STRIDE
BRT General Engineering Consultant

Transmittal

To: Dustin Fairbrook Nazanin Samimi, Sound Transit

Date: 05/20/24

Procurement Number OA 0206-19

Project Name BT306 NE 145th St/SR 522 Roadway Improvements – Lake Forest Park

Subject of Transmittal BT306 100% Geotechnical Data Report

From Padmaja Avadutha, Jacobs

WE ARE SENDING:	**SUBMITTED FOR:**
☐ Meeting Agenda	☐ Approval
☐ Meeting Minutes	☐ Your Use
☒ Deliverables	☐ As Requested
☐ Other:	☒ Review and Comment

DOCUMENT NAME	REV. NO.	STATUS
0A 0206-19 24.05.02 BT306 100Pct Geotechnical Data Report	0	Final

STRIDE Bus Rapid Transit

SR 522 (Bothell Way NE) Roadway & Stations BRT – Lake Forest Park Segment

BT306 – 100% Geotechnical Data Report

D3458607

April 2024

Prepared by the

STRIDE

BRT General Engineering Consultant

STRIDE Bus Rapid Transit

Project No:	D3458607
Document Title:	100% Geotechnical Data Report – SR 522 (Bothell Way NE) BRT – Lake Forest Park Segment
Document No.:	OA 0206-19 TO 24
Revision:	100% Design Draft
Document Status:	DRAFT
Date:	April 2024
Client Name:	Central Puget Sound Regional Transit Authority (Sound Transit)
Client No:	82074
Program Manager:	Padmaja Avadutha
Author:	Sean Schlitt & JoLyn Gillie
File Name:	BRT GEC BT306 SR522 (Bothell Way NE) Geotechnical Data Report 100 pct.docx

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	04/17/2024	Issued for 100% Design Review	S. Schlitt	J. Gillie	A. Heinze Fry	J. Gillie

Contents

1. Introduction 1-1
1.1 Project Description 1-1
1.1.1 STRIDE Bus Rapid Transit Program 1-1
1.1.2 SR 522 (Bothell Way NE) Roadway & Stations BRT – Lake Forest Park 1-1
1.2 Purpose and Scope 1-2
2. Geotechnical Borings 2-2
2.1 Lake Forest Park 2-2
2.2 Drilling Methods 2-5
2.3 In-Situ Testing 2-6
2.3.1 Testing Methods 2-6
2.3.2 Hammer Efficiency 2-6
2.4 Soil Sampling 2-8
3. Geotechnical Laboratory Testing 3-8
3.1 Moisture Content (by mass) 3-8
3.2 Moisture Content, Ash, and Organic Matter 3-8
3.3 Particle Size Analysis of Soils 3-8
3.4 Percent Finer than No. 200 Sieve 3-8
3.5 Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits) 3-9
3.6 Direct Shear Test of Soils Under Consolidated Drained Conditions 3-9
4. Groundwater Monitoring 4-9
4.1 Vibrating Wire Piezometers 4-9
4.2 Standpipe Monitoring Wells 4-9
5. Previous Explorations 5-10
5.1 Overview 5-10
5.2 Lake Forest Park Segment 5-10
6. Limitations 6-11
7. References 7-11

Figures

Figures 1 Site and Vicinity Map
Figures 2D – 2I Site and Exploration Plan

Tables

Table 2-1. Summary Table of Lake Forest Park Segment Completed Borings 2-3
Table 2-2. Summary Location Table of Lake Forest Park Borings 2-4
Table 2-3. Summary Table of Drill Rigs and Hammer Efficiencies for Completed Borings 2-7

Appendix A: Field Explorations

Figure A-1 Legend of Terms and Symbols Used on Exploration Logs
Figures A-2 – A-65 Logs of Borings BH-25 through BH-29, BH-31, BH-36A, BH-36B, BH-37, BH-39, BH-41 through BH-43, BH-45 through BH-58, BH-60 through BH-77, and BH-79 through BH-90

Appendix B: Laboratory Testing

Figures B-1 – B-35 Summary of Material Properties
Figures B-36 – B-107 Particle-Size Analysis of Soils
Figures B-108–B-117 Atterberg Limits
Figures B-118–B-120 Direct Shear Test of Soils Under Consolidated Drained Conditions

Appendix C: Hammer Efficiency Testing Results

Appendix D: Groundwater Monitoring Data

Appendix E: Previous Investigations

1. Introduction

Jacobs Engineering (Jacobs) was retained by Sound Transit to provide engineering design services for the STRIDE Bus Rapid Transit (BRT) program located in the State of Washington. The project will provide BRT service along the State Route 522 (SR 522) and Interstate 405 (I-405) corridors. The I-405 corridor will span 37 miles between the cities of Lynnwood and Burien while the SR 522 corridor will span about 9 miles between Interstate 5 (I-5) and I-405. There are multiple individual projects that make up the overall STRIDE program. This report focuses on the segment of BRT service in Lake Forest Park, which has been identified as BT306 within the STRIDE program. A separate Pavement Coring Report (PCR) has also been produced to present the data obtained from pavement coring for the proposed pavement improvements along the BT306 alignment.

HWA GeoSciences Inc. (HWA) was contracted as a subconsultant to Jacobs as part of the STRIDE BRT General Engineering Consultant (GEC) team under Agreement OA 0206-19. Authorization to perform geotechnical site investigations and prepare a summary report is provided in Task Orders 7 and 24 to the GEC Professional Services Contract between Sound Transit and the Jacobs team. The project scope of work requires the development of this Geotechnical Data Report (GDR) summarizing the testing and methods used in the site investigation and providing the data obtained for use in preparing design and construction recommendations for the SR 522 (Bothell Way NE) Roadway & Stations project in Lake Forest Park (BT306).

1.1 Project Description

1.1.1 STRIDE Bus Rapid Transit Program

Sound Transit's STRIDE BRT is planned to operate as frequent, high-capacity transit lines along I-405 and SR 522. STRIDE is expected to launch in 2026 for I-405 South (S1) and SR 522 (S3), and in 2027 for I-405 North (S2). The STRIDE program includes two new transit centers, including the new SR 522/I-405 Transit Hub with lines providing connections to four Link stations, as well as freeway and arterial BRT stations. The BRT stations connect to Link light rail at Shoreline, Lynnwood, Bellevue, and Tukwila, and other transit services provided by Sound Transit, Community Transit, and King County Metro.

The BRT project consists of the following three main segments:

- (S1 Line) I-405 South spanning from the Bellevue Transit Center to the Burien Transit Center
- (S2 Line) I-405 North spanning from the Bellevue Transit Center to the Lynnwood City Center Station
- (S3 Line) SR 522 running from the Shoreline South/148th Link light rail station to the new SR 522/I-405 Transit Hub

1.1.2 SR 522 (Bothell Way NE) Roadway & Stations BRT – Lake Forest Park

The STRIDE program includes construction of corridor improvements for the SR 522/NE 145th BRT Project along approximately 9.3 miles of existing public roadway between Shoreline/Seattle (BT305), Lake Forest Park (BT306), and Kenmore/Bothell (BT307), including portions of SR 523 (NE 145th Street) and SR 522 (Bothell Way NE). The proposed BRT project will increase regional mobility and improve transit speed and reliability along the corridor, with interconnections to Link light rail and to other bus services. This report focuses on the SR 522 (Bothell Way NE) Roadway & Stations BRT in Lake Forest Park (BT306).

The BT306 segment of the project includes:

- Three BRT stations in Lake Forest Park
- Business access and transit (BAT) lanes
- Bus-only lanes
- Transit signal priority (TSP) improvements at certain intersections
- A variety of bicycle and pedestrian improvements are also associated with some of the above components

- Use of infiltration for stormwater management or installation of stormwater utilities where infiltration is not considered feasible.

The approximate location of the project site is shown on the Vicinity Map, Figure 1. Locations of the proposed improvements are shown on the Site and Exploration Plans, Figures 2D through 2I following the text.

This report presents a summary of the previous exploration data available along the Project alignment, and the results of a series of subsurface explorations performed at select locations along the Project alignment, with the results of laboratory testing performed on selected samples obtained from the explorations.

1.2 Purpose and Scope

This GDR presents the results of HWA's subsurface exploration program, including in situ testing, and laboratory testing for the SR 522 (Bothell Way NE) Roadway & Stations BRT Project within the Lake Forest Park segment (BT306). The purpose of the subsurface exploration program was to provide data regarding the soil, pavement, and groundwater conditions at the project site.

This report describes the data-gathering procedures and presents the boring logs, field test data, groundwater conditions observed during drilling, and laboratory testing data assembled for this project. Historical data from previous exploration programs completed for various projects conducted at the site is also included; however, the historic data locations and quality cannot be confirmed, and therefore is provided for reference only.

2. Geotechnical Borings

This GDR presents the results of HWA's subsurface exploration program, including in situ testing, and laboratory testing for the SR 522 (Bothell Way NE) Roadway & Stations BRT Project within Lake Forest Park. The purpose of the subsurface exploration program was to provide data regarding the soil, pavement, and groundwater conditions at the project site. This report describes the data-gathering procedures and presents the boring logs, field test data, groundwater conditions along the alignment, and laboratory testing data assembled for this project. Boring logs are provided in Appendix A and laboratory testing is provided in Appendix B.

Historical data from previous exploration programs completed for various projects conducted along the alignment are also included; however, the historical data locations and quality cannot be confirmed, and therefore is provided for reference only.

2.1 Lake Forest Park

Seventy (70) machine-drilled borings, designated BH-25 through BH-94, were proposed within the Lake Forest Park segment of the project in support of design of walls, luminaires, signal poles, and infiltration facilities. As of the time of this report, borings have been completed at fifty six (56) of the proposed locations, for a total of sixty four (64) individual borings. Note that several boring locations had more than one exploration (e.g., BH-36A and BH-36B). The additional borings were added where the size of the drill rig and depth of the borings was limited by steep slopes. In these cases, additional data was provided by drilling at different elevations along the slope. Table 2-1 provides a summary of the purpose together with the boring designations for the borings completed to date. The coordinates and elevations, based on the survey data provided to HWA by Furtado & Associates, Inc., are provided in Table 2-2.

Due to delays in the permitting process, the GEC team reviewed the need to complete fourteen (14) borings. Seven (7) borings, designated as BH-30, BH-32, BH-33, BH-34, BH-35, BH-92, and BH-93, have since been deemed unnecessary as the improvements associated with those borings are no longer part of the design. One (1) boring, designated BH-40, was eliminated due to right of entry refusal and because no suitable place to relocate the boring was identified. A request for deviation (RFD) was submitted by the design team to Sound Transit on May 12, 2023 and was confirmed for removal from the original Geotechnical Site Investigation Plan (GSIP) (HWA, 2022). The six (6) remaining incomplete borings, designated BH-38, BH-44, BH-59, BH-78, BH-91, and BH-94, are pending critical area permit approval.

Note: BH-40 and rest in paragraph are not in Bsche'tla area.PG

Table 2-1. Summary Table of Lake Forest Park Segment Completed Borings

Purpose	General Location	Boring Designations	Depth range	Dates	Notes
Bsche'tla Creek Fill Wall / STA 193+00 to 195+50	Between SR 522 intersections with NE 153rd St and NE 155th St	BH-31 (In Center roadway.PG)	71.5 feet	March 22, 2023	
Westbound Cut Walls / STA 190+00 to 235+00	West side of the SR 522 Alignment from near NE 153rd Place and 41st Avenue NE (West side of median PG)	BH-29, BH-36A, BH-36B, BH-37, BH-39, BH-41, BH-42, BH-43, BH-45, BH-47, BH-48A, BH-48B, BH-49, BH-50, BH-51, BH-52A, BH-52B, BH-53, BH-54A, BH-54B, BH-55W, BH-56, BH-57, BH-62, BH-63, BH-64A, BH-64B, BH-65, BH-66A, BH-66B, BH-67, BH-68A, BH-68B, BH-69, BH-70, BH-72, BH-74, BH-75, BH-76, BH-77, and BH-79	5 to 20.5 feet at locations completed using an Acker rig; 17.6 to 56.5 feet at other locations	June 13, 2022 to May 31, 2023	Acker locations are BH-36B, BH-42, BH-48A, BH-52A, BH-52B, BH-54A, BH-54B, BH-56, BH-63, BH-76, and BH-79
Eastbound Cut Wall / STA 180+50 to 183+60	On SR 522, between NE 149th Street and NE 153rd Street	BH-25 and BH-84 (Before 153rd PG)	20.4 to 21.5 feet	August 15 and 19, 2022	Also provide information for infiltration feasibility and luminaires
Eastbound Fill Walls / STA 172+50 to 239+50	Between NE 145th Street and 41st Avenue NE	BH-46W, BH-58, BH-60, BH-61, BH-71, BH-73, BH-80A, BH-80B, BH-81W, BH-83W and BH-86	20.3 to 51.5 feet	August 2, 2022, to January 27, 2023	Also provide information for infiltration feasibility and luminaires
Luminaires / STA 187+25 to 191+35	On SR 522, between north and south intersections with NE 153rd Street	BH-26, BH-27, and BH-28 (Before 153rd PG)	21.5 to 26.5 feet	August 16, 2022, and April 7, 2023	Also provide information for infiltration feasibility and signal poles
Signal Poles / STA 224+90 to 225+65	Near the intersection of NE 165th Street and SR 522	BH-60, BH-61, BH-62	31.5 to 36.5 feet	December 5 to December 12, 2022	
Infiltration / STA 172+00 to 232+00	Between NE 145th Street and 41st Avenue NE	BH-82, BH-84, BH-85W, BH-87, BH-88, BH-89, and BH-90	20.9 to 26.5 feet	July 28, 2022, to December 12, 2022	

Table 2-2. Summary Location Table of Lake Forest Park Borings

Boring Designation	Northing (WA State Plane NAD83 2011)	Easting (WA State Plane NAD83 2011)	Elevation (feet) (NAVD 88)	Depth (feet)
BH-25	272397.60	1281687.87	212.6	20.4
BH-26	272853.81	1281952.62	192.4	21.5
BH-27	272998.26	1281983.45	188.6	21.5
BH-28	273101.84	1282128.90	185.1	26.5
BH-29	273132.00	1282089.62	185.6	41.5
BH-31	273413.54	1282254.63	181.9	71.5
BH-36A	274195.43	1282627.40	187.0	40
BH-36B	274222.68	1282651.38	181.3	5
BH-37	274204.55	1282697.95	162.1	51.5
BH-39	274379.07	1282779.69	153.1	51.5
BH-41	274572.01	1282837.99	143.7	51.5
BH-42	274775.30	1282845.45	143.5	5.5
BH-43	274765.06	1282877.52	134.8	51.5
BH-45	274960.29	1282913.73	126.6	56.5
BH-46W	275011.50	1282966.61	124.5	51.5
BH-47	275147.56	1282854.19	133.2	40.3
BH-48A	275361.37	1282952.49	124.6	11.5
BH-48B	275358.00	1282903.87	138.6	41.5
BH-49	275354.36	1282987.95	112.5	51.4
BH-50	275693.66	1283041.90	101.8	36.5
BH-51	275563.37	1283028.89	105.6	51.5
BH-52A	275805.90[1]	1283059.54[1]	109.5[1]	6.5
BH-52B	275863.74[1]	1283078.30[1]	108.4[1]	11.5
BH-53	275749.33	1283081.99	99.4	51
BH-54A	275925.04	1283123.49	99.6	11.5
BH-54B	275883.39	1283081.55	109.8	10.9
BH-55W	275933.47	1283155.51	93.1	51.5
BH-56	276059.14	1283162.16	105.3	13.9
BH-57	276116.08	1283236.99	87.2	51.5
BH-58	276159.23	1283301.20	85.3	51.5
BH-60	276238.10	1283338.58	82.8	31.5
BH-61	276271.06	1283418.38	77.3	36.5
BH-62	276334.27	1283276.41	83.5	31.5
BH-63	276393.80	1283267.47	93.2	9
BH-64A	276625.75	1283440.78	72.7	26.5
BH-64B	276620.00	1283442.45	73.0	41.4
BH-65	276567.16	1283443.62	74.0	51.5
BH-66A	276888.60[1]	1283574.23[1]	84.9[1]	22.4
BH-66B	276922.21[1]	1283596.28[1]	85.4[1]	22.5
BH-67	276744.33	1283546.29	69.6	51.4
BH-68A	277079.38	1283736.36	65.9	22.2
BH-68B	277096.23	1283755.67	65.3	17.6
BH-69	276968.35	1283703.77	62.2	51.3
BH-70	277151.66	1283823.30	54.1	30.5
BH-71	277043.83	1283817.91	57.6	26.5
BH-72W[2]	277137.03	1283844.57	54.1	51.5
BH-73	277213.08	1283970.30	48.9	50.2

Boring Designation	Northing (WA State Plane NAD83 2011)	Easting (WA State Plane NAD83 2011)	Elevation (feet) (NAVD 88)	Depth (feet)
BH-74	273805.08	1282483.89	177.9	51.5 (Past 155th PG)
BH-75	273925.12	1282554.35	174.5	51.5
BH-76	273909.24	1282492.05	181.4	6.5
BH-77	275187.46	1282841.57	141.6	40.7
BH-79	276418.07	1283330.14	88.0	20.5
BH-80A	277176.31	1283980.66	44.2	26.5
BH-80B	277087.40	1283901.55	47.9	20.3
BH-81W	271504.22	1281404.12	234.5	21.5
BH-82	271784.11	1281433.49	233.7	21.5
BH-83W	272076.60	1281509.52	227.5	21.5
BH-84	272526.43	1281764.81	206.5	21.5
BH-85W	273639.22	1282412.85	180.2	26.5
BH-86	274564.69	1282880.62	144.3	21.5
BH-87	275660.72	1283102.16	100.0	26.5
BH-88	276229.18	1283514.30	64.2	21.3
BH-89	276713.14	1283578.12	69.8	21.5
BH-90	276848.75	1283667.50	65.7	20.9

(1) Survey has not been completed and access to locations for future survey is not anticipated. Coordinates and elevation listed are based on estimations from available references.
(2) Well location BH-72W surveyed. Soil boring BH-72 drilled approximately 4 feet north of survey point.

2.2 Drilling Methods

All geotechnical borings were machine drilled using a combination of mud rotary and hollow stem auger drilling methods. For hollow stem auger drilling, the borehole is drilled by simultaneously rotating and axially advancing a continuous flight auger with a hollow stem into the soil. The cutting teeth on the auger break up the soils and convey them upwards along the rotating auger flights. Water may be added to the internal auger casing to combat soil heave due to the presence of groundwater. To mitigate heave, mud rotary drilling methods were used in many of the borings. For mud rotary drilling, the borehole is advanced in rock and/or sediments by rapid rotation of a tri-cone drill bit mounted at the end of drill rods. Drilling fluid circulates in the borehole by being pumped down through the rod string, where it picks up drill cuttings and carries the cuttings to the surface where the mud is separated from the cuttings and reused. The drilling fluid within the borehole helps to maintain stability of the borehole walls.

All machine-drilled subsurface explorations except those listed below were performed by Holocene Drilling (Holocene), of Puyallup, Washington. Subsurface explorations BH-65, BH-67, BH-69, and BH-72 were performed by Advance Drill Technologies, Inc. of Snohomish, Washington. Subsurface exploration BH-29, BH-36A, BH-36B, BH-42, BH-47, BH-48A, BH-48B, BH-50, BH-52A, BH-52B, BH-54A, BH-54B, BH-56, BH-63, BH-64A, BH-64B, BH-66A, BH-66B, BH-68A, BH-68B, BH-70, BH-76, BH-77, BH-79, BH-80A and BH-80B were performed by Geologic Drill Partners of Fall City, Washington. All drilling companies were subcontracted by HWA to perform the work.

Borings BH-37, BH-39, BH-41, BH-43, BH-46W, BH-49, BH-51, BH-53, BH-55W, BH-57, BH-58, BH-71, BH-72W, and BH-73 through BH-75 were completed using mud rotary methods using a 5-inch tricone bit. Borings BH-28, BH-31, BH-45, BH-60 through BH-62, and BH-81W through BH-90 were completed using hollow stem augers with 4¼-inch inside diameter and 8-inch outside diameter. Borings BH-25 through BH-27, BH-29, BH-65, BH-67, BH-69, and BH-72 were completed using hollow stem augers with 3¼-inch inside diameter and 7-inch outside diameter.

Geologic Drill Partners performed borings BH-36A, BH-47, BH-48B, BH-50, BH-64A, BH-64B, BH-66A, BH-66B, BH-68A, BH-68B, BH-70, BH-77, BH-80A and BH-80B using a mini-Bobcat track rig using hollow stem augers with 2¼-inch inside diameter and 6-inch outside diameter. Borings BH-36B, BH-42, BH-48A, BH-52A, BH-52B, BH-54A, BH-54B, BH-56, BH-63, BH-76, and BH-79 were drilled using an Acker limited access rig using hollow stem augers with a 2¼-inch inside diameter.

For eight (8) explorations, a vacuum truck was used to advance beyond potential utilities prior to starting to drill. Borings BH-27, BH-46W, BH-73, BH-74, BH-75, BH-81W, BH-82, and BH-86 were advanced to depths ranging from 5 to 7.5 feet prior to beginning drilling.

2.3 In-Situ Testing

2.3.1 Testing Methods

In situ testing was performed using either Standard Penetration Tests (SPTs) or Non-Standard Penetration Tests (NSPTs). Where SPTs were performed they were conducted in accordance with ASTM D 1586 using a 2-inch outside diameter (OD), split-spoon sampler driven with a 140-pound hammer free-falling 30 inches. During the SPT, samples were obtained by driving the sampler 18 inches into the soil with the hammer free falling 30 inches. The number of blows required for each 6 inches of penetration was recorded. The Standard Penetration Resistance ("N-value") of the soil was taken to be the number of blows required for the final 12 inches of penetration. If a total of 50 blows was recorded within a single 6-inch interval, the test was terminated, and the blow count was recorded as 50 blows for the number of inches of actual penetration. This resistance, or N-value, provides an indication of the relative density of granular soils and the relative consistency of cohesive soils. The SPT N-values plotted on the exploration logs are as measured in the field and are not corrected for hammer efficiency or overburden pressure.

Where NSPTs were performed, a larger 3-inch OD, California Modified split-spoon sampler with ring inserts was driven with a 140-pound automatic hammer free-falling 30 inches. The samples collected with this sampler have blow counts that do not reflect standardized values as they utilized the larger, non-standard sampler. These values should be adjusted utilizing appropriate correction factors to reflect standard SPT N-value blow counts for the purpose of design. The boring logs indicate the sampler type used. Field-recorded N-values have not been corrected for hammer efficiency, overburden pressure, rod flexure, or silt content.

2.3.2 Hammer Efficiency

SPT and NSPT values should be adjusted based on the estimated hammer efficiency. Borings performed by Holocene and Advance Drill Technologies, Inc., and BH-29 performed by Geologic Drill Partners were performed using automatic hammers. Other borings performed by Geologic Drill Partners used a cathead and pully system to drive the samples. For hammers operated by Holocene, hammer energy transfer efficiency testing was performed by Robert Miner Dynamic Testing (RMDT). For the automatic hammer operated by Geologic Drill Partners, the equipment manufacturer provided hammer efficiency, and a field test for efficiency has not been conducted at this time. The results of the testing for hammers used for the borings are summarized in Table 2-3 and provided in Appendix C. No hammer efficiency testing was available for the automatic hammer used by Advance Drill Technologies, Inc. and the cathead and pulley systems used by Geologic Drill Partners. For these hammers, per *Section 5.5* of the WSDOT *GDM*, the efficiency was estimated as 60% for conventional drop hammers using rope and cathead and 80% for automatic trip hammers.

Table 2-3. Summary Table of Drill Rigs and Hammer Efficiencies for Completed Borings

Drilling Company	Rig Model/Company Rig No.	Reference/Date Tested	Hammer Efficiency (%)	Applicable Borings
Holocene	Diedrich B-58 Truck Rig/ Rig No. 92	Efficiency tested Dec 29, 2023(1)	95	BH-83W, BH-84, BH-85W
Holocene	Diedrich D-50 Track Rig/ Rig No. 26	Efficiency tested Jul 2, 2018(1)	89	BH-25, BH-26, BH-27
Holocene	Diedrich D-50 Track Rig/ Rig No. 107	Efficiency tested Jun 30, 2020(1)	96	BH-46W, BH-58, BH-60, BH-61, BH-62, BH-74, BH-75, BH-88
Holocene	Diedrich D-70 Track Rig/ Rig No. 124	Efficiency tested Dec 29, 2023(1)	90	BH-43, BH-45
Holocene	Diedrich D-70 Track Rig/ Rig No. 129	Efficiency tested Dec 29, 2023(1)	70	BH-28, BH-31, BH-49, BH-51, BH-53, BH-55W, BH-57, BH-73, BH-82, BH-86, BH-89, BH-90
Holocene	Diedrich D-90 Truck Rig/ Rig No. 96	Efficiency tested Jun 30, 2020(1)	87	BH-71, BH-81W, BH-87
Holocene	Diedrich D-120 Truck Rig/ Rig No. 113	Efficiency tested Jun 30, 2020(1)	89	BH-37, BH-39, BH-41
Advance Drill Technologies, Inc.	Diedrich D-50 / N/A	Studies of Automatic hammer system(2)	~80	BH-65, BH-67, BH-69, BH-72
Geologic Drill Partners	Mini Bobcat Limited Access Rig / NA	Studies of cathead-pully system(2)	~60	BH-36A, BH-47, BH-48B, BH-50, BH-64A, BH-64B, BH-66A, BH-66B, BH-68A, BH-68B, BH-70, BH-77, BH-80A, BH-80B
Geologic Drill Partners	Acker Limited Access Rig/ N/A	Studies of cathead-pully system(2)	~60	BH-36B, BH-42, BH-48A, BH-52A, BH-52B, BH-54A, BH-54B, BH-56, BH-63, BH-76, BH-79
Geologic Drill Partners	Acker Recon Track Rig/ N/A	Efficiency Provided from Factory Dated May 10, 2023(3)	90	BH-29

(1) Hammer efficiency measured by Robert Miner Dynamic Testing (RMDT) with results provided in Appendix C
(2) Average energy efficiency assumed as specified in the WSDOT *GDM*.
(3) Hammer Efficiency provided by equipment manufacturer. In field tests for efficiency has not been conducted at this time; results provided in Appendix C

2.4 Soil Sampling

Soil samples obtained from the borings were obtained from the split-spoon samplers driven for the SPTs and NSPTs and are considered disturbed samples. SPTs were obtained in general accordance with *ASTM International* (ASTM) D 1586. NSPTs were conducted using a 3-inch OD sampler fitted with thin-walled 2.5-inch diameter inserts consisting of either 1-inch-tall or 6-inch-tall brass rings to obtain samples with less disturbance than an SPT sample; however, they are still considered disturbed samples since they are driven with an automatic hammer.

A representative from HWA logged each of the explorations and recorded pertinent information, including sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence. Soil samples obtained from the explorations were classified in the field and representative portions were placed in plastic bags. These soil samples were then taken to our laboratory in Bothell, Washington for further examination and testing. A Legend of Terms and Symbols Used on Exploration Logs is presented on Figure A-1, Appendix A. Summary soil exploration logs are presented on Figures A-2 through A-65. It should be noted that the stratigraphic contacts shown on the individual exploration logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific date and locations reported and, therefore, are not necessarily representative of other locations or times.

3. Geotechnical Laboratory Testing

Laboratory tests were conducted on selected samples retrieved from the explorations to characterize relevant engineering and index properties of the soils encountered at the site. The tests included moisture content determination, grain size distribution analyses, Atterberg limits (plasticity characteristics), organic content, and direct shear tests.

The tests were conducted in general accordance with appropriate ASTM standards and are discussed in further detail in Appendix B. The test results and a discussion of laboratory test methodologies are presented in Appendix B, or displayed on the boring logs in Appendix A, as appropriate.

3.1 Moisture Content (by mass)

The moisture content of selected soil samples was determined in general accordance with ASTM D 2216. The results are summarized on the attached Summary of Material Properties, Figures B-1 through B-35, which also provide information regarding the classification of the sample, as determined using ASTM D 2487, and are shown at the sampled intervals on the appropriate summary logs in Appendix A.

3.2 Moisture Content, Ash, and Organic Matter

Selected samples were tested in general accordance with method ASTM D 2974, using moisture content method 'A' (oven dried at 105° C) and ash content method 'C' (burned at 440° C). The results are summarized on the attached Summary of Material Properties, Figures B-1 through B-35. The results are percent by weight of dry soil.

3.3 Particle Size Analysis of Soils

Selected samples were tested to determine the particle (grain) size distribution of material in general accordance with ASTM D 6913 for materials with particles sizes between 3 inches and the No. 200 sieve (75μm) and ASTM D 7928 for particles smaller than the No. 200 sieve. Particle Size Analysis of Soils reports are provided on Figures B-36 through B-107, which also provide information regarding the classification of the sample, as determined using ASTM D 7928.

3.4 Percent Finer than No. 200 Sieve

The percentage of material finer than the No. 200 sieve was determined for select samples in general accordance with ASTM D 1140. The soil was oven dried, and washed over a No. 200 sieve to determine the percentage of fines. The results are provided on Figures B-36 through B-107, which also provide information regarding the classification of the sample, as determined using ASTM D 2487.

3.5 Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Atterberg Limits)

Selected samples were tested using method ASTM D 4318, multi-point method. The results are reported on the attached Liquid Limit, Plastic Limit, and Plasticity Index report, Figures B-108 through B-117, which also provide information regarding the classification of the sample, as determined using ASTM D 2487.

3.6 Direct Shear Test of Soils Under Consolidated Drained Conditions

Direct shear testing was conducted in general accordance with ASTM D 3080 on select samples collected in thin-walled brass rings from NSPTs. Three trials were run at selected normal stresses that were determined based on the depths from which each sample was retrieved. The results of these tests are presented in the Direct Shear Test of Soils Under Consolidated Drained Conditions report, Figures B-118 through B-120, provided in a graphical format. The indicated shear stress at each point on the figures represents the maximum value obtained (i.e. peak stress condition). The apparent cohesion and friction angle of the soil for both the peak conditions are inferred from a least-squares linear regression of the three test points (see trend lines on Figures B-118 through B-120).

4. Groundwater Monitoring

A series of three (3) vibrating wire piezometers (VWPs) and three (3) standpipe wells were installed to monitor groundwater levels at the site. The VWPs were installed in borings BH-46W, and BH-55W below encountered or anticipated confining layers to monitor groundwater levels within confined aquifers. The standpipe wells were installed in borings BH-81W, BH-83W, and BH-85W as groundwater monitoring wells to measure near surface ground water fluctuations. Groundwater data was recorded in the wells by installing a datalogging pressure transducer. Figures of the monitored groundwater data based on elevations are presented in Appendix D. Details regarding the VWP and groundwater well installation are provided below. For borings without wells or VWPs, groundwater conditions observed during drilling of the explorations were noted and are included on the applicable boring logs, presented on Figures A-2 through A-65.

4.1 Vibrating Wire Piezometers

VWPs consist of a vibrating wire pressure transducer contained in a stainless steel housing. A low-air-entry filter is located at one end of the housing to allow the outside water pressure to act on the transducer. The transducer is connected to a signal cable that is routed up the borehole to the ground surface. Each VWP was placed at a specified depth below ground surface (bgs). The VWPs were grouted into each boring at the selected depths using bentonite-cement grout placed using tremie methods. A datalogger consisting of a Durham Geo MiniLogger was connected to the signal cable and placed within the well monuments. The dataloggers were set to record data every hour throughout the monitoring period. Once the data was collected, readings were converted to pressure head measured in feet above the elevation of the VWP using the formula and calibration factors from the manufacturer's calibration sheets as well as baseline readings collected prior to installation.

VWPs were installed in borings in which substantial drilling heave was observed at depth or confined aquifer conditions were anticipated. VWPs and their Miniloggers were installed between August 2 and December 7, 2022 and readings collected on August 7, 2023. Updates will be provided following additional data collection events.

Based on data obtained to date, the VWPs installed at STA 211+60 (BH-46W) and STA 221+00 (BH-55W) show a confined groundwater condition with piezometric surfaces ranging from approximately 11 to 15 feet bgs. A VWP was installed adjacent to BH-72, designated BH-72W, near STA 234+95 but malfunctioned such that no groundwater data was collected from this location.

4.2 Standpipe Monitoring Wells

Standpipe monitoring wells were constructed in selected borings and consisted of approximately 10 feet of slotted 2-inch diameter PVC pipe and the annulus backfilled with filter sand at the selected depths. Solid PVC pipe was then installed, and the annulus backfilled with a bentonite seal and completed at the ground surface with a flush mounted well

monument. Automated pressure transducer dataloggers were installed to collect groundwater data at specified intervals from the monitoring wells.

Standpipe wells BH-81W and BH-83W are at relatively similar elevations, between STA 172+70 and STA 178+65. After stabilization, both wells show similar perched groundwater fluctuations. Groundwater depths at these locations generally ranged from about 4 to 8 feet bgs with generally higher levels during the wetter months. Standpipe well BH-85W at STA 196+70 is further along the alignment to the north and lower in elevation. Groundwater depths typically varied between 13.5 and 15.5 feet bgs with higher elevations in the wetter months, but with less variability with rain event response when compared to BH-81W and BH-83W.

5. Previous Explorations

5.1 Overview

HWA conducted a comprehensive search for geotechnical information in the vicinity of each project site. This effort included a search of online geotechnical databases and a review of HWA's project library. Geologic maps, project files, and archives from several sources were reviewed to obtain geologic information as well as site-specific geotechnical subsurface information at points of interest for the project. Data, primarily consisting of boring logs and other subsurface explorations, were collected from the following sources:

- Geologic Information Portal, Washington Department of Natural Resources (DNR) (DNR, 2024)
- WSDOT boring logs for the alignment obtained from Public Records Requests
- Online database for King County and the City of Lake Forest Park, and HWA's Project Library

5.2 Lake Forest Park Segment

The documents listed below were identified to contain data of subsurface explorations located within or near the Lake Forest Park segment. The approximate locations of the borings are presented on the Lake Forest Park segment of the Site and Existing Exploration Plan, Figures 2D through 2I. Logs of these explorations are presented in Appendix E.

- WSDOT. 2006. *SR-522, MP 4.28 to MP 4.89, WL-2222, Corridor Improvement, 153rd Signal and Roadway Widening, Geotechnical Recommendations.* (Internal Memorandum). Dated February 1, 2006.
    - Fifteen explorations were performed by WSDOT in support of roadway widening and signalization along SR 522, near the intersection with NE 153rd Street. Eight of the explorations, designated H-1-05 through H-4-05, H-5-06, S-1-05, S-2-05, and S-4-05, were machine-drilled borings, while the portable penetrometer explorations, designated PP-1-05 though PP-7-05, were advanced using hand holes. Nine of these borings, designated PP-3-05 through PP-7-05, H-3-05, H-4-05, and S-4-05, were located west of the roadway while the remainder were located along the east side.
- Nelson-Couvrette and Associates, Inc. 1997. *Geotechnical Evaluation, Burke-Gilman Trail Footbridge, Lake Forest Park, Washington, NCA File No. 207497.* Prepared for King County. Dated June 10, 1997.
    - A total of 4 hand holes were completed by Nelson-Couvrette and Associates, Inc. in support of the construction of a new pedestrian footbridge along the Burke-Gilman Trail that runs parallel with SR 522 to the east of the intersection with 41st Avenue NE. All of the hand holes were located within the vicinity of the BT306 project.
- GeoEngineers, Inc. 1993. *Geotechnical Engineering Services, McAleer Creek Bypass Pipeline, Lake Forest Park, Washington.* Prepared for King County Department of Public Works Surface Water Management Division. Dated April 23, 1993.

  - Four borings were performed by GeoEngineers, Inc. in support of a pipeline bypass beneath SR 522 at McAleer Creek near the intersection with Brookside Boulevard NE. One of these borings, designated B-4, was located south of the roadway.

- HWA Geosciences, Inc. 2021. *SR 522/NE 145th BRT Phase 3 Preliminary Geotechnical Data Report.* Prepared for Sound Transit. Dated July 31, 2021.

  - Eight machine-drilled borings designated BH-1 through BH-6, BH-3B, and BH-8, and two hand holes, designated HH-1 and HH-2, were performed along SR 522 in support of road widening associated with bus rapid transit between NE 153rd Street and Ballinger Way NE. All borings are within the current area of the project alignment.

- Wasatch Environmental, Inc. 2001. *As-Built Report, Operations and Maintenance Manual, Magic Cleaners DDC System, Lake Forest Park Town Center, Lake Forest Park, Washington.* Prepared for URS Corporation. Dated 2001.

  - Seven borings were performed by Wasatch Environmental, Inc in support of the environmental investigation and remediation for the Magic Cleaners facility near the intersection of SR 522 and Ballinger Way NE. All borings, designated DDC1 through DDC7 were within the vicinity of the project alignment, near the Lake Forest Park Town Center.

- ZZA-Terracon. 2008. *Geotechnical Engineering Report: Lyon Creek Bridge Replacement, Burke Gilman Trail, Lake Forest Park, Washington.* Prepared for MacLeod Reckord. Dated July 7, 2008.

  - Two borings were performed by ZZA-Terracon in support of a bridge replacement over Lyon Creek along the Burke Gilman Trail, south of Lake Forest Park Town Center. Both borings, designated B-1 and B-2, are within the vicinity of the project alignment.

6. Limitations

This GDR has been prepared for exclusive application to the Lake Forest Park Segment (BT306) of the SR 522 (Bothell NE Way) Roadway and Stations BRT Project. This report provides the geotechnical data obtained at our exploration locations and is not a warranty of subsurface conditions across the project area. The data contained herein are based upon site conditions as they existed at the time of the field explorations. Within the limitations of the scope, schedule, and budget, the data presented in this report were collected and presented in accordance with generally accepted professional geotechnical practice in this area at the time this report was prepared. No other warranty, expressed or implied, is made. This report was completed to provide designers and Contractors with geotechnical information. No design recommendations or interpretive information are provided herein.

The scope of this GDR does not include environmental site assessments or evaluations regarding the presence or absence of hazardous or toxic materials or cultural resources in the soil, surface water, groundwater, or air, on or below the site, or for evaluation or disposal of contaminated soils or groundwater, should any be encountered.

7. References

Environmental Associates, Inc. 1995. *Geotechnical Engineering Report: Proposed Retail Development, 14330 and 14350 Lake City Way NE, Seattle, Washington.* Submitted to Metromark Investment Management. Dated May 18, 1995.

GeoEngineers, Inc. 1993. *Geotechnical Engineering Services, McAleer Creek Bypass Pipeline, Lake Forest Park, Washington.* Prepared for King County Department of Public Works Subsurface Water Management Division. Dated April 23, 1993.

HWA Geosciences, Inc. 2021. *SR 522/NE 145th BRT Phase 3 Preliminary Geotechnical Data Report*. Prepared for Sound Transit. Dated July 31, 2021.

Nelson-Couvrette and Associates, Inc. 1997. *Geotechnical Evaluation, Burke-Gilman Trail Footbridge, Lake Forest Park, Washington, NCA File No. 207497.*Prepared for King County. Dated June 10, 1997.

Wasatch Environmental, Inc. 2001. *As-Built Report, Operations and Maintenance Manual, Magic Cleaners DDC System, Lake Forest Park Town Center, Lake Forest Park, Washington.* Prepared for URS Corporation. Dated 2001.

Washington State Department of Natural Resources (DNR). 2024. *Washington Geologic Information Portal.* (*Internet* Site: https://geologyportal.dnr.wa.gov/) accessed August 2018 through February 2024.

Washington State Department of Transportation (WSDOT). 2022. *Geotechnical Design Manual*. Version M46-03.16. February 10, 2022.

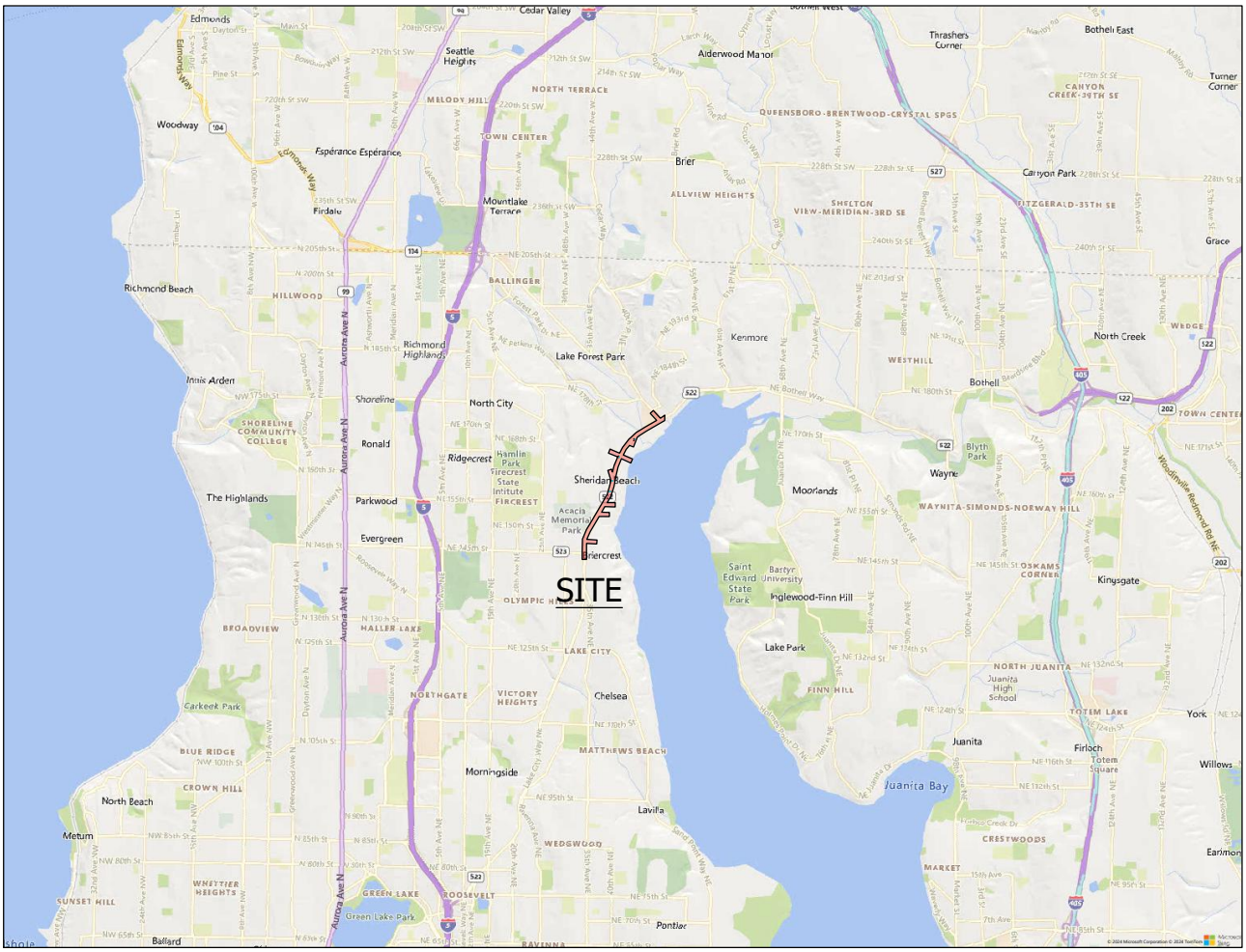
WSDOT. 2006. *SR-522, MP 4.28 to MP 4.89, WL-2222, Corridor Improvement, 153rd Signal and Roadway Widening, Geotechnical Recommendations.* (Internal Memorandum). Dated February 1, 2006.

ZZA-Terracon. 2008. *Geotechnical Engineering Report: Lyon Creek Bridge Replacement, Burke Gilman Trail, Lake Forest Park, Washington.* Prepared for MacLeod Reckord. Dated July 7, 2008.

SITE MAP

0 2500' 5000' 7500' 10000'

SCALE: 1" = 5000'



SITE

VICINITY MAP

0 5000' 10000' 15000' 20000'

SCALE: 1" = 10000'

GeoSciences Inc.
DBE/MWBE

SITE AND VICINITY MAP

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.: 1

DRAWN BY: CF
CHECK BY: SKS

PROJECT # 2021-133-21

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <1> Plotted: 4/5/2024 7:35 PM

EXPLORATION LEGEND

BH-81W — BOREHOLE DESIGNATION AND APPROXIMATE LOCATION (HWA, 2024)

HMA PAVEMENT

HMA OVERLAY

CUT WALL

FILL WALL

NE 145TH STREET & BOTHELL WAY NE

Scale: 1" = 80'-0"

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

N

0 40 80 120 160

SCALE: 1" = 80'

HWA GEOSCIENCES INC. DBE/MWBE

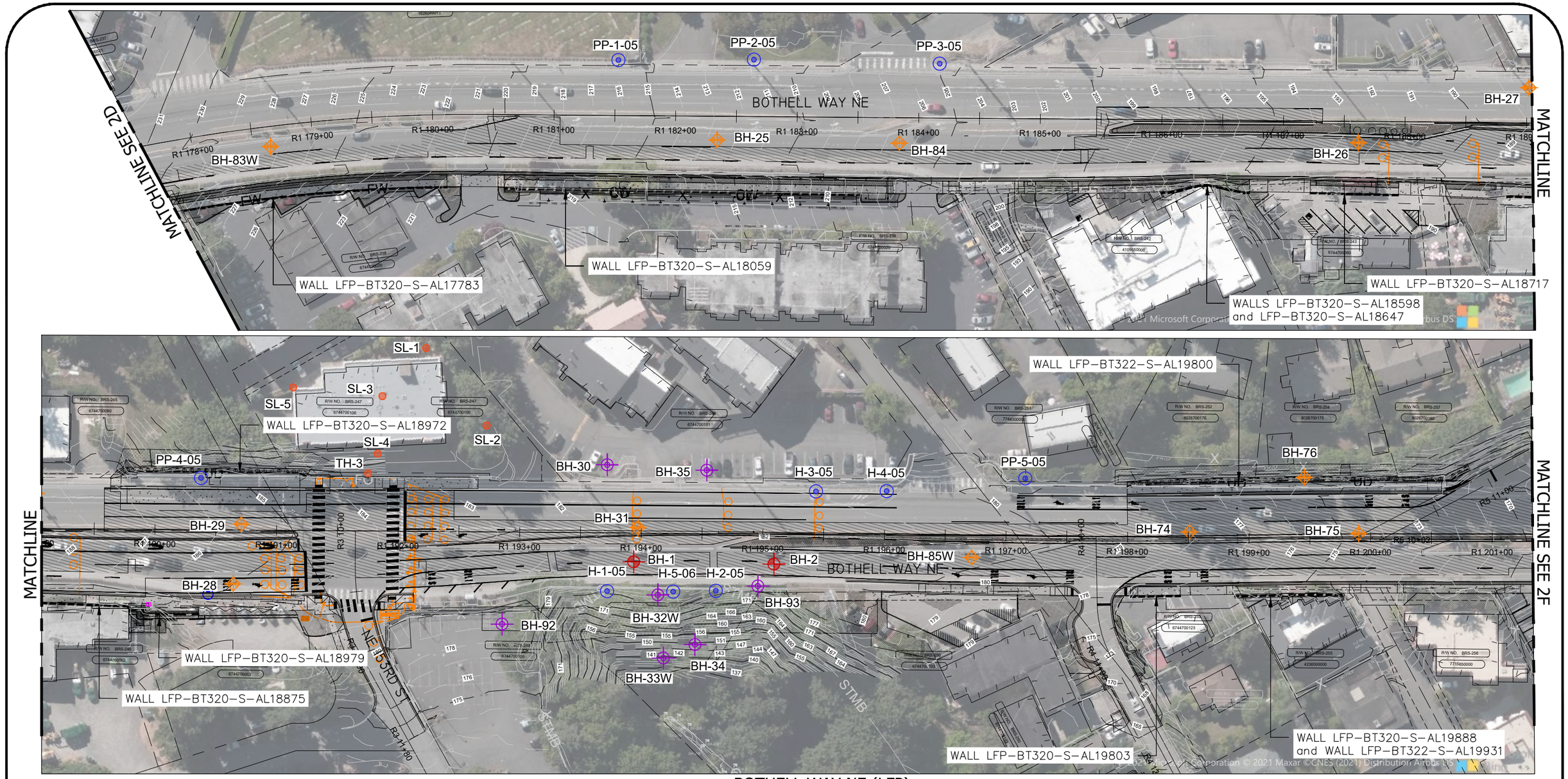
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2D
CHECK BY	PROJECT #
SKS/JLG	2021-133-21

BASE MAP PROVIDED BY: DEA

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <Fig 2d (SR 522-LFP) GDR> Plotted: 4/10/2024 4:05 PM



EXPLORATION LEGEND

- BH-25 — BOREHOLE DESIGNATION AND APPROXIMATE LOCATION (HWA, 2024)
- BH-30 — REMOVED BORING DESIGNATION AND APPROXIMATE LOCATION
- BH-1 — APPROXIMATE LOCATION OF EXPLORATIONS (HWA, 2021)
- H-1-05 — APPROXIMATE LOCATION OF EXPLORATIONS (WSDOT, 2006)
- SL-1 — APPROXIMATE LOCATION OF HAND BORINGS (EARTH ANALYSIS, 1985)
- HMA PAVEMENT
- HMA OVERLAY
- CUT WALL
- FILL WALL

BASE MAP PROVIDED BY: DEA

BOTHELL WAY NE (LFP)

Scale: 1" = 80'-0"

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

0 40 80 120 160

SCALE: 1" = 80'

HWA GEOSCIENCES INC. DBE/MWBE

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2E
CHECK BY	PROJECT #
SKS/JLG	2021-133-21

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <Fig 2e (Bothell Wa NE_SR 522-LFP) GDR> Plotted: 4/10/2024 4:06 PM

MATCHLINE SEE 2E

MATCHLINE SEE 2G

WALL LFP–39TH N–1120

WALL LFP–39TH S–1084

WALL LFP–BT322–S–AL20143

WALL LFP–BT322–S–AL20154

WALL LFP–BT322–S–AL20420

WALL LFP–BT322–S–AL20446

WALL LFP–BT322–S–ALXXX–BRS270–272

WALL LFP–BT322–S–AL20879

WALL LFP–BT322–S–AL20155

BH-77

BH-47

BH-3A

BH-3

BH-44

BH-45

BH-46W

BH-42

BH-43

BH-40

BH-38

BH-41

BH-86

BH-39

BH-37

BH-36A

BH-36B

38TH AVE NE

BOTHELL WAY NE

NE 157TH LN

NE 158TH LN

R5 20+00
R5 19+00
R5 18+00
R5 17+00
R5 16+00
R5 15+00
R5 14+00
R5 13+00
R5 12+00
R5 11+00
R5 10+00
R1 213+00
R1 212+00
R1 211+00
R1 210+00
R1 209+00
R1 208+00
R1 207+00
R1 206+00
R1 205+00
R1 204+00
R1 203+00
R1 202+00

EXPLORATION LEGEND

- BH-39 — BOREHOLE DESIGNATION AND APPROXIMATE LOCATION (HWA, 2024)
- BH-40 — REMOVED BORING DESIGNATION AND APPROXIMATE LOCATION
- BH-38 — PLANNED BOREHOLES DELAYED BY CRITICAL AREA PERMITS
- BH-3 — APPROXIMATE LOCATION OF EXPLORATIONS (HWA, 2021)
- HMA PAVEMENT
- HMA OVERLAY
- CUT WALL
- FILL WALL

BASE MAP PROVIDED BY: DEA

BOTHELL WAY NE (LFP)

Scale: 1" = 80'-0"

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

0 40 80 120 160

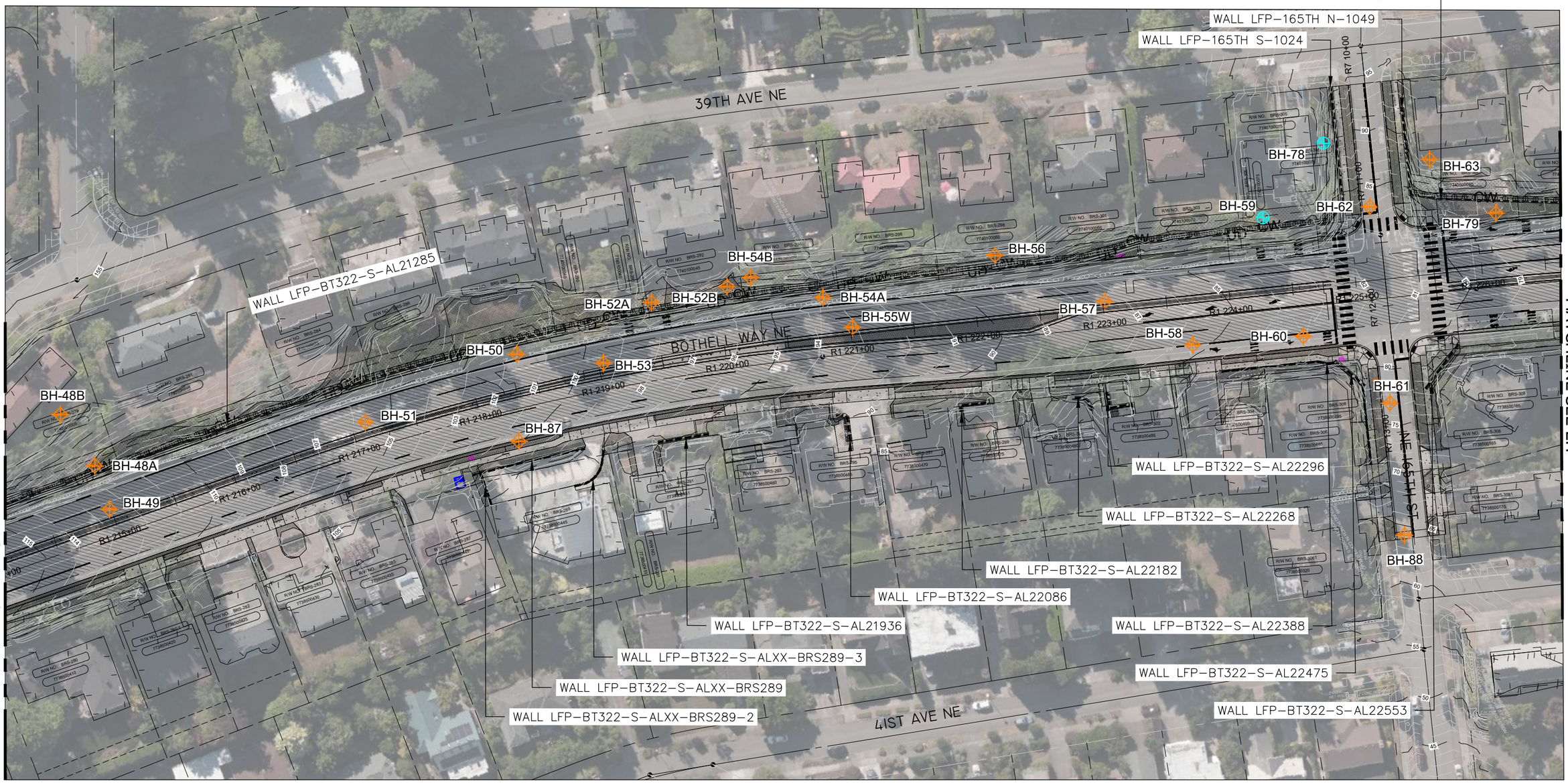
SCALE: 1" = 80'

HWA GEOSCIENCES INC. DBE/MWBE

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2F
CHECK BY	PROJECT #
SKS/JLG	2021-133-21



EXPLORATION LEGEND

- BH-49 — BOREHOLE DESIGNATION AND APPROXIMATE LOCATION (HWA, 2024)
- BH-59 — PLANNED BOREHOLES DELAYED BY CRITICAL AREA PERMITS
- HMA PAVEMENT
- HMA OVERLAY
- CUT WALL
- FILL WALL

BOTHELL WAY NE (LFP)

Scale: 1" = 80'-0"

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

0 40 80 120 160

SCALE: 1" = 80'

BASE MAP PROVIDED BY: DEA

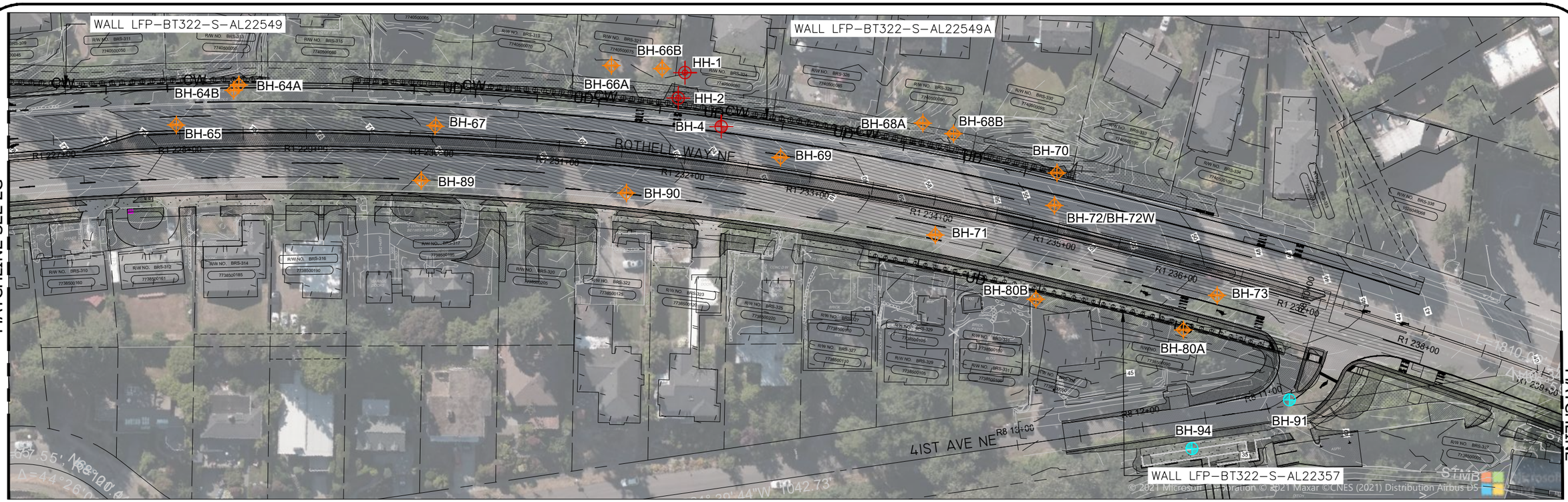
HWA GEOSCIENCES INC. DBE/MWBE

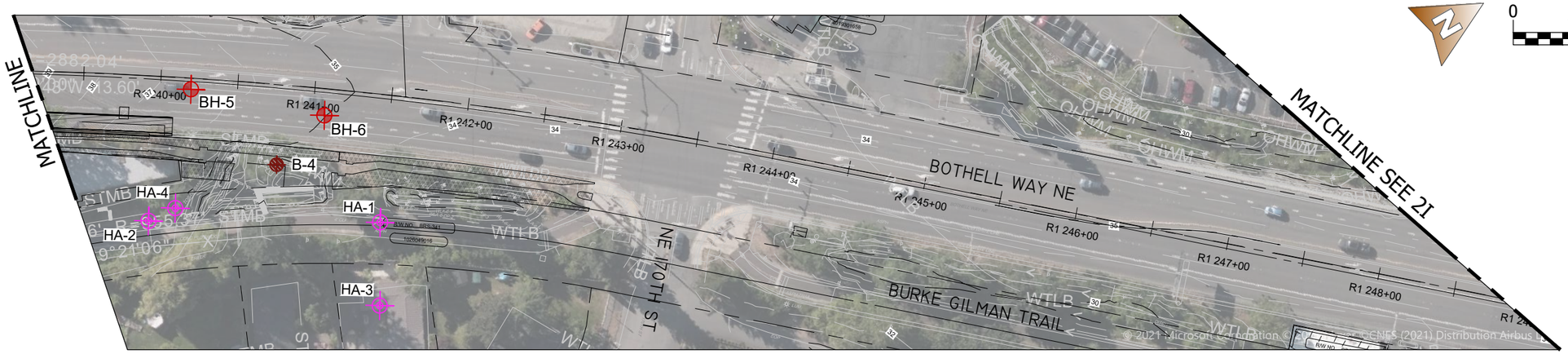
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2G
CHECK BY	PROJECT #
SKS/JLG	2021-133-21

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <Fig 2g (Bothell Wa NE_SR 522-LFP) GDR> Plotted: 4/10/2024 4:14 PM





BOTHELL WAY NE (LFP)
Scale: 1" = 80'-0"

EXPLORATION LEGEND

- BH-65 — BOREHOLE DESIGNATION AND APPROXIMATE LOCATION (HWA, 2024)
- BH-91 — PLANNED BOREHOLES DELAYED BY CRITICAL AREA PERMITS
- BH-4 — APPROXIMATE LOCATION OF BORINGS (HWA, 2021)
- HH-4 — APPROXIMATE LOCATION OF HANDHOLES (HWA, 2021)
- B-3 — APPROXIMATE LOCATION OF BORINGS (GEOENGINEERS, 1993)
- HA-1 — APPROXIMATE LOCATION OF BORINGS (NELSON-COUVRETTE AND ASSOCIATES, 1997)
- HMA PAVEMENT
- HMA OVERLAY
- CUT WALL
- FILL WALL

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

BASE MAP PROVIDED BY: DEA

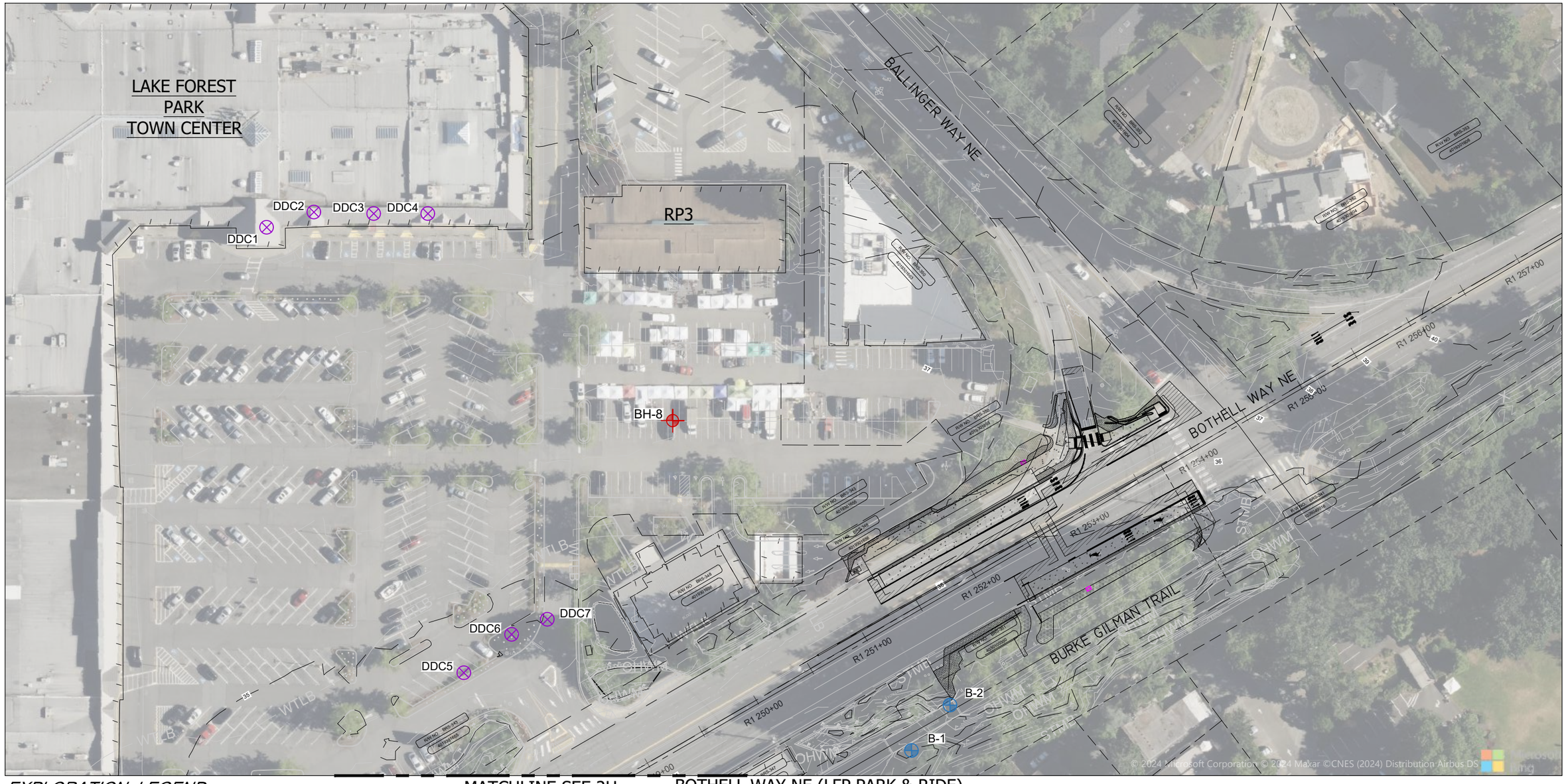
HWA GEOSCIENCES INC. DBE/MWBE

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2H
CHECK BY	PROJECT #
SKS/JLG	2021-133-21

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <Fig 2h (Bothell Wa NE_SR 522-LFP) GDR> Plotted: 4/17/2024 12:15 PM



EXPLORATION LEGEND

BH-8 APPROXIMATE LOCATION OF EXPLORATIONS (HWA, 2021)

DDC1 APPROXIMATE LOCATION OF EXPLORATIONS (WASATCH ENVIRONMENTAL, 2001)

B-1 APPROXIMATE LOCATION OF EXPLORATIONS (ZZA-TERRACON, 2008)

HMA PAVEMENT

HMA OVERLAY

CUT WALL

FILL WALL

MATCHLINE SEE 2H

BOTHELL WAY NE (LFP PARK & RIDE)

Scale: 1" = 80'-0"

AERIAL IMAGERY REFERENCE IS APPROXIMATE AND MAY APPEAR OFFSET FROM SURVEYED DATA AND BASEMAPS. LOCATIONS OF ALL BORINGS COMPLETED FOR THIS STUDY, EXCEPT BH-52A, BH-52B, BH-66A, AND BH-66B, HAVE BEEN SURVEYED. ALL OTHER EXPLORATIONS ARE SHOWN AT APPROXIMATE LOCATIONS ESTIMATED FROM AVAILABLE REFERENCES.

N

0 40 80 120 160

SCALE: 1" = 80'

BASE MAP PROVIDED BY: DEA

C:\USERS\CFRY\DESKTOP\2021-133-21 BT306-LAKE FOREST PARK\2021-133-21 BT306-LAKE FOREST PARK.DWG <Fig 2i-rev (SR 522-LFP) GDR> Plotted: 4/17/2024 10:35 AM

HWA GEOSCIENCES INC. DBE/MWBE

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

SITE AND EXPLORATION PLAN

DRAWN BY	FIGURE #
CF	2I
CHECK BY	PROJECT #
SKS/JLG	2021-133-21

Appendix A

FIELD EXPLORATIONS

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve		GP	Poorly-graded GRAVEL
		Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
			SP	Poorly-graded SAND
More than 50% Retained on No. 200 Sieve Size	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines
AL	Atterberg Limits: PL = Plastic Limit, LL = Liquid Limit
CBR	California Bearing Ratio
CN	Consolidation
DD	Dry Density (pcf)
DS	Direct Shear
GS	Grain Size Distribution
K	Permeability
MD	Moisture/Density Relationship (Proctor)
MR	Resilient Modulus
OC	Organic Content
pH	pH of Soils
PID	Photoionization Device Reading
PP	Pocket Penetrometer (Approx. Comp. Strength, tsf)
Res.	Resistivity
SG	Specific Gravity
CD	Consolidated Drained Triaxial
CU	Consolidated Undrained Triaxial
UU	Unconsolidated Undrained Triaxial
TV	Torvane (Approx. Shear Strength, tsf)
UC	Unconfined Compression

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- Non-standard Penetration Test (3.0" OD Split Spoon with Brass Rings)
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- 3-1/4" OD Split Spoon

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation. Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

GeoSciences Inc.

