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Fill sample.

Date Received: 02/01/2022 **Date Tested:** 02/02/2022

Tested By: LB

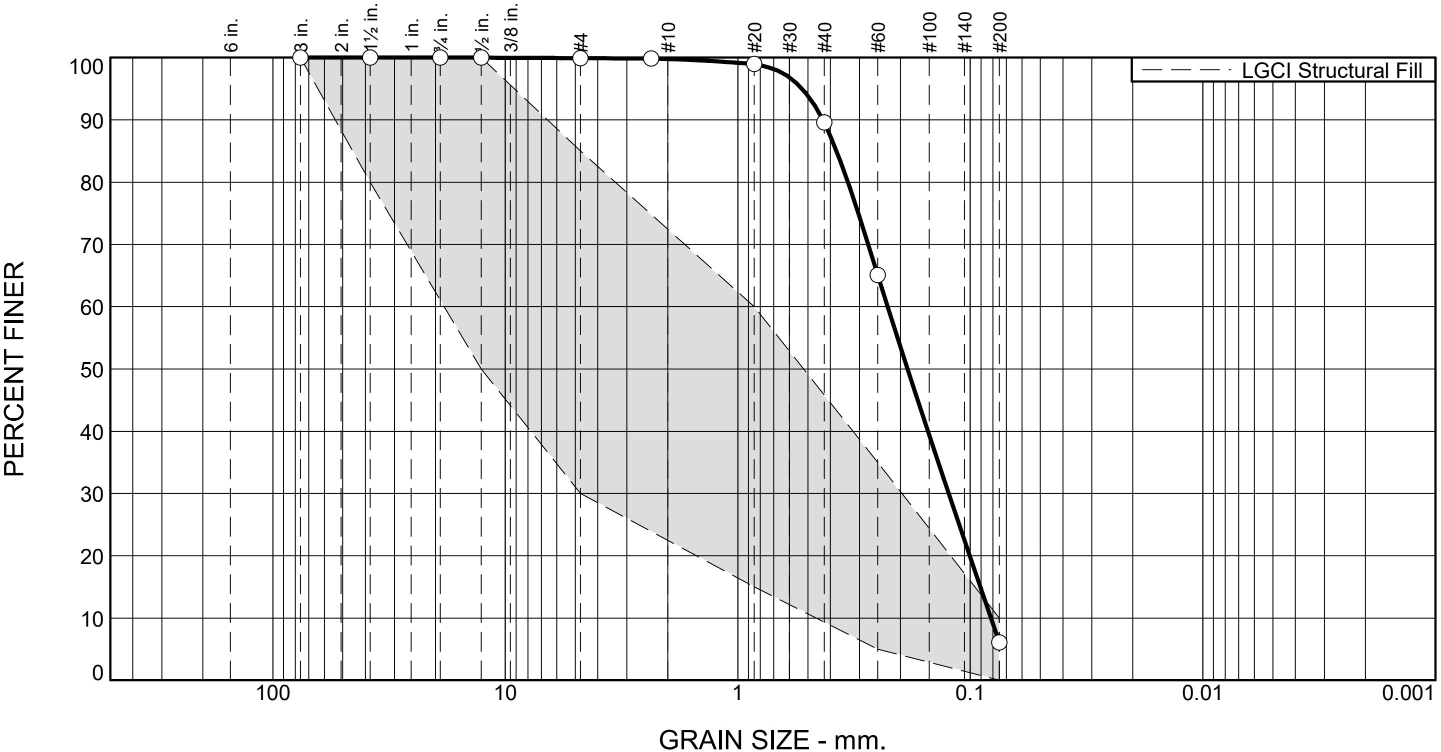
Checked By: OIL

Location: Boring B-1
Sample Number: S2 **Depth:** 2'-4'
Date Sampled: 02/01/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow Elementary School, Maynard, MA
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	10.2	83.5	6.1	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.9		
#20	99.0	15.0 - 60.0	X
#40	89.6		
#60	65.1	5.0 - 35.0	X
#200	6.1	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), fine, 5-10% fines, trace gravel, tan

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.4307	D_{85}= 0.3758	D_{60}= 0.2265
D_{50}= 0.1859	D_{30}= 0.1237	D_{15}= 0.0905
D_{10}= 0.0815	C_u= 2.78	C_c= 0.83

Remarks

Sand sample.

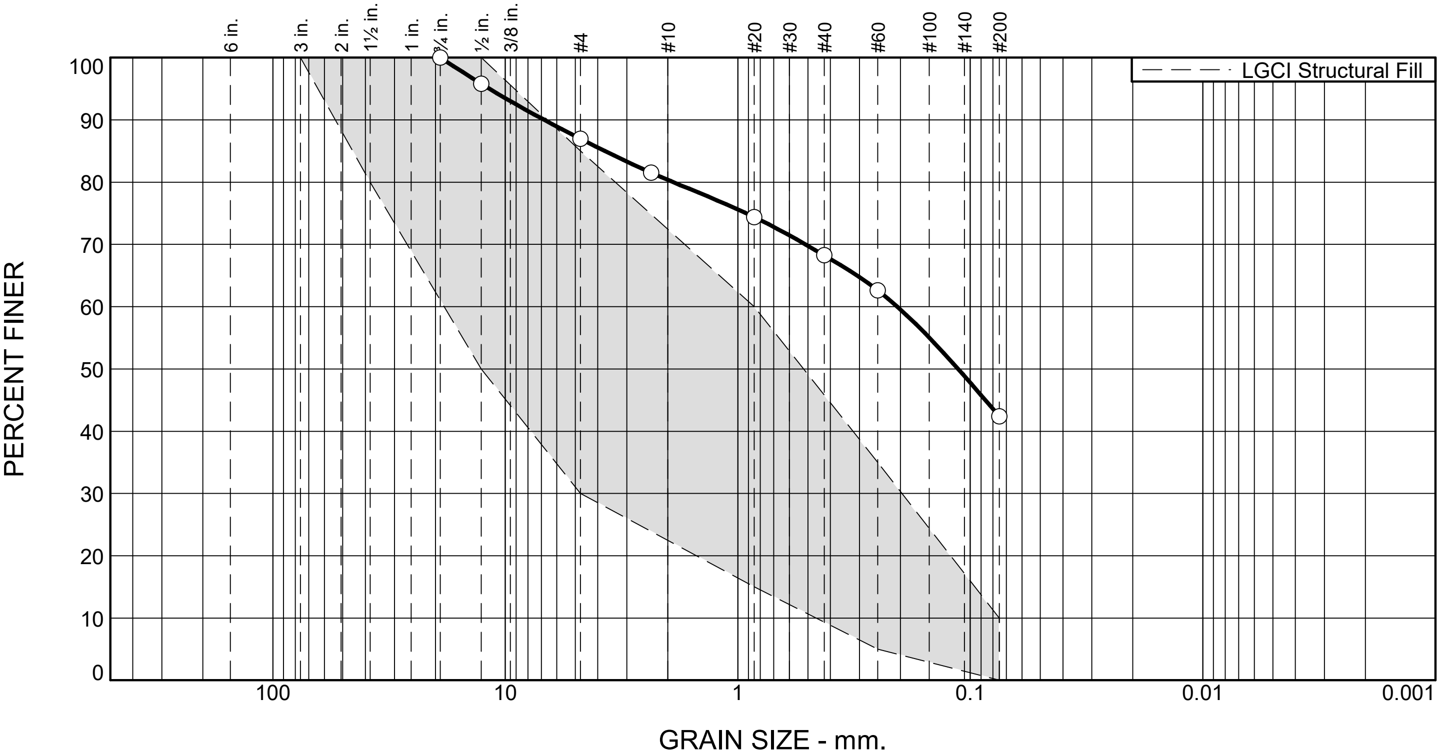
Date Received: 01/31/2022 **Date Tested:** 02/02/2022
Tested By: LB
Checked By: OIL

Location: Boring B-6
Sample Number: S2 **Depth:** 2'-4'
Date Sampled: 01/31/2022

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow Elementary School, Maynard, MA
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.0	6.6	12.1	25.9	42.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	95.8	50.0 - 100.0	
#4	87.0	30.0 - 85.0	X
#8	81.5		
#20	74.4	15.0 - 60.0	X
#40	68.3		
#60	62.6	5.0 - 35.0	X
#200	42.4	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to medium with trace coarse, 40-45% fines, 10-15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 6.7884 D_{85}= 3.7286 D_{60}= 0.2058
D_{50}= 0.1127 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 2/20/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

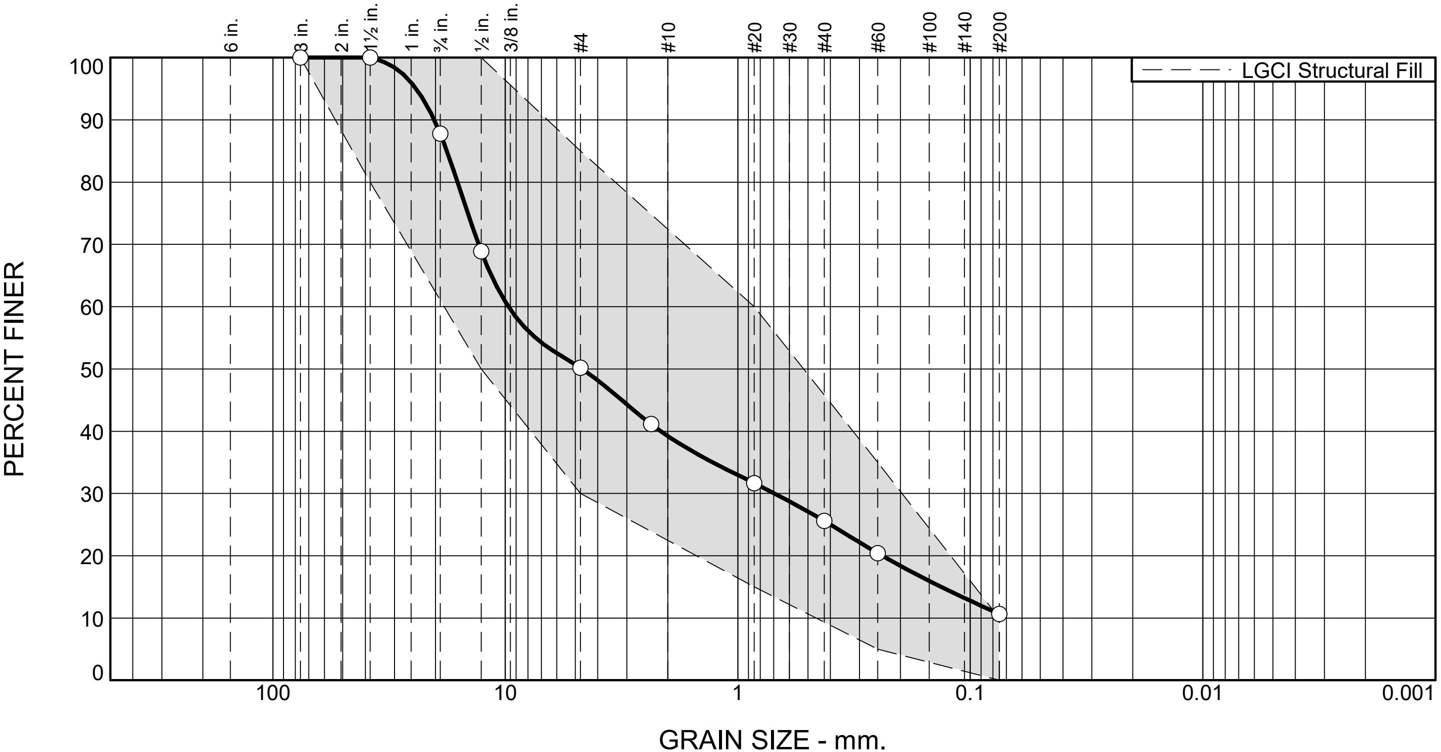
Location: B-104
Sample Number: S2 **Depth:** 2.0'-4.0'
Date Sampled: 2/19/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	37.6	11.0	13.6	15.0	10.6	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	87.8		
0.5"	68.9	50.0 - 100.0	
#4	50.2	30.0 - 85.0	
#8	41.1		
#20	31.7	15.0 - 60.0	
#40	25.6		
#60	20.4	5.0 - 35.0	
#200	10.6	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded Gravel with Silt and Sand (GP-GM), mostly fine with coarse, 10% fines, 40% fine to coarse sand

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 20.2222	D_{85}= 17.8454	D_{60}= 9.6793
D_{50}= 4.6729	D_{30}= 0.6954	D_{15}= 0.1331
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/26/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

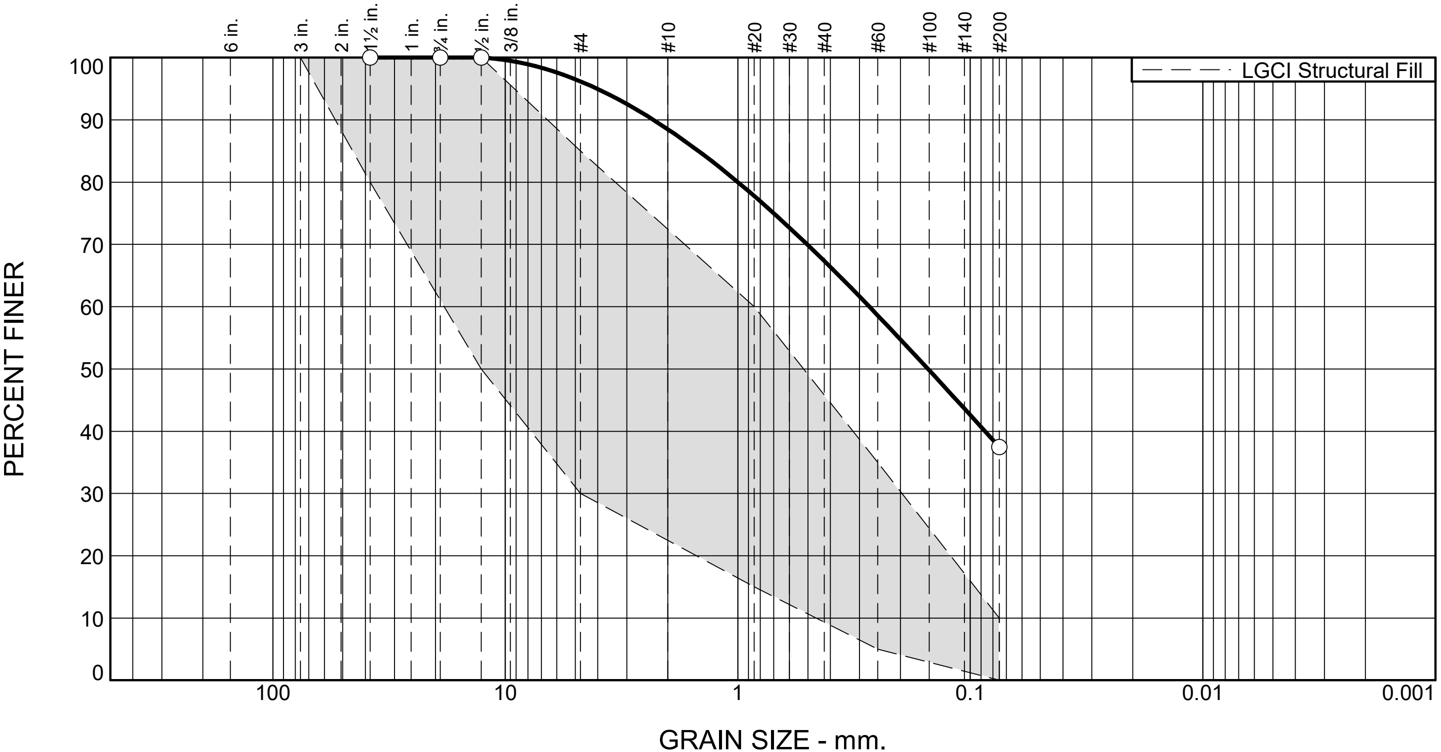
Location: B-105
Sample Number: S1 Bot 11 **Depth:** 0'-2.0'
Date Sampled: 2/26/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.8	7.7	21.2	29.8	37.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 35-40% fines, 0-5% fine subangular gravel, brown to grey.

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 2.3045 D_{85}= 1.4758 D_{60}= 0.2716
D_{50}= 0.1519 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

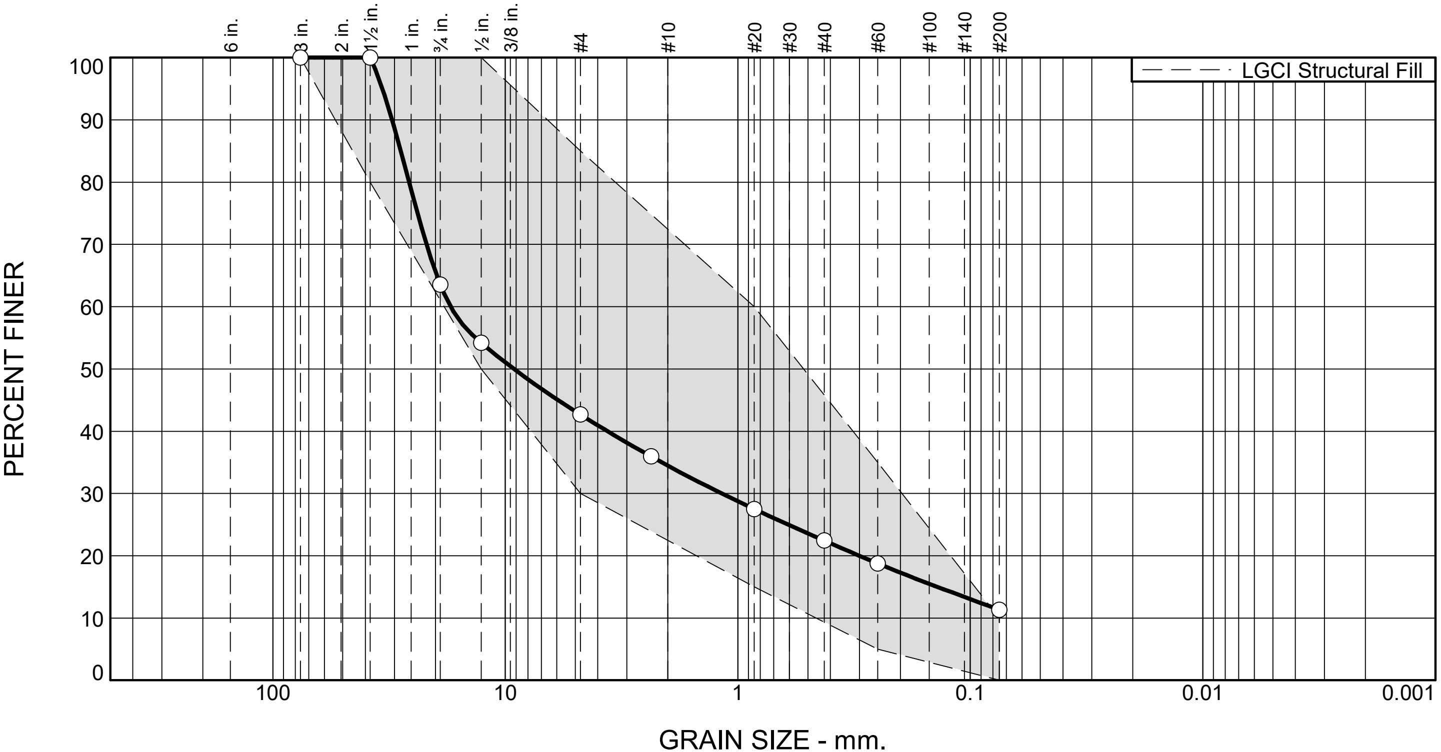
Date Received: 2/23/24 **Date Tested:** 3/22/24
Tested By: AS
Checked By:

Location: B-109
Sample Number: S2 **Depth:** 2.0'-4.0'
Date Sampled: 2/23/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	36.5	20.8	8.2	12.1	11.1	11.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	63.5		
0.5"	54.2	50.0 - 100.0	
#4	42.7	30.0 - 85.0	
#8	35.9		
#20	27.5	15.0 - 60.0	
#40	22.4		
#60	18.8	5.0 - 35.0	
#200	11.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded Gravel with Sand and Silt (GW-GM), fine to coarse subangular gravel, 30-35% fine to coarse sand, 10-15% fines, brown to grey.

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 30.6883	D_{85}= 28.1524	D_{60}= 17.1867
D_{50}= 9.1729	D_{30}= 1.1709	D_{15}= 0.1385
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/22/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: SL

Location: B-109

Sample Number: S3 **Depth:** 4.0'-6.0'

Date Sampled: 2/21/24

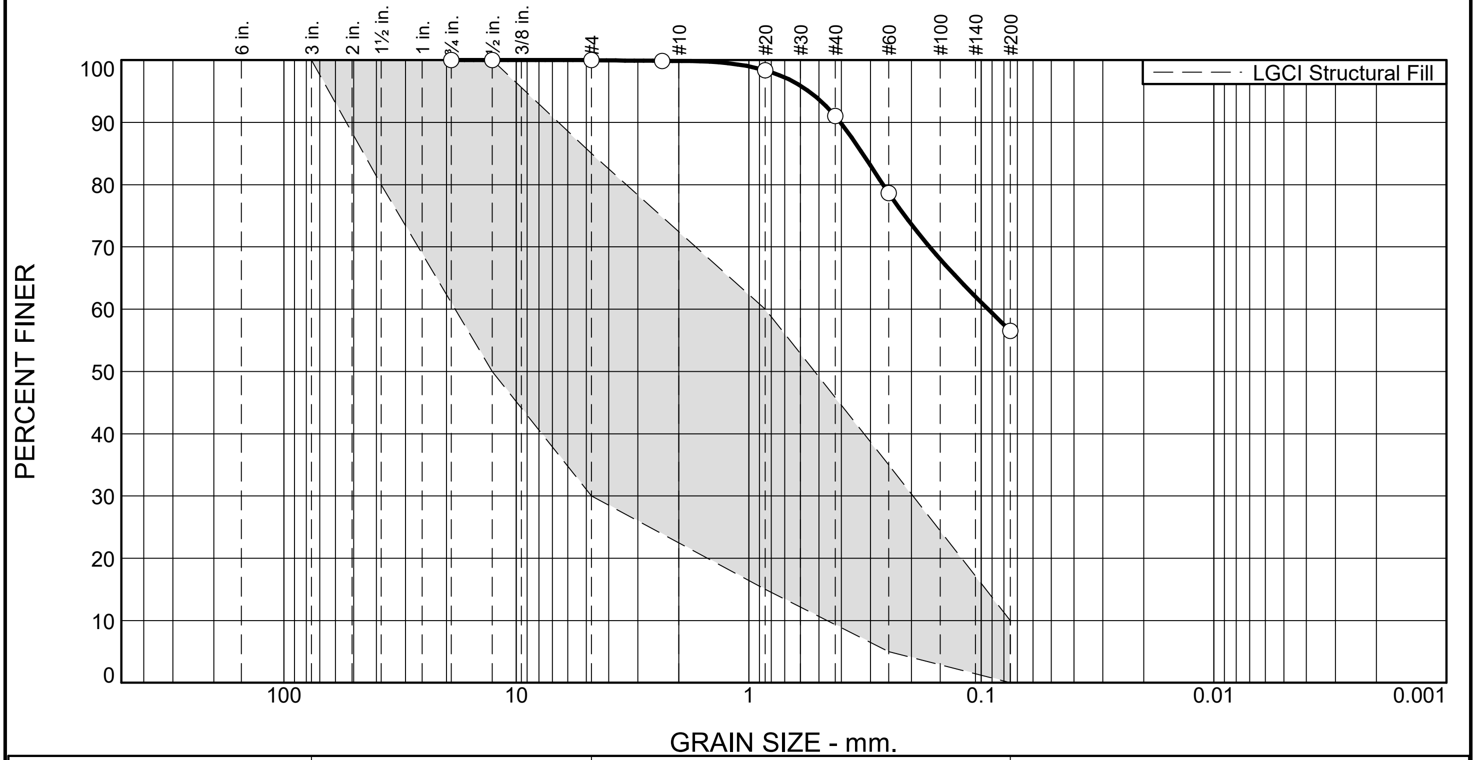
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	8.9	34.5	56.5	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	100.0	30.0 - 85.0	X
#8	99.9		
#20	98.4	15.0 - 60.0	X
#40	91.0		
#60	78.7	5.0 - 35.0	X
#200	56.5	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Sandy SILT (ML), 40-45% fine sand

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.4035	D_{85}= 0.3239	D_{60}= 0.0935
D_{50}=	D_{30}=	D_{15}=
D_{10}=	C_u=	C_c=

Remarks

Date Received: 2/22/24 **Date Tested:** 3/22/24

Tested By: AS

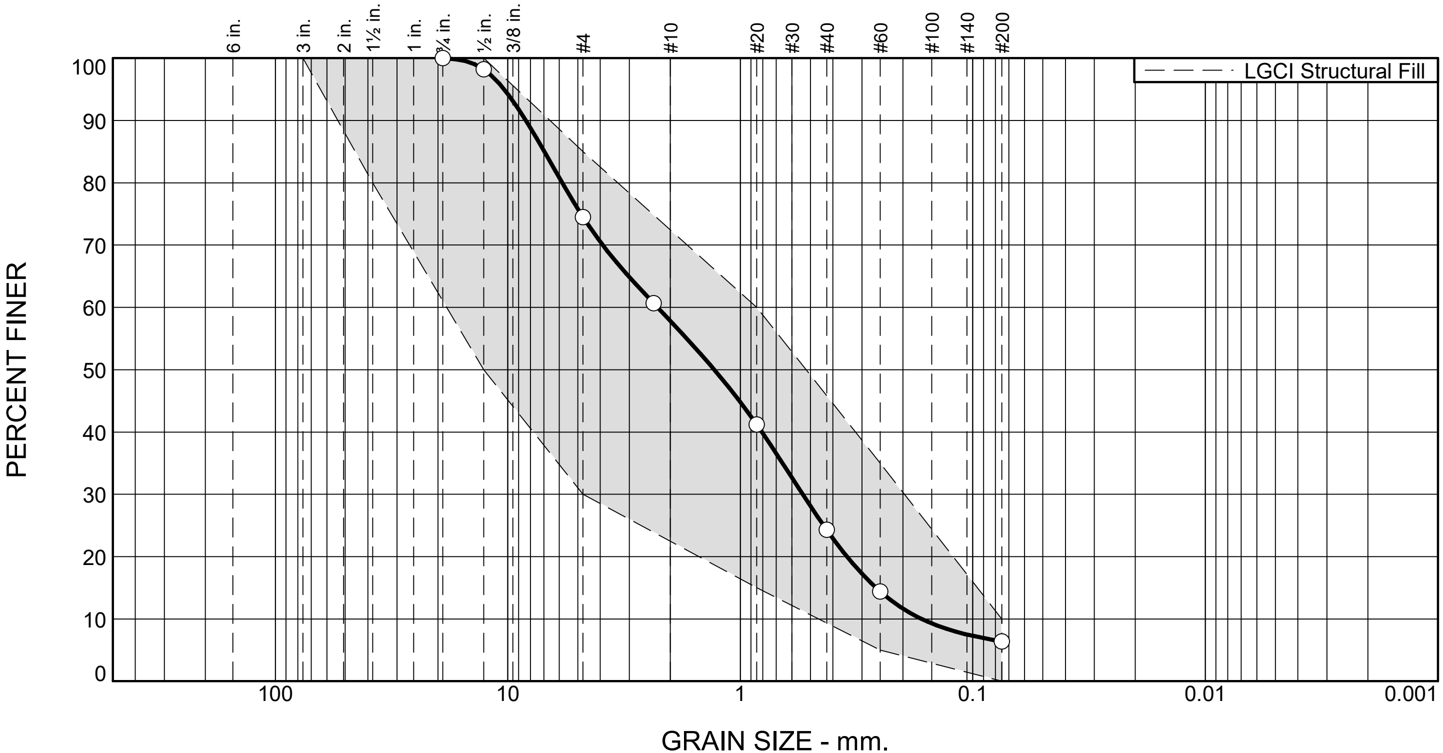
Checked By: JKW

Location: B-110
Sample Number: S2 **Depth:** 2.0'-4.0'
Date Sampled: 2/22/24

Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	25.5	16.7	33.5	17.9	6.4	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	98.2	50.0 - 100.0	
#4	74.5	30.0 - 85.0	
#8	60.7		
#20	41.2	15.0 - 60.0	
#40	24.3		
#60	14.4	5.0 - 35.0	
#200	6.4	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 25% fine subangular gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 8.3517 D_{85}= 6.9519 D_{60}= 2.2686
D_{50}= 1.2939 D_{30}= 0.5393 D_{15}= 0.2606
D_{10}= 0.1662 C_u= 13.65 C_c= 0.77

Remarks

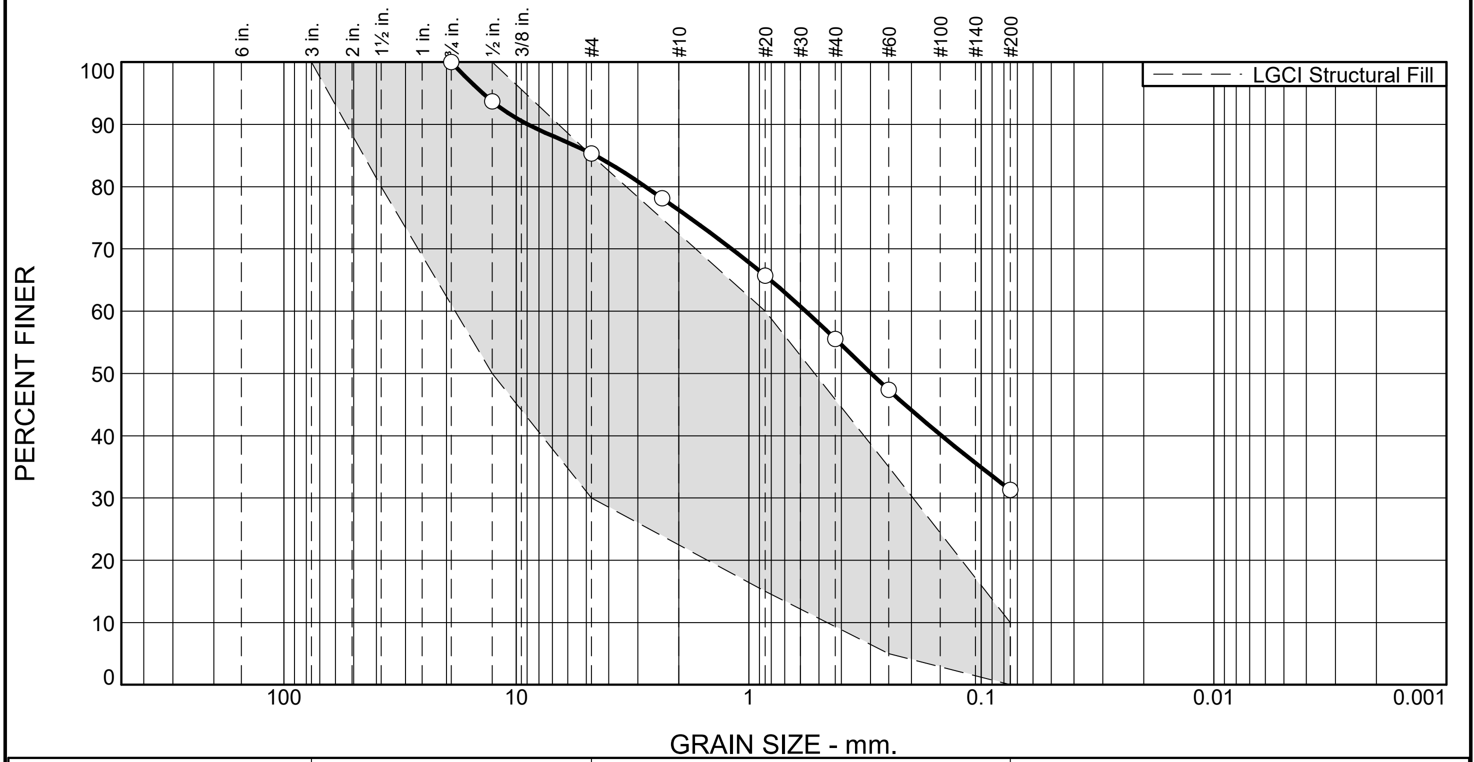
Date Received: 2/22/24 **Date Tested:** 3/22/24
Tested By: AS
Checked By:

Location: B-110
Sample Number: S3 **Depth:** 4.0'-6.0'
Date Sampled: 2/22/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	14.7	9.1	20.7	24.2	31.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	93.7	50.0 - 100.0	
#4	85.3	30.0 - 85.0	X
#8	78.1		
#20	65.7	15.0 - 60.0	X
#40	55.5		
#60	47.4	5.0 - 35.0	X
#200	31.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to coarse, 30-35% fines, 15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 8.9103 D_{85}= 4.5668 D_{60}= 0.5697
D_{50}= 0.2976 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

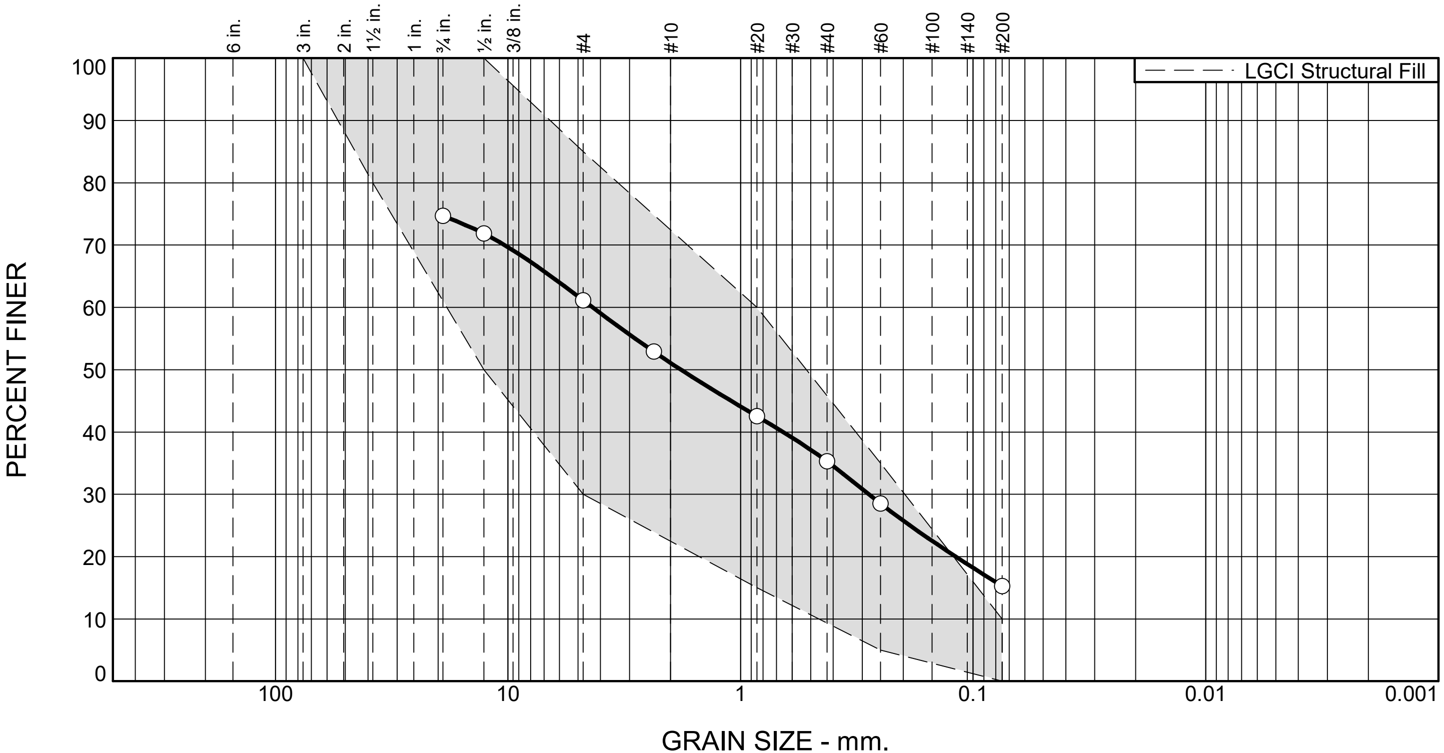
Date Received: 2/21/24 **Date Tested:** 3/22/24
Tested By: AS
Checked By: JKW

Location: B-112
Sample Number: S2 Bot. 13" **Depth:** 2.0'-4.0'
Date Sampled: 2/21/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		13.6	10.0	15.8	20.0	15.3	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	74.7		
0.5"	71.9	50.0 - 100.0	
#4	61.1	30.0 - 85.0	
#8	52.9		
#20	42.5	15.0 - 60.0	
#40	35.3		
#60	28.5	5.0 - 35.0	
#200	15.3	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND (SM), fine to coarse, 15% fines, 10-15% fine gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=		D_{85}=		D_{60}=	4.3239
D_{50}=	1.8031	D_{30}=	0.2805	D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/19/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: B-116

Sample Number: S2 **Depth:** 2.0'-4.0'

Date Sampled: 2/19/24

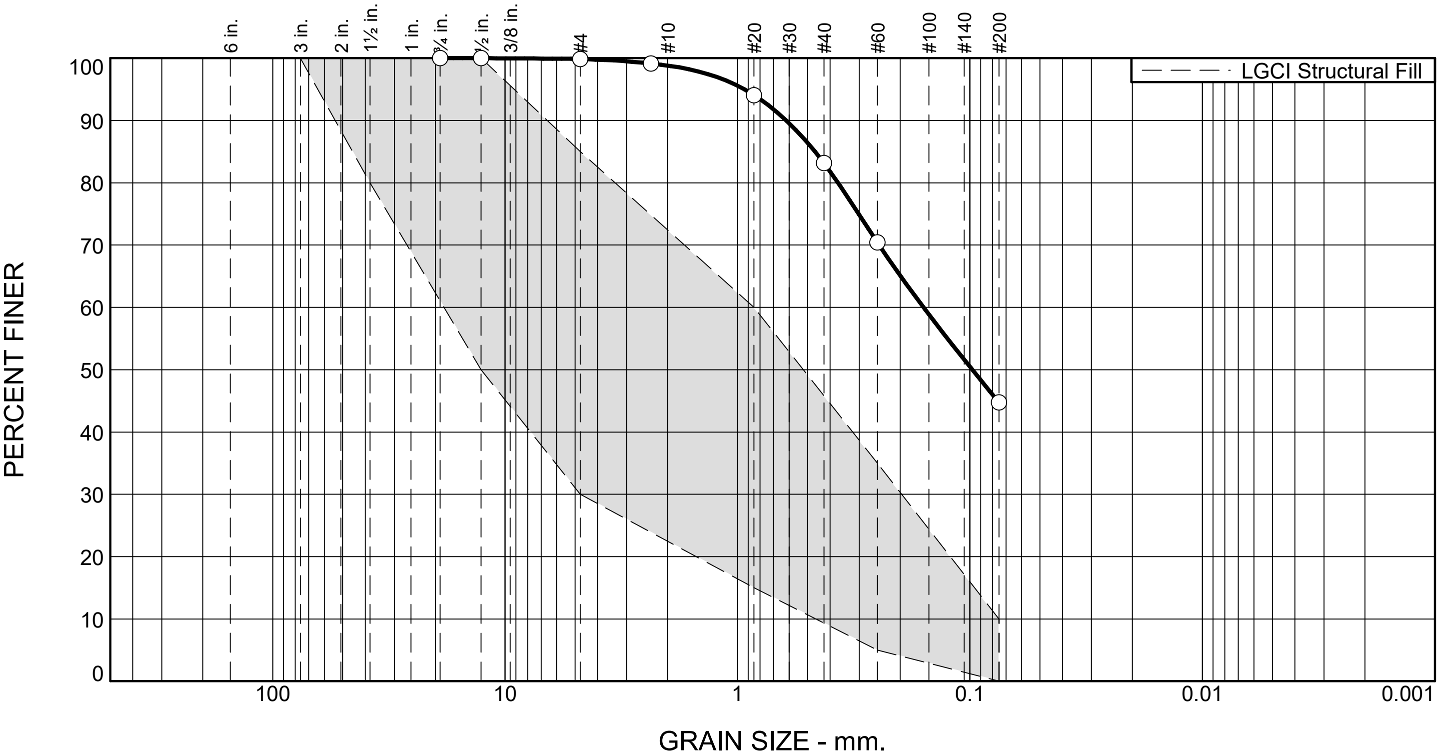
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.1	15.6	38.5	44.7	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.1		
#20	94.1	15.0 - 60.0	X
#40	83.2		
#60	70.4	5.0 - 35.0	X
#200	44.7	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), mostly fine with trace coarse and medium, 45% fines

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.6173 D_{85}= 0.4643 D_{60}= 0.1583
D_{50}= 0.0977 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

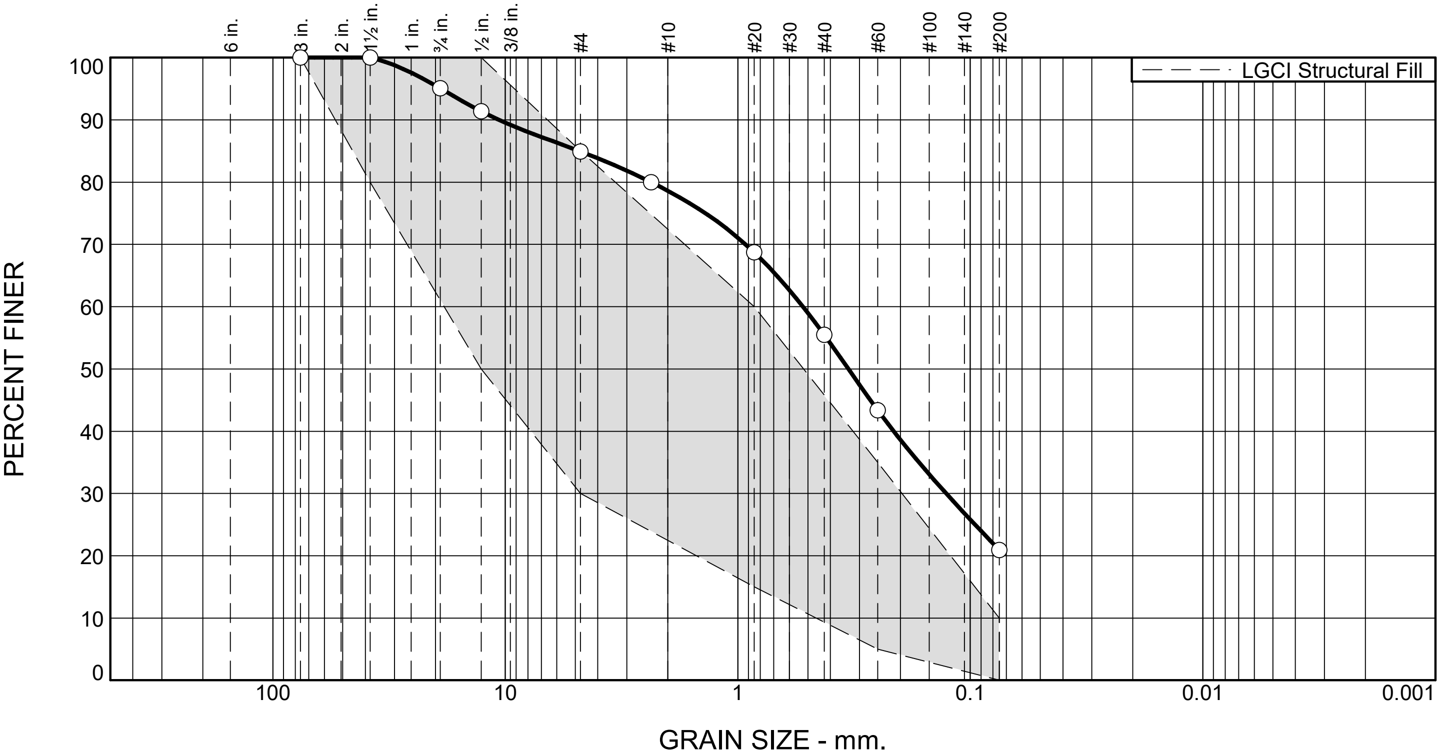
Date Received: 2/9/24 **Date Tested:** 3/22/24
Tested By: AS
Checked By: JKW

Location: TP-17
Sample Number: G1 **Depth:** 0.3'-2.5'
Date Sampled: 2/9/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School
Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.9	10.2	6.3	23.1	34.6	20.9	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0	100.0	
1.5"	100.0	80.0 - 100.0	
0.75"	95.1		
0.5"	91.4	50.0 - 100.0	
#4	84.9	30.0 - 85.0	
#8	80.0		
#20	68.7	15.0 - 60.0	X
#40	55.5		
#60	43.4	5.0 - 35.0	X
#200	20.9	0.0 - 10.0	X

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Silty SAND with Gravel (SM) , fine to medium with trace coarse, 20% fines, 15% fine to coarse gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	10.6281	D_{85}=	4.8027	D_{60}=	0.5247
D_{50}=	0.3340	D_{30}=	0.1268	D_{15}=	
D_{10}=		C_u=		C_c=	

Remarks

Date Received: 2/9/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-17

Sample Number: G2 **Depth:** 2.5'-4.7'

Date Sampled: 2/9/24

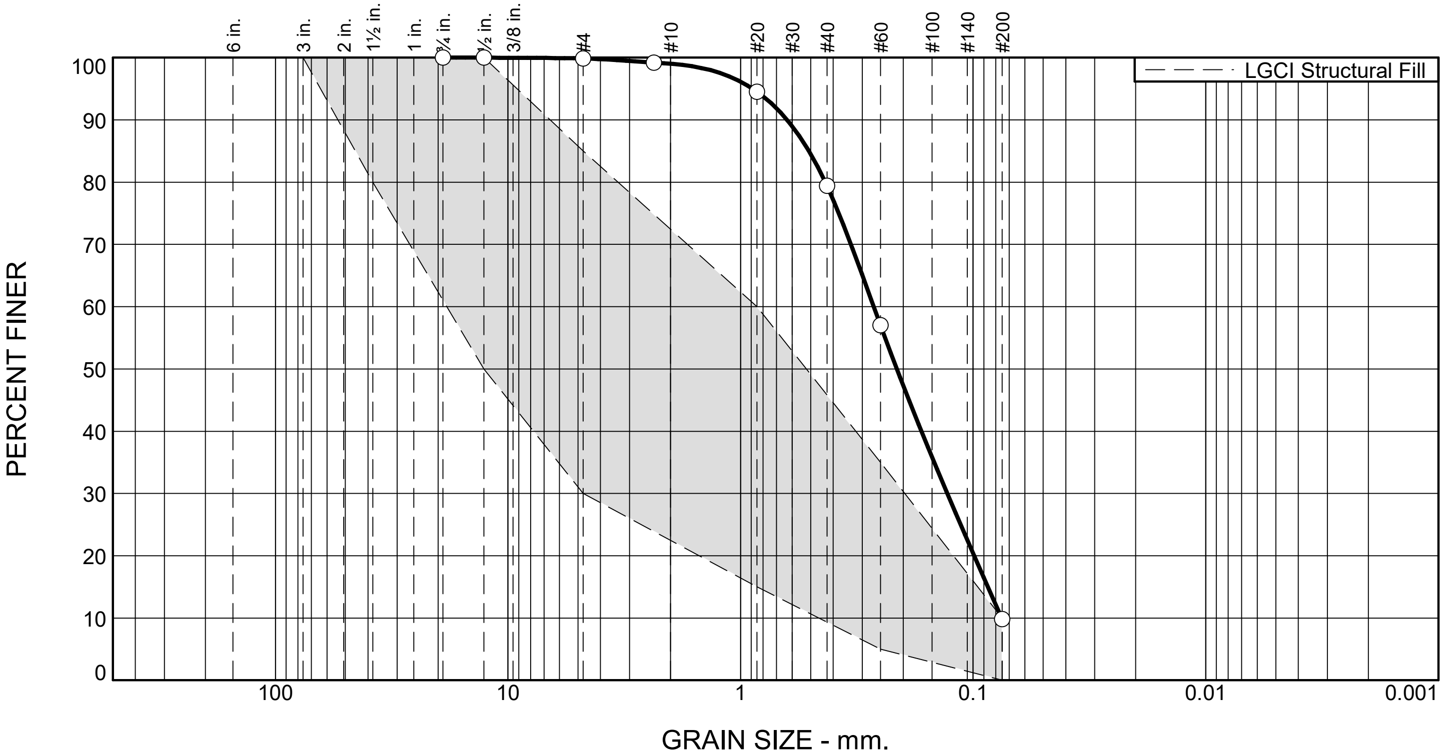
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.9	19.6	69.6	9.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	100.0	50.0 - 100.0	
#4	99.9	30.0 - 85.0	X
#8	99.2		
#20	94.5	15.0 - 60.0	X
#40	79.4		
#60	57.0	5.0 - 35.0	X
#200	9.8	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), mostly fine with trace medium to coarse, 10% fines

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}=	0.6312	D_{85}=	0.5085	D_{60}=	0.2674
D_{50}=	0.2126	D_{30}=	0.1291	D_{15}=	0.0864
D_{10}=	0.0754	C_u=	3.55	C_c=	0.83

Remarks

Infiltrometer Test

Date Received: 2/8/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-23

Sample Number: 4.0' **Depth:** 4.0'

Date Sampled: 2/8/24

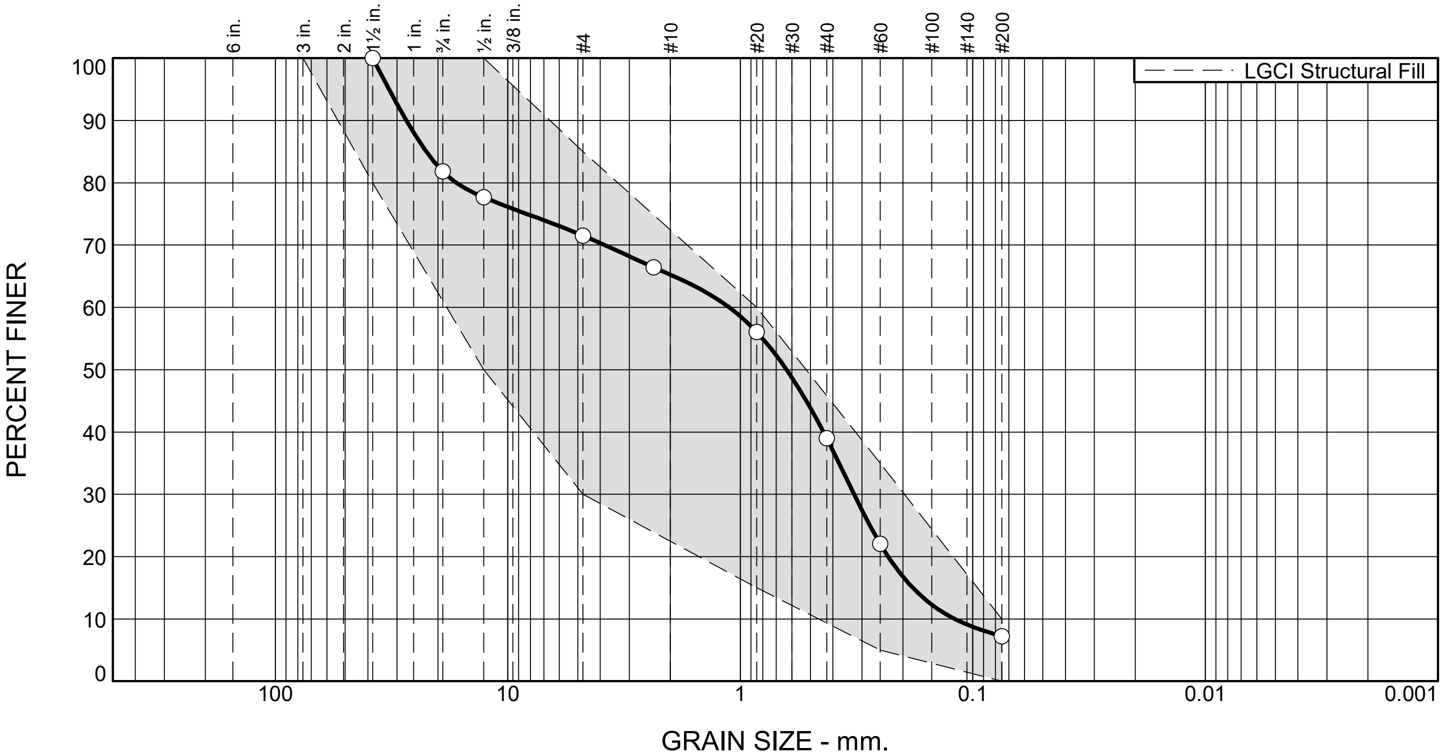
LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.

Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.2	10.3	6.2	26.3	31.8	7.2	

TEST RESULTS

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100.0	80.0 - 100.0	
0.75"	81.8		
0.5"	77.7	50.0 - 100.0	
#4	71.5	30.0 - 85.0	
#8	66.4		
#20	56.0	15.0 - 60.0	
#40	39.0		
#60	22.0	5.0 - 35.0	
#200	7.2	0.0 - 10.0	

* LGCI Structural Fill

Material Description

ASTM (D 2488) Classification: Poorly Graded SAND with Silt (SP-SM), fine to medium with trace coarse, 5-10% fines, 10% fine subangular gravel

Atterberg Limits (ASTM D 4318)

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

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 27.3179 D_{85}= 22.4211 D_{60}= 1.1159
D_{50}= 0.6323 D_{30}= 0.3239 D_{15}= 0.1810
D_{10}= 0.1197 C_u= 9.33 C_c= 0.79

Remarks

Date Received: 2/8/24 **Date Tested:** 3/22/24

Tested By: AS

Checked By: JKW

Location: TP-26

Sample Number: 3.5' **Depth:** 3.5'

Date Sampled: 2/8/24

LGCI
Lahlaf Geotechnical Consulting, Inc.

Client: Mount Vernon Group Architects, Inc.
Project: Proposed Green Meadow School

Project No: 2201 **Figure**

Lord Environmental, Inc.
Consulting & Licensed Site Professional Services

1506 Providence Highway - Suite 30
Norwood, MA 02062-4647

Voice: 781.255.5554
Fax: 781.255.5535
www.lordenv.com

April 8, 2024

Christopher LeBlanc
Mount Vernon Group Architects, Inc.
264 Exchange Street, Suite G4
Chicopee, MA 02013

RE: ***Soil Sampling and Analysis:***
Green Meadow Elementary School
5 Tiger Drive
Maynard, Massachusetts

Dear Christopher:

In accordance with the March 27, 2023, proposal, approved by Mount Vernon Group Architects, Inc. (MVG), Lord Environmental, Inc. (LEI) has completed additional soil sampling and analyses at the above-referenced property. The objective of this work was to further evaluate soil at the proposed new building location to determine the extent, if any, of urban fill and submit representative samples to a state-certified laboratory for off-site disposal characterization.

This report supplements our earlier report dated April 5, 2023 that provided the results of samples collected from the north and west perimeter of the playground east of the school where urban fill was identified that contained concentrations of benzo (b) fluoranthene, previously detected on an abutting property as summarized in a report titled "*Response Action Outcome Statement, Maynard Public School Department, Green Meadow School Soccer Field, Off Great Road, Maynard, Massachusetts, Release Tracking Number 2-12298*", dated July 1998. This report indicated contamination on the soccer field located on Parcel 2, Sheet 24 on the Town of Maynard Assessor's Map. A Site Plan is attached as **Figure 1**.

Soil Sampling and Organic Vapor Screening March 2023

A total of seventy-three (73) soil borings, designated B-1 to B-73, were advanced at the Site on March 22 and March 24, 2023 to evaluate shallow soil conditions. Soil borings were advanced with a GeoProbe© 6712DT track-mounted, direct-push drill rig in locations as shown on the attached Site Plan (**Figure 1**). Continuous soil samples were collected in acetate sleeves to a depth of 3 feet below surface grade in all borings. Generally, soil encountered during drilling consisted of a loam topsoil to depths ranging from 2-8 inches with underlying coarse to fine sand and varying amounts of gravel and trace silt. Soil sample descriptions are attached in **Table 1**. No groundwater was detected.

All soil samples were screened in the field for total organic vapors (TOV) using a MiniRAE photoionization detector (PID) capable of detecting organic vapors from petroleum and solvents in soil at concentrations above 0.1 parts per million by volume (ppmv). No organic vapors were detected above the PID detection limit in any of the soil samples.

Laboratory Analyses of Soil March 2023

Twelve soil samples were submitted to a Massachusetts certified laboratory for analyses of extractable petroleum hydrocarbons (EPH) with target polycyclic aromatic hydrocarbons (PAH) via MassDEP Methodologies. As is shown in **Table 2** attached, no PAH compounds were detected above their respective laboratory detection limits.

EPH fractions C_{19}-C_{36} aliphatic hydrocarbons and C_{11}-C_{22} aromatic hydrocarbons were detected. C_{19}-C_{36} aliphatics were detected in two soil samples at concentrations of 17.7 milligram per kilogram (mg/kg) in B-2 and 15.7 mg/kg in B-52. Both detected concentrations of C_{19}-C_{36} aliphatics are slightly above the laboratory detection limit of 15.1 mg/kg and well below the MassDEP S-1 Reportable Concentration of 3,000 mg/kg.

C_{11}-C_{22} aliphatics were detected in two soil samples at concentrations of 21 mg/kg in B-18 and 8.7 mg/kg in B-52. Both detected concentrations of C_{11}-C_{22} aliphatics are slightly above the laboratory detection limit of approximately 7.5 mg/kg and well below the MassDEP S-1 Reportable Concentration of 1,000 mg/kg.

Soil Sampling and Organic Vapor Screening February 2024

Additional soil samples were collected from the school entrance roadway, rear of the existing school and the hillside slope on February 23 and 27, 2024. These samples were collected from the split-spoon soil sampler driven by Lahlaf Geotechnical' s contractor's rig. Generally, soil encountered during drilling consisted of a loam topsoil to depths ranging from 2-8 inches with underlying coarse to fine sand and varying amounts of gravel and trace silt. Detailed soil sample descriptions are provided with the test pit and test boring logs in the geotechnical report. No groundwater was detected.

All soil samples were screened in the field for total organic vapors (TOV) using a MiniRAE photoionization detector (PID) capable of detecting organic vapors from petroleum and solvents in soil at concentrations above 0.1 parts per million by volume (ppmv). No organic vapors were detected above the PID detection limit in any of the soil samples.

Laboratory Analyses of Soil February 2024

Six soil samples were submitted to a Massachusetts certified laboratory for disposal characterization analyses including the Comm-97 landfill parameters, MCP 14 metals and RCRA Hazardous Waste parameters. As is shown in **Table 3** attached, no compounds or parameters were detected above their respective MassDEP S-1 Reportable Concentrations or landfill disposal criteria.

Conclusions

No organic vapors were detected above the field screening instrument detection limit, and no compounds or parameters were detected above their respective MassDEP S-1 Reportable

Concentrations or Massachusetts landfill disposal criteria. Note that not all privately operated landfills utilize these disposal criteria.

Feel free to call with any questions or comments. We appreciate the opportunity to provide our professional environmental consulting and analytical services.

Sincerely,
LORD ENVIRONMENTAL, INC.

Jonathon D. Puliafico
Ralph J. Tella

Jonathon D. Puliafico, CPG
Senior Project Manager

Ralph J. Tella, LSP, CHMM
President

Enc: **Limitations**
Site Plan
Tables
Laboratory Analysis Report

Limitations

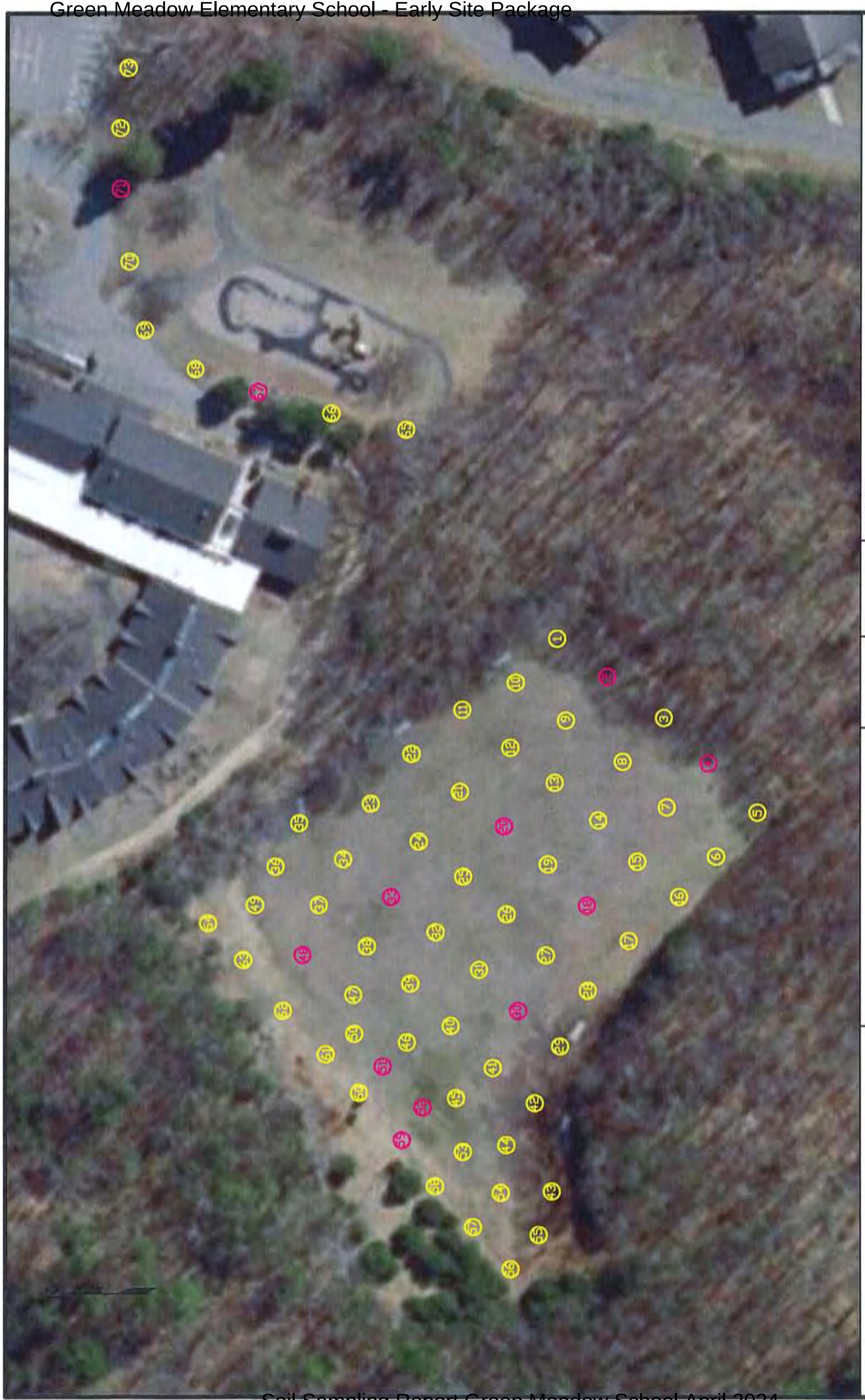
No warranty, whether expressed or implied, is given with respect to this report or any opinions expressed herein. It is expressly understood that this report and the opinions expressed herein are based upon Site conditions as they existed only at the time of assessment.

The data reported and the findings, observations, and opinions expressed in the report are limited by the Scope of Work. The Scope of Work was performed based on budgetary, time, and other constraints imposed by the Client, and the agencies and persons reviewed.
Due to the fact that geological and soil formations are inherently random, variable and indeterminate (heterogeneous) in nature, the professional services and opinions provided by Lord Environmental, Inc. under our agreement are not guaranteed to be a representation of complete Site conditions, which are variable and subject to change with time or the result of natural or man-made processes.

Although our services are extensive, opinions, findings and conclusions presented are limited to and by the data supplied, reported and obtained. Lord Environmental, Inc. makes no expressed or implied representations, warranties or guarantees regarding any changes in the condition of the premises after the date of the on-site inspection(s).

In preparing this report, Lord Environmental, Inc. has relied upon and presumed accurate certain information about the Site and adjacent properties provided by governmental agencies, the client and others identified in the report. Except as otherwise stated in the report, Lord Environmental, Inc. has not attempted to verify the accuracy or completeness of any such information.

FIGURES



LORD ENVIRONMENTAL, INC.
1506 PROVIDENCE HWY #30
NORWOOD, MA
(781) 255-5554
FAX (781) 255-5535

SITE:
GREEN MEADOW ELEMENTARY SCHOOL
5 TIGER DRIVE
MAYNARD, MA

TITLE:
SAMPLING PLAN

FILE:
Soil Sampling Plan

DRAWN BY: JDP

FIGURE: 1

SHEET: 1 of 1

DATE/REV: 4/4/2023

LEGEND:
④ SOIL SAMPLING LOCATION w/LAB ANALYSIS

NOTES:
Scale: 1" = 100' (approx)

TABLES

Table 1

SOIL BORING LOGS - FIELD SCREENING

5 TIGER DRIVE, MAYNARD, MA

BORING METHOD: Geoprobe 6712DT Track Rig DATEs: March 22 and 24, 2023

Boring	Depth (ft)	PID Reading (ppm)	Soil Description
B-1	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-2	0-3	ND	6" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-3	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand, little coarse sand, trace silt
B-4	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-5	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-6	0-3	ND	7" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-7	0-3	ND	2" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace gravel, silt
B-8	0-3	ND	7" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-9	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand and gravel
B-10	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand and gravel
B-11	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand and gravel
B-12	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-13	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-14	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-15	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-16	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-17	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-18	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-19	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-20	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-21	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-22	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-23	0-3	ND	3" Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-24	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-25	0-3	ND	2" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-26	0-3	ND	2" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-27	0-3	ND	2" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-28	0-3	ND	Brown, coarse to fine sand, some gravel, trace silt
B-29	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-30	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-31	0-3	ND	6" Loam topsoil. Red brown, coarse to fine sand, some gravel, trace silt
B-32	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-33	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-34	0-3	ND	4" Loam topsoil. Red brown, medium to fine sand, some gravel, little coarse sand, trace silt
B-35	0-3	ND	Red brown, coarse to fine sand, some gravel, trace silt
B-36	0-3	ND	Red brown, coarse to fine sand, some gravel, trace silt
B-37	0-3	ND	6" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-38	0-3	ND	6" Loam topsoil. Brown, coarse to fine sand and gravel. One 1' boulder
B-39	0-3	ND	3" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-40	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-41	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-42	0-3	ND	3" Loam topsoil. Brown, medium to fine sand, little coarse sand, trace silt
B-43	0-3	ND	4" Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt

Table 1

SOIL BORING LOGS - FIELD SCREENING

5 TIGER DRIVE, MAYNARD, MA

BORING METHOD: Geoprobe 6712DT Track Rig DATEs: March 22 and 24, 2023

Boring	Depth (ft)	PID Reading (ppm)	Soil Description
B-44	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-45	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-46	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-47	0-3	ND	8” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-48	0-3	ND	3” Loam topsoil. Brown, medium to fine sand, some silt
B-49	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-50	0-3	ND	10” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-51	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, trace gravel, silt
B-52	0-3	ND	Brown and grey, coarse to fine sand, little gravel, silt
B-53	0-3	ND	Brown, coarse to fine sand, little gravel, trace
B-54	0-3	ND	Brown and grey, coarse to fine sand, little gravel, silt
B-55	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-56	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-57	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-58	0-3	ND	3” Loam topsoil. Brown, medium to fine sand, little gravel, coarse sand, trace silt
B-59	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-60	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-61	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-62	0-3	ND	3” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-63	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-64	0-3	ND	8” Loam topsoil. Brown, coarse to fine sand, little cobbles, gravel, trace silt
B-65	0-3	ND	4” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-66	0-3	ND	4” Loam topsoil. Brown, medium to fine sand, trace gravel, coarse sand, silt
B-67	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-68	0-3	ND	6” Loam topsoil. Brown, coarse to fine sand, little gravel, trace silt
B-69	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-70	0-3	ND	2” Loam topsoil. Brown, coarse to fine sand, some gravel, trace silt
B-71	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt
B-72	0-3	ND	Brown, medium to fine sand, trace gravel, coarse sand, silt
B-73	0-3	ND	Brown, coarse to fine sand, little gravel, trace silt

Notes:
ND – Not Detected

Table 2
Soil Analysis Results (mg/kg), 3/24/2023
5 Tiger Drive, Maynard, MA

Sample	**B-2**		**B-4**		**B-18**		**B-20**		**B-30**		**B-33**		**B-48**		**B-51**		**B-52**		**B-59**		**B-67**		**B-71**		**MADEP Standards**	
Date Sampled:	3/22/23		3/22/23		3/22/23		3/22/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23		3/24/23			
Parameter	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	Sample Result	RL	**RC-S1**	**RC-S2**
EPH and PAH																										
Unadjusted C11-C22 Aromatic Hydrocarbons	ND	7.59	ND	7.48	**21**	8.46	ND	6.99	ND	7.04	ND	7.47	ND	7.57	ND	7.57	**8.7**	7.53	ND	7.63	ND	7.26	ND	7.33		
Naphthalene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	4	20
2-Methylnaphthalene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	0.7	80
Phenanthrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	10	1000
Acenaphthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	4	3000
Acenaphthylene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1	10
Fluorene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
Benzo(a)anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Chrysene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	70	400
Benzo(b)fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Benzo(k)fluoranthene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	70	400
Benzo(a)pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	2	7
Indeno(1,2,3-cd)pyrene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	7	40
Dibenz(a,h)anthracene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	0.7	4
Benzo(g,h,i)perylene	ND	0.38	ND	0.37	ND	0.42	ND	0.35	ND	0.35	ND	0.37	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.36	ND	0.36	1000	3000
C9-C18 Aliphatic Hydrocarbons	ND	15.1	ND	14.9	ND	16.9	ND	13.9	ND	14	ND	14.9	ND	15.1	ND	15.1	ND	15	ND	15.2	ND	14.5	ND	14.6	1000	3000
C19-C36 Aliphatic Hydrocarbons	**17.7**	15.1	ND	14.9	ND	16.9	ND	13.9	ND	14	ND	14.9	ND	15.1	ND	15.1	**15.7**	15	ND	15.2	ND	14.5	ND	14.6	3000	5000
C11-C22 Aromatic Hydrocarbons	ND	7.59	ND	7.48	**21**	8.46	ND	6.99	ND	7.04	ND	7.47	ND	7.57	ND	7.57	**8.7**	7.53	ND	7.63	ND	7.26	ND	7.33	1000	3000

Notes
mg/kg: Milligrams per kilogram
EPH: Extractable Petroleum Hydrocarbons
PAH: Polycyclic Aromatic Hydrocarbons
RL: Reporting Limit
RC-S1: MassDEP Reportable Concentration S-1
RC-S2: MassDEP Reportable Concentration S-2
Detected analytes are highlighted blue 🟦
No analytes were detected above their MADEP S-1 Reportable Concentrations

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
General Chemistry																	
Flashpoint	> 200	70	> 200	70	> 200	70	> 200	70	> 200	70	> 200	70	degrees F				
Specific Conductance	**13.7**	2	**296**	2	**56.3**	2	**15.9**	2	**9.4**	2	**17.4**	2	uS/cm			8000	4000
pH	**8.1**		**7.1**		**7**		**6**		**5.1**		**5.2**		SU				
Polychlorinated Biphenyls (PCBs)																	
Aroclor-1016	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1221	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1232	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1242	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1248	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1254	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1260	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	see PCBs (Total)	see PCBs (Total)
Aroclor-1262	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg			see PCBs (Total)	see PCBs (Total)
Aroclor-1268	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg			see PCBs (Total)	see PCBs (Total)
PCBs (Total)	ND	71	ND	69	ND	82	ND	75	ND	76	ND	72	ug/kg	1000	4000	2000	2000
Reactivity																	
Cyanide	ND	0.2	ND	0.2	ND	0.3	ND	0.2	ND	0.2	ND	0.2	mg/kg	30	100		
Sulfide	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1	mg/kg				
Semivolatile organic compounds																	
1,2,4-Trichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	6000		
1,2-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	9000	100000		
1,3-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	3000	200000		
1,4-Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	1000		
Phenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	900	10000		
2,4,5-Trichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	600000		
2,4,6-Trichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	20000		
2,4-Dichlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	40000		
2,4-Dimethylphenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	700	100000		
2,4-Dinitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	50000		
2,4-Dinitrotoluene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	10000		
2,6-Dinitrotoluene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
2-Chloronaphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
2-Chlorophenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	100000		
2-Methylnaphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	80000		
Nitrobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
2-Methylphenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
2-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
2-Nitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	100000	1000000		
3,3'-Dichlorobenzidine	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	20000		
3-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
4,6-Dinitro-2-methylphenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	50000	500000		
4-Bromophenyl phenyl ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
4-Chloro-3-methylphenol	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
4-Chloroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000	3000		
4-Chlorophenyl phenyl ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
4-Nitroaniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
4-Nitrophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	100000	1000000		
Acenaphthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	3000000		
Acenaphthylene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	10000		
Aniline	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	1.00E+07		
Anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Benzo(a)anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Benzo(a)pyrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	30000		
Benzo(b)fluoranthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Benzo(g,h,i)perylene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Benzo(k)fluoranthene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	200000	3000000		
Benzoic acid	ND	1080	ND	1050	ND	1250	ND	1150	ND	1180	ND	1100	ug/kg	1000000	1.00E+07		
Biphenyl	ND	22	ND	21	ND	25	ND	23	ND	24	ND	22	ug/kg	50	6000		
Bis(2-chloroethoxy)methane	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
Bis(2-chloroethyl)ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	700		
Bis(2-chloroisopropyl)ether	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	700		
Bis(2-ethylhexyl)phthalate	ND	433	ND	422	ND	501	ND	460	ND	474	ND	440	ug/kg	100000	700000		
Butyl benzyl phthalate	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Chrysene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	200000	3000000		
Di-n-octyl phthalate	ND	217	ND	211	ND	250	ND	230	ND	237	ND	220	ug/kg	1000000	1.00E+07		
Dibenz(a,h)anthracene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	2000	30000		
Dibenzofuran	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Diethyl phthalate	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	10000	200000		
Dimethyl phthalate	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	700	50000		
Di-n-butyl phthalate	ND	217	ND	211	ND	250	ND	230	ND	237	ND	220	ug/kg	50000	500000		

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
Fluoranthene	ND	141	ND	137	**208**	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Fluorene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
Hexachlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	900		
Hexachlorobutadiene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	30000	100000		
Hexachlorocyclopentadiene	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	50000	500000		
Hexachloroethane	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	3000		
Indeno(1,2,3-cd)pyrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	20000	300000		
Isophorone	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Naphthalene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	4000	20000		
N-Nitrosodimethylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	50000	500000		
N-Nitrosodi-n-propylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	50000	500000		
N-Nitrosodiphenylamine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	100000	1000000		
Pentachlorophenol	ND	357	ND	348	ND	413	ND	380	ND	391	ND	363	ug/kg	3000	10000		
Phenanthrene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	10000	1000000		
Pyrene	ND	141	ND	137	**240**	163	ND	150	ND	154	ND	143	ug/kg	1000000	3000000		
m&p-Cresol	ND	282	ND	274	ND	326	ND	299	ND	308	ND	286	ug/kg	500000	5000000		
Pyridine	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	500000	5000000		
Azobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg				
Total Dichlorobenzene	ND	141	ND	137	ND	163	ND	150	ND	154	ND	143	ug/kg	700	4000		
Total Metals																	
Antimony	ND	0.81	ND	0.77	**1.09**	0.86	ND	0.88	ND	0.95	ND	0.88	mg/kg	20	40		
Arsenic	**8.77**	1.22	**6.64**	1.17	**10.5**	1.3	**5.92**	1.33	**9.73**	1.44	**6.4**	1.33	mg/kg	20	20	40	40
Barium	**29.1**	0.4	**55.4**	0.39	**32.5**	0.43	**38**	0.44	**13.6**	0.48	**65.3**	0.44	mg/kg	1000	3000		
Beryllium	ND	0.4	ND	0.39	ND	0.43	ND	0.44	ND	0.48	ND	0.44	mg/kg	100	200		
Cadmium	**2.43**	0.61	**4.49**	0.58	**3.42**	0.65	**4.33**	0.66	**2.54**	0.72	**5.34**	0.66	mg/kg	80	80	80	30
Chromium	**10.6**	0.61	**22.8**	0.58	**13.7**	0.65	**19.5**	0.66	**13**	0.72	**21.8**	0.66	mg/kg	100	200	1000	1000
Lead	**3.35**	0.61	**5.7**	0.58	**38.7**	0.65	**5.29**	0.66	**3.91**	0.72	**5.94**	0.66	mg/kg	200	600	2000	1000
Nickel	**6.35**	0.61	**13.7**	0.58	**9.11**	0.65	**9.06**	0.66	**8.94**	0.72	**9.97**	0.66	mg/kg	700	1000		
Selenium	ND	1.22	ND	1.17	ND	1.3	ND	1.33	ND	1.44	ND	1.33	mg/kg	400	800		
Silver	ND	1.22	ND	1.17	ND	1.3	ND	1.33	ND	1.44	ND	1.33	mg/kg	100	200		
Vanadium	**12.4**	0.4	**26.1**	0.39	**21.4**	0.43	**24.4**	0.44	**14.4**	0.48	**36.7**	0.44	mg/kg	500	800		
Zinc	**16.7**	2.4	**24.6**	2.3	**48.6**	2.6	**22.9**	2.7	**18**	2.9	**26.3**	2.7	mg/kg	1000	3000		
Thallium	ND	0.4	ND	0.39	ND	0.43	ND	0.44	ND	0.48	ND	0.44	mg/kg	8	70		
Mercury	ND	0.104	ND	0.09	**0.129**	0.118	**0.184**	0.111	ND	0.11	ND	0.097	mg/kg	20	40	10	10
Total Petroleum Hydrocarbons																	
Total Petroleum Hydrocarbons	ND	29	ND	28	ND	33	ND	30	ND	31	ND	28	mg/kg	1000	3000	5000	2500
Volatile Organic Compounds 8260C (5035-LL)																	
Acetone	ND	93	ND	92	ND	103	ND	106	ND	823	ND	137	ug/kg	6000	50000		
Benzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	2000	200000		
Bromobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Bromochloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
Bromodichloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Bromoform	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	1000		
Bromomethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500	500		
2-Butanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	4000	50000		
tert-Butyl alcohol	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
sec-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
n-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
tert-Butylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Methyl t-butyl ether (MTBE)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100000		
Carbon Disulfide	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Carbon Tetrachloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	5000	5000		
Chlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	3000		
Chloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Chloroform	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	200	200		
Chloromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
4-Chlorotoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
2-Chlorotoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,2-Dibromo-3-chloropropane (DBCP)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10000	100000		
Dibromochloromethane	ND	5	ND	5	ND	5	ND	5	ND	*6*	ND	*7*	ug/kg	5	30		
1,2-Dibromoethane (EDB)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Dibromomethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
1,2-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	9000	100000		
1,3-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	200000		
1,4-Dichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	700	1000		
1,1-Dichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	400	9000		
1,2-Dichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
1,2 Dichloroethene, Total	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	400		
trans-1,2-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	1000		
cis-1,2-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		

Table 3
Soil Sample Results
Green Meadow School

Sample ID:	**B-108 2-4'**		**B-118 2-4'**		**TP-6**		**B-103 0-6'**		**B-113 2-4'**		**B-112 2-6'**						
Lab Sample Number:	**4B27035-01**		**4B27035-02**		**4B26010-01**		**4B26010-02**		**4B26010-03**		**4B26010-04**						
Date Sampled:	2/27/2024 0:00		2/27/2024 0:00		2/23/2024 10:30		2/23/2024 10:00		2/23/2024 10:45		2/23/2024 11:00						
Date Received:	2/27/2024 13:34		2/27/2024 13:34		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38		2/26/2024 10:38						
Parameter	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Sample Result	Reporting Limit	Units	MOHML Reportable Concentration S-1	MOHML Reportable Concentration S-2	MA COMM-97 Disposal Criteria	MA COMM-97 Disposal Criteria
1,1-Dichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	40000		
1,2-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
2,2-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
cis-1,3-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	100	,3-Dichloropropene (cis +	,3-Dichloropropene (cis +
trans-1,3-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	100	,3-Dichloropropene (cis +	,3-Dichloropropene (cis +
1,1-Dichloropropene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,3-Dichloropropene (cis + trans)	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10	400		
Diethyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,4-Dioxane	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	200	5000		
Ethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	40000	1000000		
Hexachlorobutadiene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	100000		
2-Hexanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	100000	1000000		
Isopropylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
p-Isopropyltoluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Methylene Chloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	3000		
4-Methyl-2-pentanone	ND	93	ND	92	ND	103	ND	106	ND	118	ND	137	ug/kg	400	50000		
Naphthalene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	4000	20000		
n-Propylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Styrene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	3000	4000		
1,1,1,2-Tetrachloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	100		
Tetrachloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000	4000		
Tetrahydrofuran	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
Toluene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	1000000		
1,2,4-Trichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	2000	6000		
1,2,3-Trichlorobenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,1,2-Trichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100	2000		
1,1,1-Trichloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	30000	600000		
Trichloroethene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	300		
1,2,3-Trichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
1,3,5-Trimethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	10000	100000		
1,2,4-Trimethylbenzene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
Vinyl Chloride	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	300	700		
o-Xylene	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	see Total xylenes	see Total xylenes	see Total xylenes	see Total xylenes
m&p-Xylene	ND	9	ND	9	ND	10	ND	11	ND	12	ND	14	ug/kg	see Total xylenes	see Total xylenes	see Total xylenes	see Total xylenes
Total xylenes	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	100000		
1,1,2,2-Tetrachloroethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	5	20		
tert-Amyl methyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
1,3-Dichloropropane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	500000	5000000		
Ethyl tert-butyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg				
Diisopropyl ether	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	100000	1000000		
Trichlorofluoromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		
Dichlorodifluoromethane	ND	5	ND	5	ND	5	ND	5	ND	6	ND	7	ug/kg	1000000	1.00E+07		

LABORATORY REPORTS

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 3C27022
Client Project: 3096 - MVG Green

Report Date: 04-April-2023

Prepared for:

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Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 03/27/23. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 3C27022. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
3C27022-01	B-2	Soil	03/22/2023	03/27/2023
3C27022-02	B-4	Soil	03/22/2023	03/27/2023
3C27022-03	B-18	Soil	03/22/2023	03/27/2023
3C27022-04	B-20	Soil	03/22/2023	03/27/2023
3C27022-05	B-30	Soil	03/24/2023	03/27/2023
3C27022-06	B-33	Soil	03/24/2023	03/27/2023
3C27022-07	B-48	Soil	03/24/2023	03/27/2023
3C27022-08	B-51	Soil	03/24/2023	03/27/2023
3C27022-09	B-52	Soil	03/24/2023	03/27/2023
3C27022-10	B-59	Soil	03/24/2023	03/27/2023
3C27022-11	B-67	Soil	03/24/2023	03/27/2023
3C27022-12	B-71	Soil	03/24/2023	03/27/2023

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-18 (Lab Number: 3C27022-03)

Analysis	Method
MADEP EPH	MADEP EPH

B-2 (Lab Number: 3C27022-01)

Analysis	Method
MADEP EPH	MADEP EPH

B-20 (Lab Number: 3C27022-04)

Analysis	Method
MADEP EPH	MADEP EPH

B-30 (Lab Number: 3C27022-05)

Analysis	Method
MADEP EPH	MADEP EPH

B-33 (Lab Number: 3C27022-06)

Analysis	Method
MADEP EPH	MADEP EPH

B-4 (Lab Number: 3C27022-02)

Analysis	Method
MADEP EPH	MADEP EPH

B-48 (Lab Number: 3C27022-07)

Analysis	Method
MADEP EPH	MADEP EPH

B-51 (Lab Number: 3C27022-08)

Analysis	Method
MADEP EPH	MADEP EPH

B-52 (Lab Number: 3C27022-09)

Analysis	Method
MADEP EPH	MADEP EPH

B-59 (Lab Number: 3C27022-10)

Analysis	Method
MADEP EPH	MADEP EPH

B-67 (Lab Number: 3C27022-11)

Analysis	Method
MADEP EPH	MADEP EPH

B-71 (Lab Number: 3C27022-12)

Analysis	Method
MADEP EPH	MADEP EPH

Method References

Method for the Determination of Extractable Petroleum Hydrocarbons, Rev. 2.1, Massachusetts Department of Environmental Protection, 2004

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Extractable Petroleum Hydrocarbons

Sample: B-2 (3C27022-01)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-2
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-01
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.70

RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.59	mg/kg	<7.59	04/03/23 17:27
Diesel PAH Analytes	Naphthalene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	2-Methylnaphthalene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Phenanthrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Acenaphthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
Other Target PAH Analytes	Acenaphthylene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Fluorene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(a)anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Chrysene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(b)fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(k)fluoranthene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(a)pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Indeno(1,2,3-cd)pyrene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Dibenz(a,h)anthracene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
	Benzo(g,h,i)perylene	1X	0.38	mg/kg	<0.38	04/03/23 17:27
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/03/23 23:00
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	**17.7**	04/03/23 23:00
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.59	mg/kg	<7.59	04/03/23 17:27
Chlorooctadecane (Sample Surrogate)				%	90.3	04/03/23 23:00
o-Terphenyl (Sample Surrogate)				%	76.0	04/03/23 17:27
2-Fluorobiphenyl (Fractionation Surrogate)				%	99.8	04/03/23 17:27
2-Bromonaphthalene (Fractionation Surrogate)				%	97.6	04/03/23 17:27
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-4 (3C27022-02)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-4
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-02
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	11.40