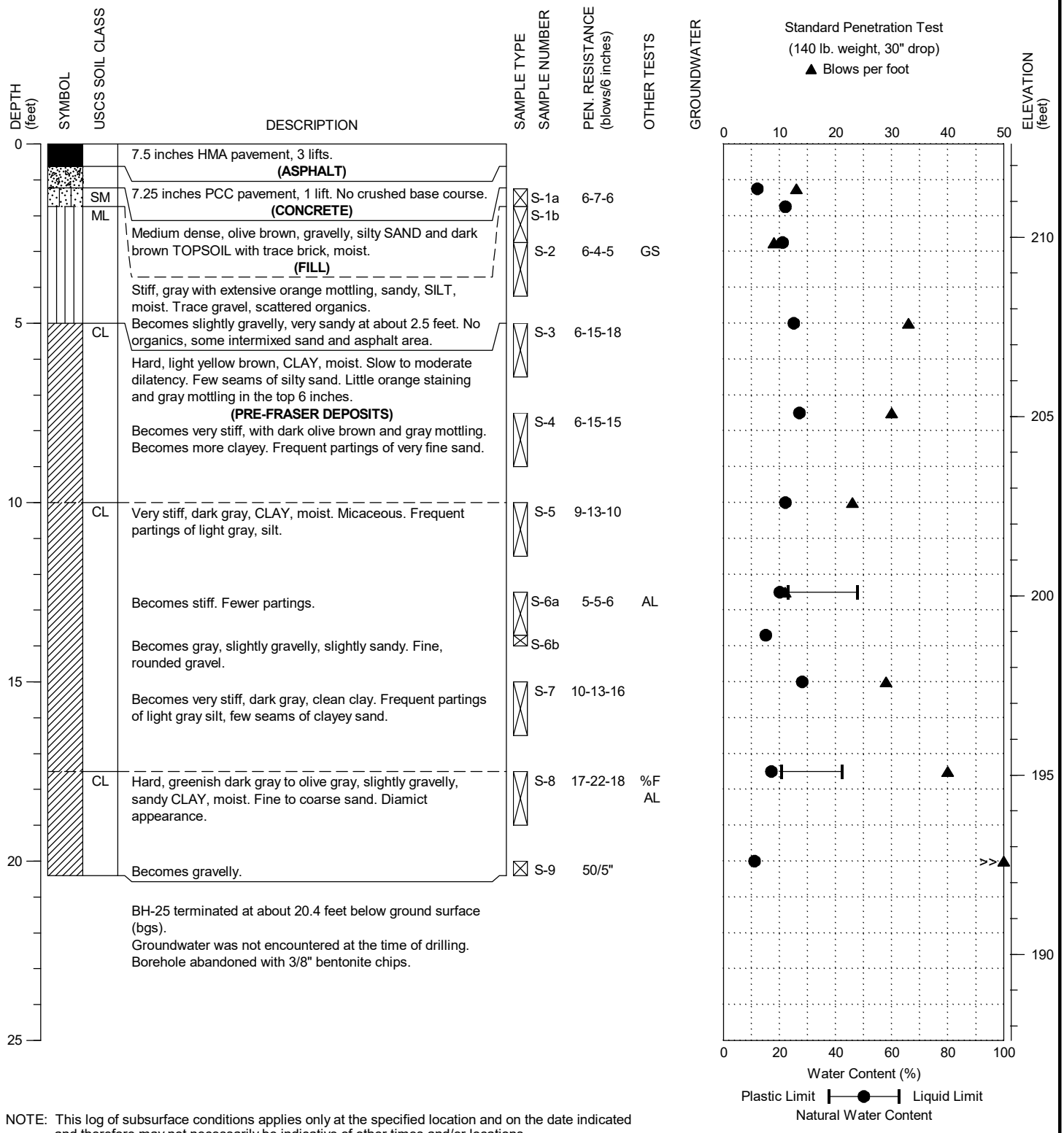
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 2021-133-21 FIGURE: A-1

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 182+35; See Figure 2E

DATE STARTED: 8/15/2022
DATE COMPLETED: 8/15/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 212.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-25

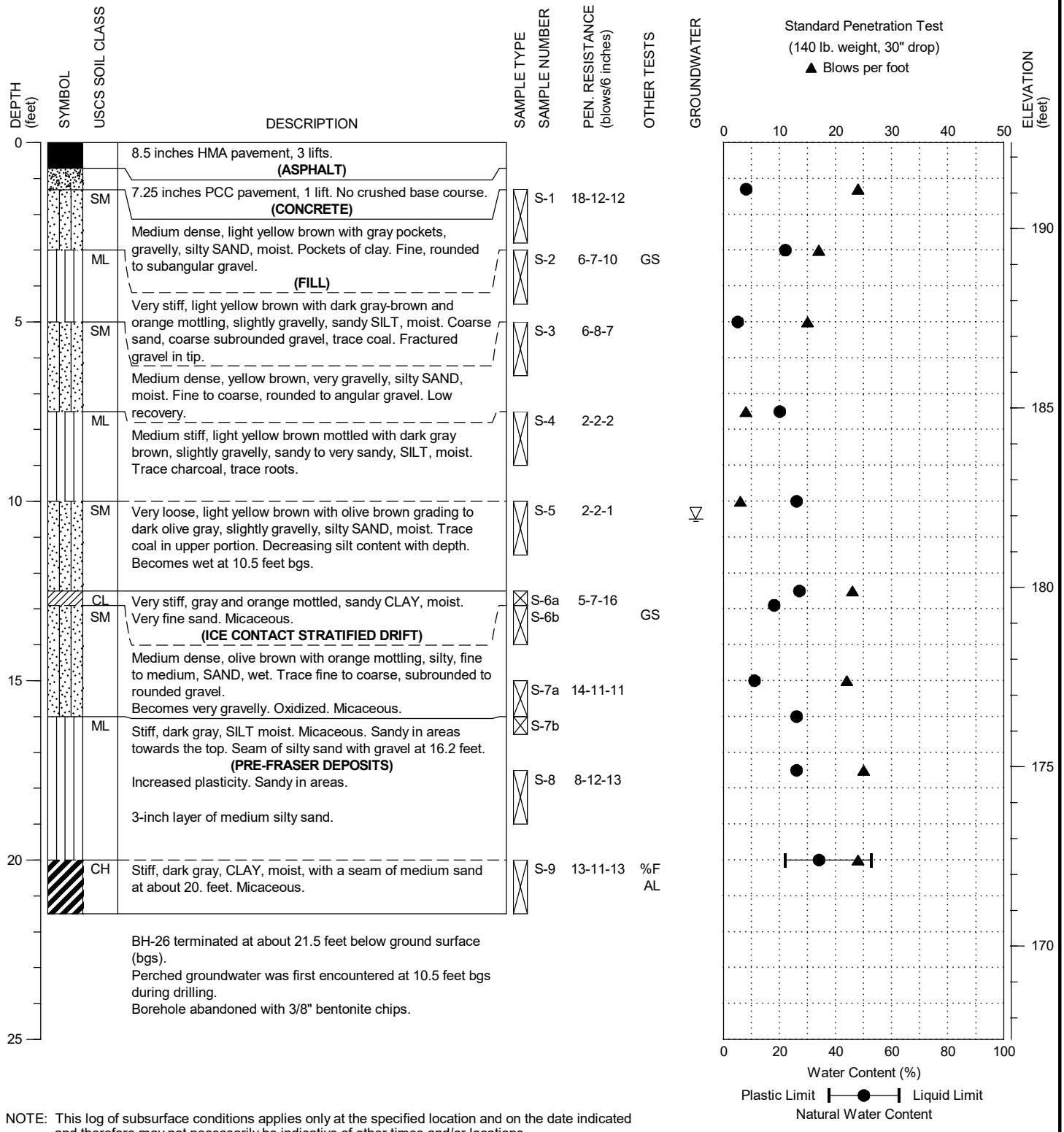
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-2

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 187+60; See Figure 2E

DATE STARTED: 8/16/2022
DATE COMPLETED: 8/16/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 192.4 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-26

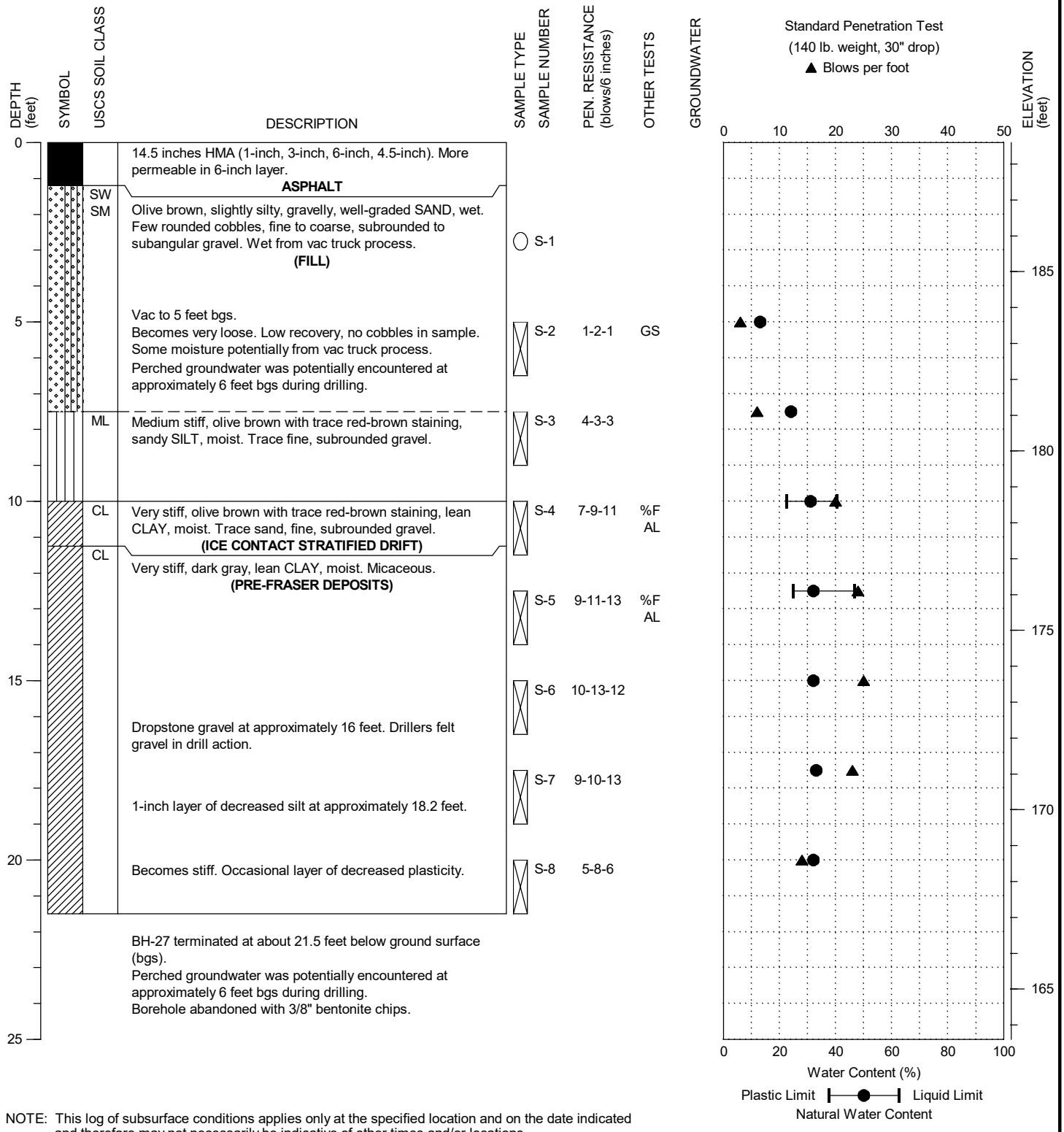
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-3

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, HSA, Diedrich D-50, Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 189+00; See Figure 2E

DATE STARTED: 1/11/2023
DATE COMPLETED: 1/11/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 188.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

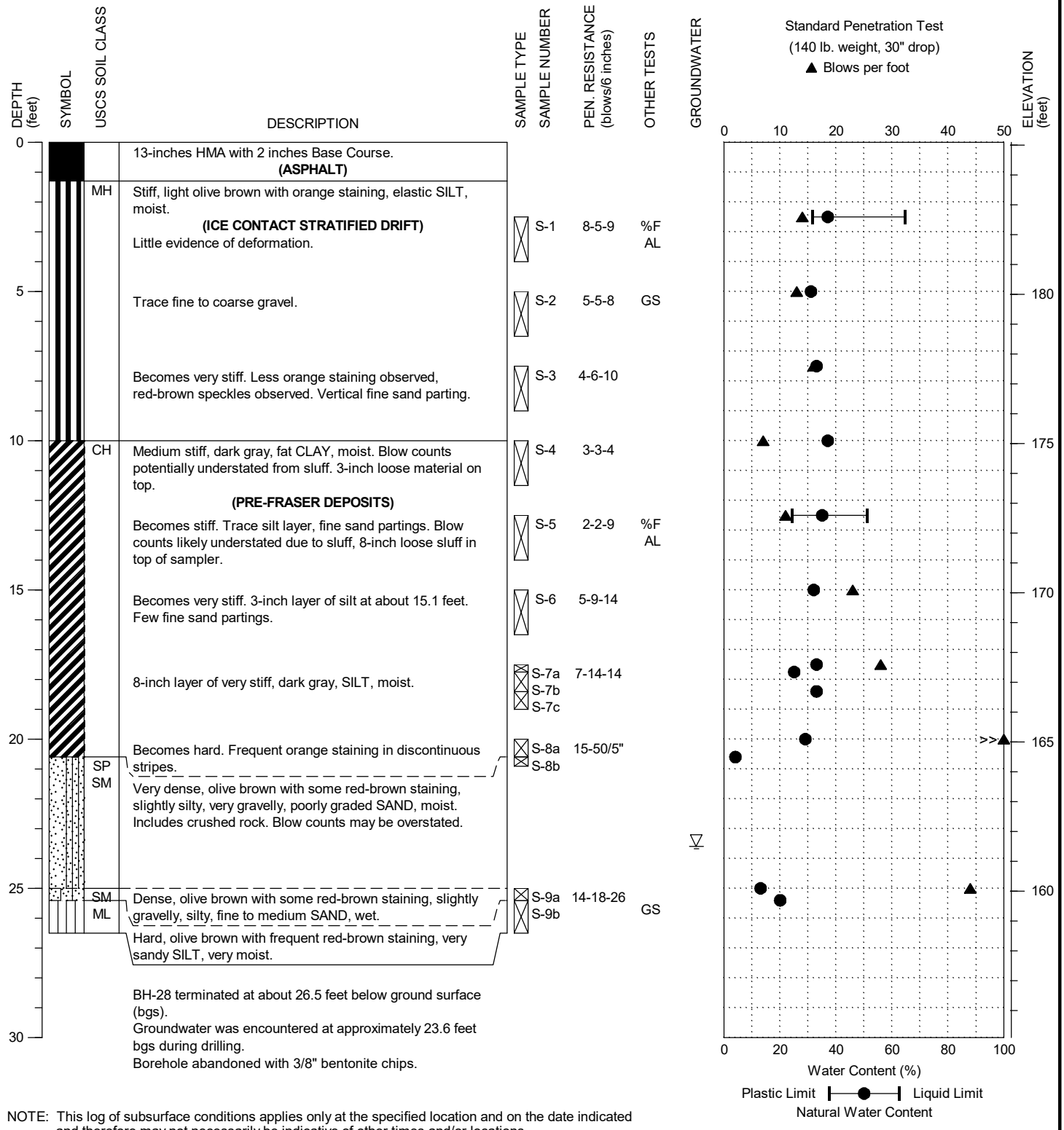
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-27

PROJECT NO.: 2021-133-21 FIGURE: A-4

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 190+65; See Figure 2E

DATE STARTED: 4/7/2023
DATE COMPLETED: 4/7/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 185.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-28

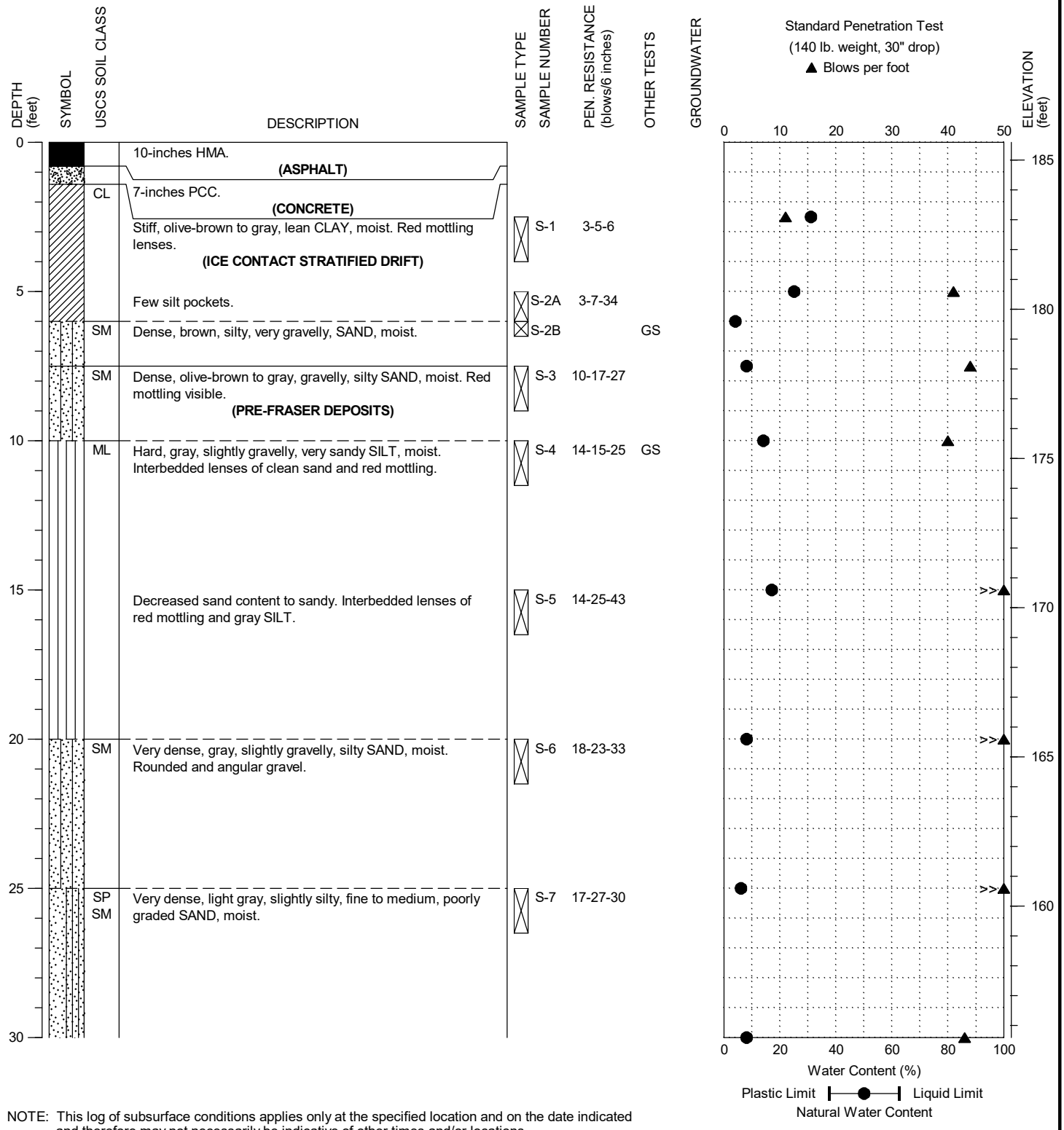
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-5

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Geologic Drill Partners, Inc.
DRILLING METHOD: HSA, Acker Recon w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 190+70; See Figure 2E

DATE STARTED: 5/31/2023
DATE COMPLETED: 5/31/2023
LOGGED BY: L. Cressler
SURFACE ELEVATION: 185.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

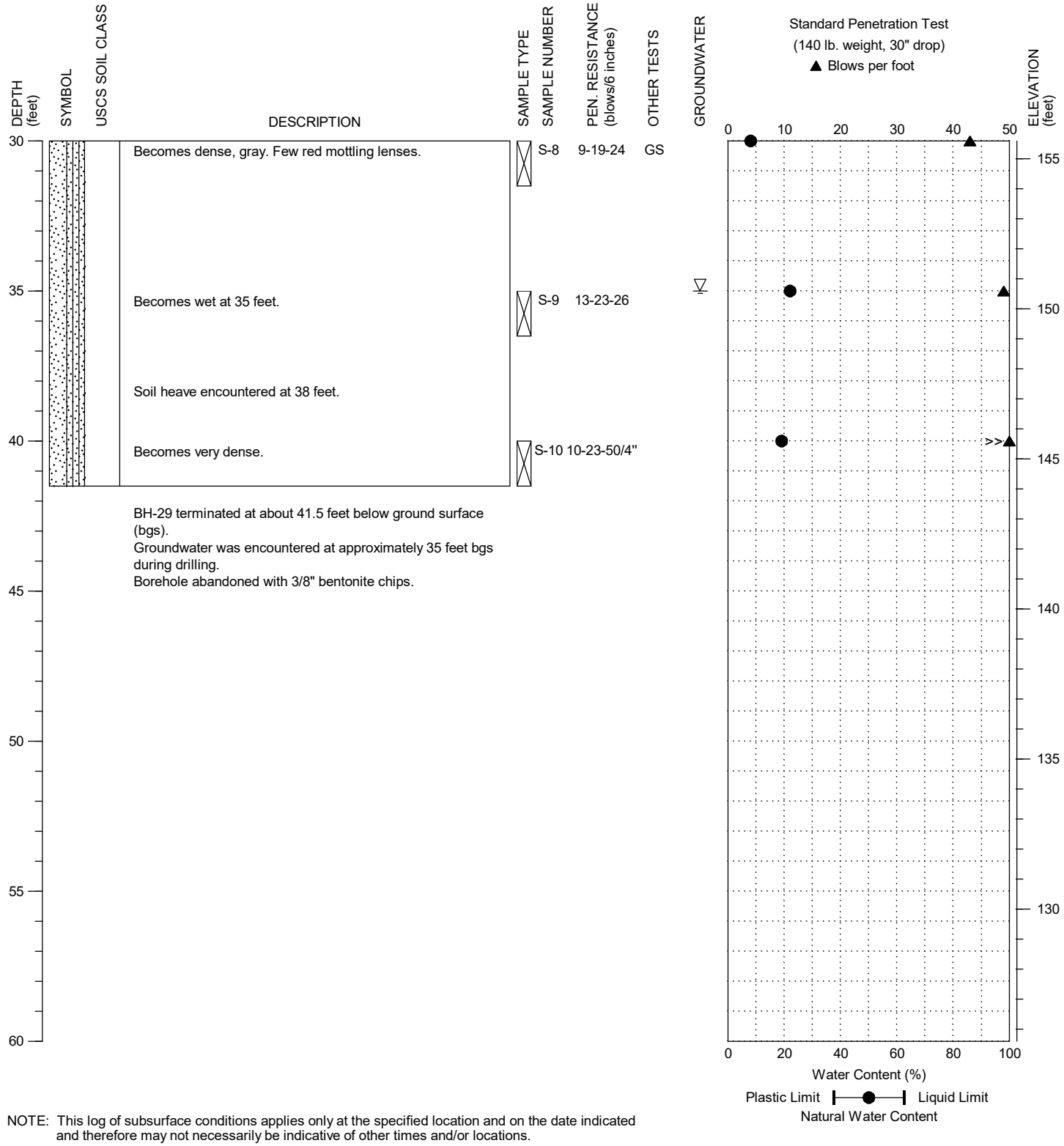
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-29

PROJECT NO.: 2021-133-21 FIGURE: A-6

DRILLING COMPANY: Geologic Drill Partners, Inc.
DRILLING METHOD: HSA, Acker Recon w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 190+70; See Figure 2E

DATE STARTED: 5/31/2023
DATE COMPLETED: 5/31/2023
LOGGED BY: L. Cressler
SURFACE ELEVATION: 185.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

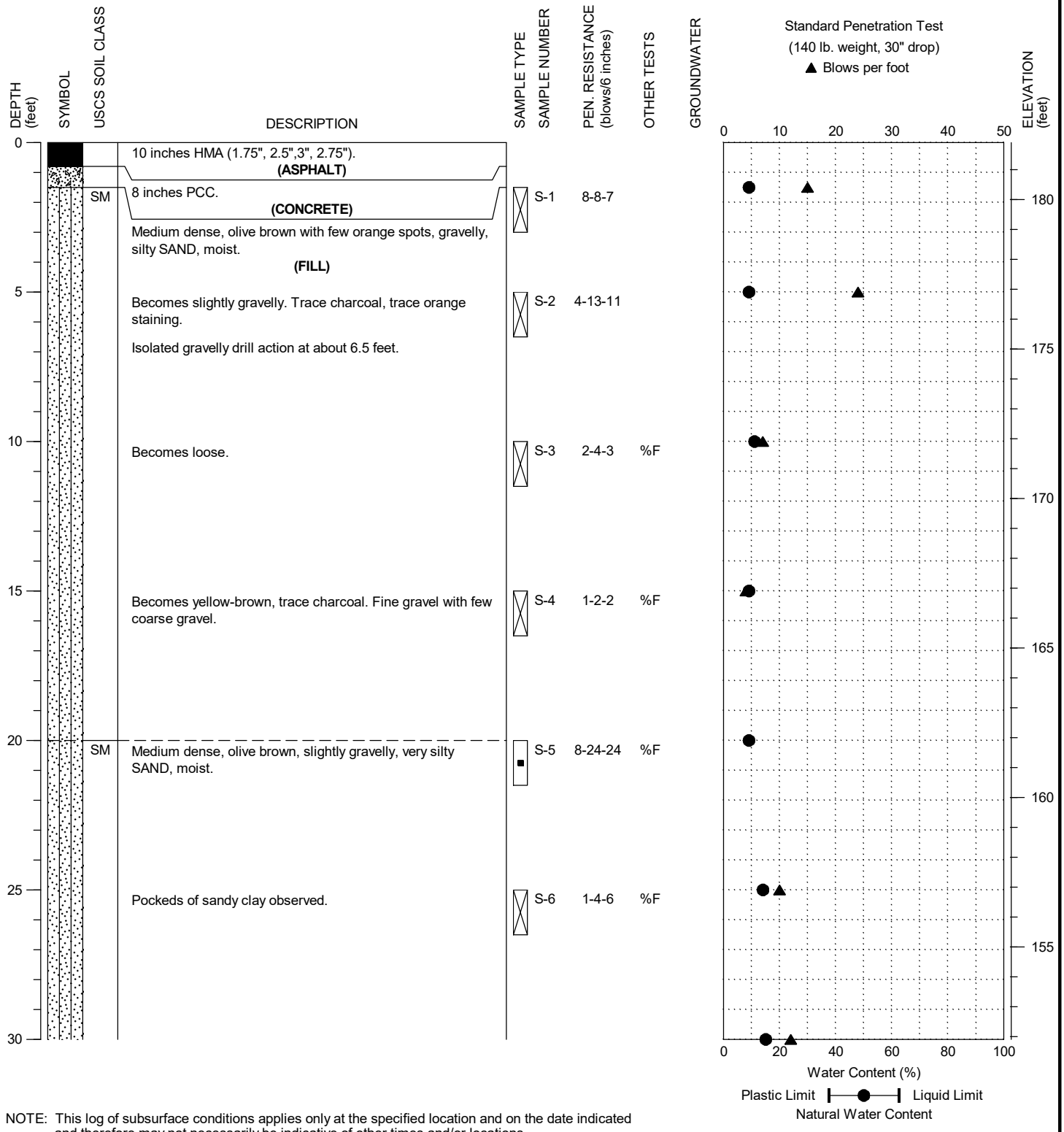
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-29

PROJECT NO.: 2021-133-21 FIGURE: A-6

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer, CalMod Ring Sampler
LOCATION: Approximate station 193+95; See Figure 2E

DATE STARTED: 3/22/2023
DATE COMPLETED: 3/22/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 181.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-31

PROJECT NO.: 2021-133-21 FIGURE: A-7

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer, CalMod Ring Sampler
LOCATION: Approximate station 193+95; See Figure 2E

DATE STARTED: 3/22/2023
DATE COMPLETED: 3/22/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 181.9 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Increased silt content with sandy clay pocket in tip. 1.5-inch fractured coarse gravel in sampler.		S-7	6-5-7	%F
35		SM	Medium dense, dark gray with minor brown and red-brown staining, silty, fine to medium SAND, moist. Trace fine gravel and organics. Slight moisture increase.		S-8	3-4-6	GS
40		SP SM	Medium dense, olive brown, slightly silty, fine to medium, poorly graded SAND, wet. **(ADVANCE OUTWASH)**		S-9a S-9b S-9c S-9d	8-15-24	GS DS
45		SP	Medium dense, olive brown, poorly graded SAND, wet. Coarse gravel at contact.		S-10a	8-9-14	GS
		ML	Very stiff, olive brown, sandy SILT, moist. Micaceous. About 1 foot of heave observed after sample. **(PRE-FRASER DEPOSITS)** Stiffer/choppy drilling noted by driller.		S-10b		%F
50			Driller notes about 9 to 12 inches of heave. Becomes hard, very sandy, moist to very moist. 1-inch layer slightly gravelly clay at the top.		S-11	5-13-30	GS
55			Driller notes 9 to 12 inches of heave.				
		CL	Hard, dark gray, lean CLAY, moist. Micaceous. 1-inch layer of silt at about 55.2 feet.		S-12a S-12b	8-14-27	
		SM	Dense, dark gray, silty to very silty, fine to medium SAND, moist to wet. Alternating layers with more and less silt. Sand content finer where more silt. Higher saturation where less silt.				
60							

GROUNDWATER ▽

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

ELEVATION (feet)
150 145 140 135 130 125

0 20 40 60 80 100
Water Content (%)
Plastic Limit ●—● Liquid Limit
Natural Water Content

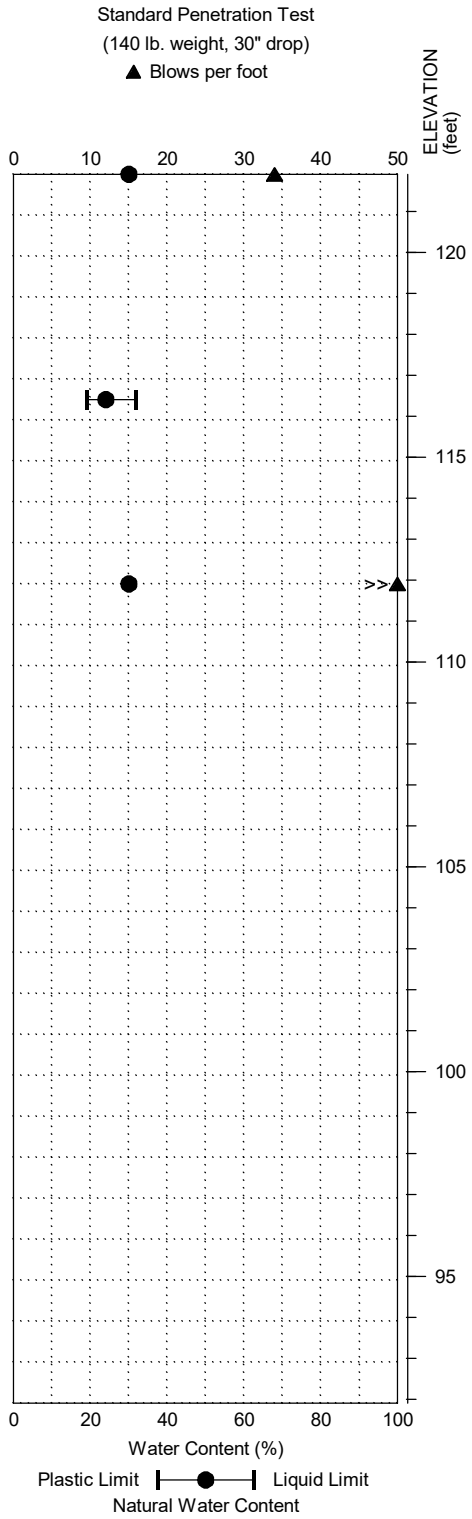
NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer, CalMod Ring Sampler
LOCATION: Approximate station 193+95; See Figure 2E

DATE STARTED: 3/22/2023
DATE COMPLETED: 3/22/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 181.9 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
60		CL	Hard, dark gray, sandy lean CLAY, moist, intermixed with irregular shaped silt pockets with varying amounts of sand to clean clay, and wet, fine to medium sand seams.		S-13	7-12-22	
			Driller notes significant stiffening in drilling action.				
65			Interbedded with sand layers. Not irregularly intermixed.		S-14a S-14b S-14c S-14d	19-22-31	%F AL DD
70			Numerous partings to seams of wet slightly clayey, fine sand. 1-inch layers of sand at about 70.2 and 71.4 feet. Some sand layers are in irregular shapes.		S-15	11-23-45	
			BH-31 terminated at about 71.5 feet below ground surface (bgs). Groundwater was encountered at about 39 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.				
75							
80							
85							
90							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

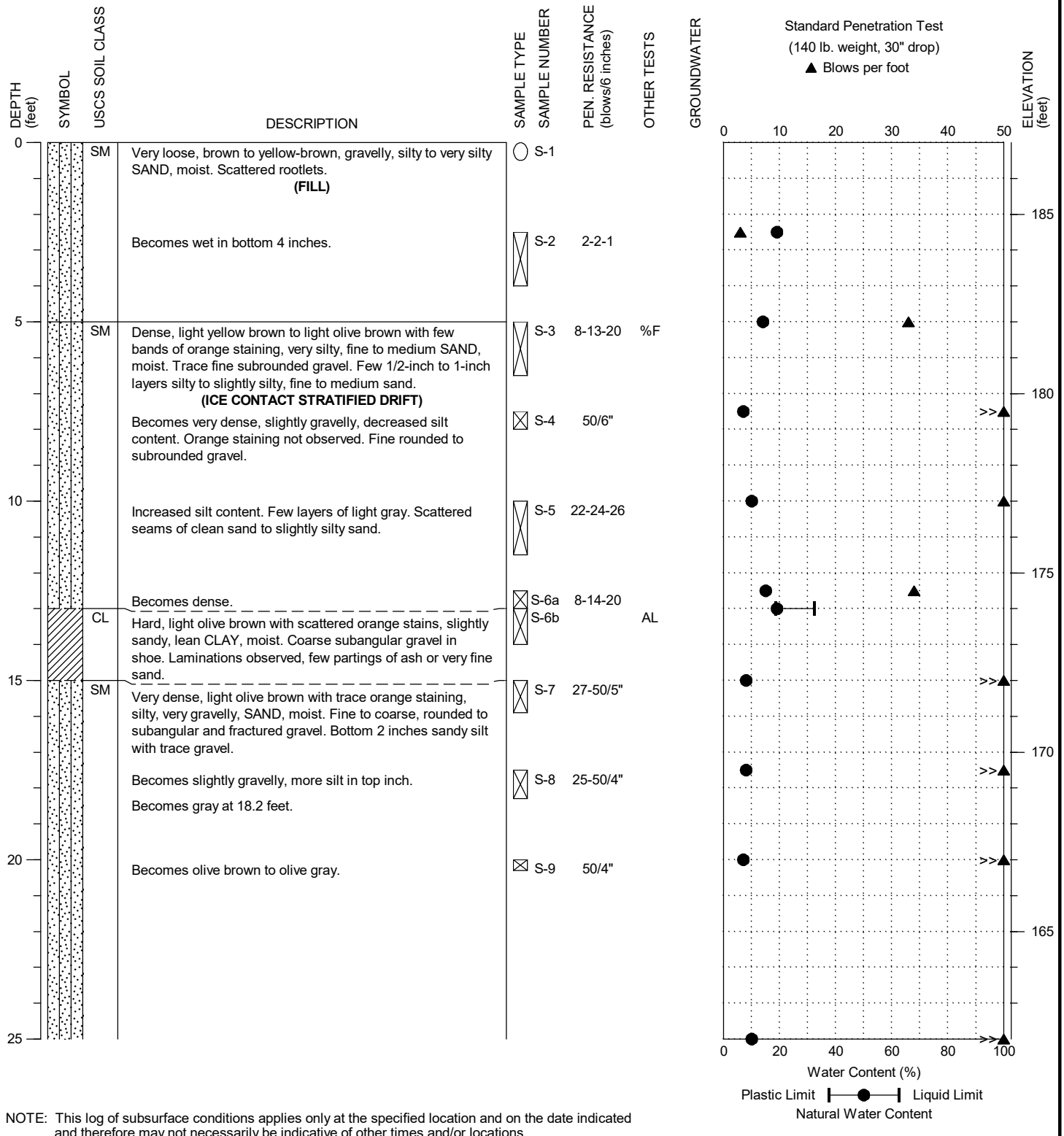
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-31

PROJECT NO.: 2021-133-21 FIGURE: A-7

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/ Rope and Cathead
LOCATION: Approximate station 202+65; See Figure 2F

DATE STARTED: 11/2/2022
DATE COMPLETED: 11/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 187.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

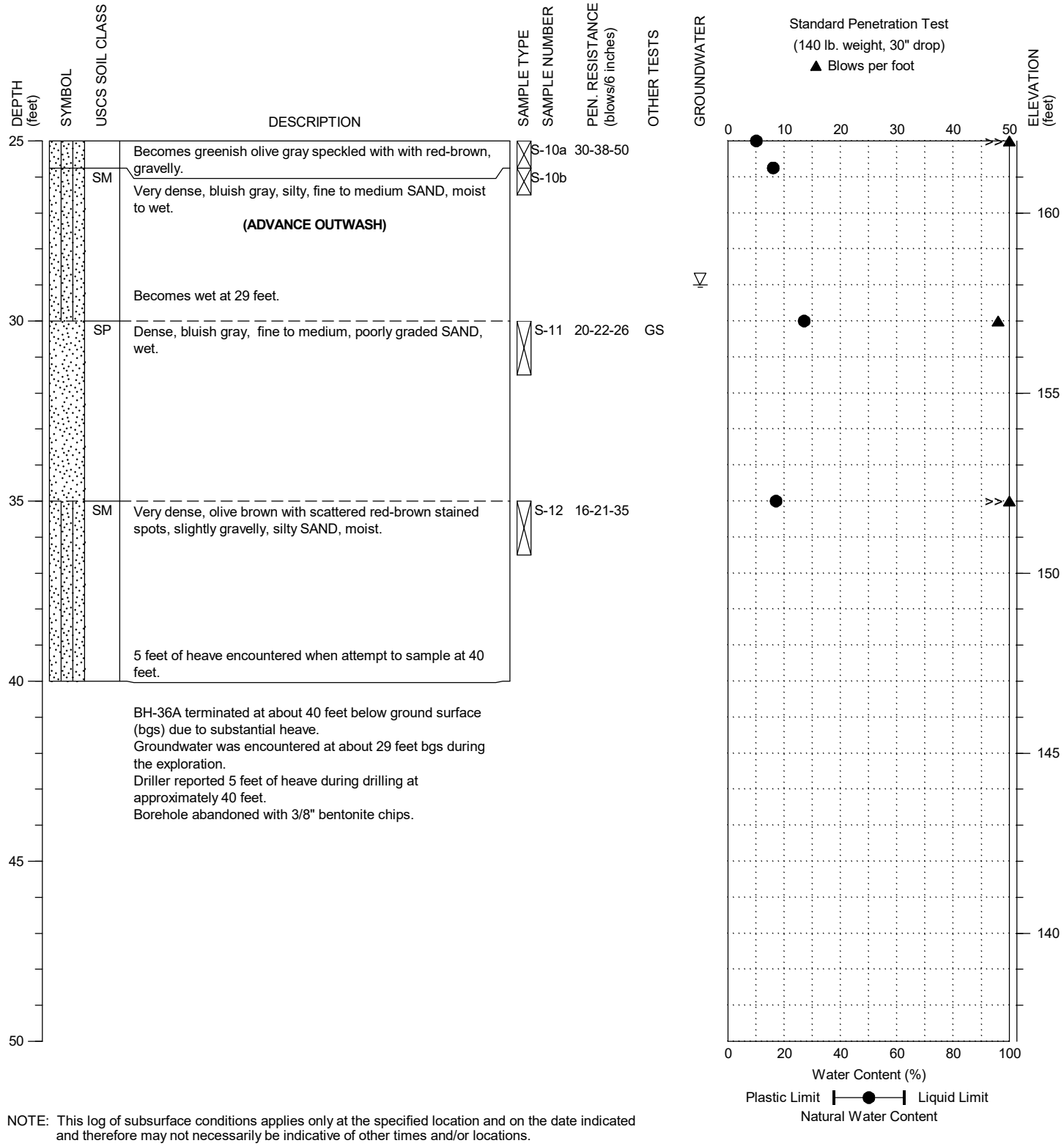
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-36A

PROJECT NO.: 2021-133-21 FIGURE: A-8

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/ Rope and Cathead
LOCATION: Approximate station 202+65; See Figure 2F

DATE STARTED: 11/2/2022
DATE COMPLETED: 11/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 187.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-36A

PROJECT NO.: 2021-133-21 FIGURE: A-8

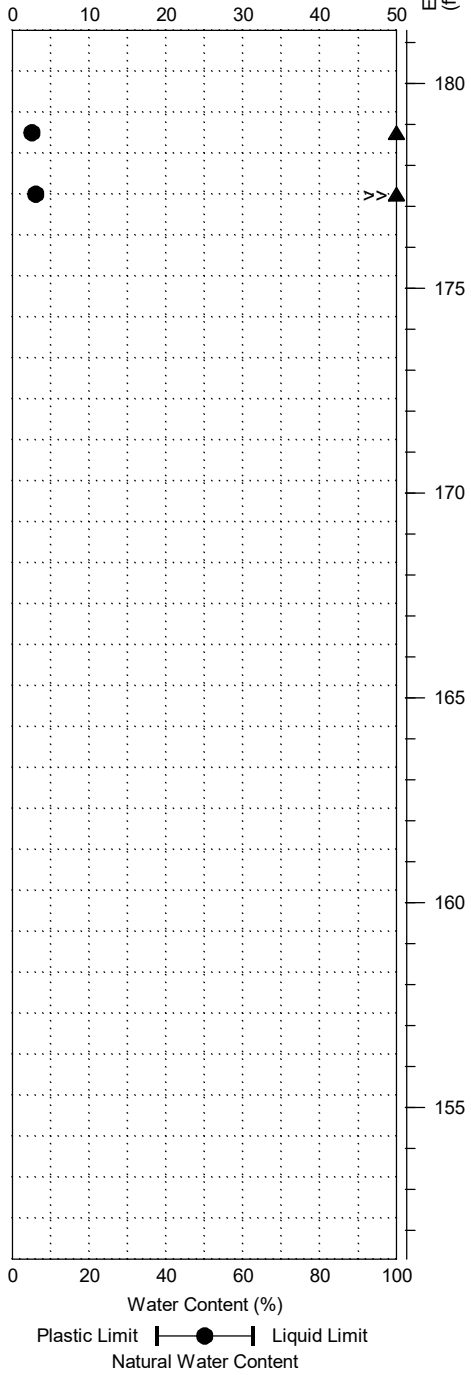
DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/ Rope and Cathead
LOCATION: Approximate station 203+00; See Figure 2F

DATE STARTED: 11/2/2022
DATE COMPLETED: 11/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 181.3 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Brown to yellow-brown, very gravelly, very silty SAND, moist. Few cobbles, trace brick. Clear with post digger to 2.5 feet. **(FILL)**	○	S-1		
		SM	Very dense, yellow-brown to light yellow brown, silty, very gravelly, SAND, moist. Diamict appearance. More competent in bottom 2 inches. Coarse fractured gravel in sampler. Blow counts potentially overstated. **(ICE CONTACT STRATIFIED DRIFT)**	⊠	S-2	3-12-38	GS
5			Rock in shoe. Low recovery. Broke hammer at 5 feet.	⊠	S-3	17-50/6"	
			BH-36B terminated at about 5 feet below ground surface (bgs) due to refusal. Groundwater was not encountered during the exploration. Borehole abandoned with 3/8" bentonite chips.				
10							
15							
20							
25							
30							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

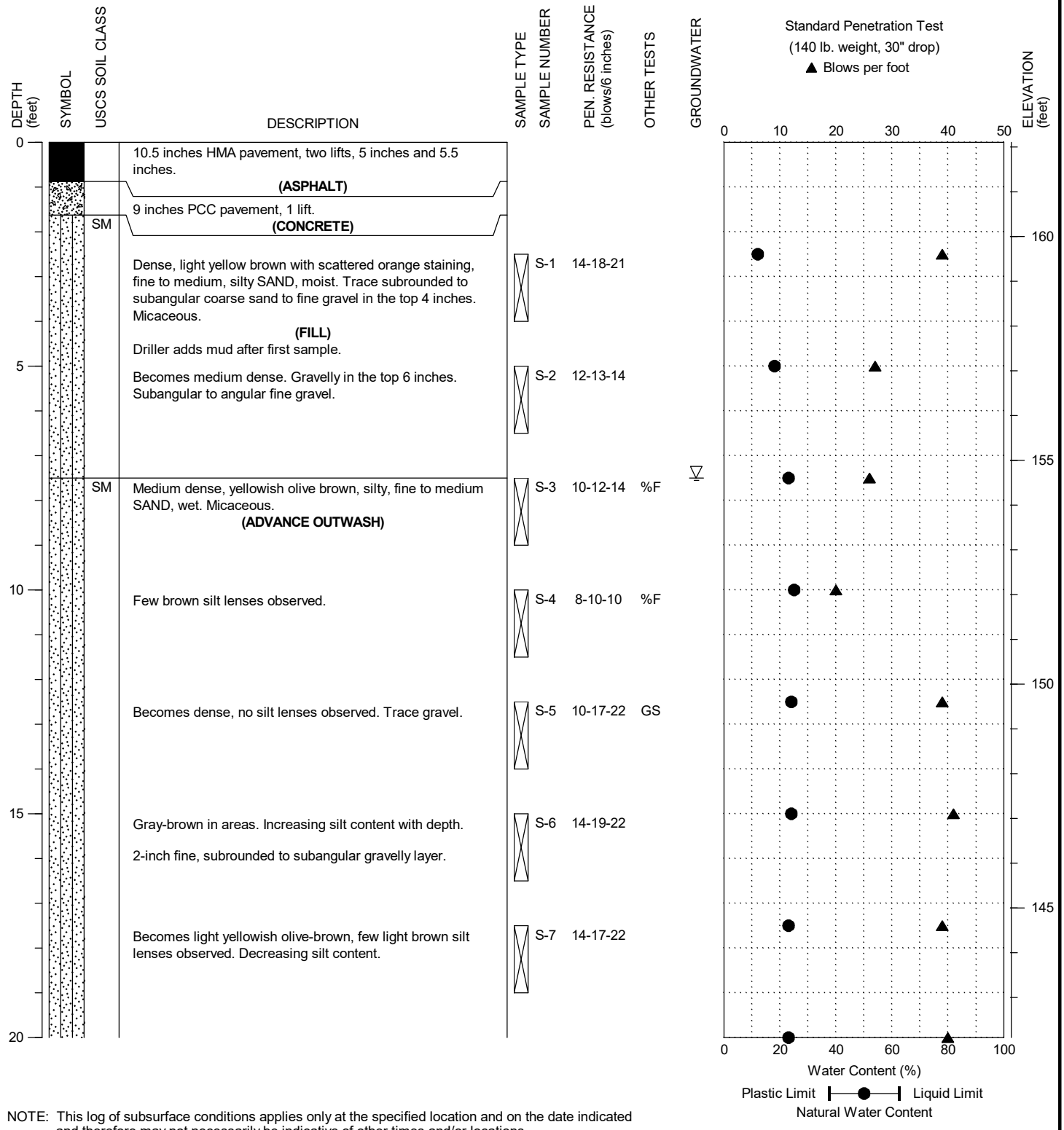
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-36B

PROJECT NO.: 2021-133-21 FIGURE: A-9

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 203+05; See Figure 2F

DATE STARTED: 7/29/2022
DATE COMPLETED: 7/29/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 162.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

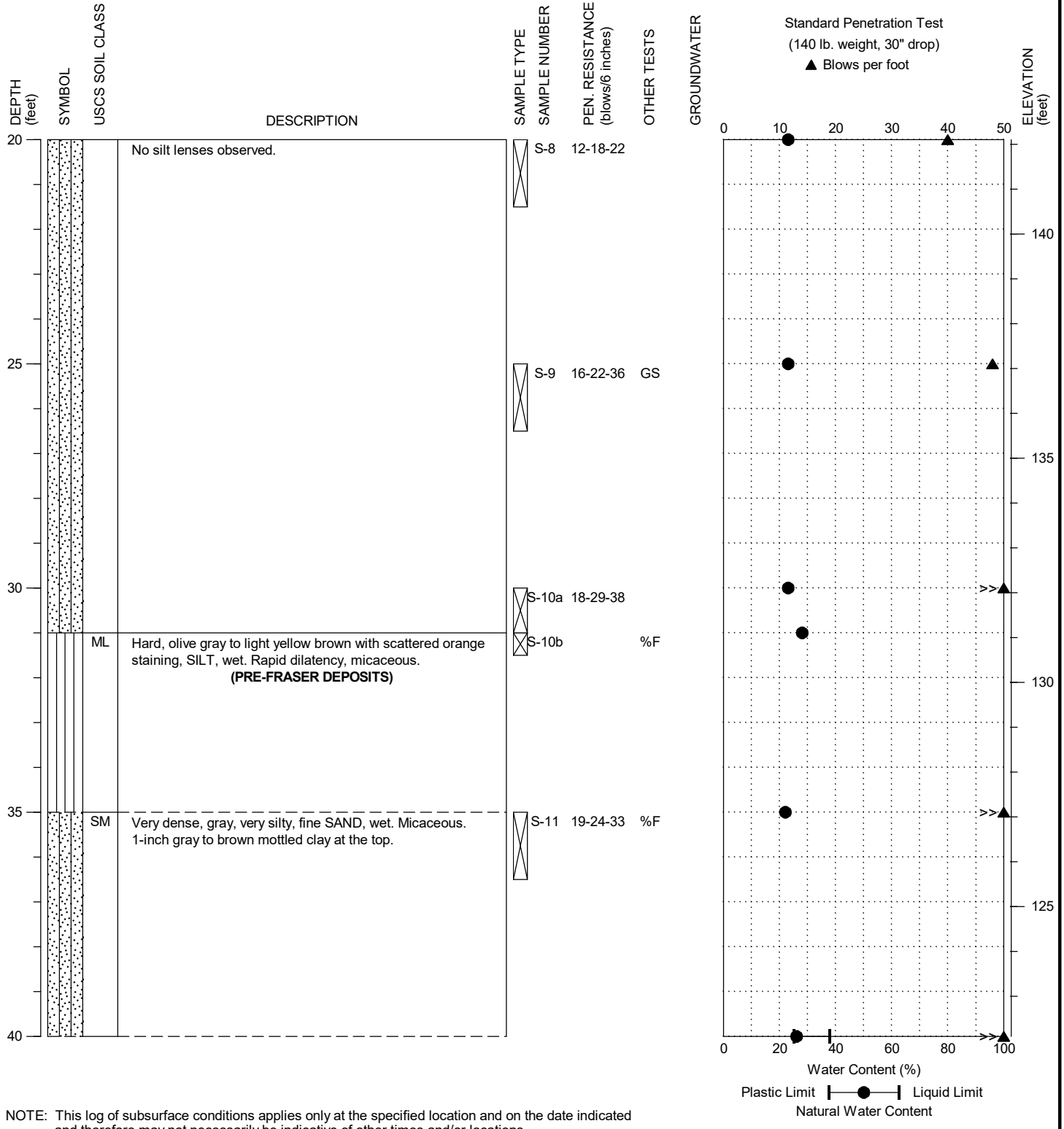
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-37

PROJECT NO.: 2021-133-21 FIGURE: A-10

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 203+05; See Figure 2F

DATE STARTED: 7/29/2022
DATE COMPLETED: 7/29/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 162.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

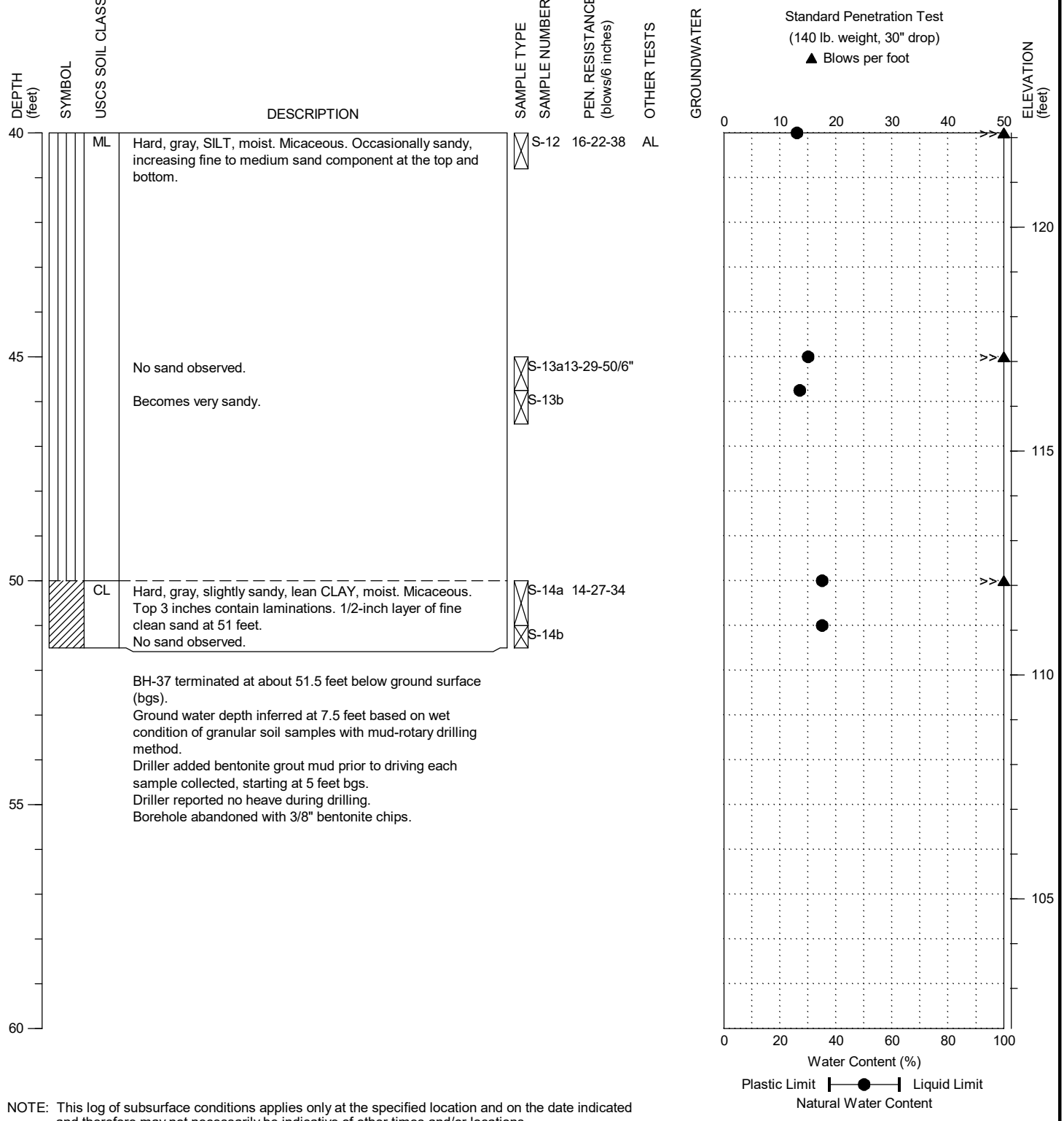
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-37

PROJECT NO.: 2021-133-21 FIGURE: A-10

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 203+05; See Figure 2F

DATE STARTED: 7/29/2022
DATE COMPLETED: 7/29/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 162.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

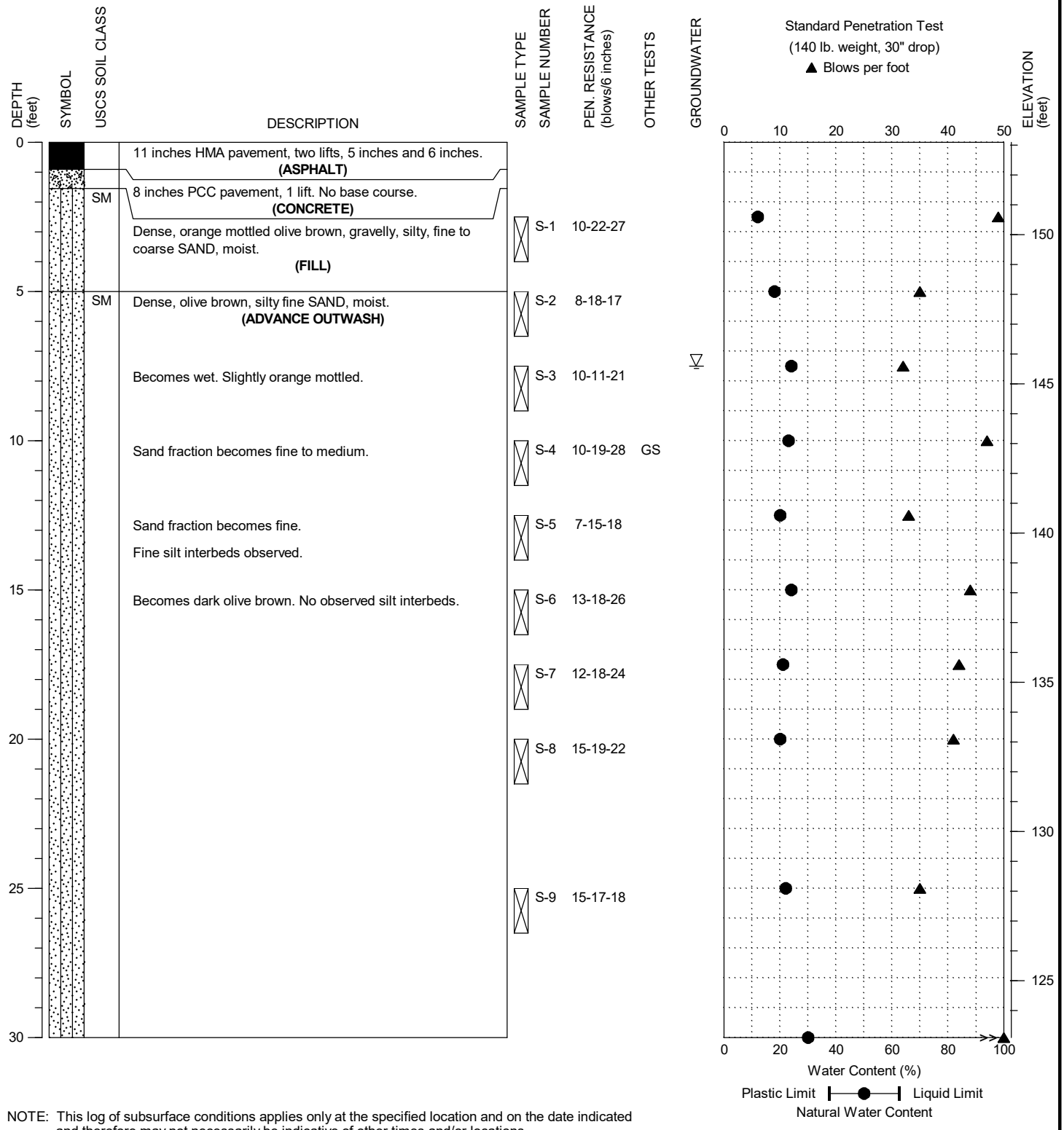
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-37

PROJECT NO.: 2021-133-21 FIGURE: A-10

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 205+00; See Figure 2F

DATE STARTED: 7/28/2022
DATE COMPLETED: 7/28/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 153.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-39

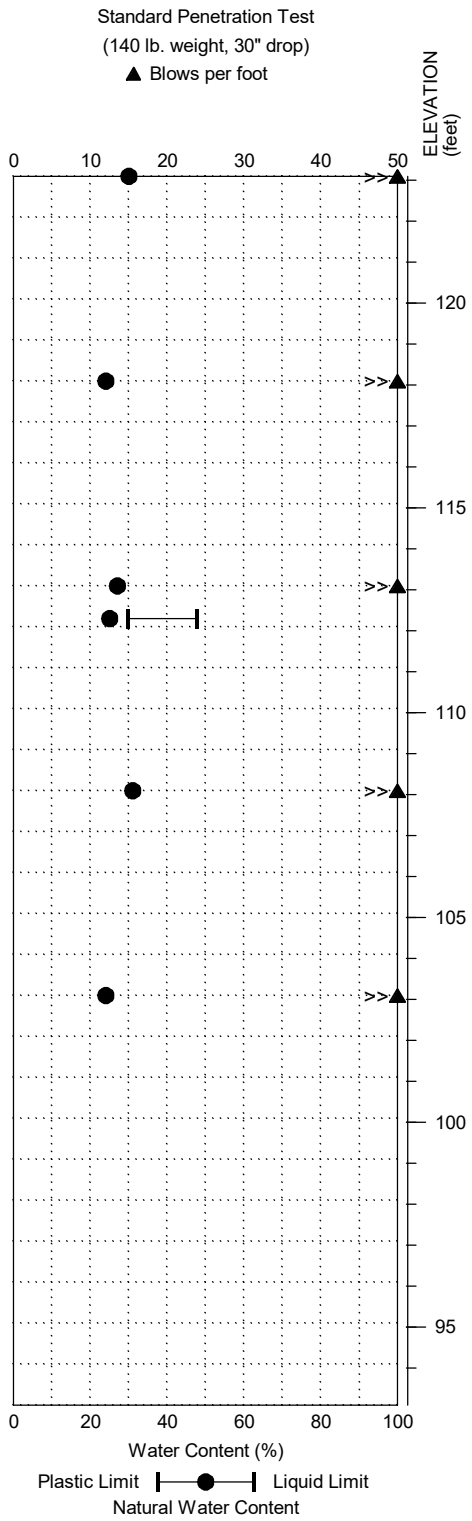
PROJECT NO.: 2021-133-21 FIGURE: A-11

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 205+00; See Figure 2F

DATE STARTED: 7/28/2022
DATE COMPLETED: 7/28/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 153.1 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30		ML	Hard, orange mottled olive brown, slightly sandy SILT, moist. Moderate plasticity. **(PRE-FRASER DEPOSITS)**		S-10	15-21-31	GS
35			Becomes sandy, moist to wet. 2-inch-thick red-brown mottled sand lens.		S-11	17-22-40	
40			Becomes dark gray, slightly sandy, wet. Micaceous. Clean silt, becomes moist.		S-12a S-12b	18-20-23	%F AL
45			Slightly sandy, becomes wet.		S-13	18-26-34	
50			Becomes sandy.		S-14	25-34-39	
55			BH-39 terminated at about 51.5 feet below ground surface (bgs). Ground water depth inferred at 7.5 feet based on wet condition of granular soil samples with mud-rotary drilling method. Driller added bentonite grout mud prior to driving each sample collected. Driller reported no heave during drilling. Borehole abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

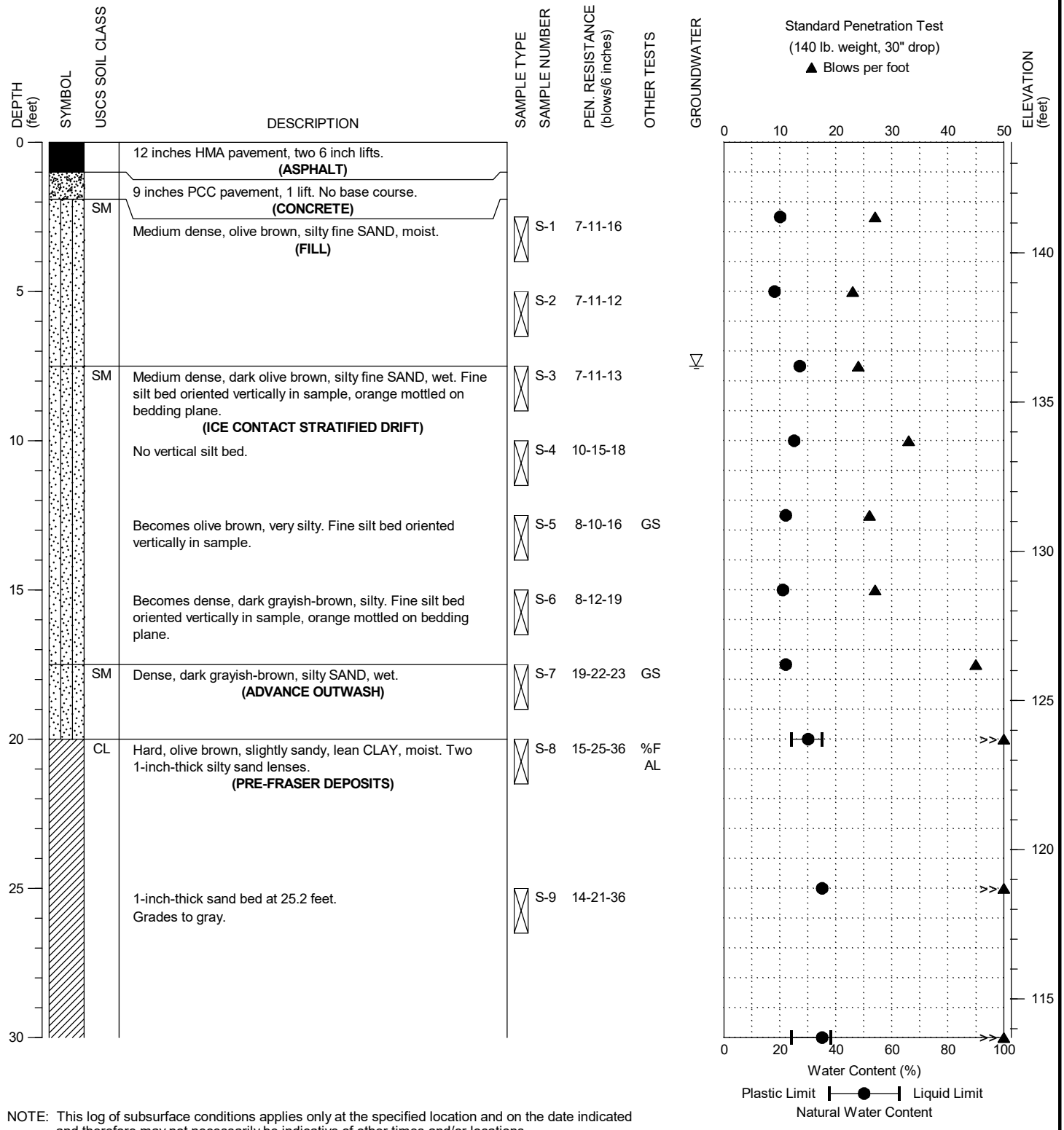
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-39