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.48	mg/kg	<7.48	04/03/23 17:04
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Fluorene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Chrysene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/03/23 17:04
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/03/23 23:24
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/03/23 23:24
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.48	mg/kg	<7.48	04/03/23 17:04
Chlorooctadecane (Sample Surrogate)				%	71.3	04/03/23 23:24
o-Terphenyl (Sample Surrogate)				%	68.3	04/03/23 17:04
2-Fluorobiphenyl (Fractionation Surrogate)				%	92.2	04/03/23 17:04
2-Bromonaphthalene (Fractionation Surrogate)				%	89.8	04/03/23 17:04
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-18 (3C27022-03)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-18
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-03
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/22/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	21.70

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	8.46	mg/kg	**21.0**	04/03/23 17:50
Diesel PAH Analytes	Naphthalene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	2-Methylnaphthalene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Phenanthrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Acenaphthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
Other Target PAH Analytes	Acenaphthylene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Fluorene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(a)anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Chrysene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(b)fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(k)fluoranthene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(a)pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Indeno(1,2,3-cd)pyrene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Dibenz(a,h)anthracene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
	Benzo(g,h,i)perylene	1X	0.42	mg/kg	<0.42	04/03/23 17:50
C9-C18 Aliphatic Hydrocarbons [1]		1X	16.9	mg/kg	<16.9	04/03/23 23:49
C19-C36 Aliphatic Hydrocarbons [1]		1X	16.9	mg/kg	<16.9	04/03/23 23:49
C11-C22 Aromatic Hydrocarbons [1,2]		1X	8.46	mg/kg	**21.0**	04/03/23 17:50
Chlorooctadecane (Sample Surrogate)				%	74.2	04/03/23 23:49
o-Terphenyl (Sample Surrogate)				%	62.8	04/03/23 17:50
2-Fluorobiphenyl (Fractionation Surrogate)				%	89.2	04/03/23 17:50
2-Bromonaphthalene (Fractionation Surrogate)				%	85.6	04/03/23 17:50
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-20 (3C27022-04)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	B-20	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3C27022-04	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	03/22/23	
				Date Received	03/27/23	
				Date Thawed	NA	
				Date Extracted	03/30/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	5.10	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	6.99	mg/kg	<6.99	04/03/23 16:42
Diesel PAH Analytes	Naphthalene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	2-Methylnaphthalene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Phenanthrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Acenaphthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
Other Target PAH Analytes	Acenaphthylene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Fluorene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(a)anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Chrysene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(b)fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(k)fluoranthene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(a)pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Indeno(1,2,3-cd)pyrene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Dibenz(a,h)anthracene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
	Benzo(g,h,i)perylene	1X	0.35	mg/kg	<0.35	04/03/23 16:42
C9-C18 Aliphatic Hydrocarbons [1]		1X	13.9	mg/kg	<13.9	04/04/23 00:14
C19-C36 Aliphatic Hydrocarbons [1]		1X	13.9	mg/kg	<13.9	04/04/23 00:14
C11-C22 Aromatic Hydrocarbons [1,2]		1X	6.99	mg/kg	<6.99	04/03/23 16:42
Chlorooctadecane (Sample Surrogate)				%	98.5	04/04/23 00:14
o-Terphenyl (Sample Surrogate)				%	80.3	04/03/23 16:42
2-Fluorobiphenyl (Fractionation Surrogate)				%	99.5	04/03/23 16:42
2-Bromonaphthalene (Fractionation Surrogate)				%	96.1	04/03/23 16:42
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons

Sample: B-30 (3C27022-05)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-30
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-05
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	5.90

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.04	mg/kg	<7.04	04/04/23 01:52
Diesel PAH Analytes	Naphthalene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	2-Methylnaphthalene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Phenanthrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Acenaphthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
Other Target PAH Analytes	Acenaphthylene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Fluorene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(a)anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Chrysene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(b)fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(k)fluoranthene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(a)pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Indeno(1,2,3-cd)pyrene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Dibenz(a,h)anthracene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
	Benzo(g,h,i)perylene	1X	0.35	mg/kg	<0.35	04/04/23 01:52
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.0	mg/kg	<14.0	04/04/23 03:56
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.0	mg/kg	<14.0	04/04/23 03:56
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.04	mg/kg	<7.04	04/04/23 01:52
Chlorooctadecane (Sample Surrogate)				%	109	04/04/23 03:56
o-Terphenyl (Sample Surrogate)				%	94.6	04/04/23 01:52
2-Fluorobiphenyl (Fractionation Surrogate)				%	111	04/04/23 01:52
2-Bromonaphthalene (Fractionation Surrogate)				%	107	04/04/23 01:52
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons

Sample: B-33 (3C27022-06)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-33
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-06
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	11.30

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.47	mg/kg	<7.47	04/04/23 13:14
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 13:14
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/04/23 04:20
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.9	mg/kg	<14.9	04/04/23 04:20
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.47	mg/kg	<7.47	04/04/23 13:14
Chlorooctadecane (Sample Surrogate)				%	103	04/04/23 04:20
o-Terphenyl (Sample Surrogate)				%	80.9	04/04/23 13:14
2-Fluorobiphenyl (Fractionation Surrogate)				%	97.7	04/04/23 13:14
2-Bromonaphthalene (Fractionation Surrogate)				%	91.3	04/04/23 13:14
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-48 (3C27022-07)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-48
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-07
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.50

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.57	mg/kg	<7.57	04/04/23 13:37
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 13:37
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 04:45
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 04:45
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.57	mg/kg	<7.57	04/04/23 13:37
Chlorooctadecane (Sample Surrogate)				%	98.6	04/04/23 04:45
o-Terphenyl (Sample Surrogate)				%	83.4	04/04/23 13:37
2-Fluorobiphenyl (Fractionation Surrogate)				%	104	04/04/23 13:37
2-Bromonaphthalene (Fractionation Surrogate)				%	99.7	04/04/23 13:37
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-51 (3C27022-08)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-51
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-08
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.40

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.57	mg/kg	<7.57	04/04/23 03:45
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 03:45
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 05:09
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.1	mg/kg	<15.1	04/04/23 05:09
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.57	mg/kg	<7.57	04/04/23 03:45
Chlorooctadecane (Sample Surrogate)				%	115	04/04/23 05:09
o-Terphenyl (Sample Surrogate)				%	102	04/04/23 03:45
2-Fluorobiphenyl (Fractionation Surrogate)				%	113	04/04/23 03:45
2-Bromonaphthalene (Fractionation Surrogate)				%	108	04/04/23 03:45
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-52 (3C27022-09)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-52
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-09
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	12.00

RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.53	mg/kg	**8.70**	04/04/23 02:37
Diesel PAH Analytes	Naphthalene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	2-Methylnaphthalene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Phenanthrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Acenaphthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
Other Target PAH Analytes	Acenaphthylene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Fluorene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(a)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Chrysene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(b)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(k)fluoranthene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(a)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Indeno(1,2,3-cd)pyrene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Dibenz(a,h)anthracene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
	Benzo(g,h,i)perylene	1X	0.37	mg/kg	<0.37	04/04/23 02:37
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.0	mg/kg	<15.0	04/04/23 05:34
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.0	mg/kg	**15.7**	04/04/23 05:34
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.53	mg/kg	**8.70**	04/04/23 02:37
Chlorooctadecane (Sample Surrogate)				%	89.2	04/04/23 05:34
o-Terphenyl (Sample Surrogate)				%	70.4	04/04/23 02:37
2-Fluorobiphenyl (Fractionation Surrogate)				%	98.7	04/04/23 02:37
2-Bromonaphthalene (Fractionation Surrogate)				%	96.4	04/04/23 02:37
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons

Sample: B-59 (3C27022-10)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-59
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-10
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	13.20

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.63	mg/kg	<7.63	04/04/23 02:15
Diesel PAH Analytes	Naphthalene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	2-Methylnaphthalene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Phenanthrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Acenaphthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
Other Target PAH Analytes	Acenaphthylene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Fluorene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(a)anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Chrysene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(b)fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(k)fluoranthene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(a)pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Indeno(1,2,3-cd)pyrene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Dibenz(a,h)anthracene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
	Benzo(g,h,i)perylene	1X	0.38	mg/kg	<0.38	04/04/23 02:15
C9-C18 Aliphatic Hydrocarbons [1]		1X	15.2	mg/kg	<15.2	04/04/23 05:58
C19-C36 Aliphatic Hydrocarbons [1]		1X	15.2	mg/kg	<15.2	04/04/23 05:58
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.63	mg/kg	<7.63	04/04/23 02:15
Chlorooctadecane (Sample Surrogate)				%	96.2	04/04/23 05:58
o-Terphenyl (Sample Surrogate)				%	54.3	04/04/23 02:15
2-Fluorobiphenyl (Fractionation Surrogate)				%	65.9	04/04/23 02:15
2-Bromonaphthalene (Fractionation Surrogate)				%	63.1	04/04/23 02:15
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.

[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.

[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-67 (3C27022-11)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-67
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-11
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	8.80

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.26	mg/kg	<7.26	04/04/23 13:59
Diesel PAH Analytes	Naphthalene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	2-Methylnaphthalene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Phenanthrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Acenaphthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
Other Target PAH Analytes	Acenaphthylene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Fluorene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(a)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Chrysene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(b)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(k)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(a)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Indeno(1,2,3-cd)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Dibenz(a,h)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
	Benzo(g,h,i)perylene	1X	0.36	mg/kg	<0.36	04/04/23 13:59
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.5	mg/kg	<14.5	04/04/23 06:23
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.5	mg/kg	<14.5	04/04/23 06:23
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.26	mg/kg	<7.26	04/04/23 13:59
Chlorooctadecane (Sample Surrogate)				%	112	04/04/23 06:23
o-Terphenyl (Sample Surrogate)				%	71.3	04/04/23 13:59
2-Fluorobiphenyl (Fractionation Surrogate)				%	78.9	04/04/23 13:59
2-Bromonaphthalene (Fractionation Surrogate)				%	75.1	04/04/23 13:59
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: B-71 (3C27022-12)

SAMPLE INFORMATION

Matrix	Soil
Containers	Satisfactory
Aqueous Preservatives	NA
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3546

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1	Client ID	B-71
Method for Target Analytes: MADEP EPH 4-1.1	Lab ID	3C27022-12
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl	Date Collected	03/24/23
	Date Received	03/27/23
	Date Thawed	NA
	Date Extracted	03/30/23
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene	Percent Moisture	9.70

RANGE/TARGET ANALYTE		Dilution	RL	Units	Result	Analyzed
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	7.33	mg/kg	<7.33	04/04/23 03:22
Diesel PAH Analytes	Naphthalene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	2-Methylnaphthalene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Phenanthrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Acenaphthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
Other Target PAH Analytes	Acenaphthylene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Fluorene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(a)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Chrysene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(b)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(k)fluoranthene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(a)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Indeno(1,2,3-cd)pyrene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Dibenz(a,h)anthracene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
	Benzo(g,h,i)perylene	1X	0.36	mg/kg	<0.36	04/04/23 03:22
C9-C18 Aliphatic Hydrocarbons [1]		1X	14.6	mg/kg	<14.6	04/04/23 06:47
C19-C36 Aliphatic Hydrocarbons [1]		1X	14.6	mg/kg	<14.6	04/04/23 06:47
C11-C22 Aromatic Hydrocarbons [1,2]		1X	7.33	mg/kg	<7.33	04/04/23 03:22
Chlorooctadecane (Sample Surrogate)				%	100	04/04/23 06:47
o-Terphenyl (Sample Surrogate)				%	82.6	04/04/23 03:22
2-Fluorobiphenyl (Fractionation Surrogate)				%	96.6	04/04/23 03:22
2-Bromonaphthalene (Fractionation Surrogate)				%	93.2	04/04/23 03:22
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Quality Control

Extractable Petroleum Hydrocarbons (MADEP-EPH)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3C1293 - EPA 3546										
Blank (B3C1293-BLK1)					Prepared: 03/30/23 Analyzed: 04/03/23					
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Naphthalene	ND		0.33	mg/kg						
2-Methylnaphthalene	ND		0.33	mg/kg						
Phenanthrene	ND		0.33	mg/kg						
Acenaphthene	ND		0.33	mg/kg						
Acenaphthylene	ND		0.33	mg/kg						
Fluorene	ND		0.33	mg/kg						
Anthracene	ND		0.33	mg/kg						
Fluoranthene	ND		0.33	mg/kg						
Pyrene	ND		0.33	mg/kg						
Benzo(a)anthracene	ND		0.33	mg/kg						
Chrysene	ND		0.33	mg/kg						
Benzo(b)fluoranthene	ND		0.33	mg/kg						
Benzo(k)fluoranthene	ND		0.33	mg/kg						
Benzo(a)pyrene	ND		0.33	mg/kg						
Indeno(1,2,3-cd)pyrene	ND		0.33	mg/kg						
Dibenz(a,h)anthracene	ND		0.33	mg/kg						
Benzo(g,h,i)perylene	ND		0.33	mg/kg						
C9-C18 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C19-C36 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Surrogate: Chlorooctadecane			*7.41*	mg/kg	*8.28*		*89.5*	*40-140*		
Surrogate: o-Terphenyl			*5.29*	mg/kg	*8.28*		*63.9*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.95*	mg/kg	*3.31*		*89.2*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.78*	mg/kg	*3.31*		*83.8*	*40-140*		
LCS (B3C1293-BS1)					Prepared: 03/30/23 Analyzed: 04/04/23					
Naphthalene	1.66		0.33	mg/kg	2.65		62.8	40-140		
2-Methylnaphthalene	1.66		0.33	mg/kg	2.65		62.5	40-140		
Phenanthrene	1.83		0.33	mg/kg	2.65		69.1	40-140		
Acenaphthene	1.81		0.33	mg/kg	2.65		68.2	40-140		
Acenaphthylene	1.71		0.33	mg/kg	2.65		64.5	40-140		
Fluorene	1.73		0.33	mg/kg	2.65		65.5	40-140		
Anthracene	1.78		0.33	mg/kg	2.65		67.0	40-140		
Fluoranthene	1.93		0.33	mg/kg	2.65		72.7	40-140		
Pyrene	1.93		0.33	mg/kg	2.65		72.7	40-140		
Benzo(a)anthracene	1.92		0.33	mg/kg	2.65		72.6	40-140		
Chrysene	2.03		0.33	mg/kg	2.65		76.8	40-140		
Benzo(b)fluoranthene	1.88		0.33	mg/kg	2.65		71.0	40-140		
Benzo(k)fluoranthene	1.98		0.33	mg/kg	2.65		74.8	40-140		
Benzo(a)pyrene	1.86		0.33	mg/kg	2.65		70.1	40-140		
Indeno(1,2,3-cd)pyrene	1.84		0.33	mg/kg	2.65		69.4	40-140		
Dibenz(a,h)anthracene	1.91		0.33	mg/kg	2.65		72.0	40-140		
Benzo(g,h,i)perylene	1.85		0.33	mg/kg	2.65		69.9	40-140		
EPH_LCS_Aliphatic_C19-C36	14.6		0.00	mg/kg	21.2		68.8	40-140		
EPH_LCS_Aliphatic_C9-C18	8.48		0.00	mg/kg	15.9		53.4	40-140		
EPH_LCS_Aromatic_C11-C22	31.3		0.00	mg/kg	45.0		69.5	40-140		
Nonane	0.88		0.33	mg/kg	2.65		33.2	30-140		
Decane	1.25		0.33	mg/kg	2.65		47.4	40-140		
Dodecane	1.50		0.33	mg/kg	2.65		56.8	40-140		
Tetradecane	1.55		0.33	mg/kg	2.65		58.6	40-140		
Hexadecane	1.60		0.33	mg/kg	2.65		60.2	40-140		
Octadecane	1.70		0.33	mg/kg	2.65		64.0	40-140		
Nonadecane	1.76		0.33	mg/kg	2.65		66.3	40-140		

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Batch: B3C1293 - EPA 3546 (Continued)

LCS (B3C1293-BS1) Prepared: 03/30/23 Analyzed: 04/03/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Eicosane	1.81		0.33	mg/kg	2.65		68.5	40-140		
Docosane	1.88		0.33	mg/kg	2.65		71.0	40-140		
Tetracosane	1.91		0.33	mg/kg	2.65		72.2	40-140		
Hexacosane	1.91		0.33	mg/kg	2.65		71.9	40-140		
Octacosane	1.89		0.33	mg/kg	2.65		71.3	40-140		
Triacontane	1.85		0.33	mg/kg	2.65		69.9	40-140		
Hexatriacontane	1.57		0.33	mg/kg	2.65		59.4	40-140		
Surrogate: Chlorooctadecane			*6.48*	mg/kg	*8.28*		*78.3*	*40-140*		
Surrogate: o-Terphenyl			*6.31*	mg/kg	*8.28*		*76.2*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.15*	mg/kg	*3.31*		*95.1*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.05*	mg/kg	*3.31*		*92.1*	*40-140*		

LCS Dup (B3C1293-BSD1) Prepared: 03/30/23 Analyzed: 04/03/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Naphthalene	1.66		0.33	mg/kg	2.65		62.5	40-140	0.439	25
2-Methylnaphthalene	1.63		0.33	mg/kg	2.65		61.6	40-140	1.57	25
Phenanthrene	1.81		0.33	mg/kg	2.65		68.2	40-140	1.35	25
Acenaphthene	1.79		0.33	mg/kg	2.65		67.6	40-140	0.847	25
Acenaphthylene	1.72		0.33	mg/kg	2.65		65.1	40-140	0.926	25
Fluorene	1.75		0.33	mg/kg	2.65		66.1	40-140	1.03	25
Anthracene	1.84		0.33	mg/kg	2.65		69.4	40-140	3.52	25
Fluoranthene	1.87		0.33	mg/kg	2.65		70.7	40-140	2.82	25
Pyrene	1.90		0.33	mg/kg	2.65		71.7	40-140	1.42	25
Benzo(a)anthracene	1.79		0.33	mg/kg	2.65		67.6	40-140	7.02	25
Chrysene	2.01		0.33	mg/kg	2.65		75.7	40-140	1.38	25
Benzo(b)fluoranthene	1.79		0.33	mg/kg	2.65		67.4	40-140	5.27	25
Benzo(k)fluoranthene	1.92		0.33	mg/kg	2.65		72.3	40-140	3.40	25
Benzo(a)pyrene	1.73		0.33	mg/kg	2.65		65.2	40-140	7.13	25
Indeno(1,2,3-cd)pyrene	1.53		0.33	mg/kg	2.65		57.9	40-140	18.1	25
Dibenz(a,h)anthracene	1.75		0.33	mg/kg	2.65		66.1	40-140	8.62	25
Benzo(g,h,i)perylene	1.77		0.33	mg/kg	2.65		66.7	40-140	4.65	25
EPH_LCS_Aliphatic_C19-C36	13.5		0.00	mg/kg	21.2		63.7	40-140	7.71	25
EPH_LCS_Aliphatic_C9-C18	7.46		0.00	mg/kg	15.9		46.9	40-140	12.8	25
EPH_LCS_Aromatic_C11-C22	30.2		0.00	mg/kg	45.0		67.2	40-140	3.42	25
Nonane	0.81		0.33	mg/kg	2.65		30.4	30-140	8.72	25
Decane	1.10		0.33	mg/kg	2.65		41.4	40-140	13.3	25
Dodecane	1.30		0.33	mg/kg	2.65		49.2	40-140	14.3	25
Tetradecane	1.30		0.33	mg/kg	2.65		49.1	40-140	17.6	25
Hexadecane	1.42		0.33	mg/kg	2.65		53.4	40-140	12.0	25
Octadecane	1.54		0.33	mg/kg	2.65		58.0	40-140	9.83	25
Nonadecane	1.62		0.33	mg/kg	2.65		61.0	40-140	8.29	25
Eicosane	1.68		0.33	mg/kg	2.65		63.2	40-140	7.93	25
Docosane	1.75		0.33	mg/kg	2.65		66.1	40-140	7.26	25
Tetracosane	1.79		0.33	mg/kg	2.65		67.4	40-140	6.95	25
Hexacosane	1.78		0.33	mg/kg	2.65		67.1	40-140	7.01	25
Octacosane	1.75		0.33	mg/kg	2.65		66.1	40-140	7.53	25
Triacontane	1.71		0.33	mg/kg	2.65		64.7	40-140	7.80	25
Hexatriacontane	1.43		0.33	mg/kg	2.65		54.1	40-140	9.29	25
Surrogate: Chlorooctadecane			*5.94*	mg/kg	*8.28*		*71.8*	*40-140*		
Surrogate: o-Terphenyl			*6.53*	mg/kg	*8.28*		*78.9*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.27*	mg/kg	*3.31*		*98.8*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.11*	mg/kg	*3.31*		*93.8*	*40-140*		

Quality Control
(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Batch: B3C1325 - EPA 3546

Blank (B3C1325-BLK1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Naphthalene	ND		0.33	mg/kg						
2-Methylnaphthalene	ND		0.33	mg/kg						
Phenanthrene	ND		0.33	mg/kg						
Acenaphthene	ND		0.33	mg/kg						
Acenaphthylene	ND		0.33	mg/kg						
Fluorene	ND		0.33	mg/kg						
Anthracene	ND		0.33	mg/kg						
Fluoranthene	ND		0.33	mg/kg						
Pyrene	ND		0.33	mg/kg						
Benzo(a)anthracene	ND		0.33	mg/kg						
Chrysene	ND		0.33	mg/kg						
Benzo(b)fluoranthene	ND		0.33	mg/kg						
Benzo(k)fluoranthene	ND		0.33	mg/kg						
Benzo(a)pyrene	ND		0.33	mg/kg						
Indeno(1,2,3-cd)pyrene	ND		0.33	mg/kg						
Dibenz(a,h)anthracene	ND		0.33	mg/kg						
Benzo(g,h,i)perylene	ND		0.33	mg/kg						
C9-C18 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C19-C36 Aliphatic Hydrocarbons	ND		13.2	mg/kg						
C11-C22 Aromatic Hydrocarbons	ND		6.63	mg/kg						
Surrogate: Chlorooctadecane			*9.65*	mg/kg	*8.28*		*117*	*40-140*		
Surrogate: o-Terphenyl			*6.57*	mg/kg	*8.28*		*79.4*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*2.78*	mg/kg	*3.31*		*83.9*	*40-140*		
Surrogate: 2-Bromonaphthalene			*2.63*	mg/kg	*3.31*		*79.4*	*40-140*		

LCS (B3C1325-BS1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Naphthalene	2.15		0.33	mg/kg	2.65		81.2	40-140		
2-Methylnaphthalene	2.09		0.33	mg/kg	2.65		78.9	40-140		
Phenanthrene	2.22		0.33	mg/kg	2.65		83.6	40-140		
Acenaphthene	2.17		0.33	mg/kg	2.65		82.0	40-140		
Acenaphthylene	2.14		0.33	mg/kg	2.65		80.9	40-140		
Fluorene	2.14		0.33	mg/kg	2.65		80.9	40-140		
Anthracene	2.25		0.33	mg/kg	2.65		85.0	40-140		
Fluoranthene	2.35		0.33	mg/kg	2.65		88.6	40-140		
Pyrene	2.34		0.33	mg/kg	2.65		88.4	40-140		
Benzo(a)anthracene	2.30		0.33	mg/kg	2.65		87.0	40-140		
Chrysene	2.44		0.33	mg/kg	2.65		92.0	40-140		
Benzo(b)fluoranthene	2.26		0.33	mg/kg	2.65		85.4	40-140		
Benzo(k)fluoranthene	2.31		0.33	mg/kg	2.65		87.3	40-140		
Benzo(a)pyrene	2.15		0.33	mg/kg	2.65		81.1	40-140		
Indeno(1,2,3-cd)pyrene	2.05		0.33	mg/kg	2.65		77.3	40-140		
Dibenz(a,h)anthracene	2.05		0.33	mg/kg	2.65		77.2	40-140		
Benzo(g,h,i)perylene	2.13		0.33	mg/kg	2.65		80.5	40-140		
EPH_LCS_Aliphatic_C19-C36	18.7		0.00	mg/kg	21.2		88.0	40-140		
EPH_LCS_Aliphatic_C9-C18	10.3		0.00	mg/kg	15.9		65.0	40-140		
EPH_LCS_Aromatic_C11-C22	37.5		0.00	mg/kg	45.0		83.4	40-140		
Nonane	1.04		0.33	mg/kg	2.65		39.1	30-140		
Decane	1.50		0.33	mg/kg	2.65		56.8	40-140		
Dodecane	1.84		0.33	mg/kg	2.65		69.3	40-140		
Tetradecane	1.86		0.33	mg/kg	2.65		70.2	40-140		
Hexadecane	1.96		0.33	mg/kg	2.65		74.0	40-140		
Octadecane	2.14		0.33	mg/kg	2.65		80.9	40-140		
Nonadecane	2.25		0.33	mg/kg	2.65		85.1	40-140		
Eicosane	2.31		0.33	mg/kg	2.65		87.3	40-140		
Docosane	2.37		0.33	mg/kg	2.65		89.6	40-140		
Tetracosane	2.41		0.33	mg/kg	2.65		90.9	40-140		

Quality Control
(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Batch: B3C1325 - EPA 3546 (Continued)

LCS (B3C1325-BS1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Hexacosane	2.42		0.33	mg/kg	2.65		91.2	40-140		
Octacosane	2.40		0.33	mg/kg	2.65		90.7	40-140		
Triacontane	2.38		0.33	mg/kg	2.65		90.0	40-140		
Hexatriacontane	2.11		0.33	mg/kg	2.65		79.5	40-140		
Surrogate: Chlorooctadecane			*8.41*	mg/kg	*8.28*		*102*	*40-140*		
Surrogate: o-Terphenyl			*7.92*	mg/kg	*8.28*		*95.7*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.61*	mg/kg	*3.31*		*109*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.49*	mg/kg	*3.31*		*105*	*40-140*		

LCS Dup (B3C1325-BSD1) Prepared: 03/30/23 Analyzed: 04/04/23

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Naphthalene	2.24		0.33	mg/kg	2.65		84.4	40-140	3.90	25
2-Methylnaphthalene	2.16		0.33	mg/kg	2.65		81.7	40-140	3.49	25
Phenanthrene	2.20		0.33	mg/kg	2.65		83.1	40-140	0.630	25
Acenaphthene	2.23		0.33	mg/kg	2.65		84.0	40-140	2.44	25
Acenaphthylene	2.20		0.33	mg/kg	2.65		83.1	40-140	2.71	25
Fluorene	2.17		0.33	mg/kg	2.65		81.9	40-140	1.29	25
Anthracene	2.23		0.33	mg/kg	2.65		84.2	40-140	0.886	25
Fluoranthene	2.28		0.33	mg/kg	2.65		86.0	40-140	3.01	25
Pyrene	2.28		0.33	mg/kg	2.65		86.0	40-140	2.72	25
Benzo(a)anthracene	2.24		0.33	mg/kg	2.65		84.7	40-140	2.71	25
Chrysene	2.38		0.33	mg/kg	2.65		89.8	40-140	2.47	25
Benzo(b)fluoranthene	2.23		0.33	mg/kg	2.65		84.2	40-140	1.36	25
Benzo(k)fluoranthene	2.32		0.33	mg/kg	2.65		87.4	40-140	0.172	25
Benzo(a)pyrene	2.14		0.33	mg/kg	2.65		80.8	40-140	0.402	25
Indeno(1,2,3-cd)pyrene	2.02		0.33	mg/kg	2.65		76.3	40-140	1.37	25
Dibenz(a,h)anthracene	2.03		0.33	mg/kg	2.65		76.7	40-140	0.617	25
Benzo(g,h,i)perylene	2.19		0.33	mg/kg	2.65		82.5	40-140	2.45	25
EPH_LCS_Aliphatic_C19-C36	20.4		0.00	mg/kg	21.2		96.2	40-140	8.84	25
EPH_LCS_Aliphatic_C9-C18	11.9		0.00	mg/kg	15.9		74.6	40-140	13.7	25
EPH_LCS_Aromatic_C11-C22	37.5		0.00	mg/kg	45.0		83.4	40-140	0.0265	25
Nonane	1.34		0.33	mg/kg	2.65		50.5	30-140	25.6	25
Decane	1.83		0.33	mg/kg	2.65		68.9	40-140	19.3	25
Dodecane	2.11		0.33	mg/kg	2.65		79.5	40-140	13.7	25
Tetradecane	2.10		0.33	mg/kg	2.65		79.3	40-140	12.1	25
Hexadecane	2.17		0.33	mg/kg	2.65		81.8	40-140	9.98	25
Octadecane	2.31		0.33	mg/kg	2.65		87.4	40-140	7.63	25
Nonadecane	2.42		0.33	mg/kg	2.65		91.2	40-140	7.00	25
Eicosane	2.50		0.33	mg/kg	2.65		94.4	40-140	7.84	25
Docosane	2.60		0.33	mg/kg	2.65		98.1	40-140	9.06	25
Tetracosane	2.65		0.33	mg/kg	2.65		99.9	40-140	9.41	25
Hexacosane	2.65		0.33	mg/kg	2.65		100	40-140	9.38	25
Octacosane	2.64		0.33	mg/kg	2.65		99.7	40-140	9.45	25
Triacontane	2.61		0.33	mg/kg	2.65		98.4	40-140	8.92	25
Hexatriacontane	2.32		0.33	mg/kg	2.65		87.5	40-140	9.61	25
Surrogate: Chlorooctadecane			*8.87*	mg/kg	*8.28*		*107*	*40-140*		
Surrogate: o-Terphenyl			*7.65*	mg/kg	*8.28*		*92.4*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*3.30*	mg/kg	*3.31*		*99.5*	*40-140*		
Surrogate: 2-Bromonaphthalene			*3.12*	mg/kg	*3.31*		*94.3*	*40-140*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

NEW ENGLAND TESTING LABORATO
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

3 C 2 7022

PROJ. NO. 3096

PROJECT NAME/LOCATION MVG Green

CLIENT Lord Environmental

REPORT TO:

INVOICE TO:

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** MADEP EPH with targets					REMARKS
3/22/23	9:00		X	B-2		X		1		X					PID = 0
↓	10:00		X	B-4		X		1		X					↓
	11:00		X	B-18		X		1		X					
	12:00		X	B-20		X		1		X					
3/24/23	9:00		X	B-30		X		1		X					
↓	9:30		X	B-33		X		1		X					
	10:00		X	B-48		X		1		X					
	10:30		X	B-51		X		1		X					
	11:00		X	B-52		X		1		X					
	11:30		X	B-59		X		1		X					
	12:30		X	B-67		X		1		X					
	1:00		X	B-71		X		1		X					

Sampled by: (Signature)	Date/Time		Received by: (Signature)	Date/Time	
	3/24/23	3:00pm			
Relinquished by: (Signature)	**Date/Time**		**Received by: (Signature)**	**Date/Time**	
Pam Glidwell	3/27/23	12:20 pm		3/27/23	1230
Relinquished by: (Signature)	**Date/Time**		**Received for Laboratory by: (Signature)**	**Date/Time**	
	3/27/23	1500		3/27/23	1500

Laboratory Remarks:
Temp. received: 5
Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:
MADEP
S-1

Turnaround (Business Days) 5

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.	Project #: 3096

Project Location: MVG Green	RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
3C27022

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☐	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☒	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☒ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

<u>Data User Note</u>: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:

Position: Laboratory Director

Printed Name: Richard Warila

Date: 4/4/2023

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 4B26010
Client Project: 3096 - Maynard

Report Date: 06-March-2024

Prepared for:

Ralph Tella
Lord Environmental, Inc.
1506 Providence Highway, Suite 30
Norwood, MA 02062

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 02/26/24. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client’s designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 4B26010. Custody records are included in this report.

Lab ID	**Sample**	**Matrix**	**Date Sampled**	**Date Received**
4B26010-01	TP-6	Soil	02/23/2024	02/26/2024
4B26010-02	B-103 0-6'	Soil	02/23/2024	02/26/2024
4B26010-03	B-113 2-4'	Soil	02/23/2024	02/26/2024
4B26010-04	B-112 2-6'	Soil	02/23/2024	02/26/2024

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-103 0-6' (Lab Number: 4B26010-02)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

B-112 2-6' (Lab Number: 4B26010-04)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Request for Analysis (continued)

B-113 2-4' (Lab Number: 4B26010-03)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

TP-6 (Lab Number: 4B26010-01)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Method References

Reactive Cyanide, Standard Operating Procedure 407, New England Testing Laboratory Inc.

Reactive Sulfide, Standard Operating Procedure 426, New England Testing Laboratory Inc.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

VOA 8260: Sample 'TP-6' and 'B-113 2-4" were prepared and analyzed utilizing bulk material provided by the client due to matrix interference.

Results: General Chemistry

Sample: TP-6
Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**7.0**			SU	02/28/24	02/28/24
Specific Conductance	**56.3**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**6.0**			SU	02/28/24	02/28/24
Specific Conductance	**15.9**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**5.1**			SU	02/28/24	02/28/24
Specific Conductance	**9.4**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-112 2-6'
Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**5.2**			SU	02/28/24	02/28/24
Specific Conductance	**17.4**		2.0	uS/cm	02/28/24	02/28/24

Results: Reactivity

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.3	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-103 0-6'
Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Total Metals

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	**1.09**		0.86	mg/kg	02/27/24	03/01/24
Arsenic	**10.5**		1.30	mg/kg	02/27/24	03/01/24
Barium	**32.5**		0.43	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.43	mg/kg	02/27/24	03/01/24
Cadmium	**3.42**		0.65	mg/kg	02/27/24	03/01/24
Chromium	**13.7**		0.65	mg/kg	02/27/24	03/01/24
Lead	**38.7**		0.65	mg/kg	02/27/24	03/01/24
Mercury	**0.129**		0.118	mg/kg	02/28/24	02/28/24
Nickel	**9.11**		0.65	mg/kg	02/27/24	03/01/24
Selenium	ND		1.30	mg/kg	02/27/24	03/01/24
Silver	ND		1.30	mg/kg	02/27/24	03/01/24
Vanadium	**21.4**		0.43	mg/kg	02/27/24	03/01/24
Zinc	**48.6**		2.6	mg/kg	02/27/24	03/01/24
Thallium	ND		0.43	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.88	mg/kg	02/27/24	03/01/24
Arsenic	**5.92**		1.33	mg/kg	02/27/24	03/01/24
Barium	**38.0**		0.44	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.44	mg/kg	02/27/24	03/01/24
Cadmium	**4.33**		0.66	mg/kg	02/27/24	03/01/24
Chromium	**19.5**		0.66	mg/kg	02/27/24	03/01/24
Lead	**5.29**		0.66	mg/kg	02/27/24	03/01/24
Mercury	**0.184**		0.111	mg/kg	02/28/24	02/28/24
Nickel	**9.06**		0.66	mg/kg	02/27/24	03/01/24
Selenium	ND		1.33	mg/kg	02/27/24	03/01/24
Silver	ND		1.33	mg/kg	02/27/24	03/01/24
Vanadium	**24.4**		0.44	mg/kg	02/27/24	03/01/24
Zinc	**22.9**		2.7	mg/kg	02/27/24	03/01/24
Thallium	ND		0.44	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.95	mg/kg	02/27/24	03/01/24
Arsenic	**9.73**		1.44	mg/kg	02/27/24	03/01/24
Barium	**13.6**		0.48	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.48	mg/kg	02/27/24	03/01/24
Cadmium	**2.54**		0.72	mg/kg	02/27/24	03/01/24
Chromium	**13.0**		0.72	mg/kg	02/27/24	03/01/24
Lead	**3.91**		0.72	mg/kg	02/27/24	03/01/24
Mercury	ND		0.110	mg/kg	02/28/24	02/28/24
Nickel	**8.94**		0.72	mg/kg	02/27/24	03/01/24
Selenium	ND		1.44	mg/kg	02/27/24	03/01/24
Silver	ND		1.44	mg/kg	02/27/24	03/01/24
Vanadium	**14.4**		0.48	mg/kg	02/27/24	03/01/24
Zinc	**18.0**		2.9	mg/kg	02/27/24	03/01/24
Thallium	ND		0.48	mg/kg	02/27/24	03/01/24

Results: Total Metals

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.88	mg/kg	02/27/24	03/01/24
Arsenic	**6.40**		1.33	mg/kg	02/27/24	03/01/24
Barium	**65.3**		0.44	mg/kg	02/27/24	03/01/24
Beryllium	ND		0.44	mg/kg	02/27/24	03/01/24
Cadmium	**5.34**		0.66	mg/kg	02/27/24	03/01/24
Chromium	**21.8**		0.66	mg/kg	02/27/24	03/01/24
Lead	**5.94**		0.66	mg/kg	02/27/24	03/01/24
Mercury	ND		0.097	mg/kg	02/28/24	02/28/24
Nickel	**9.97**		0.66	mg/kg	02/27/24	03/01/24
Selenium	ND		1.33	mg/kg	02/27/24	03/01/24
Silver	ND		1.33	mg/kg	02/27/24	03/01/24
Vanadium	**36.7**		0.44	mg/kg	02/27/24	03/01/24
Zinc	**26.3**		2.7	mg/kg	02/27/24	03/01/24
Thallium	ND		0.44	mg/kg	02/27/24	03/01/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		103	ug/kg	03/05/24	03/05/24
Benzene	ND		5	ug/kg	03/05/24	03/05/24
Bromobenzene	ND		5	ug/kg	03/05/24	03/05/24
Bromochloromethane	ND		5	ug/kg	03/05/24	03/05/24
Bromodichloromethane	ND		5	ug/kg	03/05/24	03/05/24
Bromoform	ND		5	ug/kg	03/05/24	03/05/24
Bromomethane	ND		5	ug/kg	03/05/24	03/05/24
2-Butanone	ND		103	ug/kg	03/05/24	03/05/24
tert-Butyl alcohol	ND		5	ug/kg	03/05/24	03/05/24
sec-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
n-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
tert-Butylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	03/05/24	03/05/24
Carbon Disulfide	ND		5	ug/kg	03/05/24	03/05/24
Carbon Tetrachloride	ND		5	ug/kg	03/05/24	03/05/24
Chlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
Chloroethane	ND		5	ug/kg	03/05/24	03/05/24
Chloroform	ND		5	ug/kg	03/05/24	03/05/24
Chloromethane	ND		5	ug/kg	03/05/24	03/05/24
4-Chlorotoluene	ND		5	ug/kg	03/05/24	03/05/24
2-Chlorotoluene	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	03/05/24	03/05/24
Dibromochloromethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	03/05/24	03/05/24
Dibromomethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,4-Dichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,2 Dichloroethene, Total	ND		5	ug/kg	03/05/24	03/05/24
trans-1,2-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
cis-1,2-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,2-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
2,2-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
cis-1,3-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
trans-1,3-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
1,1-Dichloropropene	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	03/05/24	03/05/24
Diethyl ether	ND		5	ug/kg	03/05/24	03/05/24
1,4-Dioxane	ND		103	ug/kg	03/05/24	03/05/24
Ethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Hexachlorobutadiene	ND		5	ug/kg	03/05/24	03/05/24
2-Hexanone	ND		103	ug/kg	03/05/24	03/05/24
Isopropylbenzene	ND		5	ug/kg	03/05/24	03/05/24
p-Isopropyltoluene	ND		5	ug/kg	03/05/24	03/05

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-6 (Continued)

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	03/05/24	03/05/24
4-Methyl-2-pentanone	ND		103	ug/kg	03/05/24	03/05/24
Naphthalene	ND		5	ug/kg	03/05/24	03/05/24
n-Propylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Styrene	ND		5	ug/kg	03/05/24	03/05/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	03/05/24	03/05/24
Tetrachloroethene	ND		5	ug/kg	03/05/24	03/05/24
Tetrahydrofuran	ND		5	ug/kg	03/05/24	03/05/24
Toluene	ND		5	ug/kg	03/05/24	03/05/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	03/05/24	03/05/24
1,1,2-Trichloroethane	ND		5	ug/kg	03/05/24	03/05/24
1,1,1-Trichloroethane	ND		5	ug/kg	03/05/24	03/05/24
Trichloroethene	ND		5	ug/kg	03/05/24	03/05/24
1,2,3-Trichloropropane	ND		5	ug/kg	03/05/24	03/05/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	03/05/24	03/05/24
Vinyl Chloride	ND		5	ug/kg	03/05/24	03/05/24
o-Xylene	ND		5	ug/kg	03/05/24	03/05/24
m&p-Xylene	ND		10	ug/kg	03/05/24	03/05/24
Total xylenes	ND		5	ug/kg	03/05/24	03/05/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	03/05/24	03/05/24
tert-Amyl methyl ether	ND		5	ug/kg	03/05/24	03/05/24
1,3-Dichloropropane	ND		5	ug/kg	03/05/24	03/05/24
Ethyl tert-butyl ether	ND		5	ug/kg	03/05/24	03/05/24
Diisopropyl ether	ND		5	ug/kg	03/05/24	03/05/24
Trichlorofluoromethane	ND		5	ug/kg	03/05/24	03/05/24
Dichlorodifluoromethane	ND		5	ug/kg	03/05/24	03/05/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*81.1%*	*70-130*	03/05/24	03/05/24
1,2-Dichloroethane-d4	*103%*	*70-130*	03/05/24	03/05/24
Toluene-d8	*92.5%*	*70-130*	03/05/24	03/05/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		106	ug/kg	03/04/24	03/04/24
Benzene	ND		5	ug/kg	03/04/24	03/04/24
Bromobenzene	ND		5	ug/kg	03/04/24	03/04/24
Bromochloromethane	ND		5	ug/kg	03/04/24	03/04/24
Bromodichloromethane	ND		5	ug/kg	03/04/24	03/04/24
Bromoform	ND		5	ug/kg	03/04/24	03/04/24
Bromomethane	ND		5	ug/kg	03/04/24	03/04/24
2-Butanone	ND		106	ug/kg	03/04/24	03/04/24
tert-Butyl alcohol	ND		5	ug/kg	03/04/24	03/04/24
sec-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
n-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
tert-Butylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	03/04/24	03/04/24
Carbon Disulfide	ND		5	ug/kg	03/04/24	03/04/24
Carbon Tetrachloride	ND		5	ug/kg	03/04/24	03/04/24
Chlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
Chloroethane	ND		5	ug/kg	03/04/24	03/04/24
Chloroform	ND		5	ug/kg	03/04/24	03/04/24
Chloromethane	ND		5	ug/kg	03/04/24	03/04/24
4-Chlorotoluene	ND		5	ug/kg	03/04/24	03/04/24
2-Chlorotoluene	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	03/04/24	03/04/24
Dibromochloromethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	03/04/24	03/04/24
Dibromomethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,4-Dichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,2 Dichloroethene, Total	ND		5	ug/kg	03/04/24	03/04/24
trans-1,2-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
cis-1,2-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,2-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
2,2-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
cis-1,3-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
trans-1,3-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
1,1-Dichloropropene	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	03/04/24	03/04/24
Diethyl ether	ND		5	ug/kg	03/04/24	03/04/24
1,4-Dioxane	ND		106	ug/kg	03/04/24	03/04/24
Ethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Hexachlorobutadiene	ND		5	ug/kg	03/04/24	03/04/24
2-Hexanone	ND		106	ug/kg	03/04/24	03/04/24
Isopropylbenzene	ND		5	ug/kg	03/04/24	03/04/24
p-Isopropyltoluene	ND		5	ug/kg	03/04/24	03/04