PROJECT NO.: 2021-133-21 FIGURE: A-11

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 207+00; See Figure 2F

DATE STARTED: 7/27/2022
DATE COMPLETED: 7/27/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 143.7 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

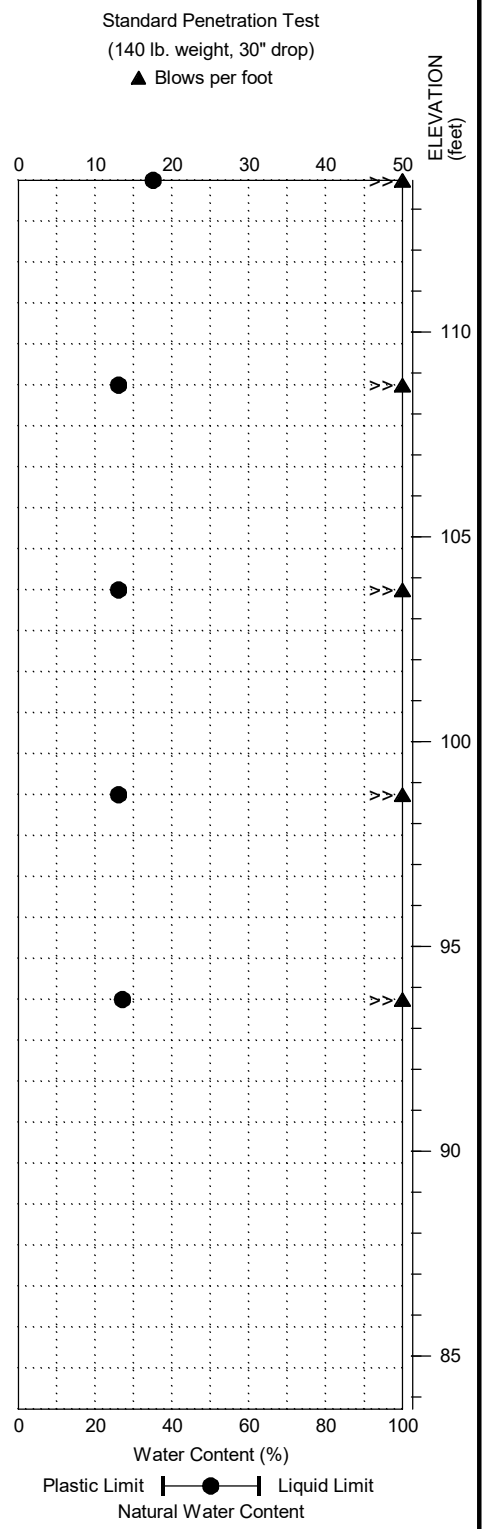
BORING:
BH-41

PROJECT NO.: 2021-133-21 FIGURE: A-12

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 207+00; See Figure 2F

DATE STARTED: 7/27/2022
DATE COMPLETED: 7/27/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 143.7 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Trace sand, becomes micaceous.		S-10	9-20-32	%F AL
			2-inch-thick sandy silt lens.				
35		ML	Hard, dark gray, sandy SILT, wet. Micaceous. Sand fraction very fine.		S-11	28-50/6"	
40					S-12	16-28-50/6"	
45			Becomes clean silt - no sand observed.		S-13	22-35-50/6"	
50					S-14	26-31-36	
55			BH-41 terminated at about 51.5 feet below ground surface (bgs). Ground water depth inferred at 7.5 feet based on wet condition of granular soil samples with mud-rotary drilling method. Borehole abandoned with 3/8" bentonite chips.				
60							



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

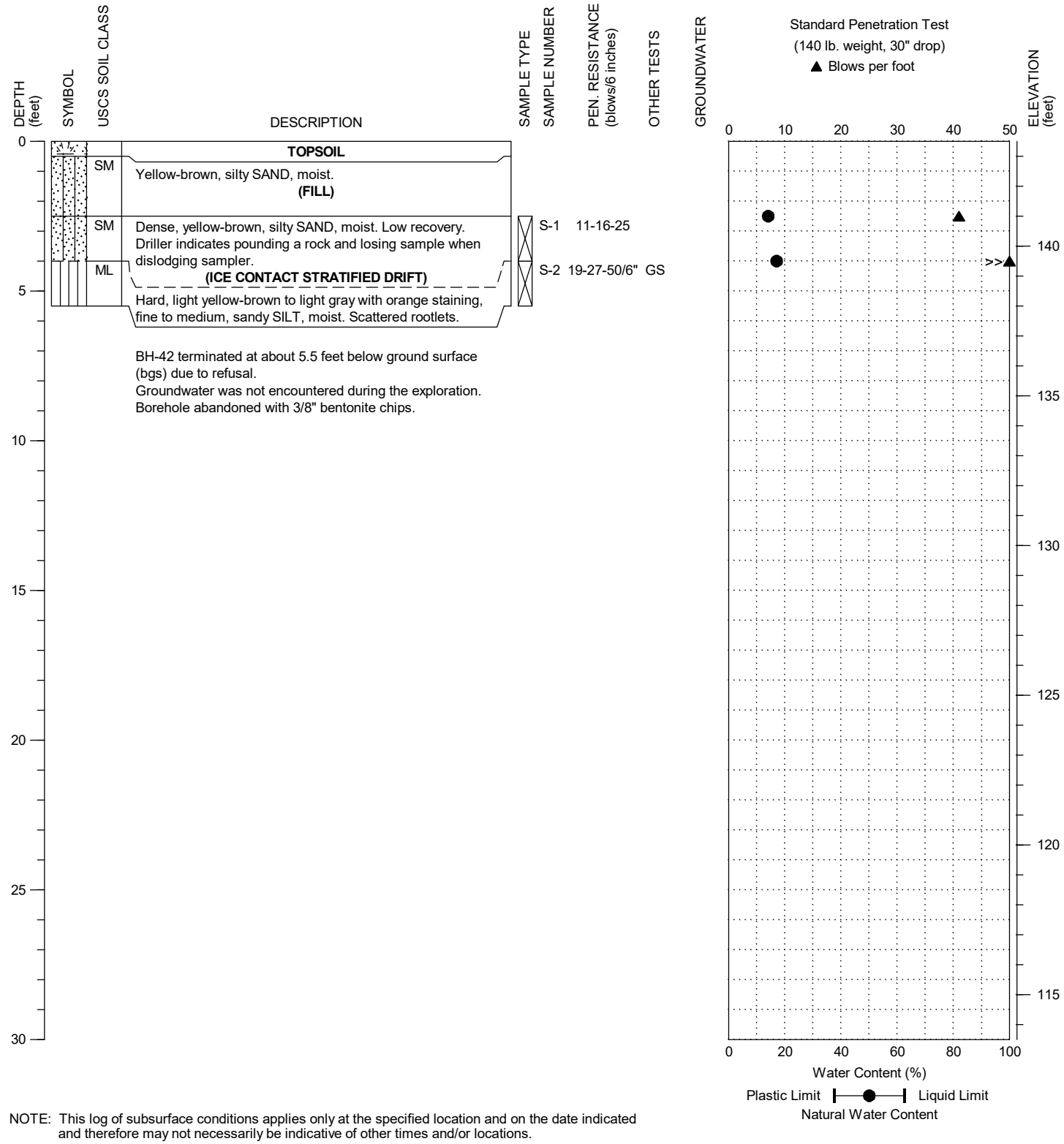
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-41

PROJECT NO.: 2021-133-21 FIGURE: A-12

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 209+05; See Figure 2F

DATE STARTED: 11/9/2022
DATE COMPLETED: 11/9/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 143.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

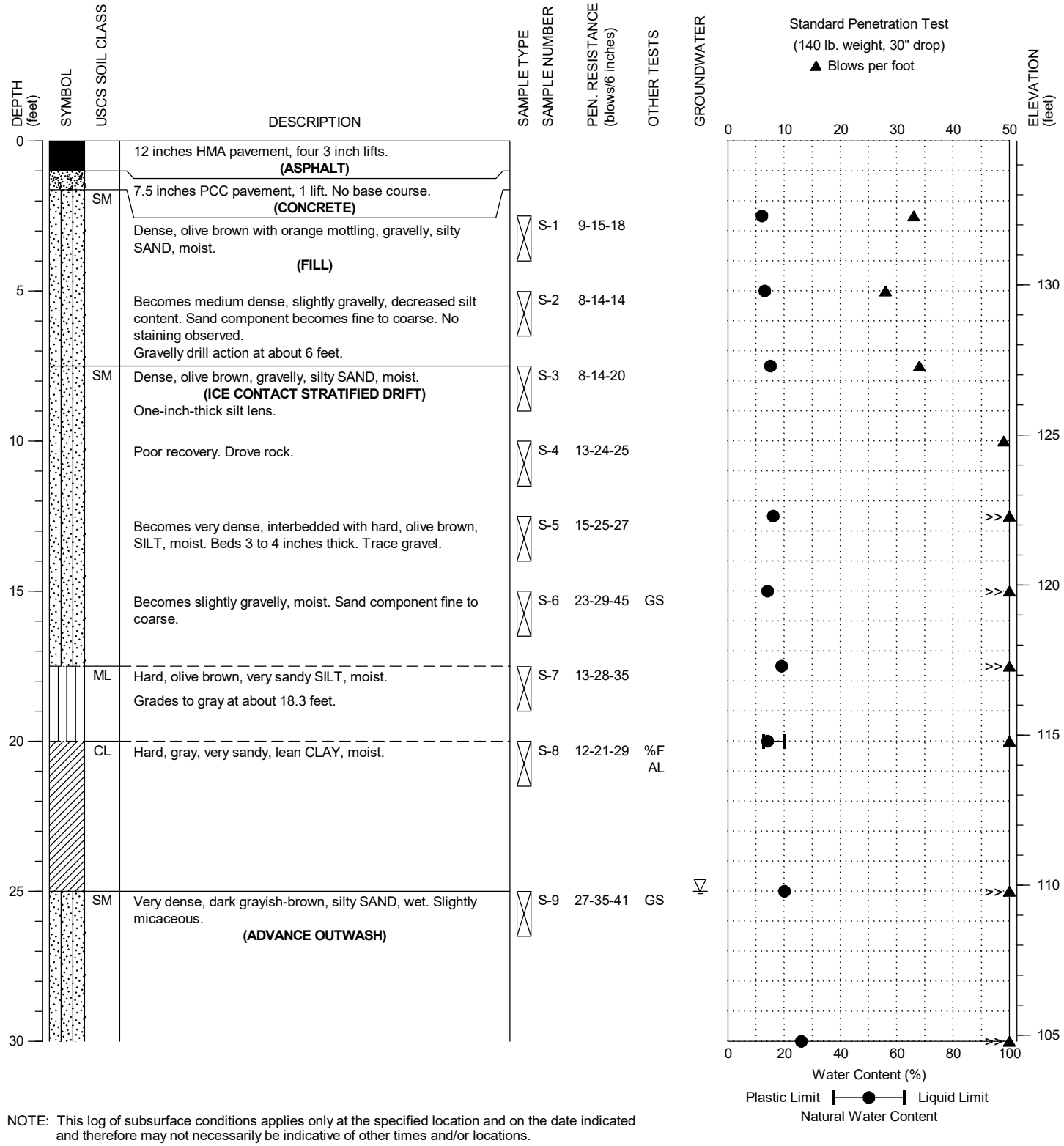
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-42

PROJECT NO.: 2021-133-21 FIGURE: A-13

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 209+00; See Figure 2F

DATE STARTED: 7/26/2022
DATE COMPLETED: 7/26/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 134.8 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

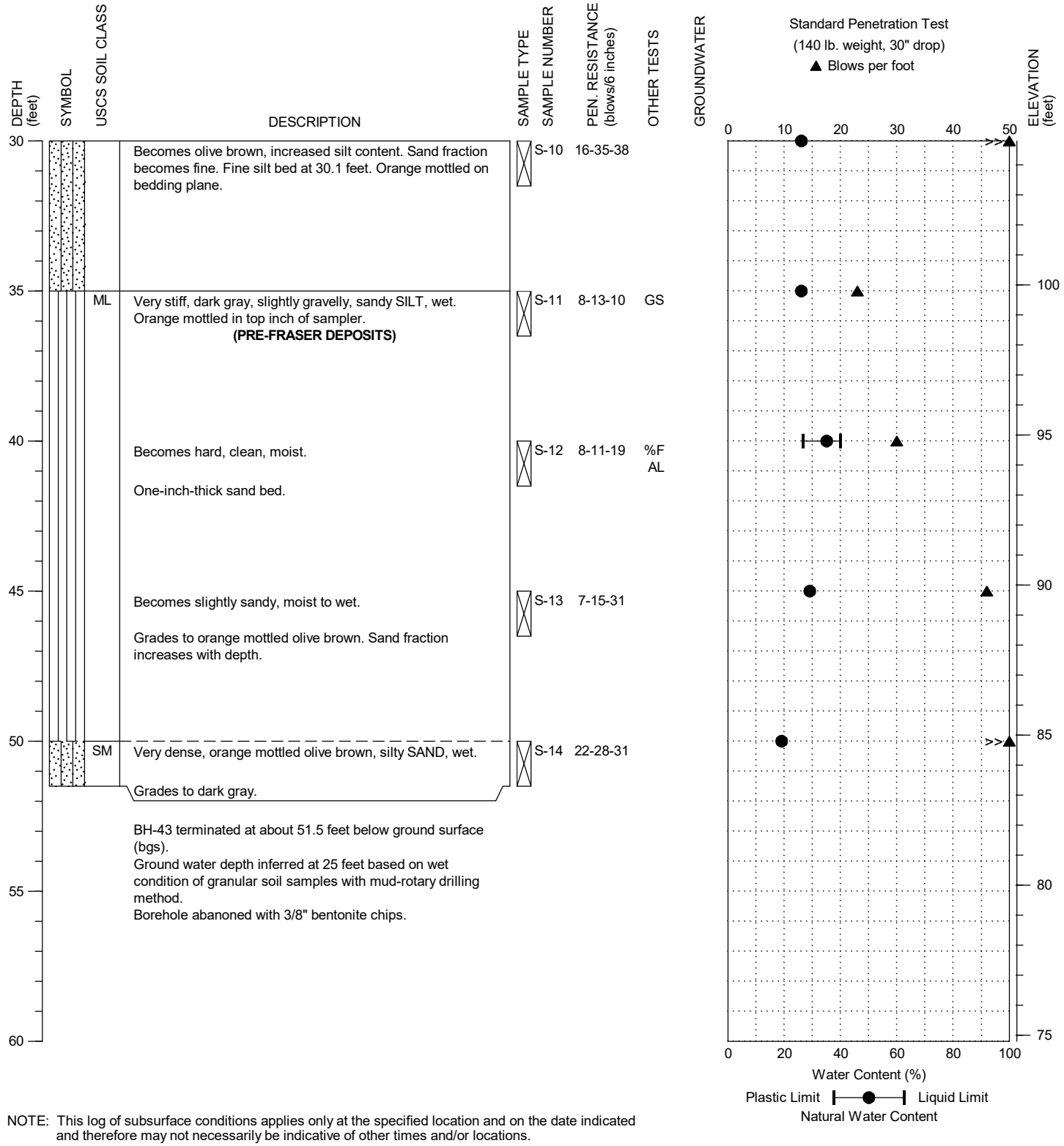
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-43

PROJECT NO.: 2021-133-21 FIGURE: A-14

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 209+00; See Figure 2F

DATE STARTED: 7/26/2022
DATE COMPLETED: 7/26/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 134.8 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

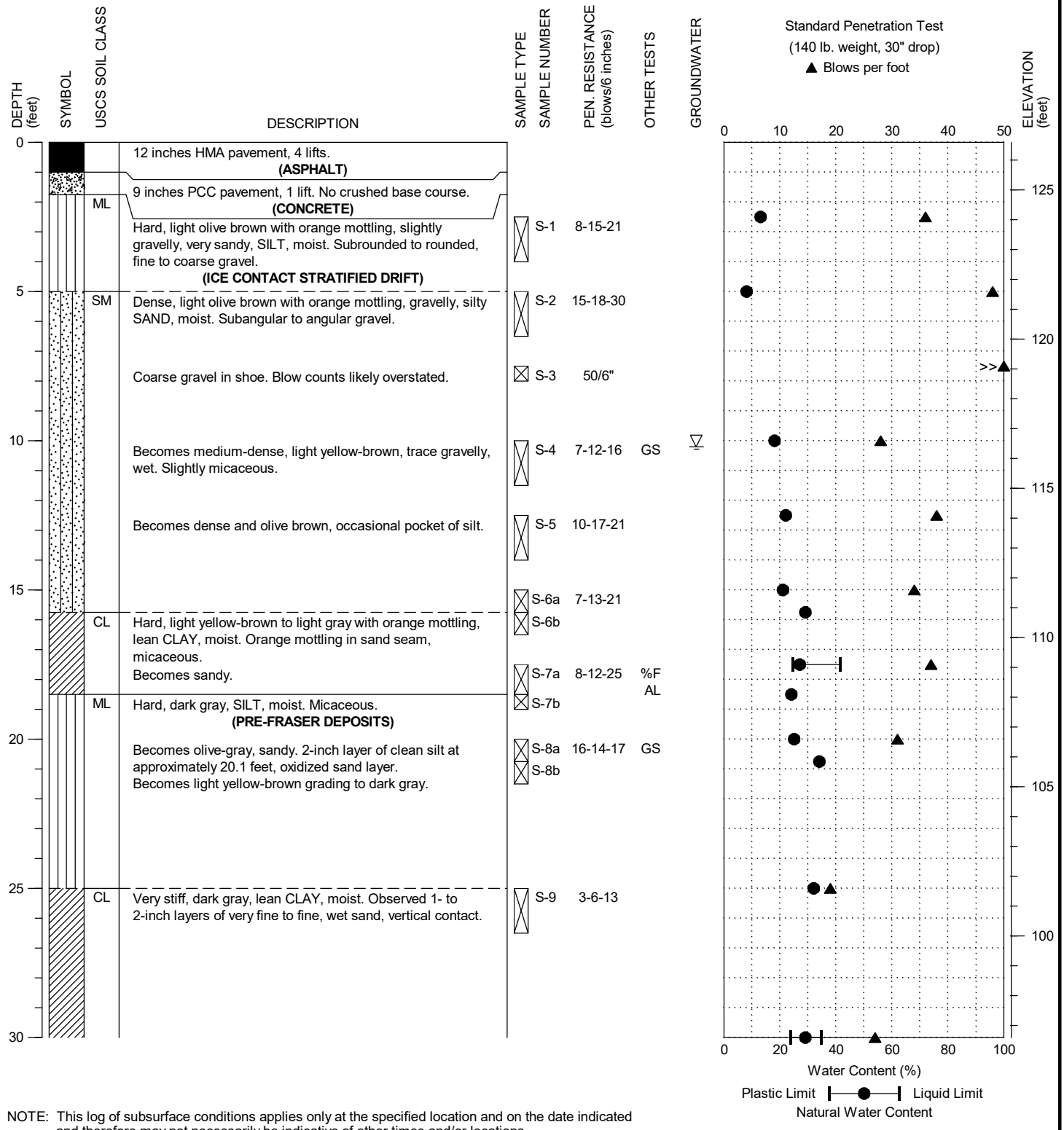
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-43

PROJECT NO.: 2021-133-21 FIGURE: A-14

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 211+00; See Figure 2F

DATE STARTED: 7/25/2022
DATE COMPLETED: 7/25/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 126.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-45

PROJECT NO.: 2021-133-21 FIGURE: A-15

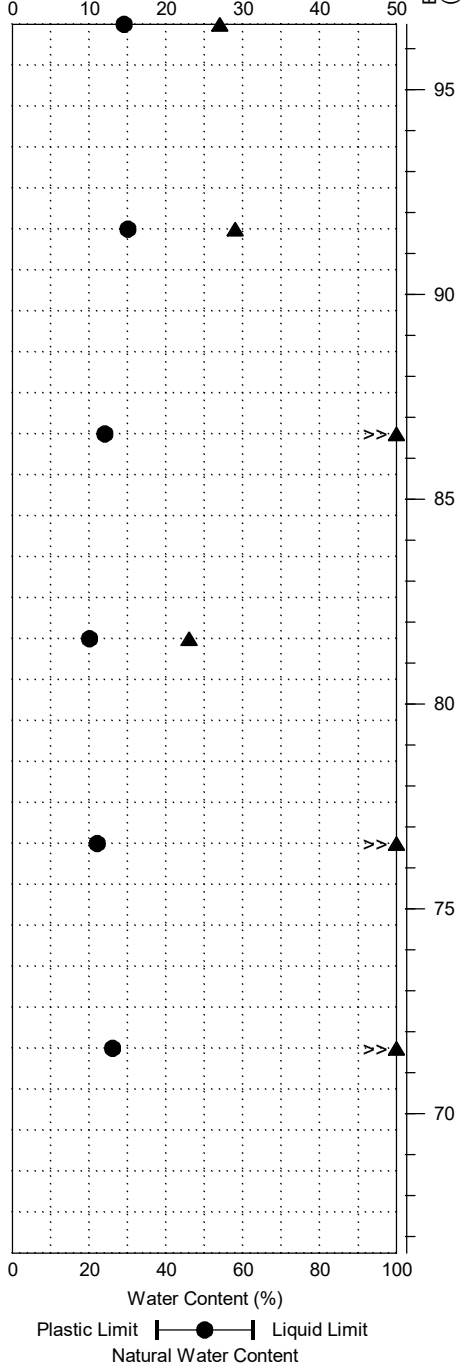
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 211+00; See Figure 2F

DATE STARTED: 7/25/2022
DATE COMPLETED: 7/25/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 126.6 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Driller added water prior to driving 30 foot sample. No heave noted. Sand layers become thicker and more silty.		S-10	8-11-16	%F AL
35		SM	Medium dense, dark gray, very silty, very fine, SAND, moist. Occasional pocket of clay, occasional lense highly dilatent very fine sand, micaceous.		S-11	4-10-19	
40		ML	Hard, dark gray, sandy SILT, wet.		S-12	16-30-32	GS
45		SM	Medium dense, dark gray, fine to medium, silty SAND, wet. Interbedded with higher silt content in the top 3 inches, slightly micaceous. Blow counts potentially understated due to possible heave.		S-13	6-9-14	
50			Becomes very dense. 3-inch layer of silt at approximately 50.5 feet.		S-14	20-35-37	
55			Interbedded with layers of higher silt content. Increasing silt content with depth, micaceous.		S-15	18-32-32	
60			BH-45 terminated at about 56.5 feet below ground surface (bgs). Groundwater was encountered at about 10.2 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.				

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

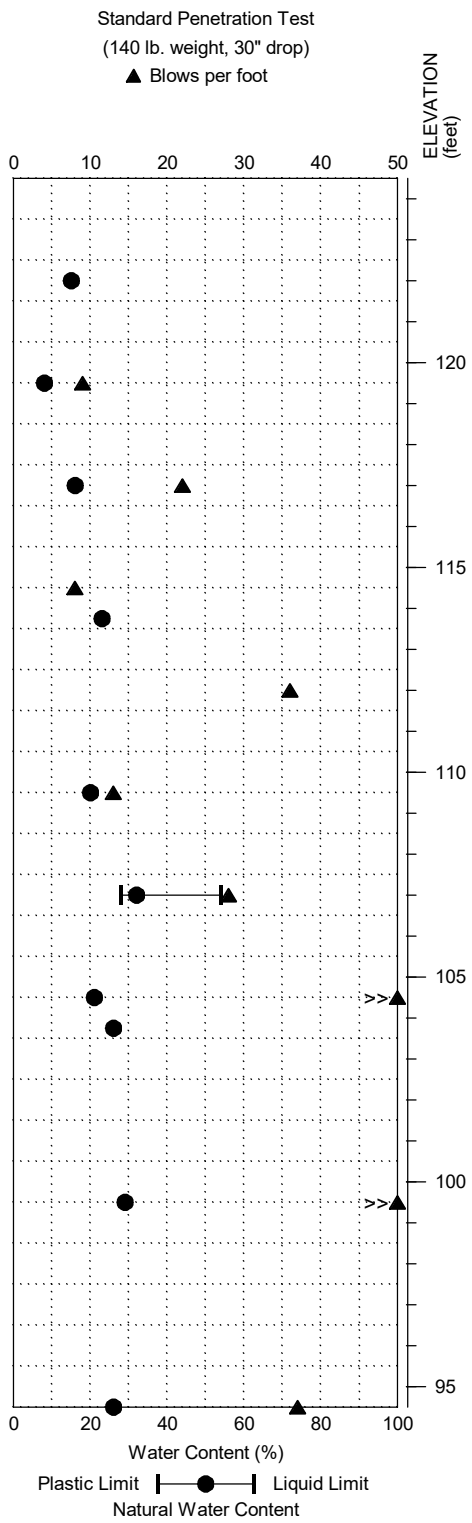
BORING:
BH-45

PROJECT NO.: 2021-133-21 FIGURE: A-15

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 211+60; See Figure 2F

DATE STARTED: 8/5/2022
DATE COMPLETED: 8/5/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 124.5 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			10.5 inches HMA pavement, one lifts. **(ASPHALT)**					
		SM	Yellow brown, very silty, SAND, moist. Frequent pockets of light brown clay. Few slightly gravelly pockets. **(FILL)** Dense indicated by 1/2-inch T-probe penetration.		S-1		GS	
5			Vac to 5 feet bgs. Becomes loose, light yellow-brown with occasional gray pocket. Trace subrounded gravel. Sand component becomes fine. Mud added after sample.		S-2	3-3-6		
		SM	Medium dense, light yellow-brown with scattered orange staining, fine to medium silty SAND, wet. 3-inch layer of light brown orange-laminated silt. **(ICE CONTACT STRATIFIED DRIFT)**		S-3	6-10-12	%F	▽
10			Becomes loose. Trace subrounded gravel. S-4a ends in 1-inch layer of laminated silt. Blow counts potentially understated due to possible heave.		S-4a S-4b	5-5-3		▼
		ML	Stiff, light yellowish brown, very sandy SILT, wet. Fine to medium sand, micaceous. Becomes hard at about 12.5 feet. Low recovery.		S-5	6-18-18		
15		SM	Medium dense, olive brown with occasional orange staining, slightly gravelly, silty, fine to coarse, SAND, wet. Interbedded with 1/2-inch layers of silt. Subrounded to rounded fine gravel. Blow counts potentially understated due to possible heave.		S-6	6-6-7	%F	
		CH	Very stiff, dark gray with olive brown and orange weathering in top 6-inches, fat CLAY, moist. Grades to silt with depth. Micaceous.		S-7	13-12-16	AL	
20			**(PRE-FRASER DEPOSITS)**		S-8a	16-19-25		
		ML	Hard, dark gray, SILT, moist. Rapid to moderate dilatency. Micaceous.		S-8b		GS	
		ML	Hard, olive brown, slightly sandy SILT, moist to wet. Fine sand, rapid dilatency, micaceous.					
25			Becomes sandy, scattered orange staining. Interbedded with 1- to 2-inch layers of olive brown clay in the top 6 inches. Significant red-brown staining at 25.5 feet.		S-9	12-25-28		
30								



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-46W

PROJECT NO.: 2021-133-21 FIGURE: A-16

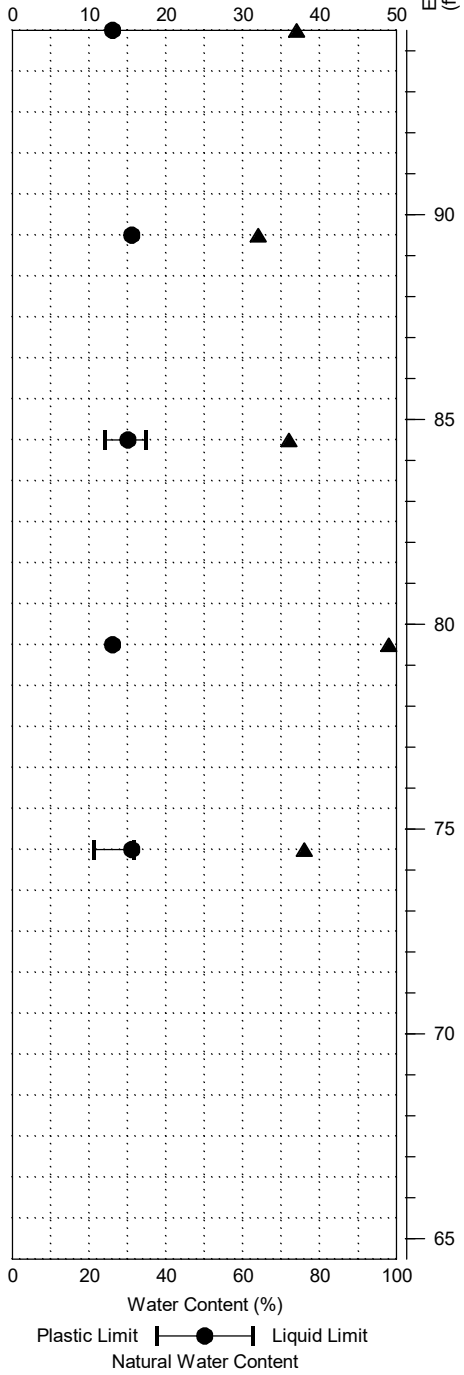
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 211+60; See Figure 2F

DATE STARTED: 8/5/2022
DATE COMPLETED: 8/5/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 124.5 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Pockets of clayey, very fine sand. Increased moisture with depth.		S-10	12-17-20	
35		CL	Hard, dark gray, lean CLAY, moist interbedded with dense, dark gray, silty, fine to very fine SAND, wet. Clay is 2-inch and 6-inch layers.		S-11	6-13-19	
40			Massive bedding. Few seams of silty sand.		S-12	11-16-20	AL
45		ML	Hard, dark gray, sandy SILT, moist. Mottled with areas of silty sand, 1-inch layer of highly oxidized silty, fine to medium sand, 3-inch layer of clean clay at the bottom. Deformed appearance.		S-13	14-25-24	
50		CL	Hard, dark gray, sandy CLAY, moist. Mottled with very dense, dark gray, very silty to silty, very fine to fine, SAND, wet. Deformed appearance.		S-14	19-18-20	AL
55			BH-46W terminated at about 51.5 feet below ground surface (bgs). Perched groundwater depth inferred at 7.5 feet based on wet condition of granular soil samples with mud-rotary drilling method. Driller reported no heave during drilling. Borehole backfilled with bentonite grout. Piezometer (Serial # 2200659) installed at 30 feet bgs. DOE unique well tag #BPK 141. Highest groundwater measured in piezometer as of 8/7/2023: 11.6 feet bgs on 4/21/2023.				
60							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

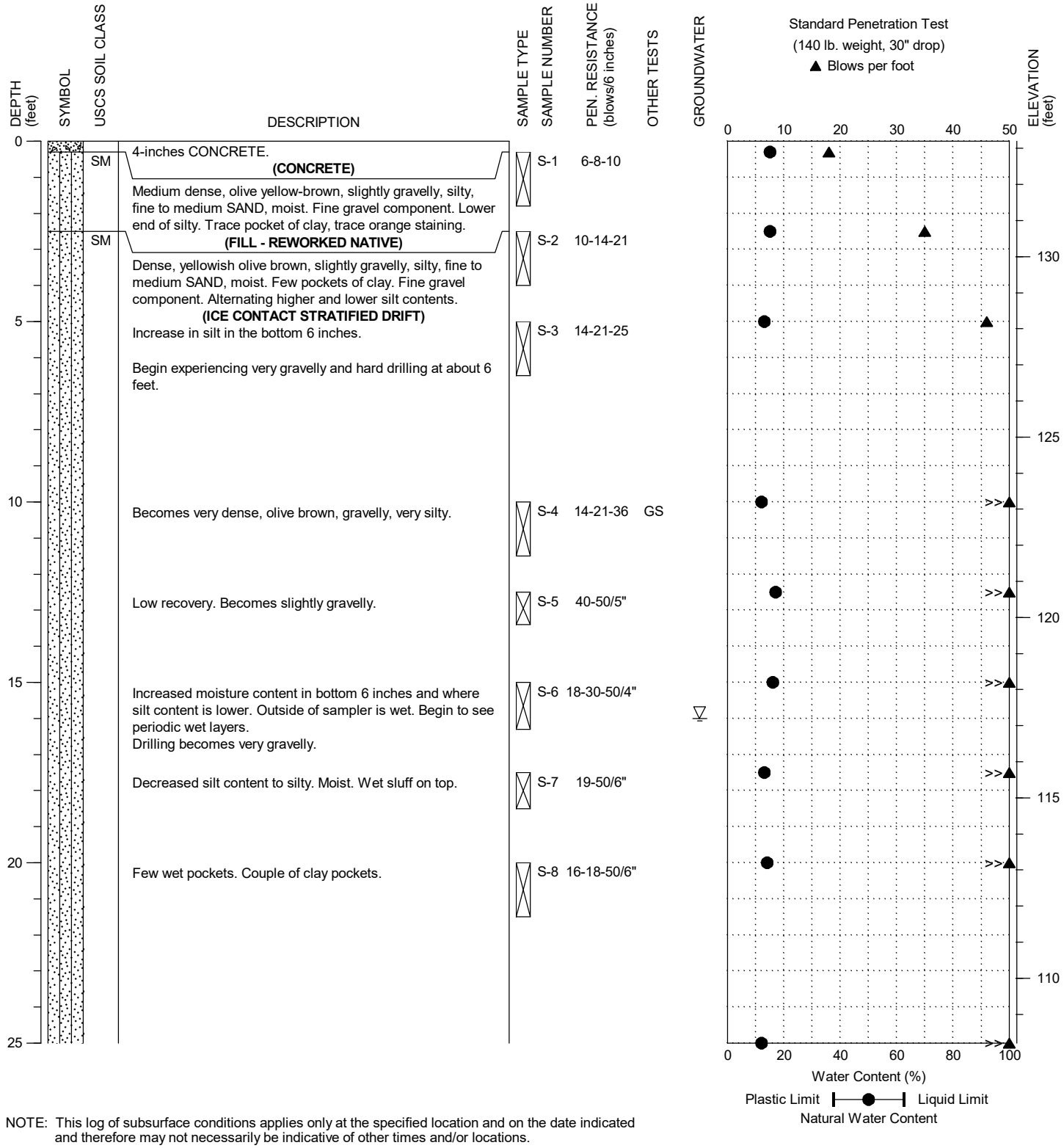
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-46W

PROJECT NO.: 2021-133-21 FIGURE: A-16

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 212+70/R6 11+95; See Figure 2F

DATE STARTED: 4/4/2023
DATE COMPLETED: 4/4/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 133.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

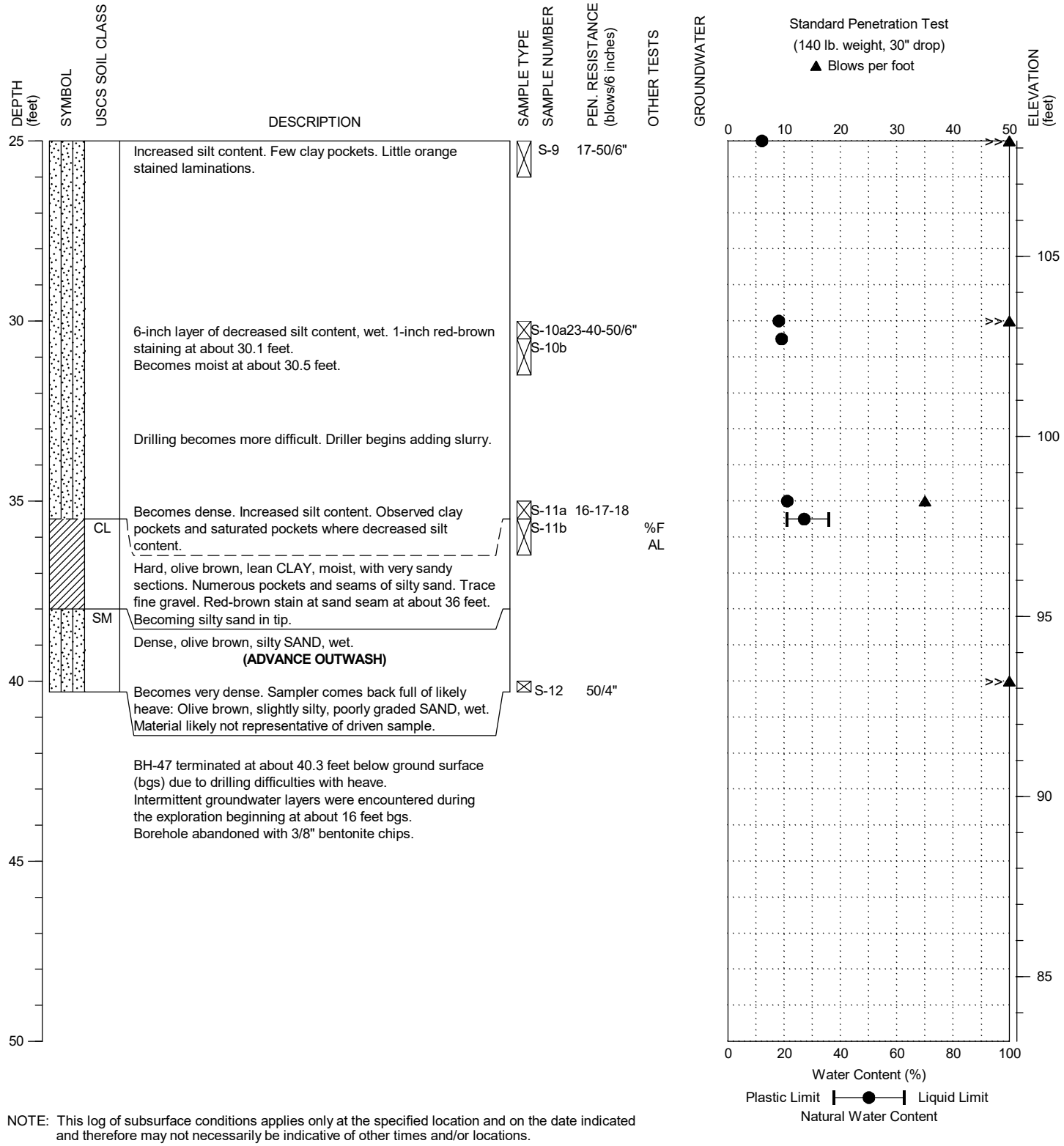
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-47

PROJECT NO.: 2021-133-21 FIGURE: A-17

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 212+70/R6 11+95; See Figure 2F

DATE STARTED: 4/4/2023
DATE COMPLETED: 4/4/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 133.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-47

PROJECT NO.: 2021-133-21 FIGURE: A-17

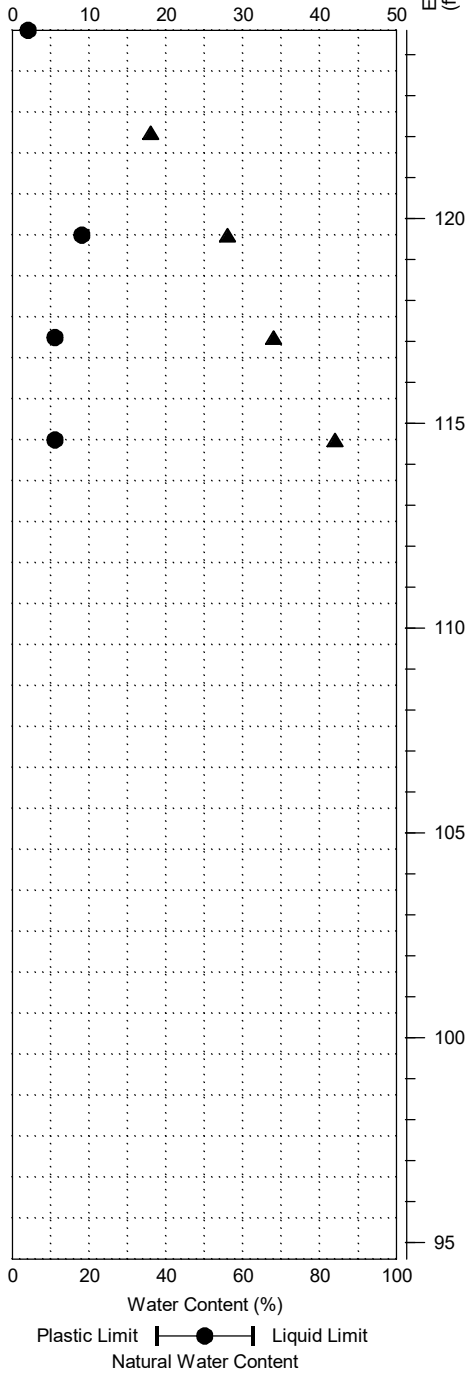
DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 215+00; See Figure 2G

DATE STARTED: 9/14/2022
DATE COMPLETED: 9/14/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 124.6 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Medium dense, yellow brown, gravelly silty SAND, moist. **(COLLUVIUM)**		S-1		
			No recovery.		S-2	7-8-10	
5		SM	Medium dense, olive brown with orange mottling, very silty to silty, fine to medium SAND, moist. Trace charcoal and fine subrounded gravel. Gravelly and difficult drilling begins at 5 feet. Driller adds water after sample.		S-3	10-12-16	
		SM	Dense, olive brown, slightly gravelly, very silty, fine to medium SAND, moist. Fine subrounded to subangular gravel. **(ICE CONTACT STRATIFIED DRIFT)**		S-4	11-14-20	
10					S-5	20-22-20	GS
15			BH-48A terminated at about 11.5 feet below ground surface (bgs) due to refusal. Groundwater was not encountered during the exploration. Borehole abandoned with 3/8" bentonite chips.				
20							
25							
30							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

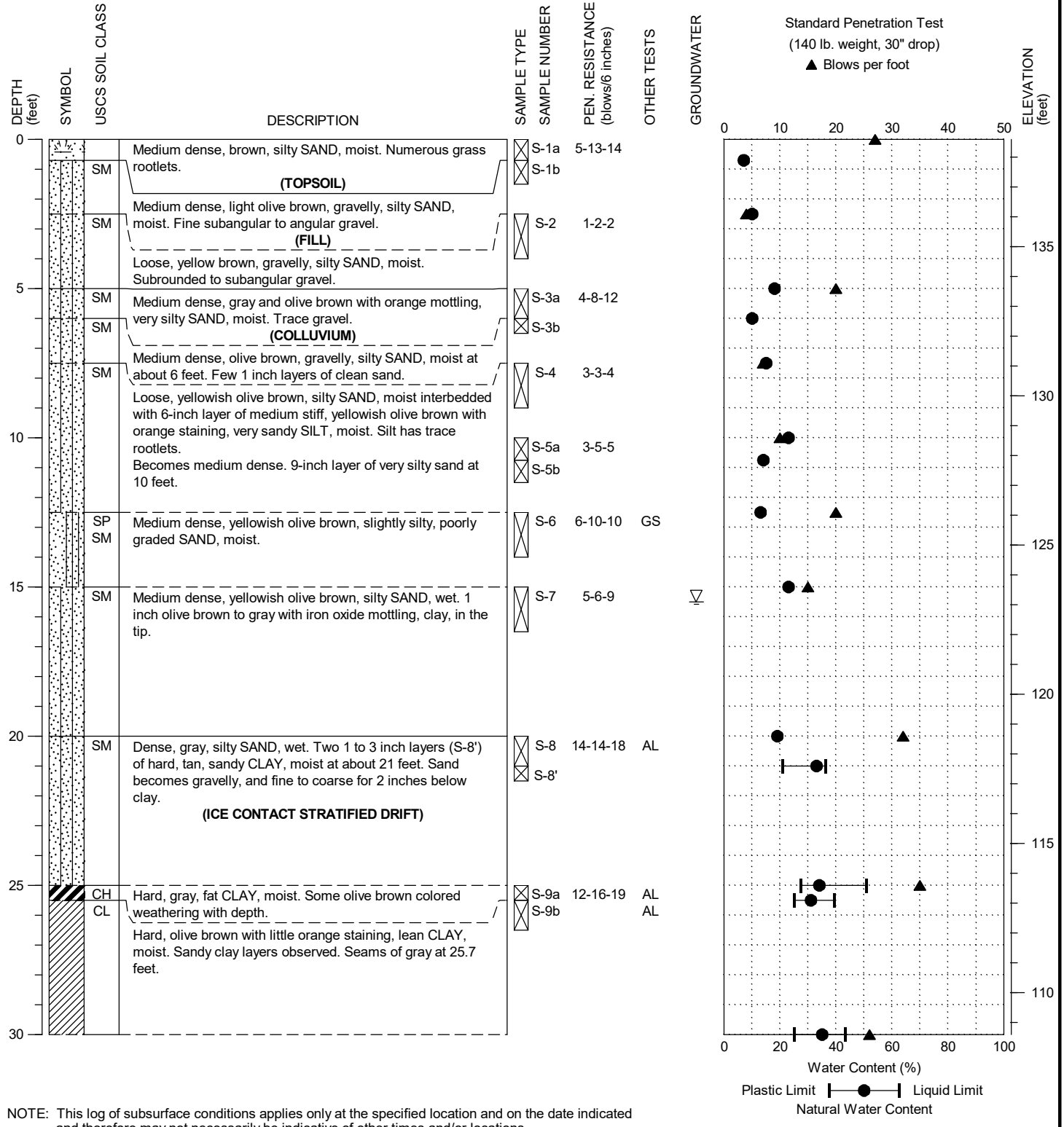
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-48A

PROJECT NO.: 2021-133-21 FIGURE: A-18

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 214+85; See Figure 2G

DATE STARTED: 9/14/2022
DATE COMPLETED: 9/14/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 138.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

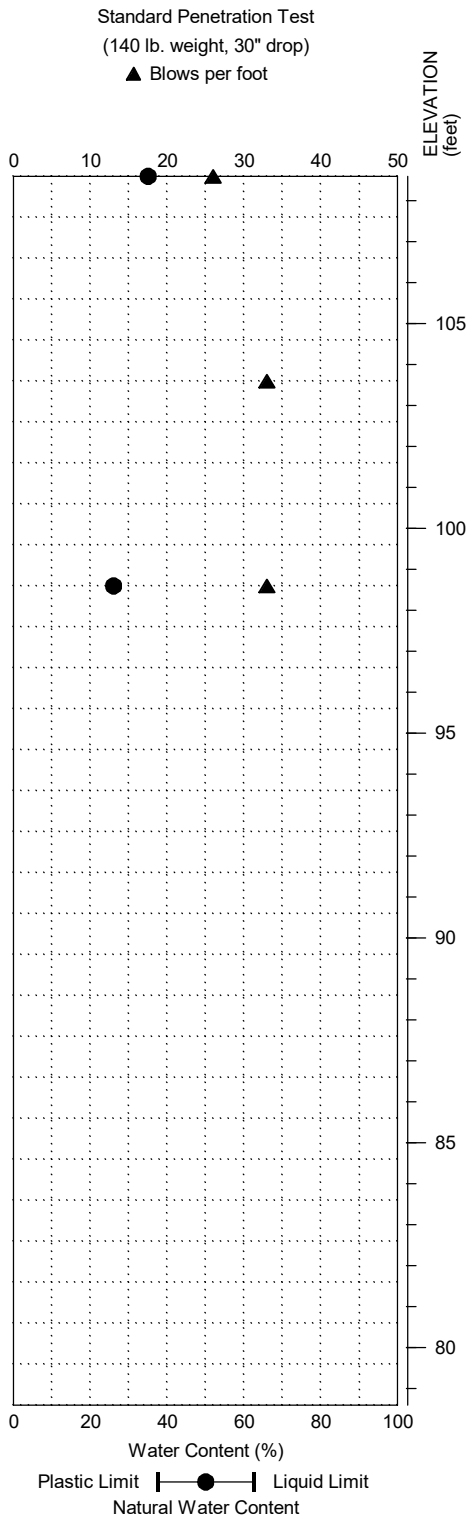
BORING:
BH-48B

PROJECT NO.: 2021-133-21 FIGURE: A-19

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 214+85; See Figure 2G

DATE STARTED: 9/14/2022
DATE COMPLETED: 9/14/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 138.6 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30		CL	Very stiff, olive brown, lean CLAY, moist. At 31 feet, 2-inch layer red-brown, fine, very sandy silt at 31 feet over 5-inch layer of medium dense, olive brown, fine to medium, silty SAND, moist.		S-10	6-9-17	AL
35		SM	Dense, olive brown with orange mottling, fine to medium, silty SAND, moist, interbedded with hard, olive brown, sandy SILT, moist. Vertical contact with silt. Deformed, finely laminated, gray and tan clay in bottom 4 inches. Drill action becomes slow at 35 feet.		S-11	7-16-17	
40		SM	Dense, yellowish olive brown, silty SAND, wet. Micaceous. Driller reported 6 inches heave at 40 feet.		S-12	10-16-17	GS
45			BH-48B terminated at about 41.5 feet below ground surface (bgs). Groundwater was encountered at about 15.5 feet bgs during the exploration. Driller reported 6-inches heave at 40 feet. Borehole abandoned with 3/8" bentonite chips.				
50							
55							
60							



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

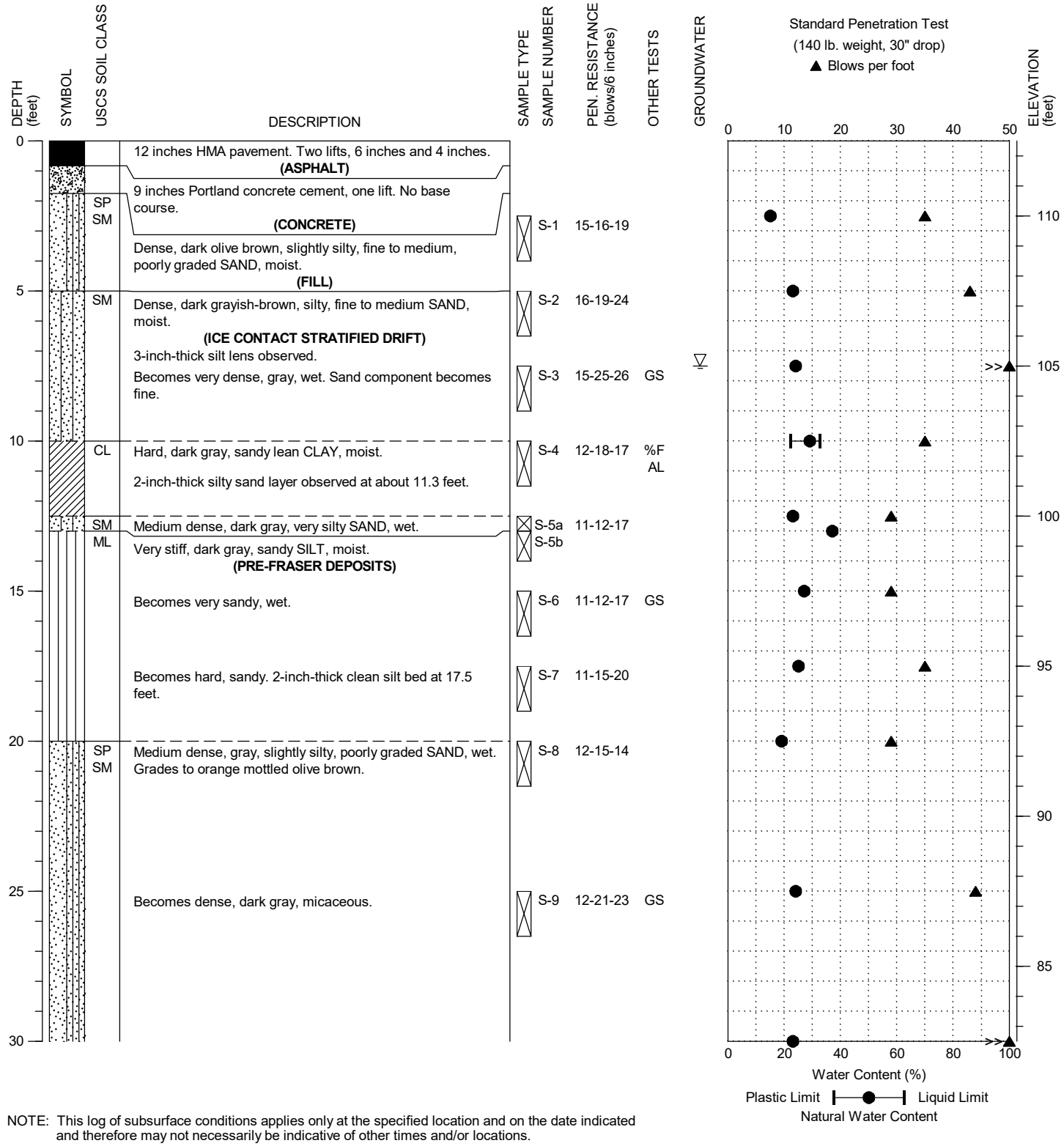
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-48B

PROJECT NO.: 2021-133-21 FIGURE: A-19

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT and NSPT w/Autohammer
LOCATION: Approximate station 215+00; See Figure 2G

DATE STARTED: 7/22/2022
DATE COMPLETED: 7/22/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 112.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

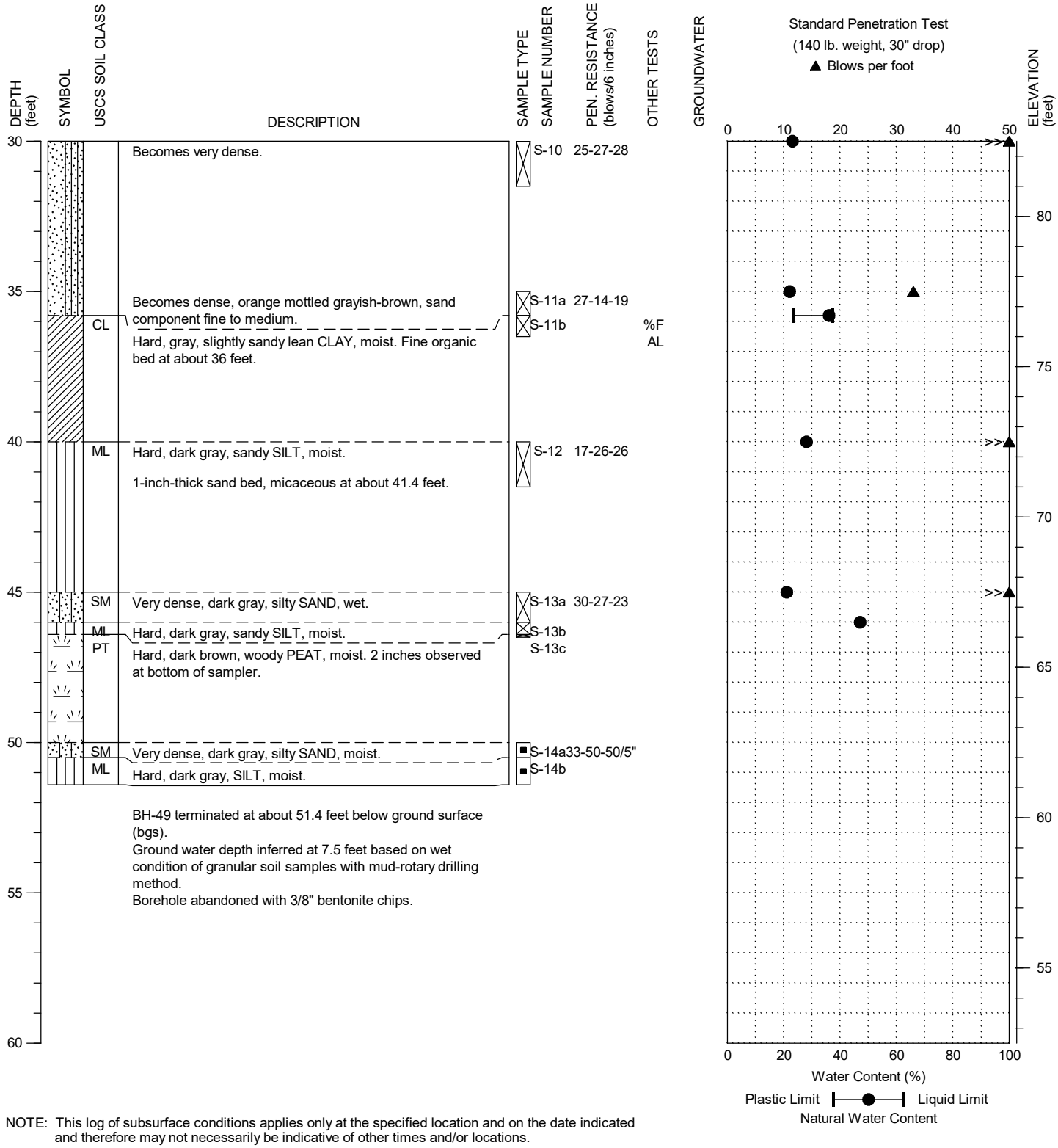
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-49

PROJECT NO.: 2021-133-21 FIGURE: A-20

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT and NSPT w/Autohammer
LOCATION: Approximate station 215+00; See Figure 2G

DATE STARTED: 7/22/2022
DATE COMPLETED: 7/22/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 112.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

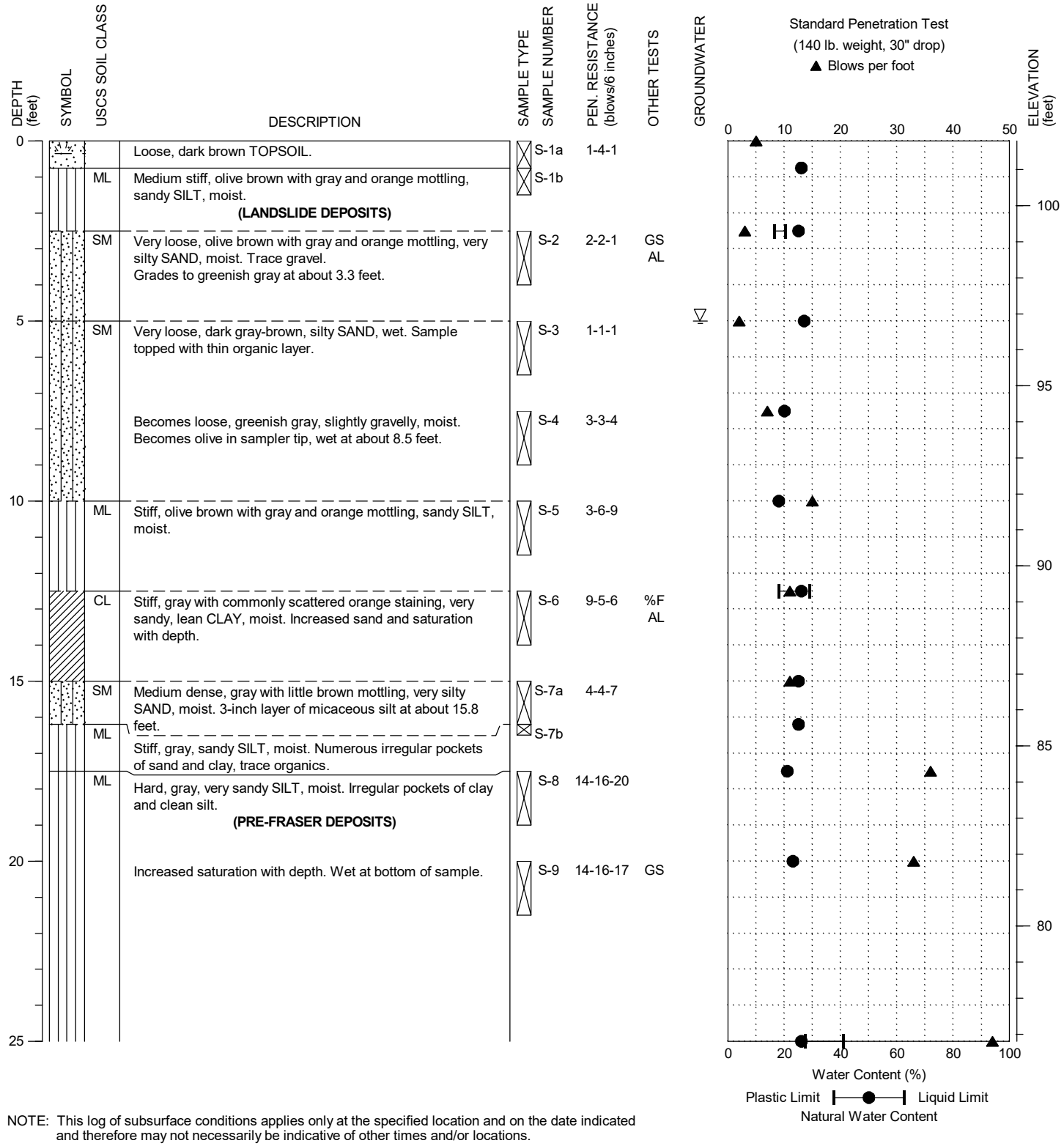
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-49

PROJECT NO.: 2021-133-21 FIGURE: A-20

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 218+40; See Figure 2G

DATE STARTED: 1/24/2023
DATE COMPLETED: 1/24/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 101.8 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-50

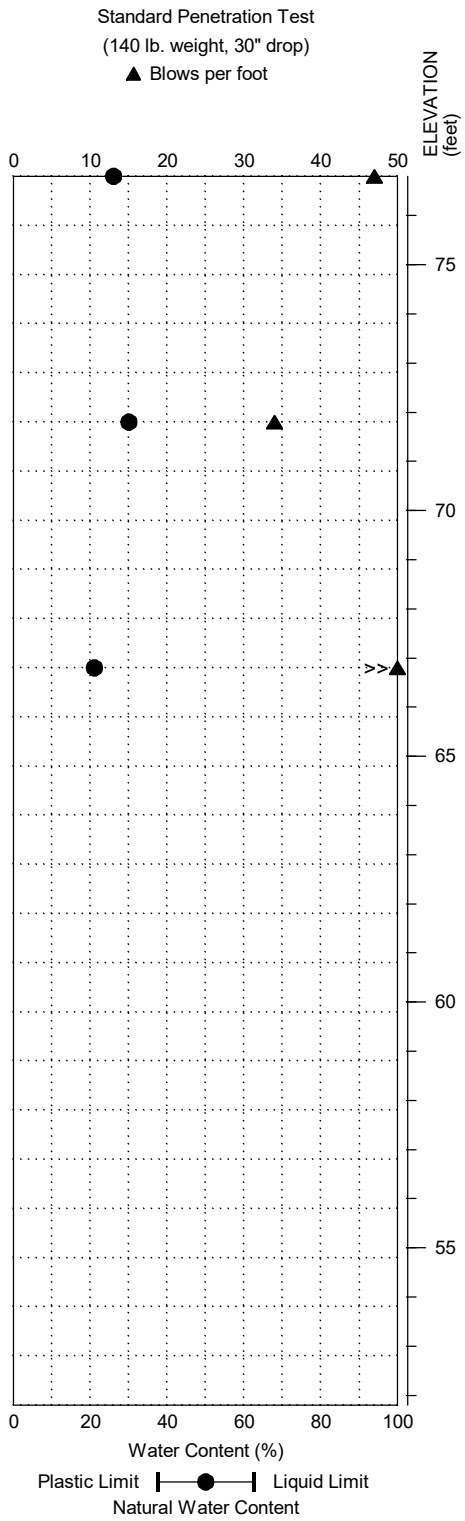
PROJECT NO.: 2021-133-21 FIGURE: A-21

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 218+40; See Figure 2G

DATE STARTED: 1/24/2023
DATE COMPLETED: 1/24/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 101.8 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
25			Becomes sandy. Micaceous. Scattered layers of silty sand and pockets of clay. Sandiest in top 6 inches.		S-10	10-15-32	%F AL
30			Very sandy with 3 inches of very fine laminations in the top 6 inches. Pockets of clay and silty sand with high-angle contacts. Laminations in some silt. Saturated in sandy areas.		S-11	12-13-21	
35		SP SM	Very dense, dark gray, slightly silty, fine to medium, poorly graded SAND, wet. Driller indicates about 8 feet of heave at the bottom as removing sample and augers.		S-12	27-37-48	
40			BH-50 terminated at about 36.5 feet below ground surface (bgs) due to difficulties associated with heave. Perched groundwater encountered at about 5 feet bgs during the exploration. The driller observed approximately 8 feet of heave while removing the last sample. Borehole abanodned with 3/8" bentonite chips.				
45							
50							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

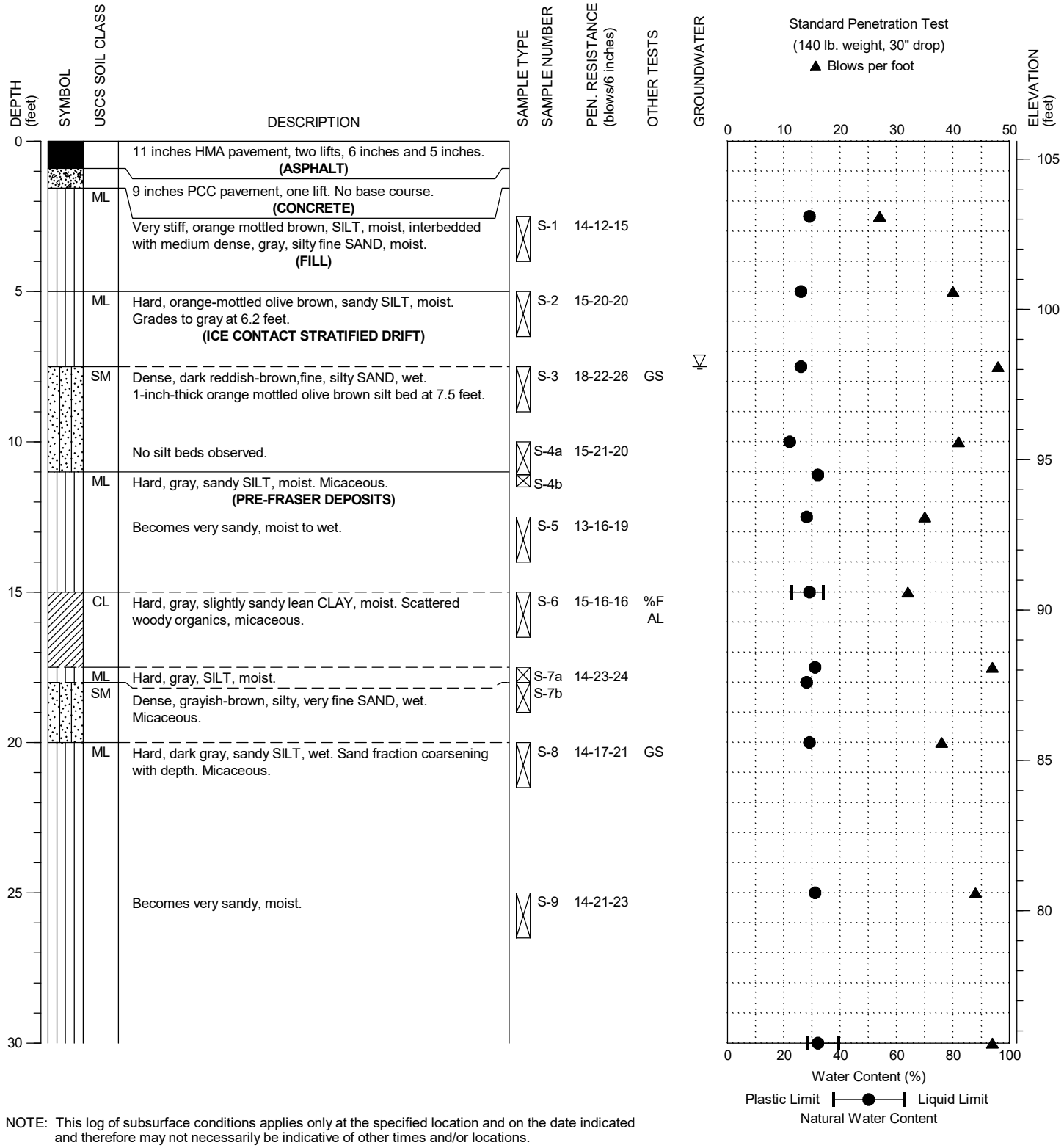
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-50

PROJECT NO.: 2021-133-21 FIGURE: A-21

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 217+10; See Figure 2G

DATE STARTED: 7/21/2022
DATE COMPLETED: 7/21/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 105.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

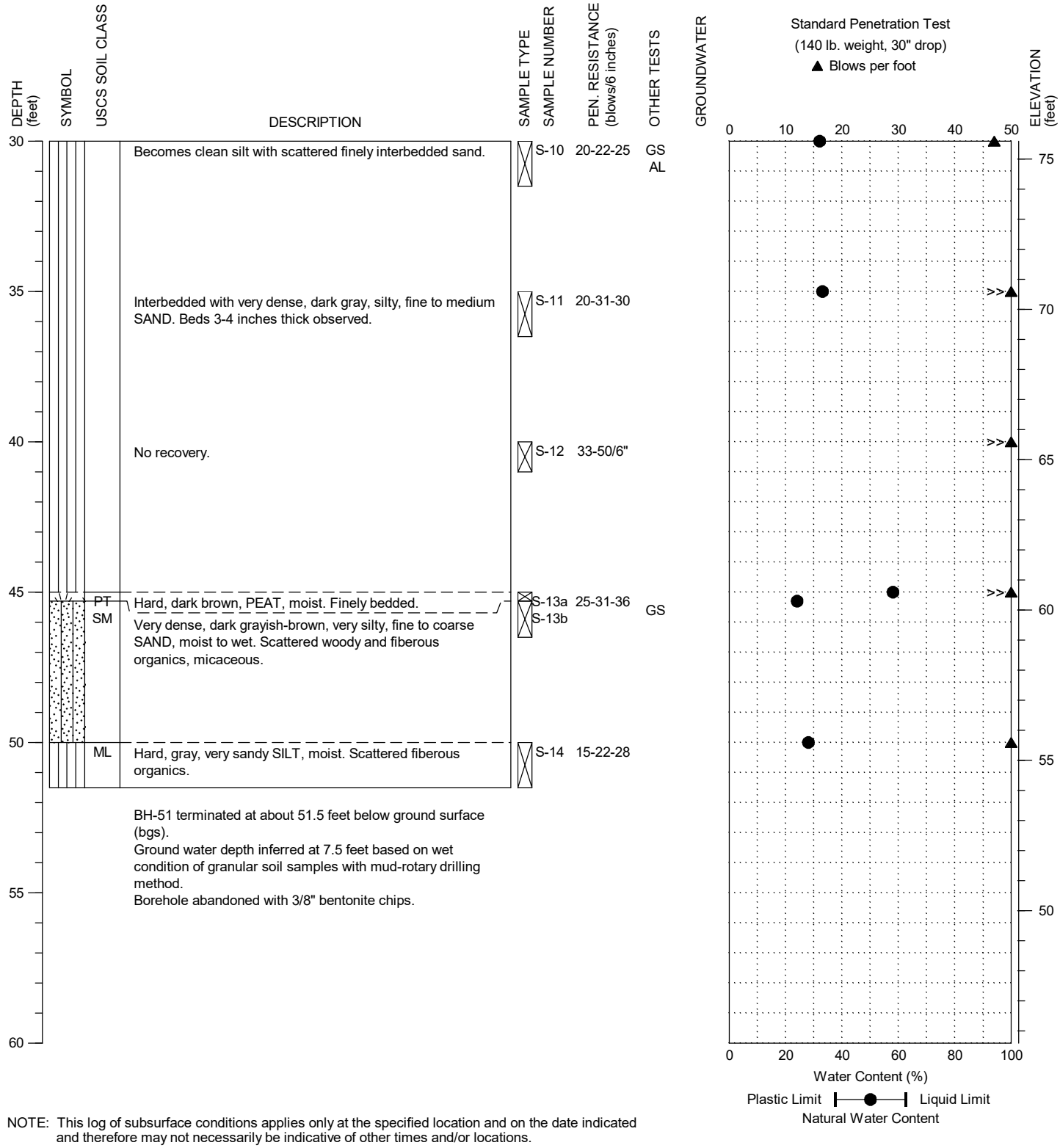
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-51

PROJECT NO.: 2021-133-21 FIGURE: A-22

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 217+10; See Figure 2G

DATE STARTED: 7/21/2022
DATE COMPLETED: 7/21/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 105.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

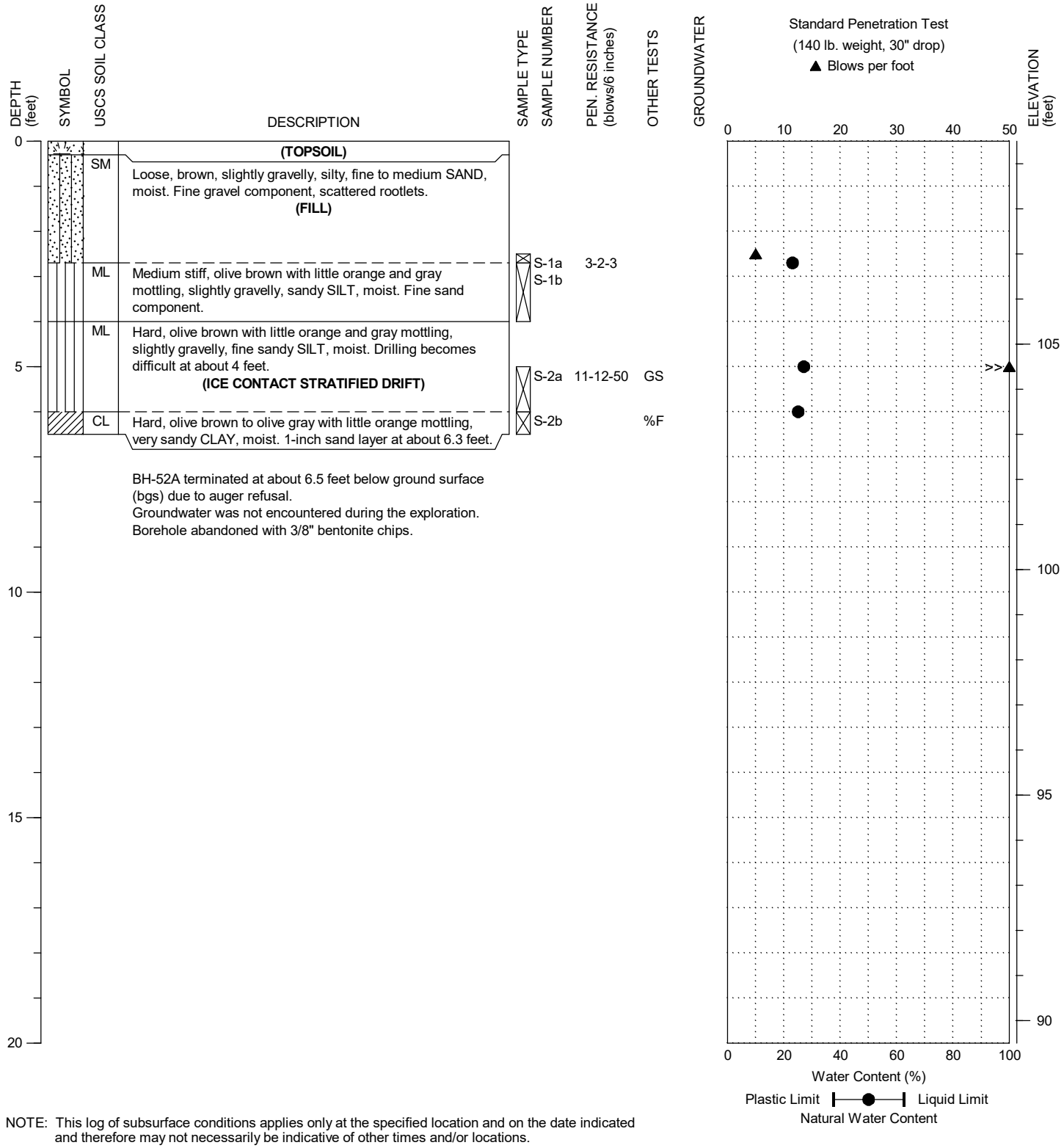
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-51

PROJECT NO.: 2021-133-21 FIGURE: A-22

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 219+50; See Figure 2G

DATE STARTED: 2/20/2023
DATE COMPLETED: 2/20/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 109.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-52A

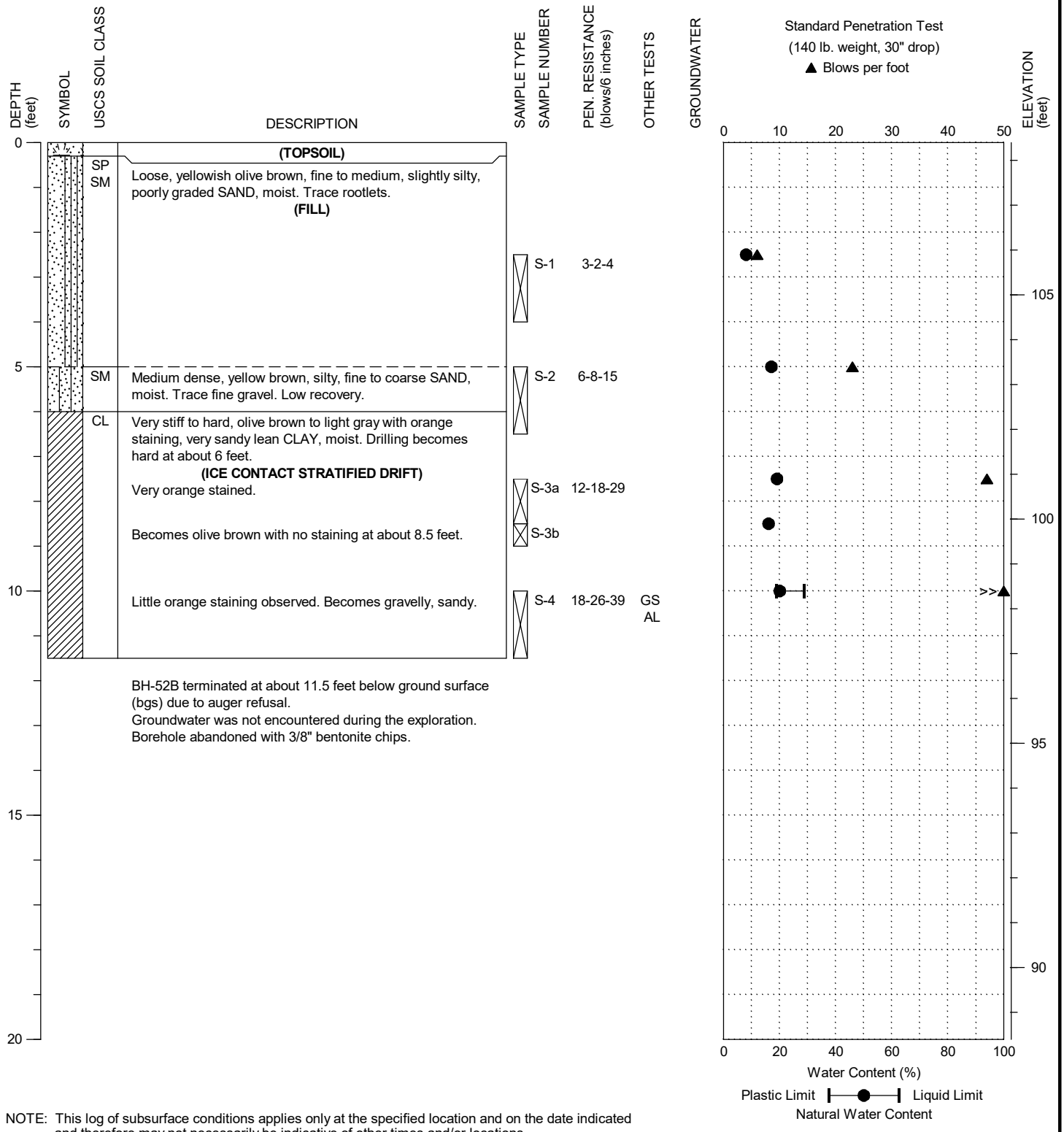
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-23

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 220+10; See Figure 2G

DATE STARTED: 2/20/2023
DATE COMPLETED: 2/20/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 108.4 ± feet



BH-52B terminated at about 11.5 feet below ground surface (bgs) due to auger refusal.
Groundwater was not encountered during the exploration.
Borehole abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

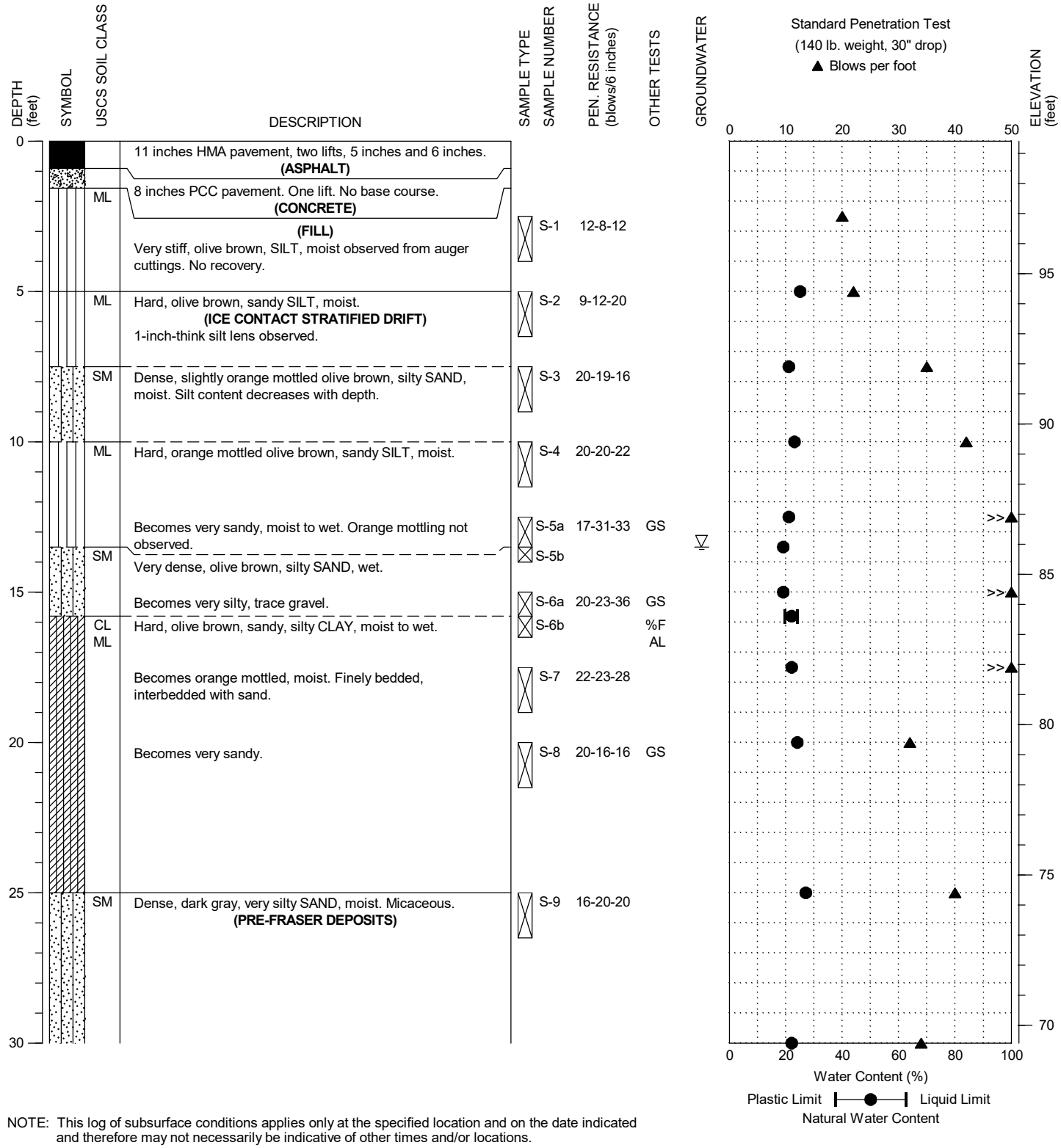
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-52B

PROJECT NO.: 2021-133-21 FIGURE: A-24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 219+05; See Figure 2G

DATE STARTED: 7/20/2022
DATE COMPLETED: 7/20/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 99.4 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-53

PROJECT NO.: 2021-133-21 FIGURE: A-25

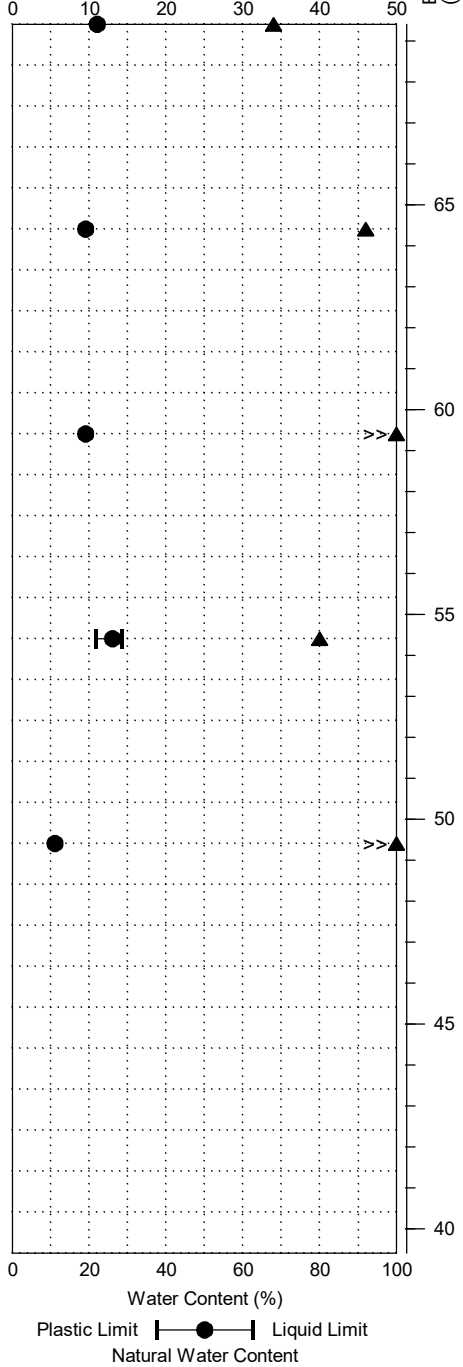
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 219+05; See Figure 2G

DATE STARTED: 7/20/2022
DATE COMPLETED: 7/20/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 99.4 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Becomes silty, wet.		S-10	13-16-18	
35		SP SM	Dense, dark gray, fine, slightly silty, poorly graded SAND, wet.		S-11	15-20-26	
40		SM	Very dense, dark gray, slightly gravelly, very silty SAND, wet. 3-inch-thick silt bed.		S-12	22-25-32	GS
45		CL ML	Hard, gray, slightly sandy, silty CLAY, moist. Micaceous.		S-13	13-18-22	%F AL
50		SP SM	Very dense, dark gray, slightly gravelly, slightly silty, poorly graded SAND, wet.		S-14	27-50/6"	
55			BH-53 terminated at about 51 feet below ground surface (bgs). Ground water depth inferred at 13.5 feet based on wet condition of granular soil samples with mud-rotary drilling method. Borehole abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

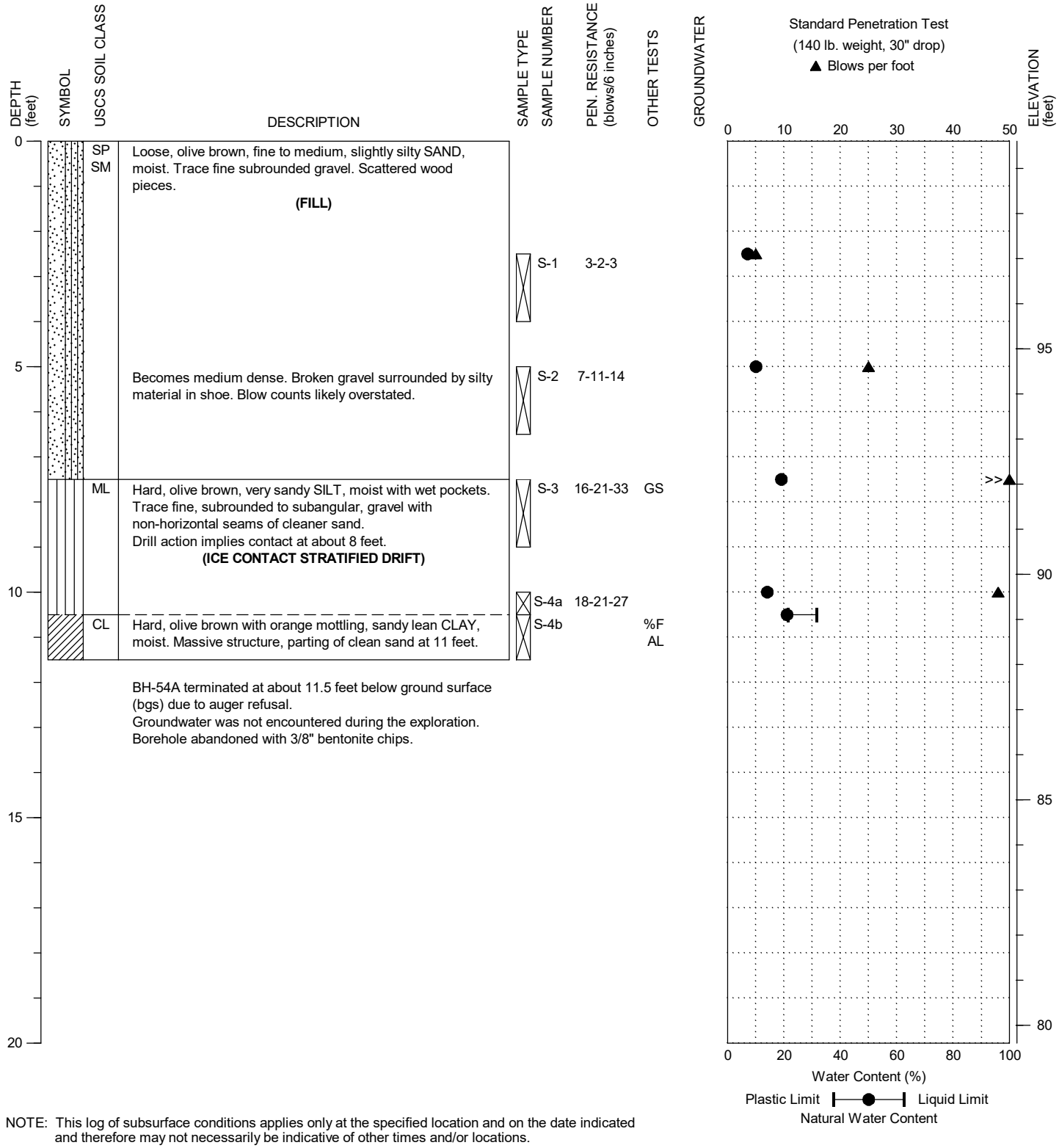
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-53

PROJECT NO.: 2021-133-21 FIGURE: A-25

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 220+80; See Figure 2G

DATE STARTED: 11/8/2022
DATE COMPLETED: 11/8/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 99.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-54A

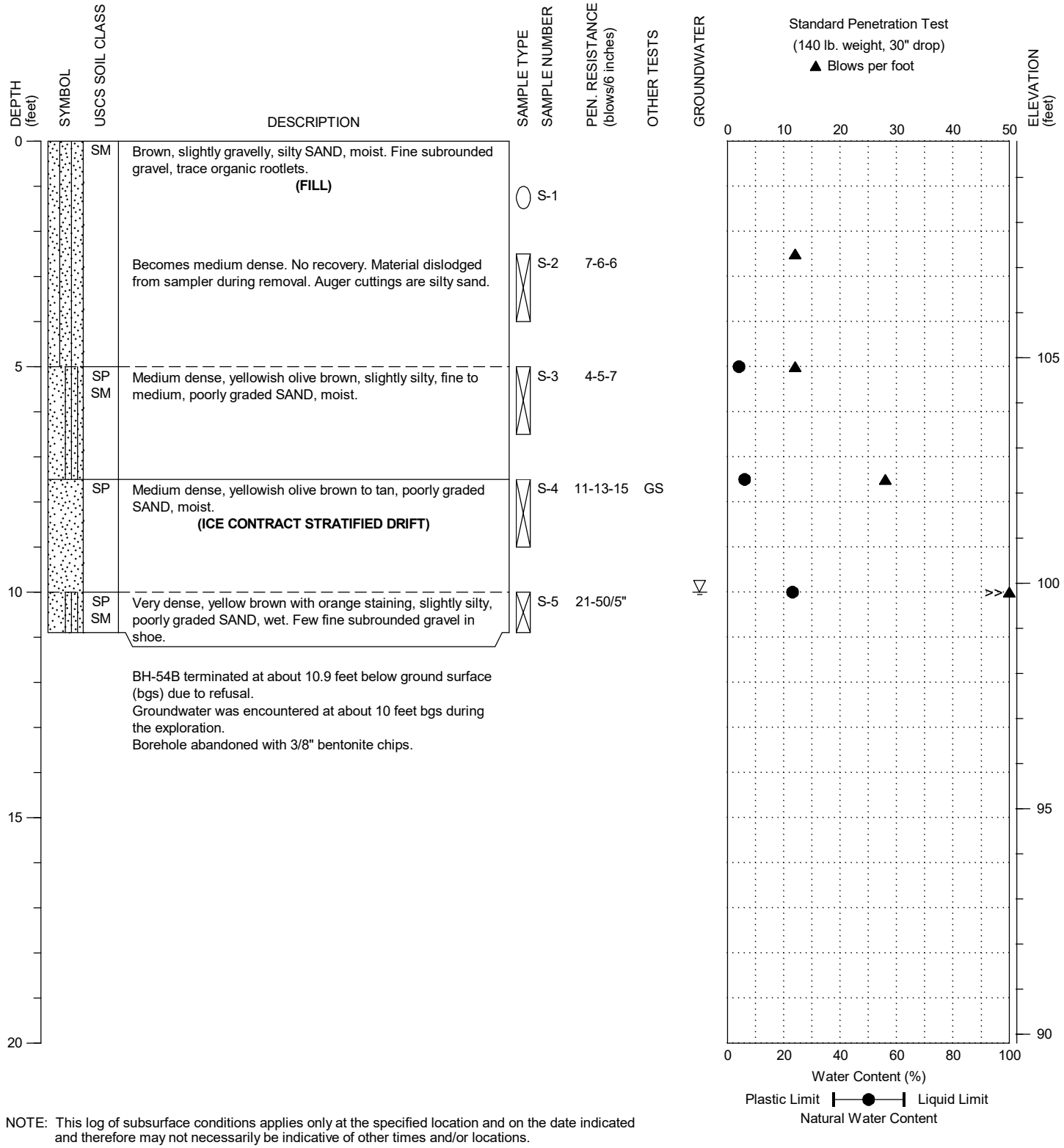
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-26

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 220+30; See Figure 2G

DATE STARTED: 11/8/2022
DATE COMPLETED: 11/8/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 109.8 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-54B

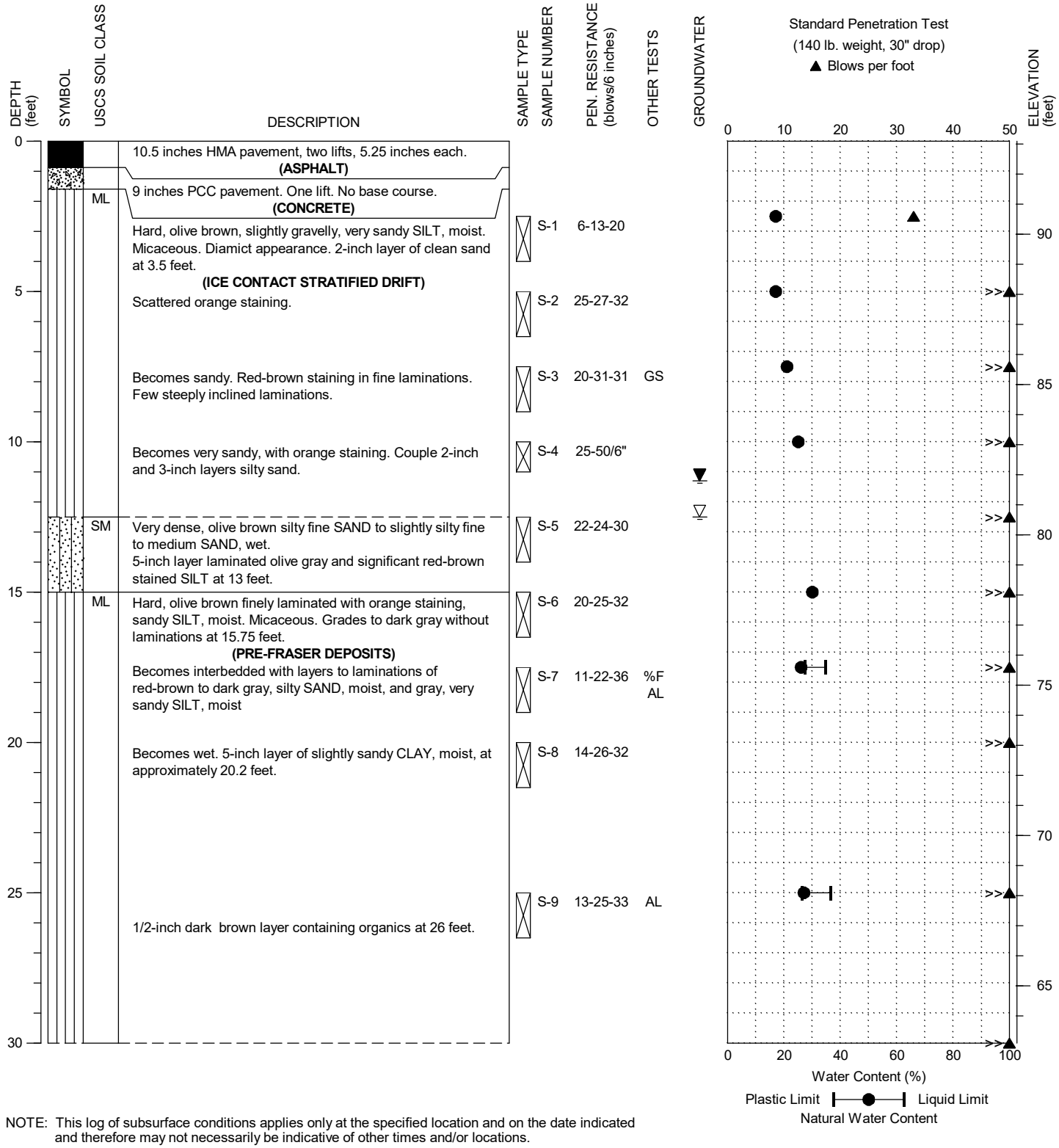
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-27

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 221+00; See Figure 2G

DATE STARTED: 10/21/2022
DATE COMPLETED: 10/21/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 93.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

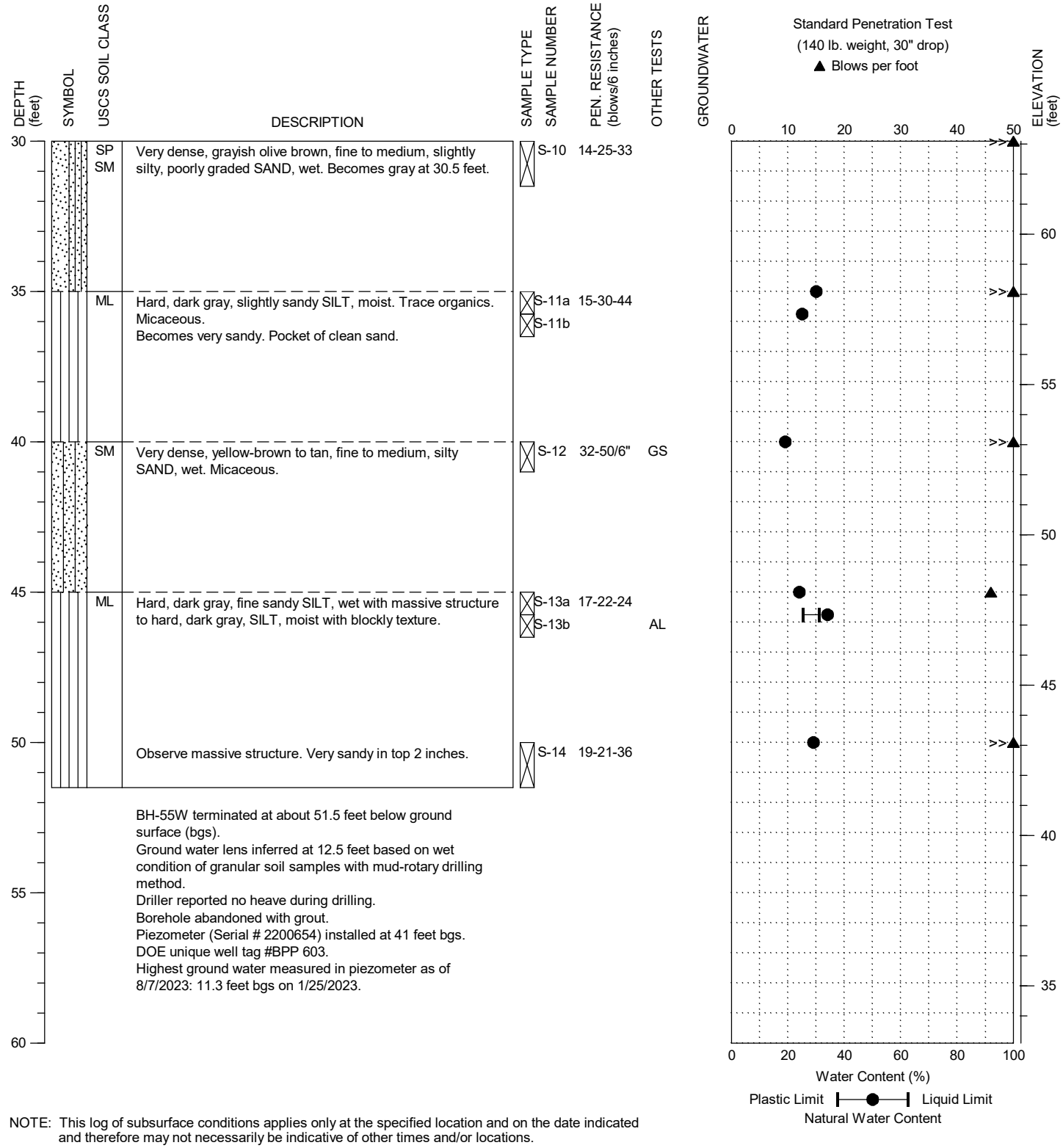
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-55W

PROJECT NO.: 2021-133-21 FIGURE: A-28

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 221+00; See Figure 2G

DATE STARTED: 10/21/2022
DATE COMPLETED: 10/21/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 93.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

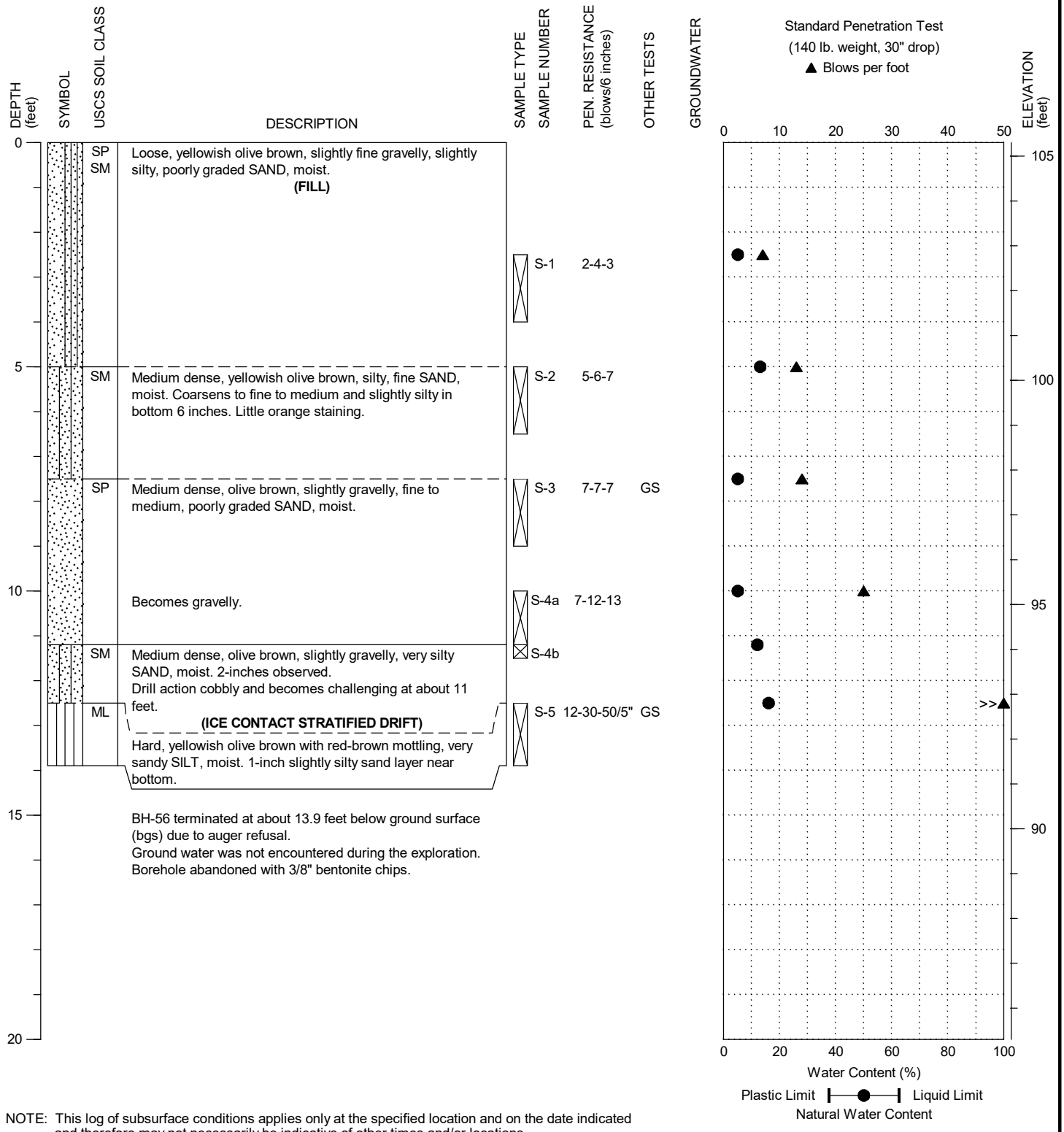
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-55W

PROJECT NO.: 2021-133-21 FIGURE: A-28

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 222+20; See Figure 2G

DATE STARTED: 5/30/2023
DATE COMPLETED: 5/30/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 105.3 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-56

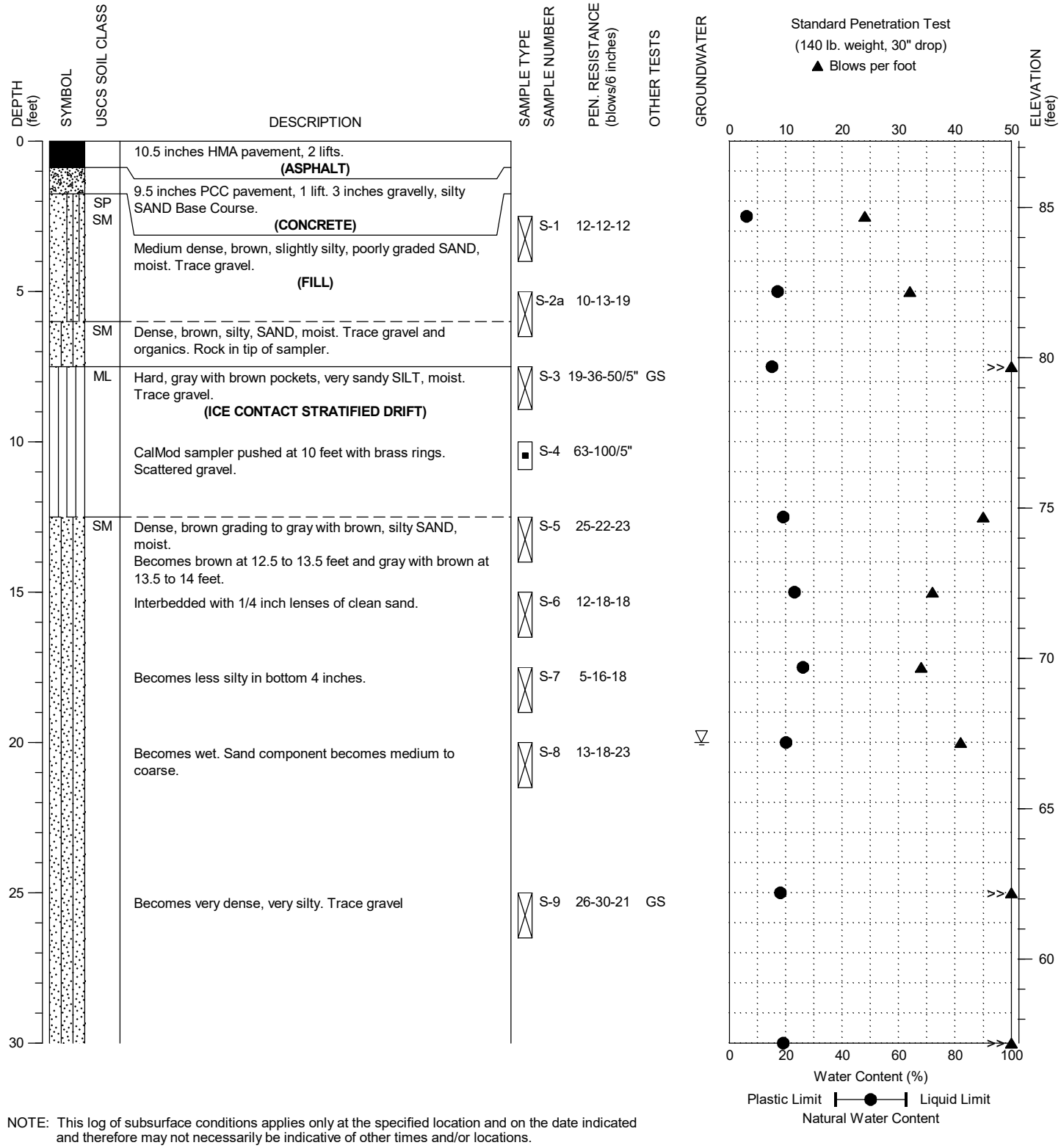
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-29

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT and NSPT w/Autohammer
LOCATION: Approximate station 223+00; See Figure 2G

DATE STARTED: 7/11/2022
DATE COMPLETED: 7/11/2022
LOGGED BY: S. Schlitt
SURFACE ELEVATION: 87.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

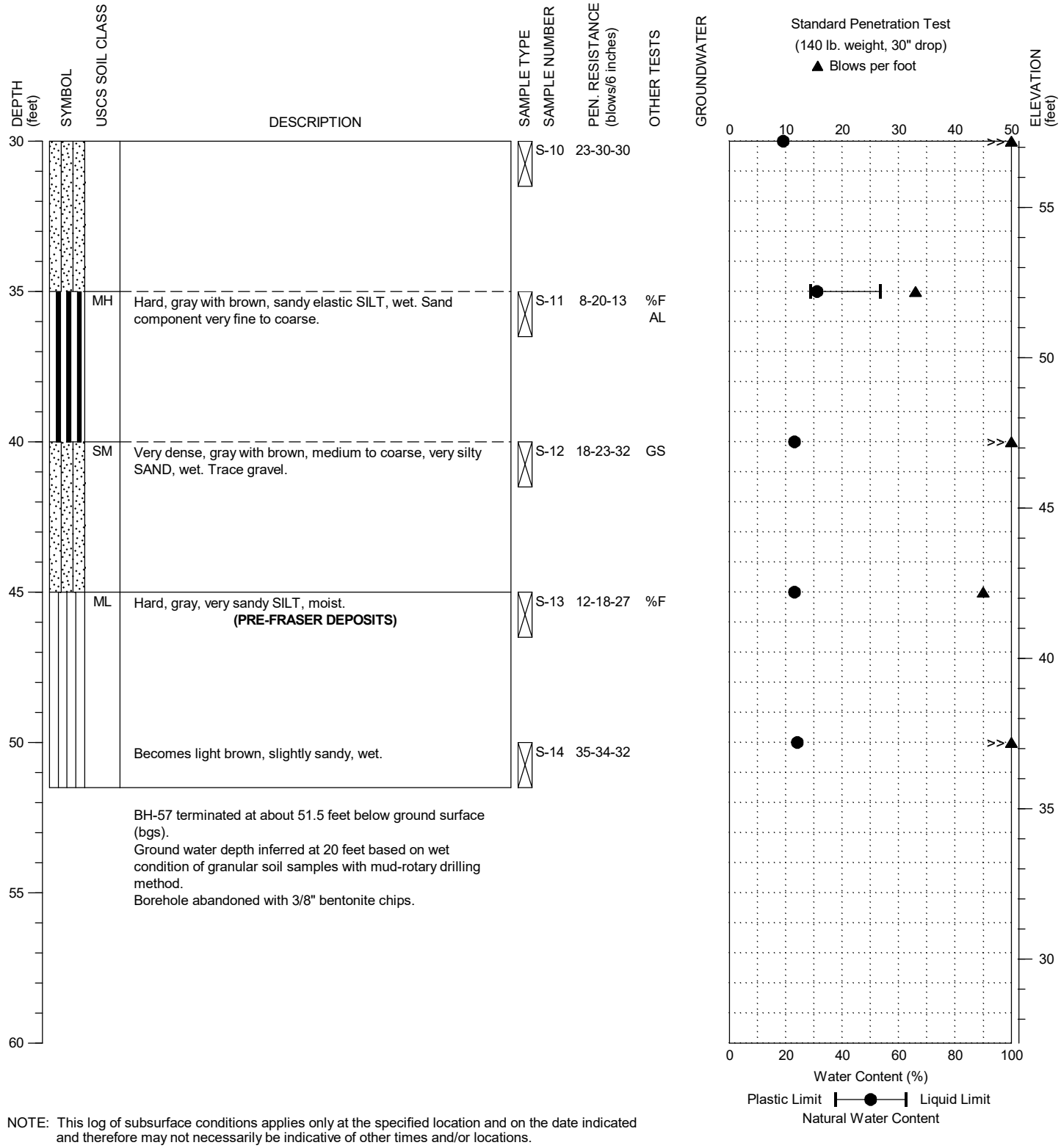
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-57

PROJECT NO.: 2021-133-21 FIGURE: A-30

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-70 Tracked Rig
SAMPLING METHOD: SPT and NSPT w/Autohammer
LOCATION: Approximate station 223+00; See Figure 2G

DATE STARTED: 7/11/2022
DATE COMPLETED: 7/11/2022
LOGGED BY: S. Schlitt
SURFACE ELEVATION: 87.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

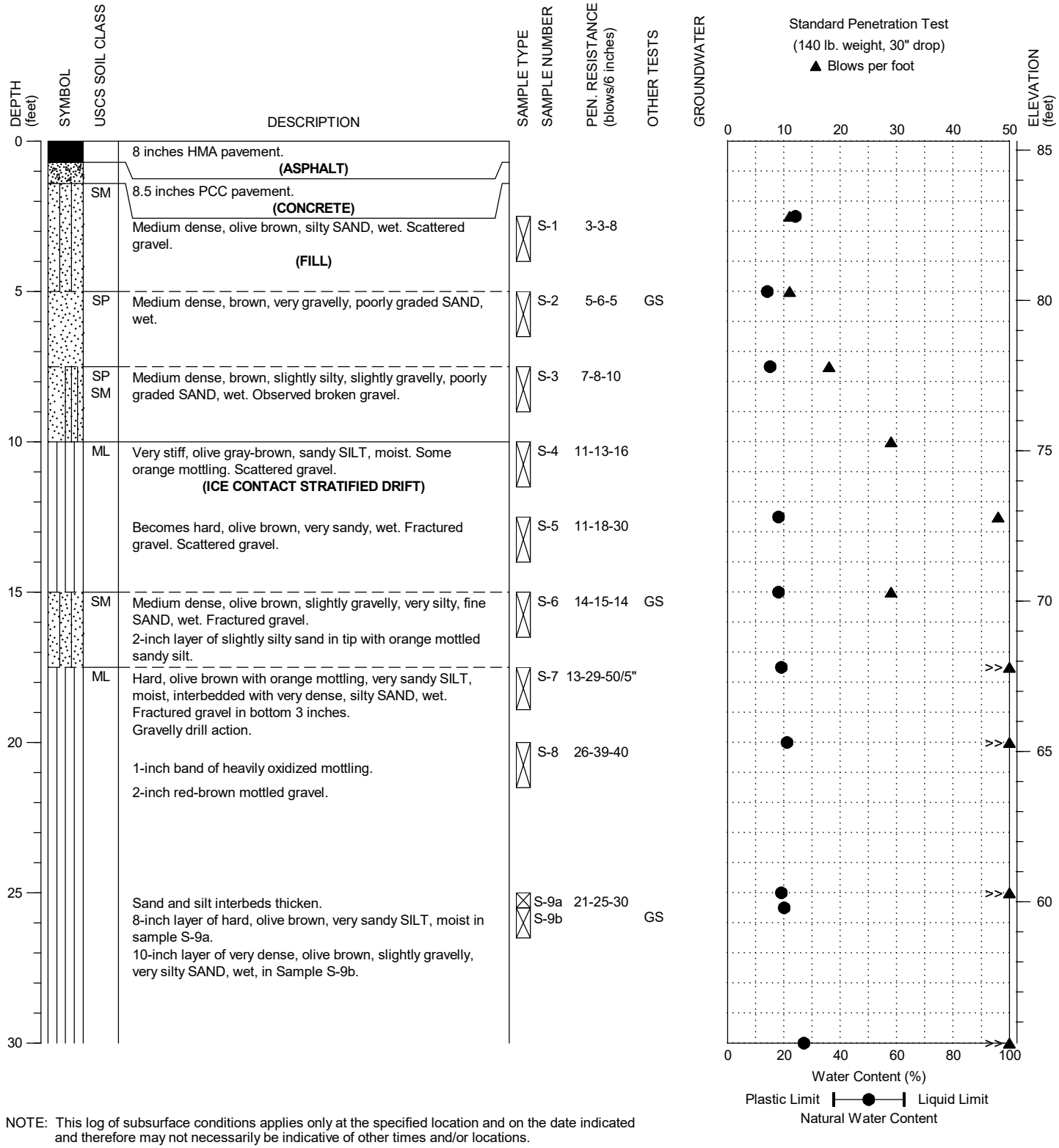
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-57

PROJECT NO.: 2021-133-21 FIGURE: A-30

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 223+65; See Figure 2G

DATE STARTED: 11/30/2022
DATE COMPLETED: 11/30/2022
LOGGED BY: C. Wilson
SURFACE ELEVATION: 85.3 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-58

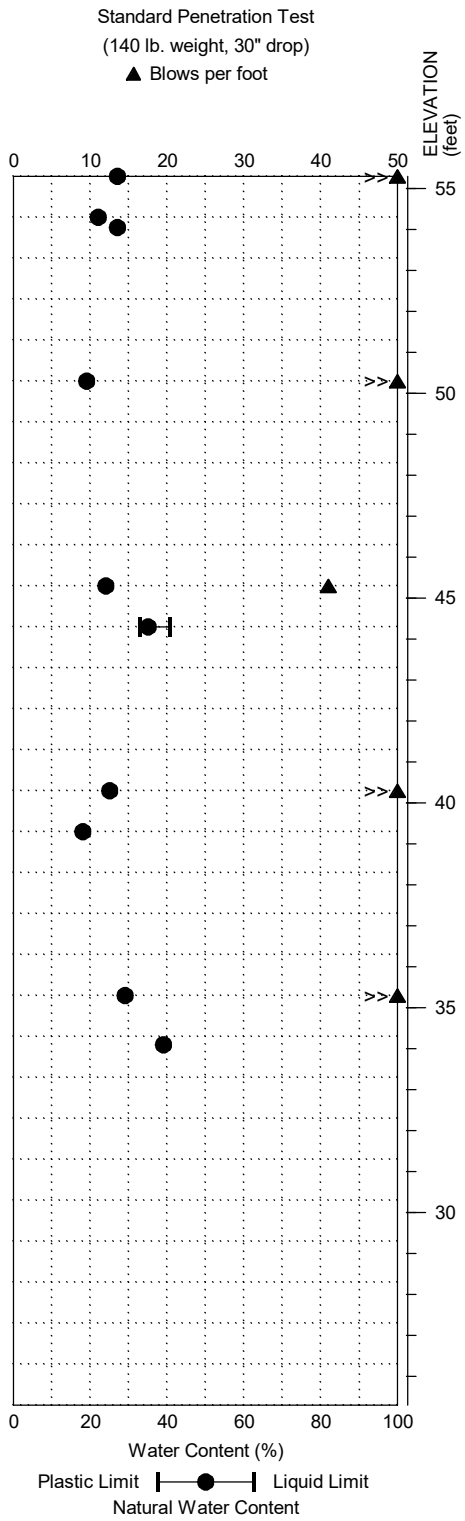
PROJECT NO.: 2021-133-21 FIGURE: A-31

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 223+65; See Figure 2G

DATE STARTED: 11/30/2022
DATE COMPLETED: 11/30/2022
LOGGED BY: C. Wilson
SURFACE ELEVATION: 85.3 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Return to more finely interbedded with orange mottling. Heavily red-brown stained band silt in bottom 4.5 inches.		S-10a	25-34-39	%F
					S-10b		
					S-10c		
35		SM	Very dense, olive brown, silty SAND, wet with 4-inch layer of very silty sand.		S-11	31-39-46	
40		ML	Hard, olive brown, sandy SILT, wet.		S-12a	25-19-22	
		ML	Hard, gray with little orange mottling, sandy SILT, moist. Layers of clean silt observed. **(PRE-FRASER DEPOSITS)**		S-12b		%F AL
45			Becomes, olive brown to olive gray.		S-13a	13-32-37	%F
		SM	Dense, olive gray, slightly gravelly, silty SAND, wet. 2-inch orange band at top. Interbedded with sandy silt in tip.		S-13b		GS
50		ML	Hard, gray to dark gray, slightly sandy SILT, moist. Increased sand content in bottom 4 inches.		S-14a	16-26-34	
					S-14b		
55			BH-58 terminated at about 51.5 feet below ground surface (bgs). Groundwater conditions were not observed due to the use of mud rotary drilling, however, ground water likely present based on wet conditions of granular soils. Borehole abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

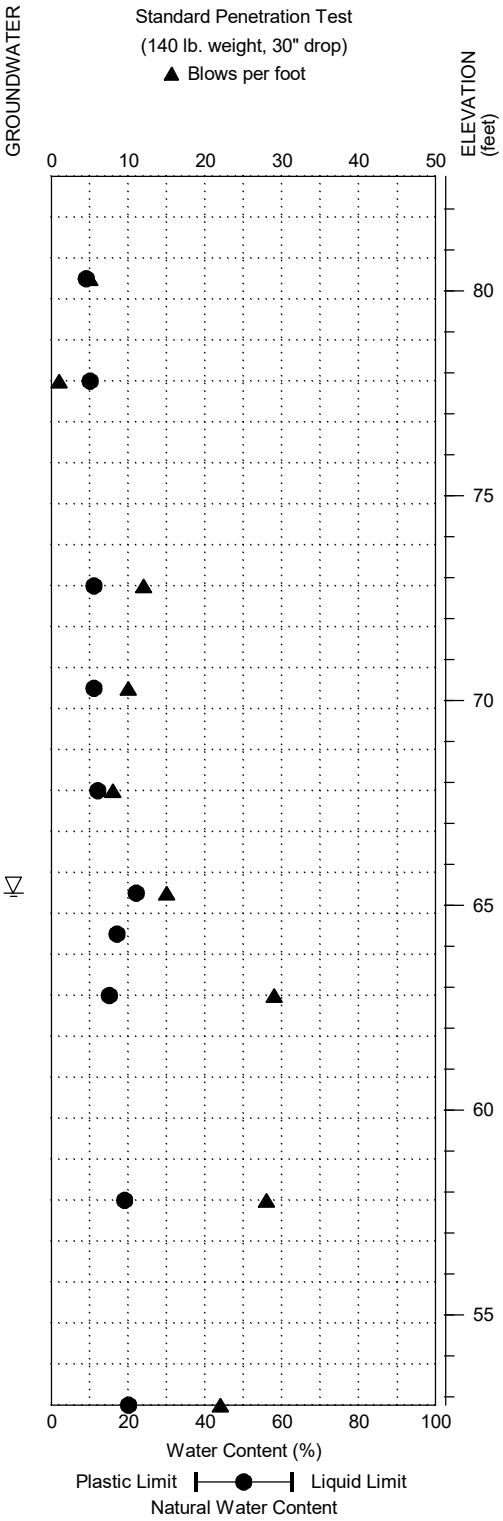
BORING: BH-58

PROJECT NO.: 2021-133-21 FIGURE: A-31

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 224+55; See Figure 2G

DATE STARTED: 12/5/2022
DATE COMPLETED: 12/5/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 82.8 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			7 inches HMA pavement, 3 lifts.					
		SP	**(ASPHALT)**					
		SM	Loose, yellow-brown, slightly silty, gravelly, fine to medium, poorly graded SAND, moist. **(FILL)**		S-1	3-3-2		
5			Becomes very loose, trace charcoal.		S-2	1-0-1	GS	
			Driller observes soft drilling similar to above.					
10		SM	Medium dense, orangish brown, gravelly, silty SAND, moist.		S-3	2-5-7		
		SM	Medium dense, olive brown, silty SAND, moist. Trace fine gravel. 1/2-inch oxidized band at 13.5 feet. **(RECESSIONAL OUTWASH)**		S-4	3-4-6		
15			Becomes loose, yellow-brown.		S-5	4-5-3	GS	
		SP SM	Medium dense, slightly silty, fine to medium, poorly graded SAND, wet. Trace fine gravel.		S-6a	4-6-9		▽
		ML	Stiff, yellowish olive brown, very sandy SILT, moist with layers of sand.		S-6b			
20		SP SM	**(ICE CONTACT STRATIFIED DRIFT)** Medium dense, yellowish olive brown, slightly silty, gravelly, poorly graded SAND, moist to wet, intermixed with gravelly, sandy SILT, moist.		S-7	6-14-15		
25			Becomes wet. No silt layers observed. Silty sand layers observed in Sample S-8.		S-8	4-10-18	GS	
30			Driller notes 3 to 4 inches of heave.					