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-103 0-6' (Continued)

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	03/04/24	03/04/24
4-Methyl-2-pentanone	ND		106	ug/kg	03/04/24	03/04/24
Naphthalene	ND		5	ug/kg	03/04/24	03/04/24
n-Propylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Styrene	ND		5	ug/kg	03/04/24	03/04/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	03/04/24	03/04/24
Tetrachloroethene	ND		5	ug/kg	03/04/24	03/04/24
Tetrahydrofuran	ND		5	ug/kg	03/04/24	03/04/24
Toluene	ND		5	ug/kg	03/04/24	03/04/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	03/04/24	03/04/24
1,1,2-Trichloroethane	ND		5	ug/kg	03/04/24	03/04/24
1,1,1-Trichloroethane	ND		5	ug/kg	03/04/24	03/04/24
Trichloroethene	ND		5	ug/kg	03/04/24	03/04/24
1,2,3-Trichloropropane	ND		5	ug/kg	03/04/24	03/04/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	03/04/24	03/04/24
Vinyl Chloride	ND		5	ug/kg	03/04/24	03/04/24
o-Xylene	ND		5	ug/kg	03/04/24	03/04/24
m&p-Xylene	ND		11	ug/kg	03/04/24	03/04/24
Total xylenes	ND		5	ug/kg	03/04/24	03/04/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	03/04/24	03/04/24
tert-Amyl methyl ether	ND		5	ug/kg	03/04/24	03/04/24
1,3-Dichloropropane	ND		5	ug/kg	03/04/24	03/04/24
Ethyl tert-butyl ether	ND		5	ug/kg	03/04/24	03/04/24
Diisopropyl ether	ND		5	ug/kg	03/04/24	03/04/24
Trichlorofluoromethane	ND		5	ug/kg	03/04/24	03/04/24
Dichlorodifluoromethane	ND		5	ug/kg	03/04/24	03/04/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.1%*	*70-130*	03/04/24	03/04/24
1,2-Dichloroethane-d4	*106%*	*70-130*	03/04/24	03/04/24
Toluene-d8	*98.5%*	*70-130*	03/04/24	03/04/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-113 2-4'
Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		823	ug/kg	03/05/24	03/05/24
Benzene	ND		6	ug/kg	03/05/24	03/05/24
Bromobenzene	ND		6	ug/kg	03/05/24	03/05/24
Bromochloromethane	ND		6	ug/kg	03/05/24	03/05/24
Bromodichloromethane	ND		6	ug/kg	03/05/24	03/05/24
Bromoform	ND		6	ug/kg	03/05/24	03/05/24
Bromomethane	ND		6	ug/kg	03/05/24	03/05/24
2-Butanone	ND		118	ug/kg	03/05/24	03/05/24
tert-Butyl alcohol	ND		6	ug/kg	03/05/24	03/05/24
sec-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
n-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
tert-Butylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Methyl t-butyl ether (MTBE)	ND		6	ug/kg	03/05/24	03/05/24
Carbon Disulfide	ND		6	ug/kg	03/05/24	03/05/24
Carbon Tetrachloride	ND		6	ug/kg	03/05/24	03/05/24
Chlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
Chloroethane	ND		6	ug/kg	03/05/24	03/05/24
Chloroform	ND		6	ug/kg	03/05/24	03/05/24
Chloromethane	ND		6	ug/kg	03/05/24	03/05/24
4-Chlorotoluene	ND		6	ug/kg	03/05/24	03/05/24
2-Chlorotoluene	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		6	ug/kg	03/05/24	03/05/24
Dibromochloromethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dibromoethane (EDB)	ND		6	ug/kg	03/05/24	03/05/24
Dibromomethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,4-Dichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,2 Dichloroethene, Total	ND		6	ug/kg	03/05/24	03/05/24
trans-1,2-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
cis-1,2-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,2-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
2,2-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
cis-1,3-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
trans-1,3-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
1,1-Dichloropropene	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichloropropene (cis + trans)	ND		6	ug/kg	03/05/24	03/05/24
Diethyl ether	ND		6	ug/kg	03/05/24	03/05/24
1,4-Dioxane	ND		118	ug/kg	03/05/24	03/05/24
Ethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Hexachlorobutadiene	ND		6	ug/kg	03/05/24	03/05/24
2-Hexanone	ND		118	ug/kg	03/05/24	03/05/24
Isopropylbenzene	ND		6	ug/kg	03/05/24	03/05/24
p-Isopropyltoluene	ND		6	ug/kg	03/05/24	03/05

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-113 2-4' (Continued)

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		6	ug/kg	03/05/24	03/05/24
4-Methyl-2-pentanone	ND		118	ug/kg	03/05/24	03/05/24
Naphthalene	ND		6	ug/kg	03/05/24	03/05/24
n-Propylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Styrene	ND		6	ug/kg	03/05/24	03/05/24
1,1,1,2-Tetrachloroethane	ND		6	ug/kg	03/05/24	03/05/24
Tetrachloroethene	ND		6	ug/kg	03/05/24	03/05/24
Tetrahydrofuran	ND		6	ug/kg	03/05/24	03/05/24
Toluene	ND		6	ug/kg	03/05/24	03/05/24
1,2,4-Trichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,2,3-Trichlorobenzene	ND		6	ug/kg	03/05/24	03/05/24
1,1,2-Trichloroethane	ND		6	ug/kg	03/05/24	03/05/24
1,1,1-Trichloroethane	ND		6	ug/kg	03/05/24	03/05/24
Trichloroethene	ND		6	ug/kg	03/05/24	03/05/24
1,2,3-Trichloropropane	ND		6	ug/kg	03/05/24	03/05/24
1,3,5-Trimethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
1,2,4-Trimethylbenzene	ND		6	ug/kg	03/05/24	03/05/24
Vinyl Chloride	ND		6	ug/kg	03/05/24	03/05/24
o-Xylene	ND		6	ug/kg	03/05/24	03/05/24
m&p-Xylene	ND		12	ug/kg	03/05/24	03/05/24
Total xylenes	ND		6	ug/kg	03/05/24	03/05/24
1,1,2,2-Tetrachloroethane	ND		6	ug/kg	03/05/24	03/05/24
tert-Amyl methyl ether	ND		6	ug/kg	03/05/24	03/05/24
1,3-Dichloropropane	ND		6	ug/kg	03/05/24	03/05/24
Ethyl tert-butyl ether	ND		6	ug/kg	03/05/24	03/05/24
Diisopropyl ether	ND		6	ug/kg	03/05/24	03/05/24
Trichlorofluoromethane	ND		6	ug/kg	03/05/24	03/05/24
Dichlorodifluoromethane	ND		6	ug/kg	03/05/24	03/05/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.7%*	*70-130*	03/05/24	03/05/24
1,2-Dichloroethane-d4	*101%*	*70-130*	03/05/24	03/05/24
Toluene-d8	*96.0%*	*70-130*	03/05/24	03/05/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		137	ug/kg	03/04/24	03/04/24
Benzene	ND		7	ug/kg	03/04/24	03/04/24
Bromobenzene	ND		7	ug/kg	03/04/24	03/04/24
Bromochloromethane	ND		7	ug/kg	03/04/24	03/04/24
Bromodichloromethane	ND		7	ug/kg	03/04/24	03/04/24
Bromoform	ND		7	ug/kg	03/04/24	03/04/24
Bromomethane	ND		7	ug/kg	03/04/24	03/04/24
2-Butanone	ND		137	ug/kg	03/04/24	03/04/24
tert-Butyl alcohol	ND		7	ug/kg	03/04/24	03/04/24
sec-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
n-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
tert-Butylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Methyl t-butyl ether (MTBE)	ND		7	ug/kg	03/04/24	03/04/24
Carbon Disulfide	ND		7	ug/kg	03/04/24	03/04/24
Carbon Tetrachloride	ND		7	ug/kg	03/04/24	03/04/24
Chlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
Chloroethane	ND		7	ug/kg	03/04/24	03/04/24
Chloroform	ND		7	ug/kg	03/04/24	03/04/24
Chloromethane	ND		7	ug/kg	03/04/24	03/04/24
4-Chlorotoluene	ND		7	ug/kg	03/04/24	03/04/24
2-Chlorotoluene	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		7	ug/kg	03/04/24	03/04/24
Dibromochloromethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dibromoethane (EDB)	ND		7	ug/kg	03/04/24	03/04/24
Dibromomethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,4-Dichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,2 Dichloroethene, Total	ND		7	ug/kg	03/04/24	03/04/24
trans-1,2-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
cis-1,2-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,2-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
2,2-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
cis-1,3-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
trans-1,3-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
1,1-Dichloropropene	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichloropropene (cis + trans)	ND		7	ug/kg	03/04/24	03/04/24
Diethyl ether	ND		7	ug/kg	03/04/24	03/04/24
1,4-Dioxane	ND		137	ug/kg	03/04/24	03/04/24
Ethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Hexachlorobutadiene	ND		7	ug/kg	03/04/24	03/04/24
2-Hexanone	ND		137	ug/kg	03/04/24	03/04/24
Isopropylbenzene	ND		7	ug/kg	03/04/24	03/04/24
p-Isopropyltoluene	ND		7	ug/kg	03/04/24	03/0

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-112 2-6' (Continued)

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		7	ug/kg	03/04/24	03/04/24
4-Methyl-2-pentanone	ND		137	ug/kg	03/04/24	03/04/24
Naphthalene	ND		7	ug/kg	03/04/24	03/04/24
n-Propylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Styrene	ND		7	ug/kg	03/04/24	03/04/24
1,1,1,2-Tetrachloroethane	ND		7	ug/kg	03/04/24	03/04/24
Tetrachloroethene	ND		7	ug/kg	03/04/24	03/04/24
Tetrahydrofuran	ND		7	ug/kg	03/04/24	03/04/24
Toluene	ND		7	ug/kg	03/04/24	03/04/24
1,2,4-Trichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,2,3-Trichlorobenzene	ND		7	ug/kg	03/04/24	03/04/24
1,1,2-Trichloroethane	ND		7	ug/kg	03/04/24	03/04/24
1,1,1-Trichloroethane	ND		7	ug/kg	03/04/24	03/04/24
Trichloroethene	ND		7	ug/kg	03/04/24	03/04/24
1,2,3-Trichloropropane	ND		7	ug/kg	03/04/24	03/04/24
1,3,5-Trimethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
1,2,4-Trimethylbenzene	ND		7	ug/kg	03/04/24	03/04/24
Vinyl Chloride	ND		7	ug/kg	03/04/24	03/04/24
o-Xylene	ND		7	ug/kg	03/04/24	03/04/24
m&p-Xylene	ND		14	ug/kg	03/04/24	03/04/24
Total xylenes	ND		7	ug/kg	03/04/24	03/04/24
1,1,2,2-Tetrachloroethane	ND		7	ug/kg	03/04/24	03/04/24
tert-Amyl methyl ether	ND		7	ug/kg	03/04/24	03/04/24
1,3-Dichloropropane	ND		7	ug/kg	03/04/24	03/04/24
Ethyl tert-butyl ether	ND		7	ug/kg	03/04/24	03/04/24
Diisopropyl ether	ND		7	ug/kg	03/04/24	03/04/24
Trichlorofluoromethane	ND		7	ug/kg	03/04/24	03/04/24
Dichlorodifluoromethane	ND		7	ug/kg	03/04/24	03/04/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*99.4%*	*70-130*	03/04/24	03/04/24
1,2-Dichloroethane-d4	*105%*	*70-130*	03/04/24	03/04/24
Toluene-d8	*97.8%*	*70-130*	03/04/24	03/04/24

Results: Semivolatile organic compounds

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
Phenol	ND		163	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		413	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		413	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		163	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		163	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		163	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		163	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		163	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		163	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		163	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		413	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		413	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		413	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		163	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		163	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		163	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		163	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		163	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		413	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		163	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		163	ug/kg	02/28/24	02/29/24
Aniline	ND		163	ug/kg	02/28/24	02/29/24
Anthracene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		163	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		163	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1250	ug/kg	02/28/24	02/29/24
Biphenyl	ND		25	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		163	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		501	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		163	ug/kg	02/28/24	02/29/24
Chrysene	ND		163	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		250	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		163	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: TP-6 (Continued)

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		163	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		163	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		413	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		250	ug/kg	02/28/24	02/29/24
Fluoranthene	**208**		163	ug/kg	02/28/24	02/29/24
Fluorene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		163	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		413	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		163	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		163	ug/kg	02/28/24	02/29/24
Isophorone	ND		163	ug/kg	02/28/24	02/29/24
Naphthalene	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		163	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		163	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		413	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		163	ug/kg	02/28/24	02/29/24
Pyrene	**240**		163	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		326	ug/kg	02/28/24	02/29/24
Pyridine	ND		163	ug/kg	02/28/24	02/29/24
Azobenzene	ND		163	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		163	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.7%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*90.1%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*50.1%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*53.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*52.1%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*60.9%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
Phenol	ND		150	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		380	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		380	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		150	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		150	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		150	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		150	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		150	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		150	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		150	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		380	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		380	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		380	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		150	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		150	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		150	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		150	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		150	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		380	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		150	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		150	ug/kg	02/28/24	02/29/24
Aniline	ND		150	ug/kg	02/28/24	02/29/24
Anthracene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		150	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1150	ug/kg	02/28/24	02/29/24
Biphenyl	ND		23	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		150	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		460	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		150	ug/kg	02/28/24	02/29/24
Chrysene	ND		150	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		230	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		150	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-103 0-6' (Continued)

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		150	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		150	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		380	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		230	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		150	ug/kg	02/28/24	02/29/24
Fluorene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		150	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		380	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		150	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		150	ug/kg	02/28/24	02/29/24
Isophorone	ND		150	ug/kg	02/28/24	02/29/24
Naphthalene	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		150	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		150	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		380	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		150	ug/kg	02/28/24	02/29/24
Pyrene	ND		150	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		299	ug/kg	02/28/24	02/29/24
Pyridine	ND		150	ug/kg	02/28/24	02/29/24
Azobenzene	ND		150	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		150	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.0%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*80.8%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*50.9%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*53.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*51.6%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*61.9%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
Phenol	ND		154	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		391	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		391	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		154	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		154	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		154	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		154	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		154	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		154	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		154	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		391	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		391	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		391	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		154	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		154	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		154	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		154	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		154	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		391	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		154	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		154	ug/kg	02/28/24	02/29/24
Aniline	ND		154	ug/kg	02/28/24	02/29/24
Anthracene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		154	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1180	ug/kg	02/28/24	02/29/24
Biphenyl	ND		24	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		154	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		474	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		154	ug/kg	02/28/24	02/29/24
Chrysene	ND		154	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		237	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		154	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-113 2-4' (Continued)

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		154	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		154	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		391	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		237	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		154	ug/kg	02/28/24	02/29/24
Fluorene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		154	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		391	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		154	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		154	ug/kg	02/28/24	02/29/24
Isophorone	ND		154	ug/kg	02/28/24	02/29/24
Naphthalene	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		154	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		154	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		391	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		154	ug/kg	02/28/24	02/29/24
Pyrene	ND		154	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		308	ug/kg	02/28/24	02/29/24
Pyridine	ND		154	ug/kg	02/28/24	02/29/24
Azobenzene	ND		154	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		154	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*55.6%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*76.7%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*48.1%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*47.2%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*51.8%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*56.6%*	*30-130*	02/28/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-112 2-6'

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,2-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,3-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
1,4-Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
Phenol	ND		143	ug/kg	02/28/24	02/29/24
2,4,5-Trichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4,6-Trichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4-Dichlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2,4-Dimethylphenol	ND		363	ug/kg	02/28/24	02/29/24
2,4-Dinitrophenol	ND		363	ug/kg	02/28/24	02/29/24
2,4-Dinitrotoluene	ND		143	ug/kg	02/28/24	02/29/24
2,6-Dinitrotoluene	ND		143	ug/kg	02/28/24	02/29/24
2-Chloronaphthalene	ND		143	ug/kg	02/28/24	02/29/24
2-Chlorophenol	ND		143	ug/kg	02/28/24	02/29/24
2-Methylnaphthalene	ND		143	ug/kg	02/28/24	02/29/24
Nitrobenzene	ND		143	ug/kg	02/28/24	02/29/24
2-Methylphenol	ND		143	ug/kg	02/28/24	02/29/24
2-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
2-Nitrophenol	ND		363	ug/kg	02/28/24	02/29/24
3,3′-Dichlorobenzidine	ND		363	ug/kg	02/28/24	02/29/24
3-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
4,6-Dinitro-2-methylphenol	ND		363	ug/kg	02/28/24	02/29/24
4-Bromophenyl phenyl ether	ND		143	ug/kg	02/28/24	02/29/24
4-Chloro-3-methylphenol	ND		143	ug/kg	02/28/24	02/29/24
4-Chloroaniline	ND		143	ug/kg	02/28/24	02/29/24
4-Chlorophenyl phenyl ether	ND		143	ug/kg	02/28/24	02/29/24
4-Nitroaniline	ND		143	ug/kg	02/28/24	02/29/24
4-Nitrophenol	ND		363	ug/kg	02/28/24	02/29/24
Acenaphthene	ND		143	ug/kg	02/28/24	02/29/24
Acenaphthylene	ND		143	ug/kg	02/28/24	02/29/24
Aniline	ND		143	ug/kg	02/28/24	02/29/24
Anthracene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(a)anthracene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(a)pyrene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(b)fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(g,h,i)perylene	ND		143	ug/kg	02/28/24	02/29/24
Benzo(k)fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Benzoic acid	ND		1100	ug/kg	02/28/24	02/29/24
Biphenyl	ND		22	ug/kg	02/28/24	02/29/24
Bis(2-chloroethoxy)methane	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-chloroethyl)ether	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-chloroisopropyl)ether	ND		143	ug/kg	02/28/24	02/29/24
Bis(2-ethylhexyl)phthalate	ND		440	ug/kg	02/28/24	02/29/24
Butyl benzyl phthalate	ND		143	ug/kg	02/28/24	02/29/24
Chrysene	ND		143	ug/kg	02/28/24	02/29/24
Di-n-octyl phthalate	ND		220	ug/kg	02/28/24	02/29/24
Dibenz(a,h)anthracene	ND		143	ug/kg	02/28/24	02/29

Results: Semivolatile organic compounds (Continued)

Sample: B-112 2-6' (Continued)

Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		143	ug/kg	02/28/24	02/29/24
Diethyl phthalate	ND		143	ug/kg	02/28/24	02/29/24
Dimethyl phthalate	ND		363	ug/kg	02/28/24	02/29/24
Di-n-butyl phthalate	ND		220	ug/kg	02/28/24	02/29/24
Fluoranthene	ND		143	ug/kg	02/28/24	02/29/24
Fluorene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorobenzene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorobutadiene	ND		143	ug/kg	02/28/24	02/29/24
Hexachlorocyclopentadiene	ND		363	ug/kg	02/28/24	02/29/24
Hexachloroethane	ND		143	ug/kg	02/28/24	02/29/24
Indeno(1,2,3-cd)pyrene	ND		143	ug/kg	02/28/24	02/29/24
Isophorone	ND		143	ug/kg	02/28/24	02/29/24
Naphthalene	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodimethylamine	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodi-n-propylamine	ND		143	ug/kg	02/28/24	02/29/24
N-Nitrosodiphenylamine	ND		143	ug/kg	02/28/24	02/29/24
Pentachlorophenol	ND		363	ug/kg	02/28/24	02/29/24
Phenanthrene	ND		143	ug/kg	02/28/24	02/29/24
Pyrene	ND		143	ug/kg	02/28/24	02/29/24
m&p-Cresol	ND		286	ug/kg	02/28/24	02/29/24
Pyridine	ND		143	ug/kg	02/28/24	02/29/24
Azobenzene	ND		143	ug/kg	02/28/24	02/29/24
Total Dichlorobenzene	ND		143	ug/kg	02/28/24	02/29/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*61.5%*	*30-126*	02/28/24	02/29/24
p-Terphenyl-d14	*86.8%*	*47-130*	02/28/24	02/29/24
2-Fluorobiphenyl	*53.5%*	*34-130*	02/28/24	02/29/24
Phenol-d6	*57.5%*	*30-130*	02/28/24	02/29/24
2,4,6-Tribromophenol	*56.2%*	*30-130*	02/28/24	02/29/24
2-Fluorophenol	*64.5%*	*30-130*	02/28/24	02/29/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		82	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		82	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		82	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*61.6%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*52.0%*	*43.3-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-103 0-6'

Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		75	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		75	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		75	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*61.9%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*50.3%*	*43.3-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1221	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1232	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1242	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1248	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1254	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1260	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1262	ND		76	ug/kg	02/28/24	03/02/24
Aroclor-1268	ND		76	ug/kg	02/28/24	03/02/24
PCBs (Total)	ND		76	ug/kg	02/28/24	03/02/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*56.4%*	*36.2-130*	02/28/24	03/02/24
Decachlorobiphenyl (DCBP)	*48.0%*	*43.3-130*	02/28/24	03/02/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-112 2-6'
Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1221	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1232	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1242	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1248	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1254	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1260	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1262	ND		72	ug/kg	02/28/24	03/01/24
Aroclor-1268	ND		72	ug/kg	02/28/24	03/01/24
PCBs (Total)	ND		72	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*65.0%*	*36.2-130*	02/28/24	03/01/24
Decachlorobiphenyl (DCBP)	*58.9%*	*43.3-130*	02/28/24	03/01/24

Results: Total Petroleum Hydrocarbons

Sample: TP-6

Lab Number: 4B26010-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		33	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*96.4%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-103 0-6'
Lab Number: 4B26010-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		30	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*107%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-113 2-4'

Lab Number: 4B26010-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		31	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*81.0%*		*50-130*		02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-112 2-6'
Lab Number: 4B26010-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		28	mg/kg	02/28/24	02/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*84.7%*		*50-130*		02/28/24	02/28/24

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1194 - Flashpoint-EPA 1010A-Mod										
LCS (B4B1194-BS1)					Prepared & Analyzed: 02/28/24					
Flashpoint	80		70	degrees F	80.0		100	90-110		
Duplicate (B4B1194-DUP1)		Source: 4B22012-01			Prepared & Analyzed: 02/28/24					
Flashpoint	> 200		70	degrees F		ND				20
Batch: B4B1197 - Conductivity										
Blank (B4B1197-BLK1)					Prepared & Analyzed: 02/28/24					
Specific Conductance	ND		2.0	uS/cm						
Duplicate (B4B1197-DUP1)		Source: 4B23014-01			Prepared & Analyzed: 02/28/24					
Specific Conductance	258		2.0	uS/cm		258			0.00	200
Batch: B4B1200 - pH										
LCS (B4B1200-BS1)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
LCS (B4B1200-BS2)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
Duplicate (B4B1200-DUP1)		Source: 4B23046-06			Prepared & Analyzed: 02/28/24					
pH	6.8			SU		6.8			0.587	200
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod										
LCS (B4C0033-BS1)					Prepared & Analyzed: 03/01/24					
Flashpoint	83		70	degrees F	80.0		104	90-110		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod (Continued)										
Duplicate (B4C0033-DUP1)		Source: 4B26010-04			Prepared & Analyzed: 03/01/24					
Flashpoint	> 200		70	degrees F		> 200				20

Quality Control
(Continued)

Reactivity

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1244 - Reactivity										
Blank (B4B1244-BLK1)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
Blank (B4B1244-BLK2)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
LCS (B4B1244-BS1)					Prepared & Analyzed: 02/29/24					
Sulfide	3.6		0.1	mg/kg	4.00		90.0	90-110		
LCS (B4B1244-BS2)					Prepared & Analyzed: 02/29/24					
Sulfide	3.7		0.1	mg/kg	4.00		91.5	90-110		
Duplicate (B4B1244-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg dry		ND				20
Matrix Spike (B4B1244-MS1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	4.5		0.1	mg/kg dry	4.59	ND	98.5	80-120		
Batch: B4B1245 - Reactivity										
Blank (B4B1245-BLK1)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Blank (B4B1245-BLK2)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Duplicate (B4B1245-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg dry		ND				20

Quality Control
(Continued)

Total Metals

Batch: B4B1103 - Metals Digestion Soils

Blank (B4B1103-BLK1) Prepared: 02/27/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	ND		0.66	mg/kg						
Beryllium	ND		0.33	mg/kg						
Arsenic	ND		1.00	mg/kg						
Cadmium	ND		0.50	mg/kg						
Chromium	ND		0.50	mg/kg						
Nickel	ND		0.50	mg/kg						
Lead	ND		0.50	mg/kg						
Silver	ND		1.00	mg/kg						
Zinc	ND		2.0	mg/kg						
Barium	ND		0.33	mg/kg						
Vanadium	ND		0.33	mg/kg						
Selenium	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						

Blank (B4B1103-BLK2) Prepared: 02/27/24 Analyzed: 03/04/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Antimony	ND		0.66	mg/kg						
Beryllium	ND		0.33	mg/kg						
Lead	ND		0.50	mg/kg						
Silver	ND		1.00	mg/kg						
Cadmium	ND		0.50	mg/kg						
Nickel	ND		0.50	mg/kg						
Zinc	ND		2.0	mg/kg						
Chromium	ND		0.50	mg/kg						
Arsenic	ND		1.00	mg/kg						
Selenium	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						

LCS (B4B1103-BS1) Prepared: 02/27/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Beryllium	20.1		0.33	mg/kg	20.0		101	85-115		
Zinc	93.9		2.0	mg/kg	100		93.9	85-115		
Cadmium	93.4		0.50	mg/kg	100		93.4	85-115		
Chromium	94.5		0.50	mg/kg	100		94.5	85-115		
Nickel	93.9		0.50	mg/kg	100		93.9	85-112		
Lead	97.3		0.50	mg/kg	100		97.3	85-115		
Antimony	91.8		0.66	mg/kg	100		91.8	85-115		
Selenium	19.9		1.00	mg/kg	20.0		99.4	85-115		
Vanadium	101		0.33	mg/kg	100		101	85-115		
Barium	94.2		0.33	mg/kg	100		94.2	85-115		
Arsenic	21.1		1.00	mg/kg	20.0		105	85-115		
Silver	37.7		1.00	mg/kg	40.0		94.2	85-115		
Thallium	90.9		0.33	mg/kg	100		90.9	85-115		

Quality Control
(Continued)

Total Metals (Continued)

Batch: B4B1103 - Metals Digestion Soils (Continued)

Matrix Spike (B4B1103-MS1) Source: 4B26010-01 Prepared: 02/27/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Beryllium	30.1		0.50	mg/kg dry	30.0	ND	100	75-125		
Arsenic	40.7		1.50	mg/kg dry	30.0	10.5	100	75-125		
Barium	159		0.50	mg/kg dry	150	32.5	84.2	75-125		
Cadmium	134		0.75	mg/kg dry	150	3.42	86.8	75-125		
Chromium	146		0.75	mg/kg dry	150	13.7	88.5	75-125		
Nickel	142		0.75	mg/kg dry	150	9.11	88.4	75-125		
Silver	54.1		1.50	mg/kg dry	60.0	ND	90.2	75-125		
Lead	169		0.75	mg/kg dry	150	38.7	86.9	75-125		
Selenium	23.6		1.50	mg/kg dry	30.0	ND	78.7	75-125		
Vanadium	163		0.50	mg/kg dry	150	21.4	94.3	75-125		
Zinc	179		3.0	mg/kg dry	150	48.6	86.7	75-125		
Thallium	123		0.50	mg/kg dry	150	ND	81.9	75-125		

Matrix Spike Dup (B4B1103-MSD1) Source: 4B26010-01 Prepared: 02/27/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Arsenic	38.6		1.40	mg/kg dry	28.0	10.5	100	75-125	0.0916	20
Chromium	139		0.70	mg/kg dry	140	13.7	89.1	75-125	5.54	20
Vanadium	155		0.46	mg/kg dry	140	21.4	95.6	75-125	4.76	20
Silver	48.3		1.40	mg/kg dry	56.0	ND	86.3	75-125	4.41	20
Lead	164		0.70	mg/kg dry	140	38.7	89.3	75-125	3.24	20
Barium	153		0.46	mg/kg dry	140	32.5	85.9	75-125	3.91	20
Nickel	133		0.70	mg/kg dry	140	9.11	88.6	75-125	6.22	20
Cadmium	126		0.70	mg/kg dry	140	3.42	87.7	75-125	5.68	20
Selenium	21.2		1.40	mg/kg dry	28.0	ND	75.8	75-125	3.75	20
Beryllium	28.7		0.46	mg/kg dry	28.0	ND	102	75-125	4.82	20
Zinc	171		2.8	mg/kg dry	140	48.6	87.1	75-125	4.59	20
Thallium	117		0.46	mg/kg dry	140	ND	83.3	75-125	5.15	20

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury										
Blank (B4B1185-BLK1)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
Blank (B4B1185-BLK2)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
LCS (B4B1185-BS1)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS (B4B1185-BS2)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS Dup (B4B1185-BSD1)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
LCS Dup (B4B1185-BSD2)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
Matrix Spike (B4B1185-MS1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.716		0.126	mg/kg dry	0.630	0.129	93.1	80-120		
Matrix Spike (B4B1185-MS2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.564		0.094	mg/kg dry	0.469	0.135	91.3	80-120		
Matrix Spike (B4B1185-MS3)		Source: 4B27003-01			Prepared & Analyzed: 02/28/24					
Mercury	0.649		0.098	mg/kg dry	0.489	0.125	107	80-120		
Matrix Spike Dup (B4B1185-MSD1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.688		0.115	mg/kg dry	0.577	0.129	96.8	80-120	4.01	20

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury (Continued)										
Matrix Spike Dup (B4B1185-MSD2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.576		0.093	mg/kg dry	0.465	0.135	94.7	80-120	2.10	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL)

Batch: B4C0126 - EPA 5035

Blank (B4C0126-BLK1) Prepared & Analyzed: 03/04/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0126 - EPA 5035 (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (B4C0126-BLK1)					Prepared & Analyzed: 03/04/24					
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*49.0*	ug/kg	*50.0*		*98.0*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.8*	ug/kg	*50.0*		*99.6*	*70-130*		
Surrogate: Toluene-d8			*47.7*	ug/kg	*50.0*		*95.4*	*70-130*		
LCS (B4C0126-BS1)					Prepared & Analyzed: 03/04/24					
Acetone	42		5	ug/kg	50.0		83.1	50-150		
Benzene	46		5	ug/kg	50.0		91.8	70-130		
Bromobenzene	43		5	ug/kg	50.0		86.4	70-130		
Bromochloromethane	45		5	ug/kg	50.0		90.1	70-130		
Bromodichloromethane	44		5	ug/kg	50.0		87.4	70-130		
Bromoform	47		5	ug/kg	50.0		93.3	70-130		
Bromomethane	48		5	ug/kg	50.0		95.0	50-150		
2-Butanone	43		5	ug/kg	50.0		85.6	50-150		
tert-Butyl alcohol	41		5	ug/kg	50.0		82.5	70-130		
sec-Butylbenzene	45		5	ug/kg	50.0		89.8	70-130		
n-Butylbenzene	46		5	ug/kg	50.0		92.4	70-130		
tert-Butylbenzene	45		5	ug/kg	50.0		90.1	70-130		
Methyl t-butyl ether (MTBE)	39		5	ug/kg	50.0		77.2	70-130		
Carbon Disulfide	32		5	ug/kg	50.0		64.0	50-150		
Carbon Tetrachloride	46		5	ug/kg	50.0		93.0	70-130		
Chlorobenzene	41		5	ug/kg	50.0		82.2	70-130		
Chloroethane	37		5	ug/kg	50.0		74.5	50-150		
Chloroform	43		5	ug/kg	50.0		86.8	70-130		
Chloromethane	37		5	ug/kg	50.0		74.1	50-150		
4-Chlorotoluene	44		5	ug/kg	50.0		87.4	70-130		
2-Chlorotoluene	40		5	ug/kg	50.0		80.6	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		92.5	70-130		
Dibromochloromethane	45		5	ug/kg	50.0		90.8	70-130		
1,2-Dibromoethane (EDB)	45		5	ug/kg	50.0		90.1	70-130		
Dibromomethane	46		5	ug/kg	50.0		92.1	60-140		
1,2-Dichlorobenzene	43		5	ug/kg	50.0		85.1	70-130		
1,3-Dichlorobenzene	44		5	ug/kg	50.0		87.2	70-130		
1,4-Dichlorobenzene	43		5	ug/kg	50.0		85.7	70-130		
1,1-Dichloroethane	43		5	ug/kg	50.0		86.1	70-130		
1,2-Dichloroethane	46		5	ug/kg	50.0		92.3	70-130		
trans-1,2-Dichloroethene	44		5	ug/kg	50.0		87.4	70-130		
cis-1,2-Dichloroethene	44		5	ug/kg	50.0		87.7	70-130		
1,1-Dichloroethene	33		5	ug/kg	50.0		65.7	70-130		
1,2-Dichloropropane	43		5	ug/kg	50.0		86.5	70-130		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0126 - EPA 5035 (Continued)

LCS (B4C0126-BS1) Prepared & Analyzed: 03/04/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
2,2-Dichloropropane	48		5	ug/kg	50.0		95.1	70-130		
cis-1,3-Dichloropropene	44		5	ug/kg	50.0		87.5	70-130		
trans-1,3-Dichloropropene	48		5	ug/kg	50.0		95.2	70-130		
1,1-Dichloropropene	45		5	ug/kg	50.0		89.5	70-130		
Diethyl ether	35		5	ug/kg	50.0		70.4	60-140		
1,4-Dioxane	222		100	ug/kg	250		88.7	0-200		
Ethylbenzene	45		5	ug/kg	50.0		90.0	70-130		
Hexachlorobutadiene	52		5	ug/kg	50.0		103	70-130		
2-Hexanone	42		5	ug/kg	50.0		83.3	50-150		
Isopropylbenzene	45		5	ug/kg	50.0		89.0	70-130		
p-Isopropyltoluene	45		5	ug/kg	50.0		90.6	70-130		
Methylene Chloride	42		5	ug/kg	50.0		84.8	60-140		
4-Methyl-2-pentanone	45		5	ug/kg	50.0		89.5	50-150		
Naphthalene	50		5	ug/kg	50.0		100	70-130		
n-Propylbenzene	45		5	ug/kg	50.0		90.5	70-130		
Styrene	43		5	ug/kg	50.0		86.1	70-130		
1,1,1,2-Tetrachloroethane	44		5	ug/kg	50.0		87.5	70-130		
Tetrachloroethene	47		5	ug/kg	50.0		93.1	70-130		
Tetrahydrofuran	47		5	ug/kg	50.0		93.2	50-150		
Toluene	49		5	ug/kg	50.0		98.4	70-130		
1,2,4-Trichlorobenzene	49		5	ug/kg	50.0		97.0	70-130		
1,2,3-Trichlorobenzene	50		5	ug/kg	50.0		99.1	70-130		
1,1,2-Trichloroethane	42		5	ug/kg	50.0		84.8	70-130		
1,1,1-Trichloroethane	44		5	ug/kg	50.0		88.8	70-130		
Trichloroethene	44		5	ug/kg	50.0		88.6	70-130		
1,2,3-Trichloropropane	42		5	ug/kg	50.0		83.6	70-130		
1,3,5-Trimethylbenzene	45		5	ug/kg	50.0		90.3	70-130		
1,2,4-Trimethylbenzene	48		5	ug/kg	50.0		96.8	70-130		
Vinyl Chloride	39		5	ug/kg	50.0		78.7	50-150		
o-Xylene	46		5	ug/kg	50.0		91.5	70-130		
m&p-Xylene	90		10	ug/kg	100		89.8	70-130		
1,1,2,2-Tetrachloroethane	42		5	ug/kg	50.0		84.7	70-130		
tert-Amyl methyl ether	41		5	ug/kg	50.0		83.0	70-130		
1,3-Dichloropropane	45		5	ug/kg	50.0		89.2	70-130		
Ethyl tert-butyl ether	41		5	ug/kg	50.0		81.5	70-130		
Trichlorofluoromethane	43		5	ug/kg	50.0		86.8	50-150		
Dichlorodifluoromethane	50		5	ug/kg	50.0		100	50-150		
Surrogate: 4-Bromofluorobenzene			*51.6*	ug/kg	*50.0*		*103*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*54.6*	ug/kg	*50.0*		*109*	*70-130*		
Surrogate: Toluene-d8			*53.5*	ug/kg	*50.0*		*107*	*70-130*		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0126 - EPA 5035 (Continued)										
LCS Dup (B4C0126-BSD1)					Prepared & Analyzed: 03/04/24					
Acetone	29		5	ug/kg	50.0		58.9	50-150	34.2	30
Benzene	53		5	ug/kg	50.0		106	70-130	14.4	20
Bromobenzene	49		5	ug/kg	50.0		98.4	70-130	13.0	20
Bromochloromethane	52		5	ug/kg	50.0		104	70-130	14.3	20
Bromodichloromethane	51		5	ug/kg	50.0		102	70-130	15.0	20
Bromoform	53		5	ug/kg	50.0		107	70-130	13.3	20
Bromomethane	60		5	ug/kg	50.0		120	50-150	23.0	30
2-Butanone	35		5	ug/kg	50.0		70.0	50-150	19.9	30
tert-Butyl alcohol	39		5	ug/kg	50.0		78.2	70-130	5.35	20
sec-Butylbenzene	51		5	ug/kg	50.0		101	70-130	12.2	20
n-Butylbenzene	53		5	ug/kg	50.0		106	70-130	14.0	20
tert-Butylbenzene	52		5	ug/kg	50.0		104	70-130	14.1	20
Methyl t-butyl ether (MTBE)	43		5	ug/kg	50.0		86.0	70-130	10.7	20
Carbon Disulfide	37		5	ug/kg	50.0		73.9	50-150	14.3	40
Carbon Tetrachloride	54		5	ug/kg	50.0		108	70-130	14.6	20
Chlorobenzene	48		5	ug/kg	50.0		95.5	70-130	15.0	20
Chloroethane	43		5	ug/kg	50.0		86.9	50-150	15.3	30
Chloroform	50		5	ug/kg	50.0		100	70-130	14.3	20
Chloromethane	44		5	ug/kg	50.0		87.1	50-150	16.2	30
4-Chlorotoluene	44		5	ug/kg	50.0		88.5	70-130	1.25	20
2-Chlorotoluene	46		5	ug/kg	50.0		91.3	70-130	12.5	20
1,2-Dibromo-3-chloropropane (DBCP)	52		5	ug/kg	50.0		104	70-130	12.2	20
Dibromochloromethane	52		5	ug/kg	50.0		104	70-130	13.4	20
1,2-Dibromoethane (EDB)	51		5	ug/kg	50.0		101	70-130	11.7	20
Dibromomethane	51		5	ug/kg	50.0		102	60-140	10.3	30
1,2-Dichlorobenzene	49		5	ug/kg	50.0		98.7	70-130	14.8	20
1,3-Dichlorobenzene	49		5	ug/kg	50.0		98.2	70-130	11.9	20
1,4-Dichlorobenzene	49		5	ug/kg	50.0		99.0	70-130	14.3	20
1,1-Dichloroethane	50		5	ug/kg	50.0		100	70-130	14.9	20
1,2-Dichloroethane	52		5	ug/kg	50.0		105	70-130	12.8	20
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		101	70-130	14.2	20
cis-1,2-Dichloroethene	49		5	ug/kg	50.0		97.9	70-130	11.0	20
1,1-Dichloroethene	38		5	ug/kg	50.0		76.2	70-130	14.8	20
1,2-Dichloropropane	49		5	ug/kg	50.0		98.8	70-130	13.3	20
2,2-Dichloropropane	54		5	ug/kg	50.0		109	70-130	13.2	20
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		102	70-130	15.0	20
trans-1,3-Dichloropropene	54		5	ug/kg	50.0		108	70-130	13.0	20
1,1-Dichloropropene	52		5	ug/kg	50.0		104	70-130	15.1	20
Diethyl ether	39		5	ug/kg	50.0		77.5	60-140	9.68	30
1,4-Dioxane	240		100	ug/kg	250		95.8	0-200	7.69	50
Ethylbenzene	53		5	ug/kg	50.0		105	70-130	15.8	20
Hexachlorobutadiene	59		5	ug/kg	50.0		117	70-130	12.8	20
2-Hexanone	36		5	ug/kg	50.0		71.0	50-150	15.9	20
Isopropylbenzene	51		5	ug/kg	50.0		101	70-130	13.0	20
p-Isopropyltoluene	52		5	ug/kg	50.0		103	70-130	13.2	20
Methylene Chloride	48		5	ug/kg	50.0		96.6	60-140	13.1	30
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.0	50-150	3.83	20
Naphthalene	57		5	ug/kg	50.0		115	70-130	13.2	20
n-Propylbenzene	51		5	ug/kg	50.0		102	70-130	12.2	20
Styrene	50		5	ug/kg	50.0		99.4	70-130	14.4	20
1,1,1,2-Tetrachloroethane	51		5	ug/kg	50.0		102	70-130	15.1	20
Tetrachloroethene	53		5	ug/kg	50.0		106	70-130	12.7	20
Tetrahydrofuran	50		5	ug/kg	50.0		100	50-150	7.34	40
Toluene	56		5	ug/kg	50.0		111	70-130	12.1	20
1,2,4-Trichlorobenzene	56		5	ug/kg	50.0		112	70-130	14.3	20
1,2,3-Trichlorobenzene	57		5	ug/kg	50.0		114	70-130	14.1	20
1,1,2-Trichloroethane	52		5	ug/kg	50.0		104	70-130	[illegible]	[illegible]

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0126 - EPA 5035 (Continued)