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-60

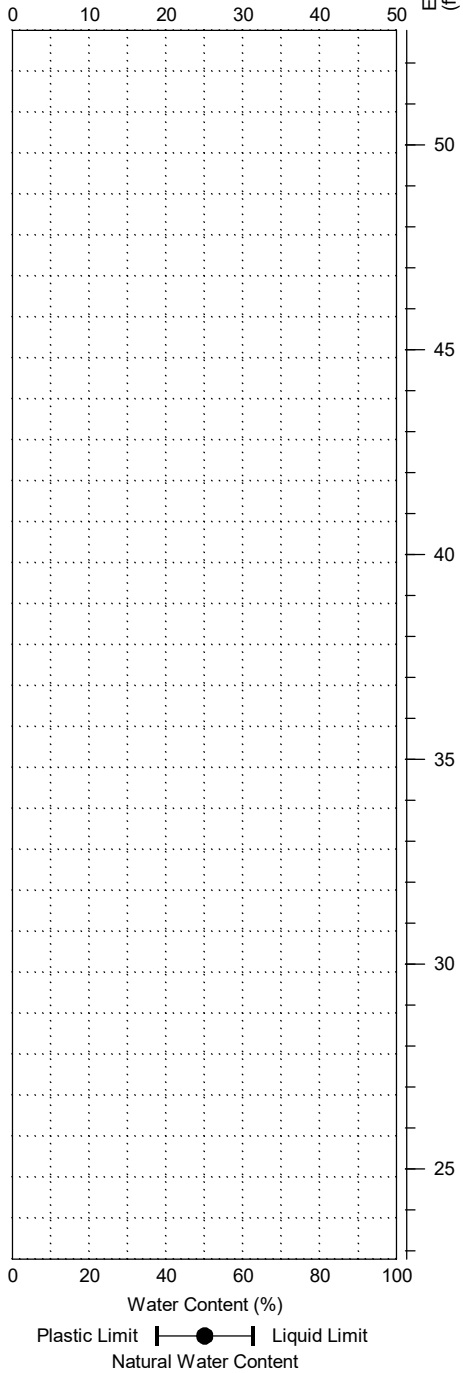
PROJECT NO.: 2021-133-21 FIGURE: A-32

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 224+55; See Figure 2G

DATE STARTED: 12/5/2022
DATE COMPLETED: 12/5/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 82.8 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30			Becomes gravelly.		S-9	14-9-13		
			2-inch layer of silty sand at 31 feet.					
			BH-60 terminated at about 31.5 feet below ground surface (bgs). Groundwater was encountered at about 17.5 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.					
35								
40								
45								
50								
55								
60								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

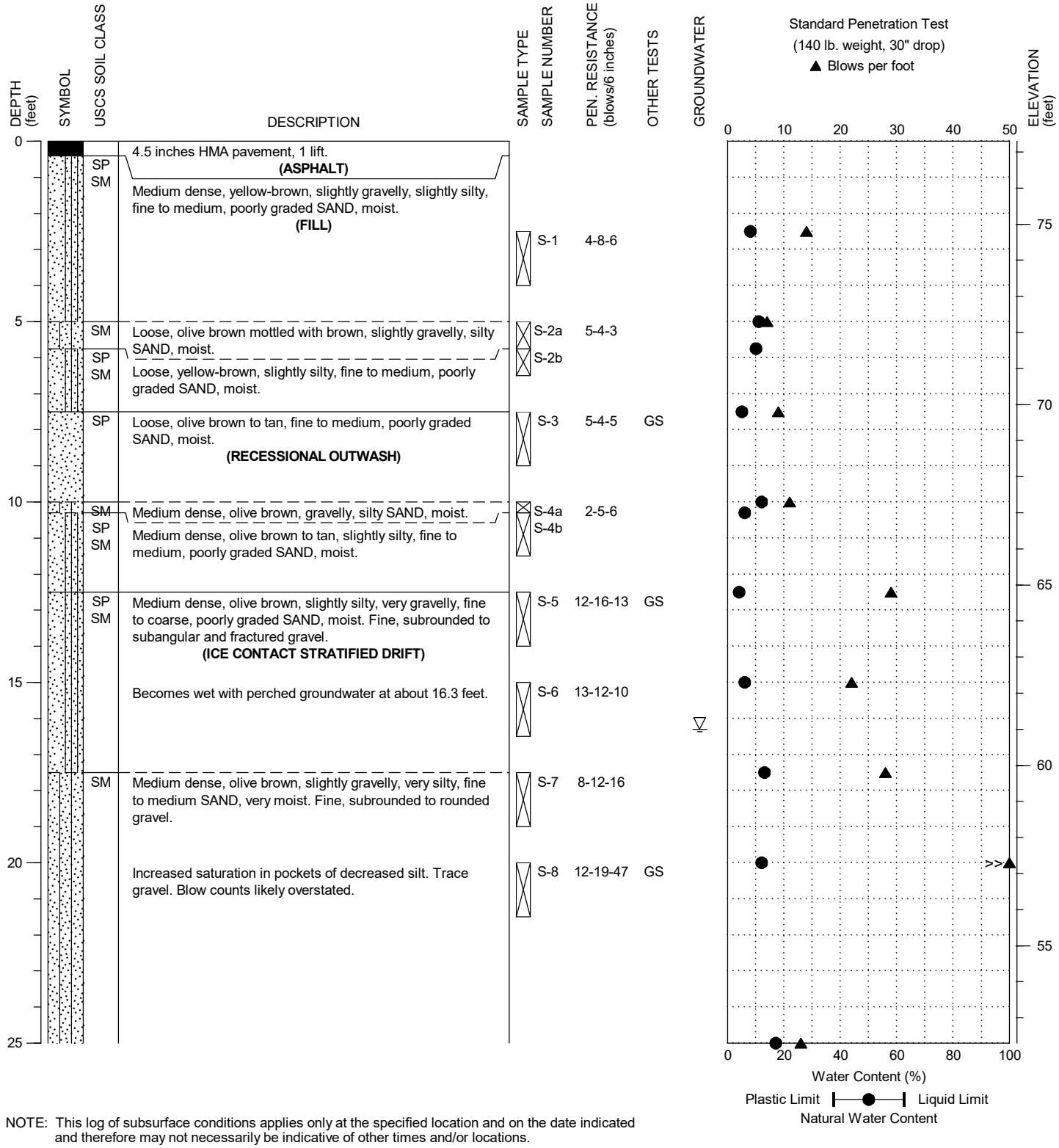
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-60

PROJECT NO.: 2021-133-21 FIGURE: A-32

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 225+15/R7 12+75; See Figure 2G

DATE STARTED: 12/12/2022
DATE COMPLETED: 12/12/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 77.3 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

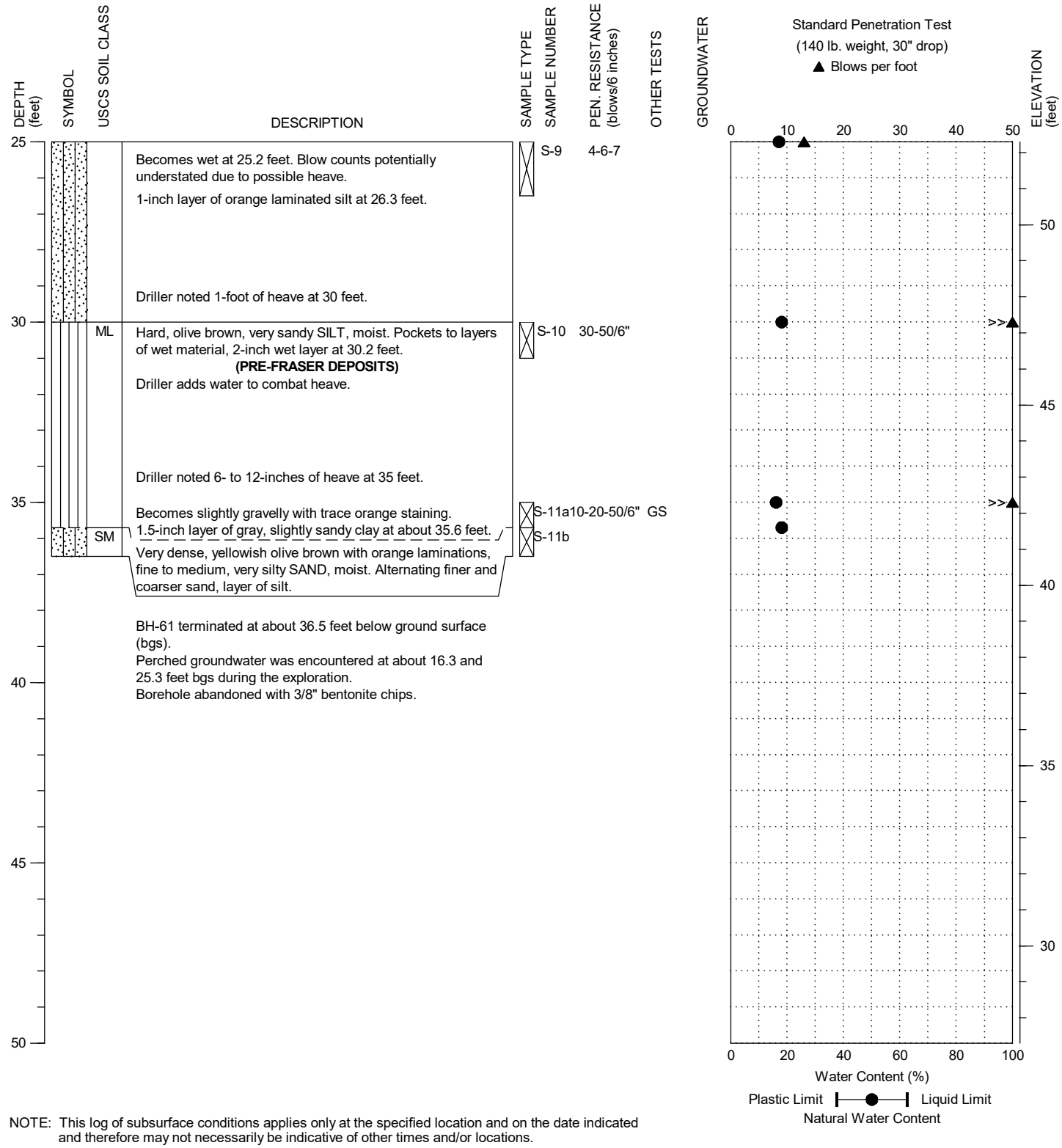
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-61

PROJECT NO.: 2021-133-21 FIGURE: A-33

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 225+15/R7 12+75; See Figure 2G

DATE STARTED: 12/12/2022
DATE COMPLETED: 12/12/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 77.3 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

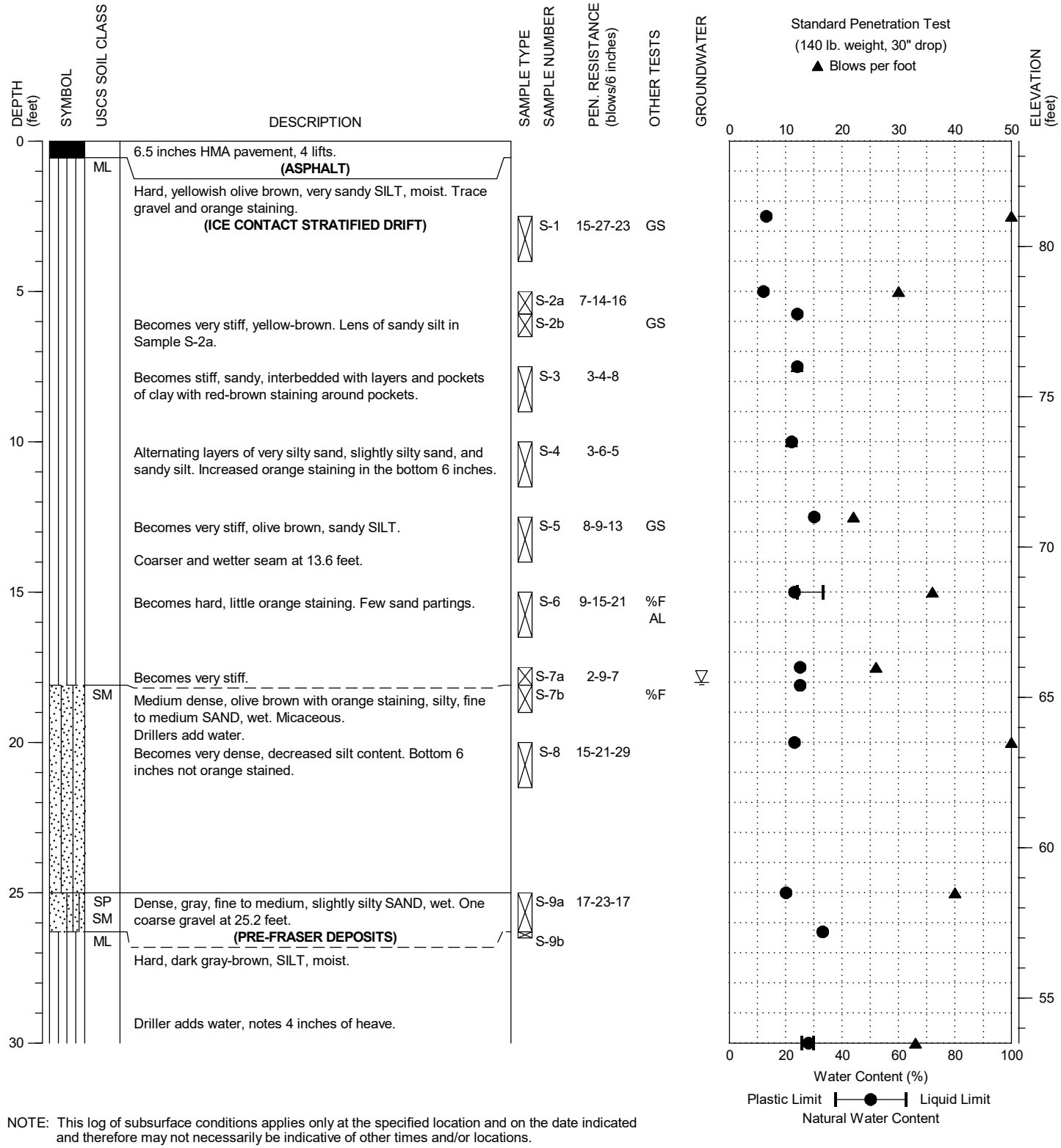
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-61

PROJECT NO.: 2021-133-21 FIGURE: A-33

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 225+15/ R7 11+20; See Figure 2G

DATE STARTED: 12/6/2022
DATE COMPLETED: 12/6/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 83.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-62

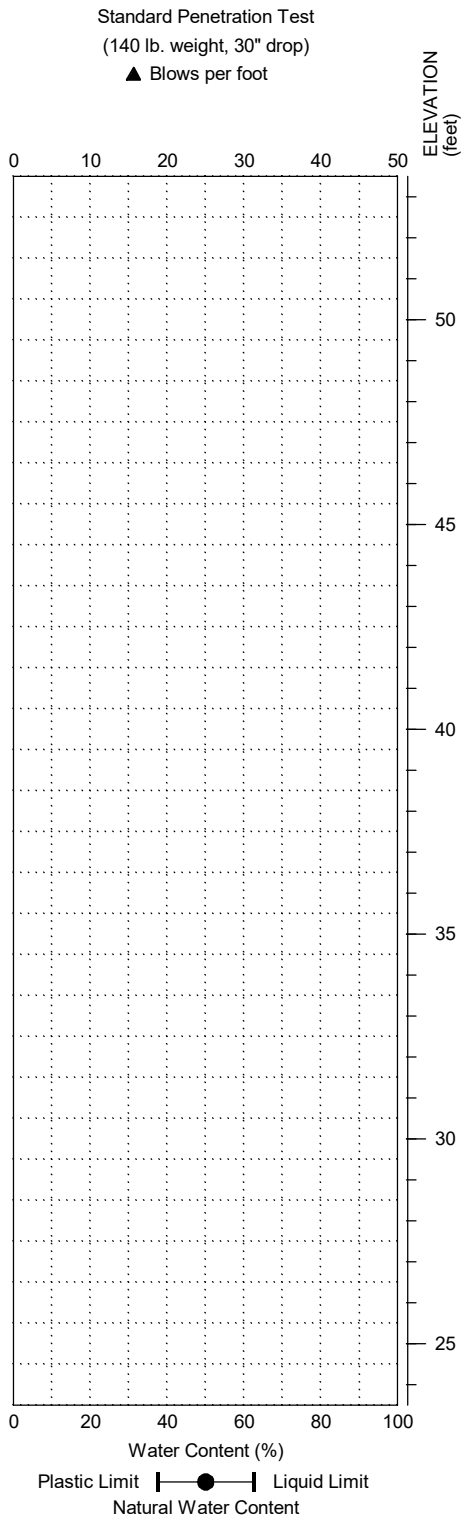
PROJECT NO.: 2021-133-21 FIGURE: A-34

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 225+15/ R7 11+20; See Figure 2G

DATE STARTED: 12/6/2022
DATE COMPLETED: 12/6/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 83.5 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30			Becomes sandy. Moist with wet pockets in top 1 foot.		S-10	7-11-22	%F AL	

BH-62 terminated at about 31.5 feet below ground surface (bgs).
Groundwater was encountered at about 18 feet bgs during the exploration.
Borehole abandoned with 3/8" bentonite chips.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

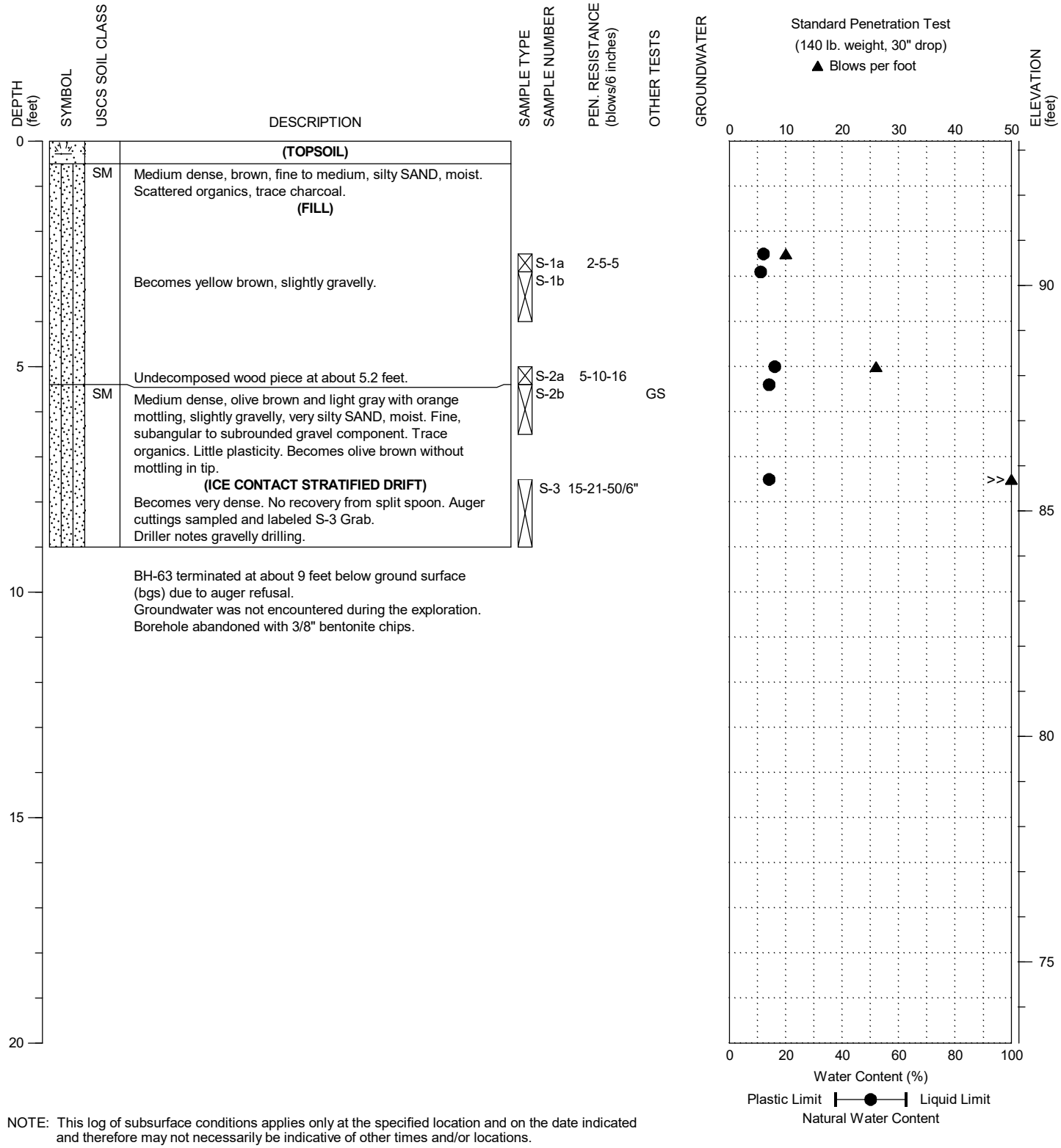
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-62

PROJECT NO.: 2021-133-21 FIGURE: A-34

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 225+70/R7 10+90; See Figure 2G

DATE STARTED: 2/21/2023
DATE COMPLETED: 2/21/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 93.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-63

PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-35

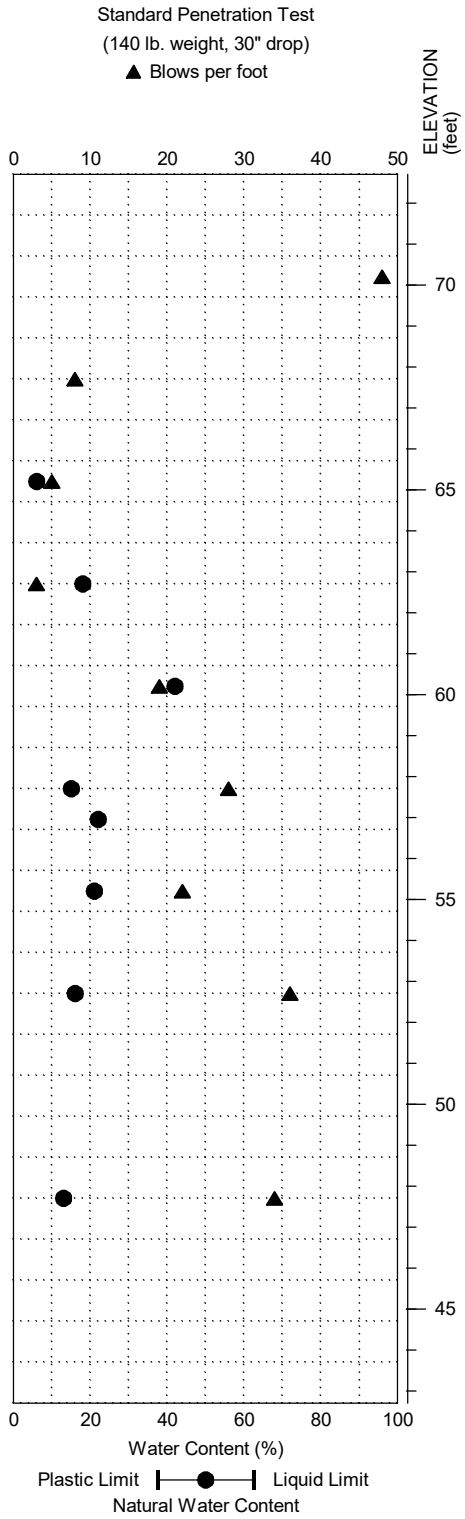
BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 228+45; See Figure 2H

DATE STARTED: 11/7/2022
DATE COMPLETED: 11/7/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 72.7 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Thin layer mulch over brown, very gravelly, silty SAND, with fragments of ASPHALT, moist. **(FILL)**				
			Becomes dense. Blow counts likely overstated due to gravel and asphalt.		S-1	7-40-8	
5			Becomes loose, tan to brown layers, slightly gravelly, moist.		S-2	2-3-5	
		SP SM	Loose, tan to yellow brown with orange staining, slightly silty SAND, moist. Trace fine, subrounded gravel. Trace rootlets and end of orange staining at 8.5 feet. **(WETLAND DEPOSIT)**		S-3	3-3-2	
10			Becomes very loose, gravelly, wet.		S-4	2-1-2	
		SM	Medium dense, dark brown to dark gray-brown, slightly gravelly, silty SAND with organics, wet. 6.6% organic content.		S-5	9-6-13	GS OC
15		SM	Medium dense, brownish gray to gray, silty SAND, wet.		S-6a	11-14-14	
		SP SM	**RECESSIONAL OUTWASH)** Medium dense, gray, slightly silty, poorly graded SAND, wet. Driller begins adding mud. Becomes red-brown, silty layers observed.		S-6b S-7	9-10-12	
20		SP	Dense, olive brown, poorly graded SAND, wet. Becomes gravelly at 21 feet.		S-8	13-15-21	GS
25		SP SM	Dense, olive brown, slightly silty, gravelly, poorly graded SAND, wet. Increased silt content at about 26 feet.		S-9	27-18-16	
30			BH-64A terminated at about 26.5 feet below ground surface (bgs) due to combating heave. Groundwater was encountered at about 10 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.				

GROUNDWATER ▽



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

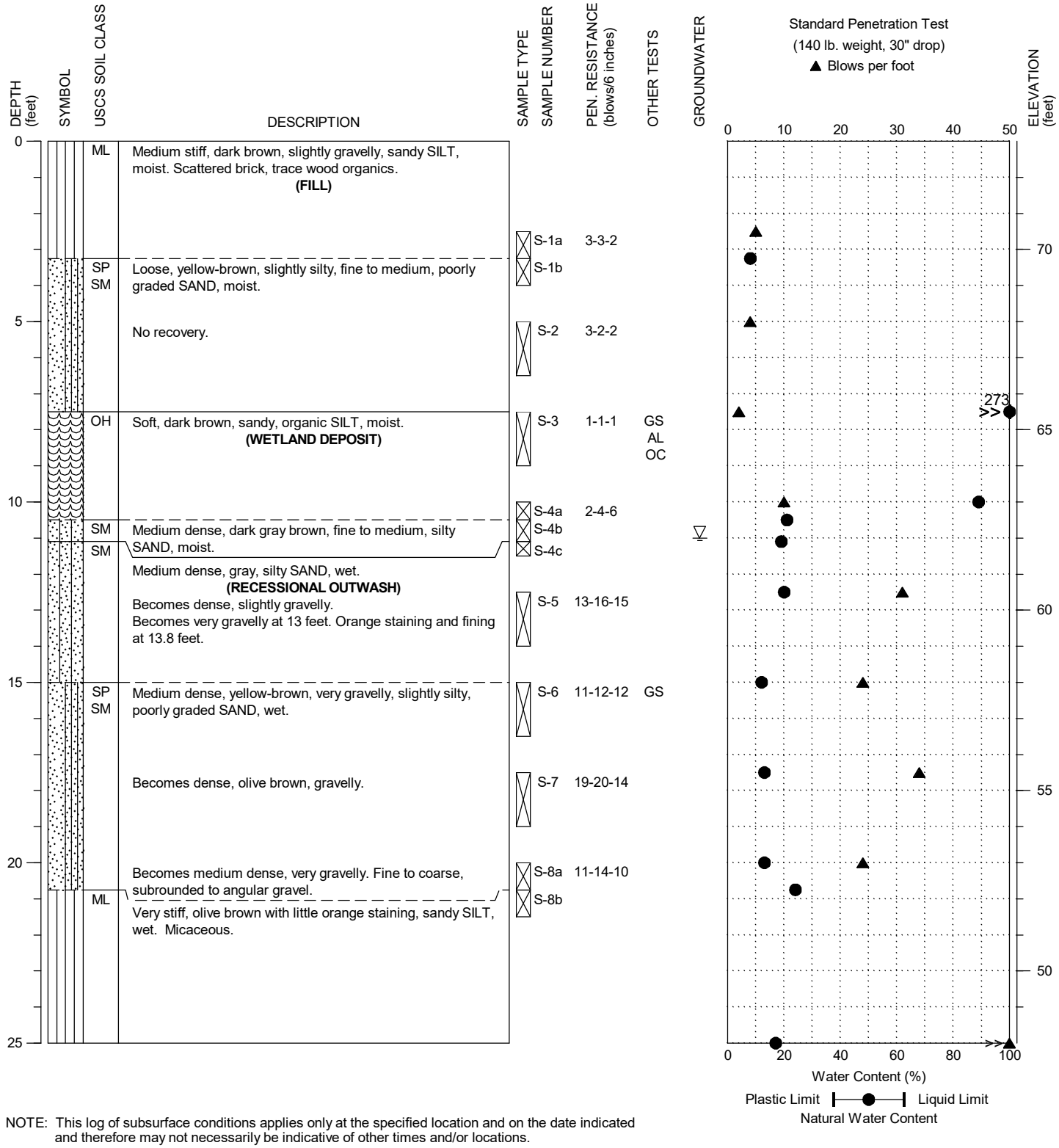
BORING:
BH-64A

PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-36

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 228+45; See Figure 2H

DATE STARTED: 11/7/2022
DATE COMPLETED: 11/7/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 73.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-64B

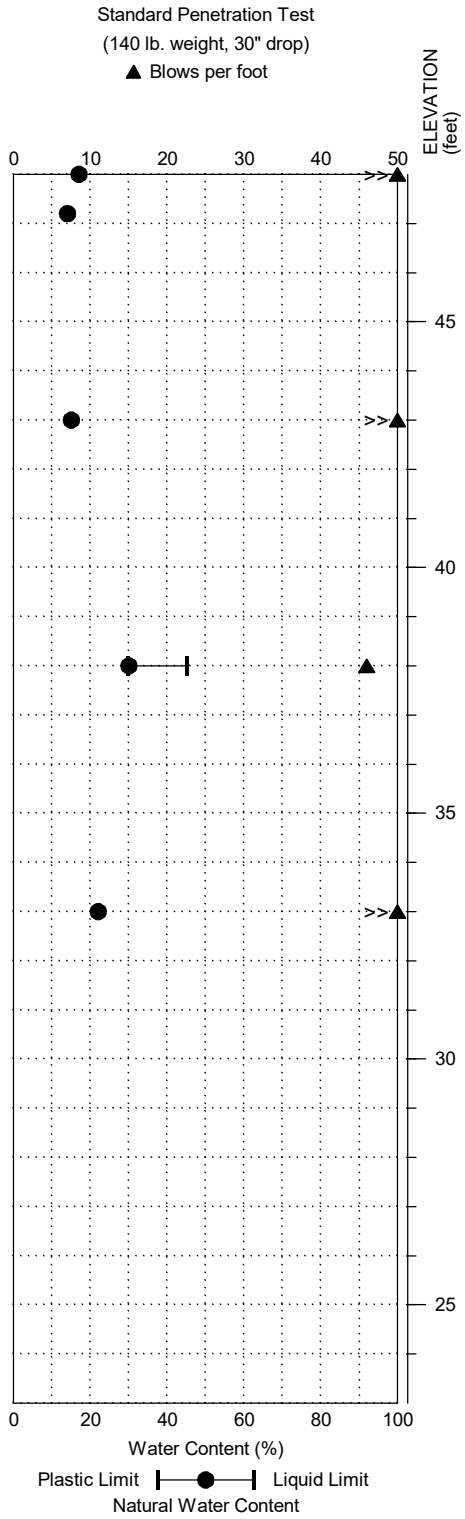
PROJECT NO.: 2021-133-21 FIGURE: A-37

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 228+45; See Figure 2H

DATE STARTED: 11/7/2022
DATE COMPLETED: 11/7/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 73.0 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
25		SP SM	Very dense, olive brown, fine to medium, slightly silty, poorly graded SAND, wet.		S-9a	25-37-44	
		SM	**(ADVANCED OUTWASH)**		S-9b		
			Very dense, olive brown, silty, fine to medium SAND, wet. Trace fine gravel.				
30			Becomes slightly gravelly. Decreasing silt content with depth. Coarse gravel surrounded by orange mottled silt layer at 30.5 feet.		S-10	21-26-30	GS
35		ML	Hard, dark gray with gray-brown staining, slightly sandy SILT, moist. Massive structure. Scattered seams of fine to medium sand with trace fine gravel. **(PRE-FRASER DEPOSITS)**		S-11	11-19-27	%F AL
40		SP SM	Very dense, dark gray, slightly silty, fine to medium, poorly graded SAND, wet.		S-12	13-35-50/5"	
			BH-64B terminated at about 41.4 feet below ground surface (bgs) due to practical refusal. Groundwater was encountered at about 11 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.				
45							
50							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

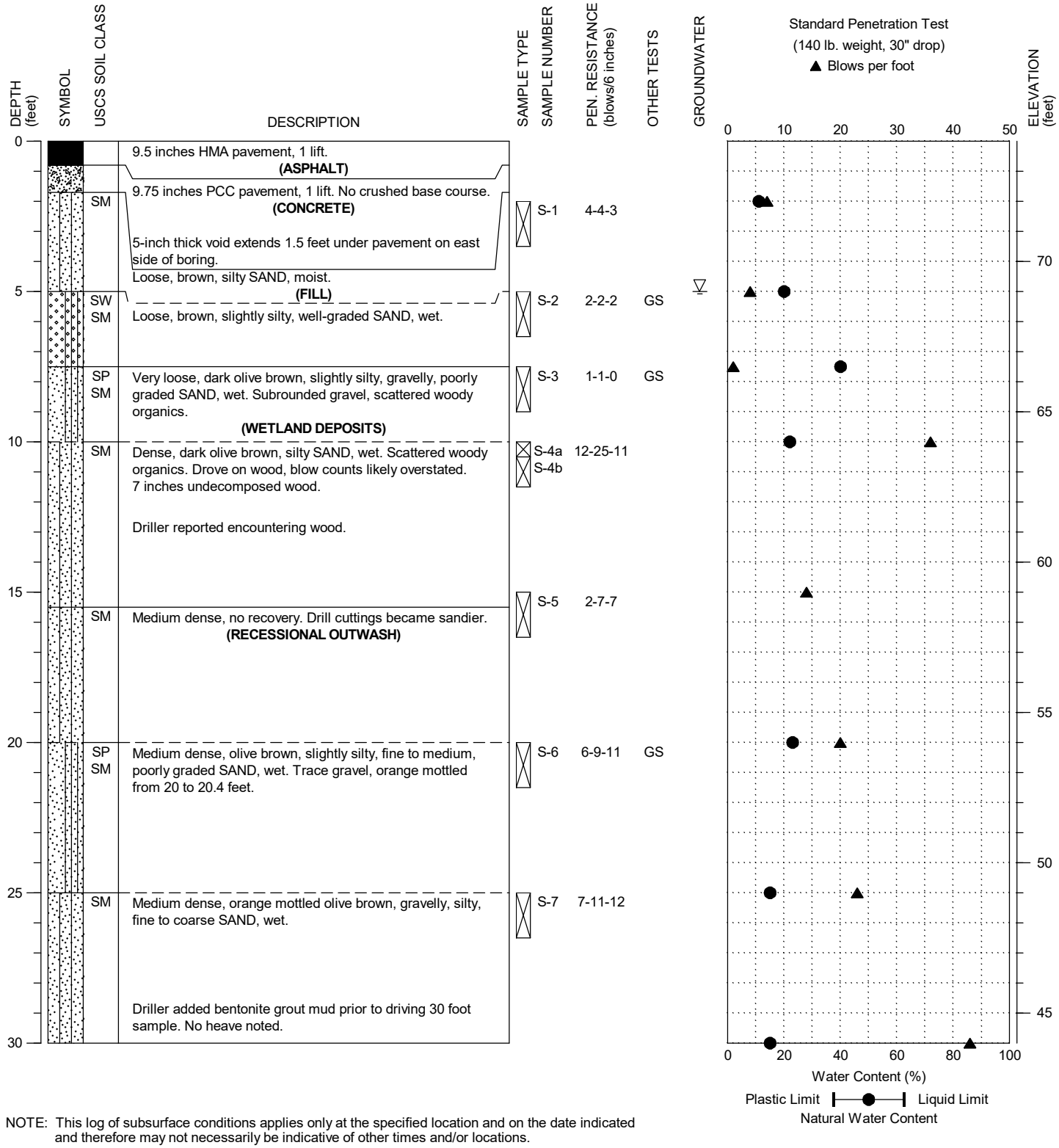
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-64B

PROJECT NO.: 2021-133-21 FIGURE: A-37

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 227+95; See Figure 2H

DATE STARTED: 6/16/2022
DATE COMPLETED: 6/16/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 74.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-65

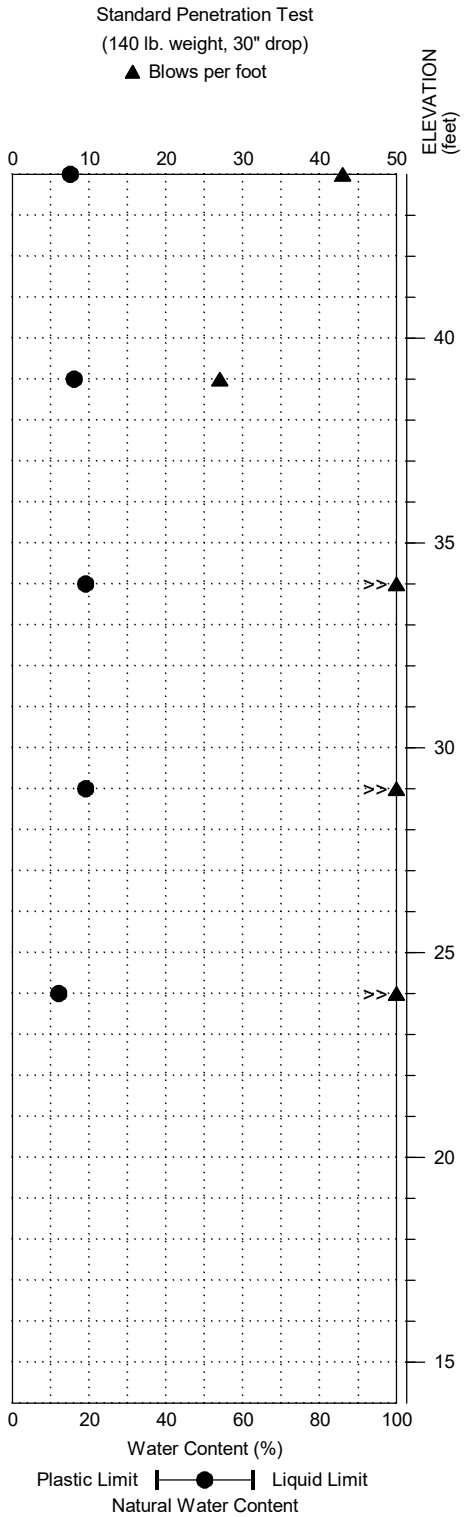
PROJECT NO.: 2021-133-21 FIGURE: A-38

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 227+95; See Figure 2H

DATE STARTED: 6/16/2022
DATE COMPLETED: 6/16/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 74.0 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30		SM	Dense, olive brown with slight orange mottling, slightly gravelly, very silty SAND, wet. **(ADVANCED OUTWASH)**	X	S-8	19-19-24	
35			Becomes medium dense, dark gray. Decreased silt content.	X	S-9	12-14-13	
40		SM	Very dense, dark gray, silty, fine to medium SAND, wet. Micaceous. **(PRE-FRASER DEPOSITS)**	X	S-10	16-21-31	
45				X	S-11	22-40-50	
50			Becomes gray. Sand component becomes fine to coarse.	X	S-12	27-44-41	
55			BH-65 terminated at about 51.5 feet below ground surface (bgs). Groundwater was encountered at about 5 feet bgs during the exploration. Driller added bentonite grout mud prior to driving each sample collected, starting at 30 feet bgs. Driller reported no heave during drilling. Borehole abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

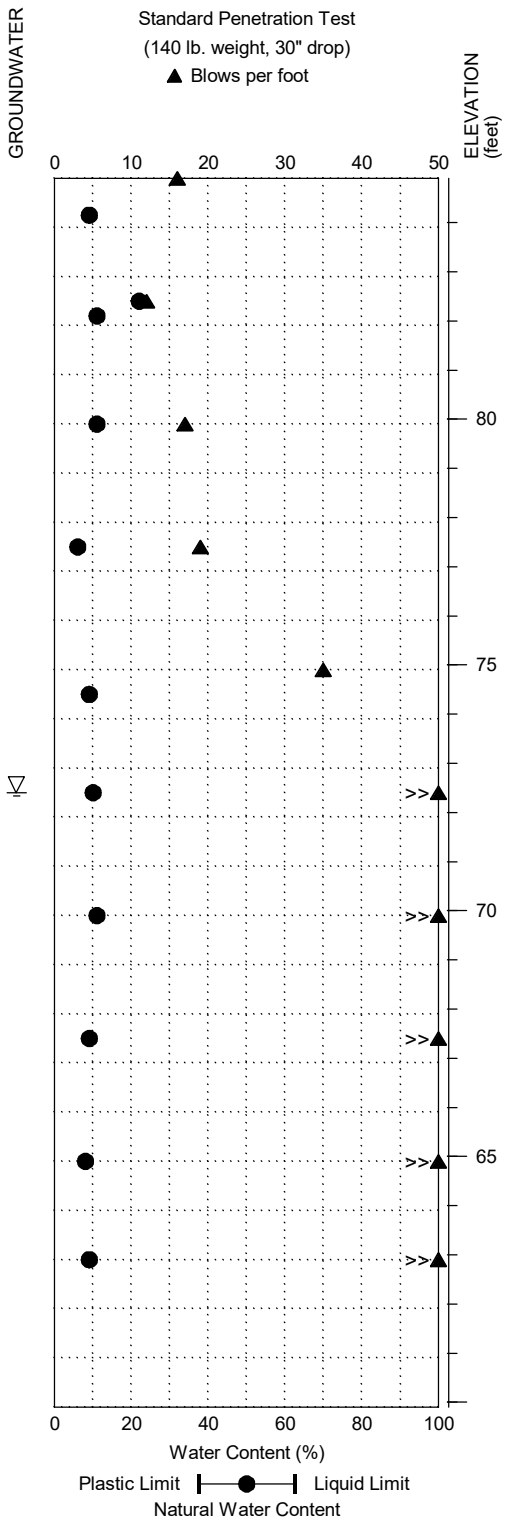
BORING:
BH-65

PROJECT NO.: 2021-133-21 FIGURE: A-38

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 231+35; See Figure 2H

DATE STARTED: 5/5/2023
DATE COMPLETED: 5/5/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 84.9 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Medium dense, yellow brown, silty, fine to medium SAND, moist. Scattered organics, rootlets, influenced by vegetation.		S-1a	2-7-9	
		SM	**(ALLUVIUM)**		S-1b		
			Becomes light yellow brown. Decreasing silt content with depth. Organics not observed. 4-inch layer stiff, light yellow-brown, slightly sandy, SILT, moist. Few 0.5-inch bands of orange staining in sand.		S-2a S-2b	7-5-7	
5			Increased silt content. Trace fine gravel. Few orange stained pockets. One silt pocket observed.		S-3	6-8-9	
		SP	Medium dense, light yellow brown, poorly graded SAND, moist.		S-4	8-9-10	GS
10			Becomes interbedded with sandy, gravelly silt.		S-5a S-5b	11-15-20	
		SM	Dense, olive brown, slightly gravelly, very silty SAND, moist. **(ICE CONTACT STRATIFIED DRIFT)** Drilling becomes gravelly at about 11 feet. Becomes very dense. Decreased silt content, increased moisture content to wet in pockets. One pocket of dark brown organics.		S-6	17-21-30	
15			Increased silt content. Few wet pockets near top of sample. Drilling becomes more difficult and gravelly with grinding on few cobbles.		S-7	27-50/6"	GS
			Low recovery. Increased silt content, moist.		S-8	50/6"	
20			Trace fine gravel.		S-9	50/3"	
			Becomes slightly gravelly.		S-10	50/5"	
25			BH-66A terminated at about 22.4 feet below ground surface (bgs) due to refusal on cobbles. Groundwater was encountered at about 12.5 feet bgs during the exploration. Driller did not report heave during drilling. Borehole abandoned with 3/8" bentonite chips.				



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-66A

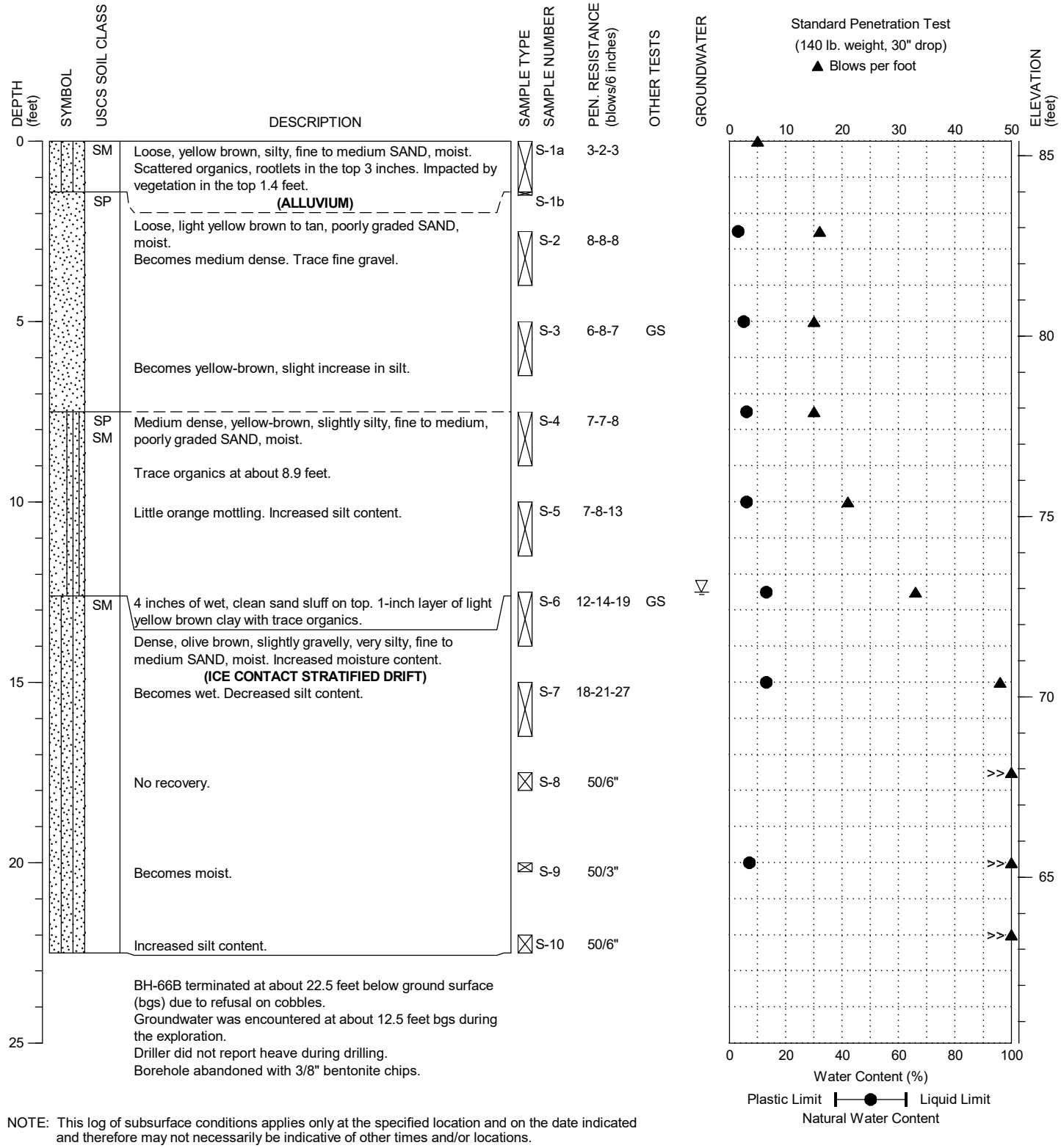
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-39

BORING-DSM 2021-133-21 CUD 6.GPJ 4/16/24

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 231+75; See Figure 2H

DATE STARTED: 5/5/2023
DATE COMPLETED: 5/5/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 85.4 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

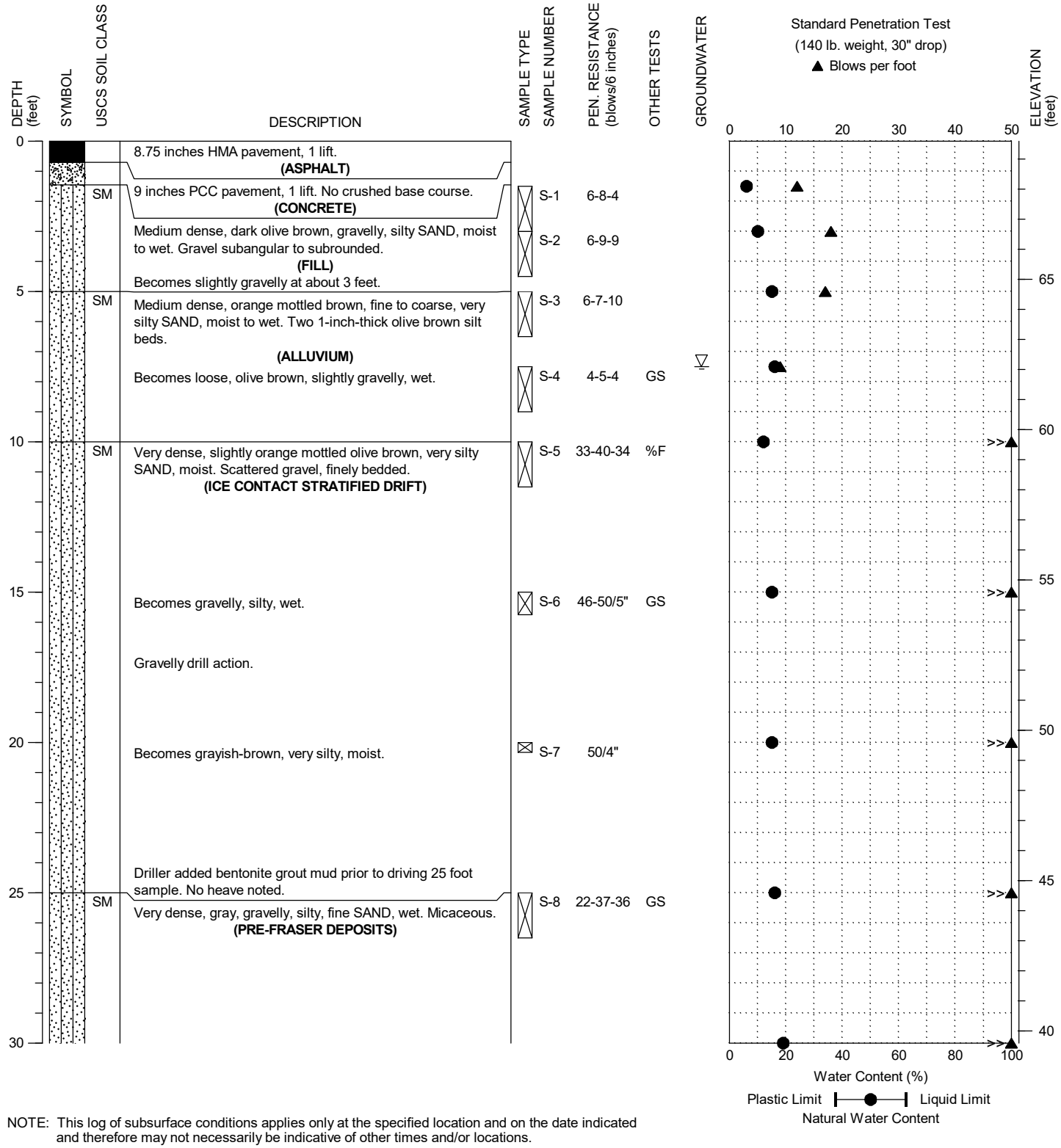
BORING: BH-66B
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-40

BORING-DSM 2021-133-21 CUD 6.GPJ 4/16/24

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 230+00; See Figure 2H

DATE STARTED: 6/15/2022
DATE COMPLETED: 6/15/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 69.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

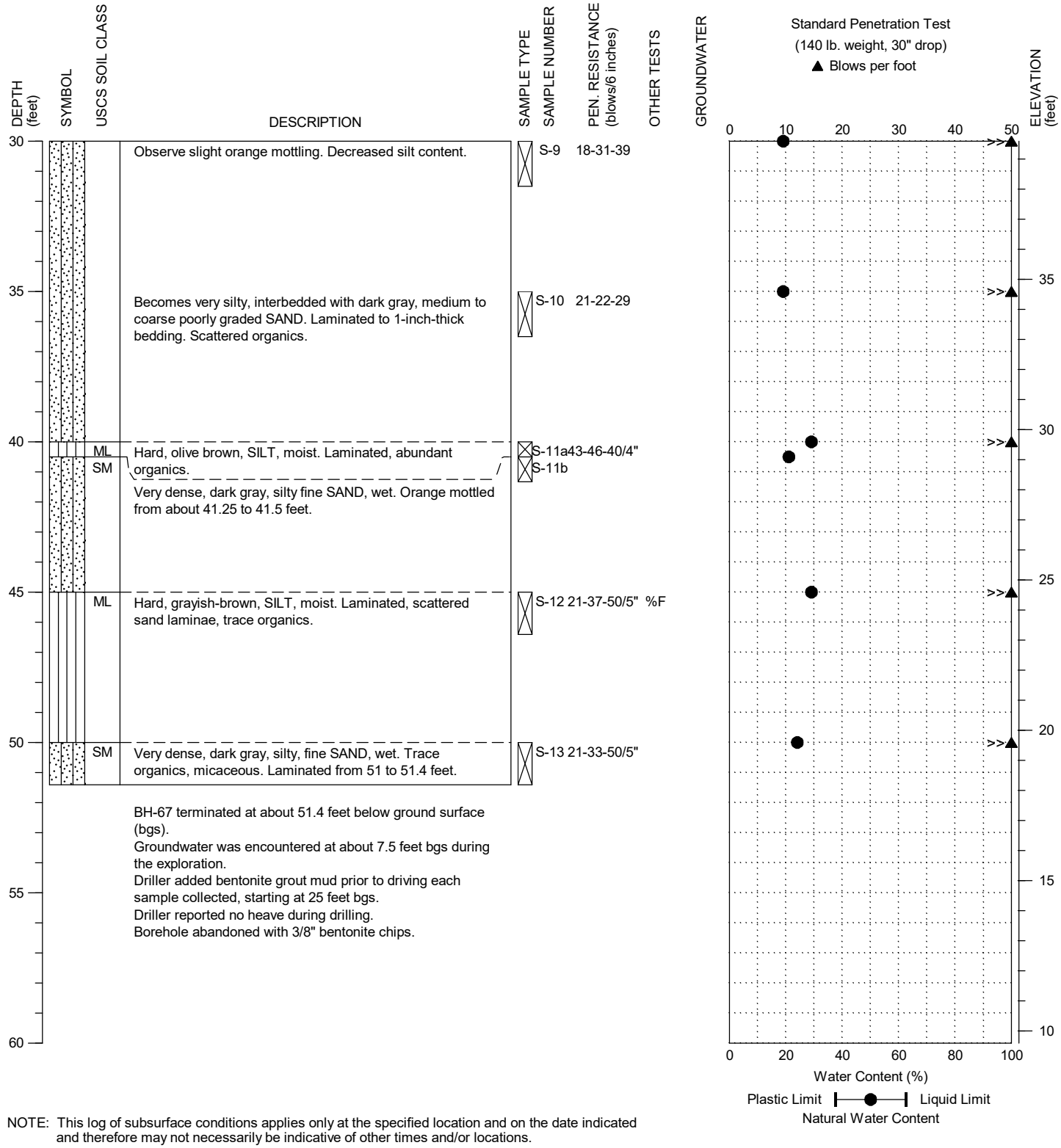
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-67

PROJECT NO.: 2021-133-21 FIGURE: A-41

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 230+00; See Figure 2H

DATE STARTED: 6/15/2022
DATE COMPLETED: 6/15/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 69.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

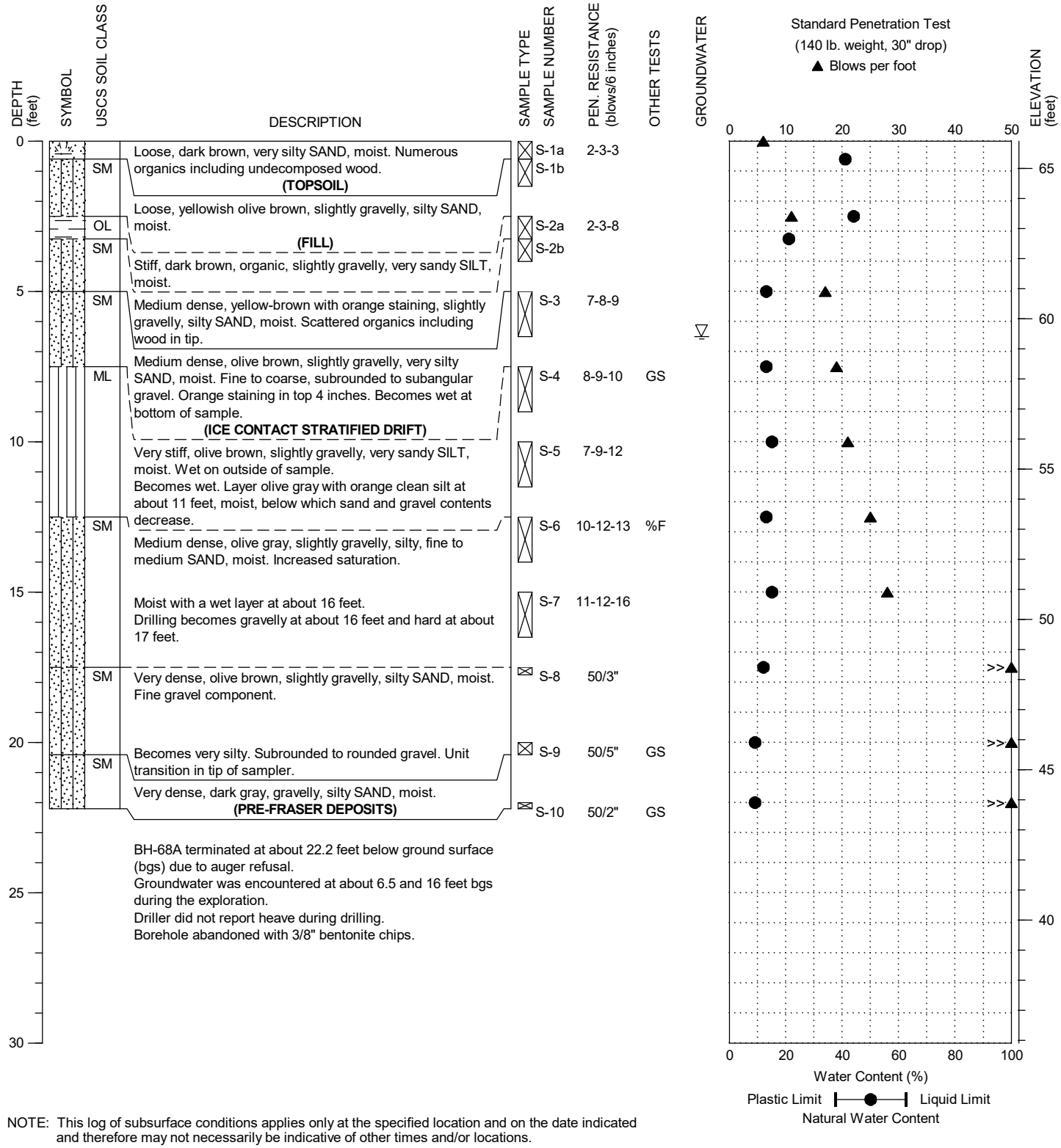
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-67

PROJECT NO.: 2021-133-21 FIGURE: A-41

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 233+80; See Figure 2H

DATE STARTED: 2/22/2023
DATE COMPLETED: 2/22/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 65.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

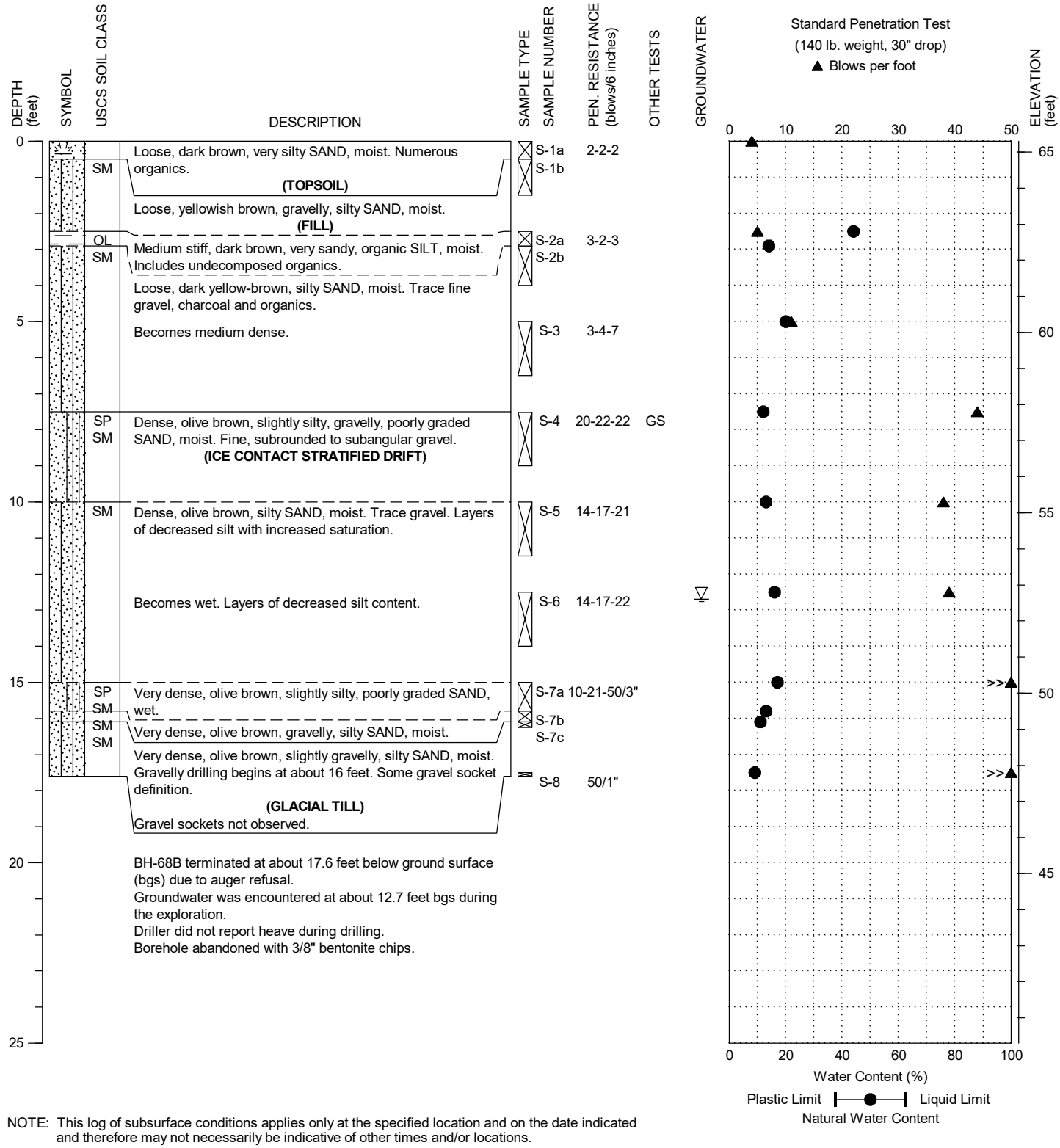
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-68A

PROJECT NO.: 2021-133-21 FIGURE: A-42

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 234+05; See Figure 2H

DATE STARTED: 2/22/2023
DATE COMPLETED: 2/22/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 65.3 ± feet



BH-68B terminated at about 17.6 feet below ground surface (bgs) due to auger refusal.
Groundwater was encountered at about 12.7 feet bgs during the exploration.
Driller did not report heave during drilling.
Borehole abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-68B

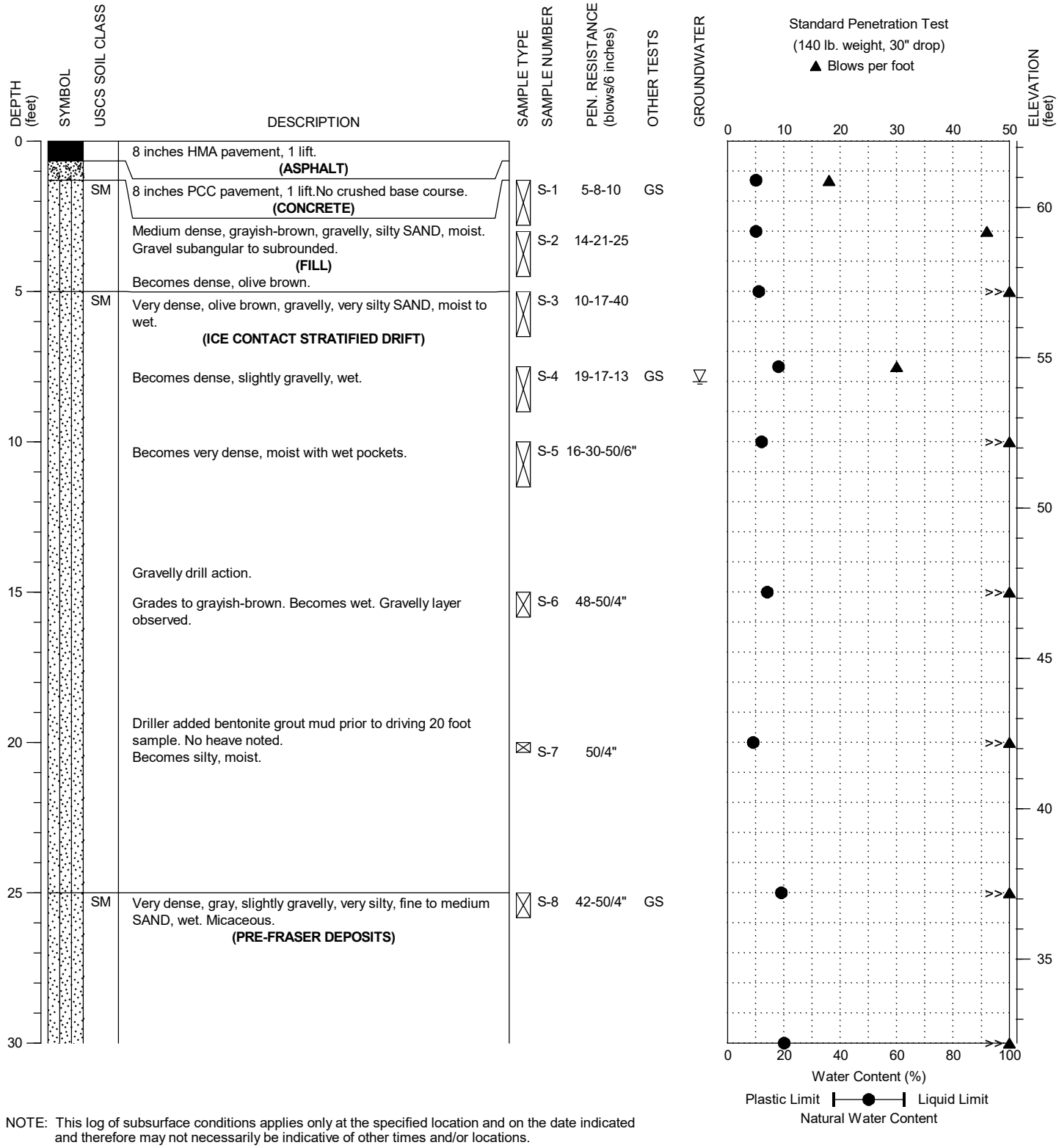
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-43

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 232+75; See Figure 2H

DATE STARTED: 6/14/2022
DATE COMPLETED: 6/14/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 62.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-69

PROJECT NO.: 2021-133-21 FIGURE: A-44

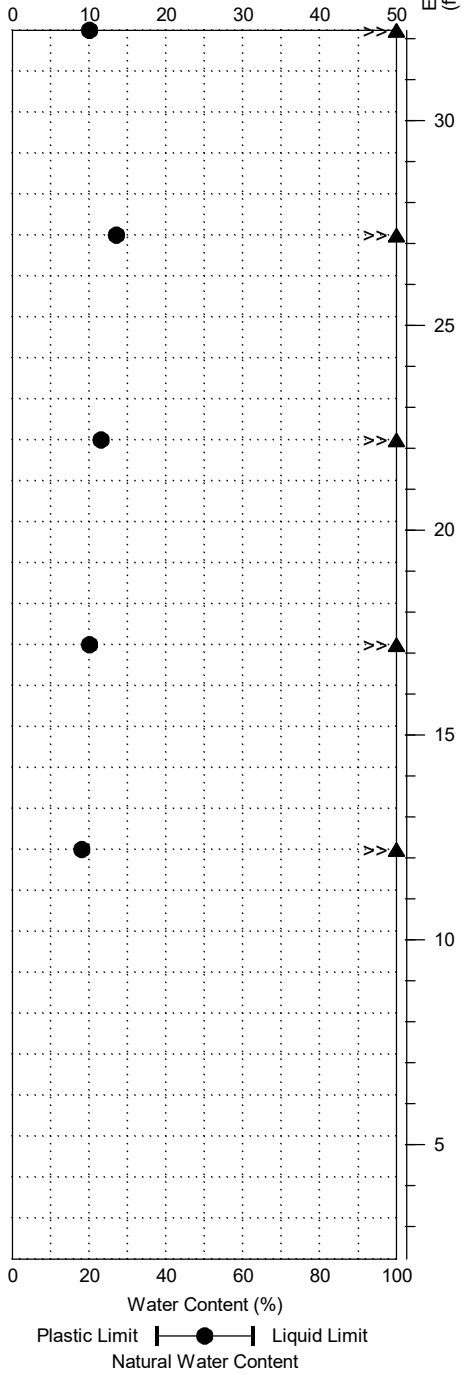
DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 232+75; See Figure 2H

DATE STARTED: 6/14/2022
DATE COMPLETED: 6/14/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 62.2 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30			Decreased silt content.		S-9	19-25-30	
35		ML	Hard, gray, sandy SILT, moist. Laminated to finely bedded, some orange staining on bedding planes. Micaceous.		S-10	18-30-29	%F
40		SM	Very dense, gray, silty, fine SAND, moist. Finely bedded, micaceous.		S-11	25-39-50/5"	
45					S-12	22-38-50/6"	
50			Becomes dark gray with decreased silt content. Sand fraction becomes very fine to fine. Moist with wet pockets.		S-13	24-41-50/4"	
55			BH-69 terminated at about 51.3 feet below ground surface (bgs). Groundwater was encountered at about 8 feet bgs during the exploration. Driller added bentonite grout mud prior to driving each sample collected, starting at 20 feet bgs. Driller reported no heave during drilling. Borehole abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

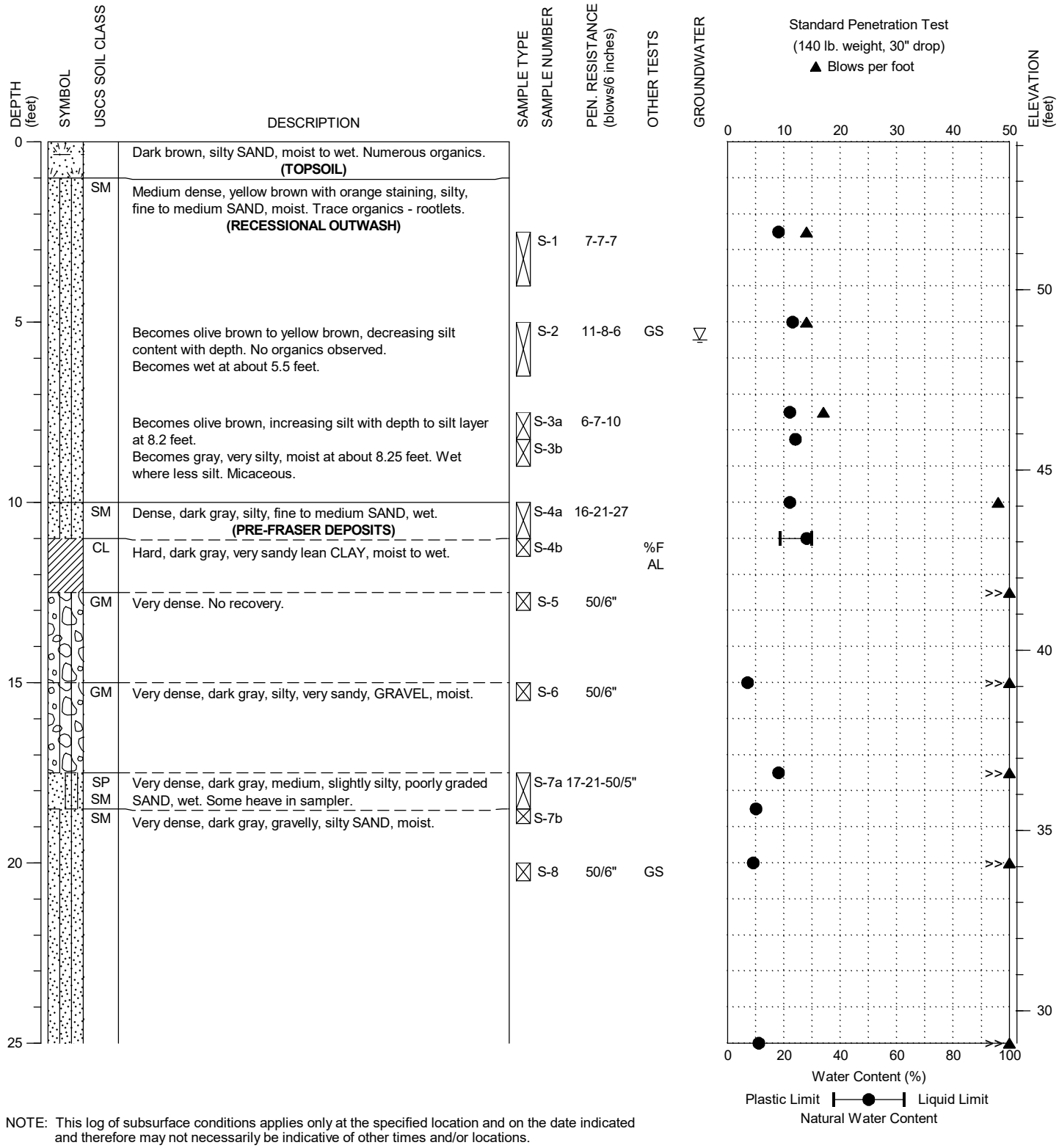
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-69

PROJECT NO.: 2021-133-21 FIGURE: A-44

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 234+90; See Figure 2H

DATE STARTED: 11/10/2022
DATE COMPLETED: 11/10/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 54.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