LCS Dup (B4C0126-BSD1) Prepared & Analyzed: 03/04/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1-Trichloroethane	51		5	ug/kg	50.0		101	70-130	13.0	20
Trichloroethene	49		5	ug/kg	50.0		98.7	70-130	10.7	20
1,2,3-Trichloropropane	46		5	ug/kg	50.0		92.0	70-130	9.54	20
1,3,5-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130	12.2	20
1,2,4-Trimethylbenzene	55		5	ug/kg	50.0		110	70-130	12.5	20
Vinyl Chloride	46		5	ug/kg	50.0		92.3	50-150	16.0	30
o-Xylene	53		5	ug/kg	50.0		106	70-130	14.7	20
m&p-Xylene	103		10	ug/kg	100		103	70-130	14.2	20
1,1,2,2-Tetrachloroethane	48		5	ug/kg	50.0		95.2	70-130	11.6	20
tert-Amyl methyl ether	47		5	ug/kg	50.0		93.6	70-130	12.1	20
1,3-Dichloropropane	51		5	ug/kg	50.0		102	70-130	13.4	20
Ethyl tert-butyl ether	46		5	ug/kg	50.0		92.8	70-130	13.0	20
Trichlorofluoromethane	50		5	ug/kg	50.0		100	50-150	14.3	20
Dichlorodifluoromethane	59		5	ug/kg	50.0		118	50-150	16.3	30
Surrogate: 4-Bromofluorobenzene			*51.2*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*52.5*	ug/kg	*50.0*		*105*	*70-130*		
Surrogate: Toluene-d8			*53.0*	ug/kg	*50.0*		*106*	*70-130*		

Batch: B4C0189 - EPA 5035

Blank (B4C0189-BLK1) Prepared & Analyzed: 03/05/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
Blank (B4C0189-BLK1)					Prepared & Analyzed: 03/05/24					
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*50.8*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.8*	*70-130*		
Surrogate: Toluene-d8			*48.4*	ug/kg	*50.0*		*96.8*	*70-130*		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
LCS (B4C0189-BS1)					Prepared & Analyzed: 03/05/24					
Acetone	49		5	ug/kg	50.0		97.2	50-150		
Benzene	52		5	ug/kg	50.0		104	70-130		
Bromobenzene	54		5	ug/kg	50.0		108	70-130		
Bromochloromethane	51		5	ug/kg	50.0		103	70-130		
Bromodichloromethane	54		5	ug/kg	50.0		107	70-130		
Bromoform	49		5	ug/kg	50.0		98.7	70-130		
Bromomethane	26		5	ug/kg	50.0		52.4	50-150		
2-Butanone	47		5	ug/kg	50.0		93.0	50-150		
tert-Butyl alcohol	53		5	ug/kg	50.0		105	70-130		
sec-Butylbenzene	56		5	ug/kg	50.0		112	70-130		
n-Butylbenzene	60		5	ug/kg	50.0		119	70-130		
tert-Butylbenzene	56		5	ug/kg	50.0		113	70-130		
Methyl t-butyl ether (MTBE)	49		5	ug/kg	50.0		97.2	70-130		
Carbon Disulfide	46		5	ug/kg	50.0		92.8	50-150		
Carbon Tetrachloride	54		5	ug/kg	50.0		108	70-130		
Chlorobenzene	53		5	ug/kg	50.0		105	70-130		
Chloroethane	38		5	ug/kg	50.0		76.5	50-150		
Chloroform	51		5	ug/kg	50.0		102	70-130		
Chloromethane	42		5	ug/kg	50.0		84.9	50-150		
4-Chlorotoluene	54		5	ug/kg	50.0		108	70-130		
2-Chlorotoluene	50		5	ug/kg	50.0		101	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	47		5	ug/kg	50.0		93.9	70-130		
Dibromochloromethane	49		5	ug/kg	50.0		97.3	70-130		
1,2-Dibromoethane (EDB)	47		5	ug/kg	50.0		93.8	70-130		
Dibromomethane	51		5	ug/kg	50.0		103	60-140		
1,2-Dichlorobenzene	51		5	ug/kg	50.0		102	70-130		
1,3-Dichlorobenzene	55		5	ug/kg	50.0		109	70-130		
1,4-Dichlorobenzene	50		5	ug/kg	50.0		99.1	70-130		
1,1-Dichloroethane	50		5	ug/kg	50.0		99.0	70-130		
1,2-Dichloroethane	55		5	ug/kg	50.0		109	70-130		
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		99.8	70-130		
cis-1,2-Dichloroethene	52		5	ug/kg	50.0		104	70-130		
1,1-Dichloroethene	46		5	ug/kg	50.0		92.6	70-130		
1,2-Dichloropropane	55		5	ug/kg	50.0		109	70-130		
2,2-Dichloropropane	55		5	ug/kg	50.0		109	70-130		
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		103	70-130		
trans-1,3-Dichloropropene	50		5	ug/kg	50.0		99.1	70-130		
1,1-Dichloropropene	47		5	ug/kg	50.0		93.7	70-130		
Diethyl ether	46		5	ug/kg	50.0		92.2	60-140		
1,4-Dioxane	238		100	ug/kg	250		95.3	0-200		
Ethylbenzene	57		5	ug/kg	50.0		113	70-130		
Hexachlorobutadiene	59		5	ug/kg	50.0		118	70-130		
2-Hexanone	44		5	ug/kg	50.0		87.9	50-150		
Isopropylbenzene	55		5	ug/kg	50.0		110	70-130		
p-Isopropyltoluene	58		5	ug/kg	50.0		115	70-130		
Methylene Chloride	56		5	ug/kg	50.0		111	60-140		
4-Methyl-2-pentanone	45		5	ug/kg	50.0		90.3	50-150		
Naphthalene	42		5	ug/kg	50.0		83.1	70-130		
n-Propylbenzene	57		5	ug/kg	50.0		115	70-130		
Styrene	56		5	ug/kg	50.0		112	70-130		
1,1,1,2-Tetrachloroethane	56		5	ug/kg	50.0		113	70-130		
Tetrachloroethene	52		5	ug/kg	50.0		104	70-130		
Tetrahydrofuran	46		5	ug/kg	50.0		91.9	50-150		
Toluene	51		5	ug/kg	50.0		102	70-130		
1,2,4-Trichlorobenzene	47		5	ug/kg	50.0		94.4	70-130		
1,2,3-Trichlorobenzene	41		5	ug/kg	50.0		81.4	70-130		
1,1,2-Trichloroethane	50		5	ug/kg	50.0		99.8	70-130		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
LCS (B4C0189-BS1)					Prepared & Analyzed: 03/05/24					
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130		
Trichloroethene	51		5	ug/kg	50.0		102	70-130		
1,2,3-Trichloropropane	51		5	ug/kg	50.0		102	70-130		
1,3,5-Trimethylbenzene	56		5	ug/kg	50.0		113	70-130		
1,2,4-Trimethylbenzene	60		5	ug/kg	50.0		120	70-130		
Vinyl Chloride	38		5	ug/kg	50.0		76.1	50-150		
o-Xylene	58		5	ug/kg	50.0		116	70-130		
m&p-Xylene	113		10	ug/kg	100		113	70-130		
1,1,2,2-Tetrachloroethane	51		5	ug/kg	50.0		102	70-130		
tert-Amyl methyl ether	48		5	ug/kg	50.0		95.3	70-130		
1,3-Dichloropropane	51		5	ug/kg	50.0		103	70-130		
Ethyl tert-butyl ether	47		5	ug/kg	50.0		94.2	70-130		
Trichlorofluoromethane	45		5	ug/kg	50.0		90.0	50-150		
Dichlorodifluoromethane	49		5	ug/kg	50.0		97.2	50-150		
Surrogate: 4-Bromofluorobenzene			*53.9*	ug/kg	*50.0*		*108*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*50.6*	ug/kg	*50.0*		*101*	*70-130*		
Surrogate: Toluene-d8			*49.7*	ug/kg	*50.0*		*99.4*	*70-130*		
LCS Dup (B4C0189-BSD1)					Prepared & Analyzed: 03/05/24					
Acetone	48		5	ug/kg	50.0		95.8	50-150	1.41	30
Benzene	52		5	ug/kg	50.0		105	70-130	1.15	20
Bromobenzene	55		5	ug/kg	50.0		109	70-130	0.810	20
Bromochloromethane	52		5	ug/kg	50.0		104	70-130	1.29	20
Bromodichloromethane	55		5	ug/kg	50.0		109	70-130	1.87	20
Bromoform	50		5	ug/kg	50.0		100	70-130	1.61	20
Bromomethane	34		5	ug/kg	50.0		68.9	50-150	27.2	30
2-Butanone	46		5	ug/kg	50.0		91.5	50-150	1.63	30
tert-Butyl alcohol	48		5	ug/kg	50.0		95.7	70-130	9.44	20
sec-Butylbenzene	56		5	ug/kg	50.0		112	70-130	0.571	20
n-Butylbenzene	60		5	ug/kg	50.0		119	70-130	0.218	20
tert-Butylbenzene	57		5	ug/kg	50.0		113	70-130	0.530	20
Methyl t-butyl ether (MTBE)	50		5	ug/kg	50.0		99.6	70-130	2.50	20
Carbon Disulfide	46		5	ug/kg	50.0		92.4	50-150	0.389	40
Carbon Tetrachloride	56		5	ug/kg	50.0		111	70-130	2.84	20
Chlorobenzene	53		5	ug/kg	50.0		107	70-130	1.46	20
Chloroethane	40		5	ug/kg	50.0		79.3	50-150	3.52	30
Chloroform	52		5	ug/kg	50.0		105	70-130	3.08	20
Chloromethane	43		5	ug/kg	50.0		85.6	50-150	0.845	30
4-Chlorotoluene	54		5	ug/kg	50.0		108	70-130	0.185	20
2-Chlorotoluene	50		5	ug/kg	50.0		101	70-130	0.00	20
1,2-Dibromo-3-chloropropane (DBCP)	50		5	ug/kg	50.0		99.6	70-130	5.81	20
Dibromochloromethane	50		5	ug/kg	50.0		99.9	70-130	2.62	20
1,2-Dibromoethane (EDB)	48		5	ug/kg	50.0		95.8	70-130	2.17	20
Dibromomethane	51		5	ug/kg	50.0		103	60-140	0.0585	30
1,2-Dichlorobenzene	53		5	ug/kg	50.0		105	70-130	2.74	20
1,3-Dichlorobenzene	55		5	ug/kg	50.0		110	70-130	0.639	20
1,4-Dichlorobenzene	51		5	ug/kg	50.0		102	70-130	3.37	20
1,1-Dichloroethane	51		5	ug/kg	50.0		102	70-130	2.61	20
1,2-Dichloroethane	55		5	ug/kg	50.0		110	70-130	0.384	20
trans-1,2-Dichloroethene	50		5	ug/kg	50.0		99.8	70-130	0.0601	20
cis-1,2-Dichloroethene	52		5	ug/kg	50.0		105	70-130	1.07	20
1,1-Dichloroethene	47		5	ug/kg	50.0		94.5	70-130	2.05	20
1,2-Dichloropropane	55		5	ug/kg	50.0		110	70-130	1.13	20
2,2-Dichloropropane	55		5	ug/kg	50.0		110	70-130	1.02	20
cis-1,3-Dichloropropene	52		5	ug/kg	50.0		105	70-130	1.99	20
trans-1,3-Dichloropropene	50		5	ug/kg	50.0		101	70-130	1.84	20
1,1-Dichloropropene	49		5	ug/kg	50.0		97.3	70-130	3.79	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0189 - EPA 5035 (Continued)										
LCS Dup (B4C0189-BSD1)					Prepared & Analyzed: 03/05/24					
Diethyl ether	46		5	ug/kg	50.0		92.9	60-140	0.735	30
1,4-Dioxane	246		100	ug/kg	250		98.6	0-200	3.43	50
Ethylbenzene	57		5	ug/kg	50.0		114	70-130	0.475	20
Hexachlorobutadiene	60		5	ug/kg	50.0		120	70-130	1.84	20
2-Hexanone	43		5	ug/kg	50.0		86.6	50-150	1.51	20
Isopropylbenzene	55		5	ug/kg	50.0		110	70-130	0.00	20
p-Isopropyltoluene	58		5	ug/kg	50.0		117	70-130	1.29	20
Methylene Chloride	56		5	ug/kg	50.0		112	60-140	0.682	30
4-Methyl-2-pentanone	46		5	ug/kg	50.0		91.6	50-150	1.41	20
Naphthalene	45		5	ug/kg	50.0		91.0	70-130	9.03	20
n-Propylbenzene	57		5	ug/kg	50.0		114	70-130	0.0699	20
Styrene	55		5	ug/kg	50.0		111	70-130	0.503	20
1,1,1,2-Tetrachloroethane	57		5	ug/kg	50.0		114	70-130	1.48	20
Tetrachloroethene	54		5	ug/kg	50.0		107	70-130	3.30	20
Tetrahydrofuran	49		5	ug/kg	50.0		98.7	50-150	7.13	40
Toluene	51		5	ug/kg	50.0		103	70-130	0.800	20
1,2,4-Trichlorobenzene	53		5	ug/kg	50.0		106	70-130	11.8	20
1,2,3-Trichlorobenzene	52		5	ug/kg	50.0		105	70-130	24.9	20
1,1,2-Trichloroethane	45		5	ug/kg	50.0		90.4	70-130	9.93	20
1,1,1-Trichloroethane	53		5	ug/kg	50.0		106	70-130	2.00	20
Trichloroethene	53		5	ug/kg	50.0		107	70-130	4.50	20
1,2,3-Trichloropropane	52		5	ug/kg	50.0		104	70-130	1.48	20
1,3,5-Trimethylbenzene	57		5	ug/kg	50.0		113	70-130	0.655	20
1,2,4-Trimethylbenzene	60		5	ug/kg	50.0		120	70-130	0.0501	20
Vinyl Chloride	40		5	ug/kg	50.0		79.2	50-150	4.07	30
o-Xylene	58		5	ug/kg	50.0		115	70-130	0.467	20
m&p-Xylene	113		10	ug/kg	100		113	70-130	0.0265	20
1,1,2,2-Tetrachloroethane	50		5	ug/kg	50.0		100	70-130	2.29	20
tert-Amyl methyl ether	48		5	ug/kg	50.0		96.3	70-130	1.00	20
1,3-Dichloropropane	52		5	ug/kg	50.0		104	70-130	1.14	20
Ethyl tert-butyl ether	49		5	ug/kg	50.0		98.2	70-130	4.16	20
Trichlorofluoromethane	45		5	ug/kg	50.0		90.8	50-150	0.863	20
Dichlorodifluoromethane	50		5	ug/kg	50.0		99.1	50-150	2.00	30
Surrogate: 4-Bromofluorobenzene			*52.3*	ug/kg	*50.0*		*105*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.8*	*70-130*		
Surrogate: Toluene-d8			*49.7*	ug/kg	*50.0*		*99.4*	*70-130*		

Quality Control
(Continued)

Semivolatile organic compounds

Batch: B4B1213 - 1_Semivolatiles Extractions

Blank (B4B1213-BLK1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	ND		129	ug/kg						
1,2-Dichlorobenzene	ND		129	ug/kg						
1,3-Dichlorobenzene	ND		129	ug/kg						
1,4-Dichlorobenzene	ND		129	ug/kg						
Phenol	ND		129	ug/kg						
2,4,5-Trichlorophenol	ND		129	ug/kg						
2,4,6-Trichlorophenol	ND		129	ug/kg						
2,4-Dichlorophenol	ND		129	ug/kg						
2,4-Dimethylphenol	ND		328	ug/kg						
2,4-Dinitrophenol	ND		328	ug/kg						
2,4-Dinitrotoluene	ND		129	ug/kg						
2,6-Dinitrotoluene	ND		129	ug/kg						
2-Chloronaphthalene	ND		129	ug/kg						
2-Chlorophenol	ND		129	ug/kg						
2-Methylnaphthalene	ND		129	ug/kg						
Nitrobenzene	ND		129	ug/kg						
2-Methylphenol	ND		129	ug/kg						
2-Nitroaniline	ND		129	ug/kg						
2-Nitrophenol	ND		328	ug/kg						
3,3′-Dichlorobenzidine	ND		328	ug/kg						
3-Nitroaniline	ND		129	ug/kg						
4,6-Dinitro-2-methylphenol	ND		328	ug/kg						
4-Bromophenyl phenyl ether	ND		129	ug/kg						
4-Chloro-3-methylphenol	ND		129	ug/kg						
4-Chloroaniline	ND		129	ug/kg						
4-Chlorophenyl phenyl ether	ND		129	ug/kg						
4-Nitroaniline	ND		129	ug/kg						
4-Nitrophenol	ND		328	ug/kg						
Acenaphthene	ND		129	ug/kg						
Acenaphthylene	ND		129	ug/kg						
Aniline	ND		129	ug/kg						
Anthracene	ND		129	ug/kg						
Benzo(a)anthracene	ND		129	ug/kg						
Benzo(a)pyrene	ND		129	ug/kg						
Benzo(b)fluoranthene	ND		129	ug/kg						
Benzo(g,h,i)perylene	ND		129	ug/kg						
Benzo(k)fluoranthene	ND		129	ug/kg						
Benzoic acid	ND		993	ug/kg						
Biphenyl	ND		20	ug/kg						
Bis(2-chloroethoxy)methane	ND		129	ug/kg						
Bis(2-chloroethyl)ether	ND		129	ug/kg						
Bis(2-chloroisopropyl)ether	ND		129	ug/kg						
Bis(2-ethylhexyl)phthalate	ND		397	ug/kg						
Butyl benzyl phthalate	ND		129	ug/kg						
Chrysene	ND		129	ug/kg						
Di-n-octyl phthalate	ND		199	ug/kg						
Dibenz(a,h)anthracene	ND		129	ug/kg						
Dibenzofuran	ND		129	ug/kg						
Diethyl phthalate	ND		129	ug/kg						
Dimethyl phthalate	ND		328	ug/kg						
Di-n-butyl phthalate	ND		199	ug/kg						
Fluoranthene	ND		129	ug/kg						
Fluorene	ND		129	ug/kg						
Hexachlorobenzene	ND		129	ug/kg						
Hexachlorobutadiene	ND		129	ug/kg						
Hexachlorocyclopentadiene	ND		328	ug/kg						
Hexachloroethane	ND		129	ug/kg						

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

Blank (B4B1213-BLK1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Indeno(1,2,3-cd)pyrene	ND		129	ug/kg						
Isophorone	ND		129	ug/kg						
Naphthalene	ND		129	ug/kg						
N-Nitrosodimethylamine	ND		129	ug/kg						
N-Nitrosodi-n-propylamine	ND		129	ug/kg						
N-Nitrosodiphenylamine	ND		129	ug/kg						
Pentachlorophenol	ND		328	ug/kg						
Phenanthrene	ND		129	ug/kg						
Pyrene	ND		129	ug/kg						
m&p-Cresol	ND		258	ug/kg						
Pyridine	ND		129	ug/kg						
Azobenzene	ND		129	ug/kg						
Total Dichlorobenzene	ND		129	ug/kg						
Surrogate: Nitrobenzene-d5			*3910*	ug/kg	*6620*		*59.0*	*30-126*		
Surrogate: p-Terphenyl-d14			*5220*	ug/kg	*6620*		*78.8*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3410*	ug/kg	*6620*		*51.5*	*34-130*		
Surrogate: Phenol-d6			*3720*	ug/kg	*6620*		*56.2*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3230*	ug/kg	*6620*		*48.8*	*30-130*		
Surrogate: 2-Fluorophenol			*3980*	ug/kg	*6620*		*60.1*	*30-130*		

LCS (B4B1213-BS1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	2280		129	ug/kg	3310		68.7	40-130		
1,2-Dichlorobenzene	3110		129	ug/kg	3310		94.0	40-130		
1,3-Dichlorobenzene	2990		129	ug/kg	3310		90.2	40-130		
1,4-Dichlorobenzene	2650		129	ug/kg	3310		79.9	40-130		
Phenol	3350		129	ug/kg	3310		101	40-130		
2,4,5-Trichlorophenol	2470		129	ug/kg	3310		74.5	40-130		
2,4,6-Trichlorophenol	2660		129	ug/kg	3310		80.3	40-130		
2,4-Dichlorophenol	2670		129	ug/kg	3310		80.7	40-130		
2,4-Dimethylphenol	2640		328	ug/kg	3310		79.8	40-130		
2,4-Dinitrophenol	2190		328	ug/kg	3310		66.3	15-140		
2,4-Dinitrotoluene	2580		129	ug/kg	3310		78.0	40-130		
2,6-Dinitrotoluene	2680		129	ug/kg	3310		80.9	40-130		
2-Chloronaphthalene	2640		129	ug/kg	3310		79.7	40-130		
2-Chlorophenol	3130		129	ug/kg	3310		94.5	40-130		
2-Methylnaphthalene	2310		129	ug/kg	3310		69.6	40-130		
Nitrobenzene	2840		129	ug/kg	3310		85.7	40-130		
2-Methylphenol	2560		129	ug/kg	3310		77.2	40-130		
2-Nitroaniline	2570		129	ug/kg	3310		77.8	40-130		
2-Nitrophenol	2700		328	ug/kg	3310		81.4	40-130		
3-Nitroaniline	2530		129	ug/kg	3310		76.3	40-130		
4,6-Dinitro-2-methylphenol	2240		328	ug/kg	3310		67.7	30-130		
4-Bromophenyl phenyl ether	2050		129	ug/kg	3310		61.9	40-130		
4-Chloro-3-methylphenol	2280		129	ug/kg	3310		68.8	40-130		
4-Chlorophenyl phenyl ether	2220		129	ug/kg	3310		67.1	40-130		
4-Nitroaniline	2680		129	ug/kg	3310		80.9	40-130		
4-Nitrophenol	2360		328	ug/kg	3310		71.4	40-130		
Acenaphthene	2210		129	ug/kg	3310		66.6	40-130		
Acenaphthylene	2610		129	ug/kg	3310		78.8	40-130		
Anthracene	2940		129	ug/kg	3310		88.8	40-130		
Benzo(a)anthracene	2650		129	ug/kg	3310		79.9	40-130		
Benzo(a)pyrene	2770		129	ug/kg	3310		83.5	40-130		
Benzo(b)fluoranthene	2950		129	ug/kg	3310		89.0	40-130		
Benzo(g,h,i)perylene	2500		129	ug/kg	3310		75.4	40-130		
Benzo(k)fluoranthene	3090		129	ug/kg	3310		93.2	40-130		
Biphenyl	626		20	ug/kg	828		75.7	40-130		
Bis(2-chloroethoxy)methane	2870		129	ug/kg	3310		86.8	40-130		

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS (B4B1213-BS1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bis(2-chloroethyl)ether	3100		129	ug/kg	3310		93.5	40-130		
Bis(2-chloroisopropyl)ether	3600		129	ug/kg	3310		109	40-130		
Bis(2-ethylhexyl)phthalate	2960		397	ug/kg	3310		89.3	40-130		
Butyl benzyl phthalate	2870		129	ug/kg	3310		86.8	40-130		
Chrysene	2860		129	ug/kg	3310		86.3	40-130		
Di-n-octyl phthalate	2150		199	ug/kg	3310		64.9	40-130		
Dibenz(a,h)anthracene	2490		129	ug/kg	3310		75.3	40-130		
Dibenzofuran	2570		129	ug/kg	3310		77.6	40-130		
Diethyl phthalate	2730		129	ug/kg	3310		82.5	40-130		
Dimethyl phthalate	2500		328	ug/kg	3310		75.5	40-130		
Di-n-butyl phthalate	3200		199	ug/kg	3310		96.6	40-130		
Fluoranthene	2990		129	ug/kg	3310		90.3	40-130		
Fluorene	2510		129	ug/kg	3310		75.7	40-130		
Hexachlorobenzene	2570		129	ug/kg	3310		77.7	40-130		
Hexachlorobutadiene	2580		129	ug/kg	3310		78.0	40-130		
Hexachlorocyclopentadiene	2530		328	ug/kg	3310		76.3	40-130		
Hexachloroethane	2970		129	ug/kg	3310		89.7	40-130		
Indeno(1,2,3-cd)pyrene	2600		129	ug/kg	3310		78.5	40-130		
Isophorone	3010		129	ug/kg	3310		90.8	40-130		
Naphthalene	2360		129	ug/kg	3310		71.2	40-130		
N-Nitrosodimethylamine	2890		129	ug/kg	3310		87.4	40-130		
N-Nitrosodi-n-propylamine	2830		129	ug/kg	3310		85.5	40-130		
N-Nitrosodiphenylamine	2750		129	ug/kg	3310		82.9	40-130		
Pentachlorophenol	2410		328	ug/kg	3310		72.8	15-140		
Phenanthrene	3070		129	ug/kg	3310		92.6	40-130		
Pyrene	3010		129	ug/kg	3310		91.0	40-130		
m&p-Cresol	2500		258	ug/kg	3310		75.5	40-130		
Surrogate: Nitrobenzene-d5			*4160*	ug/kg	*6620*		*62.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5200*	ug/kg	*6620*		*78.6*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3730*	ug/kg	*6620*		*56.3*	*34-130*		
Surrogate: Phenol-d6			*4630*	ug/kg	*6620*		*70.0*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3910*	ug/kg	*6620*		*59.0*	*30-130*		
Surrogate: 2-Fluorophenol			*5100*	ug/kg	*6620*		*77.0*	*30-130*		

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4B1213-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
1,2,4-Trichlorobenzene	2270		129	ug/kg	3310		68.7	40-130	0.0874	30
1,2-Dichlorobenzene	2550		129	ug/kg	3310		77.0	40-130	19.9	30
1,3-Dichlorobenzene	2480		129	ug/kg	3310		75.0	40-130	18.4	30
1,4-Dichlorobenzene	2260		129	ug/kg	3310		68.4	40-130	15.5	30
Phenol	2680		129	ug/kg	3310		81.0	40-130	22.3	30
2,4,5-Trichlorophenol	2640		129	ug/kg	3310		79.6	40-130	6.67	30
2,4,6-Trichlorophenol	2540		129	ug/kg	3310		76.6	40-130	4.71	30
2,4-Dichlorophenol	2640		129	ug/kg	3310		79.8	40-130	1.07	30
2,4-Dimethylphenol	2420		328	ug/kg	3310		73.1	40-130	8.87	30
2,4-Dinitrophenol	2130		328	ug/kg	3310		64.2	15-140	3.13	30
2,4-Dinitrotoluene	2740		129	ug/kg	3310		82.7	40-130	5.87	30
2,6-Dinitrotoluene	2730		129	ug/kg	3310		82.3	40-130	1.76	30
2-Chloronaphthalene	2740		129	ug/kg	3310		82.8	40-130	3.82	30
2-Chlorophenol	2630		129	ug/kg	3310		79.3	40-130	17.4	30
2-Methylnaphthalene	2250		129	ug/kg	3310		67.9	40-130	2.50	30
Nitrobenzene	2800		129	ug/kg	3310		84.5	40-130	1.41	30
2-Methylphenol	2170		129	ug/kg	3310		65.6	40-130	16.3	30
2-Nitroaniline	2600		129	ug/kg	3310		78.5	40-130	0.973	30
2-Nitrophenol	2540		328	ug/kg	3310		76.8	40-130	5.89	30
3-Nitroaniline	2660		129	ug/kg	3310		80.5	40-130	5.31	30
4,6-Dinitro-2-methylphenol	2700		328	ug/kg	3310		81.5	30-130	18.5	30
4-Bromophenyl phenyl ether	2240		129	ug/kg	3310		67.6	40-130	8.81	30
4-Chloro-3-methylphenol	2220		129	ug/kg	3310		66.9	40-130	2.80	30
4-Chlorophenyl phenyl ether	2260		129	ug/kg	3310		68.4	40-130	1.92	30
4-Nitroaniline	1970		129	ug/kg	3310		59.5	40-130	30.5	30
4-Nitrophenol	2680		328	ug/kg	3310		80.9	40-130	12.4	30
Acenaphthene	2220		129	ug/kg	3310		67.1	40-130	0.688	30
Acenaphthylene	2690		129	ug/kg	3310		81.3	40-130	3.10	30
Anthracene	3050		129	ug/kg	3310		92.1	40-130	3.58	30
Benzo(a)anthracene	2670		129	ug/kg	3310		80.5	40-130	0.773	30
Benzo(a)pyrene	2920		129	ug/kg	3310		88.2	40-130	5.43	30
Benzo(b)fluoranthene	3050		129	ug/kg	3310		92.0	40-130	3.27	30
Benzo(g,h,i)perylene	2800		129	ug/kg	3310		84.5	40-130	11.4	30
Benzo(k)fluoranthene	3270		129	ug/kg	3310		98.8	40-130	5.83	30
Biphenyl	663		20	ug/kg	828		80.1	40-130	5.65	30
Bis(2-chloroethoxy)methane	2890		129	ug/kg	3310		87.3	40-130	0.643	30
Bis(2-chloroethyl)ether	2740		129	ug/kg	3310		82.8	40-130	12.1	30
Bis(2-chloroisopropyl)ether	3070		129	ug/kg	3310		92.8	40-130	15.9	30
Bis(2-ethylhexyl)phthalate	3030		397	ug/kg	3310		91.4	40-130	2.30	30
Butyl benzyl phthalate	2900		129	ug/kg	3310		87.5	40-130	0.895	30
Chrysene	2930		129	ug/kg	3310		88.6	40-130	2.63	30
Di-n-octyl phthalate	3290		199	ug/kg	3310		99.4	40-130	42.1	30
Dibenz(a,h)anthracene	2610		129	ug/kg	3310		78.8	40-130	4.46	30
Dibenzofuran	2720		129	ug/kg	3310		82.1	40-130	5.66	30
Diethyl phthalate	2830		129	ug/kg	3310		85.6	40-130	3.64	30
Dimethyl phthalate	2580		328	ug/kg	3310		78.0	40-130	3.23	30
Di-n-butyl phthalate	3310		199	ug/kg	3310		99.9	40-130	3.38	30
Fluoranthene	3080		129	ug/kg	3310		93.0	40-130	2.92	30
Fluorene	2640		129	ug/kg	3310		79.8	40-130	5.28	30
Hexachlorobenzene	2790		129	ug/kg	3310		84.1	40-130	8.01	30
Hexachlorobutadiene	2510		129	ug/kg	3310		75.8	40-130	2.76	30
Hexachlorocyclopentadiene	2640		328	ug/kg	3310		79.8	40-130	4.46	30
Hexachloroethane	2460		129	ug/kg	3310		74.3	40-130	18.8	30
Indeno(1,2,3-cd)pyrene	2730		129	ug/kg	3310		82.3	40-130	4.68	30
Isophorone	2960		129	ug/kg	3310		89.3	40-130	1.75	30
Naphthalene	2400		129	ug/kg	3310		72.5	40-130	1.84	30
N-Nitrosodimethylamine	2060		129	ug/kg	3310		62.3	40-130	[illegible]	30

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS Dup (B4B1213-BSD1) Prepared: 02/28/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
N-Nitrosodi-n-propylamine	2530		129	ug/kg	3310		76.3	40-130	11.4	30
N-Nitrosodiphenylamine	2890		129	ug/kg	3310		87.4	40-130	5.24	30
Pentachlorophenol	2620		328	ug/kg	3310		79.3	15-140	8.44	30
Phenanthrene	3230		129	ug/kg	3310		97.5	40-130	5.11	30
Pyrene	3050		129	ug/kg	3310		92.1	40-130	1.20	30
m&p-Cresol	2270		258	ug/kg	3310		68.5	40-130	9.73	30
Surrogate: Nitrobenzene-d5			*4090*	ug/kg	*6620*		*61.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5160*	ug/kg	*6620*		*77.9*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3750*	ug/kg	*6620*		*56.7*	*34-130*		
Surrogate: Phenol-d6			*3870*	ug/kg	*6620*		*58.5*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*4140*	ug/kg	*6620*		*62.6*	*30-130*		
Surrogate: 2-Fluorophenol			*4220*	ug/kg	*6620*		*63.8*	*30-130*		

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Batch: B4B1201 - 1_Semivolatiles Extractions

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (B4B1201-BLK1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	ND		66	ug/kg						
Aroclor-1221	ND		66	ug/kg						
Aroclor-1232	ND		66	ug/kg						
Aroclor-1242	ND		66	ug/kg						
Aroclor-1248	ND		66	ug/kg						
Aroclor-1254	ND		66	ug/kg						
Aroclor-1260	ND		66	ug/kg						
Aroclor-1262	ND		66	ug/kg						
Aroclor-1268	ND		66	ug/kg						
PCBs (Total)	ND		66	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*8.58*	ug/kg	*13.3*		*64.4*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*7.12*	ug/kg	*13.3*		*53.4*	*43.3-130*		
LCS (B4B1201-BS1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	156		66	ug/kg	167		93.8	58.2-125		
Aroclor-1260	170		66	ug/kg	167		102	65.5-130		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*9.00*	ug/kg	*13.3*		*67.5*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.98*	ug/kg	*13.3*		*52.4*	*43.3-130*		
LCS Dup (B4B1201-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
Aroclor-1016	170		66	ug/kg	167		102	58.2-125	8.40	20
Aroclor-1260	193		66	ug/kg	167		116	65.5-130	12.9	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*9.58*	ug/kg	*13.3*		*71.9*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*7.76*	ug/kg	*13.3*		*58.2*	*43.3-130*		

Quality Control
(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1186 - 1_Semivolatiles Extractions										
Blank (B4B1186-BLK1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*9.08*	mg/kg	*8.33*		*109*	*50-130*		
LCS (B4B1186-BS1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	583		27	mg/kg	667		87.5	44.7-125		
Surrogate: Chlorooctadecane			*9.39*	mg/kg	*8.33*		*113*	*50-130*		
LCS Dup (B4B1186-BSD1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	551		27	mg/kg	667		82.6	44.7-125	5.71	30
Surrogate: Chlorooctadecane			*9.05*	mg/kg	*8.33*		*109*	*50-130*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

!'s in Freezer

NEW ENGLAND TESTING LABORATORY, INC
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

4 B 2 6010 k

PROJ. NO. 3096

PROJECT NAME/LOCATION MAYNARD

CLIENT LORD ENV. INC

REPORT TO: RTella @ LORDENV.COM

INVOICE TO: " " "

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** COM-97 plus MCP14	HAZ CHARACTERISTICS					REMARKS
2-23-24	10:30		X	TP-6		X		3	As on container	X	X					PID <0.1 ppmV
2-23-24	10:00	X		B-103; 0-6'		↓		3		↓	↓					↓
2/23/24	10:45	X		~~B-113~~ B-113; 2-4'		↓		3		↓	↓					↓
2/23/24	~~10:00~~ 11:00	X		B-112; 2-6'		↓		3		↓	↓					↓

Sampled by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
RJTella	2/23/24 2pm		2/26 1030
Relinquished by: (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**
	2/26 1525		
Relinquished by: (Signature)	**Date/Time**	**Received for Laboratory by: (Signature)**	**Date/Time**
			2/26 1525

Laboratory Remarks:
Temp. received: 3
Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:

Turnaround (Business Days)

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.

Project #: 3096

Project Location: Maynard

RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
4B26010

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

<u>Data User Note</u>: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:

Position: Laboratory Director

Printed Name: Richard Warila

Date: 3/6/2024

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 4B27035
Client Project: 3096 - Maynard

Report Date: 05-March-2024

Prepared for:

Ralph Tella
Lord Environmental, Inc.
1506 Providence Highway, Suite 30
Norwood, MA 02062

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 02/27/24. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client’s designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 4B27035. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
4B27035-01	B-108 2-4'	Soil	02/27/2024	02/27/2024
4B27035-02	B-118 2-4'	Soil	02/27/2024	02/27/2024

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

B-108 2-4' (Lab Number: 4B27035-01)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

B-118 2-4' (Lab Number: 4B27035-02)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Method References

Reactive Cyanide, Standard Operating Procedure 407, New England Testing Laboratory Inc.

Reactive Sulfide, Standard Operating Procedure 426, New England Testing Laboratory Inc.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**8.1**			SU	02/28/24	02/28/24
Specific Conductance	**13.7**		2.0	uS/cm	02/28/24	02/28/24

Results: General Chemistry

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Flashpoint	> 200		70	degrees F	03/01/24	03/01/24
pH	**7.1**			SU	02/28/24	02/28/24
Specific Conductance	**296**		2.0	uS/cm	02/28/24	02/28/24

Results: Reactivity

Sample: B-108 2-4'
Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Reactivity

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	02/29/24	02/29/24
Reactive Sulfide	ND		0.1	mg/kg	02/29/24	02/29/24

Results: Total Metals

Sample: B-108 2-4'
Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.81	mg/kg	02/28/24	03/04/24
Arsenic	**8.77**		1.22	mg/kg	02/28/24	03/04/24
Barium	**29.1**		0.40	mg/kg	02/28/24	03/04/24
Beryllium	ND		0.40	mg/kg	02/28/24	03/04/24
Cadmium	**2.43**		0.61	mg/kg	02/28/24	03/04/24
Chromium	**10.6**		0.61	mg/kg	02/28/24	03/04/24
Lead	**3.35**		0.61	mg/kg	02/28/24	03/04/24
Mercury	ND		0.104	mg/kg	02/28/24	02/28/24
Nickel	**6.35**		0.61	mg/kg	02/28/24	03/04/24
Selenium	ND		1.22	mg/kg	02/28/24	03/04/24
Silver	ND		1.22	mg/kg	02/28/24	03/04/24
Vanadium	**12.4**		0.40	mg/kg	02/28/24	03/04/24
Zinc	**16.7**		2.4	mg/kg	02/28/24	03/04/24
Thallium	ND		0.40	mg/kg	02/28/24	03/04/24

Results: Total Metals

Sample: B-118 2-4'
Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.77	mg/kg	02/28/24	03/04/24
Arsenic	**6.64**		1.17	mg/kg	02/28/24	03/04/24
Barium	**55.4**		0.39	mg/kg	02/28/24	03/04/24
Beryllium	ND		0.39	mg/kg	02/28/24	03/04/24
Cadmium	**4.49**		0.58	mg/kg	02/28/24	03/04/24
Chromium	**22.8**		0.58	mg/kg	02/28/24	03/04/24
Lead	**5.70**		0.58	mg/kg	02/28/24	03/04/24
Mercury	ND		0.090	mg/kg	02/28/24	02/28/24
Nickel	**13.7**		0.58	mg/kg	02/28/24	03/04/24
Selenium	ND		1.17	mg/kg	02/28/24	03/04/24
Silver	ND		1.17	mg/kg	02/28/24	03/04/24
Vanadium	**26.1**		0.39	mg/kg	02/28/24	03/04/24
Zinc	**24.6**		2.3	mg/kg	02/28/24	03/04/24
Thallium	ND		0.39	mg/kg	02/28/24	03/04/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		93	ug/kg	02/29/24	02/29/24
Benzene	ND		5	ug/kg	02/29/24	02/29/24
Bromobenzene	ND		5	ug/kg	02/29/24	02/29/24
Bromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromodichloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromoform	ND		5	ug/kg	02/29/24	02/29/24
Bromomethane	ND		5	ug/kg	02/29/24	02/29/24
2-Butanone	ND		93	ug/kg	02/29/24	02/29/24
tert-Butyl alcohol	ND		5	ug/kg	02/29/24	02/29/24
sec-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
n-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
tert-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	02/29/24	02/29/24
Carbon Disulfide	ND		5	ug/kg	02/29/24	02/29/24
Carbon Tetrachloride	ND		5	ug/kg	02/29/24	02/29/24
Chlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
Chloroethane	ND		5	ug/kg	02/29/24	02/29/24
Chloroform	ND		5	ug/kg	02/29/24	02/29/24
Chloromethane	ND		5	ug/kg	02/29/24	02/29/24
4-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
2-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	02/29/24	02/29/24
Dibromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	02/29/24	02/29/24
Dibromomethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2 Dichloroethene, Total	ND		5	ug/kg	02/29/24	02/29/24
trans-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
cis-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
2,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
cis-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
trans-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	02/29/24	02/29/24
Diethyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dioxane	ND		93	ug/kg	02/29/24	02/29/24
Ethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Hexachlorobutadiene	ND		5	ug/kg	02/29/24	02/29/24
2-Hexanone	ND		93	ug/kg	02/29/24	02/29/24
Isopropylbenzene	ND		5	ug/kg	02/29/24	02/29/24
p-Isopropyltoluene	ND		5	ug/kg	02/29/24	02/29

Sample: B-108 2-4' (Continued)

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	02/29/24	02/29/24
4-Methyl-2-pentanone	ND		93	ug/kg	02/29/24	02/29/24
Naphthalene	ND		5	ug/kg	02/29/24	02/29/24
n-Propylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Styrene	ND		5	ug/kg	02/29/24	02/29/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
Tetrachloroethene	ND		5	ug/kg	02/29/24	02/29/24
Tetrahydrofuran	ND		5	ug/kg	02/29/24	02/29/24
Toluene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1,2-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,1,1-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
Trichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichloropropane	ND		5	ug/kg	02/29/24	02/29/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Vinyl Chloride	ND		5	ug/kg	02/29/24	02/29/24
o-Xylene	ND		5	ug/kg	02/29/24	02/29/24
m&p-Xylene	ND		9	ug/kg	02/29/24	02/29/24
Total xylenes	ND		5	ug/kg	02/29/24	02/29/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
tert-Amyl methyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
Ethyl tert-butyl ether	ND		5	ug/kg	02/29/24	02/29/24
Diisopropyl ether	ND		5	ug/kg	02/29/24	02/29/24
Trichlorofluoromethane	ND		5	ug/kg	02/29/24	02/29/24
Dichlorodifluoromethane	ND		5	ug/kg	02/29/24	02/29/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*96.3%*	*70-130*	02/29/24	02/29/24
1,2-Dichloroethane-d4	*104%*	*70-130*	02/29/24	02/29/24
Toluene-d8	*103%*	*70-130*	02/29/24	02/29/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		92	ug/kg	02/29/24	02/29/24
Benzene	ND		5	ug/kg	02/29/24	02/29/24
Bromobenzene	ND		5	ug/kg	02/29/24	02/29/24
Bromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromodichloromethane	ND		5	ug/kg	02/29/24	02/29/24
Bromoform	ND		5	ug/kg	02/29/24	02/29/24
Bromomethane	ND		5	ug/kg	02/29/24	02/29/24
2-Butanone	ND		92	ug/kg	02/29/24	02/29/24
tert-Butyl alcohol	ND		5	ug/kg	02/29/24	02/29/24
sec-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
n-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
tert-Butylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	02/29/24	02/29/24
Carbon Disulfide	ND		5	ug/kg	02/29/24	02/29/24
Carbon Tetrachloride	ND		5	ug/kg	02/29/24	02/29/24
Chlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
Chloroethane	ND		5	ug/kg	02/29/24	02/29/24
Chloroform	ND		5	ug/kg	02/29/24	02/29/24
Chloromethane	ND		5	ug/kg	02/29/24	02/29/24
4-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
2-Chlorotoluene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	02/29/24	02/29/24
Dibromochloromethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	02/29/24	02/29/24
Dibromomethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,2 Dichloroethene, Total	ND		5	ug/kg	02/29/24	02/29/24
trans-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
cis-1,2-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
2,2-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
cis-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
trans-1,3-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,1-Dichloropropene	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	02/29/24	02/29/24
Diethyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,4-Dioxane	ND		92	ug/kg	02/29/24	02/29/24
Ethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Hexachlorobutadiene	ND		5	ug/kg	02/29/24	02/29/24
2-Hexanone	ND		92	ug/kg	02/29/24	02/29/24
Isopropylbenzene	ND		5	ug/kg	02/29/24	02/29/24
p-Isopropyltoluene	ND		5	ug/kg	02/29/24	02/29

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: B-118 2-4' (Continued)

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		5	ug/kg	02/29/24	02/29/24
4-Methyl-2-pentanone	ND		92	ug/kg	02/29/24	02/29/24
Naphthalene	ND		5	ug/kg	02/29/24	02/29/24
n-Propylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Styrene	ND		5	ug/kg	02/29/24	02/29/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
Tetrachloroethene	ND		5	ug/kg	02/29/24	02/29/24
Tetrahydrofuran	ND		5	ug/kg	02/29/24	02/29/24
Toluene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	02/29/24	02/29/24
1,1,2-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
1,1,1-Trichloroethane	ND		5	ug/kg	02/29/24	02/29/24
Trichloroethene	ND		5	ug/kg	02/29/24	02/29/24
1,2,3-Trichloropropane	ND		5	ug/kg	02/29/24	02/29/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	02/29/24	02/29/24
Vinyl Chloride	ND		5	ug/kg	02/29/24	02/29/24
o-Xylene	ND		5	ug/kg	02/29/24	02/29/24
m&p-Xylene	ND		9	ug/kg	02/29/24	02/29/24
Total xylenes	ND		5	ug/kg	02/29/24	02/29/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	02/29/24	02/29/24
tert-Amyl methyl ether	ND		5	ug/kg	02/29/24	02/29/24
1,3-Dichloropropane	ND		5	ug/kg	02/29/24	02/29/24
Ethyl tert-butyl ether	ND		5	ug/kg	02/29/24	02/29/24
Diisopropyl ether	ND		5	ug/kg	02/29/24	02/29/24
Trichlorofluoromethane	ND		5	ug/kg	02/29/24	02/29/24
Dichlorodifluoromethane	ND		5	ug/kg	02/29/24	02/29/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*96.5%*	*70-130*	02/29/24	02/29/24
1,2-Dichloroethane-d4	*104%*	*70-130*	02/29/24	02/29/24
Toluene-d8	*102%*	*70-130*	02/29/24	02/29/24

Results: Semivolatile organic compounds

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,2-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,3-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
1,4-Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
Phenol	ND		141	ug/kg	02/28/24	03/01/24
2,4,5-Trichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4,6-Trichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4-Dichlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2,4-Dimethylphenol	ND		357	ug/kg	02/28/24	03/01/24
2,4-Dinitrophenol	ND		357	ug/kg	02/28/24	03/01/24
2,4-Dinitrotoluene	ND		141	ug/kg	02/28/24	03/01/24
2,6-Dinitrotoluene	ND		141	ug/kg	02/28/24	03/01/24
2-Chloronaphthalene	ND		141	ug/kg	02/28/24	03/01/24
2-Chlorophenol	ND		141	ug/kg	02/28/24	03/01/24
2-Methylnaphthalene	ND		141	ug/kg	02/28/24	03/01/24
Nitrobenzene	ND		141	ug/kg	02/28/24	03/01/24
2-Methylphenol	ND		141	ug/kg	02/28/24	03/01/24
2-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
2-Nitrophenol	ND		357	ug/kg	02/28/24	03/01/24
3,3′-Dichlorobenzidine	ND		357	ug/kg	02/28/24	03/01/24
3-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
4,6-Dinitro-2-methylphenol	ND		357	ug/kg	02/28/24	03/01/24
4-Bromophenyl phenyl ether	ND		141	ug/kg	02/28/24	03/01/24
4-Chloro-3-methylphenol	ND		141	ug/kg	02/28/24	03/01/24
4-Chloroaniline	ND		141	ug/kg	02/28/24	03/01/24
4-Chlorophenyl phenyl ether	ND		141	ug/kg	02/28/24	03/01/24
4-Nitroaniline	ND		141	ug/kg	02/28/24	03/01/24
4-Nitrophenol	ND		357	ug/kg	02/28/24	03/01/24
Acenaphthene	ND		141	ug/kg	02/28/24	03/01/24
Acenaphthylene	ND		141	ug/kg	02/28/24	03/01/24
Aniline	ND		141	ug/kg	02/28/24	03/01/24
Anthracene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(a)anthracene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(a)pyrene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(b)fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(g,h,i)perylene	ND		141	ug/kg	02/28/24	03/01/24
Benzo(k)fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Benzoic acid	ND		1080	ug/kg	02/28/24	03/01/24
Biphenyl	ND		22	ug/kg	02/28/24	03/01/24
Bis(2-chloroethoxy)methane	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-chloroethyl)ether	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-chloroisopropyl)ether	ND		141	ug/kg	02/28/24	03/01/24
Bis(2-ethylhexyl)phthalate	ND		433	ug/kg	02/28/24	03/01/24
Butyl benzyl phthalate	ND		141	ug/kg	02/28/24	03/01/24
Chrysene	ND		141	ug/kg	02/28/24	03/01/24
Di-n-octyl phthalate	ND		217	ug/kg	02/28/24	03/01/24
Dibenz(a,h)anthracene	ND		141	ug/kg	02/28/24	03/01

Results: Semivolatile organic compounds (Continued)

Sample: B-108 2-4' (Continued)

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		141	ug/kg	02/28/24	03/01/24
Diethyl phthalate	ND		141	ug/kg	02/28/24	03/01/24
Dimethyl phthalate	ND		357	ug/kg	02/28/24	03/01/24
Di-n-butyl phthalate	ND		217	ug/kg	02/28/24	03/01/24
Fluoranthene	ND		141	ug/kg	02/28/24	03/01/24
Fluorene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorobenzene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorobutadiene	ND		141	ug/kg	02/28/24	03/01/24
Hexachlorocyclopentadiene	ND		357	ug/kg	02/28/24	03/01/24
Hexachloroethane	ND		141	ug/kg	02/28/24	03/01/24
Indeno(1,2,3-cd)pyrene	ND		141	ug/kg	02/28/24	03/01/24
Isophorone	ND		141	ug/kg	02/28/24	03/01/24
Naphthalene	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodimethylamine	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodi-n-propylamine	ND		141	ug/kg	02/28/24	03/01/24
N-Nitrosodiphenylamine	ND		141	ug/kg	02/28/24	03/01/24
Pentachlorophenol	ND		357	ug/kg	02/28/24	03/01/24
Phenanthrene	ND		141	ug/kg	02/28/24	03/01/24
Pyrene	ND		141	ug/kg	02/28/24	03/01/24
m&p-Cresol	ND		282	ug/kg	02/28/24	03/01/24
Pyridine	ND		141	ug/kg	02/28/24	03/01/24
Azobenzene	ND		141	ug/kg	02/28/24	03/01/24
Total Dichlorobenzene	ND		141	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*65.2%*	*30-126*	02/28/24	03/01/24
p-Terphenyl-d14	*93.4%*	*47-130*	02/28/24	03/01/24
2-Fluorobiphenyl	*58.2%*	*34-130*	02/28/24	03/01/24
Phenol-d6	*59.7%*	*30-130*	02/28/24	03/01/24
2,4,6-Tribromophenol	*55.4%*	*30-130*	02/28/24	03/01/24
2-Fluorophenol	*68.8%*	*30-130*	02/28/24	03/01/24

Results: Semivolatile organic compounds

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,2-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,3-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
1,4-Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
Phenol	ND		137	ug/kg	02/28/24	03/01/24
2,4,5-Trichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4,6-Trichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4-Dichlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2,4-Dimethylphenol	ND		348	ug/kg	02/28/24	03/01/24
2,4-Dinitrophenol	ND		348	ug/kg	02/28/24	03/01/24
2,4-Dinitrotoluene	ND		137	ug/kg	02/28/24	03/01/24
2,6-Dinitrotoluene	ND		137	ug/kg	02/28/24	03/01/24
2-Chloronaphthalene	ND		137	ug/kg	02/28/24	03/01/24
2-Chlorophenol	ND		137	ug/kg	02/28/24	03/01/24
2-Methylnaphthalene	ND		137	ug/kg	02/28/24	03/01/24
Nitrobenzene	ND		137	ug/kg	02/28/24	03/01/24
2-Methylphenol	ND		137	ug/kg	02/28/24	03/01/24
2-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
2-Nitrophenol	ND		348	ug/kg	02/28/24	03/01/24
3,3′-Dichlorobenzidine	ND		348	ug/kg	02/28/24	03/01/24
3-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
4,6-Dinitro-2-methylphenol	ND		348	ug/kg	02/28/24	03/01/24
4-Bromophenyl phenyl ether	ND		137	ug/kg	02/28/24	03/01/24
4-Chloro-3-methylphenol	ND		137	ug/kg	02/28/24	03/01/24
4-Chloroaniline	ND		137	ug/kg	02/28/24	03/01/24
4-Chlorophenyl phenyl ether	ND		137	ug/kg	02/28/24	03/01/24
4-Nitroaniline	ND		137	ug/kg	02/28/24	03/01/24
4-Nitrophenol	ND		348	ug/kg	02/28/24	03/01/24
Acenaphthene	ND		137	ug/kg	02/28/24	03/01/24
Acenaphthylene	ND		137	ug/kg	02/28/24	03/01/24
Aniline	ND		137	ug/kg	02/28/24	03/01/24
Anthracene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(a)anthracene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(a)pyrene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(b)fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(g,h,i)perylene	ND		137	ug/kg	02/28/24	03/01/24
Benzo(k)fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Benzoic acid	ND		1050	ug/kg	02/28/24	03/01/24
Biphenyl	ND		21	ug/kg	02/28/24	03/01/24
Bis(2-chloroethoxy)methane	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-chloroethyl)ether	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-chloroisopropyl)ether	ND		137	ug/kg	02/28/24	03/01/24
Bis(2-ethylhexyl)phthalate	ND		422	ug/kg	02/28/24	03/01/24
Butyl benzyl phthalate	ND		137	ug/kg	02/28/24	03/01/24
Chrysene	ND		137	ug/kg	02/28/24	03/01/24
Di-n-octyl phthalate	ND		211	ug/kg	02/28/24	03/01/24
Dibenz(a,h)anthracene	ND		137	ug/kg	02/28/24	03/01

Results: Semivolatile organic compounds (Continued)

Sample: B-118 2-4' (Continued)

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		137	ug/kg	02/28/24	03/01/24
Diethyl phthalate	ND		137	ug/kg	02/28/24	03/01/24
Dimethyl phthalate	ND		348	ug/kg	02/28/24	03/01/24
Di-n-butyl phthalate	ND		211	ug/kg	02/28/24	03/01/24
Fluoranthene	ND		137	ug/kg	02/28/24	03/01/24
Fluorene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorobenzene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorobutadiene	ND		137	ug/kg	02/28/24	03/01/24
Hexachlorocyclopentadiene	ND		348	ug/kg	02/28/24	03/01/24
Hexachloroethane	ND		137	ug/kg	02/28/24	03/01/24
Indeno(1,2,3-cd)pyrene	ND		137	ug/kg	02/28/24	03/01/24
Isophorone	ND		137	ug/kg	02/28/24	03/01/24
Naphthalene	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodimethylamine	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodi-n-propylamine	ND		137	ug/kg	02/28/24	03/01/24
N-Nitrosodiphenylamine	ND		137	ug/kg	02/28/24	03/01/24
Pentachlorophenol	ND		348	ug/kg	02/28/24	03/01/24
Phenanthrene	ND		137	ug/kg	02/28/24	03/01/24
Pyrene	ND		137	ug/kg	02/28/24	03/01/24
m&p-Cresol	ND		274	ug/kg	02/28/24	03/01/24
Pyridine	ND		137	ug/kg	02/28/24	03/01/24
Azobenzene	ND		137	ug/kg	02/28/24	03/01/24
Total Dichlorobenzene	ND		137	ug/kg	02/28/24	03/01/24

Surrogate(s)	Recovery%	Limits	Date Prepared	Date Analyzed
Nitrobenzene-d5	*65.2%*	*30-126*	02/28/24	03/01/24
p-Terphenyl-d14	*101%*	*47-130*	02/28/24	03/01/24
2-Fluorobiphenyl	*61.6%*	*34-130*	02/28/24	03/01/24
Phenol-d6	*68.4%*	*30-130*	02/28/24	03/01/24
2,4,6-Tribromophenol	*62.5%*	*30-130*	02/28/24	03/01/24
2-Fluorophenol	*75.7%*	*30-130*	02/28/24	03/01/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1221	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1232	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1242	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1248	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1254	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1260	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1262	ND		71	ug/kg	02/29/24	03/05/24
Aroclor-1268	ND		71	ug/kg	02/29/24	03/05/24
PCBs (Total)	ND		71	ug/kg	02/29/24	03/05/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*39.5%*	*36.2-130*	02/29/24	03/05/24
Decachlorobiphenyl (DCBP)	*45.1%*	*43.3-130*	02/29/24	03/05/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1221	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1232	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1242	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1248	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1254	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1260	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1262	ND		69	ug/kg	02/29/24	03/05/24
Aroclor-1268	ND		69	ug/kg	02/29/24	03/05/24
PCBs (Total)	ND		69	ug/kg	02/29/24	03/05/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*69.6%*	*36.2-130*	02/29/24	03/05/24
Decachlorobiphenyl (DCBP)	*49.0%*	*43.3-130*	02/29/24	03/05/24

Results: Total Petroleum Hydrocarbons

Sample: B-108 2-4'

Lab Number: 4B27035-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		29	mg/kg	02/28/24	02/28/24

Surrogate(s)	Recovery%	Limits		
Chlorooctadecane	*95.2%*	*50-130*	02/28/24	02/28/24

Results: Total Petroleum Hydrocarbons

Sample: B-118 2-4'

Lab Number: 4B27035-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		28	mg/kg	02/28/24	02/28/24

Surrogate(s)	Recovery%	Limits	Date Prepared	Date Analyzed
Chlorooctadecane	*57.1%*	*50-130*	02/28/24	02/28/24

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1197 - Conductivity										
Blank (B4B1197-BLK1)					Prepared & Analyzed: 02/28/24					
Specific Conductance	ND		2.0	uS/cm						
Duplicate (B4B1197-DUP1)		Source: 4B23014-01			Prepared & Analyzed: 02/28/24					
Specific Conductance	258		2.0	uS/cm		258			0.00	200
Batch: B4B1200 - pH										
LCS (B4B1200-BS1)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
LCS (B4B1200-BS2)					Prepared & Analyzed: 02/28/24					
pH	7.1			SU	7.00		101	0-200		
Duplicate (B4B1200-DUP1)		Source: 4B23046-06			Prepared & Analyzed: 02/28/24					
pH	6.8			SU		6.8			0.587	200
Batch: B4C0033 - Flashpoint-EPA 1010A-Mod										
LCS (B4C0033-BS1)					Prepared & Analyzed: 03/01/24					
Flashpoint	83		70	degrees F	80.0		104	90-110		
Duplicate (B4C0033-DUP1)		Source: 4B26010-04			Prepared & Analyzed: 03/01/24					
Flashpoint	> 200		70	degrees F		ND				20

Quality Control
(Continued)

Reactivity

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1244 - Reactivity										
Blank (B4B1244-BLK1)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
Blank (B4B1244-BLK2)					Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg						
LCS (B4B1244-BS1)					Prepared & Analyzed: 02/29/24					
Sulfide	3.6		0.1	mg/kg	4.00		90.0	90-110		
LCS (B4B1244-BS2)					Prepared & Analyzed: 02/29/24					
Sulfide	3.7		0.1	mg/kg	4.00		91.5	90-110		
Duplicate (B4B1244-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	ND		0.1	mg/kg dry		ND				20
Matrix Spike (B4B1244-MS1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Sulfide	4.5		0.1	mg/kg dry	4.59	ND	98.5	80-120		
Batch: B4B1245 - Reactivity										
Blank (B4B1245-BLK1)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Blank (B4B1245-BLK2)					Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg						
Duplicate (B4B1245-DUP1)		Source: 4B23045-01			Prepared & Analyzed: 02/29/24					
Cyanide	ND		0.2	mg/kg dry		ND				20

Quality Control
(Continued)

Total Metals

Batch: B4B1180 - Metals Digestion Soils

Blank (B4B1180-BLK1) Prepared: 02/28/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Beryllium	ND		0.33	mg/kg						
Chromium	ND		0.50	mg/kg						
Antimony	ND		0.66	mg/kg						
Cadmium	ND		0.50	mg/kg						
Selenium	ND		1.00	mg/kg						
Nickel	ND		0.50	mg/kg						
Lead	ND		0.50	mg/kg						
Vanadium	ND		0.33	mg/kg						
Silver	ND		1.00	mg/kg						
Barium	ND		0.33	mg/kg						
Zinc	ND		2.0	mg/kg						
Arsenic	ND		1.00	mg/kg						
Thallium	ND		0.33	mg/kg						

LCS (B4B1180-BS1) Prepared: 02/28/24 Analyzed: 03/01/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Barium	86.2		0.33	mg/kg	100		86.2	85-115		
Arsenic	18.7		1.00	mg/kg	20.0		93.5	85-115		
Cadmium	85.7		0.50	mg/kg	100		85.7	85-115		
Chromium	86.8		0.50	mg/kg	100		86.8	85-115		
Beryllium	18.1		0.33	mg/kg	20.0		90.7	85-115		
Lead	93.7		0.50	mg/kg	100		93.7	85-115		
Antimony	97.4		0.66	mg/kg	100		97.4	85-115		
Selenium	18.4		1.00	mg/kg	20.0		92.2	85-115		
Silver	43.3		1.00	mg/kg	40.0		108	85-115		
Vanadium	95.1		0.33	mg/kg	100		95.1	85-115		
Zinc	85.3		2.0	mg/kg	100		85.3	85-115		
Nickel	86.3		0.50	mg/kg	100		86.3	85-112		
Thallium	90.9		0.33	mg/kg	100		90.9	85-115		

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury										
Blank (B4B1185-BLK1)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
Blank (B4B1185-BLK2)					Prepared & Analyzed: 02/28/24					
Mercury	ND		0.100	mg/kg						
LCS (B4B1185-BS1)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS (B4B1185-BS2)					Prepared & Analyzed: 02/28/24					
Mercury	0.504		0.100	mg/kg	0.500		101	93-114		
LCS Dup (B4B1185-BSD1)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
LCS Dup (B4B1185-BSD2)					Prepared & Analyzed: 02/28/24					
Mercury	0.513		0.100	mg/kg	0.500		103	93-114	1.92	200
Matrix Spike (B4B1185-MS1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.716		0.126	mg/kg dry	0.630	0.129	93.1	80-120		
Matrix Spike (B4B1185-MS2)		Source: 4B27039-02			Prepared & Analyzed: 02/28/24					
Mercury	0.564		0.094	mg/kg dry	0.469	0.135	91.3	80-120		
Matrix Spike (B4B1185-MS3)		Source: 4B27003-01			Prepared & Analyzed: 02/28/24					
Mercury	0.649		0.098	mg/kg dry	0.489	0.125	107	80-120		
Matrix Spike Dup (B4B1185-MSD1)		Source: 4B26010-01			Prepared & Analyzed: 02/28/24					
Mercury	0.688		0.115	mg/kg dry	0.577	0.129	96.8	80-120	4.01	20

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1185 - Metals Cold-Vapor Mercury (Continued)										
Matrix Spike Dup (B4B1185-MSD2)	Source: 4B27039-02				Prepared & Analyzed: 02/28/24					
Mercury	0.576		0.093	mg/kg dry	0.465	0.135	94.7	80-120	2.10	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035										
Blank (B4C0015-BLK1)					Prepared & Analyzed: 02/29/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0015 - EPA 5035 (Continued)

Blank (B4C0015-BLK1) Prepared & Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*48.9*	ug/kg	*50.0*		*97.8*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.9*	ug/kg	*50.0*		*99.7*	*70-130*		
Surrogate: Toluene-d8			*60.6*	ug/kg	*50.0*		*121*	*70-130*		

LCS (B4C0015-BS1) Prepared & Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	38		5	ug/kg	50.0		76.4	50-150		
Benzene	50		5	ug/kg	50.0		100	70-130		
Bromobenzene	48		5	ug/kg	50.0		95.7	70-130		
Bromochloromethane	53		5	ug/kg	50.0		105	70-130		
Bromodichloromethane	52		5	ug/kg	50.0		105	70-130		
Bromoform	49		5	ug/kg	50.0		98.9	70-130		
Bromomethane	51		5	ug/kg	50.0		102	50-150		
2-Butanone	41		5	ug/kg	50.0		82.3	50-150		
tert-Butyl alcohol	42		5	ug/kg	50.0		84.0	70-130		
sec-Butylbenzene	51		5	ug/kg	50.0		102	70-130		
n-Butylbenzene	49		5	ug/kg	50.0		98.5	70-130		
tert-Butylbenzene	51		5	ug/kg	50.0		102	70-130		
Methyl t-butyl ether (MTBE)	41		5	ug/kg	50.0		81.6	70-130		
Carbon Disulfide	40		5	ug/kg	50.0		79.5	50-150		
Carbon Tetrachloride	53		5	ug/kg	50.0		105	70-130		
Chlorobenzene	46		5	ug/kg	50.0		93.0	70-130		
Chloroethane	38		5	ug/kg	50.0		77.0	50-150		
Chloroform	52		5	ug/kg	50.0		103	70-130		
Chloromethane	53		5	ug/kg	50.0		106	50-150		
4-Chlorotoluene	49		5	ug/kg	50.0		97.1	70-130		
2-Chlorotoluene	47		5	ug/kg	50.0		93.0	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		92.9	70-130		
Dibromochloromethane	53		5	ug/kg	50.0		106	70-130		
1,2-Dibromoethane (EDB)	53		5	ug/kg	50.0		107	70-130		
Dibromomethane	54		5	ug/kg	50.0		107	60-140		
1,2-Dichlorobenzene	47		5	ug/kg	50.0		93.8	70-130		
1,3-Dichlorobenzene	50		5	ug/kg	50.0		99.2	70-130		
1,4-Dichlorobenzene	47		5	ug/kg	50.0		94.0	70-130		
1,1-Dichloroethane	51		5	ug/kg	50.0		101	70-130		
1,2-Dichloroethane	54		5	ug/kg	50.0		107	70-130		
trans-1,2-Dichloroethene	52		5	ug/kg	50.0		103	70-130		
cis-1,2-Dichloroethene	51		5	ug/kg	50.0		103	70-130		
1,1-Dichloroethene	40		5	ug/kg	50.0		80.5	70-130		
1,2-Dichloropropane	51		5	ug/kg	50.0		101	70-130		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0015 - EPA 5035 (Continued)

LCS (B4C0015-BS1) Prepared & Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
2,2-Dichloropropane	53		5	ug/kg	50.0		106	70-130		
cis-1,3-Dichloropropene	51		5	ug/kg	50.0		102	70-130		
trans-1,3-Dichloropropene	53		5	ug/kg	50.0		106	70-130		
1,1-Dichloropropene	53		5	ug/kg	50.0		106	70-130		
Diethyl ether	38		5	ug/kg	50.0		75.9	60-140		
1,4-Dioxane	265		100	ug/kg	250		106	0-200		
Ethylbenzene	48		5	ug/kg	50.0		95.9	70-130		
Hexachlorobutadiene	49		5	ug/kg	50.0		98.8	70-130		
2-Hexanone	42		5	ug/kg	50.0		84.1	50-150		
Isopropylbenzene	50		5	ug/kg	50.0		100	70-130		
p-Isopropyltoluene	51		5	ug/kg	50.0		102	70-130		
Methylene Chloride	50		5	ug/kg	50.0		101	60-140		
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.7	50-150		
Naphthalene	50		5	ug/kg	50.0		100	70-130		
n-Propylbenzene	51		5	ug/kg	50.0		102	70-130		
Styrene	50		5	ug/kg	50.0		99.9	70-130		
1,1,1,2-Tetrachloroethane	49		5	ug/kg	50.0		97.9	70-130		
Tetrachloroethene	52		5	ug/kg	50.0		103	70-130		
Tetrahydrofuran	51		5	ug/kg	50.0		101	50-150		
Toluene	54		5	ug/kg	50.0		108	70-130		
1,2,4-Trichlorobenzene	48		5	ug/kg	50.0		96.7	70-130		
1,2,3-Trichlorobenzene	49		5	ug/kg	50.0		98.4	70-130		
1,1,2-Trichloroethane	53		5	ug/kg	50.0		107	70-130		
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130		
Trichloroethene	51		5	ug/kg	50.0		101	70-130		
1,2,3-Trichloropropane	43		5	ug/kg	50.0		86.9	70-130		
1,3,5-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130		
1,2,4-Trimethylbenzene	51		5	ug/kg	50.0		102	70-130		
Vinyl Chloride	56		5	ug/kg	50.0		112	50-150		
o-Xylene	49		5	ug/kg	50.0		97.9	70-130		
m&p-Xylene	96		10	ug/kg	100		96.2	70-130		
1,1,2,2-Tetrachloroethane	48		5	ug/kg	50.0		95.1	70-130		
tert-Amyl methyl ether	47		5	ug/kg	50.0		94.2	70-130		
1,3-Dichloropropane	51		5	ug/kg	50.0		102	70-130		
Ethyl tert-butyl ether	48		5	ug/kg	50.0		95.3	70-130		
Trichlorofluoromethane	41		5	ug/kg	50.0		82.1	50-150		
Dichlorodifluoromethane	59		5	ug/kg	50.0		118	50-150		
Surrogate: 4-Bromofluorobenzene			*51.0*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*51.0*	ug/kg	*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8			*51.9*	ug/kg	*50.0*		*104*	*70-130*		

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Batch: B4C0015 - EPA 5035 (Continued)

LCS Dup (B4C0015-BSD1) Prepared & Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Acetone	41		5	ug/kg	50.0		81.1	50-150	5.94	30
Benzene	51		5	ug/kg	50.0		102	70-130	1.98	20
Bromobenzene	47		5	ug/kg	50.0		94.2	70-130	1.64	20
Bromochloromethane	54		5	ug/kg	50.0		109	70-130	3.07	20
Bromodichloromethane	54		5	ug/kg	50.0		109	70-130	3.71	20
Bromoform	49		5	ug/kg	50.0		97.2	70-130	1.65	20
Bromomethane	59		5	ug/kg	50.0		117	50-150	14.5	30
2-Butanone	42		5	ug/kg	50.0		84.3	50-150	2.40	30
tert-Butyl alcohol	47		5	ug/kg	50.0		94.7	70-130	12.0	20
sec-Butylbenzene	48		5	ug/kg	50.0		95.7	70-130	5.96	20
n-Butylbenzene	47		5	ug/kg	50.0		94.5	70-130	4.06	20
tert-Butylbenzene	48		5	ug/kg	50.0		95.6	70-130	6.22	20
Methyl t-butyl ether (MTBE)	33		5	ug/kg	50.0		65.7	70-130	21.6	20
Carbon Disulfide	30		5	ug/kg	50.0		60.6	50-150	26.9	40
Carbon Tetrachloride	53		5	ug/kg	50.0		106	70-130	0.341	20
Chlorobenzene	46		5	ug/kg	50.0		91.3	70-130	1.82	20
Chloroethane	51		5	ug/kg	50.0		102	50-150	28.0	30
Chloroform	53		5	ug/kg	50.0		106	70-130	2.43	20
Chloromethane	53		5	ug/kg	50.0		105	50-150	0.946	30
4-Chlorotoluene	46		5	ug/kg	50.0		92.8	70-130	4.57	20
2-Chlorotoluene	45		5	ug/kg	50.0		89.2	70-130	4.17	20
1,2-Dibromo-3-chloropropane (DBCP)	46		5	ug/kg	50.0		91.7	70-130	1.28	20
Dibromochloromethane	55		5	ug/kg	50.0		110	70-130	3.87	20
1,2-Dibromoethane (EDB)	55		5	ug/kg	50.0		110	70-130	3.29	20
Dibromomethane	56		5	ug/kg	50.0		111	60-140	3.70	30
1,2-Dichlorobenzene	46		5	ug/kg	50.0		92.0	70-130	1.87	20
1,3-Dichlorobenzene	48		5	ug/kg	50.0		95.1	70-130	4.20	20
1,4-Dichlorobenzene	46		5	ug/kg	50.0		91.4	70-130	2.80	20
1,1-Dichloroethane	42		5	ug/kg	50.0		83.6	70-130	19.1	20
1,2-Dichloroethane	53		5	ug/kg	50.0		107	70-130	0.411	20
trans-1,2-Dichloroethene	41		5	ug/kg	50.0		82.3	70-130	22.5	20
cis-1,2-Dichloroethene	54		5	ug/kg	50.0		107	70-130	4.59	20
1,1-Dichloroethene	44		5	ug/kg	50.0		87.3	70-130	8.08	20
1,2-Dichloropropane	52		5	ug/kg	50.0		104	70-130	3.29	20
2,2-Dichloropropane	52		5	ug/kg	50.0		104	70-130	1.85	20
cis-1,3-Dichloropropene	53		5	ug/kg	50.0		106	70-130	3.79	20
trans-1,3-Dichloropropene	55		5	ug/kg	50.0		111	70-130	4.42	20
1,1-Dichloropropene	53		5	ug/kg	50.0		105	70-130	0.454	20
Diethyl ether	41		5	ug/kg	50.0		81.4	60-140	6.97	30
1,4-Dioxane	268		100	ug/kg	250		107	0-200	1.21	50
Ethylbenzene	46		5	ug/kg	50.0		91.5	70-130	4.78	20
Hexachlorobutadiene	48		5	ug/kg	50.0		96.5	70-130	2.38	20
2-Hexanone	43		5	ug/kg	50.0		86.6	50-150	2.93	20
Isopropylbenzene	47		5	ug/kg	50.0		93.9	70-130	6.39	20
p-Isopropyltoluene	48		5	ug/kg	50.0		96.3	70-130	5.73	20
Methylene Chloride	38		5	ug/kg	50.0		75.7	60-140	28.4	30
4-Methyl-2-pentanone	47		5	ug/kg	50.0		93.6	50-150	0.128	20
Naphthalene	49		5	ug/kg	50.0		97.3	70-130	3.24	20
n-Propylbenzene	48		5	ug/kg	50.0		96.7	70-130	5.32	20
Styrene	48		5	ug/kg	50.0		96.1	70-130	3.94	20
1,1,1,2-Tetrachloroethane	48		5	ug/kg	50.0		95.4	70-130	2.57	20
Tetrachloroethene	52		5	ug/kg	50.0		104	70-130	1.02	20
Tetrahydrofuran	53		5	ug/kg	50.0		105	50-150	3.85	40
Toluene	55		5	ug/kg	50.0		110	70-130	1.98	20
1,2,4-Trichlorobenzene	47		5	ug/kg	50.0		94.3	70-130	2.45	20
1,2,3-Trichlorobenzene	49		5	ug/kg	50.0		98.1	70-130	0.285	20
1,1,2-Trichloroethane	50		5	ug/kg	50.0		100	70-130	6.17	20

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4C0015 - EPA 5035 (Continued)										
LCS Dup (B4C0015-BSD1)					Prepared & Analyzed: 02/29/24					
1,1,1-Trichloroethane	52		5	ug/kg	50.0		104	70-130	0.269	20
Trichloroethene	51		5	ug/kg	50.0		103	70-130	1.47	20
1,2,3-Trichloropropane	42		5	ug/kg	50.0		84.1	70-130	3.27	20
1,3,5-Trimethylbenzene	49		5	ug/kg	50.0		97.7	70-130	4.70	20
1,2,4-Trimethylbenzene	48		5	ug/kg	50.0		95.8	70-130	5.88	20
Vinyl Chloride	53		5	ug/kg	50.0		106	50-150	4.88	30
o-Xylene	47		5	ug/kg	50.0		93.5	70-130	4.58	20
m&p-Xylene	92		10	ug/kg	100		92.1	70-130	4.36	20
1,1,2,2-Tetrachloroethane	46		5	ug/kg	50.0		92.4	70-130	2.88	20
tert-Amyl methyl ether	49		5	ug/kg	50.0		97.0	70-130	2.93	20
1,3-Dichloropropane	54		5	ug/kg	50.0		108	70-130	5.15	20
Ethyl tert-butyl ether	45		5	ug/kg	50.0		89.5	70-130	6.34	20
Trichlorofluoromethane	47		5	ug/kg	50.0		94.4	50-150	13.9	20
Dichlorodifluoromethane	60		5	ug/kg	50.0		119	50-150	1.40	30
Surrogate: 4-Bromofluorobenzene			*49.9*	ug/kg	*50.0*		*99.7*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*53.1*	ug/kg	*50.0*		*106*	*70-130*		
Surrogate: Toluene-d8			*54.1*	ug/kg	*50.0*		*108*	*70-130*		

Quality Control
(Continued)

Semivolatile organic compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Batch: B4B1213 - 1_Semivolatiles Extractions

Blank (B4B1213-BLK1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	ND		129	ug/kg						
1,2-Dichlorobenzene	ND		129	ug/kg						
1,3-Dichlorobenzene	ND		129	ug/kg						
1,4-Dichlorobenzene	ND		129	ug/kg						
Phenol	ND		129	ug/kg						
2,4,5-Trichlorophenol	ND		129	ug/kg						
2,4,6-Trichlorophenol	ND		129	ug/kg						
2,4-Dichlorophenol	ND		129	ug/kg						
2,4-Dimethylphenol	ND		328	ug/kg						
2,4-Dinitrophenol	ND		328	ug/kg						
2,4-Dinitrotoluene	ND		129	ug/kg						
2,6-Dinitrotoluene	ND		129	ug/kg						
2-Chloronaphthalene	ND		129	ug/kg						
2-Chlorophenol	ND		129	ug/kg						
2-Methylnaphthalene	ND		129	ug/kg						
Nitrobenzene	ND		129	ug/kg						
2-Methylphenol	ND		129	ug/kg						
2-Nitroaniline	ND		129	ug/kg						
2-Nitrophenol	ND		328	ug/kg						
3,3′-Dichlorobenzidine	ND		328	ug/kg						
3-Nitroaniline	ND		129	ug/kg						
4,6-Dinitro-2-methylphenol	ND		328	ug/kg						
4-Bromophenyl phenyl ether	ND		129	ug/kg						
4-Chloro-3-methylphenol	ND		129	ug/kg						
4-Chloroaniline	ND		129	ug/kg						
4-Chlorophenyl phenyl ether	ND		129	ug/kg						
4-Nitroaniline	ND		129	ug/kg						
4-Nitrophenol	ND		328	ug/kg						
Acenaphthene	ND		129	ug/kg						
Acenaphthylene	ND		129	ug/kg						
Aniline	ND		129	ug/kg						
Anthracene	ND		129	ug/kg						
Benzo(a)anthracene	ND		129	ug/kg						
Benzo(a)pyrene	ND		129	ug/kg						
Benzo(b)fluoranthene	ND		129	ug/kg						
Benzo(g,h,i)perylene	ND		129	ug/kg						
Benzo(k)fluoranthene	ND		129	ug/kg						
Benzoic acid	ND		993	ug/kg						
Biphenyl	ND		20	ug/kg						
Bis(2-chloroethoxy)methane	ND		129	ug/kg						
Bis(2-chloroethyl)ether	ND		129	ug/kg						
Bis(2-chloroisopropyl)ether	ND		129	ug/kg						
Bis(2-ethylhexyl)phthalate	ND		397	ug/kg						
Butyl benzyl phthalate	ND		129	ug/kg						
Chrysene	ND		129	ug/kg						
Di-n-octyl phthalate	ND		199	ug/kg						
Dibenz(a,h)anthracene	ND		129	ug/kg						
Dibenzofuran	ND		129	ug/kg						
Diethyl phthalate	ND		129	ug/kg						
Dimethyl phthalate	ND		328	ug/kg						
Di-n-butyl phthalate	ND		199	ug/kg						
Fluoranthene	ND		129	ug/kg						
Fluorene	ND		129	ug/kg						
Hexachlorobenzene	ND		129	ug/kg						
Hexachlorobutadiene	ND		129	ug/kg						
Hexachlorocyclopentadiene	ND		328	ug/kg						
Hexachloroethane	ND		129	ug/kg						

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
Blank (B4B1213-BLK1)					Prepared: 02/28/24 Analyzed: 02/29/24					
Indeno(1,2,3-cd)pyrene	ND		129	ug/kg						
Isophorone	ND		129	ug/kg						
Naphthalene	ND		129	ug/kg						
N-Nitrosodimethylamine	ND		129	ug/kg						
N-Nitrosodi-n-propylamine	ND		129	ug/kg						
N-Nitrosodiphenylamine	ND		129	ug/kg						
Pentachlorophenol	ND		328	ug/kg						
Phenanthrene	ND		129	ug/kg						
Pyrene	ND		129	ug/kg						
m&p-Cresol	ND		258	ug/kg						
Pyridine	ND		129	ug/kg						
Azobenzene	ND		129	ug/kg						
Total Dichlorobenzene	ND		129	ug/kg						
Surrogate: Nitrobenzene-d5			*3910*	ug/kg	*6620*		*59.0*	*30-126*		
Surrogate: p-Terphenyl-d14			*5220*	ug/kg	*6620*		*78.8*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3410*	ug/kg	*6620*		*51.5*	*34-130*		
Surrogate: Phenol-d6			*3720*	ug/kg	*6620*		*56.2*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3230*	ug/kg	*6620*		*48.8*	*30-130*		
Surrogate: 2-Fluorophenol			*3980*	ug/kg	*6620*		*60.1*	*30-130*		
LCS (B4B1213-BS1)					Prepared: 02/28/24 Analyzed: 02/29/24					
1,2,4-Trichlorobenzene	2280		129	ug/kg	3310		68.7	40-130		
1,2-Dichlorobenzene	3110		129	ug/kg	3310		94.0	40-130		
1,3-Dichlorobenzene	2990		129	ug/kg	3310		90.2	40-130		
1,4-Dichlorobenzene	2650		129	ug/kg	3310		79.9	40-130		
Phenol	3350		129	ug/kg	3310		101	40-130		
2,4,5-Trichlorophenol	2470		129	ug/kg	3310		74.5	40-130		
2,4,6-Trichlorophenol	2660		129	ug/kg	3310		80.3	40-130		
2,4-Dichlorophenol	2670		129	ug/kg	3310		80.7	40-130		
2,4-Dimethylphenol	2640		328	ug/kg	3310		79.8	40-130		
2,4-Dinitrophenol	2190		328	ug/kg	3310		66.3	15-140		
2,4-Dinitrotoluene	2580		129	ug/kg	3310		78.0	40-130		
2,6-Dinitrotoluene	2680		129	ug/kg	3310		80.9	40-130		
2-Chloronaphthalene	2640		129	ug/kg	3310		79.7	40-130		
2-Chlorophenol	3130		129	ug/kg	3310		94.5	40-130		
2-Methylnaphthalene	2310		129	ug/kg	3310		69.6	40-130		
Nitrobenzene	2840		129	ug/kg	3310		85.7	40-130		
2-Methylphenol	2560		129	ug/kg	3310		77.2	40-130		
2-Nitroaniline	2570		129	ug/kg	3310		77.8	40-130		
2-Nitrophenol	2700		328	ug/kg	3310		81.4	40-130		
3-Nitroaniline	2530		129	ug/kg	3310		76.3	40-130		
4,6-Dinitro-2-methylphenol	2240		328	ug/kg	3310		67.7	30-130		
4-Bromophenyl phenyl ether	2050		129	ug/kg	3310		61.9	40-130		
4-Chloro-3-methylphenol	2280		129	ug/kg	3310		68.8	40-130		
4-Chlorophenyl phenyl ether	2220		129	ug/kg	3310		67.1	40-130		
4-Nitroaniline	2680		129	ug/kg	3310		80.9	40-130		
4-Nitrophenol	2360		328	ug/kg	3310		71.4	40-130		
Acenaphthene	2210		129	ug/kg	3310		66.6	40-130		
Acenaphthylene	2610		129	ug/kg	3310		78.8	40-130		
Anthracene	2940		129	ug/kg	3310		88.8	40-130		
Benzo(a)anthracene	2650		129	ug/kg	3310		79.9	40-130		
Benzo(a)pyrene	2770		129	ug/kg	3310		83.5	40-130		
Benzo(b)fluoranthene	2950		129	ug/kg	3310		89.0	40-130		
Benzo(g,h,i)perylene	2500		129	ug/kg	3310		75.4	40-130		
Benzo(k)fluoranthene	3090		129	ug/kg	3310		93.2	40-130		
Biphenyl	626		20	ug/kg	828		75.7	40-130		
Bis(2-chloroethoxy)methane	2870		129	ug/kg	3310		86.8	40-130		

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)

LCS (B4B1213-BS1) Prepared: 02/28/24 Analyzed: 02/29/24

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Bis(2-chloroethyl)ether	3100		129	ug/kg	3310		93.5	40-130		
Bis(2-chloroisopropyl)ether	3600		129	ug/kg	3310		109	40-130		
Bis(2-ethylhexyl)phthalate	2960		397	ug/kg	3310		89.3	40-130		
Butyl benzyl phthalate	2870		129	ug/kg	3310		86.8	40-130		
Chrysene	2860		129	ug/kg	3310		86.3	40-130		
Di-n-octyl phthalate	2150		199	ug/kg	3310		64.9	40-130		
Dibenz(a,h)anthracene	2490		129	ug/kg	3310		75.3	40-130		
Dibenzofuran	2570		129	ug/kg	3310		77.6	40-130		
Diethyl phthalate	2730		129	ug/kg	3310		82.5	40-130		
Dimethyl phthalate	2500		328	ug/kg	3310		75.5	40-130		
Di-n-butyl phthalate	3200		199	ug/kg	3310		96.6	40-130		
Fluoranthene	2990		129	ug/kg	3310		90.3	40-130		
Fluorene	2510		129	ug/kg	3310		75.7	40-130		
Hexachlorobenzene	2570		129	ug/kg	3310		77.7	40-130		
Hexachlorobutadiene	2580		129	ug/kg	3310		78.0	40-130		
Hexachlorocyclopentadiene	2530		328	ug/kg	3310		76.3	40-130		
Hexachloroethane	2970		129	ug/kg	3310		89.7	40-130		
Indeno(1,2,3-cd)pyrene	2600		129	ug/kg	3310		78.5	40-130		
Isophorone	3010		129	ug/kg	3310		90.8	40-130		
Naphthalene	2360		129	ug/kg	3310		71.2	40-130		
N-Nitrosodimethylamine	2890		129	ug/kg	3310		87.4	40-130		
N-Nitrosodi-n-propylamine	2830		129	ug/kg	3310		85.5	40-130		
N-Nitrosodiphenylamine	2750		129	ug/kg	3310		82.9	40-130		
Pentachlorophenol	2410		328	ug/kg	3310		72.8	15-140		
Phenanthrene	3070		129	ug/kg	3310		92.6	40-130		
Pyrene	3010		129	ug/kg	3310		91.0	40-130		
m&p-Cresol	2500		258	ug/kg	3310		75.5	40-130		
Surrogate: Nitrobenzene-d5			*4160*	ug/kg	*6620*		*62.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5200*	ug/kg	*6620*		*78.6*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3730*	ug/kg	*6620*		*56.3*	*34-130*		
Surrogate: Phenol-d6			*4630*	ug/kg	*6620*		*70.0*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*3910*	ug/kg	*6620*		*59.0*	*30-130*		
Surrogate: 2-Fluorophenol			*5100*	ug/kg	*6620*		*77.0*	*30-130*		