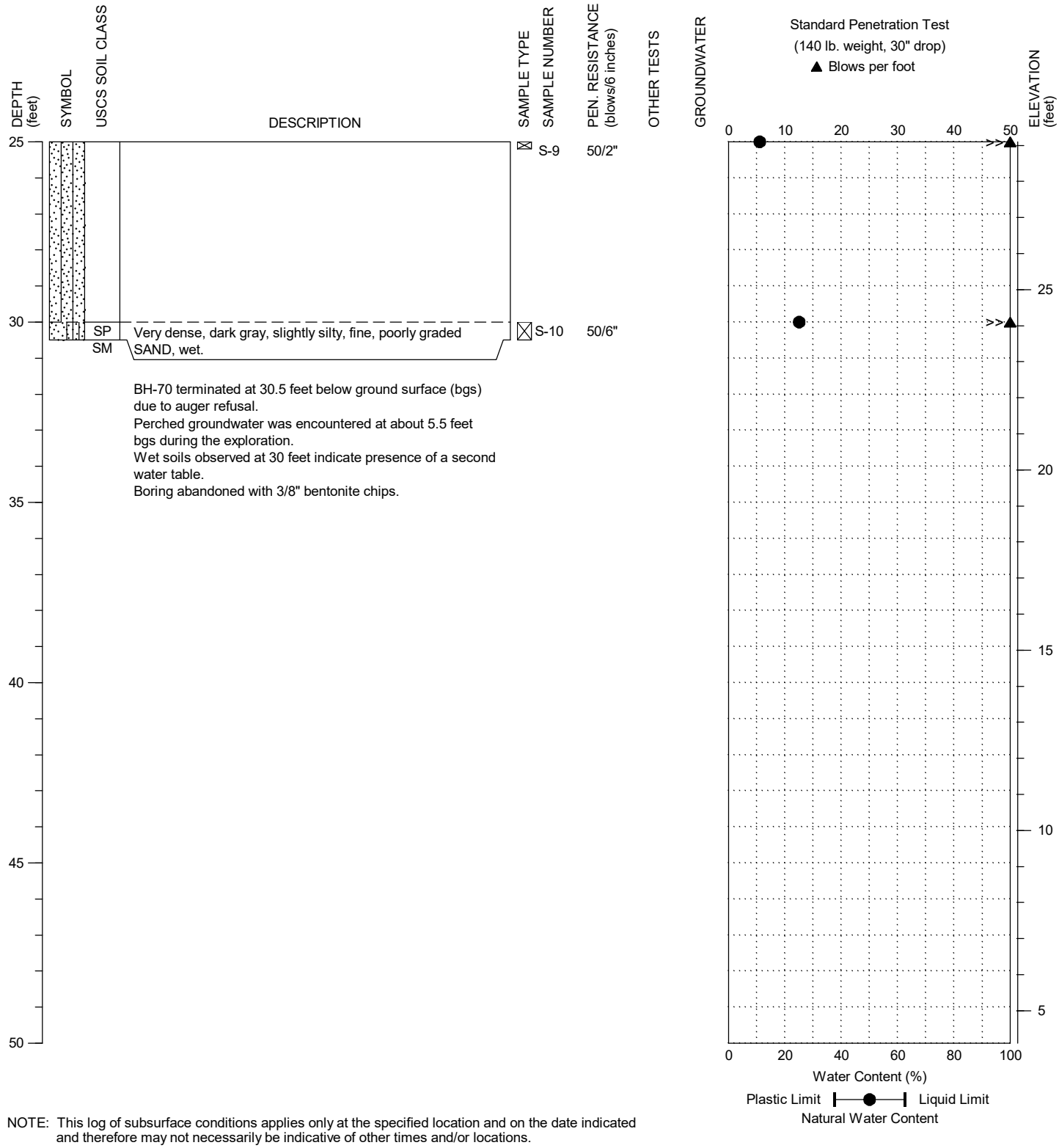
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-70

PROJECT NO.: 2021-133-21 FIGURE: A-45

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 234+90; See Figure 2H

DATE STARTED: 11/10/2022
DATE COMPLETED: 11/10/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 54.1 ± feet



BH-70 terminated at 30.5 feet below ground surface (bgs) due to auger refusal.
Perched groundwater was encountered at about 5.5 feet bgs during the exploration.
Wet soils observed at 30 feet indicate presence of a second water table.
Boring abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

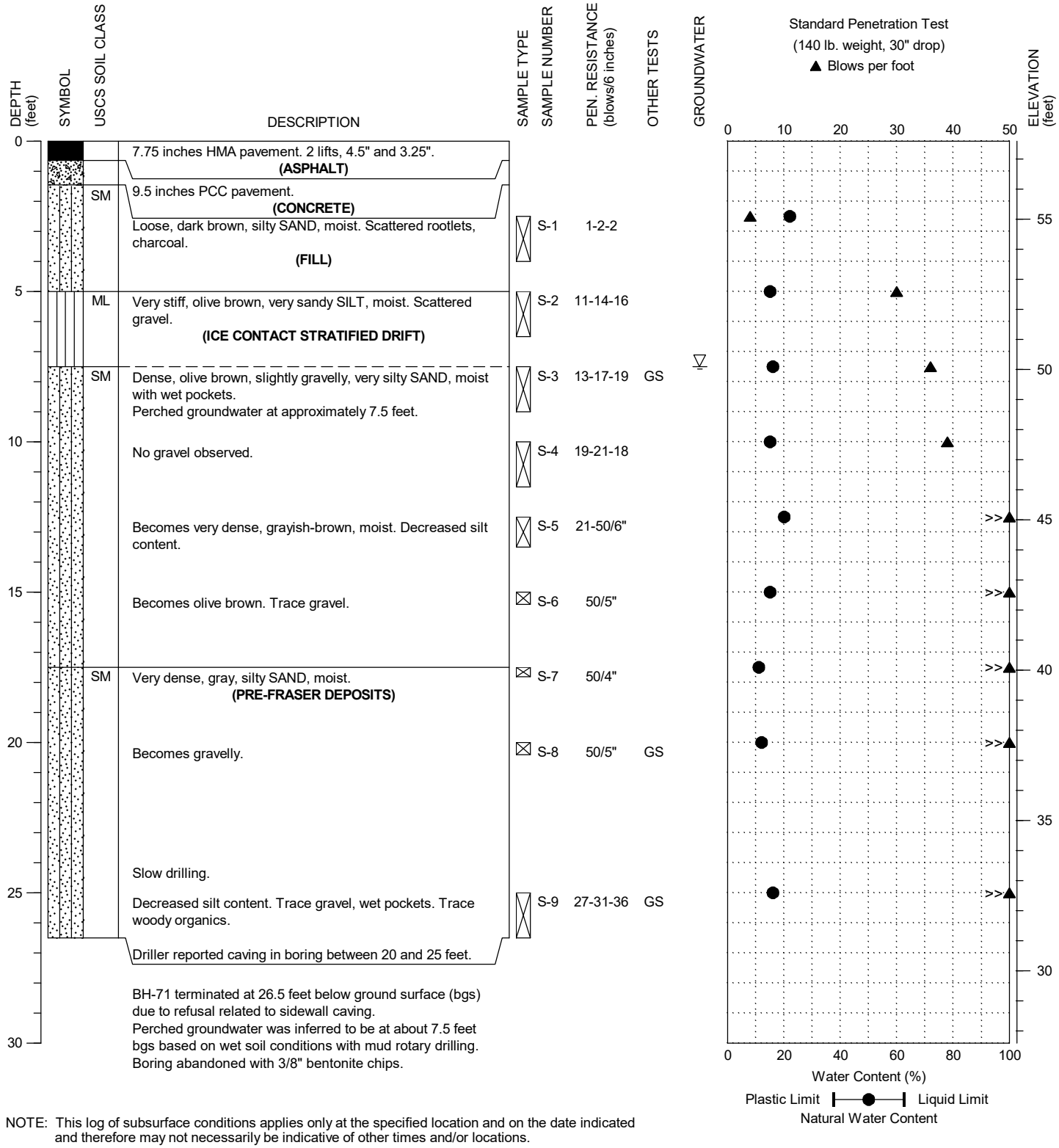
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-70

PROJECT NO.: 2021-133-21 FIGURE: A-45

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-90 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 234+05; See Figure 2H

DATE STARTED: 11/1/2022
DATE COMPLETED: 11/1/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 57.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-71

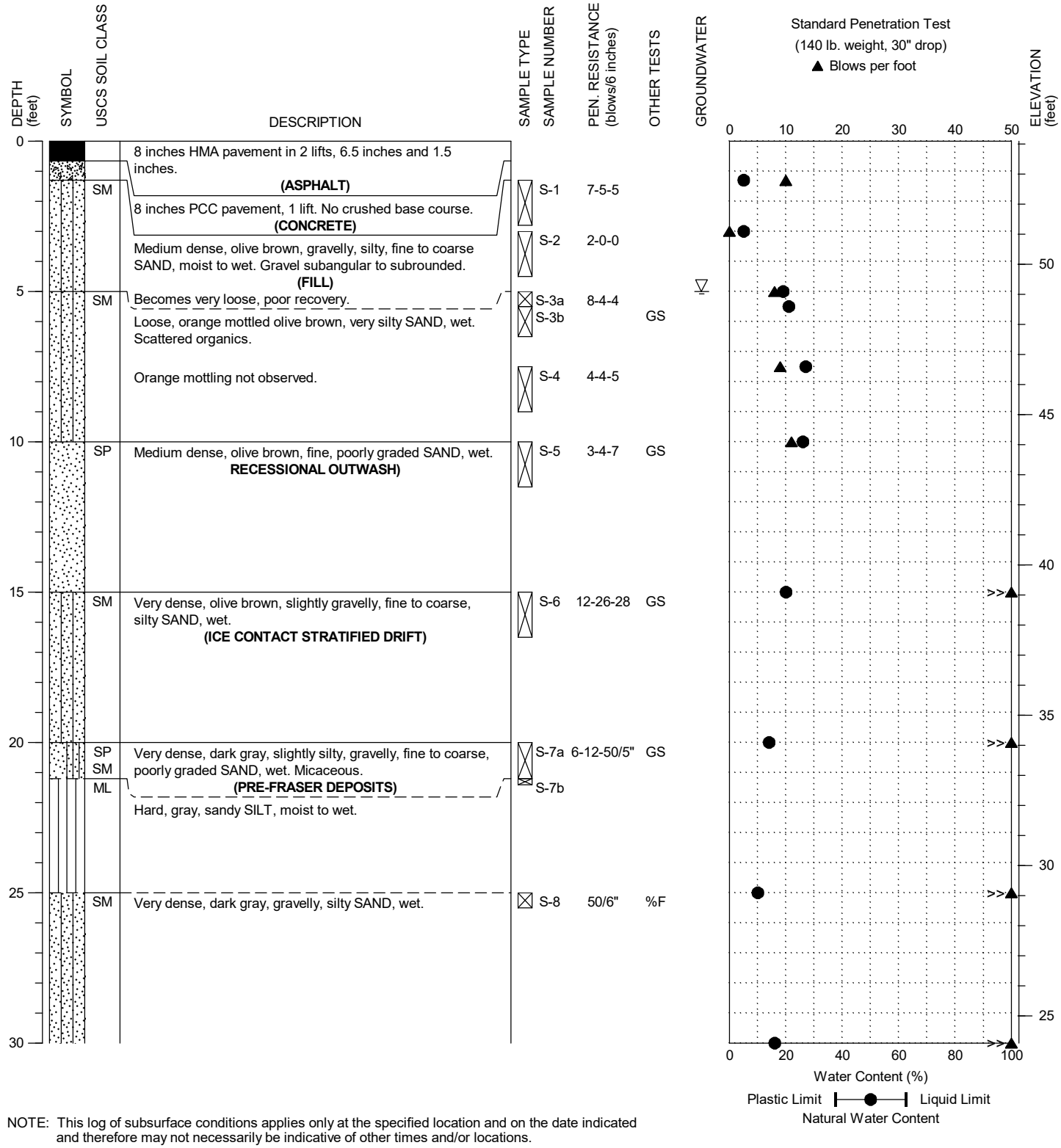
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-46

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 234+95; See Figure 2H. BH-72W drilled about 4 feet south on 12/7/2022.

DATE STARTED: 6/13/2022
DATE COMPLETED: 6/13/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 54.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

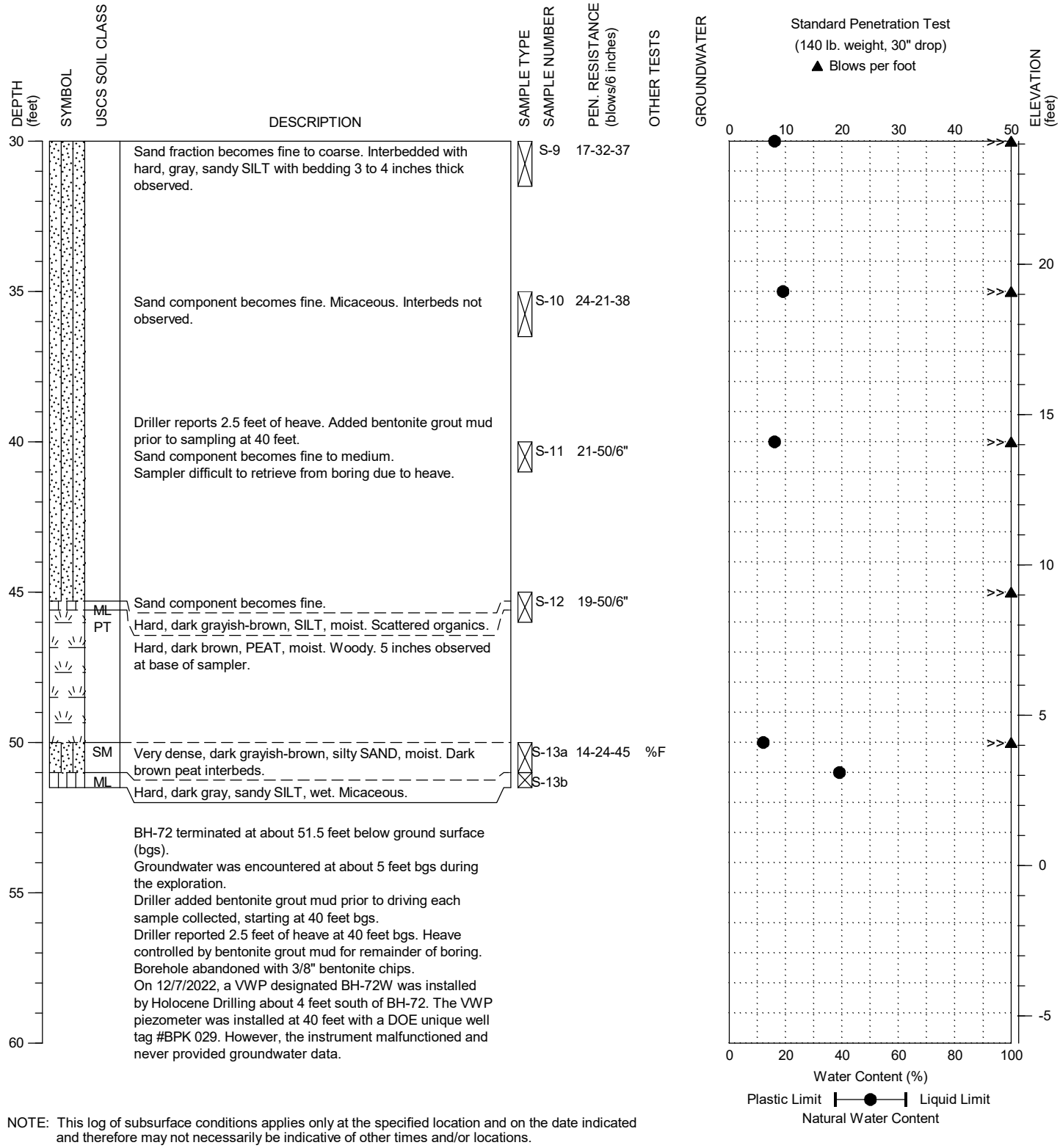
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-72/BH-72W

PROJECT NO.: 2021-133-21 FIGURE: A-47

DRILLING COMPANY: Advance Drill Technologies, Inc.
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/3.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 234+95; See Figure 2H. BH-72W drilled about 4 feet south on 12/7/2022.

DATE STARTED: 6/13/2022
DATE COMPLETED: 6/13/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 54.1 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

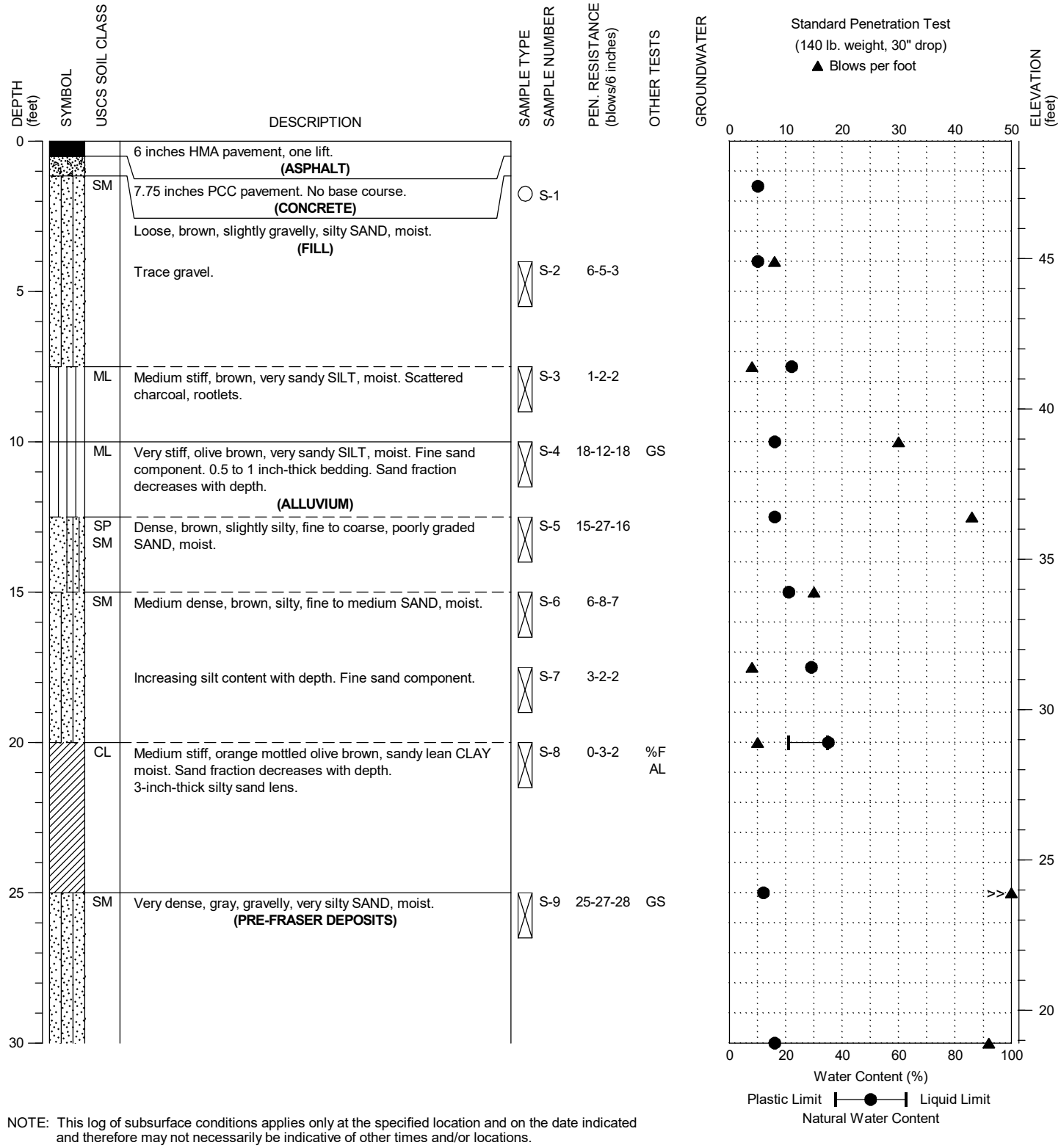
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-72/BH-72W

PROJECT NO.: 2021-133-21 FIGURE: A-47

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-70 Truck Rig
SAMPLING METHOD: SPT w/Autohammer, Grab
LOCATION: Approximate station 236+35; See Figure 2H

DATE STARTED: 11/2/2022
DATE COMPLETED: 11/2/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 48.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

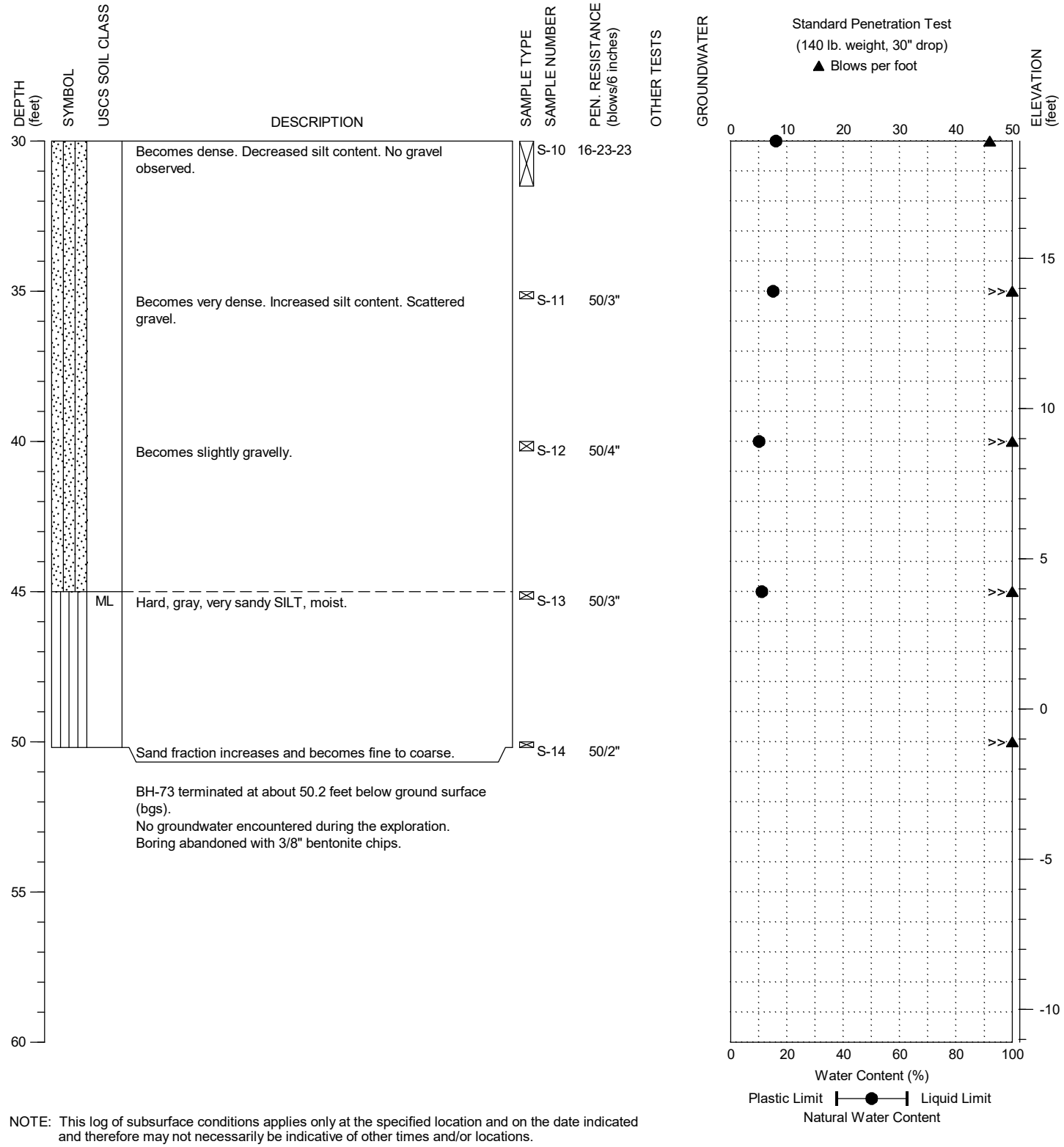
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-73

PROJECT NO.: 2021-133-21 FIGURE: A-48

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-70 Truck Rig
SAMPLING METHOD: SPT w/Autohammer, Grab
LOCATION: Approximate station 236+35; See Figure 2H

DATE STARTED: 11/2/2022
DATE COMPLETED: 11/2/2022
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 48.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

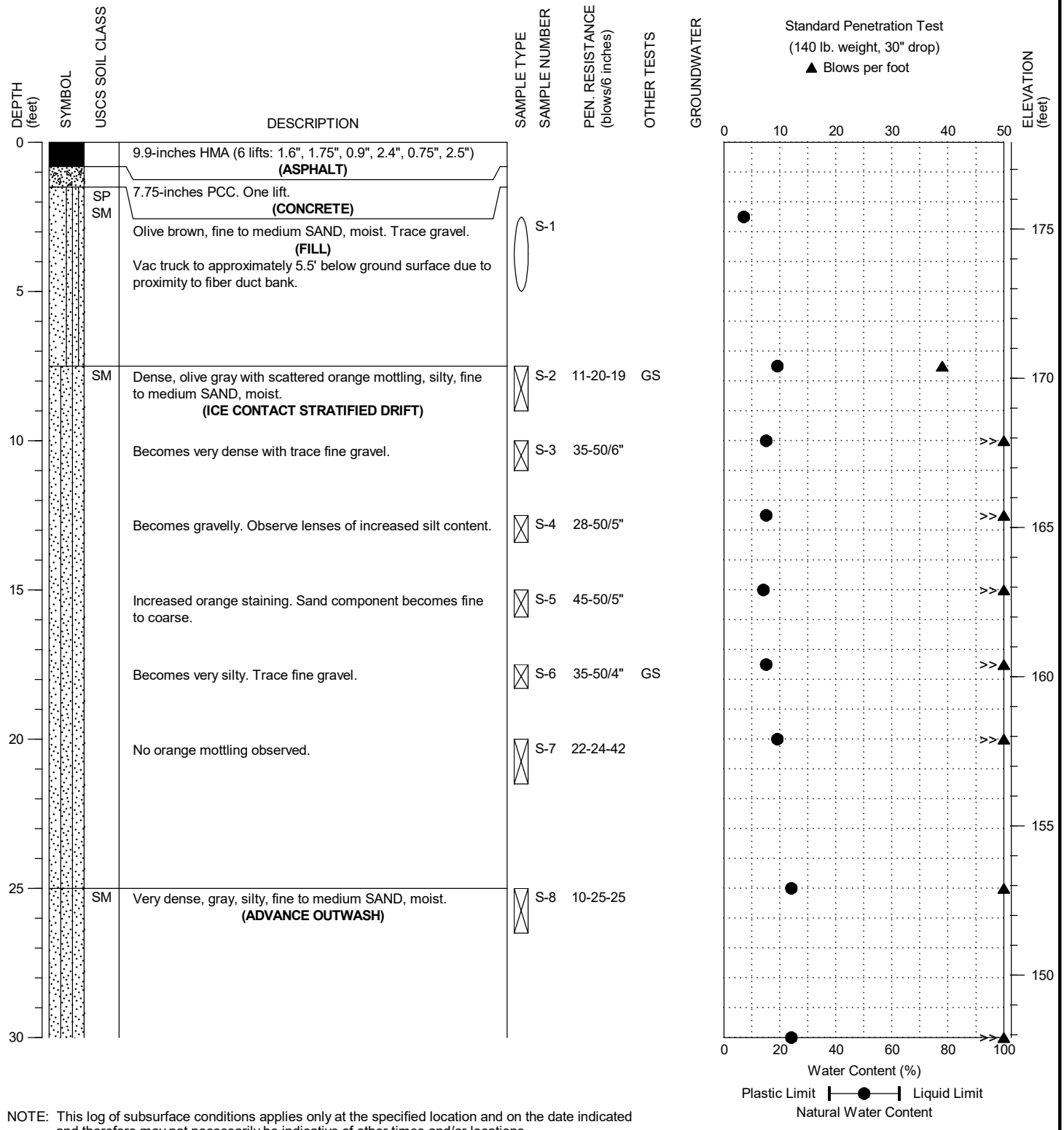
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-73

PROJECT NO.: 2021-133-21 FIGURE: A-48

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer, Grab
LOCATION: Approximate station 198+50; See Figure 2E

DATE STARTED: 12/1/2022
DATE COMPLETED: 12/1/2022
LOGGED BY: V. Oskierko
SURFACE ELEVATION: 177.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

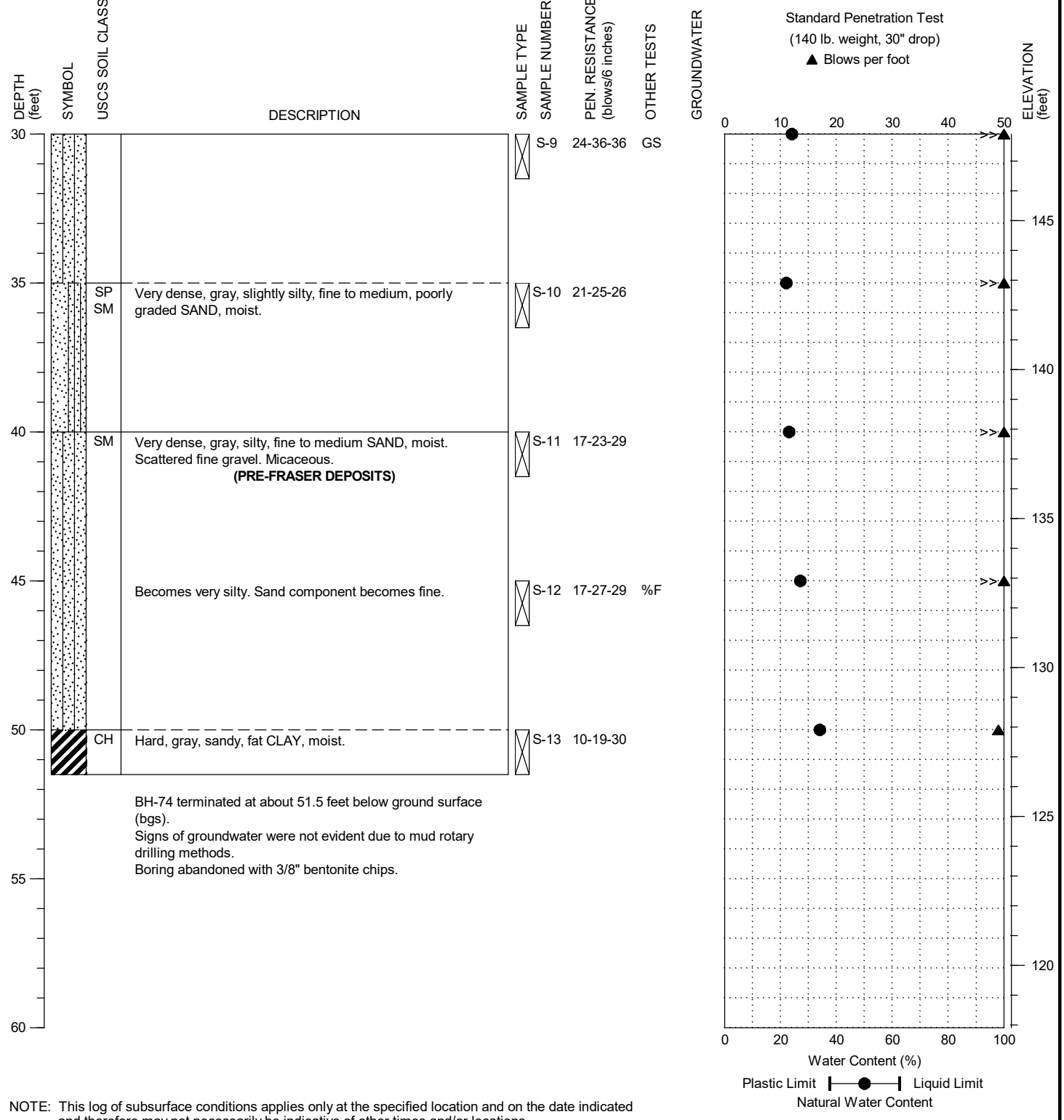
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-74

PROJECT NO.: 2021-133-21 FIGURE: A-49

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer, Grab
LOCATION: Approximate station 198+50; See Figure 2E

DATE STARTED: 12/1/2022
DATE COMPLETED: 12/1/2022
LOGGED BY: V. Oskierko
SURFACE ELEVATION: 177.9 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

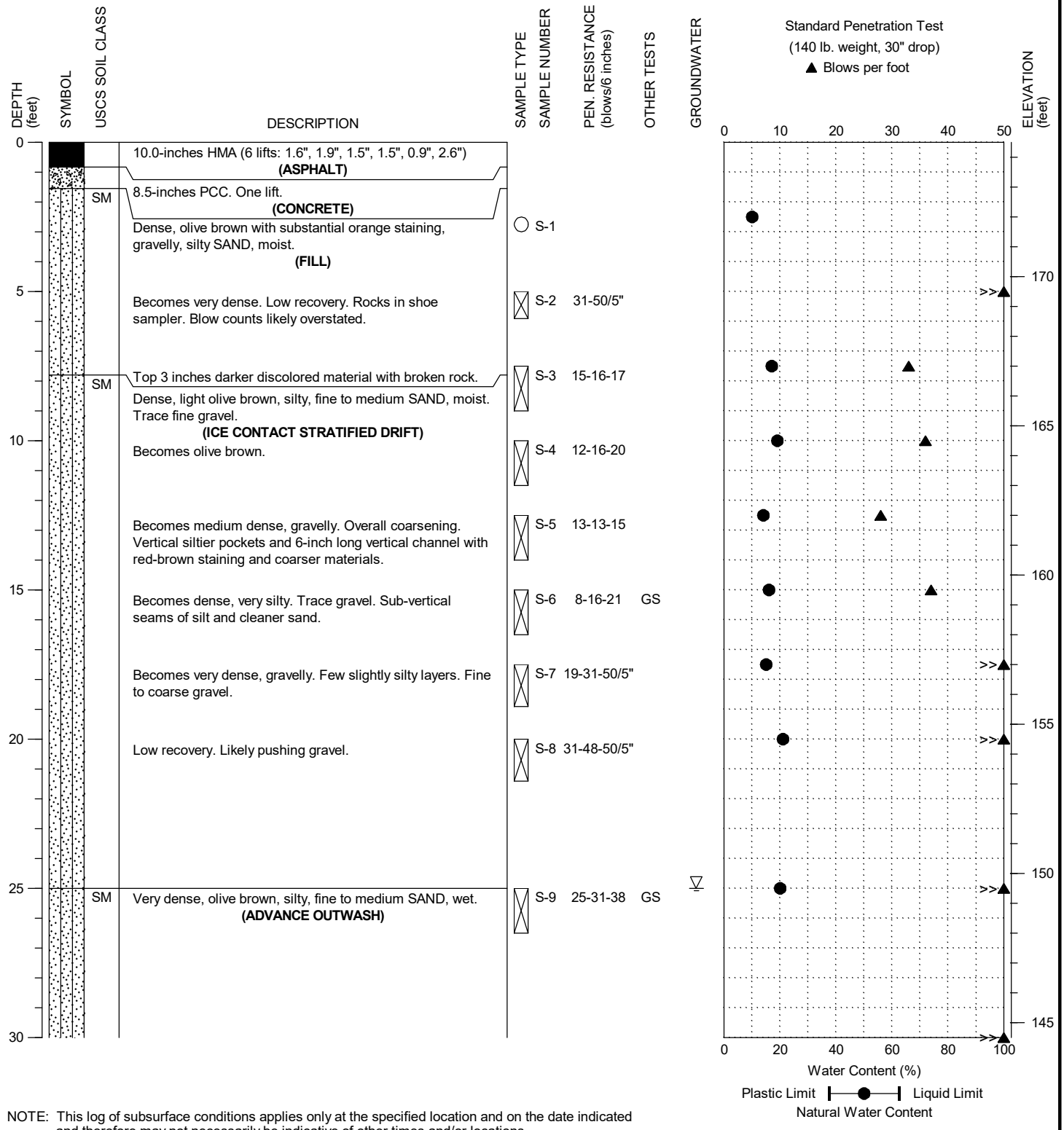
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-74

PROJECT NO.: 2021-133-21 FIGURE: A-49

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 199+90; See Figure 2E

DATE STARTED: 12/2/2022
DATE COMPLETED: 12/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 174.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-75

PROJECT NO.: 2021-133-21 FIGURE: A-50

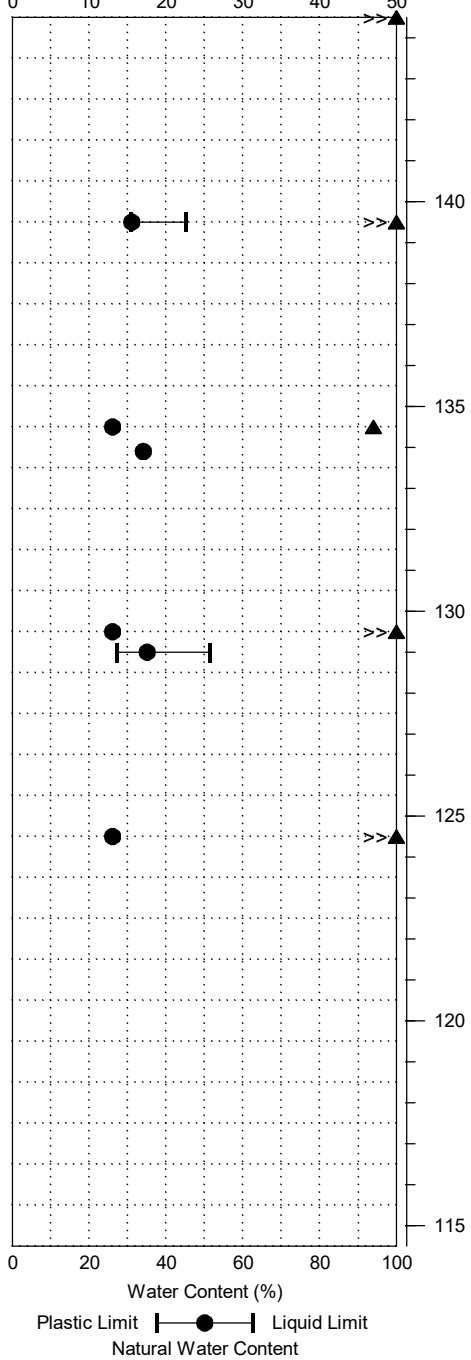
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, Mud Rotary, Diedrich D-50 Tracked Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 199+90; See Figure 2E

DATE STARTED: 12/2/2022
DATE COMPLETED: 12/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 174.5 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30				☒	S-10	50/5"	
35		ML	Hard, olive brown with numerous slightly orange laminations, slightly sandy SILT, moist. Few polished surfaces. **(PRE-FRASER DEPOSITS)** 2-inch sandy section at 36.2 feet	☒	S-11	17-25-43	%F AL
40		CL	Becomes dark gray. Becomes sandy and wet with depth. Polished surfaces not observed. Hard, dark gray, lean CLAY, moist.	☒	S-12a S-12b	16-23-24	%F
45		ML	Hard, dark gray, fine, very sandy SILT, wet.	☒	S-13a	20-25-27	
		CH	Hard, dark gray, fat CLAY, moist.	☒	S-13b		%F AL
50		ML	Hard, dark gray, SILT to very sandy SILT, moist to wet. Saturated where sandy.	☒	S-14	21-43-45	
55			BH-75 terminated at about 51.5 feet below ground surface (bgs). Groundwater inferred to be at about 25 feet bgs based on wet soil conditions with mud rotary drilling. Boring abandoned with 3/8" bentonite chips.				
60							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



ELEVATION (feet)

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

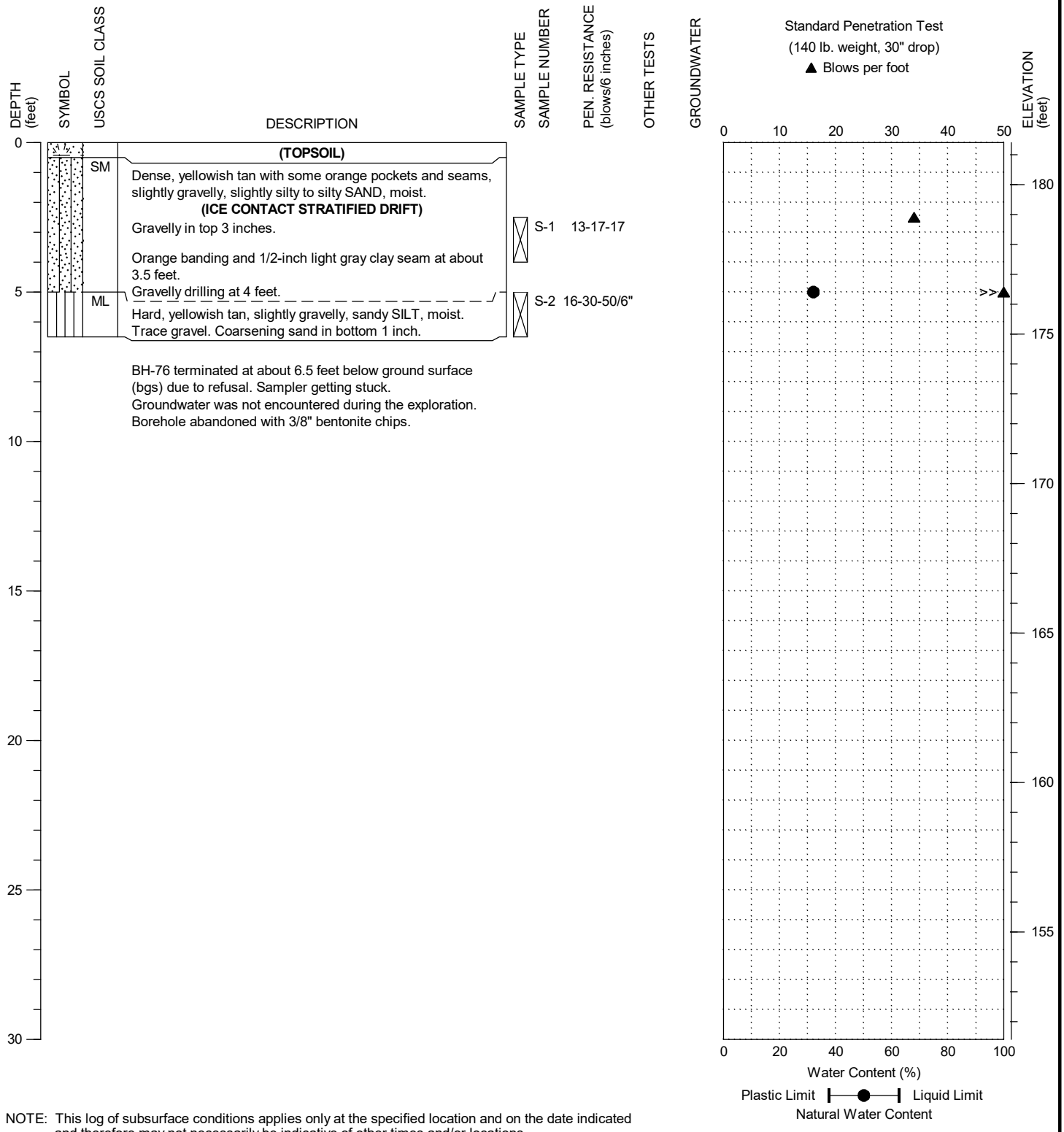
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-75

PROJECT NO.: 2021-133-21 FIGURE: A-50

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 199+45; See Figure 2E

DATE STARTED: 11/4/2022
DATE COMPLETED: 11/4/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 181.4 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-76

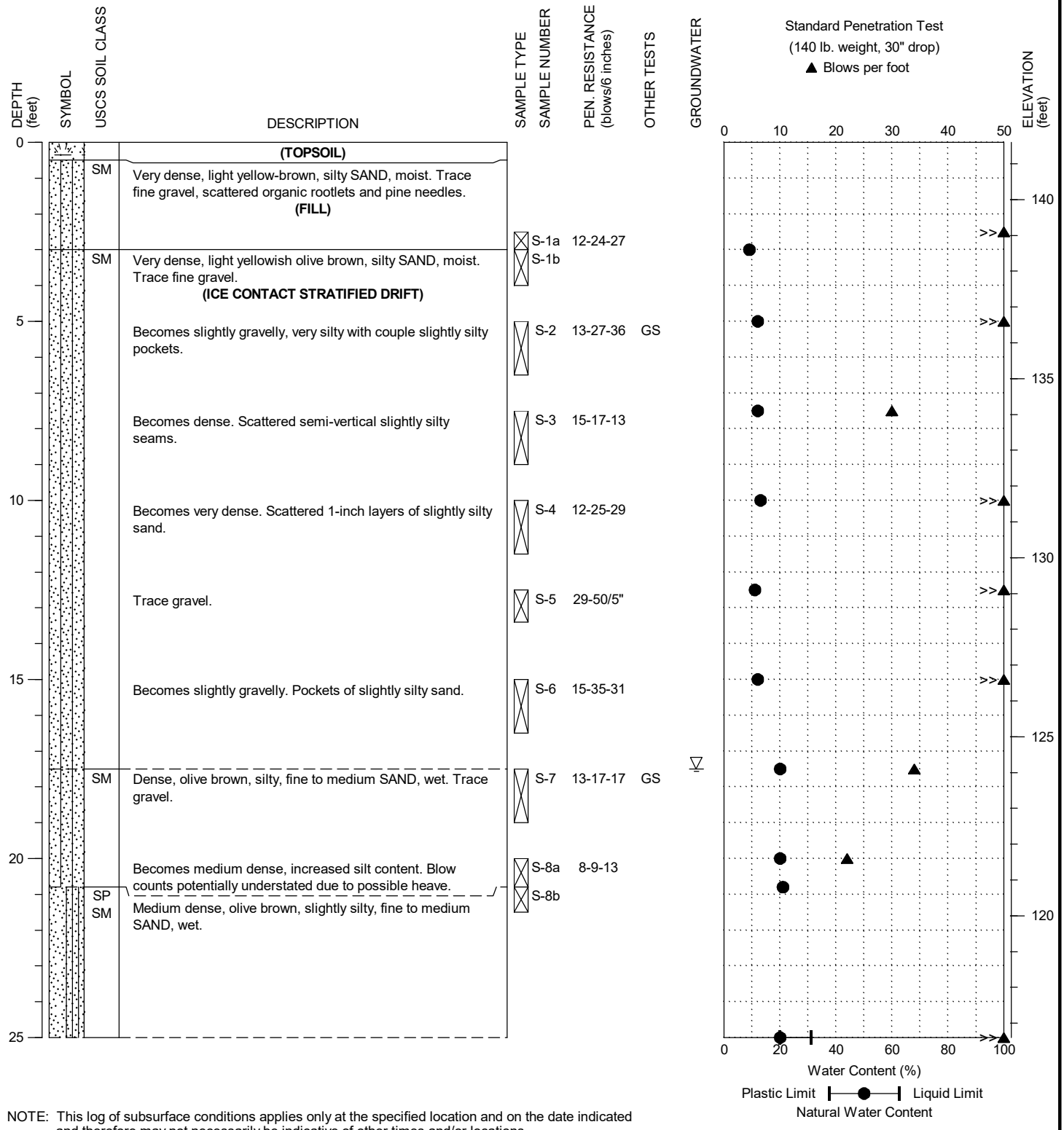
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-51

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 213+10/R6 11+50; See Figure 2F

DATE STARTED: 11/3/2022
DATE COMPLETED: 11/3/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 141.6 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-77

PROJECT NO.: 2021-133-21 FIGURE: A-52

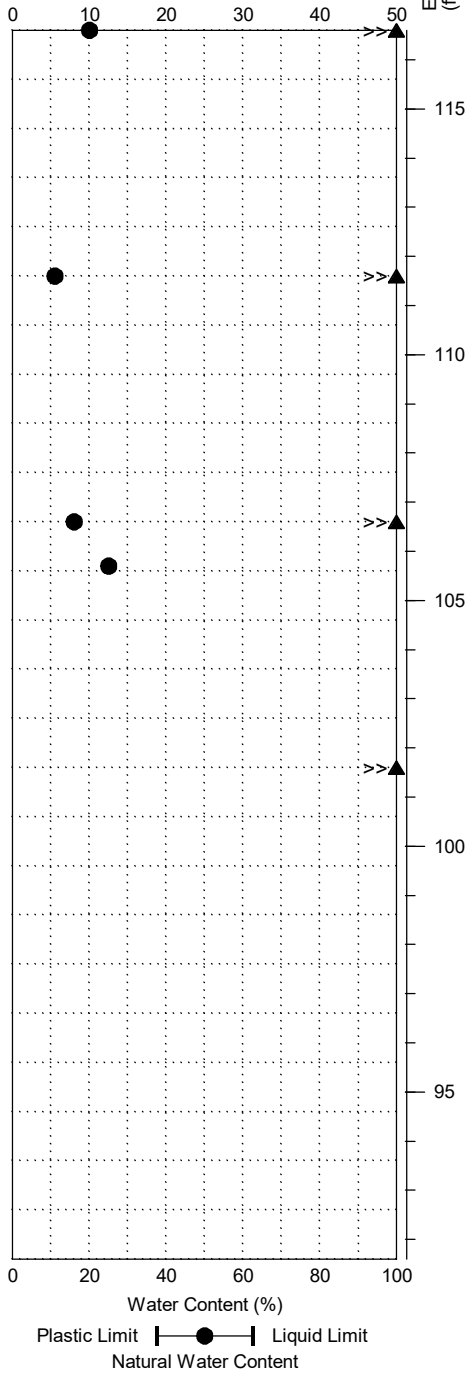
DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 213+10/R6 11+50; See Figure 2F

DATE STARTED: 11/3/2022
DATE COMPLETED: 11/3/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 141.6 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
25		CL	Hard, olive brown with orange laminations, very sandy, lean CLAY, moist. Trace fine gravel, increasing sand content towards bottom, laminations in bottom 6 inches.		S-9	17-32-50	%F AL
30		SM	Very dense, gray with some orange staining, slightly gravelly, silty SAND, moist. Pockets of very sandy clay. 2-inch layer of substantial red-brown banding with coarse gravel at 30.7 feet. Becomes greenish gray, with interbeds of higher and lower silt content layers at 30.7 feet.		S-10a	25-38-46	
					S-10b		
35			Becomes olive brown, wet. Fine subrounded to subangular gravel. Few pockets of silt.		S-11a	18-22-33	
		CL	Hard, olive brown, lean CLAY, moist. Steeply inclined slickensided fracture.		S-11b		
40			Becomes sandy, intermixed with pockets to layers of slightly silty, fine, poorly graded SAND, moist.		S-12	19-50/2"	
45			BH-77 terminated at about 40.7 feet below ground surface (bgs) due to auger refusal. Groundwater was encountered at about 17.5 feet during the exploration. Driller did not report heave during drilling. Borehole abandoned with 3/8" bentonite chips.				
50							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

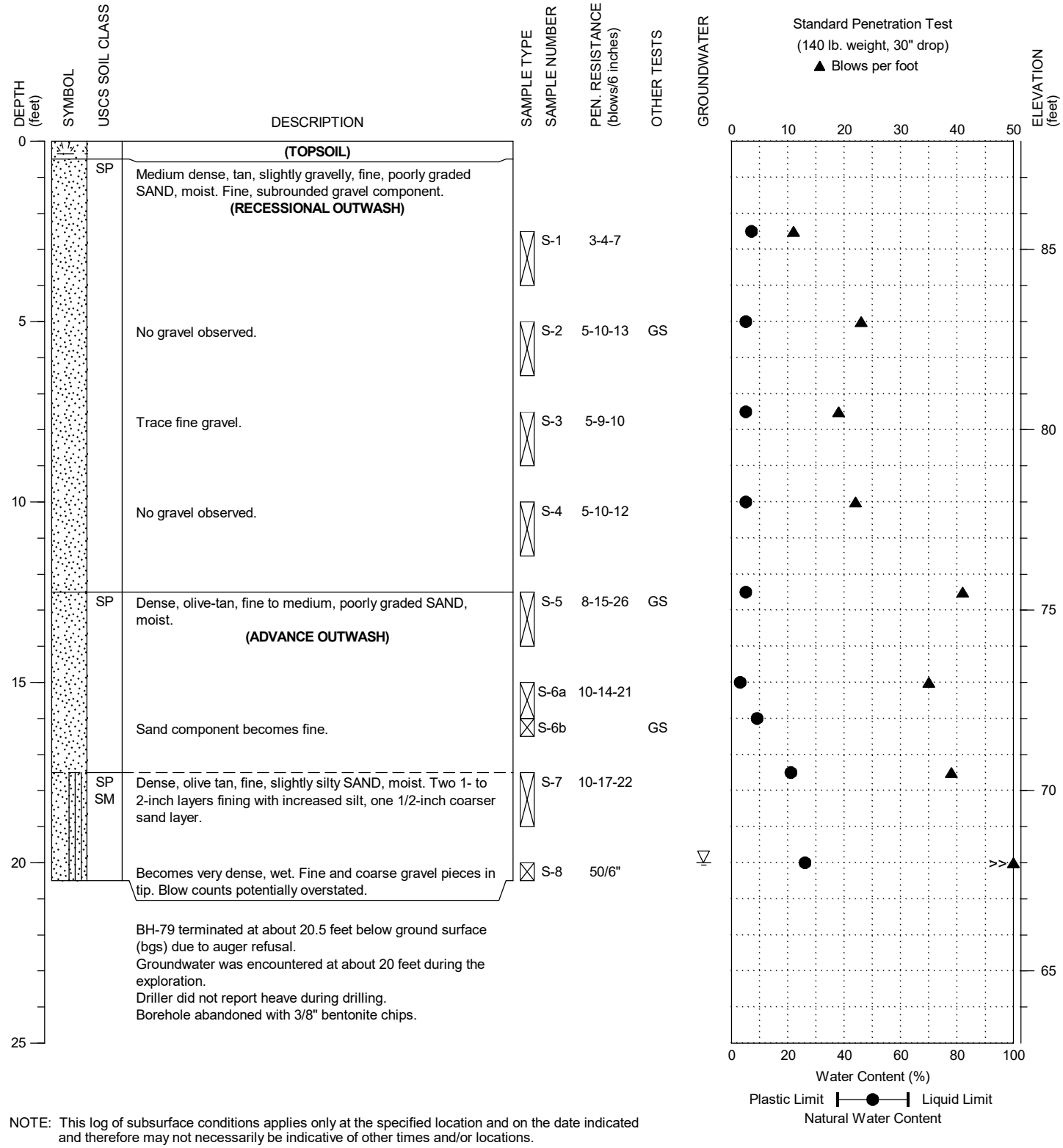
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-77

PROJECT NO.: 2021-133-21 FIGURE: A-52

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Acker Limited Access Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 226+15; See Figure 2G

DATE STARTED: 2/21/2023
DATE COMPLETED: 2/21/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 88.0 ± feet



BH-79 terminated at about 20.5 feet below ground surface (bgs) due to auger refusal.
Groundwater was encountered at about 20 feet during the exploration.
Driller did not report heave during drilling.
Borehole abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

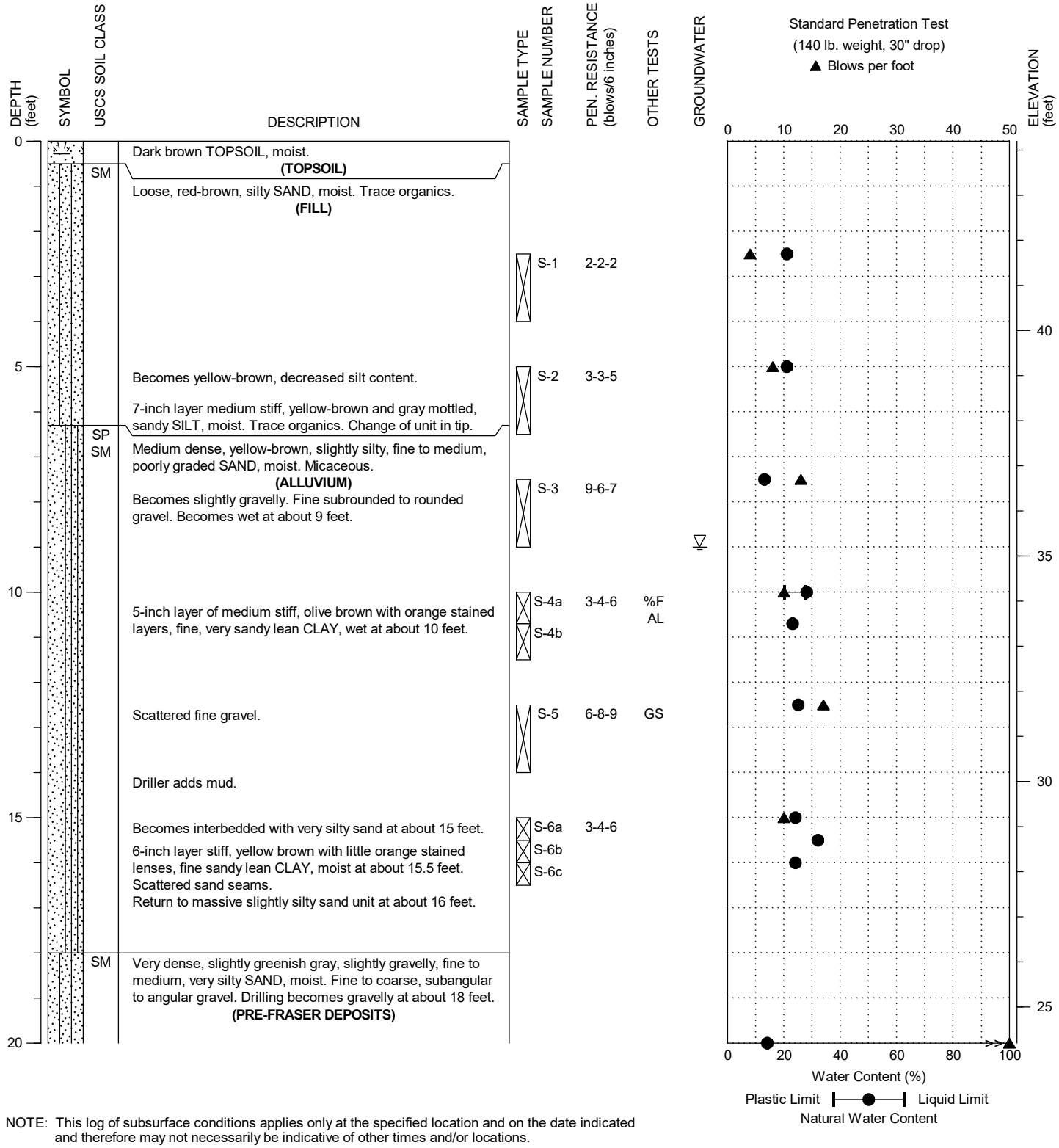
BORING: BH-79

PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-53

DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 236+15; See Figure 2H

DATE STARTED: 1/27/2023
DATE COMPLETED: 1/27/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 44.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-80A

PROJECT NO.: 2021-133-21 FIGURE: A-54

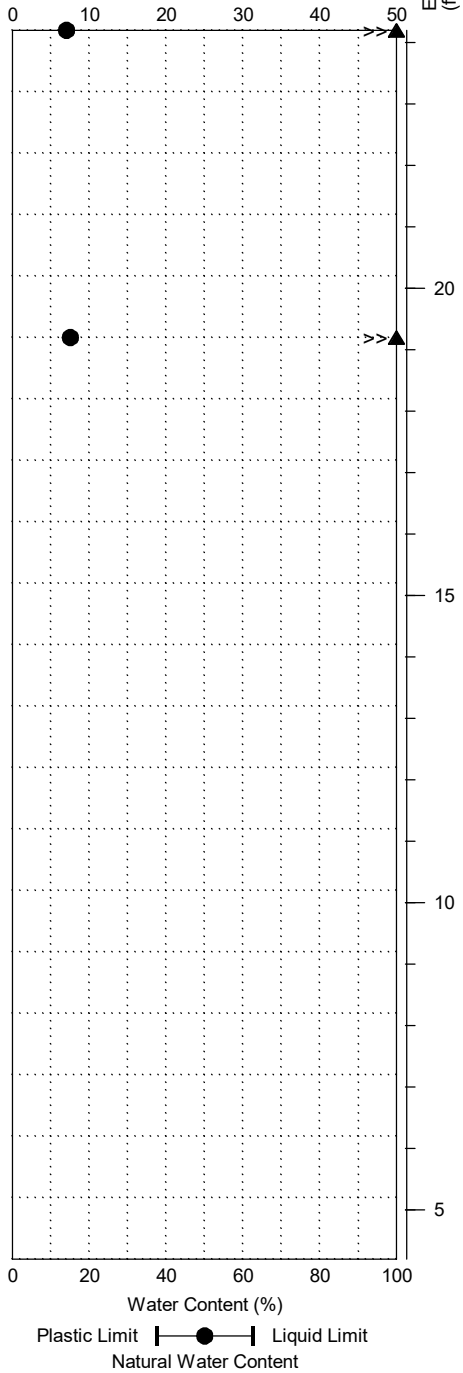
DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 236+15; See Figure 2H

DATE STARTED: 1/27/2023
DATE COMPLETED: 1/27/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 44.2 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
20					S-7	24-50/5"	
25			Decreased silt content, becomes gravelly. Clean sand in top 2 inches and at about 25.7 feet. Wet pockets where cleaner. Very gravelly bottom 2 inches. Coarse gravel in shoe.		S-8	19-30-50	GS
30			BH-80A terminated at about 26.5 feet below ground surface (bgs) due to auger refusal. Groundwater was encountered at about 9 feet during the exploration. Driller reported no heave during drilling. Borehole abandoned with 3/8" bentonite chips.				
35							
40							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-80A

PROJECT NO.: 2021-133-21 FIGURE: A-54

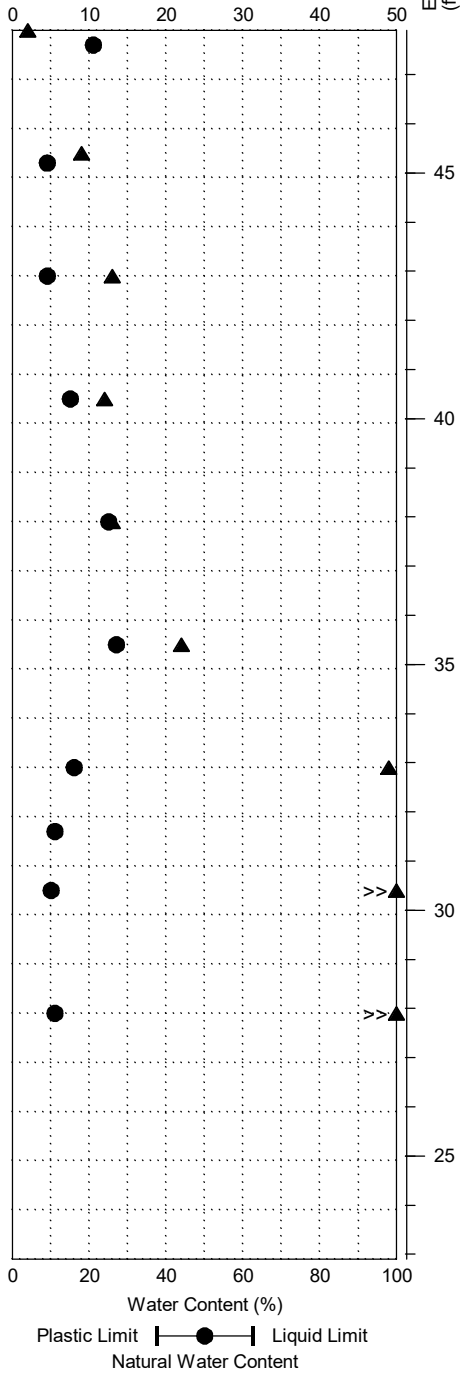
DRILLING COMPANY: Geologic Drill Partners
DRILLING METHOD: HSA, Mini Bobcat Limited Access Tracked Rig w/2.25" ID
SAMPLING METHOD: SPT w/Rope and Cathead
LOCATION: Approximate station 234+95; See Figure 2H

DATE STARTED: 1/27/2023
DATE COMPLETED: 1/27/2023
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 47.9 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Very loose, dark brown TOPSOIL, moist. **(TOPSOIL)**		S-1a S-1b	1-1-1	
			Very loose, dark yellow-brown, very silty, fine to medium SAND, moist. Scattered organics. **(FILL)**				
		SP SM	Becomes loose, yellow-brown.		S-2a S-2b	4-4-5	
			Loose, yellow-brown, slightly silty, fine, poorly graded, SAND, moist. **(ALLUVIUM)**				
5			Becomes medium dense. Trace undecomposed roots and twigs.		S-3	4-5-8	GS
			Decrease yellow color.		S-4	5-6-6	
			3-inch layer fine silty sand.				
10			Becomes wet. Scattered silty seams.		S-5	4-6-7	
			7-inch layer yellow brown with orange fine laminations, fine, very silty SAND, wet. Laminated with slightly silty sand.		S-6	4-9-13	
15		SP	Dense, olive brown, fine to coarse, poorly graded SAND, wet. **(ADVANCE OUTWASH)**		S-7a S-7b	14-21-28	GS
		SM	Dense, olive brown, slightly gravelly, silty SAND, moist. **(PRE-FRASER DEPOSITS)**				
			Becomes very dense, gray in tip.		S-8	50/4"	
			Augers spinning at 19 feet.				
20			Becomes dark gray, slightly gravelly and very silty.		S-9	50/4"	GS
25			BH-80B terminated at about 20.3 feet below ground surface (bgs) due to auger refusal. Groundwater was encountered at about 10 feet during the exploration. Driller reported no heave during drilling. Borehole abandoned with 3/8" bentonite chips.				