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4B1213-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
1,2,4-Trichlorobenzene	2270		129	ug/kg	3310		68.7	40-130	0.0874	30
1,2-Dichlorobenzene	2550		129	ug/kg	3310		77.0	40-130	19.9	30
1,3-Dichlorobenzene	2480		129	ug/kg	3310		75.0	40-130	18.4	30
1,4-Dichlorobenzene	2260		129	ug/kg	3310		68.4	40-130	15.5	30
Phenol	2680		129	ug/kg	3310		81.0	40-130	22.3	30
2,4,5-Trichlorophenol	2640		129	ug/kg	3310		79.6	40-130	6.67	30
2,4,6-Trichlorophenol	2540		129	ug/kg	3310		76.6	40-130	4.71	30
2,4-Dichlorophenol	2640		129	ug/kg	3310		79.8	40-130	1.07	30
2,4-Dimethylphenol	2420		328	ug/kg	3310		73.1	40-130	8.87	30
2,4-Dinitrophenol	2130		328	ug/kg	3310		64.2	15-140	3.13	30
2,4-Dinitrotoluene	2740		129	ug/kg	3310		82.7	40-130	5.87	30
2,6-Dinitrotoluene	2730		129	ug/kg	3310		82.3	40-130	1.76	30
2-Chloronaphthalene	2740		129	ug/kg	3310		82.8	40-130	3.82	30
2-Chlorophenol	2630		129	ug/kg	3310		79.3	40-130	17.4	30
2-Methylnaphthalene	2250		129	ug/kg	3310		67.9	40-130	2.50	30
Nitrobenzene	2800		129	ug/kg	3310		84.5	40-130	1.41	30
2-Methylphenol	2170		129	ug/kg	3310		65.6	40-130	16.3	30
2-Nitroaniline	2600		129	ug/kg	3310		78.5	40-130	0.973	30
2-Nitrophenol	2540		328	ug/kg	3310		76.8	40-130	5.89	30
3-Nitroaniline	2660		129	ug/kg	3310		80.5	40-130	5.31	30
4,6-Dinitro-2-methylphenol	2700		328	ug/kg	3310		81.5	30-130	18.5	30
4-Bromophenyl phenyl ether	2240		129	ug/kg	3310		67.6	40-130	8.81	30
4-Chloro-3-methylphenol	2220		129	ug/kg	3310		66.9	40-130	2.80	30
4-Chlorophenyl phenyl ether	2260		129	ug/kg	3310		68.4	40-130	1.92	30
4-Nitroaniline	1970		129	ug/kg	3310		59.5	40-130	30.5	30
4-Nitrophenol	2680		328	ug/kg	3310		80.9	40-130	12.4	30
Acenaphthene	2220		129	ug/kg	3310		67.1	40-130	0.688	30
Acenaphthylene	2690		129	ug/kg	3310		81.3	40-130	3.10	30
Anthracene	3050		129	ug/kg	3310		92.1	40-130	3.58	30
Benzo(a)anthracene	2670		129	ug/kg	3310		80.5	40-130	0.773	30
Benzo(a)pyrene	2920		129	ug/kg	3310		88.2	40-130	5.43	30
Benzo(b)fluoranthene	3050		129	ug/kg	3310		92.0	40-130	3.27	30
Benzo(g,h,i)perylene	2800		129	ug/kg	3310		84.5	40-130	11.4	30
Benzo(k)fluoranthene	3270		129	ug/kg	3310		98.8	40-130	5.83	30
Biphenyl	663		20	ug/kg	828		80.1	40-130	5.65	30
Bis(2-chloroethoxy)methane	2890		129	ug/kg	3310		87.3	40-130	0.643	30
Bis(2-chloroethyl)ether	2740		129	ug/kg	3310		82.8	40-130	12.1	30
Bis(2-chloroisopropyl)ether	3070		129	ug/kg	3310		92.8	40-130	15.9	30
Bis(2-ethylhexyl)phthalate	3030		397	ug/kg	3310		91.4	40-130	2.30	30
Butyl benzyl phthalate	2900		129	ug/kg	3310		87.5	40-130	0.895	30
Chrysene	2930		129	ug/kg	3310		88.6	40-130	2.63	30
Di-n-octyl phthalate	3290		199	ug/kg	3310		99.4	40-130	42.1	30
Dibenz(a,h)anthracene	2610		129	ug/kg	3310		78.8	40-130	4.46	30
Dibenzofuran	2720		129	ug/kg	3310		82.1	40-130	5.66	30
Diethyl phthalate	2830		129	ug/kg	3310		85.6	40-130	3.64	30
Dimethyl phthalate	2580		328	ug/kg	3310		78.0	40-130	3.23	30
Di-n-butyl phthalate	3310		199	ug/kg	3310		99.9	40-130	3.38	30
Fluoranthene	3080		129	ug/kg	3310		93.0	40-130	2.92	30
Fluorene	2640		129	ug/kg	3310		79.8	40-130	5.28	30
Hexachlorobenzene	2790		129	ug/kg	3310		84.1	40-130	8.01	30
Hexachlorobutadiene	2510		129	ug/kg	3310		75.8	40-130	2.76	30
Hexachlorocyclopentadiene	2640		328	ug/kg	3310		79.8	40-130	4.46	30
Hexachloroethane	2460		129	ug/kg	3310		74.3	40-130	18.8	30
Indeno(1,2,3-cd)pyrene	2730		129	ug/kg	3310		82.3	40-130	4.68	30
Isophorone	2960		129	ug/kg	3310		89.3	40-130	1.75	30
Naphthalene	2400		129	ug/kg	3310		72.5	40-130	1.84	30
N-Nitrosodimethylamine	2060		129	ug/kg	3310		62.3	40-130	[illegible]	30

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1213 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4B1213-BSD1)					Prepared: 02/28/24 Analyzed: 03/01/24					
N-Nitrosodi-n-propylamine	2530		129	ug/kg	3310		76.3	40-130	11.4	30
N-Nitrosodiphenylamine	2890		129	ug/kg	3310		87.4	40-130	5.24	30
Pentachlorophenol	2620		328	ug/kg	3310		79.3	15-140	8.44	30
Phenanthrene	3230		129	ug/kg	3310		97.5	40-130	5.11	30
Pyrene	3050		129	ug/kg	3310		92.1	40-130	1.20	30
m&p-Cresol	2270		258	ug/kg	3310		68.5	40-130	9.73	30
Surrogate: Nitrobenzene-d5			*4090*	ug/kg	*6620*		*61.8*	*30-126*		
Surrogate: p-Terphenyl-d14			*5160*	ug/kg	*6620*		*77.9*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3750*	ug/kg	*6620*		*56.7*	*34-130*		
Surrogate: Phenol-d6			*3870*	ug/kg	*6620*		*58.5*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*4140*	ug/kg	*6620*		*62.6*	*30-130*		
Surrogate: 2-Fluorophenol			*4220*	ug/kg	*6620*		*63.8*	*30-130*		

Polychlorinated Biphenyls (PCBs)

Batch: B4B1223 - 1_Semivolatiles Extractions

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (B4B1223-BLK1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	ND		66	ug/kg						
Aroclor-1221	ND		66	ug/kg						
Aroclor-1232	ND		66	ug/kg						
Aroclor-1242	ND		66	ug/kg						
Aroclor-1248	ND		66	ug/kg						
Aroclor-1254	ND		66	ug/kg						
Aroclor-1260	ND		66	ug/kg						
Aroclor-1262	ND		66	ug/kg						
Aroclor-1268	ND		66	ug/kg						
PCBs (Total)	ND		66	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*8.34*	ug/kg	*13.3*		*62.6*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.03*	ug/kg	*13.3*		*45.2*	*43.3-130*		
LCS (B4B1223-BS1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	199		66	ug/kg	167		119	58.2-125		
Aroclor-1260	195		66	ug/kg	167		117	65.5-130		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*10.2*	ug/kg	*13.3*		*76.4*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.50*	ug/kg	*13.3*		*48.8*	*43.3-130*		
LCS Dup (B4B1223-BSD1)					Prepared: 02/29/24 Analyzed: 03/02/24					
Aroclor-1016	206		66	ug/kg	167		124	58.2-125	3.68	20
Aroclor-1260	203		66	ug/kg	167		122	65.5-130	3.91	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*10.0*	ug/kg	*13.3*		*75.2*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*6.34*	ug/kg	*13.3*		*47.5*	*43.3-130*		

Quality Control
(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4B1186 - 1_Semivolatiles Extractions										
Blank (B4B1186-BLK1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*9.08*	mg/kg	*8.33*		*109*	*50-130*		
LCS (B4B1186-BS1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	583		27	mg/kg	667		87.5	44.7-125		
Surrogate: Chlorooctadecane			*9.39*	mg/kg	*8.33*		*113*	*50-130*		
LCS Dup (B4B1186-BSD1)					Prepared & Analyzed: 02/28/24					
Total Petroleum Hydrocarbons	551		27	mg/kg	667		82.6	44.7-125	5.71	30
Surrogate: Chlorooctadecane			*9.05*	mg/kg	*8.33*		*109*	*50-130*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

NEW ENGLAND TESTING LABORATORY, IN
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

4 B 2 7035 e

PROJ. NO. 3096

PROJECT NAME/LOCATION MAYNARD

CLIENT

REPORT TO:

INVOICE TO:

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** COM-97 + MCP 14	HAZ Characteristics					REMARKS
2/27/24		X		B-108, 2-4' • • •		X		3		X	X					PID <0.1 ppmV
2/27/24		X		B-118, 2-4' • • •		X		3		X	X					" "

Sampled by: (Signature)	Date/Time 2/27/24	Received by: (Signature)	Date/Time 2/27/24 12:36
Relinquished by: (Signature)	Date/Time 2/27/24 1:22	Received by: (Signature)	Date/Time 2/27 1320
Relinquished by: (Signature)	Date/Time 2/27 1145	Received for Laboratory by: (Signature)	Date/Time 2/27 1245

Laboratory Remarks:
Temp. received: 3
Cooled ☐

Special Instructions:
List Specific Detection
Limit Requirements:

Turnaround (Business Days)______

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc.
Project #: 3096

Project Location: Maynard
RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s): 4B27035

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

__Data User Note__: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature:
Position: Laboratory Director

Printed Name: Richard Warila
Date: 3/5/2024

SECTION 31 20 00

EARTH MOVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. All the Contract Documents, including Drawings, General and Supplementary Conditions and Division 1 – General Requirements, apply to the Work of this Section.

1.02 SPECIAL INSTRUCTIONS

A. The General Contractor shall become familiar with other Sections of the Specifications to determine the type and extent of work there under which affects the work of this section whether or not such work is specifically mentioned.

B. Examine all drawings and all other Sections of the Specifications for the requirements therein affecting the work of this trade. Plans, surveys, measurements, and dimensions, under which the work is to be performed are believed to be correct to the best of the Architect’s knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein. The contractor shall reconcile all drawings.

C. Where there is a conflict between drawings and these specifications, the stricter requirement and the interpretation that is most in favor of the owner shall be adopted at no additional cost to the owner.

D. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

E. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure a steady progress of work under this Contract.

1.03 DESCRIPTION OF WORK

A. The Base Bid shall include but is not limited to the following:

1. Removing and stacking topsoil within the limits noted in the drawings.
2. Excavation of earth, and rock excavating to the elevations noted on the drawings or specified herein, whichever is deeper. Disposing of excavated material generated within the limit of excavation and installing structural fill within the footprint of the proposed building and within the influence zone starting from the natural sand and gravel or rock up to finish grade as shown on drawings.
3. Removal and disposal of existing utilities as shown in the drawings.
4. Removal and disposal of asphalt and concrete pavement, retaining walls, fences, curbing, brush, trees and tree stumps to the limits as shown on drawings. [ADD2]
5. Improving the existing fill within proposed paved areas.

B. The Work of this Section includes, but is not limited to, furnishing and installation of the following:

1. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.
2. All materials, equipment, labor, and services required for all Earth Moving work, including all items incidental thereto, as specified herein and as shown on the Drawings:
3. All excavated soil shall be removed from the site and disposed of.
4. No burning on the site shall be permitted.

5. Removing unsuitable materials from within the proposed building footprint and the clearing limits noted on the drawings, including asphalt, existing fill, and organic matter, construction debris, remnants of existing foundations, and other deleterious matter.
6. Improving the subgrade of the proposed paved areas in the existing fill as described in these specifications.
7. Dewatering
8. Proof-rolling of exposed subgrade for fill, footings, foundations, slabs, walks, pavements, lawns and grasses, and exterior plants.
9. Performing test pits before the start of and during excavation as required by the Geotechnical Engineer;
10. Removing and/or improving the existing fill in accordance with the requirements of Section 3.02 of these specifications.
11. Amending the existing fill to meet the gradation requirements of Structural Fill and/or Ordinary Fill.
12. Fill slopes and site retaining walls.
13. Installing excavation support, shoring or bracing as necessary.
14. Protecting existing utilities during the different phases of the earthwork operations.
15. Disposing off-site of excess or unsuitable materials.
16. Placing bedding, sub-base and base course layers.
17. Stabilizing/mitigating saturated or otherwise disturbed materials.
18. Excavating and backfilling required for the installation of the building slab and footings, pavements, underground utilities including storm drainage, sanitary, electrical and water.
19. Pumping and/or bailing necessary to maintain excavated spaces free from water from any source whatsoever.
20. Preparation, submission of, and compliance with an approved, phased erosion control plan in accordance with DEP requirements for a SWPPP (Stormwater Pollution Prevention Plan) to include materials and measures required to control soil erosion resulting from construction operations for the duration of the project.
21. All temporary stormwater management controls shall be in accordance with the Town of Maynard Stormwater Drain System By-Laws Chapter 33, Stormwater Management By-Laws Chapter 34 latest addition and the Town of Maynard MS-4 permit. As enforced by the Town of Maynard (DPW) Department of Public Works or a DPW duly authorized representative.
22. Designation of an Erosion Control Supervisor and submission of weekly erosion control reports.
23. Coordination with Archaeological Monitor.
24. Sediment removal and disposal.
25. Maintenance of erosion control devices.
26. Removal of erosion control devices as directed.
27. Install temporary construction fencing and safety devices or controls as specified and as necessary.
28. Dust control and clean-up.
29. Performing material testing, and field density testing as needed.
30. Groundwater Control, dewatering, pumping, bailing, filtering, and control of groundwater and surface water for all work under this contract in accordance with item 1.13 of these specifications.
31. Refer to specification Section 31 21 01 Site Utilities Preparation for additional dewatering requirements.
32. Installing fencing and safety devices or controls as specified and as necessary.
33. Notifying all affected utility companies and Dig Safe before the start of work.
34. Processing and improving onsite marginal soil, as needed, including by crushing and blending, to meet the specifications herein.
35. Installing seismographs and monitoring vibration at the nearby existing buildings during construction. The cost of vibration monitoring shall be included in the base bid.

1.04 GENERAL REQUIREMENTS

A. The Contractor shall furnish all labor, material, tools, and equipment necessary to excavate materials; segregate, track, handle, sample, analyze, and test excavated materials, backfill, and re-grade as indicated on the Drawings.

B. The Contractor shall use suitable, amended on-site soils and fill, and soil from off-site sources, as needed. Please note that most of the on-site materials will likely not be suitable for reuse without amendment, nor will all required material gradations be present on the site. The contractor shall avoid mixing the reusable soils with fine-grained and/or organic soils.

C. Rock blasted or excavated from the excavation area shall not be used directly for backfill below footings or retaining walls unless the rock is processed to meet the gradations of the individual fill materials as noted herein.

D. The Contractor shall make excavations in such a manner and to such widths that will provide suitable room for performing the Work and shall furnish and place all sheeting, bracing, and supports, if necessary. Excavation support is anticipated for this project.

E. The Contractor shall provide labor and material for all pumping and draining, as necessary; and shall render the bottom of excavation firm and unyielding, and dry and in all respects acceptable. The Contractor shall collect and properly dispose of all discharge water from dewatering systems in accordance with Town of Maynard Bylaws noted herein and all State requirements, regulations and permits.

F. The contractor shall provide a dewatering system for the discharge water used during the installation of the geothermal wells. Refer to Section 31 21 00 Site Utilities Preparation for requirements.

G. The Contractor shall raise the Site to final grades and compact the subgrade and intermediate layers to the required criteria set forth within this Section.

H. The contractor shall provide routine monitoring of in-place excavation support system.

I. Contractor shall protect and moisture condition all onsite and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture in order to maintain suitable workability of the soil materials. Failure by the Contractor to follow this requirement shall not be cause for additional cost to the Owner.

1.05 LAWS AND REGULATIONS

A. Work shall be accomplished in accordance with regulations of local, county, state and national agencies or utility company standards as they apply.

B. Comply with the rules, regulations, laws and ordinances of the Town of Maynard, of the State of Massachusetts, appropriate agencies of the State of Massachusetts and all other authorities having jurisdiction. Coordinate all work done within Town and State rights of way with the appropriate agencies. Provide all required traffic control and safety measures, including uniformed police officers per Town and State requirements. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

C. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc., the Commonwealth of Massachusetts Rules and Regulations For the Prevention of Accidents in Construction Operations, and the requirements of the Occupational Safety and Health Administration (OSHA), United States Department of Labor.

D. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

1.06 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all the Contract Documents for requirements that affect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this section include, but are not limited to, the following Sections:

1. Section 31 09 00 – Subsurface Investigation
2. Section 31 10 00 - Site Clearing
3. Section 31 21 00 - Site Preparation
4. Section 31 21 01 - Site Utilities Preparation
5. Section 32 25 00 - Erosion & Sedimentation Controls
6. Section 32 16 00 – Wood Guard Rail
7. Section 32-31 70 – Chain Link Fences and Gates
8. Section 33 32 23 – Segmental Retaining Walls
9. Section 33 61 37 – Geothermal Ground -Source Heat Exchange System

1.07 REFERENCE SPECIFICATIONS [ADD2]

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements govern.

1. American Society for Testing and Materials (ASTM):
    a. ASTM C136, Sieve Analysis of Fine and Coarse Aggregates.
    b. ASTM D1556, Density of Soil In Place by the Sand-Cone Method
    c. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbs/ft.^{3} (2,700 kN-m/m^3)).
    d. ASTM D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
    e. ASTM D6913, Particle Size Analysis of Soils.
    f. ASTM D2487, Standard Test Method for Classification of Soils for Engineering Purposes.
2. Commonwealth of Massachusetts:
    a. Massachusetts Department of Transportation (MassDOT), "Standard Specifications for Highways and Bridges" latest edition.
    b. Commonwealth of Massachusetts State Building Code.
3. American Association of State Highway and Transportation Officials (AASHTO):
    a. AASHTO T-11, Standard Method of Test for amount of material finer than 0.075 mm sieve in aggregate.
    b. AASHTO T-27, Standard Method of Test for sieve analysis of fine and coarse aggregates.
4. Occupational Safety and Health Act (OSHA) of 1970 (Public Law 91-596 of the United States, 29 USC Section 651 et seq.).
5. Deleted [ADD2]
6. DD Phase Geotechnical Report, Proposed Green Meadow Elementary School dated April 24, 2024 [ADD2]

1.08 BENCH MARKS AND ENGINEERING

A. Employ, with the Contract Price, a competent Civil Engineer or Land Surveyor, registered in Massachusetts, who shall perform the following work:

1. All lines and grade work not presently established at the site shall be laid out by the Engineer/Surveyor in accordance with the Drawings and Specifications. Establish permanent benchmarks necessary for the work under this Contract. Maintain all established bounds and bench marks and replace as directed at no expense to the Owner any that are destroyed or disturbed.
2. Establish all lines and grades for the work and verify all locations, property lines, work lines, and other dimensioned points indicated on the Contract Drawings for the existing site.

3. Submit to the Architect, a written confirmation of locations of all lines, and any discrepancies between conditions and locations as they actually exist and those indicated on the Contract Drawings. Such confirmation shall bear the registration stamp of the Engineer/Surveyor.

B. The General Contractor shall use GPS (Global Positioning System) to locate all horizontal and vertical data shown on the CAD drawings for all proposed site work.

C. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.

D. Do not commence any excavation or construction work until verification of the layout performed by the Engineer/Surveyor has been received and approved by the Architect.

1.09 SOIL REPORT

A. DD Phase Geotechnical Report, Proposed Green Meadows Elementary School Maynard Massachusetts dated: April 27, 2024 prepared by Lahlaf Geotechnical Consulting, Inc. is attached hereto, and hereby made part of the Contract Documents. [ADD2]

B. The Owner assumes no responsibility for the General Contractor's failure to make his own site investigation and makes no representation other than the soils reports regarding the character of the soil or subsurface conditions which may be encountered during the performance of the work. The General Contractor shall refer to Section 31 09 00 - Subsurface Investigation, and attached soil Reports. Failure by the General Contractor to be aware of existing site conditions shall not be cause for additional cost to the Owner.

C. The subsurface explorations and geotechnical report were performed primarily for use in preparing the foundation design and are included for the convenience of the contractor. Use and interpretation of these data for purposes of the work shall be the responsibility of the Contractor. Subsurface conditions and groundwater levels are not considered as accurate for any times or locations other than the specific time and location of each of the explorations.

D. Interpretation of this data for purposes of construction is the responsibility of the Contractor. It is the Contractor's responsibility to make interpretations and draw conclusions with respect to the character of materials to be encountered and groundwater conditions at the site and their impact upon Contractor's work based on his expert knowledge of the area, construction dewatering methods, and support of excavation methods. Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

E. Information on subsurface conditions is made available for the convenience of the Bidders. The Owner does not represent to the General Contractor that the information is either an accurate or a comprehensive indication of subsurface conditions. Bidders are invited to review the information to apprise themselves of the information available, and also to make additional investigations at their own expense.

F. Test boring location as depicted on the Drawings are located by tape measurements from existing site features and structures and shall only be considered as accurate as the procedure utilized.

G. The Contractor shall be aware that the ground surface elevation was interpolated to the nearest foot and are approximate.

H. No claim for extra cost or extension of time resulting from reliance by the General Contractor on information presented herein shall be allowed, except as provided in the Contract Documents.

1.10 EXISTING UTILITIES

A. Locate and mark underground utilities to remain in service before beginning the work. Active utilities existing on the site and work areas shall be carefully protected from damage and relocated or removed as necessitated by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

B. Active utilities existing at the site and work areas shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

C. Inactive or abandoned utilities encountered during construction shall be removed if within the building area or grouted, plugged, or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect.

1.11 SAMPLING AND TESTING

A. The contractor shall submit two (2) 50-lbs samples of each type of fill material, in air-tight containers, proposed for use on-site in accordance with PART 2 - PRODUCTS, to the Owner's testing agency for preliminary compliance testing at least two (2) weeks prior to use. No fill material shall be delivered to the site or placed until the material has been preliminarily approved. The final review of the material will be based on a sample tested by the owner's testing agency upon delivery of the material to the site. The gradation curves shall fit entirely within the envelopes defined by the limits specified herein for the material to be approved for use at the site.

1. Samples shall be delivered to the office of the Architect or as directed.
2. Samples required in connection with compaction tests will be taken and transported by the Soils Representative.
3. Additional tests, including grain-size analyses and laboratory compaction tests shall be performed on the material after it is delivered to the site.
4. For on-site materials, submit representative samples, collected from each stockpile of excavated on-site material to be used, directly to the Owner's Geotechnical Consultant's office or as directed at least two (2) weeks in advance of use of these materials.

B. Product Data: Submit location of pits for borrow material. Samples shall include name of source, name of material, sampling date, and intended use.

C. Samples shall be representative of the source pit. If materials are found to vary once construction begins, the Contractor will be required to submit additional representative samples, for compliance testing, at his own cost.

D. Compaction (Field Density) tests:

1. Field density tests shall be performed at all bench and other site fixture pads.
2. Compaction tests shall be performed on each lift of placed and compacted material and at every 100 feet within the same lift. Accordingly, it is the responsibility of the Contractor to provide ample notice to the testing agency to provide a field representative to perform field density tests.

E. Materials imported to the site by the Contractor for on-site use shall not contain oil, hazardous waste, or deleterious materials.

1. The Contractor shall be responsible for all costs incurred by the Owner as a result of the Contractor's action to import materials containing concentrations of oil and/or hazardous materials to the site, including the cost of removing the contaminated soil, the cost of remediation of onsite soils affected by the contamination, and the cost of replacement..
2. In the event that site characterization of off-site borrow sources indicates that soils are acceptable to the Architect or Engineer for use, then chemical testing will not be required. It is anticipated that chemical testing would not normally be required for material from customarily utilized commercial borrow sources.

   No fill material from "urban areas" will be accepted for fill at the site, even if chemical testing indicates no exceedances of "Reportable Concentrations".

   If requested by the Owner or Engineer, based on review of the borrow site characterization, the Contractor shall conduct testing on proposed fill material and submit results prior to delivery to the site, at no additional cost to the Owner. Testing shall be conducted by a DEP-certified testing laboratory and shall include, at a minimum, the following analytical test data.

   a. Total Petroleum Hydrocarbons (EPA Method 418.1) every 100 yards
   b. Volatile Organic Compounds (EPA Method 8420) every 500 yards

    c. PCB and Pesticides (EPA Method 8080) every 500 yards
    d. Total RCRA Metals (EPA Method 6000-7000 series) every 500 yards
    e. Polynuclear Aromatic Hydrocarbons (EPA Method 8270) every 500 yards
    f. TCLP for those total parameters which exceed twenty times the TCP criteria every 500 yards.
    g. Total cyanide (EPA 9020)

3. All off-site material submitted for use on the project site shall conform to the S-1 Soils Standards contained in the Massachusetts Contingency Plan, dated October 1, 1993, Section 310 CMR 40.0975 or site soil background levels, whichever is lower. Samples will be chemically tested to determine their conformance with the S-1 Soils Standards and site soil background levels.

4. Testing parameters and testing frequencies may be reduced, as directed by the Soils Representative.

5. All sieve analyses for conformance of on-site and off-site fill materials to be used in the work shall be done by means of a mechanical wet sieve analysis and in accordance with ASTM D 6913 using the sieves listed in Sections 2.01, A. plus the following sieves: #40, #10, and 1 inch. [ADD2]

1.12 QUALITY ASSURANCE

A. The Owner may retain and pay for the services of an independent testing agency (Soils Representative) to monitor backfill operations, perform laboratory tests on soil samples, and to perform field density tests; and a Geotechnical Engineer to periodically observe the earthwork operations, observe the preparation of the subgrade for footings, slabs, and paved areas, and to review laboratory and field test data. The geotechnical engineer may from time to time request that the contractor excavate tests pits ahead of excavation to confirm subsurface conditions. Test pits shall be performed at no additional cost to the Owner.

B. The Engineer's duties do not include the supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the contractor from defects discovered in his Work at that time or subsequent to the testing.

C. The services of the Soils representative may include but are not limited to monitoring and performing observations of the backfill operations and testing during placement of fills and backfills within the proposed building, parking area, underneath structures in general, and controlled fill areas.

D. Subgrades shall be observed and approved by the geotechnical engineer before placing fill. The compaction and material composition shall be approved by the geotechnical engineer before placement. The by the Architect, and/or Geotechnical Engineer prior to placing subsequent lifts. If inspections indicate subgrade does not meet specified requirements, the unsuitable subgrade shall be excavated, the unsuitable material shall be removed, and replaced with approved structural backfill material and compacted at no additional cost to the owner or architect. The work shall be done in accordance with this specification.

E. Costs related to retesting due to unacceptable quality of work and failures discovered by testing shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

    1. The Soils Representative's presence or the Geotechnical Engineer does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Soils Representative, nor any observations and testing performed by him, nor any notice or failure to give notice shall excuse the Contractor from defects discovered in his work.
    2. The Owner reserves the right to modify the services of the Soils Representative or Geotechnical engineer.

F. The contractor shall make provisions for allowing safe and timely observations and testing of Contractor's Work by the Geotechnical Engineer and by the Soils Representative. The presence of the independent testing agency and/or the Geotechnical Engineer does not include supervision or direction of the actual work of the Contractor, his employees or agents. Neither the presence of the Soils Representative and/or the Geotechnical Engineer, nor any observations and testing performed by them, nor failure to give notice of defects shall excuse the Contractor from defects discovered in his work.

G. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, Soils Representative, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

H. Testing: Compaction tests will be required by the Owner and will be paid for by the owner. No specific testing schedule has been established at this time. If tests indicate that density requirement have not been achieved, the contractor continue compacting the tested material. All retesting is these areas shall be paid for by the contractor.

I. The Owner's Testing Agency will perform water content, gradation tests on onsite and processed materials, and compaction tests at a frequency and at locations as required. The results of these tests will be submitted to the Architect, and a copy submitted to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy the indicated deficiencies.

J. Contractor shall notify Architect when excavations have reached required subgrade and provide a minimum notice of 24 hours prior to placement of backfill on exposed subgrade. Density and Compaction Testing: The contractor is responsible to schedule compaction tests and allow adequate time for the proper execution of said tests. **This section also applies to instances when the General Contractor resumes earthwork operations after a period of pause in earthwork operations that require observations by the Geotechnical Engineer.**

K. Testing frequency shall be as follows:

Material	**Responsible Party**	**Situation**	**Test**	**Minimum Frequency**
Structural Fill/ Ordinary Fill/ Processed Gravel for Subbase/ Common Borrow/ Bedding Material/ Crushed Stone / Pea Gravel	Contractor	Source Investigation	Grain Size Moisture Density Relationship	1 per source 1 per source
	Owner	During Placement	Grain Size t Moisture Density Relationship	1 per source 1 per 100 tons
	Owner	As-Placed	Dry Density and As-Placed Moisture	2 per lift per location or activity and no less than 1 every 500 sf
Loam Borrow	Contractor	During Placement	PH, Nitrogen, Phosphorous, Potassium, and USDA Classification	2 per Acre
Riprap	Contractor	Source Investigation	Source Material Certification Specific Gravity	1 per source 1 per source
	Contractor	During Placement	Source Material Certification Specific Gravity	1 per 500 tons 1 per 500 tons

The Owner reserves the right to modify the services of the Soils Representative or Geotechnical engineer.

1.13 PROTECTION

A. All rules and regulations governing the respective utilities shall be observed in executing all work under this Section.

B. All work shall be executed in such a manner as to prevent any damage to existing streets, curbs, paving, service utility lines, structures and adjoining property. Monuments and benchmarks shall be carefully maintained and, if disturbed or destroyed and replaced.

C. The work of this Section shall be performed in such a manner as to cause no interference with access by the abutters, Subcontractors or other Contractors to all portions of the site as is necessary for the normal conduct of their work.

1.14 DEFINITIONS

A. MassDOT specifications shall mean “The Standard Specification for Highways and Bridges”, Commonwealth of Massachusetts, Massachusetts Department of Transportation, latest edition, including supplements.

B. The words "finished grades" as used herein mean the required final grade elevations indicated on the Drawings and defined in this specification section. Where not otherwise indicated, areas outside of buildings shall be given uniform slopes between points, for which finished grades are shown, or between such points and existing grade except that vertical curves or rounding shall be provided at abrupt changes in slope.

C. Excavation: Removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed. See EXECUTION section for directions for treatment of excavations in rock.

D. Unauthorized Excavation: Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense. See EXECUTION section for instructions for treatment of unauthorized excavation.

E. Additional Excavation: Excavation required beyond anticipated subgrade elevation. See EXECUTION section for procedures.

F. Natural Subgrade: The undisturbed, inorganic native soil exposed below site fill and disturbed native soils at footing and/or structural fill bearing elevations; or Rock at least 12" below the footing bearing elevation, slabs on grade, or utilities.

G. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

H. Structure: Buildings, foundations, slabs, tanks, curbs, or other man made stationary features occurring above or below ground surface.

I. Structural Fill: Imported or approved on site aggregate or select soil meeting the physical properties described in Section 2.1 MATERIALS, and compacted in place to form a supportive bearing surface.

J. Unsuitable material: On-site materials which are of improper gradation to allow adequate compaction, and/or defined as organically contaminated (including roots), uncontrolled fill material, disturbed native material, or otherwise identified as improper for the intended use by the Architect. Refer to the Supplemental info section of the Geotechnical Engineering Report.

K. Rock: All materials which, in the opinion of the Architect, require blasting or special impact tools such as jack hammers, sledges, chisels or devices similar in purpose which are designed for use in cutting or breaking materials that have compressive strengths in excess of 300 pounds per square inch in their natural states. Boulders larger than 3 cubic yards in volume in open excavations and larger than 1 cubic yard in trenches are classified as Rock.

L. Zone of Influence: The area bounded by a one horizontal to one vertical (1H:1V) line sloping downward and outward from the bottom, outer edge of the footings and foundations.

M. The words "invert" or "invert elevation" as used herein shall be defined as the elevation at the inside bottom surface of the pipe or channel.

N. The words "bottom of the pipe" as used herein shall be defined as the base of the pipe at its outer surface

O. Trench shall be defined as an excavation of any length where the width is less than twice the depth and where the shortest distance between payment lines does not exceed ten (10') feet. All other excavations shall be defined as open excavations.

P. Rock (Mass & Rock): Excavated material in beds, ledges, unstratified masses, and conglomerate deposits that cannot be removed by rock excavating equipment equivalent to the following size and performance ratings (Caterpillar 340), without systematic drilling, ram hammering, ripping, or blasting, when permitted.

Q. Heaved Rock shall be understood to be rock that heaves as a result of blasting and shall include blasted rock and rock disturbed by blasting operations. [ADD2]

R. Common Borrow: See MATERIALS Section.

S. Structural Fill: See MATERIALS Section.

T. Bedding Fill for Pipe and Other Utility Structures: See MATERIALS Section.

U. Bedding Fill for geothermal pipe trenches: See MATERIALS Section.

V. Gravel Base Course for Paved Areas: See MATERIALS Section.

W. Trenching Fill: See MATERIALS Section.

X. Loam Borrow: See MATERIALS Section.

Y. Filter Fabric: See MATERIALS Section.

Z. Vapor Retarder: See MATERIALS Section.

1.15 SUBMITTALS

A. Submit a detailed construction sequence plan for project excavation indicating temporary stockpile areas, side slopes of excavations, limits of required temporary excavation support and sequence and procedures for subgrade protection, excavation, concrete placement, moisture conditioning of on-site excavated soils used as fill, filling, backfill, and compaction.

B. Submit Rock blasting plan shall be submitted at least 10 days before the start of blasting operations. This submittal shall include description of blasting operations, handling procedure and storage of explosives, blasting limits and depths, blasting sequence, measures to limit vibrations, as needed, measures to lo limit over-blast and rock heave to less than 2 feet, and measures to protect the existing building during blasting operations.

C. Grain-size distribution analysis test data shall be delivered with the samples. The analysis shall be performed in accordance with ASTM D 6913 and shall at the minimum include the sieve sizes listed for the respective material in Part 2. The data shall include a plot of the gradation and the envelope of the specified material. A material shall be considered meeting the specifications when its gradation curve fits entirely within the specified envelope. Borrow materials with grain-size distribution curves that do not fall entirely within the specified envelope shall be deemed unacceptable.

D. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures in accordance with requirements of the Contract Documents.
   1. Submit a detailed earthwork sequence plan for project excavation indicating temporary stockpile areas and procedures for subgrade protection.

E. Submit a dewatering plan for review by the Architect at least two weeks before the start of construction. Dewatering and groundwater control systems shall be designed to keep excavations free of water and to avoid disturbance of the subgrade.

F. Excavation and Excavation Support Plan: Submit at least 10 calendar days prior to the start of the work a detailed plan for the sequence of excavation, and methods to be used to shore roadways, sidewalks and other structures.

G. Obtain required permits for discharge of dewatering effluent. Submit two copies of all permits obtained at least one week prior to system installation.

H. Submit soil samples in accordance with Section 1.12 of these specifications.

I. Submit representative samples of approved equivalent materials, such as Filter Fabric, for approval prior to delivery to the site.

J. Submit gradations from suppliers of crushed stone for pipe bedding, structure bedding, and infiltration system encasement and bedding.

K. Submit shop drawings and calculations for proprietary site retaining walls.

1.16 EXAMINATION OF SITE AND DOCUMENTS

A. It is hereby understood that the General Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs shall be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the site.

B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the General Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

1.17 PROJECT COORDINATION

A. Prior to start of earthwork, the General Contractor shall arrange an onsite meeting with the Architect and the Geotechnical Engineer for the purpose of establishing the General Contractor’s schedule of operations, and scheduling observation and requirements. The Geotechnical Engineer may from time-to-time request that the General Contractor excavate test pits ahead of excavation to confirm subsurface conditions at no additional cost to the Owner.

B. Protect all benchmarks, monuments, and property boundary pins. Replace if destroyed by General Contractor’s operation.

C. As construction proceeds, the Contractor shall be responsible for notifying the Geotechnical Engineer and the independent testing firm prior to the start of earthwork operations requiring observation and/or testing.

1.18 PROJECT CONDITIONS

A. “GEOTECHNICAL ENGINEERING REPORT”

1. The geotechnical engineering report prepared for this site (which includes subsurface exploration data and an exploration location plan) referenced in this section is included in the Supplemental information section and is made available for the convenience and information to the Contractor only. It is expressly understood that the Owner will not be responsible for any interpretation, conclusions or generalizations made by the contractor based on the contractor’s review of the report.

B. Do not proceed with utility interruptions without Architect's written permission. Notify Architect not less than two days in advance of proposed utility interruptions.

C. Contact utility-locator service for area where Project is located before excavating.

D. Protect nearby structures from damage. All construction induced damage shall be repaired by the General Contractor at no additional expense to the Owner.

E. The General Contractor shall obtain and pay for all permits and licenses required to complete the work of this Section.

F. In case of conflict between regulations or between regulations and Specifications, the General Contractor shall comply with the strictest applicable codes, regulations, or Specifications at no additional cost to the owner.

G. The General Contractor may perform additional test borings and other explorations at no cost to the Owner.

H. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies and Town of New Bedford to shut off services if lines are active.

1.19 SEQUENCING AND SCHEDULING

A. As construction proceeds, notify the Architect prior to the start of earthwork operations which require observations and testing. A minimum of 72 hours notification shall be provided for work that requires observation or testing

1.20 AS BUILT SURVEY

A. At the completion of the specified work, a field survey shall be performed by a surveyor registered in Massachusetts of the as built building, ground elevations (spot elevations 50’ on center and at edges of pavement and or curbing, top and bottom of walls and utility structures, floor elevations, utilities, fencing, walls and all site improvements, limit-of-work line, property lines, and tree line within the limit of work. The surveyed information shall be presented in a AutoCAD electronic file format (latest version) and submitted to the Architect in the form of a CD with PDF’S at a scale of 1”=30’.

B. All field survey work and presentative of the surveyed information shall be completed and submitted to the Architect within four weeks of completion of the construction as specified and as shown on the drawings.

1.21 MEASUREMENTS

A. Measurement of Unsuitable Soil over-excavation:

1. Strip vegetation, topsoil, buried organic material and fill in accordance with drawings. Remove existing asphalt, curbing, cobbles, boulders, concrete, metal, woods, and above and below ground structures.

2. Remove unsuitable soils to top of natural soil as shown on the Contract Documents or as directed in the field by the Owner’s Geotechnical Engineer.

3. Quantity of blasted rock shall be measured by calculating the volume between the pay lines for excavated rock and the top of the rock surface as defined by rock probes performed before the start of blasting. The probes shall be performed in a grid with a maximum spacing of 50 feet. The probes shall extend at least 10 feet in rock. The probes shall be observed by the Geotechnical Engineer.

4. Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils throughout the building footprint. Excavations shall be surveyed at the corners, high and low points, and a maximum spacing for survey points of 20 feet in each direction on a grid.

5. Quantities shall be measured in their original position to the limits of clearly defined vertical construction lines and to the depth required for the defined construction. Payment will be at the Contract Unit Rates.

1.22 UNIT PRICES

A. The base bid shall include the excavating and disposing of excavated material generated within the limit of work and specified subgrades grades shown on the drawings or specified herein.

B. Unit prices shall be provided for all items listed in Part 2- PRODUCTS. The unit rates shall include furnishing/processing, stockpiling, placing, and compacting the material).

C. Provide unit rate for rock excavation in trenches and in open excavations, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.

D. Provide unit rate for rock excavation as open excavation, removed from the site, and any placement of fill required to bring excavated surface to specified subgrade.

PART 2 – PRODUCTS

2.01 FILL MATERIAL

A. Structural fill for support of Building foundations, floor slabs and base course for concrete sidewalks and pads shall be widely graded sand and gravel, free of clay, organic material, snow, ice, frozen soil or other deleterious materials, and conforming to the following graduation requirements. Soil finer than the No. 200 sieve shall be non-plastic. Structural Fill shall have a plastic index of less than 6 and shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within +- 2 percentage points of the optimum moisture content.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
3- inches	100 percent	
1-1/2 inch	80 percent	100 percent
1/2 inch	50 percent	100 percent
No.4	30 percent	85 percent
No.20	15 percent	60 percent
No.60	5 percent	35 percent
No.200	0 percent	*10 percent

* 0–5 for the top 12 inches under sidewalks, exterior slabs, pads, and walkways

2. Material falling within the above Specifications, encountered during the excavation, shall be stored in segregated stockpiles for reuse as Compacted Structural Fill. All material shall be subject to approval by the Architect.

B. Processed gravel for base course for bituminous concrete pavement shall be a processed material with angular particles meeting the requirements conforming to MassDOT Specifications Section M1.03.1.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
3-inches	100 percent	----
1-1/2 inch	70 percent	100 percent
No.3/4	50 percent	85 percent
No.4	30 percent	60 percent
No.200	3 percent	10 percent

C. Ordinary Fill - Well-graded, natural inorganic soil approved by the Architect and meeting the following requirements to be used for general filling to subgrades in lawn areas and to the bottom of the subbase beneath pavements, sidewalks and other than specified above, and conforming to the following graduation requirements. Soil finer than the No. 200 sieve shall be non-plastic. Ordinary Fill shall have a plastic index of less than 6 and shall be compacted in maximum 9-inch loose lifts to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with moisture contents within +- 2 percentage points of the optimum moisture content.

U.S. Bureau of Standards	**Percent Passing**	
Sieve Size and Number	Minimum	Maximum
6-inches	100 percent	----
1 inch	50 percent	100 percent
No.4	20 percent	100 percent
No. 20	10 percent	70 percent
No.60	5 percent	45 percent
No.200	0 percent	20

1. It shall be free of organic or other weak or compressible materials, of frozen materials, trash or other deleterious materials and of stones larger than six (6) inches maximum dimension.

2. It shall be of such nature and character that it can be compacted to the specified densities in a reasonable length of time.
3. It shall be free of highly plastic clays, of all materials subject to decay, decomposition or dissolution and of cinders or other materials which shall corrode piping or other metal.
4. It shall have a maximum dry density of not less than one hundred (100) pounds per cubic foot.
5. Material from excavation on the site may be used as ordinary fill if it meets the above requirements.

D. COMMON BORROW

a. Common Borrow material shall be soil containing no stone larger than 8 inches and shall be substantially free of organic loam, wood, trash, or other objectionable materials which may be decomposable, compressible or which cannot be properly compacted. Onsite and offsite Common Borrow materials shall not contain more than 30 and 20% percent by weight of silt and clay, respectively.

1 No Common Borrow shall be imported until available onsite Ordinary Fill has been used or with prior written approval from the Architect.

2 Common Borrow material from off-site borrow sources shall contain no detectable concentrations of asbestos.

3 Crushed concrete can be used as Common Borrow provided it meet the requirements of these specifications.

4 Common Borrow can be used beneath the topsoil in landscaped areas, and at depths greater than 3 feet in paved areas.

E. PROCESSED GRAVEL FOR SUBBASE

1. Processed Gravel for Subbase shall be onsite or imported material conforming to Item M1.03.1 of the MassDOT Standard Specifications. This material can be used as subbase in the top 12 inches beneath paved area.

2. Processed Gravel for Subbase may be anticipated to be onsite in limited quantities.

3. Crushed concrete shall not be used as Processed Gravel for Subbase.

F. DENSE GRADED CRUSHED STONE FOR SUBBASE

1. Dense graded Crushed Stone for subbase shall be imported material conforming to Item M2.01.7 of the MassDOT Standard Specifications. This material shall be used as an alternate to Processed Gravel for Subbase in the top 12 inches immediately beneath paved areas.
2. Crushed concrete shall not be used as Dense Graded Crushed Stone for Subbase.
3. Dense graded Crushed Stone for subbase are not anticipated to be present onsite.

G. CRUSHED STONE

1. Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious material, conforming to MassDOT specifications, Section M2.01.0 through M2.01.6 size as indicated on Drawings. Dense graded crushed stone shall be uniformly blended and conform to the following gradation requirements.
2. The crushed stone shall be reasonably free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone. Where crushed stone is to be used for surfacing, this requirement shall be not more than 0.5% of satisfactory material passing a No. 200 sieve.

	Percent Passing By Weight		
Sieve Size	1/2-Inch Stone	3/4-Inch Stone	1.5-Inch Stone
2 inches	100	100	100

1 ½ inch	100	100	95-100
1 inch	100	100	35-70
3/4 inch	100	90-100	0-25
5/8 inch	100	---	---
1/2 inch	85-100	10-50	---
3/8 inch	15-45	0-20	---
No. 4	0-15	0-5	---
No. 8	0-5	---	---

H. SAND

Sand shall consist of clean inert, hard, durable grains of quartz or other hard durable rock, free from clay, organics, surface coatings or other deleterious material, confirming to the MassDOT Specifications Section M1.04.1. Sand shall conform to the following gradation:

Sieve Size	**Percent Passing by Weight**
1/2-inch	100
3/8-inch	85-100
No. 4	60-100
No. 16	35-80
No. 50	10-55
No. 100	2-10

I. LOAM BORROW

Loam borrow shall meet the requirements of MassDOT Specifications for M1.05.0. Existing topsoil may also be excavated, stockpiled, screened and reused as loam on the project provided that the resultant material is consistent with the requirements of the MassDOT Specifications. All topsoil shall be screened free of roots, rocks and vegetative matter. The contractor shall amend and rehandle topsoil as needed to meet the standard specifications.

J. FILTER FABRIC

1. Conform to MassDOT Specifications for Type III Fabric Embankment or Subgrade Stabilization, Section M9.50.0, Mirafi 140 Filter Fabric, or approved equivalent.

K. VAPOR BARRIER

Vapor Retarder must have the following qualities:

1. WVTR less than or equal to 0.006 gr/ft2/hr as tested by ASTM E 96
2. ASTM E 1745 Class A (Plastics)
3. Vapor Retarder Products:
1. Stego Wrap (15-mil) Vapor Barrier by Stego Industries, LLC, San Juan Capistrano, CA (877) 464-7834 www.stegoindustries.com, or approved equivalent.

Accessories:

1. Vapor Retarding Seam Tape must have the following qualities:
    a. Water Vapor Transmission Rate of 0.3 perms or lower by ASTM E 96
2. Vapor Proofing Mastic have the following qualities:
    a. Water Vapor Transmission Rate of 0.3 perms or lower by ASTM E 96
3. Pipe Boots:
    a. Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instructions.

L. ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric
2. Yellow: Gas
3. Orange: Telephone and other communications.
4. Blue: Water System
5. Green: Sewer

L. UNDER-DRAINS

Under-slab drain pipes shall consist of 4" diameter Schedule 40 PVC with perforations in ¼ of the diameter and placed with the perforations down.

PART 3 - EXECUTION

3.01 EXCAVATION

B. Excavation of Subgrades

1. Topographic survey has been made of the project site following completion of the earthwork and this survey is included in the Bid Documents.

B. General

1. Excavate all materials to the elevations, dimensions and form as shown on the Drawings and as specified for the construction of the building, site walls, utility structures, utilities, paving, site improvements and other structures necessary for the completion of the building, utilities, and site work. All unsuitable materials within the indicated

and specified limits shall be excavated and removed from the site. Unsuitable materials shall include the following:

a. Pavements, utility structures, building foundations and other man-made structures.
b. Peat, organic silts, and other organic materials subject to decomposition, consolidation, or decay.
c. Miscellaneous fill including sand, gravel, cinders, ash, glass, wood, and metal.
d. Ledge or boulders except as specified for fills herein.
e. Material that contains more than 3 percent organic matter by weight.

2. All unsuitable materials within the indicated and specified limits shall be excavated and removed from the site. The removal shall vertically extend to the elevations of the bottom of existing fill and buried organic soil shown in the boring and test pit logs included in the Geotechnical Report or to the limits shown in the drawings, whichever is deeper. The excavation resulting from the removal of the unsuitable soils shall extend to the natural/native undisturbed soil. Horizontally, the removal shall extend to the limits of ZOI or 5 feet beyond the limits of the building and 2 feet outside the limits of footings of retaining walls, stairs, and ramps, whichever is greater. The excavations shall be carried to the bottom of the unsuitable materials but in case less than 12 inches beneath the bottom of footings and 12 inches beneath the bottom of slabs. The grades within the building and all footings shall be restored to the grades provided on the contract plans using compacted Structural Fill. [ADD2]
3. Employ a Registered Land Surveyor to survey to bottom of the excavation for unsuitable soils throughout the building footprint. Excavations shall be surveyed at the corners, high and low points, and a maximum spacing for survey points of 20 feet in each direction on a grid.
4. Control the grading so that ground is pitched to prevent water from running into excavated areas, damaging other structures, or adjacent properties.
5. Where soil has been softened or eroded by flooding, equipment, traffic, or placement during unfavorable weather, or such other conditions, it shall be removed and replaced by the Contractor with suitable material at no cost to the Owner.
6. The topsoil/subsoil layer, root balls, where encountered, organic soil, the existing fill, and other deleterious matter shall be entirely removed from within the proposed building footprint.
7. Topsoil/subsoil, organic material, root balls, where encountered, and other deleterious material shall be entirely removed from within the gravel road and paved road limits, geothermal field limits and retaining wall installation limits.
8. Cobbles and boulders shall be removed at least 6 inches from beneath footings and 18 inches from beneath the bottom of slabs within the entire building footprint, and 2 feet beneath the bottom of paved areas. The resulting excavations shall be backfilled with compacted Structural Fill under the building and with ordinary Fill under the subbase of paved areas.
9. The contractor is cautioned that some of the natural sand at the site has silt contents higher than 20 percent. Such soils can be compacted at moisture contents within 2 percent of the optimum moisture content determined from the laboratory compaction test. Soils with more than 20 percent fine contents are generally very sensitive to moisture content variations and are susceptible to frost. Such soils are very difficult to compact at moisture contents that are much higher or much lower than the optimum moisture content determined from the laboratory compaction test. Therefore, strict moisture control shall be implemented during stockpiling, placement, and compaction of the onsite soils.
10. Maintain all subgrades for site improvements in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. In areas to receive pavement or other surface materials, at top and bottom of embankments, along swales and elsewhere, place sufficient grade stakes to facilitate checking the subgrade levels. Correct all irregularities, compacting thoroughly any fill materials.
11. Minimum depth of excavation in rock shall be performed in accordance with the requirements in Section 3.04 E.
12. The base of the footing excavations in the natural soil shall be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade. All compaction shall be to specified levels.
13. The subgrades of slabs and paved areas in the natural soil shall be compacted with a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft materials are encountered, they shall be removed and

replaced with Structural Fill within the footprint of the proposed building and with Ordinary Fill within the proposed paved areas.

14. Where paved areas are located in existing fill areas, the existing fill shall be improved after the surficial topsoil and subsoil are removed by compacting the exposed subgrade in the fill using at least six (6) passes of a vibratory roller compactor imparting a dynamic effort of at least 40 kips. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic oil shall be removed and replaced with Ordinary Fill to the bottom of the subbase layer.
15. The Contractor shall obtain from the proper authority locations of all utilities within the scope of this work so that there will be no damage done to such utilities. Neither the Owner nor the Architect will be responsible for any such damage, and the Contractor shall restore any structure or utility so damaged without additional compensation. Written notifications to the appropriate utility agencies shall be made at least ten (10) days prior to the commencement of any work.
16. Excess Material - Suitable excavated material which is required for fill and backfill shall be separately stockpiled as directed by the Architect. All surplus fill other than that required to complete the intent of the Contract shall become the property of the Contractor and shall be disposed of off the property by the Contractor. All excavated materials which, in the opinion of the Architect, are not suitable for fill or backfill shall be removed and disposed of off the property.
17. Any unsanitary conditions encountered, such as broken sewer mains or uncovered garbage shall be corrected or removed entirely as directed by the Architect.
18. The Contractor shall remove materials beneath the existing building to 12 inches beneath bottom of proposed footings, 12 inches beneath bottom of proposed slab, or to the bottom of the unsuitable material, whichever is deeper. In proposed paved areas, the Contractor shall remove a minimum of 18 inches beneath the existing grades. Refer to quantities in item. Should quantities of certain materials or classes of work be increased or decreased from what is shown in the drawings and specified herein, the Contract Unit Rates listed below shall be the basis of payment to the Contractor, or credit to the Owner, for such increase or decrease in the work. The Contract Unit Rates shall represent the exact net amount, per unit, to be paid to the Contractor in the case of increase in the quantities, and the exact amount to be refunded to the Owner in the case of decreases in the quantities. No additional adjustment shall be allowed for overhead, profit, insurance, or other direct or indirect expenses by the Contractor. Contract Unit Rates of materials shall include hauling, storing, stockpiling, moving, importing, spreading, and compacting. Increases or decrease in the quantities shall be approved by the Owner.
19. Amending the existing fill free of organic matter by adding and blending with crushed stone shall be allowed. Blending shall produce a uniform, homogeneous mixture. Blending by pushing with a dozer shall not be allowed.
20. To reduce the potential for mixing of organic soil with blasted rock intended for crushing, the topsoil, roots, tree stumps, and vegetation shall be removed before blasting. The remainder of the overburden soils and excavatable weathered rock shall not be removed before blasting.

C. Excavation for Site Improvements

1. Excavate to the lines and grades shown on the Drawings and as specified to obtain the subgrades for the following items of work:
    a. Concrete slabs on grade
    b. Bituminous concrete road and parking pavement
    c. Gravel road limits
    d. Concrete paving
    e. Curbing Seeded areas
    f. Retaining Walls
    g. Unspecified improvements – to elevations noted on the drawings.

D. Utilities and Utility Structures

1. Construct surface subgrades including filling prior to excavation for utilities and utility structures. Excavate to the lines and grades shown on the Drawings and as specified herein to obtain the subgrade for the following items of work:

a. Utility structures - to grades shown on the Drawings in the building and outside the building. Remove by excavating all unsuitable materials; including buried organics, from under drainage structures and backfill with specified fills compacted in place to subgrades.
b. Excavation for structures and other accessories shall have twelve (12) inch minimum and twenty-four (24)
c. inch maximum clearance on all sides.
d. All utility lines - to 12 inches below bottom of utility lines or structures.
e. Trench for water pipe to provide a minimum of five feet of cover above top of pipe.
f. Unless otherwise shown, provide separate trenches for each utility. Lay all piping in open trenches except where tunneling is required. Excavation for structures and other accessories shall have 12 in. minimum and 24 in. maximum clearance on all sides.
g. Grade the bottom of trenches evenly to have a constant pitch in the direction of flow and to insure a uniform compacted thickness of selected material as called for.

E. Existing services and utilities encountered shall be immediately repaired, protected, and maintained in use until relocation of same has been completed or be cut and capped were directed or be prepared for connections when so required.

F. Excavation Classification

1. Unclassified Excavation - For the purposes of payment, materials shall be unclassified except for those materials beyond the limits specified in Section item 3.01.F.2, as described in item 3.1-B of these specifications. pavement Excavation shall comprise and include the satisfactory excavation, removal, and disposal of all materials encountered within the lines and grades shown in the Drawings or limits specified herein, whichever is deeper, regardless of the nature of the materials, and shall be understood to include, but not be limited to, earth, topsoil, subsoil, hardpan, fill, foundations, pavements, curbs, piping, railroad track and ties, cobblestones, footings, bricks, concrete, abandoned drainage and utility structures, debris, and materials classified as unsuitable materials. All excavation and replacement, if applicable, with suitable material within the lines and grades shown in the Drawings or the limits specified herein, whichever is deeper, will be considered and bid as unclassified and shall be included in the Contractor's lump sum (i.e., shall not be paid for using Unit Rates). [ADD2]
2. For bidding purposes, the limits of unclassified excavation (i.e., excavations included as part of the base bid and for which there will be no payment using Contract Unit Rates) to remove the existing fill and organic soil within the building, paved areas, and athletic fields shall be as follows:[ADD2]
    a. 32,000 cubic yards of cut, this includes:
        i. 20,000 cubic yards of blasted rock (Assume blasting within building footprint and 5 feet beyond to El. 210 feet.)
        ii. 8,000 cubic yards of topsoil removal
        iii. 4,000 cubic yards of unsuitable material[ADD2]
    b. 16,000 cubic yards of fill, this includes:
        i. 10,000 cubic yards from on-site materials
        ii. 6,000 cubic yards of imported fill

    (Assume Fill placed within proposed building and within zone of influence to El. 215 feet, and Ordinary Fill placed within proposed paved areas to 12 inches beneath the bottom of the pavement.)[ADD2]
3. All excavation and replacement, if applicable, with suitable material within the lines and grades shown in the drawings and in these specifications that are within the quantities listed in item 3.01.F.2 shall be considered and bid as unclassified and shall be included in the Contractor's lump sum (i.e., shall not be paid for using Contract Unit Rates). Excavations beyond these lines described herein and beyond the quantities listed in item 3.01.F.2in the item shall be measured and paid for after approval of the measurements by the Architects as Classified Excavation using the Contract Unit Rates for respective classification in accordance with the allowance included in the contract documents. All quantities shall be measured in place. There shall be no swell, fluff, of expansion factor allowed. Measurements using truck loads shall not be allowed. Should quantities be less than those listed in item 3.01.F.2, the Contractor shall provide a credit to the Owner using the contract unit rates.

A. Petroleum Contaminated Soil Allowance: The Contractor shall carry in the base bid an allowance of 100 cubic yards for removal of unanticipated as directed in Section 01 22 00 Unit prices, petroleum contaminated soil materials. Allowance shall cover removal and disposal of petroleum contaminated soil and furnishing imported suitable backfill materials compacted in place as directed herein. The base bid shall cover all costs related to such excavation, removal off site, disposal, and replacement with compacted fill of approved material, overhead, and profit. No amount other than that herein specified will be paid by the Owner for the work defined herein.

1. If the total void volume of unanticipated petroleum contaminated material excavation, and its replacement with compacted fill exceeds the amount included in the Contract as listed above, the Owner shall pay the excess excavation and replacement at the Unit Rate submitted in the Bid Attachment – Unit Rates Schedule.
2. If the total quantity of unanticipated petroleum contaminated materials, and its replacement with compacted fill is less than the amount included in the Contract as listed above, the contract sum will be decreased by the difference in excavation and its replacement multiplied by the Unit Rate submitted in the Bid Attachment – Unit Rates Schedule.

3.02 FROST PROTECTION

A. Protect excavation bottoms and sides against freezing. Provide protective insulating materials as necessary, including by means of heat blankets, and heating plant.

B. A layer of fill shall not be left in an uncompacted state at the close of a day's operation when there is the potential for that layer to freeze.

C. The Contractor shall not place any material on snow, ice, frozen soil, or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be at the Contractor's expense.

D. Do not excavate to full indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade, the materials installed, and the excavation backfilled the same day. Protect the excavation from frost if placing of materials or backfilling is delayed.

E. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as necessary to carry out the work.

F. Frozen materials shall be installed on frozen ground. Fill materials shall be free of frost.

G. The subgrade of footings and slabs shall be protected from frost before placing concrete. The subgrade on the sides of the footings shall be protected from frost after the footings are constructed until sufficient fill is placed to protect the bottom of footings from frost induced heave. Uninsulated slabs shall be covered with heat blankets until the slab areas are heated. The cover shall extend at least 4 feet beyond the limits of the slabs.

3.03 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

A. The Contractor shall take the necessary steps to avoid disturbance of subgrade and underlying natural soils/compacted fill during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade and underlying natural soils/compacted fill, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials. The Contractor shall coordinate with the Architect or Soils Representative to modify his operations as necessary to minimize disturbance and protect bearing soils, based on the Architect's or Soils Representative's observations.

B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with compacted approved material in accordance with these Specifications. Fill that cannot be compacted within 48 hours because of its saturated condition shall be removed and replaced with compacted approved material in accordance with these Specifications. Costs of removal of disturbed material and replacement with approved material shall be borne by the Contractor.

C. If requested by the Architect or Geotechnical Engineer, the Contractor shall place a six-inch layer of Crushed Stone or 12-inch layer of Granular Fill/Structural Fill over natural underlying soil to stabilize areas disturbed during construction.

D. The placement of the Crushed Stone layer or Granular Fill/Structural Fill as well as material costs shall be borne by the Contractor. A geotextile fabric shall be used to separate the crushed stone from the natural soil and from the overlying fill when directed by the Geotechnical Engineer at no additional cost to the owner at no extra cost to the owner.

E. Material that is above or below optimum moisture for compaction of the particular material in place as determined by the Architect or the Soils Representative and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall be classified as unsuitable bearing materials. This material shall be removed and replaced with lean concrete, suitable/approved backfill material, or crushed stone as directed by the Geotechnical Engineer or Soils Representative at no additional cost to the Owner.

3.04 FILLS, BACKFILLS AND COMPACTION

A. Samples and Testing

1. All fill material and its placement shall be subject to quality control testing. A qualified laboratory will be selected by the Owner to perform tests on materials. All costs of testing will be paid for by the Owner. Test results and laboratory recommendations shall be available to the Architect.

B. Provide samples of each fill material from the proposed source of supply including on-site sources. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate source if required.

C. Architect will be sole and final judge of suitability of all material.

D. The laboratory will determine maximum dry density and optimum water content in accordance with A.S.T.M.

E. D-1557, Method D and the in-place density in accordance with A.S.T.M. D-1556.

F. Tests of material as delivered shall be made from time to time. Materials in question shall not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace with approved material.

G. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests.

H. Placing Fills and Compacting

1. Fill material shall be placed in horizontal layers not exceeding the maximum loose lift thickness with the minimum number of passes of compaction equipment as summarized on the table below. Each layer shall be compacted to the percentage of maximum dry density specified for the particular type of fill and at a water content equal to optimum water content plus or minus two (2) percent. The maximum dry density and optimum water content shall be as specified herein:

		Max. Loose Lift Thickness		**Min, Number of Passes**	
	Max Stone Size	Below Structures & Pavements	Less Critical Areas	Below Structures & Pavements	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4 in.	8 in.	8 in.	6	4
Hand-operated Vibratory drum rollers weighing at least 1,000# in confined areas	6 in.	8 in.	10 in.	6	4
Light vibratory drum Roller, minimum weight at drum 5,000#, minimum Dynamic force 10,000#	6 in.	10 in.	12 in.	6	4
Medium to heavy Vibratory drum roller, Minimum weight at Drum 10,000#, minimum Dynamic Force 20,000#	8 in.	12 in.	12 in.	6	4

I. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when fill materials or layers below it are frozen.

J. Notify the Architect when excavation is ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Architect.

K. Before backfilling against walls, the permanent structures must be completed and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect. When filling on both sides of a wall or pier, place fill simultaneously on each side. Correct any damage to the structure caused by backfilling operations at no cost to the Owner. Place no stones closer than 18 inches to wall surfaces.

L. In confined areas adjacent to footings and foundation walls and in utility trenches beneath floor slab, the fill shall be compacted with hand operated vibration tampers. The maximum lift thickness shall be four inches. The degree of compaction attained shall be equivalent to that attained in the adjacent open areas where heavy rolling equipment is used.

M. After the subgrade under concrete slabs and paved areas has been shaped to line, grade and cross-sections, it shall be rolled with an approved power roller weighing not less than six tons until thoroughly compacted. This operation shall include any reshaping, refilling or wetting required to obtain proper compaction. Any areas that subsequently settle shall be refilled to true subgrade and properly compacted.

N. In freezing weather, a layer of fill shall not be left in an un-compacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.

O. Placing Fills

   1. In the building footprint Structural Fill shall be placed under the concrete footings and slabs. Ordinary Fill shall be placed under Processed Gravel for Subbase in paved areas. The material shall be placed and compacted in layers as described in the above table and compacted to at least 95 percent of maximum dry density as determined by A.S.T.M. Test D1557.with moisture contents within +- 2 percentage points of optimal moisture content. Incidental compaction due to traffic by construction equipment will not be credited toward the required minimum coverages.

P. Placement of structural fill should not be conducted when air temperatures are low enough to cause freezing of the moisture in the fill during or before placement, approximately 32 degrees F., or below. Fill materials should not be placed on snow, ice or un-compacted frozen soil. Structural fill should not be placed on frozen soil. No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of un-compacted soil and protected from freezing.

Q. Deficiency of Fill Materials

   1. Provide required additional fill materials as specified if a sufficient quantity of suitable materials is not available from the required excavation on the project site at no additional cost to the Owner.

R. Where water content of the fill must be adjusted to meet this Specification, the fill shall be thoroughly disked to ensure uniform distribution of any water added.

S. Fill and Backfill for Utilities

   1. Backfill trenches only after pipe and leaching chambers have been inspected, tested and locations of pipes and appurtenances have been recorded.

T. Each pipe section shall be laid on a 12 inches minimum bed of crushed stone as specified herein above. In addition, all underground utilities in the building and on the site including water lines, sanitary waste, vent piping, electrical conduit, mechanical piping, gas piping and storm drainage piping serving the roof drains and downspouts shall be set in a six inches bed of sand. Bed shall be shaped by means of hand shovels to give full and continuous support to the lower 1/3 of each pipe. Backfill by hand around pipe, until the crown of the pipe if covered by at least two (2) feet of sand for which there is a sieve analysis chart on page 8, paragraph 2.01D. Use sand or crushed stone and tamp firmly in layers not exceeding six inches in thickness. Take care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper to achieve compaction of 95 percent as specified.

U. Trenches and utility structures shall be backfilled with greatest care; fill materials required for backfilling to subgrades shall be Structural Fill or Ordinary Fill as specified. Backfill shall be compacted to 95 percent as specified. No mud, frozen earth or stone more than six inches in greatest diameter or other objectionable material shall be used for refilling. Any selected material required for filling shall be furnished and placed by the Contractor

3.05 ROCK EXCAVATION

A. Bedrock and boulders be encountered during excavation, the following shall apply:

   1. When rock is encountered within the building footprint and its zone of influence and site improvements it shall be excavated or ripped with a hydraulic excavator. When it is demonstrated to the satisfaction of the Architect and the Geotechnical Engineer that this material can no longer be removed with a hydraulic excavator and requires drilling and blasting, this material shall be classified as Rock Excavation.

B. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material.

C. Measurements:

   1. When, during the process of excavation, rock is encountered, it shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Architect shall be notified by the General Contractor, before proceeding further. The areas in question shall then be cross-sectioned as hereinafter specified.

D. The General Contractor shall perform rock probes at the site in a grid pattern before the start of excavations. At a minimum, the results of the probes should include the ground surface elevation and the elevation of the top of the rock. The probes should extend at least 10 feet beyond the perceived top of rock to make sure that the perceived top of rock is not a boulder.

E. Failure on the part of the General Contractor to perform the probes and identify the depth to top of the rock surface and to notify the Architect and proceeding by the General Contractor with the rock excavation before cross-sections are taken, shall forfeit the General Contractor right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.

F. The General Contractor shall employ and pay for a licensed Registered Civil Engineer or Land Surveyor to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Geotechnical Engineer and the computations approved by the Architect. The Owner has the option to perform independent cross-sections and computations of rock quantities.

G. Where removal of boulder or ledge is required the extent of this removal and basis of payment shall be determined by the Architect with payment made as stated in Unit Prices.

H. Blasting

   1. Blasting: Obtain written permission and approval of method from local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention of Construction" of the Associated General Contractors of America, Inc.

I. Notify the Architect at least 48 hours before any intended blasting and do no blasting without his specific approval of each blasting operation.

   1. General Contractor shall present evidence that his insurance includes coverage for blasting operations before doing any blasting work. A pre and post survey shall be performed for all buildings and utilities within 250 feet of the nearest blasting operations, conforming to the Municipal ordinance governing blasting and the Municipal Fire Department regulations.

J. All rock blasting shall be well covered with heavy mats or timbers chained together and the General Contractor shall take great care to do no damage to existing structures, utility lines and trees to remain.

K. Any damage caused by the work of this General Contractor shall be repaired to the full satisfaction of the Architect at no additional cost to the Owner.

L. Any rock fragments or loose material from blasting operations shall be removed. All voids shall be filled with a leveling layer of Structural Fill

M. Additional blasting requirements:
  a. Comply fully with National and Town of Maynard Regulations.
  b. All documentation submitted with application for “Use and Handling’ PERMIT. 527 CMR 13:04 (11) E-1 states “A Use and Handling” Permit may be suspended or revoked by the head of the Fire Department or the Marshal or their designees for any violation of 527 CMR 13:00, or MGL c. 148”
  c. Meet all requirements of 527 CMR 13;00
  d. Perform Pre-Blast Surveys completed per 527 CMR 13:00
  e. No Blasting Saturdays, Sundays or Holidays.[ADD2]
  f. All shots to be double matted unless approved in advance by the Town of Maynard Fire Chief.
  g. Shot size limited to 500 lbs. unless approved in advance by the Town of Maynard Fire Chief.
  h. Blast warning signals to be sounded in accordance with 527 CMR 13:00
  i. 24 hours notification to the fire department of intent to blast.
  j. The contractor shall schedule and pay for detail officers to block traffic on Tiger Drive at Great Road and at Fowler High School during the blast.
  k. In or near residential areas, written notification must be distributed to homes advising of intent to blast at least three (3) days prior to blasting operations. Such written notification to include time frame of blasting operations and description of warning signals. The area of distribution shall be determined by the Fire Chief during pre-blast conference. A Fire Department detail shall be required unless waived by the Fire Chief.
  l. Provide at least three (3) or more seismographs throughout construction.
  m. All seismographs to be calibrated and certified according to manufactures specifications and 527 CMR 13:00

N. Rock should be cut a minimum of 12 inches outside utility structures and a minimum of 18 inches on each side of utility pipes.[ADD2]

O. Rock surfaces that heave due to blasting should be compacted with a vibratory roller that imparts a minimum of 40 kips to the rock surface. To reduce the magnitude of rock heave, drilling for blast holes should extend no more than 2 feet beneath proposed subgrades. Where the thickness of heaved rock is more than 2 feet, the heaved rock shall be removed and replaced with approved backfill material. Where the heaved rock thickness is less than 2 feet, the rock surface shall be compacted with at least 6 passes of vibratory roller compactor imparting a minimum effort of at least 40 kips. The thickness of the heaved rock shall be assessed by means of test pits performed during blasted rock excavation. [ADD2]

P. Complaints:

Q. Report all blasting complaints to the Architect within 24 hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.

R. Submit a summary report to the Architect each week which indicates the date, time and name of person investigating the complaint, and the amount of damage, if any.

S. When settlement of a claim is made, furnish the Architect with a copy of the release of claim by the claimant.

T. Immediately notify the Architect, throughout the statutory period of liability, of any formal claim or demands made by attorneys on behalf of claimants, or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of-court settlement or court verdict resulting from litigation.

U. Immediately notify the Architect of any investigations, hearings, or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

V. Basis of Payment: The total amount of rock excavation shall be based upon the volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment, and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

W. Rock blasting if needed, shall be controlled to reduce vibrations and airblast overpressure to below thresholds established in the Contract Documents. The peak particle velocity shall be maintained at less than 2 inches per second (ips) for concrete foundations, 1ips for stone foundations, and 0.5 ips for rubble foundations at the nearest structure. [ADD2]

X. Perform rock pre-splitting along the lines separating the blasting for the Early Site Package and the blasting slated to occur during the next phase so as to reduce the potential damage to the existing building during blasting operations. [ADD2]

Payment Lines for Rock Excavation:

1. Payment shall be made for volume between El. 210 and the top rock defined by the rock probes.[ADD2]

Y. Allowance for Rock Excavation: . The Base Bid shall cover all costs relating to such rock excavation, including blasting, removal and placement of the excavated material, overhead and profit. No amount other than that herein specified will be paid by the Owner for excavation herein defined.[ADD2]

1. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed Unit Rate shall be applicable to variations in excess of the allowance quantity up to 100% of the allowance quantity.
2. If the total quantity of Rock Excavation, open and/or trench, is less than the amount of Rock Excavation included in the Contract as listed above, the Contract sum will be decreased by the difference in Rock Excavation multiplied at the fixed Unit Rate. Quantities shall be measured by the volume of void created using survey points of the excavated area. The fixed Unit Rate shall be applicable to variations of the allowance quantity by decreases of 100% of the allowance quantity.
3. Hoe ramming rock shall be paid for as rock excavation and shall not be paid for as time and material (T&M).

3.5 REUSE OF ONSITE MATERIALS AND PROCESSING OF ONSITE MATERIALS

A. Based on the borings and test pits, the existing fill contains up to 45 percent fines and the natural soil layer contains up to 45 percent fines. Subgrade support capacities may deteriorate when such soils become wet and/or disturbed. The Contractor shall keep exposed subgrades properly drained and free of ponded water. Subgrades shall be protected from machine and foot traffic to reduce disturbance. Placed onsite material that becomes soft and unsuitable to support additional lifts of fill shall be removed and replaced at no additional cost to the owner. The contractor shall not make claims due to difficulty handling the onsite material. The Fill and natural soil layer also contained up to 30 percent of cobbles and boulders ranging up to about 7 feet in diameter.

B. Organic soils shall not be reused for backfill except as directed by the landscape architect in slopes of 4H:1V or flatter.[ADD2]

C. Should onsite materials be encountered that are suitable for reuse in accordance with the requirements for these specifications, the Owner shall receive a credit from the contractor for the quantity of reused onsite material. The credit shall be based on the difference in unit rates between imported and onsite material for the particular soil designation. The contractor shall provide Unit Rates for these materials in his base bid.

D. Excavated onsite soils which are suitable for re-use at the time of excavation but become frozen or too wet for re-use due to poor material handling practices shall be disposed of off-site and replaced as necessary at no additional cost to the Owner.

E. The processing of the existing building concrete and brick materials into Ordinary Fill shall be allowed.

F. The Contractor must inspect all existing stockpiles on site including soil testing for each stockpiled material.

G. The Contractor must amend the existing stockpiles if testing determines that the stockpiles do not meet the specifications for their intended use. The Contractor shall provide third party sampling and testing for all soils amended on-site.

H. The Contractor shall be allowed to mobilize a rock crusher to the site to process cobbles, boulders, blasted rock, and imported rock by blending these materials with the existing fill and natural soil and crushing them to produce a well graded materials, provided that these materials are maintained at suitable moisture contents for proper compaction processed material obtained by crushing blasted rock, boulders, and soil shall meet the gradation requirements of Ordinary Fill and Structural Fill. Material produced by the crushing operation shall be well graded so as to reduce the potential for formation of honeycombs during its placement and compaction. Honeycombing is defined as material placed with visible voids between particles. Crushed material shall have a gradation curve that falls entirely within the specified envelope when tested for gradation using the sieves listed in item 1.12-E.5. [ADD2] The Contractor shall be allowed to transport the material offsite to perform the operations described in this item offsite and bring back the processed material provided that the processing offsite does is separate from other operations and provided that the work is approved by the project environmental professional.

I. The Contractor shall protect, and moisture condition all onsite and imported materials for proper installation, compaction, and use. This includes covering, drying, and adding moisture in order to maintain suitable workability of the soil materials. The contractor shall protect stockpiled unprocessed and processed materials from exposure to moisture using tarps. The tarps shall be secured so as not to be moved by wind or other action. No claim shall be made by the contractor, due to failure to comply with this requirement.

J. When processing the blasted rock, the Contractor shall mix the blasted rock with onsite soil free of organic soil to produce a well graded processed material meeting the specification of the material for which it is intended for use.

K. Before blasted rock, cobbles, and boulders that are crushed and processed onsite are reused, they shall be observed and approved by the geotechnical engineer. At the start of the crushing operations, the soil to rock proportions placed into the crusher shall be varied until the processed material meets the appropriate gradation requirements. The soil to rock proportion thus achieved shall be maintained throughout the duration of the project.

L. The material placed into the crusher shall be free of organics, wood, and other deleterious matter.

M. The jaws of the crusher shall be adjusted daily to maintain the crushing gradation.

N. Excess blasted rock, processed or unprocessed, not used on site shall be the property of the Contractor and shall be removed offsite at no additional cost to the Owner.

3.06 OFF-SITE DISPOSAL OF SOILS

A. All off-site disposal of soils shall meet the minimum requirements of the following as applicable:

   1. DEP Policy #Comm-97-001: Reuse and Disposal of Contaminated Soil at Massachusetts Landfills.

B. DEP Policy #WSC-13-500: Similar Soils Provision Guidance

C. The Contractor is responsible for any and all disposal characterization sampling and analysis and preparation of disposal applications as required by the facility to be used. Copies of all applications and approvals.

3.07 TEMPORARY STEEL SHEETING

A. An excavation support system will be required to construct the proposed foundations near roadways and sidewalks as referenced in the Drawings. The contractor is responsible for the adequacy of the excavation support system and shall retain the services of a Professional Engineer registered in the Commonwealth of Massachusetts to design the required excavation support systems. The contractor's Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support system and shall design in conformance with OSHA requirements. The contractor's Professional Engineer shall provide sufficient on-site inspection and supervision to assure that the excavation support system is installed and functions in accordance with his design. Criteria listed here in defining the responsibilities of the construction manager's Professional Engineer are minimum requirements.

B. The contractor shall submit the attached Certificate of Design completed and signed by the contractor and the Professional Engineer, identifying the Contractor's Professional Engineer who will be responsible for design of the excavation support system, and including, for record purposes only:

  1. An overall time schedule for construction of the braced excavation system.

C. A description of the anticipated sequence of construction.

D. Submit three (3) copies to the Architect of:

  a. Complete details of braced excavation methods, equipment and sizes and lengths of materials proposed to be used.

  b. Details of vibration monitoring devices and reports.

  c. Details of the means and methods that will be used in monitoring the integrity of the support system during its entire period of use to insure the safety of the excavation.

  d. Complete computations of the design of the braced excavation system bearing the seal of the responsible Registered Professional Engineer duly registered licensed to practice within a discipline applicable to excavation work, in the state where the project is located.

  e. Any other pertinent data required for record purposes by the Engineer.

E. Receipt of the information by the Architect will not relieve the contractor of the sole responsibility for the adequacy of the braces excavation system, and for assuring that there will be no resulting damage to adjacent existing pavement, utilities, or structures, and for providing safe conditions within the sheeted areas.

F. Further for the record, upon completion of the work of this section, the contractor shall submit three copies of all records of survey, vibration monitoring and inspection of existing structures to the Architect.

G. Work shall not be started until all materials and equipment necessary for construction are either on the site of the work or satisfactorily available for immediate use as required.

H. The sheeting shall be sufficiently tight to minimize any resulting lowering of the groundwater level outside the excavation.

I. The sheeting shall be driven by approved means to the design elevation. No ends or edges of sheeting shall be left exposed in a manner, which could create a possible had to safety of the public or a hindrance to traffic of any kind.

J. The satisfactory construction and maintenance of the excavation support system, complete in place, shall be the responsibility of the contractor.

3.08 SUBGRADE PREPARATION

A. Bring all areas to required subgrade levels as specified and as determined from the Drawings.

B. Maintain all subgrades for site improvements in satisfactory condition, protected against traffic and properly drained, until the surface improvement is placed. In areas to receive pavement or other surface materials, at top and bottom of embankments, along swales and elsewhere, place sufficient grade stakes to facilitate checking the subgrade levels. Correct all irregularities, compacting thoroughly any fill materials.

C. Check all manhole covers, grates, valve boxes and similar structures for correct elevation and position and make, or have made any necessary adjustments in such structures.

D. All subgrades must be inspected and approved by the Architect before site improvements are made.

E. The asphalt, topsoil/subsoil, root balls, organic soil, existing fill, and other deleterious matter shall be entirely removed from within the proposed building footprint.

F. Topsoil/subsoil, asphalt, organic material, root balls, and other deleterious material shall be entirely removed from within the paved areas.

G. Tree stumps, root balls, and roots larger than ½ inch in diameter shall be removed and the cavities shall be filled with Structural Fill within the building footprint and Ordinary Fill beneath the subbase layer within paved areas.

H. The base of the footing excavations in the natural soil shall be compacted with a dynamic vibratory compactor weighing at least 200 pounds and imparting a minimum of 4 kips of force to the subgrade, before placing concrete.

I. The subgrades of slabs and paved areas in the natural soil shall be compacted with a heavy vibratory roller compactor imparting a dynamic effort of at least 40 kips.

J. Where soft zones are revealed by the compaction effort and where organic soil is exposed, the soft materials or organic soil should be removed and replaced with Structural Fill within the building and with Ordinary Fill beneath the subbase of paved areas

K. Due to the high susceptibility of the natural soil for disturbance under foot and vehicular traffic, a minimum of 12 inches of Structural Fill shall be placed under footings on top of the natural soil to provide a firm working surface during placement of formwork and rebar.

L. Fill placed within the footprint of the proposed building shall meet the gradation and compaction requirements of Structural Fill.

M. Fill placed under the subbase of paved areas, shall meet the gradation and compaction requirements of Ordinary Fill.

N. Fill placed in the top 12 inches beneath sidewalks shall consist of Structural Fill with less than 5 percent fines.

O. When crushed stone is required in the drawings or it is used for the convenience of the contractor, it shall be wrapped in a geotextile fabric for separation.

P. The bottom of footings bearing in bedrock shall be prepared as level as possible and shall not be sloped steeper than 12H:1V. [ADD2]

Q. Granular fill shall not be placed directly on rock surfaces containing voids. Suitably sized crushed stone or a geotextile for separation shall be placed on the fractured surface prior to placing the fill to limit migration of smaller particles into the voids. [ADD2]

3.09 PROTECTION, SHORING AND DEWATERING

A. Protect open excavations with steel plates, fencing, warning lights and other suitable safeguards.

B. Provide all pumps and pumping facilities to keep all excavations free from water from whatever source at all times, when work is in progress.

C. The contractor shall comply with the Town of Maynard Stormwater Management Bylaws, Drainage System Bylaws and MS-4 General Permit requirements as enforced by the Maynard Department of Public Works.

D. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of groundwater and surface water in excavated areas and adjacent properties.

E. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. The flows of all water resulting from pumping shall be managed so as not to cause erosion, siltation of drainage systems, or damage to adjacent property.

F. The groundwater level shall me maintained at 12 inches beneath the bottom of excavation or deeper until the excavation is backfilled to at least 2 feet above the groundwater level.

G. Damage resulting from the failure of the dewatering operations of the Contractor, and damage resulting from the failure of the Contractor to maintain all the areas of work in a suitable dry condition, shall be repaired by the Contractor, as directed by the Engineer, at no additional expense to the Owner. The Contractor's pumping and dewatering operations shall be carried out in such a manner as to prevent damage to the Contract work and so that no loss of ground will result from these operations. Precautions shall be taken to protect new work from flooding during storms or from other causes. Pumping shall be continuous to protect the work and/or to maintain satisfactory progress.

H. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water from the trenches, excavations, and stormwater management operations shall be disposed of in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

I. The Contractor shall excavate interceptor swales and ditches, as necessary, prior to the start of major earthmoving operations to reduce the potential for erosion and to keep areas as free from surface and ponded water as possible. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

J. Should surface, rain or groundwater be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties for such water. All piping exposed above ground surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

K. The presence of groundwater or stormwater in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation

3.10 DUST CONTROL

A. Comply with 310 CMR 7.09 “Dust, Odor, Construction and Demolition” of the Commonwealth of Massachusetts.

B. Maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas free from dust which would cause the standards of air pollution to be exceed or case a hazard or nuisance to others.

C. Take necessary measures to control dust resulting from construction operations and do prevent spillage of material on public roads and streets.

D. Provide wet machine sweeping of street surfaces after each workday or as needed to minimize dust and sediment.

3.11 MAINTENANCE

A. Protection of graded areas: protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning compacted areas: where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add fill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

E. Unless directed otherwise by the Town of Maynard Department of Public Works, erosion control measures shall be maintained, inspected, repaired as required by the Architect or Department of Public Works representative and left in place.

3.12 RUBBISH REMOVAL

A. The General General Contractor shall remove all waste and debris and dispose daily in accordance with requirements of Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION

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