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

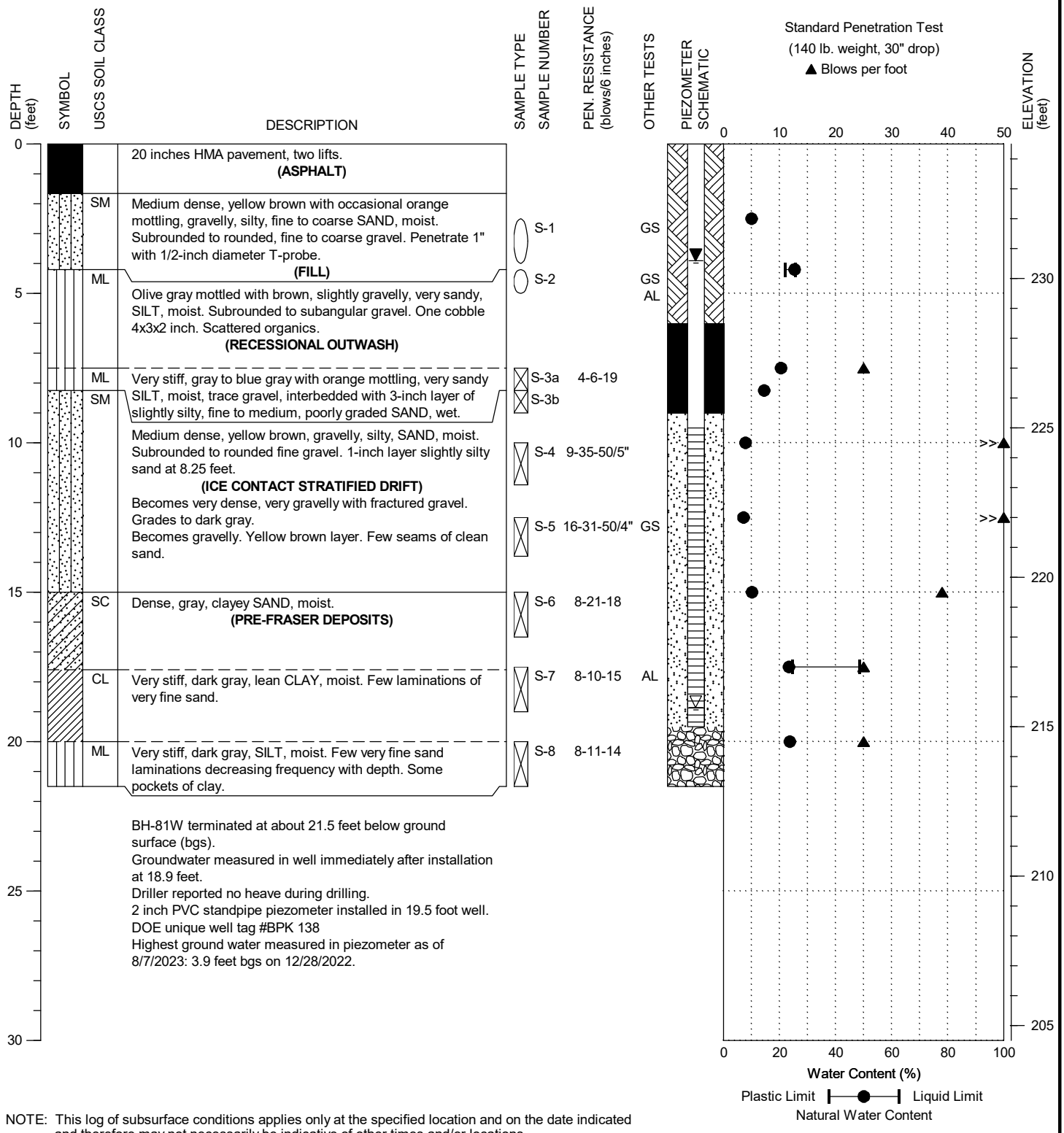
BORING:
BH-80B

PROJECT NO.: 2021-133-21 FIGURE: A-55

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, HSA, Diedrich D-90 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 172+70; See Figure 2D

DATE STARTED: 8/2/2022
DATE COMPLETED: 8/2/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 234.5 ± feet



BH-81W terminated at about 21.5 feet below ground surface (bgs).
Groundwater measured in well immediately after installation at 18.9 feet.
Driller reported no heave during drilling.
2 inch PVC standpipe piezometer installed in 19.5 foot well.
DOE unique well tag #BPK 138
Highest ground water measured in piezometer as of 8/7/2023: 3.9 feet bgs on 12/28/2022.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

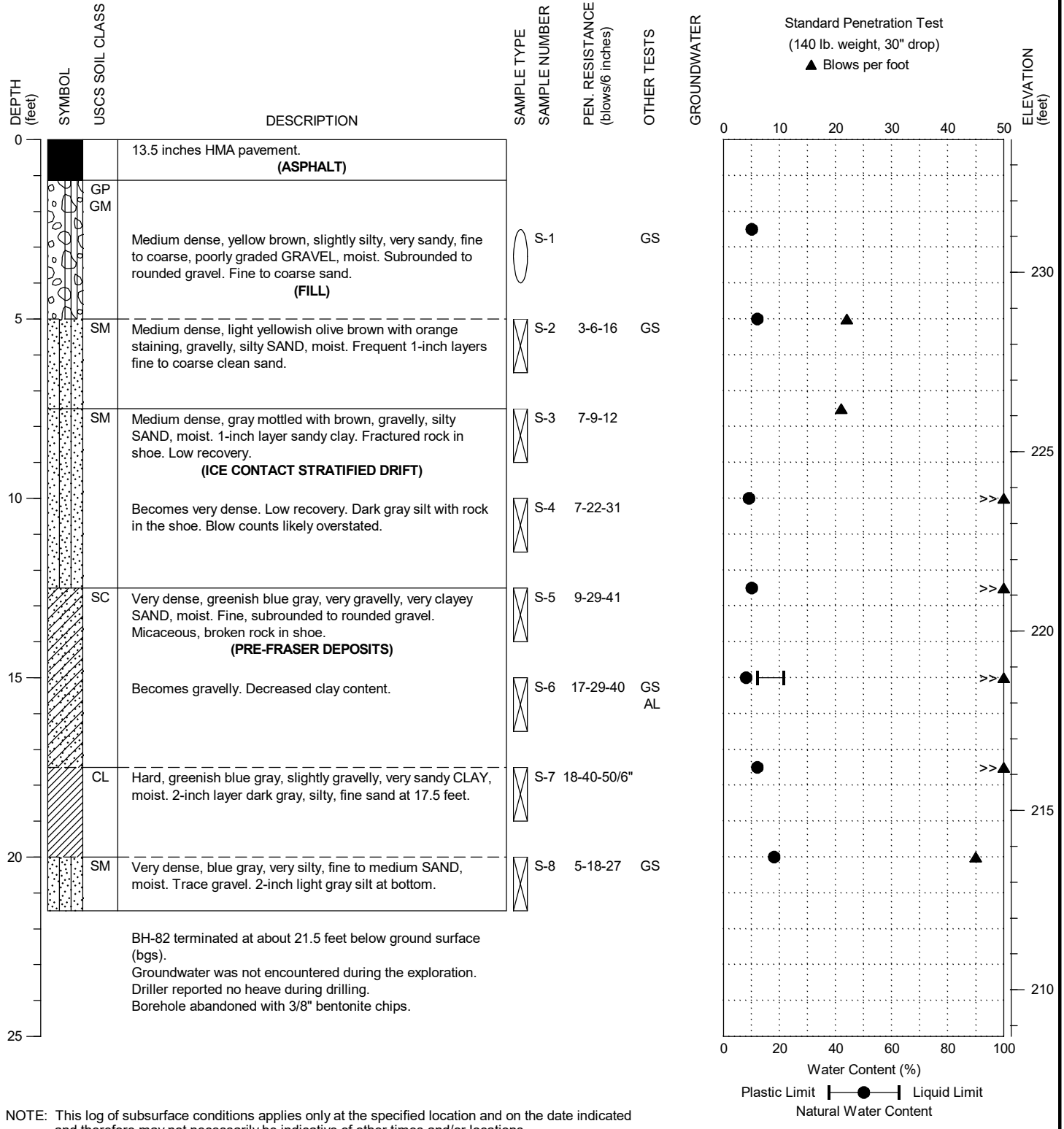
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-81W

PROJECT NO.: 2021-133-21 FIGURE: A-56

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 175+55; See Figure 2D

DATE STARTED: 8/4/2022
DATE COMPLETED: 8/4/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 233.7 ± feet



BH-82 terminated at about 21.5 feet below ground surface (bgs).
Groundwater was not encountered during the exploration.
Driller reported no heave during drilling.
Borehole abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

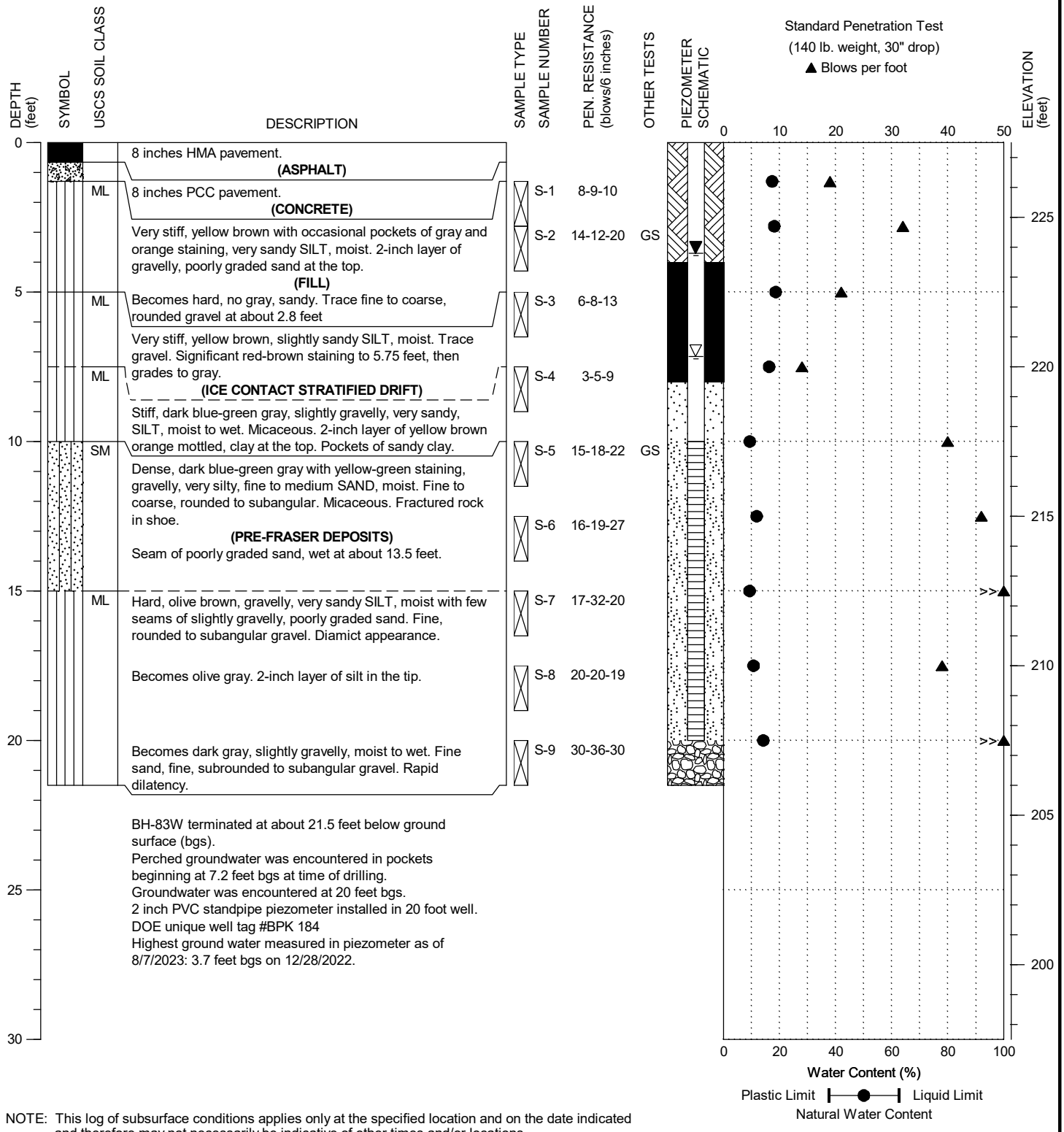
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-82

PROJECT NO.: 2021-133-21 FIGURE: A-57

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich B-58 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 178+65; See Figure 2E

DATE STARTED: 8/17/2022
DATE COMPLETED: 8/17/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 227.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-83W

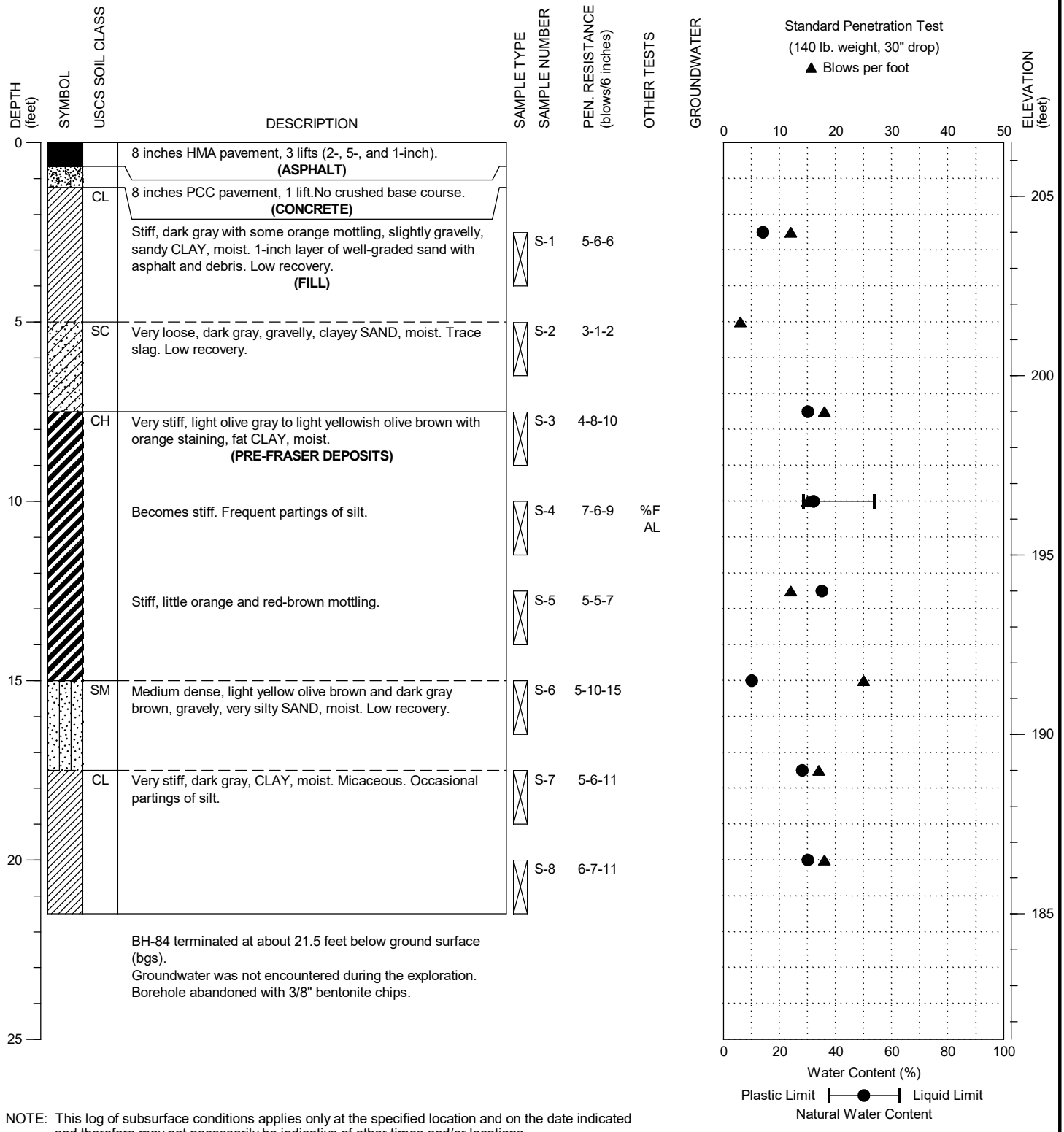
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-58

PZO-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich B-58 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 183+85; See Figure 2E

DATE STARTED: 8/19/2022
DATE COMPLETED: 8/19/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 206.5 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-84

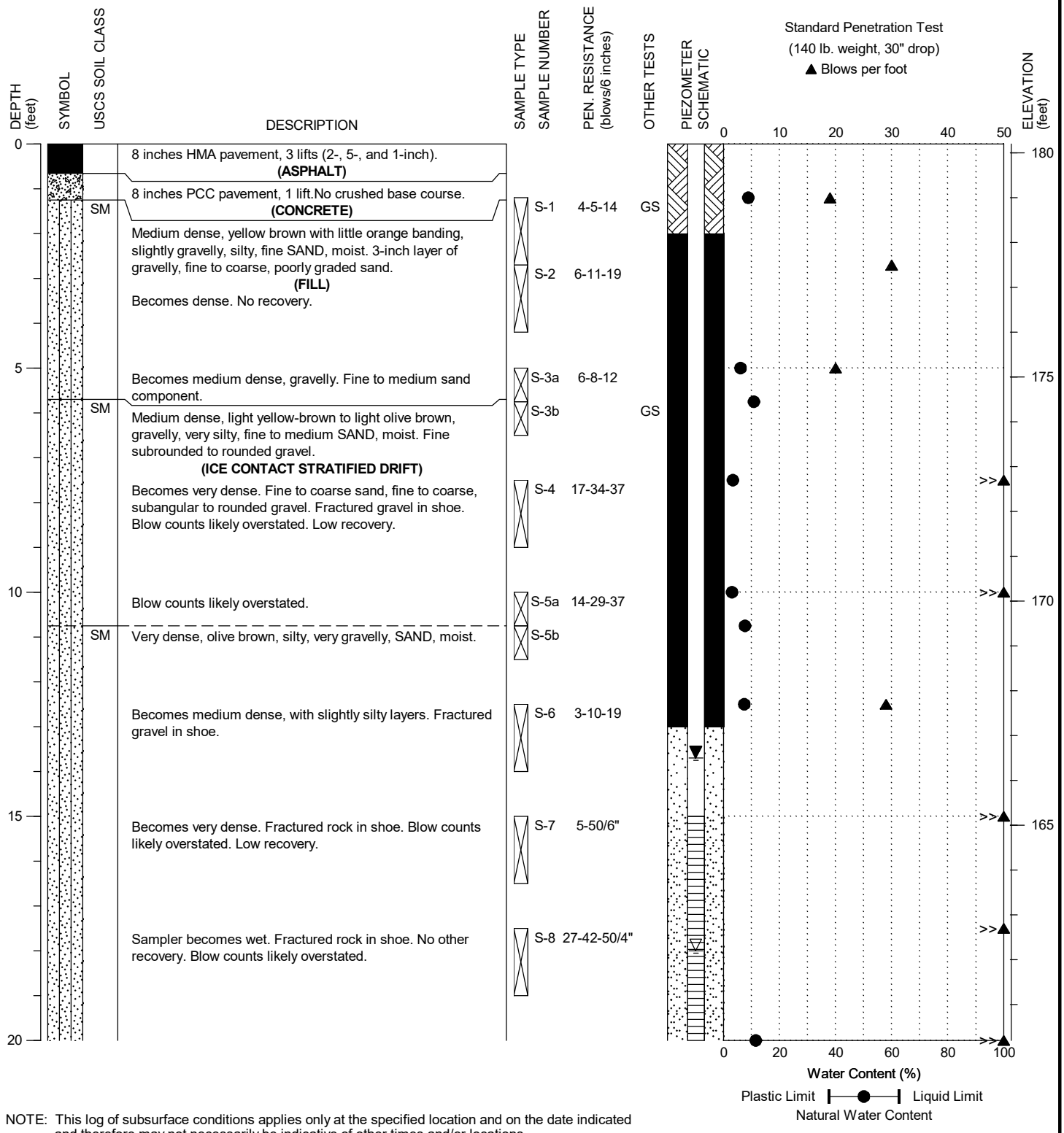
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-59

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich B-58 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 196+70; See Figure 2E

DATE STARTED: 8/19/2022
DATE COMPLETED: 8/19/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 180.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

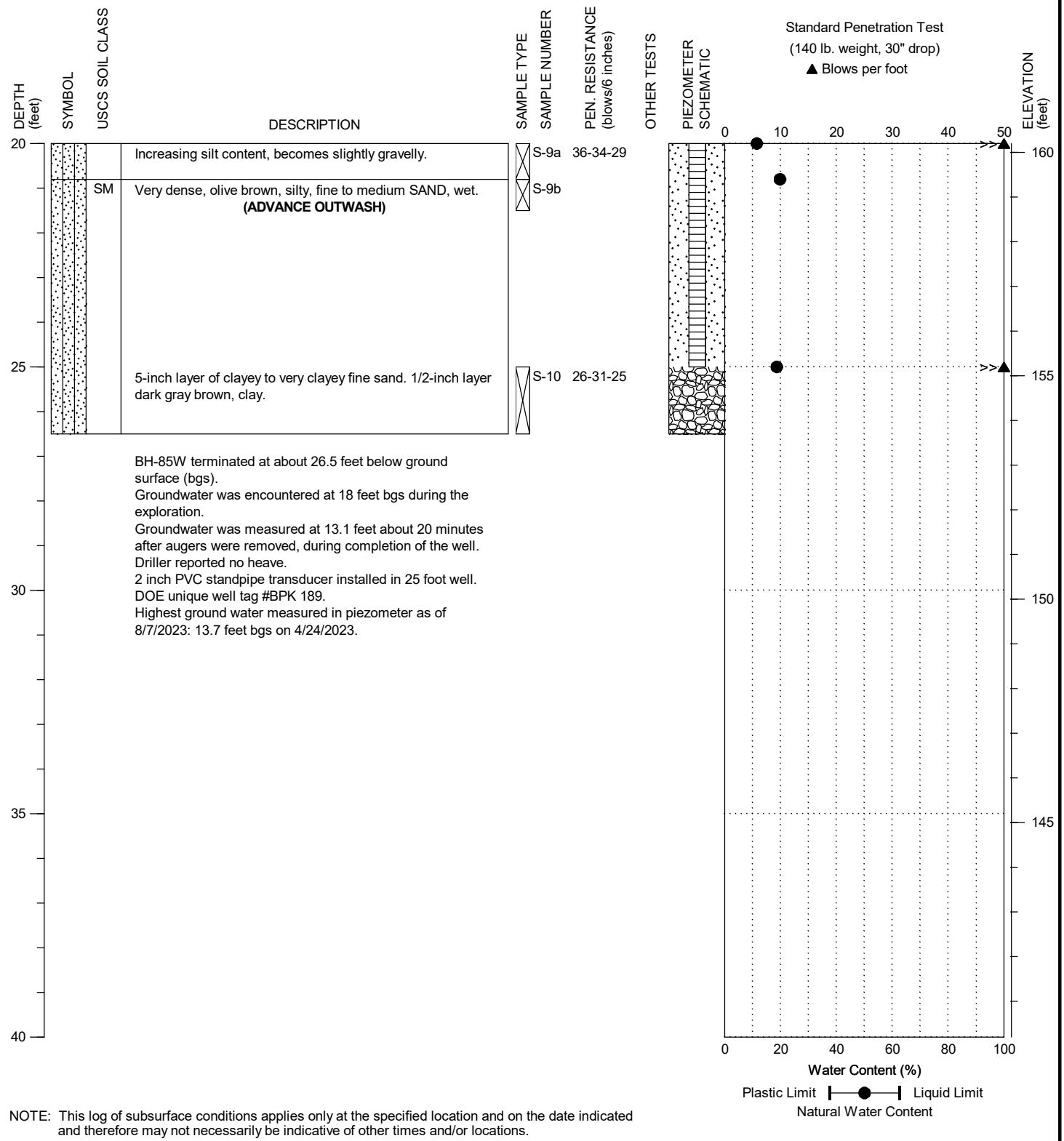
BORING:
BH-85W

PROJECT NO.: 2021-133-21 FIGURE: A-60

PZO-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich B-58 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 196+70; See Figure 2E

DATE STARTED: 8/19/2022
DATE COMPLETED: 8/19/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 180.2 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

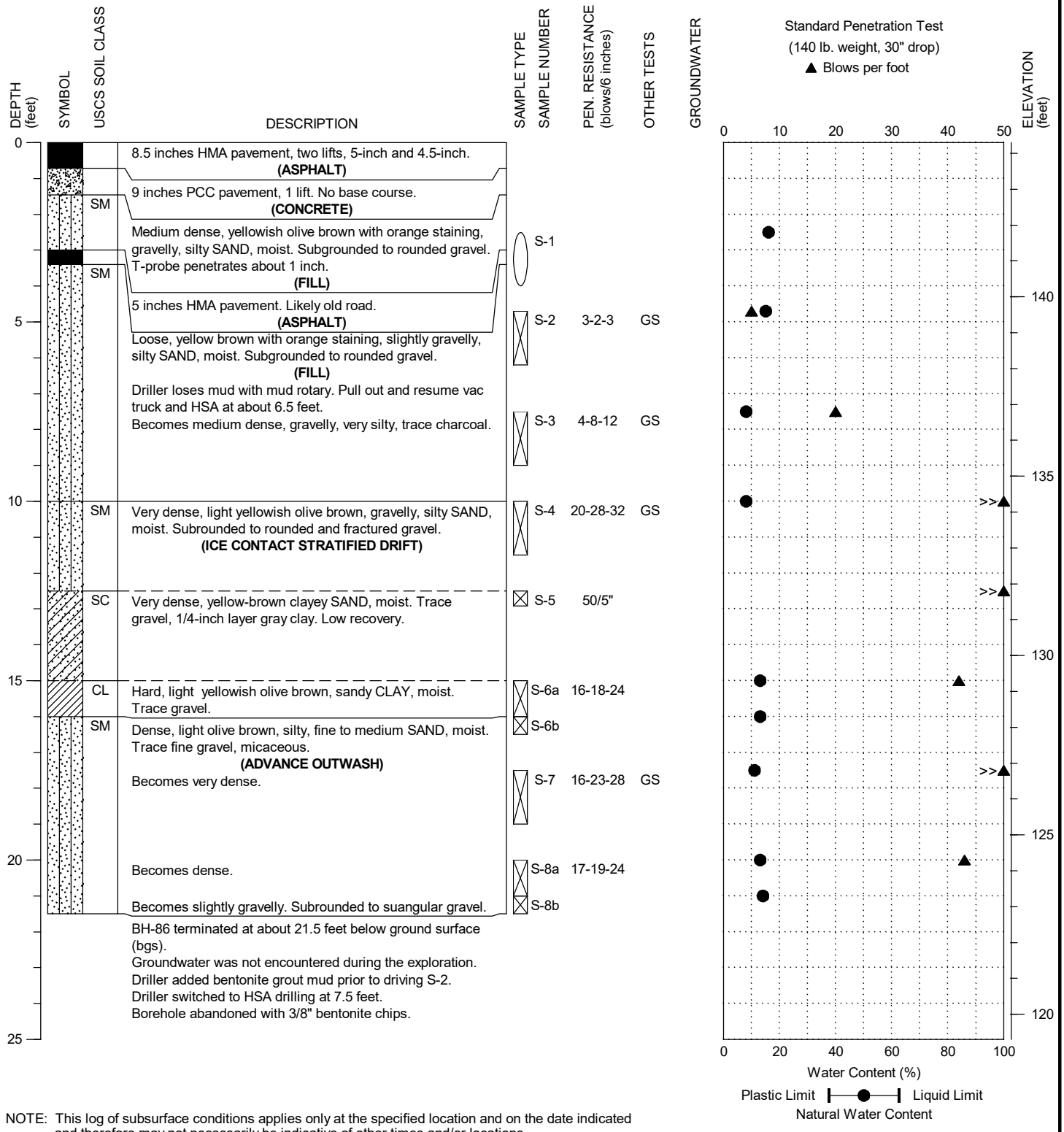
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-85W

PROJECT NO.: 2021-133-21 FIGURE: A-60

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Vac Truck, HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 207+05; See Figure 2F

DATE STARTED: 8/3/2022
DATE COMPLETED: 8/3/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 144.3 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

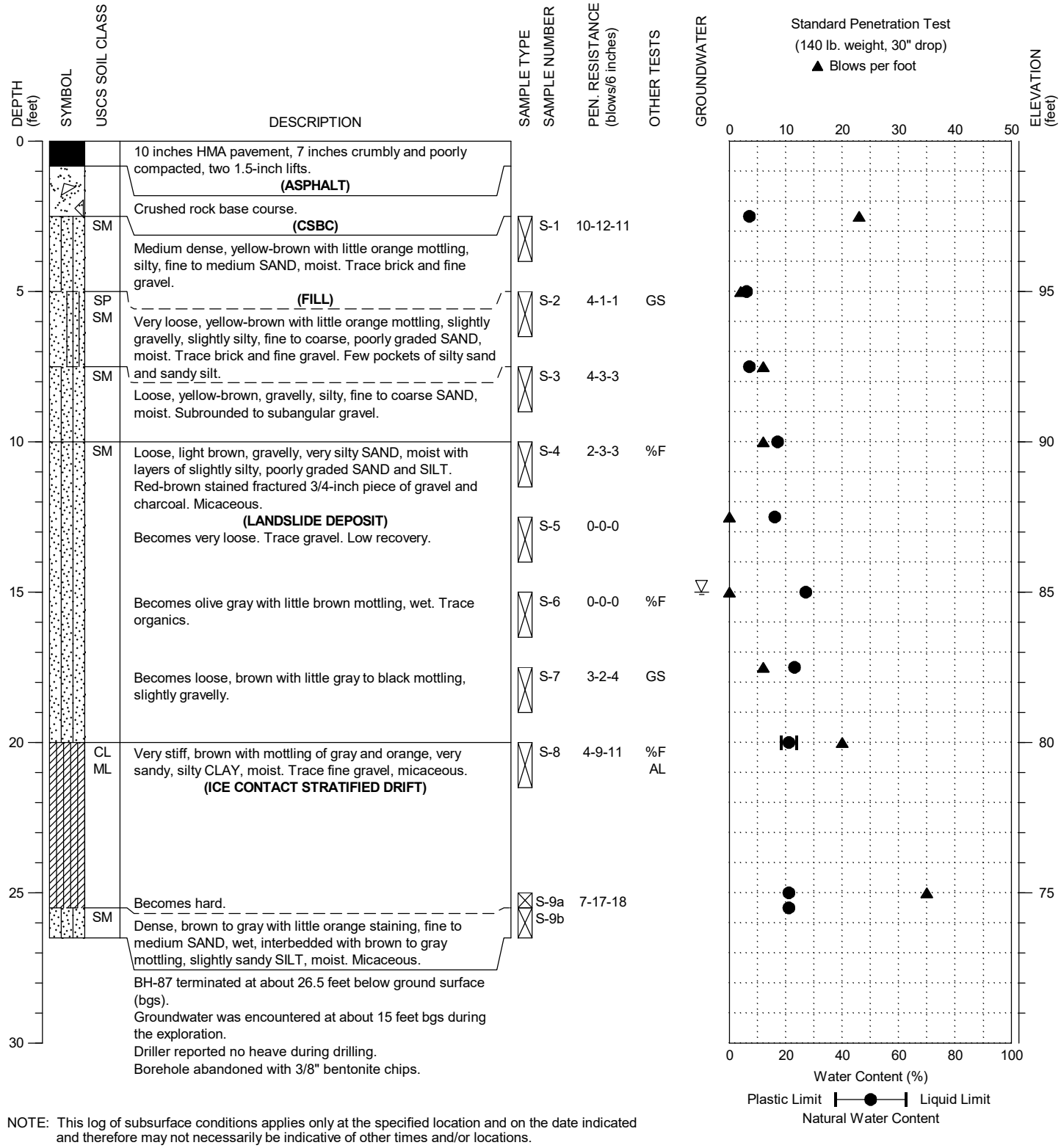
STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-86

PROJECT NO.: 2021-133-21 FIGURE: A-61

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-90 Truck Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 218+25; See Figure 2G

DATE STARTED: 7/28/2022
DATE COMPLETED: 7/28/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 100.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-87

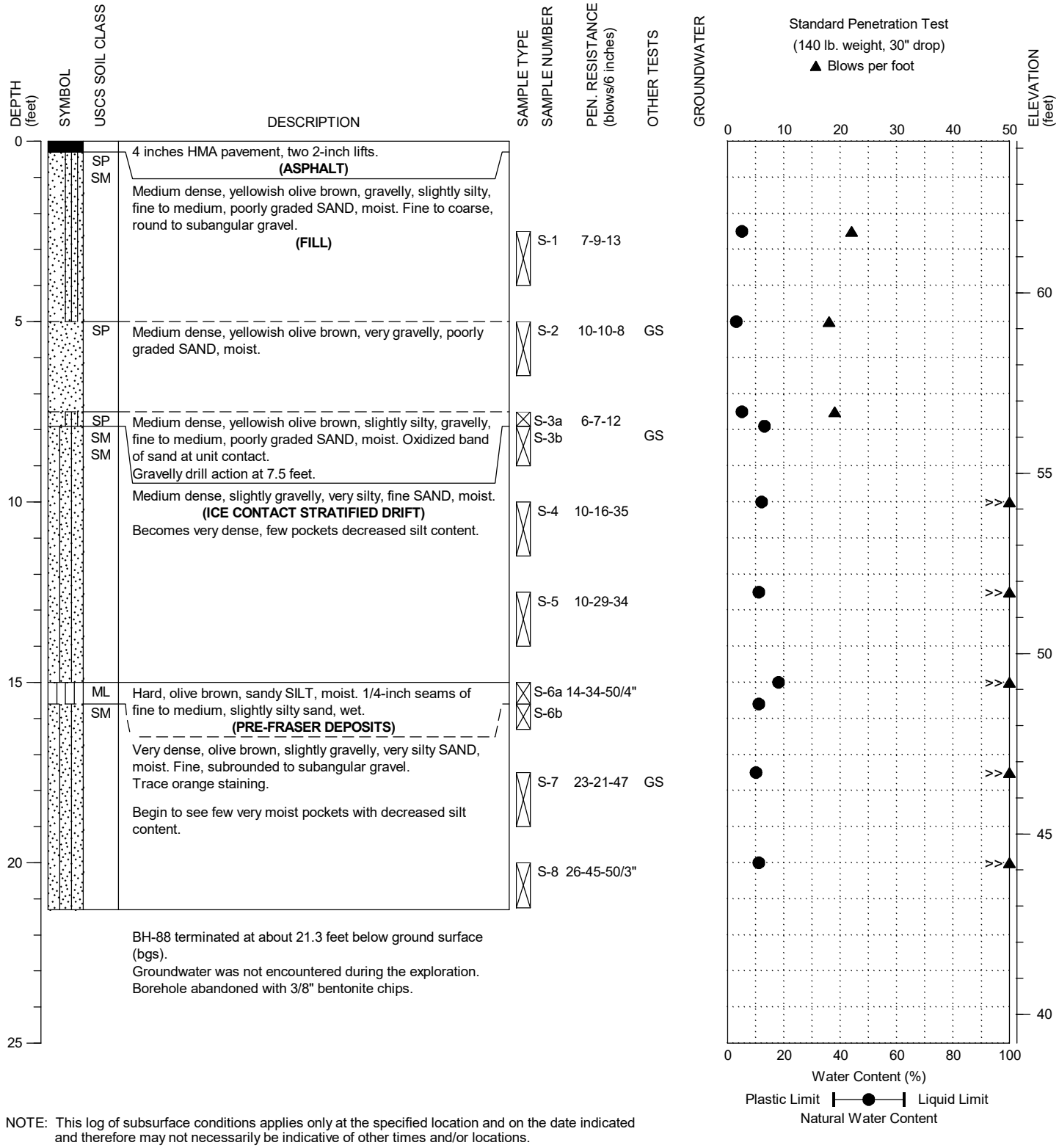
PAGE: 1 of 1

PROJECT NO.: 2021-133-21 FIGURE: A-62

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-50 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 225+15/R7 13+80; See Figure 2G

DATE STARTED: 12/12/2022
DATE COMPLETED: 12/12/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 64.2 ± feet



BH-88 terminated at about 21.3 feet below ground surface (bgs).
Groundwater was not encountered during the exploration.
Borehole abandoned with 3/8" bentonite chips.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING: BH-88

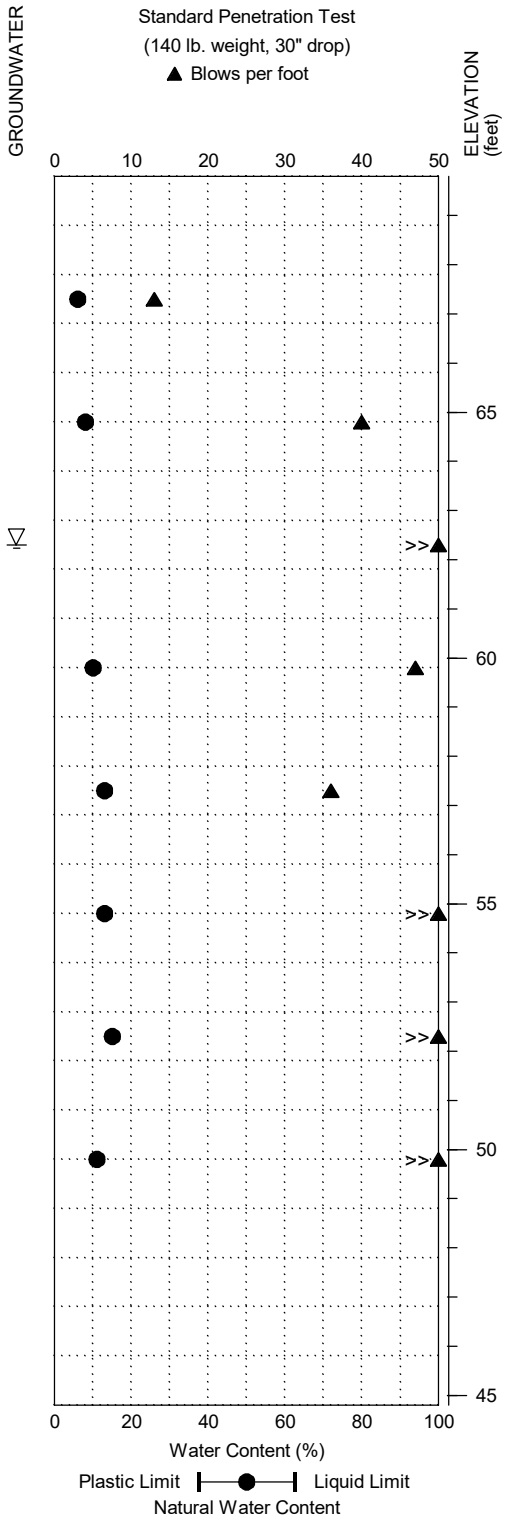
PROJECT NO.: 2021-133-21 FIGURE: A-63

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 229+90; See Figure 2H

DATE STARTED: 8/11/2022
DATE COMPLETED: 8/11/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 69.8 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SW SM	Encounter edge of former road. Part underlain by asphalt and concrete, part by just asphalt, resulting in variable thicknesses. 6.75 to 9.75 inches HMA pavement (two 4 inch lift, one 2.75 to 5.75 inch lifts. **(ASPHALT)**				
			10 inches PCC pavement, 1 lift. **(CONCRETE)**				
			Medium dense, light yellow brown with little orange staining, slightly silty, well-graded SAND, moist. **(FILL)**		S-1	7-7-6	GS
5		SW SM	Dense, yellowish olive brown, slightly silty, gravelly, well graded SAND, moist. Subrounded to subangular gravel. **(ICE CONTACT STRATIFIED DRIFT)**		S-2	9-18-22	GS
			Becomes very dense, sampler wet. No recovery.		S-3	50/6"	
10		GP GM	Dense, yellowish olive brown, slightly silty, very sandy, poorly graded GRAVEL, wet. Subangular to rounded gravel.		S-4	6-17-30	
		SM	Dense, olive brown, very silty, fine to medium SAND, wet. Trace fine, subrounded to subangular gravel.		S-5	13-14-22	GS
15			Becomes very dense. Some seams of clean sand.		S-6	22-27-28	
		ML	Hard, olive brown, very sandy SILT, wet. 2-inch layer clean, fine to medium sand at 15 feet.		S-7	20-40-50/6"	
20		SM	Very dense, olive brown, gravelly, silty SAND, wet. Fine to coarse, rounded to subangular gravel. 1-inch layer of clean sand in the shoe.		S-8	8-28-28	GS
25			BH-89 terminated at about 21.5 feet below ground surface (bgs). Groundwater was encountered at about 7.5 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.				

GROUNDWATER ▽



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

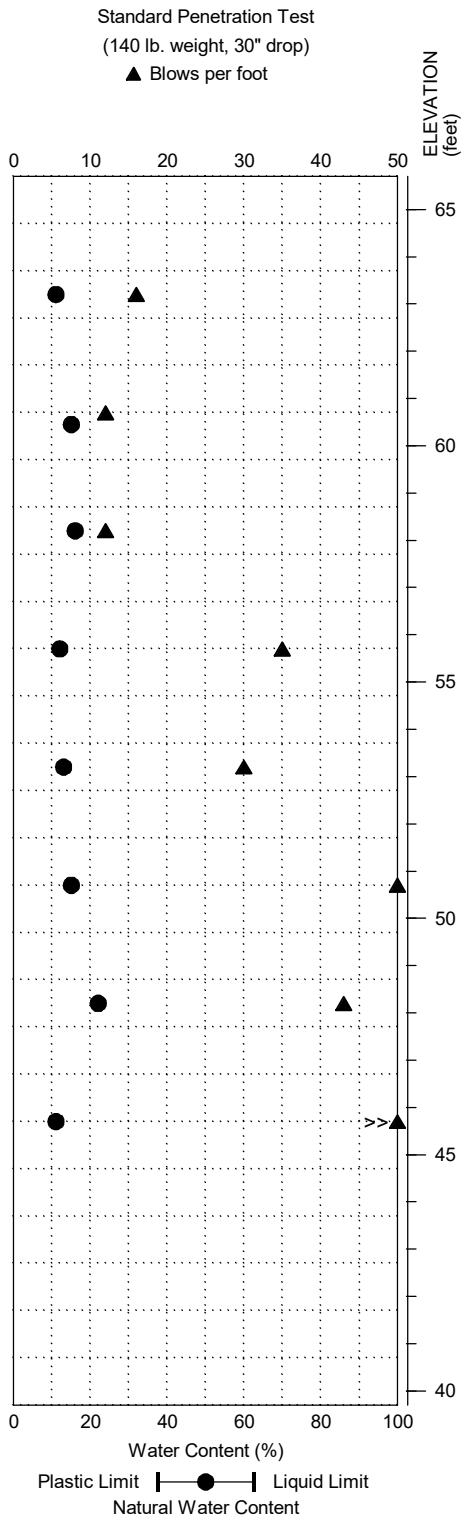
BORING:
BH-89

PROJECT NO.: 2021-133-21 FIGURE: A-64

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-70 Tracked Rig w/4.25" ID
SAMPLING METHOD: SPT w/Autohammer
LOCATION: Approximate station 231+55; See Figure 2H

DATE STARTED: 8/11/2022
DATE COMPLETED: 8/11/2022
LOGGED BY: A. Heinze Fry
SURFACE ELEVATION: 65.7 ± feet

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			6.5 to 9.75 inches HMA pavement (edge of old road), two to three 3.5 inch, 3 inch, and isolated 3.25 inch lifts. **(ASPHALT)**					
		SM	10 inches PCC pavement, 1 lift in half of core. **(CONCRETE)** Medium dense, yellow brown, silty, fine to coarse SAND, moist. 1-inch pocket of silt at 3.5 feet bgs. **(FILL)**		S-1	7-7-9	GS	
5		SM	Medium dense, yellowish olive brown with little orange staining, gravelly, very silty, fine to medium SAND, moist. Subrounded to rounded gravel. Slightly micaceous. **(ALLUVIUM)** Becomes wet at 5.75 feet bgs. Perched water. Becomes slightly gravelly. Few seams of clean sand.		S-2a S-2b	5-7-5	GS	▽
					S-3	4-5-7	%F	
10		SM	Dense, yellowish olive brown, gravelly, silty SAND, moist. Fine to coarse, subrounded to subangular gravel. **(ICE CONTACT STRATIFIED DRIFT)**		S-4	15-20-15		
			Gravel becomes fine.		S-5	10-15-15		▼
15		SM	Very dense, yellowish olive brown, silty SAND, moist. Trace gravel. **(GLACIAL TILL)**		S-6	7-20-30	GS	
			Becomes dense. Decreased silt content.		S-7	15-15-28		
20		SM	Increased silt content. Diamict appearance. Driller notes water coming up augers.		S-8	43-50/5"	GS	
			BH-90 terminated at about 20.9 feet below ground surface (bgs). Perched groundwater was encountered at about 5.75 feet bgs during the exploration. Borehole abandoned with 3/8" bentonite chips.					
25								



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

BORING:
BH-90

PROJECT NO.: 2021-133-21 FIGURE: A-65

BORING-DSM 2021-133-21 CUD 6.GPJ 4/9/24

Appendix B

LABORATORY TESTING

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-25,S-1a	1.3	1.8	11.7									SM	Dark brown, silty SAND with gravel
BH-25,S-1b	1.8	2.8	21.8									ML	Gray, SILT with sand
BH-25,S-2	2.8	4.3	21.1						5.4	32.3	62.3	ML	Dark yellowish-brown, sandy SILT
BH-25,S-3	5.0	6.5	25.0									CL	Light olive-brown, lean CLAY with sand
BH-25,S-4	7.5	9.0	27.4									CL	Light yellowish-brown, lean CLAY
BH-25,S-5	10.0	11.5	22.3									CL	Very dark gray, lean CLAY
BH-25,S-6a	12.5	13.7	20.2			48	23	25				CL	Dark gray, lean CLAY
BH-25,S-6b	13.7	14.0	15.0									CL	Very dark gray, lean CLAY
BH-25,S-7	15.0	16.5	28.3									CL	Dark gray, lean CLAY
BH-25,S-8	17.5	19.0	17.0			42	21	21			76.5	CL	Gray, lean CLAY with sand
BH-25,S-9	20.0	20.4	11.0									CL	Gray, sandy lean CLAY with gravel
BH-26,S-1	1.3	2.8	8.3									SM	Olive-brown, silty SAND with gravel
BH-26,S-2	3.0	4.5	22.1						11.0	28.3	60.7	ML	Yellowish-brown, SILT with sand
BH-26,S-3	5.0	6.5	5.4									SM	Dark yellowish-brown, silty SAND with gravel
BH-26,S-4	7.5	9.0	19.9									ML	Dark brown, sandy SILT
BH-26,S-5	10.0	11.5	25.5									SM	Very dark brown, silty SAND
BH-26,S-6a	12.5	12.9	27.1									CL	Light gray, lean CLAY with sand
BH-26,S-6b	12.9	14.0	17.8						4.6	79.1	16.3	SM	Dark olive-brown, silty SAND
BH-26,S-7a	15.0	16.0	10.8									SM	Dark brown, silty SAND with gravel
BH-26,S-7b	16.0	16.5	25.7									ML	Dark gray, SILT with sand

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-26,S-8	17.5	19.0	25.6									ML	Dark gray, SILT with sand
BH-26,S-9	20.0	21.5	34.2			53	22	31			97.8	CH	Dark gray, fat CLAY
BH-27,S-2	5.0	6.5	12.7						28.2	59.9	11.9	SW-SM	Dark brown, well-graded SAND with silt and gravel
BH-27,S-3	7.5	9.0	24.0									ML	Olive-brown, SILT with sand
BH-27,S-4	10.0	11.5	31.1			40	22	18			95.2	CL	Dark yellowish-brown, lean CLAY
BH-27,S-5	12.5	14.0	32.4			47	25	22			99.4	CL	Very dark gray, lean CLAY
BH-27,S-6	15.0	16.5	32.4									CL	Very dark gray, lean CLAY
BH-27,S-7	17.5	19.0	32.8									CL	Very dark gray, lean CLAY
BH-27,S-8	20.0	21.5	32.3									CL	Very dark gray, lean CLAY
BH-28,S-1	2.5	4.0	36.5			65	32	33			95.1	MH	Olive, elastic SILT
BH-28,S-2	5.0	6.5	30.9							2.4	97.6	MH	Olive, elastic SILT
BH-28,S-3	7.5	9.0	33.3									MH	Olive, elastic SILT
BH-28,S-4	10.0	11.5	36.7									CH	Very dark gray, fat CLAY
BH-28,S-5	12.5	14.0	34.5			51	24	27			99.7	CH	Very dark gray, fat CLAY
BH-28,S-6	15.0	16.5	32.4									CH	Very dark gray, fat CLAY
BH-28,S-7a	17.5	17.8	33.3									CH	Very dark gray, fat CLAY
BH-28,S-7b	17.8	18.4	24.7									ML	Very dark gray, SILT
BH-28,S-7c	18.4	19.0	32.9									CH	Very dark gray, fat CLAY
BH-28,S-8a	20.0	20.6	28.8									CH	Very dark gray, fat CLAY
BH-28,S-8b	20.6	20.9	4.0									SP-SM	Dark yellowish-brown, poorly graded SAND with silt and gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-28,S-9a	25.0	25.4	13.5									SM	Dark brown, silty SAND
BH-28,S-9b	25.4	26.5	20.3						3.4	31.4	65.2	ML	Brown, sandy SILT
BH-29,S-1	2.5	4.0	31.4									CL	Light yellowish-brown, lean CLAY
BH-29,S-2A	5.0	6.0	24.8									CL	Light olive-brown, lean CLAY
BH-29,S-2B	6.0	6.5	4.2						37.3	47.6	15.2	SM	Light olive-brown, silty SAND with gravel
BH-29,S-3	7.5	9.0	8.3									SM	Light olive-brown, silty SAND with gravel
BH-29,S-4	10.0	11.5	13.8						6.0	42.2	51.8	ML	Light olive-brown, sandy SILT
BH-29,S-5	15.0	16.5	17.3									ML	Light olive-brown, SILT with sand
BH-29,S-6	20.0	21.5	7.6									SM	Olive-brown, silty SAND
BH-29,S-7	25.0	26.5	6.0									SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-29,S-8	30.0	31.5	7.6							93.8	6.2	SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-29,S-9	35.0	36.5	21.9									SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-29,S-10	40.0	41.5	19.0									SP-SM	Very dark gray, poorly graded SAND with silt
BH-31,S-1	1.5	3.0	8.8									SM	Grayish-brown, silty SAND with gravel
BH-31,S-2	5.0	6.5	9.3									SM	Olive-brown, silty SAND
BH-31,S-3	10.0	11.5	11.1								28.8	SM	Olive-brown, silty SAND
BH-31,S-4	15.0	16.5	9.3								22.0	SM	Dark yellowish-brown, silty SAND
BH-31,S-5	20.0	21.5	9.4								32.3	SM	Olive-brown, silty SAND
BH-31,S-6	25.0	26.5	13.7								32.2	SM	Olive-brown, silty SAND
BH-31,S-7	30.0	31.5	14.7								48.0	SM	Light olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-31,S-8	35.0	36.5	15.8						3.6	69.0	27.4	SM	Very dark grayish-brown, silty SAND
BH-31,S-9c	41.0	41.5	22.1							91.2	8.8	SP-SM	Olive, poorly graded SAND with silt
BH-31,S-10a	45.0	46.2	26.1						0.3	95.2	4.5	SP	Very dark gray, poorly graded SAND
BH-31,S-10b	46.2	46.5	22.5								77.0	ML	Grayish-brown, SILT with sand
BH-31,S-11	50.0	51.5	27.7						0.7	41.7	57.6	ML	Olive, sandy SILT
BH-31,S-12a	55.0	55.9	31.8									CL	Dark gray, lean CLAY
BH-31,S-12b	55.9	56.5	26.0									SM	Dark gray, silty SAND
BH-31,S-13	60.0	61.5	29.5									CL	Dark gray, lean CLAY with sand
BH-31,S-14b	65.5	66.0	24.5			32	19	13			73.9	CL	Very dark gray, lean CLAY with sand
BH-31,S-15	70.0	71.5	29.9									CL	Dark gray, lean CLAY with sand
BH-36A,S-2	2.5	4.0	19.0									SM	Strong brown, silty SAND with gravel
BH-36A,S-3	5.0	6.5	13.6								45.6	SM	Dark yellowish-brown, silty SAND
BH-36A,S-4	7.5	8.0	6.5									SM	Dark brown, silty SAND
BH-36A,S-5	10.0	11.5	9.9									SM	Olive-brown, silty SAND
BH-36A,S-6a	12.5	13.0	14.9									SM	Olive-brown, silty SAND
BH-36A,S-6b	13.0	14.0	18.8			32	18	14				CL	Olive-brown, lean CLAY
BH-36A,S-7	15.0	15.9	7.6									SM	Olive-brown, silty SAND with gravel
BH-36A,S-8	17.5	18.3	8.2									SM	Olive-brown, silty SAND
BH-36A,S-9	20.0	20.3	7.1									SM	Dark gray, silty SAND
BH-36A,S-10a	25.0	25.8	10.1									SM	Very dark gray, silty SAND with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-36A,S-10b	25.8	26.5	16.0									SM	Very dark gray, silty SAND
BH-36A,S-11	30.0	31.5	26.6						0.3	95.0	4.7	SP	Very dark gray, poorly graded SAND
BH-36A,S-12	35.0	36.5	16.6									SM	Dark gray, silty SAND
BH-36B,S-2	2.5	4.0	5.1						35.3	42.7	21.9	SM	Light olive-brown, silty SAND with gravel
BH-36B,S-3	4.0	5.0	6.5									SM	Pale yellow, silty SAND
BH-37,S-1	2.5	4.0	11.7									SM	Olive-brown, silty SAND
BH-37,S-2	5.0	6.5	18.0									SM	Light olive-brown, silty SAND
BH-37,S-3	7.5	9.0	23.1								20.7	SM	Dark olive-gray, silty SAND
BH-37,S-4	10.0	11.5	24.6								16.9	SM	Dark olive-gray, silty SAND
BH-37,S-5	12.5	14.0	24.0						0.2	84.1	15.7	SM	Dark gray, silty SAND
BH-37,S-6	15.0	16.5	24.0									SM	Dark olive-gray, silty SAND
BH-37,S-7	17.5	19.0	23.1									SM	Dark olive-gray, silty SAND
BH-37,S-8	20.0	21.5	22.9									SM	Dark olive-gray, silty SAND
BH-37,S-9	25.0	26.5	23.4							86.3	13.7	SM	Dark gray, silty SAND
BH-37,S-10a	30.0	31.0	23.1									SM	Dark gray, silty SAND
BH-37,S-10b	31.0	31.5	28.4								93.7	ML	Dark olive-brown, SILT
BH-37,S-11	35.0	36.5	21.9								42.7	SM	Dark gray, silty SAND
BH-37,S-12	40.0	40.8	26.5			38	25	13				ML	Very dark gray, SILT
BH-37,S-13a	45.0	45.8	30.2									ML	Dark gray, SILT
BH-37,S-13b	45.8	46.5	26.5									ML	Very dark gray, sandy SILT

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-37,S-14a	50.0	51.0	34.8									CL	Dark gray, lean CLAY
BH-37,S-14b	51.0	51.5	35.0									CL	Dark gray, lean CLAY
BH-39,S-1	2.5	4.0	12.2									SM	Olive-gray, silty SAND with gravel
BH-39,S-2	5.0	6.5	17.9									SM	Olive-gray, silty SAND
BH-39,S-3	7.5	9.0	24.0									SM	Olive-gray, silty SAND
BH-39,S-4	10.0	11.5	23.3							83.1	16.9	SM	Dark brown, silty SAND
BH-39,S-5	12.5	14.0	20.3									SM	Olive-gray, silty SAND
BH-39,S-6	15.0	16.5	24.1									SM	Dark olive-gray, silty SAND
BH-39,S-7	17.5	19.0	21.4									SM	Dark olive-gray, silty SAND
BH-39,S-8	20.0	21.5	20.0									SM	Dark olive-gray, silty SAND
BH-39,S-9	25.0	26.5	21.8									SM	Dark olive-brown, silty SAND
BH-39,S-10	30.0	31.5	29.7							9.8	90.2	ML	Grayish-brown, SILT
BH-39,S-11	35.0	36.5	23.9									ML	Dark gray, SILT with sand
BH-39,S-12a	40.0	40.8	27.4									ML	Very dark gray, SILT
BH-39,S-12b	40.8	41.5	25.0			48	30	18			96.0	ML	Dark gray, SILT
BH-39,S-13	45.0	46.5	30.7									ML	Very dark gray, SILT
BH-39,S-14	50.0	51.5	24.3									ML	Very dark gray, SILT with sand
BH-41,S-1	2.5	4.0	19.6									SM	Olive-gray, silty SAND
BH-41,S-2	5.0	6.5	18.3									SM	Olive-gray, silty SAND
BH-41,S-3	7.5	9.0	27.2									SM	Olive-gray, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-41,S-4	10.0	11.5	25.1									SM	Dark olive-gray, silty SAND
BH-41,S-5	12.5	14.0	22.2							59.4	40.6	SM	Olive-brown, silty SAND
BH-41,S-6	15.0	16.5	20.9									SM	Olive-gray, silty SAND
BH-41,S-7	17.5	19.0	22.2							87.4	12.6	SM	Olive-brown, silty SAND
BH-41,S-8	20.0	21.5	29.7			35	24	11			90.7	CL	Olive-brown, lean CLAY
BH-41,S-9	25.0	26.5	34.8									CL	Very dark gray, lean CLAY
BH-41,S-10	30.0	31.5	35.0			38	24	14			97.2	CL	Very dark gray, lean CLAY
BH-41,S-11	35.0	36.5	25.9									ML	Dark gray, SILT with sand
BH-41,S-12	40.0	41.5	26.5									ML	Dark gray, SILT with sand
BH-41,S-13	45.0	46.5	25.9									ML	Dark gray, SILT
BH-41,S-14	50.0	51.5	26.7									ML	Very dark gray, SILT
BH-42,S-1	2.5	4.0	14.2									SM	Dark yellowish-brown, silty SAND
BH-42,S-2	4.0	5.5	16.6						0.2	28.1	71.7	ML	Yellowish-brown, SILT with sand
BH-43,S-1	2.5	4.0	11.8									SM	Light olive-brown, silty SAND with gravel
BH-43,S-2	5.0	6.5	12.8									SM	Light olive-brown, silty SAND
BH-43,S-3	7.5	9.0	15.5									SM	Light olive-brown, silty SAND with gravel
BH-43,S-5	12.5	14.0	16.4									SM	Olive-brown, silty SAND
BH-43,S-6	15.0	16.5	13.6						10.8	52.3	36.9	SM	Grayish-brown, silty SAND
BH-43,S-7	17.5	19.0	19.0									ML	Light yellowish-brown, sandy SILT
BH-43,S-8	20.0	21.5	14.2			20	12	8			65.4	CL	Very dark gray, sandy lean CLAY

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-43,S-9	25.0	26.5	20.2							86.5	13.5	SM	Very dark grayish-brown, silty SAND
BH-43,S-10	30.0	31.5	26.2									SM	Dark olive-brown, sitly SAND
BH-43,S-11	35.0	36.5	26.2						10.0	21.1	68.9	ML	Dark gray, SILT with sand
BH-43,S-12	40.0	41.5	34.8			40	26	14			98.7	ML	Gray, SILT
BH-43,S-13	45.0	46.5	29.1									ML	Very dark gray, SILT
BH-43,S-14	50.0	51.5	19.4									SM	Very dark gray, silty SAND
BH-45,S-1	2.5	4.0	13.3									ML	Light olive-brown, sandy SILT
BH-45,S-2	5.0	6.5	8.4									SM	Light olive-brown, silty SAND with gravel
BH-45,S-4	10.0	11.5	18.1						1.1	77.0	21.9	SM	Dark grayish-brown, silty SAND
BH-45,S-5	12.5	14.0	22.1									SM	Dark olive-brown, silty SAND
BH-45,S-6a	15.0	15.8	21.1									SM	Very dark gray, silty SAND
BH-45,S-6b	15.8	16.5	28.7									CL	Light yellowish-brown, lean CLAY
BH-45,S-7a	17.5	18.5	26.7			41	25	16			75.6	CL	Gray, lean CLAY with sand
BH-45,S-7b	18.5	19.0	23.7									ML	Very dark gray, SILT
BH-45,S-8a	20.0	20.8	25.1						0.5	25.6	73.9	ML	Dark olive-gray, SILT with sand
BH-45,S-8b	20.8	21.5	33.8									ML	Gray, SILT with sand
BH-45,S-9	25.0	26.5	32.0									CL	Very dark gray, lean CLAY
BH-45,S-10	30.0	31.5	29.2			35	24	11			83.0	CL	Dark gray, lean CLAY with sand
BH-45,S-11	35.0	36.5	29.6									SM	Very dark gray, silty SAND
BH-45,S-12	40.0	41.5	24.1							21.2	78.8	ML	Very dark gray, SILT with sand

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-45,S-13	45.0	46.5	20.3									SM	Very dark gray, silty SAND
BH-45,S-14	50.0	51.5	22.2									SM	Very dark gray, silty SAND
BH-45,S-15	55.0	56.5	26.4									SM	Dark gray, silty SAND
BH-46W,S-1	2.5	4.0	15.5						3.4	55.5	41.1	SM	Dark yellowish-brown, silty SAND
BH-46W,S-2	5.0	6.5	7.6									SM	Yellowish-brown, silty SAND
BH-46W,S-3	7.5	9.0	15.7								25.5	SM	Dark brown, silty SAND
BH-46W,S-4b	10.8	11.5	22.9									ML	Dark olive-brown, sandy SILT
BH-46W,S-6	15.0	16.5	20.3								27.1	SM	Dark olive-brown, silty SAND
BH-46W,S-7	17.5	19.0	32.3			54	28	26				CH	Dark grayish-brown, fat CLAY
BH-46W,S-8a	20.0	20.8	21.0									ML	Gray, SILT
BH-46W,S-8b	20.8	21.5	26.4							8.8	91.2	ML	Olive-gray, SILT
BH-46W,S-9	25.0	26.5	28.8									ML	Olive-brown, SILT with sand
BH-46W,S-10	30.0	31.5	26.2									ML	Olive, SILT with sand
BH-46W,S-11	35.0	36.5	31.4									CL	Gray, lean CLAY with sand
BH-46W,S-12	40.0	41.5	29.7			35	24	11				CL	Dark gray, lean CLAY
BH-46W,S-13	45.0	46.5	25.6									ML	Very dark gray, SILT with sand
BH-46W,S-14	50.0	51.5	30.7			31	21	10				CL	Very dark gray, lean CLAY with sand
BH-47,S-1	0.3	1.8	14.8									SM	Brown, silty SAND
BH-47,S-2	2.5	4.0	15.2									SM	Dark yellowish-brown, silty SAND
BH-47,S-3	5.0	6.5	12.6									SM	Dark yellowish-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-47,S-4	10.0	11.5	12.3						15.8	48.1	36.1	SM	Olive-brown, silty SAND with gravel
BH-47,S-5	12.5	13.4	17.4									SM	Olive-brown, silty SAND
BH-47,S-6	15.0	16.3	15.5									SM	Olive-brown, silty SAND
BH-47,S-7	17.5	18.5	13.0									SM	Dark grayish-brown, silty SAND
BH-47,S-8	20.0	21.5	14.4									SM	Very dark gray, silty SAND
BH-47,S-9	25.0	26.0	12.1									SM	Olive-brown, silty SAND
BH-47,S-10a	30.0	30.5	18.0									SM	Olive-brown, silty SAND
BH-47,S-10b	30.5	31.5	19.3									SM	Light olive-brown, silty SAND
BH-47,S-11a	35.0	35.5	20.9									SM	Olive-brown, silty SAND
BH-47,S-11b	35.5	36.5	26.7			36	21	15			68.2	CL	Dark gray, sandy lean CLAY
BH-48A,S-1	0.0	1.5	3.5									SM	Light olive-brown, silty SAND with gravel
BH-48A,S-3	5.0	6.5	17.9									SM	Light olive-brown, silty SAND
BH-48A,S-4	7.5	9.0	10.6									SM	Olive-gray, silty SAND
BH-48A,S-5	10.0	11.5	11.3						8.5	59.8	31.6	SM	Olive-brown, silty SAND
BH-48B,S-1b	0.7	1.5	6.9									SM	Light yellowish-brown, silty SAND
BH-48B,S-2	2.5	4.0	9.6									SM	Olive-brown, silty SAND with gravel
BH-48B,S-3a	5.0	6.0	17.6									SM	Light yellowish-brown, silty SAND
BH-48B,S-3b	6.0	6.5	9.7									SM	Light brownish-gray, silty SAND with gravel
BH-48B,S-4	7.5	9.0	14.7									SM	Olive-brown, silty SAND
BH-48B,S-5a	10.0	10.8	23.4									SM	Olive-gray, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-48B,S-5b	10.8	11.5	14.4									SM	Olive-gray, silty SAND
BH-48B,S-6	12.5	14.0	12.5							90.8	9.2	SP-SM	Olive-gray, poorly graded SAND with silt
BH-48B,S-7	15.0	16.5	23.5									SM	Dark olive-gray, silty SAND
BH-48B,S-8	20.0	21.0	18.6									SM	Olive-gray, silty SAND
BH-48B,S-8'	21.0	21.5	33.3			36	21	15				CL	Olive-gray, lean CLAY with sand
BH-48B,S-9a	25.0	25.5	33.5			51	27	24				CH	Gray, fat CLAY
BH-48B,S-9b	25.5	26.5	31.3			39	25	14				CL	Olive-gray, lean CLAY
BH-48B,S-10	30.0	31.5	34.5			43	25	18				CL	Olive-gray, lean CLAY with sand
BH-48B,S-12	40.0	41.5	26.4							73.4	26.6	SM	Olive, silty SAND
BH-49,S-1	2.5	4.0	14.5									SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-49,S-2	5.0	6.5	23.1									SM	Very dark grayish-brown, silty SAND
BH-49,S-3	7.5	9.0	24.1							71.5	28.5	SM	Very dark gray, silty SAND
BH-49,S-4	10.0	11.5	28.6			32	22	10			82.5	CL	Very dark gray, lean CLAY with sand
BH-49,S-5a	12.5	13.0	22.6									SM	Very dark gray, silty SAND
BH-49,S-5b	13.0	14.0	36.8									ML	Dark gray, SILT with sand
BH-49,S-6	15.0	16.5	26.5						1.0	39.4	59.6	ML	Dark gray, sandy SILT
BH-49,S-7	17.5	19.0	25.0									ML	Very dark gray, SILT with sand
BH-49,S-8	20.0	21.5	19.0									SP-SM	Dark olive-gray, poorly graded SAND with silt
BH-49,S-9	25.0	26.5	24.4						0.2	90.2	9.6	SP-SM	Dark gray, poorly graded SAND with silt
BH-49,S-10	30.0	31.5	23.5									SP-SM	Very dark gray, poorly graded SAND with silt

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-49,S-11a	35.0	35.8	22.0									SP-SM	Dark grayish-brown, poorly graded SAND with silt
BH-49,S-11b	35.8	36.5	36.2			37	23	14			88.5	CL	Gray, lean CLAY
BH-49,S-12	40.0	41.5	28.3									ML	Dark gray, SILT with sand
BH-49,S-13a	45.0	46.0	21.0									SM	Very dark gray, silty SAND
BH-49,S-13b	46.0	46.4	46.9									ML	Very dark brown, SILT with sand
BH-50,S-1b	0.8	1.5	25.5									ML	Very dark grayish-brown, SILT with sand
BH-50,S-2	2.5	4.0	24.9			20	16	4	4.8	55.9	39.3	SM	Olive-brown, silty SAND
BH-50,S-3	5.0	6.5	27.2									SM	Very dark grayish-brown, silty SAND
BH-50,S-4	7.5	9.0	20.0									SM	Dark olive-brown, silty SAND
BH-50,S-5	10.0	11.5	18.1									ML	Dark grayish-brown, SILT with sand
BH-50,S-6	12.5	14.0	26.1			29	18	11			56.6	CL	Olive, sandy lean CLAY
BH-50,S-7a	15.0	16.2	24.8									SM	Dark gray, silty SAND
BH-50,S-7b	16.2	16.5	25.3									ML	Dark gray, SILT with sand
BH-50,S-8	17.5	19.0	21.1									ML	Very dark gray, sandy SILT
BH-50,S-9	20.0	21.5	23.5							45.1	54.9	ML	Dark gray, sandy SILT
BH-50,S-10	25.0	26.5	26.2			41	27	14			80.8	ML	Dark gray, SILT with sand
BH-50,S-11	30.0	31.5	29.8									ML	Dark gray, sandy SILT
BH-50,S-12	35.0	36.5	21.1									SP-SM	Very dark gray, poorly graded SAND with silt
BH-51,S-1	2.5	4.0	29.2									ML	Olive, SILT with sand
BH-51,S-2	5.0	6.5	26.2									ML	Olive-brown, SILT with sand

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-51,S-3	7.5	9.0	26.4							70.6	29.4	SM	Olive-brown, silty SAND
BH-51,S-4a	10.0	11.1	21.9									SM	Dark olive-brown, silty SAND
BH-51,S-4b	11.1	11.5	31.5									ML	Very dark grayish-brown, SILT with sand
BH-51,S-5	12.5	14.0	27.7									ML	Dark gray, sandy SILT
BH-51,S-6	15.0	16.5	29.4			34	23	11			91.9	CL	Dark gray, lean CLAY
BH-51,S-7a	17.5	18.0	31.0									ML	Dark gray, SILT
BH-51,S-7b	18.0	19.0	27.8									SM	Very dark gray, silty SAND
BH-51,S-8	20.0	21.5	28.9							21.1	78.9	ML	Very dark gray, SILT with sand
BH-51,S-9	25.0	26.5	30.5									ML	Dark gray, sandy SILT
BH-51,S-10	30.0	31.5	32.0			39	28	11		3.9	96.1	ML	Very dark gray, SILT
BH-51,S-11	35.0	36.5	32.6									ML	Dark gray, SILT with sand
BH-51,S-13a	45.0	45.3	58.5										Dark brown, PEAT
BH-51,S-13b	45.3	46.5	23.7							51.2	48.8	SM	Very dark gray, silty SAND
BH-51,S-14	50.0	51.5	27.8									ML	Dark gray, sandy SILT
BH-52A,S-1b	2.7	4.0	23.4									SM	Light olive-brown, silty SAND
BH-52A,S-2a	5.0	6.0	26.8							26.1	73.9	ML	Light olive-brown, SILT with sand
BH-52A,S-2b	6.0	6.5	25.0								68.4	CL	Light olive-brown, sandy lean CLAY
BH-52B,S-1	2.5	4.0	7.6									SP-SM	Olive-brown, poorly graded SAND with silt
BH-52B,S-2	5.0	6.5	16.8									SM	Olive-brown, silty SAND
BH-52B,S-3a	7.5	8.5	19.3									CL	Light olive-brown, sandy lean CLAY

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-52B,S-3b	8.5	9.0	15.9									CL	Olive-brown, sandy lean CLAY
BH-52B,S-4	10.0	11.5	20.0			29	19	10	12.5	26.8	60.6	CL	Light olive-brown, lean CLAY with sand
BH-53,S-2	5.0	6.5	25.0									ML	Light olive-brown, SILT with sand
BH-53,S-3	7.5	9.0	20.6									SM	Olive-brown, silty SAND
BH-53,S-4	10.0	11.5	22.8									ML	Light olive-brown, SILT with sand
BH-53,S-5a	12.5	13.5	20.6						0.8	42.3	56.9	ML	Olive, sandy SILT
BH-53,S-5b	13.5	14.0	19.4									SM	Olive-gray, silty SAND
BH-53,S-6a	15.0	15.8	18.7						2.4	63.1	34.5	SM	Olive, silty SAND
BH-53,S-6b	15.8	16.5	22.3			24	19	5			72.8	CL-ML	Olive-gray, silty CLAY with sand
BH-53,S-7	17.5	19.0	22.1									CL-ML	Olive-gray, silty CLAY with sand
BH-53,S-8	20.0	21.5	24.2							30.8	69.2	CL-ML	Olive, silty CLAY with sand
BH-53,S-9	25.0	26.5	27.0									SM	Very dark gray, silty SAND
BH-53,S-10	30.0	31.5	22.0									SM	Very dark gray, silty SAND
BH-53,S-11	35.0	36.5	18.6									SP-SM	Very dark gray, poorly graded SAND with silt
BH-53,S-12	40.0	41.5	19.1						11.1	53.0	35.9	SM	Very dark gray, silty SAND
BH-53,S-13	45.0	46.5	25.9			28	22	6			89.0	CL-ML	Very dark gray, silty CLAY
BH-53,S-14	50.0	51.0	10.9									SP-SM	Very dark gray, poorly graded SAND with silt
BH-54A,S-1	2.5	4.0	7.3									SP-SM	Dark brown, poorly graded SAND with silt
BH-54A,S-2	5.0	6.5	9.8									SP-SM	Dark olive-brown, poorly graded SAND with silt and gravel
BH-54A,S-3	7.5	9.0	18.5						3.6	39.7	56.6	ML	Olive-brown, sandy SILT

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-54A,S-4a	10.0	10.5	13.9									ML	Olive-brown, sandy SILT
BH-54A,S-4b	10.5	11.5	21.0			32	21	11			83.6	CL	Yellowish-brown, lean CLAY with sand
BH-54B,S-3	5.0	6.5	3.9									SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-54B,S-4	7.5	9.0	5.5						0.3	94.8	4.9	SP	Dark yellowish-brown, poorly graded SAND
BH-54B,S-5	10.0	10.9	23.3									SP-SM	Brown, poorly graded SAND with silt
BH-55W,S-1	2.5	4.0	17.2									ML	Dark grayish-brown, sandy SILT
BH-55W,S-2	5.0	6.5	16.8									ML	Olive-brown, sandy SILT
BH-55W,S-3	7.5	9.0	21.0						0.6	20.8	78.5	ML	Olive, SILT with sand
BH-55W,S-4	10.0	11.0	24.8									ML	Dark olive-brown, sandy SILT
BH-55W,S-6	15.0	16.5	30.3									ML	Very dark grayish-brown, SILT with sand
BH-55W,S-7	17.5	19.0	25.8			35	27	8			87.8	ML	Very dark gray, SILT
BH-55W,S-9	25.0	26.5	27.4			37	26	11				ML	Very dark gray, SILT
BH-55W,S-11a	35.0	35.8	30.4									ML	Very dark gray, SILT
BH-55W,S-11b	35.8	36.5	25.2									ML	Very dark gray, sandy SILT
BH-55W,S-12	40.0	41.0	19.1							85.1	14.9	SM	Olive-gray, silty SAND
BH-55W,S-13a	45.0	45.8	24.0									ML	Very dark gray, SILT
BH-55W,S-13b	45.8	46.5	34.2			31	25	6				ML	Very dark gray, SILT
BH-55W,S-14	50.0	51.5	28.8									ML	Very dark gray, SILT
BH-56,S-1	2.5	4.0	4.7									SP-SM	Light olive-brown, poorly graded SAND with silt
BH-56,S-2	5.0	6.5	12.7									SM	Olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-56,S-3	7.5	9.0	5.1						10.5	86.6	2.9	SP	Olive-brown, poorly graded SAND
BH-56,S-4a	10.0	11.2	5.0									SP	Olive-brown, poorly graded SAND with gravel
BH-56,S-4b	11.2	11.5	12.1									SM	Olive-brown, silty SAND
BH-56,S-5	12.5	13.9	16.4						3.6	41.5	54.8	ML	Olive-brown, sandy SILT
BH-57,S-1	2.5	4.0	6.2									SP-SM	Olive, poorly graded SAND with silt
BH-57,S-2a	5.0	6.5	17.0									SP-SM	Olive, poorly graded SAND with silt
BH-57,S-3	7.5	8.9	14.9						1.2	45.0	53.8	ML	Olive-brown, sandy SILT
BH-57,S-5	12.5	14.0	18.9									SM	Olive, silty SAND
BH-57,S-6	15.0	16.5	23.2									SM	Olive, silty SAND
BH-57,S-7	17.5	19.0	25.8									SM	Olive, silty SAND
BH-57,S-8	20.0	21.5	20.3									SM	Olive, silty SAND
BH-57,S-9	25.0	26.5	17.8						2.6	62.1	35.3	SM	Olive-gray, silty SAND
BH-57,S-10	30.0	31.5	19.1									SM	Olive, silty SAND
BH-57,S-11	35.0	36.5	30.5			53	29	24			84.1	MH	Olive, elastic SILT with sand
BH-57,S-12	40.0	41.5	22.7						1.1	63.9	35.0	SM	Olive, silty SAND
BH-57,S-13	45.0	46.5	22.5								73.1	ML	Dark gray, SILT with sand
BH-57,S-14	50.0	51.5	23.9									ML	Olive, SILT
BH-58,S-1	2.5	4.0	24.1									SM	Dark yellowish-brown, silty SAND
BH-58,S-2	5.0	6.5	14.0						30.2	65.8	4.0	SP	Olive-brown, poorly graded SAND with gravel
BH-58,S-3	7.5	9.0	15.0									SP-SM	Dark grayish-brown, poorly graded SAND with silt

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-58,S-5	12.5	14.0	18.4									ML	Grayish-brown, SILT with sand
BH-58,S-6	15.0	16.5	18.5						8.4	61.2	30.4	SM	Olive-brown, silty SAND
BH-58,S-7	17.5	18.9	19.2									ML	Grayish-brown, sandy SILT
BH-58,S-8	20.0	21.5	21.4									ML	Grayish-brown, sandy SILT
BH-58,S-9a	25.0	25.5	19.3									ML	Grayish-brown, sandy SILT
BH-58,S-9b	25.5	26.5	19.8						0.2	65.9	33.9	SM	Olive-brown, silty SAND
BH-58,S-10a	30.0	31.0	27.0								67.2	ML	Light olive-brown, sandy SILT
BH-58,S-10b	31.0	31.3	22.2									ML	Dark yellowish-brown, sandy SILT
BH-58,S-10c	31.3	31.5	26.7									ML	Olive-gray, SILT
BH-58,S-11	35.0	36.5	18.9									SM	Light olive-brown, silty SAND
BH-58,S-12a	40.0	41.0	23.5									ML	Dark grayish-brown, SILT with sand
BH-58,S-12b	41.0	41.5	35.2			40	33	7			93.3	ML	Very dark grayish-brown, SILT
BH-58,S-13a	45.0	46.0	25.0								75.9	ML	Olive-brown, SILT with sand
BH-58,S-13b	46.0	46.5	18.4						5.5	75.3	19.2	SM	Olive-brown, silty SAND
BH-58,S-14a	50.0	51.2	29.0									ML	Very dark gray, SILT
BH-58,S-14b	51.2	51.5	39.4									ML	Very dark grayish-brown, SILT
BH-60,S-1	2.5	4.0	9.0									SP-SM	Dark yellowish-brown, poorly graded SAND with silt and gravel
BH-60,S-2	5.0	6.5	9.9						5.3	88.1	6.5	SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-60,S-3	10.0	11.5	11.2									SM	Dark yellowish-brown, silty SAND with gravel
BH-60,S-4	12.5	14.0	11.1									SM	Olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-60,S-5	15.0	16.5	11.6						3.0	84.8	12.1	SM	Light olive-brown, silty SAND
BH-60,S-6a	17.5	18.5	21.6									SP-SM	Olive-brown, poorly graded SAND with silt
BH-60,S-6b	18.5	19.0	16.8									ML	Olive-brown, sandy SILT
BH-60,S-7	20.0	21.5	15.2									SM	Olive-brown, silty SAND with gravel
BH-60,S-8	25.0	26.5	18.8						13.7	62.8	23.4	SM	Olive-brown, silty SAND
BH-60,S-9	30.0	31.5	19.5									SP-SM	Olive-brown, poorly graded SAND with gravel
BH-61,S-1	2.5	4.0	8.1									SP-SM	Dark olive-brown, poorly graded SAND with silt
BH-61,S-2a	5.0	5.8	11.1									SM	Dark olive-brown, silty SAND
BH-61,S-2b	5.8	6.5	10.4									SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-61,S-3	7.5	9.0	4.6						1.5	94.7	3.9	SP	Olive, poorly graded SAND
BH-61,S-4a	10.0	10.3	11.7									SM	Olive-brown, silty SAND with gravel
BH-61,S-4b	10.3	11.5	5.7									SP-SM	Olive, poorly graded SAND with silt
BH-61,S-5	12.5	14.0	4.1						35.4	58.3	6.3	SP-SM	Olive, poorly graded SAND with silt and gravel
BH-61,S-6	15.0	16.5	6.0									SP-SM	Olive-gray, poorly graded SAND with silt
BH-61,S-7	17.5	19.0	12.9									SM	Olive-gray, silty SAND
BH-61,S-8	20.0	21.5	12.3						4.0	58.8	37.2	SM	Olive, silty SAND
BH-61,S-9	25.0	26.5	16.5									SM	Olive-brown, silty SAND
BH-61,S-10	30.0	31.0	18.1									ML	Olive-brown, sandy SILT
BH-61,S-11a	35.0	35.7	15.7						5.4	44.3	50.3	ML	Dark grayish-brown, sandy SILT
BH-61,S-11b	35.7	36.5	18.0									SM	Olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-62,S-1	2.5	4.0	12.9						0.5	49.4	50.1	ML	Light olive-brown, sandy SILT
BH-62,S-2a	5.0	5.8	12.5									ML	Olive-brown, SILT with sand
BH-62,S-2b	5.8	6.5	23.9							32.6	67.4	ML	Olive-brown, sandy SILT
BH-62,S-3	7.5	9.0	24.3									ML	Light olive-brown, SILT with sand
BH-62,S-4	10.0	11.5	22.5									ML	Olive-brown, sandy SILT
BH-62,S-5	12.5	14.0	29.6							13.9	86.1	ML	Olive-brown, SILT
BH-62,S-6	15.0	16.5	22.8			33	24	9			84.3	ML	Light olive-brown, SILT with sand
BH-62,S-7a	17.5	18.1	24.7									ML	Light olive-brown, SILT
BH-62,S-7b	18.1	19.0	25.2								18.9	SM	Dark yellowish-brown, silty SAND
BH-62,S-8	20.0	21.5	23.2									SM	Dark yellowish-brown, silty SAND
BH-62,S-9a	25.0	26.3	20.1									SP-SM	Dark gray, poorly graded SAND with silt
BH-62,S-9b	26.3	26.5	33.4									ML	Very dark gray, SILT
BH-62,S-10	30.0	31.5	27.6			30	26	4			85.0	ML	Very dark gray, SILT with sand
BH-63,S-1a	2.5	2.9	12.1									SM	Dark brown, silty SAND
BH-63,S-1b	2.9	4.0	11.0									SM	Dark yellowish-brown, silty SAND
BH-63,S-2a	5.0	5.4	16.5									SM	Dark yellowish-brown, silty SAND
BH-63,S-2b	5.4	6.5	13.5						10.7	50.6	38.7	SM	Light olive-brown, silty SAND
BH-63,S-3	7.5	9.0	14.1									SM	Light olive-brown, silty SAND
BH-64A,S-3	7.5	9.0	6.4									SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-64A,S-4	10.0	11.5	17.8									SP-SM	Very dark gray, poorly graded SAND with silt and gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-64A,S-5	12.5	14.0	42.0	6.6					5.9	69.4	24.7	SM	Very dark brown, silty SAND with organics
BH-64A,S-6a	15.0	15.8	15.4									SM	Dark grayish-brown, silty SAND
BH-64A,S-6b	15.8	16.5	21.9									SP-SM	Very dark gray, poorly graded SAND with silt
BH-64A,S-7	17.5	19.0	21.4									SP-SM	Dark brown, poorly graded SAND with silt
BH-64A,S-8	20.0	21.5	16.1						9.5	88.2	2.3	SP	Very dark grayish-brown, poorly graded SAND
BH-64A,S-9	25.0	26.5	13.2									SP-SM	Very dark gray, poorly graded SAND with silt and gravel
BH-64B,S-1b	3.3	4.0	8.4									SP-SM	Dark brown, poorly graded SAND with silt
BH-64B,S-3	7.5	9.0	272.6	38.0		284	213	71	0.3	24.2	75.5	OH	Very dark brown, organic SILT with sand
BH-64B,S-4a	10.0	10.5	88.9									OH	Very dark brown, organic SILT
BH-64B,S-4b	10.5	11.1	20.8									SM	Very dark brown, silty SAND
BH-64B,S-4c	11.1	11.5	18.5									SM	Very dark gray, silty SAND
BH-64B,S-5	12.5	14.0	19.7									SM	Very dark gray, silty SAND with gravel
BH-64B,S-6	15.0	16.5	12.1						31.5	61.4	7.1	SP-SM	Olive-brown, poorly graded SAND with silt and gravel
BH-64B,S-7	17.5	19.0	12.8									SP-SM	Olive-brown, poorly graded SAND with silt and gravel
BH-64B,S-8a	20.0	20.8	13.3									SP-SM	Olive-brown, poorly graded SAND with silt and gravel
BH-64B,S-8b	20.8	21.5	23.8									ML	Light olive-brown, SILT with sand
BH-64B,S-9a	25.0	25.8	16.9									SP-SM	Very dark gray, poorly graded SAND with silt
BH-64B,S-9b	25.8	26.5	14.5									SM	Olive-brown, silty SAND
BH-64B,S-10	30.0	31.5	15.1						7.6	63.2	29.2	SM	Olive-brown, silty SAND
BH-64B,S-11	35.0	36.5	30.4			45	30	15			90.5	ML	Dark gray, SILT

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-64B,S-12	40.0	41.4	22.2									SP-SM	Dark gray, poorly graded SAND with silt
BH-65,S-1	2.0	3.5	10.7									SM	Dark olive-gray, silty SAND
BH-65,S-2	5.0	6.5	19.6						13.1	76.2	10.7	SW-SM	Dark olive-gray, well-graded SAND with silt
BH-65,S-3	7.5	9.0	39.9						9.9	85.1	5.0	SP-SM	Very dark gray, poorly graded SAND with silt
BH-65,S-4a	10.0	10.5	21.7									SM	Very dark gray, silty SAND
BH-65,S-6	20.0	21.5	23.5						3.1	91.1	5.7	SP-SM	Olive-brown, poorly graded SAND with silt
BH-65,S-7	25.0	26.5	14.5									SM	Olive-brown, silty SAND with gravel
BH-65,S-8	30.0	31.5	15.0									SM	Olive-gray, silty SAND
BH-65,S-9	35.0	36.5	15.8									SM	Very dark gray, silty SAND
BH-65,S-10	40.0	41.5	19.3									SM	Very dark gray, silty SAND
BH-65,S-11	45.0	46.5	19.2									SM	Very dark gray, silty SAND
BH-65,S-12	50.0	51.5	12.0									SM	Dark gray, silty SAND
BH-66A,S-1b	0.8	1.5	8.9									SM	Olive-brown, silty SAND
BH-66A,S-2a	2.5	2.8	22.1									ML	Grayish-brown, SILT
BH-66A,S-2b	2.8	4.0	11.2									SM	Olive-brown, silty SAND
BH-66A,S-3	5.0	6.5	11.1									SM	Olive-brown, silty SAND
BH-66A,S-4	7.5	9.0	5.7						1.0	95.6	3.4	SP	Olive-brown, poorly graded SAND
BH-66A,S-5b	10.5	11.5	9.3									SM	Olive, silty SAND
BH-66A,S-6	12.5	14.0	10.4									SM	Olive-brown, silty SAND
BH-66A,S-7	15.0	16.0	10.7						6.1	53.7	40.3	SM	Olive, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-66A,S-8	17.5	18.0	8.6									SM	Olive-brown, silty SAND
BH-66A,S-9	20.0	20.3	8.3									SM	Olive-brown, silty SAND
BH-66A,S-10	22.0	22.4	9.1									SM	Olive-brown, silty SAND
BH-66B,S-2	2.5	4.0	3.4									SP	Olive-brown, poorly graded SAND
BH-66B,S-3	5.0	6.5	4.7						0.2	97.6	2.2	SP	Olive-brown, poorly graded SAND
BH-66B,S-4	7.5	9.0	6.3									SP-SM	Olive-brown, poorly graded SAND with silt
BH-66B,S-5	10.0	11.5	6.4									SP-SM	Olive-brown, poorly graded SAND with silt
BH-66B,S-6	12.5	14.0	13.0						8.5	54.2	37.3	SM	Olive, silty SAND
BH-66B,S-7	15.0	16.5	13.0									SM	Olive-brown, silty SAND
BH-66B,S-9	20.0	20.3	7.4									SM	Olive-brown, silty SAND
BH-67,S-1	1.5	3.0	6.4									SM	Olive, silty SAND with gravel
BH-67,S-2	3.0	4.5	9.8									SM	Olive, silty SAND
BH-67,S-3	5.0	6.5	14.8									SM	Light olive-brown, silty SAND
BH-67,S-4	7.5	9.0	16.0						8.9	54.7	36.4	SM	Olive-gray, silty SAND
BH-67,S-5	10.0	11.5	11.9								44.8	SM	Dark olive-gray, silty SAND
BH-67,S-6	15.0	15.8	14.9						25.1	50.7	24.2	SM	Olive-gray, silty SAND with gravel
BH-67,S-7	20.0	20.3	15.0									SM	Grayish-brown, silty SAND
BH-67,S-8	25.0	26.5	15.5						12.9	60.2	27.0	SM	Very dark gray, silty SAND
BH-67,S-9	30.0	31.5	18.7									SM	Dark grayish-brown, silty SAND
BH-67,S-10	35.0	36.5	19.1									SM	Very dark gray, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-67,S-11a	40.0	40.5	28.9									ML	Dark gray, SILT with organics
BH-67,S-11b	40.5	41.3	20.6									SM	Dark gray, silty SAND
BH-67,S-12	45.0	46.4	29.0								88.5	ML	Very dark gray, SILT
BH-67,S-13	50.0	51.4	23.9									SM	Very dark gray, silty SAND
BH-68A,S-1b	0.6	1.5	40.6									SM	Very dark brown, silty SAND with organics
BH-68A,S-2a	2.5	3.3	43.9									OL	Very dark brown, sandy organic SILT
BH-68A,S-2b	3.3	4.0	20.5									SM	Dark yellowish-brown, silty SAND
BH-68A,S-3	5.0	6.5	13.5									SM	Olive-brown, silty SAND
BH-68A,S-4	7.5	9.0	12.5						5.6	43.9	50.5	ML	Dark grayish-brown, sandy SILT
BH-68A,S-5	10.0	11.5	14.6									ML	Olive, sandy SILT
BH-68A,S-6	12.5	14.0	13.1								17.0	SM	Olive, silty SAND
BH-68A,S-7	15.0	16.5	14.8									SM	Dark olive-gray, silty SAND
BH-68A,S-8	17.5	17.8	11.8									SM	Dark olive-gray, silty SAND
BH-68A,S-9	20.0	20.4	8.6						10.1	56.8	33.1	SM	Olive, silty SAND
BH-68A,S-10	22.0	22.2	9.4						24.6	47.0	28.4	SM	Olive, silty SAND with gravel
BH-68B,S-2a	2.5	2.9	43.8									OL	Very dark brown, sandy organic SILT
BH-68B,S-2b	2.9	4.0	14.1									SM	Dark olive-brown, silty SAND
BH-68B,S-3	5.0	6.5	20.4									SM	Dark yellowish-brown, silty SAND
BH-68B,S-4	7.5	9.0	12.4						23.4	66.4	10.1	SP-SM	Grayish-brown, poorly graded SAND with silt and gravel
BH-68B,S-5	10.0	11.5	13.4									SM	Light olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-68B,S-6	12.5	14.0	15.7									SM	Light olive-brown, silty SAND
BH-68B,S-7a	15.0	15.8	16.9									SP-SM	Olive-brown, poorly graded SAND with silt
BH-68B,S-7b	15.8	16.1	13.4									SM	Light olive-brown, silty SAND with gravel
BH-68B,S-7c	16.1	16.3	10.6									SM	Grayish-brown, silty SAND
BH-68B,S-8	17.5	17.6	9.2									SM	Grayish-brown, silty SAND
BH-69,S-1	1.3	2.8	10.1						16.1	56.6	27.3	SM	Olive-gray, silty SAND with gravel
BH-69,S-2	3.0	4.5	9.6									SM	Olive, silty SAND with gravel
BH-69,S-3	5.0	6.5	10.9									SM	Dark grayish-brown, silty SAND with gravel
BH-69,S-4	7.5	9.0	18.0						10.0	49.9	40.1	SM	Olive-gray, silty SAND
BH-69,S-5	10.0	11.5	11.8									SM	Olive, silty SAND
BH-69,S-6	15.0	15.8	13.6									SM	Gray, silty SAND
BH-69,S-7	20.0	20.3	9.1									SM	Dark gray, silty SAND
BH-69,S-8	25.0	25.8	19.3						10.0	64.1	25.8	SM	Dark gray, silty SAND
BH-69,S-9	30.0	31.5	20.2									SM	Dark gray, silty SAND
BH-69,S-10	35.0	36.5	27.4								79.1	ML	Dark gray, SILT with sand
BH-69,S-11	40.0	41.4	23.4									SM	Dark gray, silty SAND
BH-69,S-12	45.0	46.5	19.6									SM	Very dark gray, silty SAND
BH-69,S-13	50.0	51.3	17.8									SM	Very dark gray, silty SAND
BH-70,S-1	2.5	4.0	17.9									SM	Dark yellowish-brown, silty SAND
BH-70,S-2	5.0	6.5	22.8							84.5	15.5	SM	Dark yellowish-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-70,S-3a	7.5	8.3	22.0									SM	Dark brown, silty SAND
BH-70,S-3b	8.3	9.0	23.7									SM	Dark gray, silty SAND
BH-70,S-4a	10.0	11.0	22.0									SM	Very dark gray, silty SAND
BH-70,S-4b	11.0	11.5	28.2			30	18	12			55.8	CL	Dark gray, sandy lean CLAY
BH-70,S-6	15.0	15.5	7.3									GM	Dark gray, silty GRAVEL with sand
BH-70,S-7a	17.5	18.5	17.7									SP-SM	Very dark gray, poorly graded SAND with silt
BH-70,S-7b	18.5	18.9	10.3									SM	Very dark gray, silty SAND with gravel
BH-70,S-8	20.0	20.5	9.2						28.2	50.8	20.9	SM	Very dark gray, silty SAND with gravel
BH-70,S-9	25.0	25.2	10.7									SM	Very dark gray, silty SAND with gravel
BH-70,S-10	30.0	30.5	25.2									SP-SM	Very dark gray, poorly graded SAND with silt
BH-71,S-1	2.5	4.0	22.2									SM	Dark grayish-brown, silty SAND
BH-71,S-2	5.0	6.5	14.6									ML	Light olive-gray, sandy SILT
BH-71,S-3	7.5	9.0	16.2						7.1	52.0	40.9	SM	Dark olive-gray, silty SAND
BH-71,S-4	10.0	11.5	14.9									SM	Dark olive-gray, silty SAND
BH-71,S-5	12.5	13.5	20.4									SM	Dark olive-gray, silty SAND
BH-71,S-6	15.0	15.4	14.6									SM	Dark gray, silty SAND
BH-71,S-7	17.5	17.8	11.0									SM	Dark gray, silty SAND
BH-71,S-8	20.0	20.4	11.6						21.9	50.9	27.2	SM	Very dark gray, silty SAND with gravel
BH-71,S-9	25.0	26.5	15.6						1.8	79.5	18.7	SM	Very dark gray, silty SAND
BH-72/BH-72W,S-1	1.3	2.8	5.5									SM	Dark grayish-brown, silty SAND with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-72/BH-72W,S-2	3.0	4.5	5.1									SM	Dark grayish-brown, silty SAND with gravel
BH-72/BH-72W,S-3a	5.0	5.5	18.5									SM	Dark olive-gray, silty SAND
BH-72/BH-72W,S-3b	5.5	6.5	21.4						2.1	61.0	36.9	SM	Olive-brown, silty SAND
BH-72/BH-72W,S-4	7.5	9.0	26.9									SM	Olive-gray, silty SAND
BH-72/BH-72W,S-5	10.0	11.5	26.1						0.4	95.8	3.8	SP	Dark grayish-brown, poorly graded SAND
BH-72/BH-72W,S-6	15.0	16.5	20.3						14.6	65.1	20.2	SM	Light olive-brown, silty SAND
BH-72/BH-72W,S-7a	20.0	21.2	14.2						16.3	77.4	6.3	SP-SM	Very dark gray, poorly graded SAND with silt and gravel
BH-72/BH-72W,S-8	25.0	25.5	9.8								19.0	SM	Dark gray, silty SAND with gravel
BH-72/BH-72W,S-9	30.0	31.5	16.3									SM	Dark gray, silty SAND
BH-72/BH-72W,S-10	35.0	36.5	19.3									SM	Dark gray, silty SAND
BH-72/BH-72W,S-11	40.0	41.0	16.1									SM	Very dark gray, silty SAND
BH-72/BH-72W,S-13a	50.0	51.0	11.6								17.6	SM	Dark gray, silty SAND
BH-72/BH-72W,S-13b	51.0	51.5	39.3									ML	Very dark gray, SILT
BH-73,S-1	1.5	2.0	10.1									SM	Dark brown, silty SAND
BH-73,S-2	4.0	5.5	9.8									SM	Dark yellowish-brown, silty SAND
BH-73,S-3	7.5	9.0	21.7									ML	Brown, sandy SILT
BH-73,S-4	10.0	11.5	16.4						3.0	41.9	55.1	ML	Light olive-brown, sandy SILT
BH-73,S-5	12.5	14.0	15.7									SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-73,S-6	15.0	16.5	20.7									SM	Dark brown, silty SAND
BH-73,S-7	17.5	19.0	29.1									SM	Yellowish-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-73,S-8	20.0	21.5	34.8			35	21	14			70.1	CL	Dark yellowish-brown, lean CLAY with sand
BH-73,S-9	25.0	26.5	12.0						19.7	49.9	30.4	SM	Dark gray, silty SAND with gravel
BH-73,S-10	30.0	31.5	16.0									SM	Very dark gray, silty SAND
BH-73,S-11	35.0	35.3	15.0									SM	Very dark gray, silty SAND
BH-73,S-12	40.0	40.3	10.4									SM	Very dark gray, silty SAND
BH-73,S-13	45.0	45.3	11.1									ML	Very dark gray, sandy SILT
BH-74,S-1	2.5	5.0	6.6									SP-SM	Olive-brown, poorly graded SAND with silt
BH-74,S-2	7.5	9.0	19.0						1.5	79.2	19.3	SM	Olive-brown, silty SAND
BH-74,S-3	10.0	11.0	15.0									SM	Olive-brown, silty SAND
BH-74,S-4	12.5	13.4	14.5									SM	Olive, silty SAND with gravel
BH-74,S-5	15.0	15.9	13.7									SM	Olive-brown, silty SAND with gravel
BH-74,S-6	17.5	18.3	14.8						3.5	48.6	47.9	SM	Grayish-brown, silty SAND
BH-74,S-7	20.0	21.5	19.3									SM	Grayish-brown, silty SAND
BH-74,S-8	25.0	26.5	23.8									SM	Dark gray, silty SAND
BH-74,S-9	30.0	31.5	23.9							86.4	13.6	SM	Dark gray, silty SAND
BH-74,S-10	35.0	36.5	22.4									SP-SM	Dark gray, poorly graded SAND with silt
BH-74,S-11	40.0	41.5	23.2									SM	Dark gray, silty SAND
BH-74,S-12	45.0	46.5	27.1								36.8	SM	Dark gray, silty SAND
BH-74,S-13	50.0	51.5	34.4									CH	Dark gray, fat CLAY with sand
BH-75,S-1	2.5	3.0	9.8									SM	Brown, silty SAND with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-75,S-3	7.5	9.0	17.1									SM	Olive, silty SAND
BH-75,S-4	10.0	11.5	19.3									SM	Olive-gray, silty SAND
BH-75,S-5	12.5	14.0	14.2									SM	Gray, silty SAND
BH-75,S-6	15.0	16.5	15.8						2.2	60.8	37.0	SM	Dark gray, silty SAND
BH-75,S-7	17.5	18.9	15.2									SM	Dark gray, silty SAND
BH-75,S-8	20.0	21.4	21.2									SM	Olive-gray, silty SAND
BH-75,S-9	25.0	26.5	20.1							83.5	16.5	SM	Dark gray, silty SAND
BH-75,S-11	35.0	36.5	31.2			45	31	14			94.2	ML	Olive, SILT
BH-75,S-12a	40.0	40.6	25.7								96.3	ML	Gray, SILT
BH-75,S-12b	40.6	41.5	33.6									CL	Gray, lean CLAY
BH-75,S-13a	45.0	45.5	25.8									ML	Gray, sandy SILT
BH-75,S-13b	45.5	46.5	34.7			51	27	24			98.5	CH	Gray, fat CLAY
BH-75,S-14	50.0	51.5	25.7									ML	Gray, sandy SILT
BH-76,S-2	5.0	6.5	32.0						13.2	24.9	61.9	ML	Olive-brown, SILT with sand
BH-77,S-1b	3.0	4.0	8.9									SM	Yellowish-brown, silty SAND
BH-77,S-2	5.0	6.5	12.4						5.4	52.2	42.3	SM	Grayish-brown, silty SAND
BH-77,S-3	7.5	9.0	11.9									SM	Olive-brown, silty SAND
BH-77,S-4	10.0	11.5	13.4									SM	Olive-brown, silty SAND
BH-77,S-5	12.5	13.4	10.6									SM	Olive-brown, silty SAND
BH-77,S-6	15.0	16.5	12.0									SM	Olive-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-77,S-7	17.5	19.0	20.2						0.8	82.0	17.2	SM	Olive-brown, silty SAND
BH-77,S-8a	20.0	20.8	19.8									SM	Olive-brown, silty SAND
BH-77,S-8b	20.8	21.5	21.1									SP-SM	Olive-brown, poorly graded SAND with silt
BH-77,S-9	25.0	26.5	19.5			31	20	11			66.8	CL	Dark olive-brown, sandy lean CLAY
BH-77,S-10a	30.0	30.8	10.6									SM	Very dark gray, silty SAND
BH-77,S-11a	35.0	35.9	16.0									SM	Very dark grayish-brown, silty SAND
BH-77,S-11b	35.9	36.5	25.3									CL	Olive-brown, lean CLAY
BH-79,S-1	2.5	4.0	6.6									SP	Light olive-brown, poorly graded SAND
BH-79,S-2	5.0	6.5	5.2						0.6	97.5	1.9	SP	Yellowish-brown, poorly graded SAND
BH-79,S-3	7.5	9.0	4.9									SP	Yellowish-brown, poorly graded SAND
BH-79,S-4	10.0	11.5	5.3									SP	Yellowish-brown, poorly graded SAND
BH-79,S-5	12.5	14.0	4.8							96.6	3.4	SP	Yellowish-brown, poorly graded SAND
BH-79,S-6a	15.0	16.0	3.1									SP	Yellowish-brown, poorly graded SAND
BH-79,S-6b	16.0	16.5	9.2						0.3	94.8	4.9	SP	Yellowish-brown, poorly graded SAND
BH-79,S-7	17.5	19.0	21.3									SP-SM	Yellowish-brown, poorly graded SAND with silt
BH-79,S-8	20.0	20.5	25.9									SP-SM	Light olive-brown, poorly graded SAND with silt
BH-80A,S-1	2.5	4.0	21.2									SM	Dark yellowish-brown, silty SAND
BH-80A,S-2	5.0	6.5	20.8									SM	Light yellowish-brown, silty SAND
BH-80A,S-3	7.5	9.0	13.3									SP-SM	Dark grayish-brown, poorly graded SAND with silt
BH-80A,S-4a	10.0	10.7	27.8			28	20	8			60.0	CL	Light olive-brown, sandy lean CLAY

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-80A,S-4b	10.7	11.5	22.8									SP-SM	Olive-brown, poorly graded SAND with silt
BH-80A,S-5	12.5	14.0	25.3						1.7	92.9	5.5	SP-SM	Olive-brown, poorly graded SAND with silt
BH-80A,S-6a	15.0	15.5	23.7									SM	Olive-brown, silty SAND
BH-80A,S-6b	15.5	16.0	32.5									CL	Light olive-brown, lean CLAY with sand
BH-80A,S-6c	16.0	16.5	24.1									SP-SM	Olive-brown, poorly graded SAND with silt
BH-80A,S-7	20.0	20.9	14.0									SM	Dark gray, silty SAND
BH-80A,S-8	25.0	26.5	15.1						19.0	59.1	21.9	SM	Dark gray, silty SAND with gravel
BH-80B,S-1b	0.3	1.5	20.7									SM	Dark brown, silty SAND
BH-80B,S-2b	2.7	4.0	8.6									SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-80B,S-3	5.0	6.5	9.5							93.6	6.4	SP-SM	Yellowish-brown, poorly graded SAND with silt
BH-80B,S-4	7.5	9.0	15.4									SP-SM	Light olive-brown, poorly graded SAND with silt
BH-80B,S-5	10.0	11.5	25.1									SP-SM	Olive-brown, poorly graded SAND with silt
BH-80B,S-6	12.5	14.0	26.8									SM	Light olive-brown, silty SAND
BH-80B,S-7a	15.0	16.3	16.3						1.2	94.0	4.8	SP	Very dark gray, poorly graded SAND
BH-80B,S-7b	16.3	16.5	11.4									SM	Dark grayish-brown, silty SAND
BH-80B,S-8	17.5	17.8	10.4									SM	Grayish-brown, silty SAND
BH-80B,S-9	20.0	20.3	11.4						5.7	58.2	36.1	SM	Dark gray, silty SAND
BH-81W,S-1	2.5	4.0	9.9						23.6	49.1	27.4	SM	Dark grayish-brown, silty SAND with gravel
BH-81W,S-2	4.2	5.0	25.3			25	21	4	10.2	31.5	58.3	ML	Olive, sandy SILT
BH-81W,S-3a	7.5	8.3	20.5									ML	Dark olive-brown, sandy SILT

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-81W,S-3b	8.3	9.0	14.4									SM	Olive-brown, silty SAND with gravel
BH-81W,S-4	10.0	11.4	7.8									SM	Dark grayish-brown, silty SAND with gravel
BH-81W,S-5	12.5	13.8	7.0						22.9	48.8	28.3	SM	Dark gray, silty SAND with gravel
BH-81W,S-6	15.0	16.5	10.1									SC	Very dark gray, clayey SAND
BH-81W,S-7	17.5	19.0	23.3			48	24	24				CL	Very dark gray, lean CLAY
BH-81W,S-8	20.0	21.5	23.6									ML	Very dark gray, SILT
BH-82,S-1	2.5	4.0	9.8						47.9	45.1	7.0	GP-GM	Grayish-brown, poorly graded GRAVEL with silt and sand
BH-82,S-2	5.0	6.5	12.5						17.8	59.9	22.3	SM	Dark yellowish-brown, silty SAND with gravel
BH-82,S-4	10.0	11.5	8.6									SM	Gray, silty SAND with gravel
BH-82,S-5	12.5	14.0	9.9									SC	Bluish-gray, clayey SAND with gravel
BH-82,S-6	15.0	16.5	8.4			21	12	9	24.1	45.5	30.4	SC	Gray, clayey SAND with gravel
BH-82,S-7	17.5	19.0	11.7									CL	Bluish-gray, sandy lean CLAY
BH-82,S-8	20.0	21.5	18.2						2.8	67.0	30.2	SM	Gray, silty SAND
BH-83W,S-1	1.3	2.8	17.3									ML	Brown, sandy SILT
BH-83W,S-2	2.8	4.3	18.0						4.3	18.7	77.0	ML	Dark yellowish-brown, SILT with sand
BH-83W,S-3	5.0	6.5	18.5									ML	Dark gray, SILT
BH-83W,S-4	7.5	9.0	16.2									ML	Dark gray, sandy SILT
BH-83W,S-5	10.0	11.5	9.3						20.7	45.7	33.7	SM	Dark gray, silty SAND with gravel
BH-83W,S-6	12.5	14.0	11.7									SM	Gray, silty SAND
BH-83W,S-7	15.0	16.5	9.2									ML	Gray, sandy SILT with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-83W,S-8	17.5	19.0	10.6									ML	Very dark gray, sandy SILT with gravel
BH-83W,S-9	20.0	21.5	14.1									ML	Very dark gray, sandy SILT
BH-84,S-1	2.5	4.0	14.4									CL	Gray, lean CLAY with sand
BH-84,S-3	7.5	9.0	30.0									CL	Olive-brown, fat CLAY
BH-84,S-4	10.0	11.5	31.7			54	28	26			97.6	CH	Olive-brown, fat CLAY
BH-84,S-5	12.5	14.0	34.6									CL	Olive-brown, fat CLAY
BH-84,S-6	15.0	16.5	10.5									SM	Very dark brown, silty SAND
BH-84,S-7	17.5	19.0	28.2									CL	Very dark gray, lean CLAY
BH-84,S-8	20.0	21.5	30.5									CL	Very dark gray, lean CLAY
BH-85W,S-1	1.2	2.7	8.8						5.9	79.8	14.4	SM	Dark yellowish-brown, silty SAND
BH-85W,S-3a	5.0	5.8	6.0									SM	Dark brown, silty SAND with gravel
BH-85W,S-3b	5.8	6.5	10.8						17.8	42.7	39.4	SM	Light olive-brown, silty SAND with gravel
BH-85W,S-4	7.5	9.0	3.2									SM	Dark olive-brown, silty SAND with gravel
BH-85W,S-5a	10.0	10.8	3.0									SM	Dark yellowish-brown, silty SAND with gravel
BH-85W,S-5b	10.8	11.5	7.6									SM	Olive-brown, silty SAND with gravel
BH-85W,S-6	12.5	14.0	7.3									SM	Olive, silty SAND with gravel
BH-85W,S-9a	20.0	20.8	11.4									SM	Olive-brown, silty SAND
BH-85W,S-9b	20.8	21.5	19.7									SM	Very dark grayish-brown, silty SAND
BH-85W,S-10	25.0	26.5	18.6									SM	Olive, silty SAND
BH-86,S-1	2.5	4.0	15.6									SM	Dark olive-brown, silty SAND with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-86,S-2	4.7	6.2	15.2						10.5	59.8	29.6	SM	Dark yellowish-brown, silty SAND
BH-86,S-3	7.5	9.0	7.9						22.1	46.4	31.5	SM	Yellowish-brown, silty SAND with gravel
BH-86,S-4	10.0	11.5	8.0						25.6	46.1	28.2	SM	Yellowish-brown, silty SAND with gravel
BH-86,S-6a	15.0	16.0	12.8									CL	Olive-brown, CLAY with sand
BH-86,S-6b	16.0	16.5	13.3									SM	Olive-brown, silty SAND
BH-86,S-7	17.5	19.0	10.6						0.1	78.0	21.9	SM	Dark grayish-brown, silty SAND
BH-86,S-8a	20.0	21.0	13.4									SM	Olive-brown, silty SAND
BH-86,S-8b	21.0	21.5	14.1									SM	Olive-brown, silty SAND
BH-87,S-1	2.5	4.0	7.4									SM	Olive-brown, silty SAND
BH-87,S-2	5.0	6.5	5.6						7.0	83.2	9.8	SP-SM	Dark yellowish-brown, poorly graded SAND with silt
BH-87,S-3	7.5	9.0	7.2									SM	Dark yellowish-brown, silty SAND with gravel
BH-87,S-4	10.0	11.5	16.8								38.5	SM	Dark yellowish-brown, silty SAND with gravel
BH-87,S-5	12.5	14.0	15.6									SM	Dark yellowish-brown, silty SAND
BH-87,S-6	15.0	16.5	26.6								36.4	SM	Very dark gray, silty SAND
BH-87,S-7	17.5	19.0	22.9						6.7	54.7	38.6	SM	Dark brown, silty SAND
BH-87,S-8	20.0	21.5	21.2			24	18	6			61.3	CL-ML	Dark yellowish-brown, sandy silty CLAY
BH-87,S-9a	25.0	25.5	21.3									CL-ML	Dark olive-brown, sandy silty CLAY
BH-87,S-9b	25.5	26.5	20.9									SM	Dark olive-brown, silty SAND
BH-88,S-1	2.5	4.0	4.5									SP-SM	Olive, poorly graded SAND with silt and gravel
BH-88,S-2	5.0	6.5	2.9						45.7	50.5	3.8	SP	Olive, poorly graded SAND with gravel

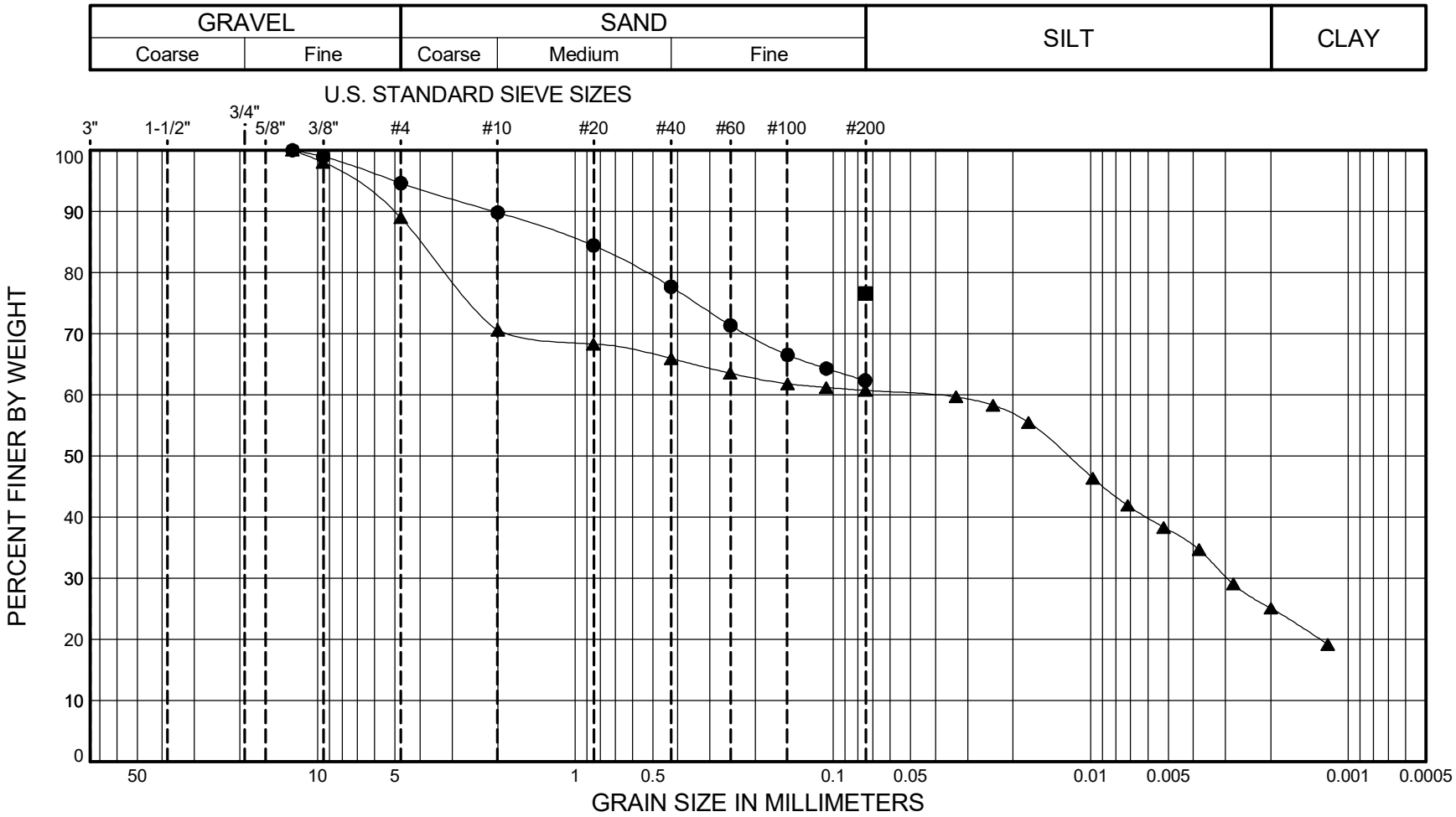
Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-88,S-3a	7.5	7.9	5.2									SP-SM	Brown, poorly graded SAND with silt and gravel
BH-88,S-3b	7.9	9.0	13.4						11.5	48.4	40.0	SM	Olive-gray, silty SAND
BH-88,S-4	10.0	11.5	12.4									SM	Olive-gray, silty SAND
BH-88,S-5	12.5	14.0	11.3									SM	Olive-gray, silty SAND
BH-88,S-6a	15.0	15.6	18.5									ML	Olive, SILT with sand
BH-88,S-6b	15.6	16.3	10.6									SM	Olive, silty SAND
BH-88,S-7	17.5	19.0	10.5						6.2	51.5	42.4	SM	Olive, silty SAND
BH-88,S-8	20.0	21.3	10.9									SM	Olive, silty SAND
BH-89,S-1	2.5	4.0	6.4						0.4	88.8	10.8	SW-SM	Yellowish-brown, well-graded SAND with silt
BH-89,S-2	5.0	6.5	7.8						19.8	70.6	9.5	SW-SM	Dark yellowish-brown, well-graded SAND with silt and gravel
BH-89,S-4	10.0	11.5	10.3									GP-GM	Dark brown, poorly graded GRAVEL with silt and sand
BH-89,S-5	12.5	14.0	13.5						4.5	58.2	37.3	SM	Olive-brown, silty SAND
BH-89,S-6	15.0	16.5	12.9									SM	Dark olive-brown, silty SAND
BH-89,S-7	17.5	19.0	15.0									ML	Olive-brown, sandy SILT
BH-89,S-8	20.0	21.5	10.8						26.6	48.0	25.4	SM	Dark olive-brown, silty SAND with gravel
BH-90,S-1	2.5	4.0	11.0						0.9	85.7	13.4	SM	Dark yellowish-brown, silty SAND
BH-90,S-2b	5.3	6.5	14.5						17.2	51.3	31.5	SM	Olive-brown, silty SAND with gravel
BH-90,S-3	7.5	9.0	16.0								35.3	SM	Olive, silty SAND
BH-90,S-4	10.0	11.5	12.3									SM	Olive-brown, silty SAND
BH-90,S-5	12.5	14.0	13.5									SM	Olive-brown, silty SAND with gravel

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.

EXPLORATION DESIGNATION	TOP DEPTH (feet)	BOTTOM DEPTH (feet)	MOISTURE CONTENT (%)	ORGANIC CONTENT (%)	SPECIFIC GRAVITY	ATTERBERG LIMITS (%)			% GRAVEL	% SAND	% FINES	ASTM SOIL CLASSIFICATION	SAMPLE DESCRIPTION
						LL	PL	PI					
BH-90,S-6	15.0	16.5	15.3						4.7	53.8	41.5	SM	Olive-brown, silty SAND
BH-90,S-7	17.5	19.0	22.0									SM	Olive, silty SAND
BH-90,S-8	20.0	20.9	11.4						3.4	55.7	40.9	SM	Dark grayish-brown, silty SAND

Notes: 1. This table summarizes information presented elsewhere in the report and should be used in conjunction with the report test, other graphs and tables, and the exploration logs.
2. The soil classifications in this table are based on ASTM D2487 and D2488 as applicable.



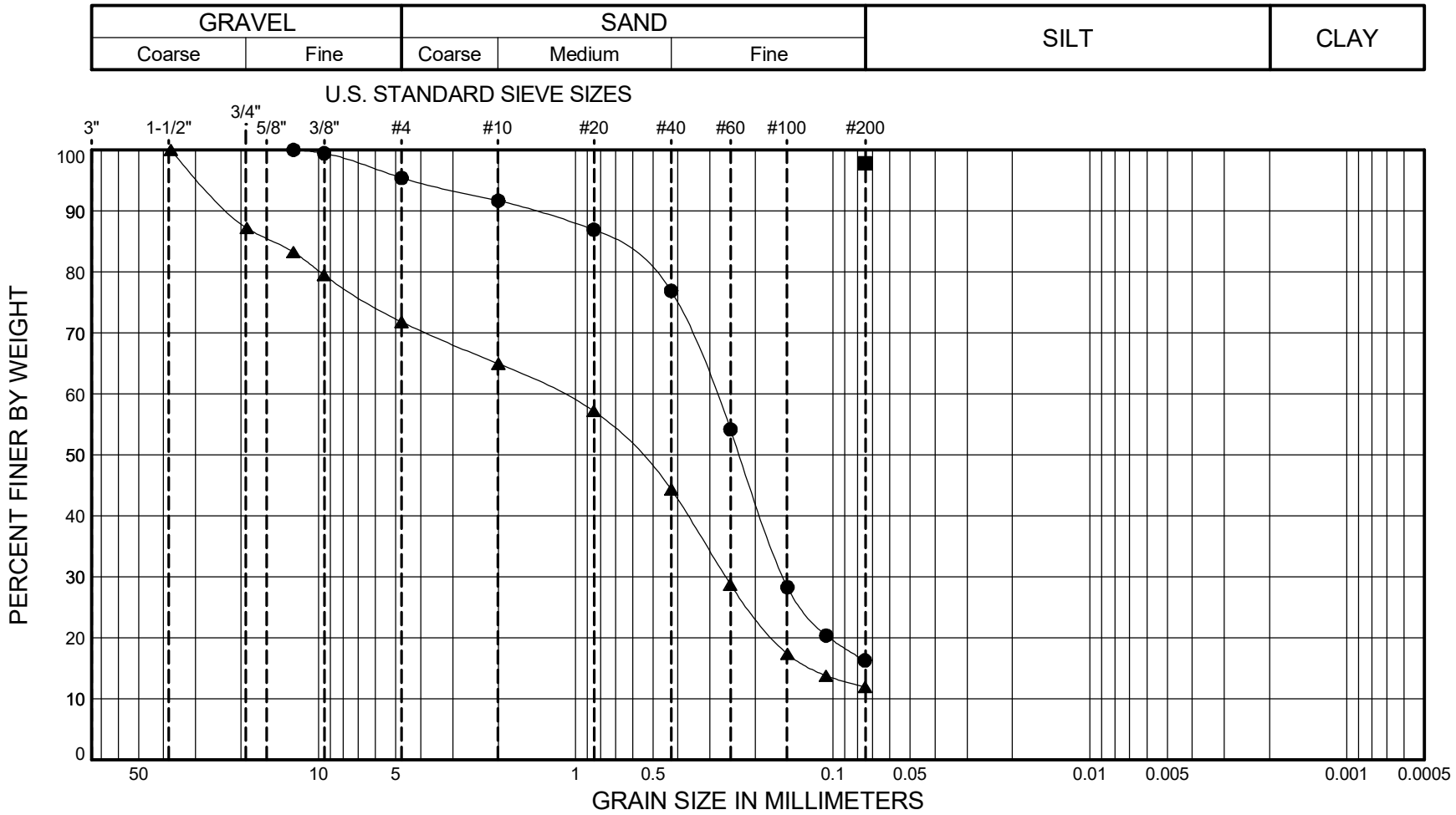
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-25	S-2	2.8 - 4.3	(ML) Dark yellowish-brown, sandy SILT	21				5.4	32.3	62.3
■	BH-25	S-8	17.5 - 19.0	(CL) Gray, lean CLAY with sand	17	42	21	21			76.5
▲	BH-26	S-2	3.0 - 4.5	(ML) Yellowish-brown, SILT with sand	22				11.0	28.3	60.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-36



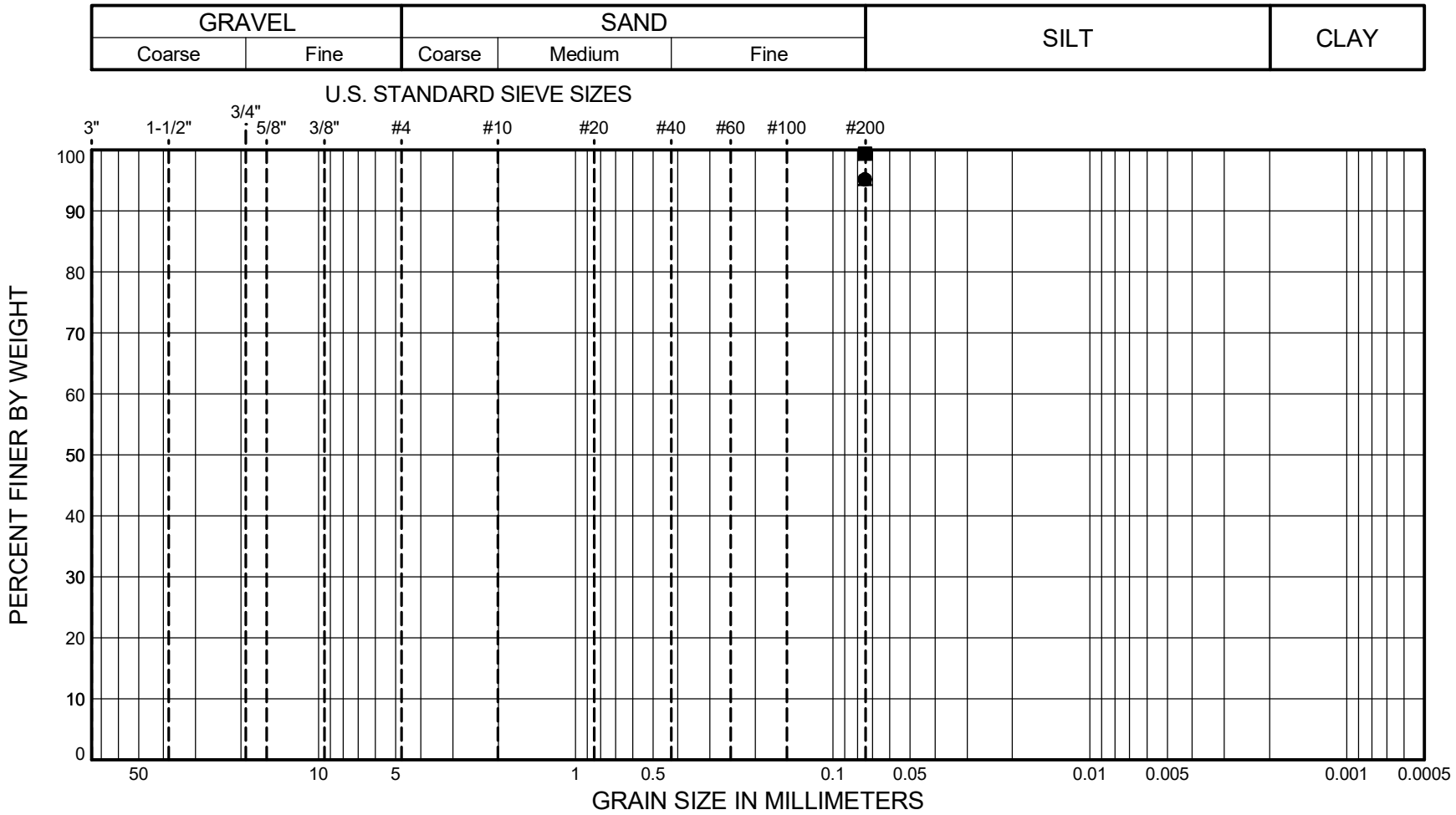
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-26	S-6b	12.9 - 14.0	(SM) Dark olive-brown, silty SAND	18				4.6	79.1	16.3
■	BH-26	S-9	20.0 - 21.5	(CH) Dark gray, fat CLAY	34	53	22	31			97.8
▲	BH-27	S-2	5.0 - 6.5	(SW-SM) Dark brown, well-graded SAND with silt and gravel	13				28.2	59.9	11.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-37



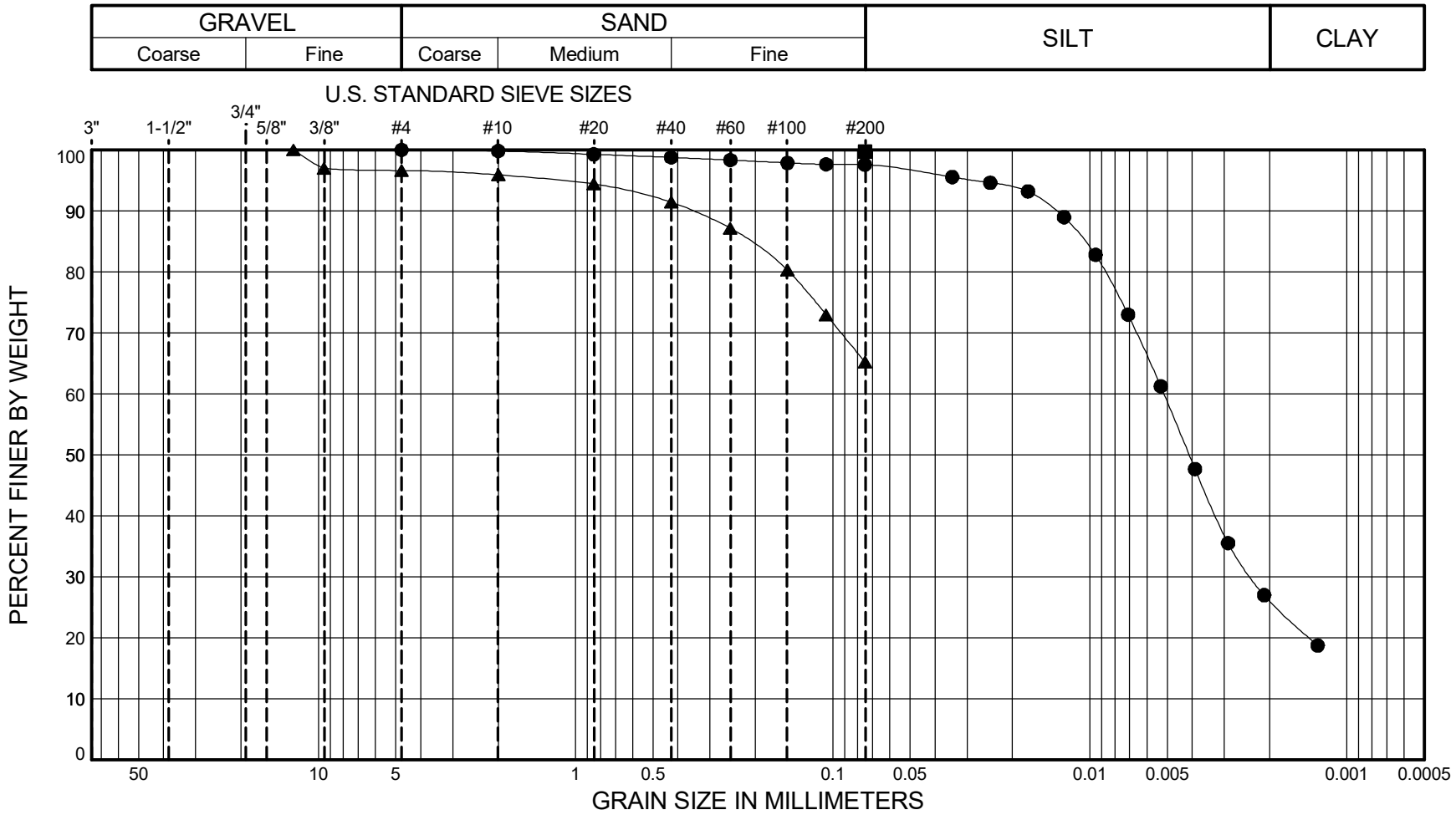
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-27	S-4	10.0 - 11.5	(CL) Dark yellowish-brown, lean CLAY	31	40	22	18			95.2
■	BH-27	S-5	12.5 - 14.0	(CL) Very dark gray, lean CLAY	32	47	25	22			99.4
▲	BH-28	S-1	2.5 - 4.0	(MH) Olive, elastic SILT	37	65	32	33			95.1

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-38



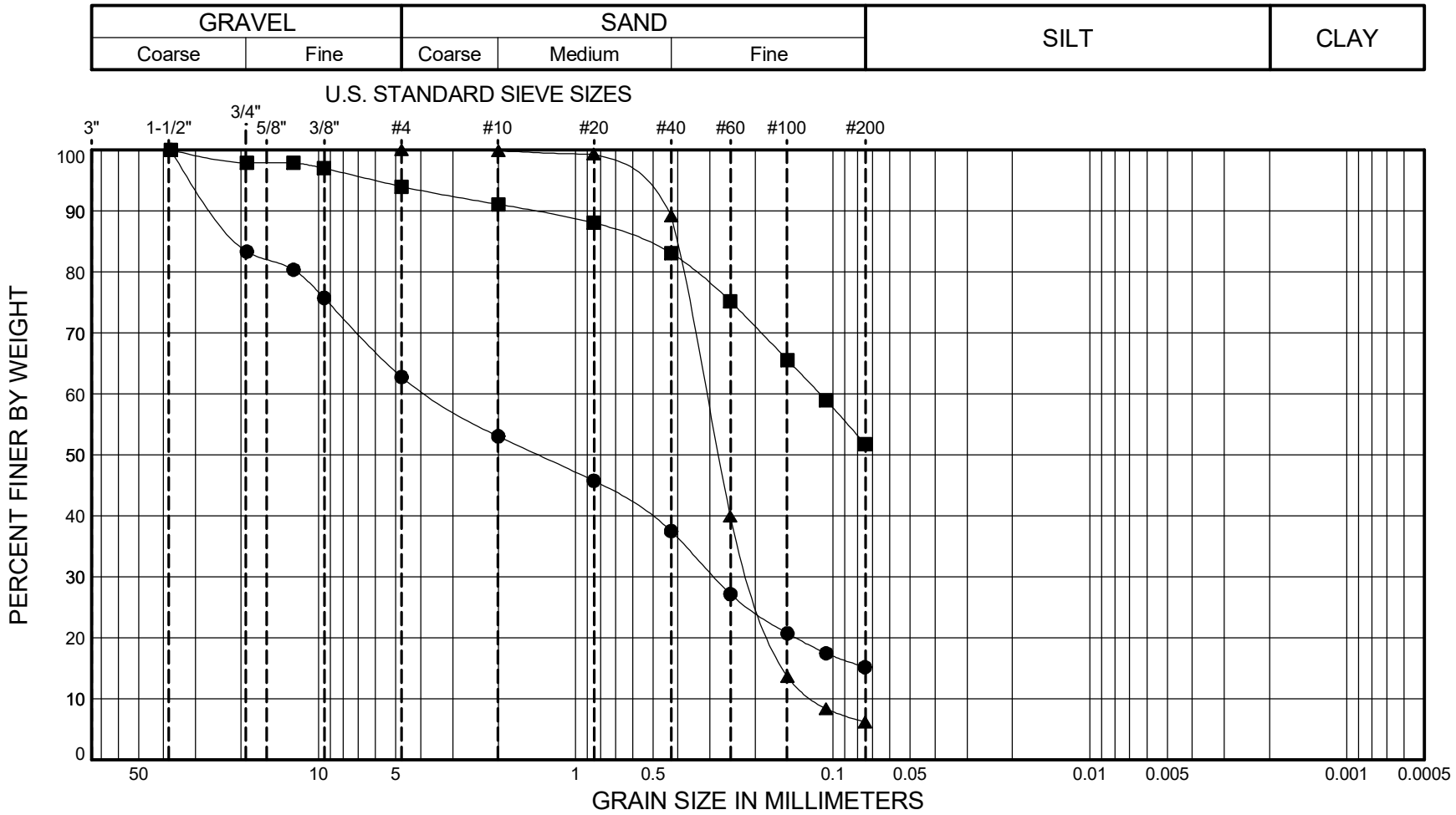
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-28	S-2	5.0 - 6.5	(MH) Olive, elastic SILT	31					2.4	97.6
■	BH-28	S-5	12.5 - 14.0	(CH) Very dark gray, fat CLAY	35	51	24	27			99.7
▲	BH-28	S-9b	25.4 - 26.5	(ML) Brown, sandy SILT	20				3.4	31.4	65.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-39



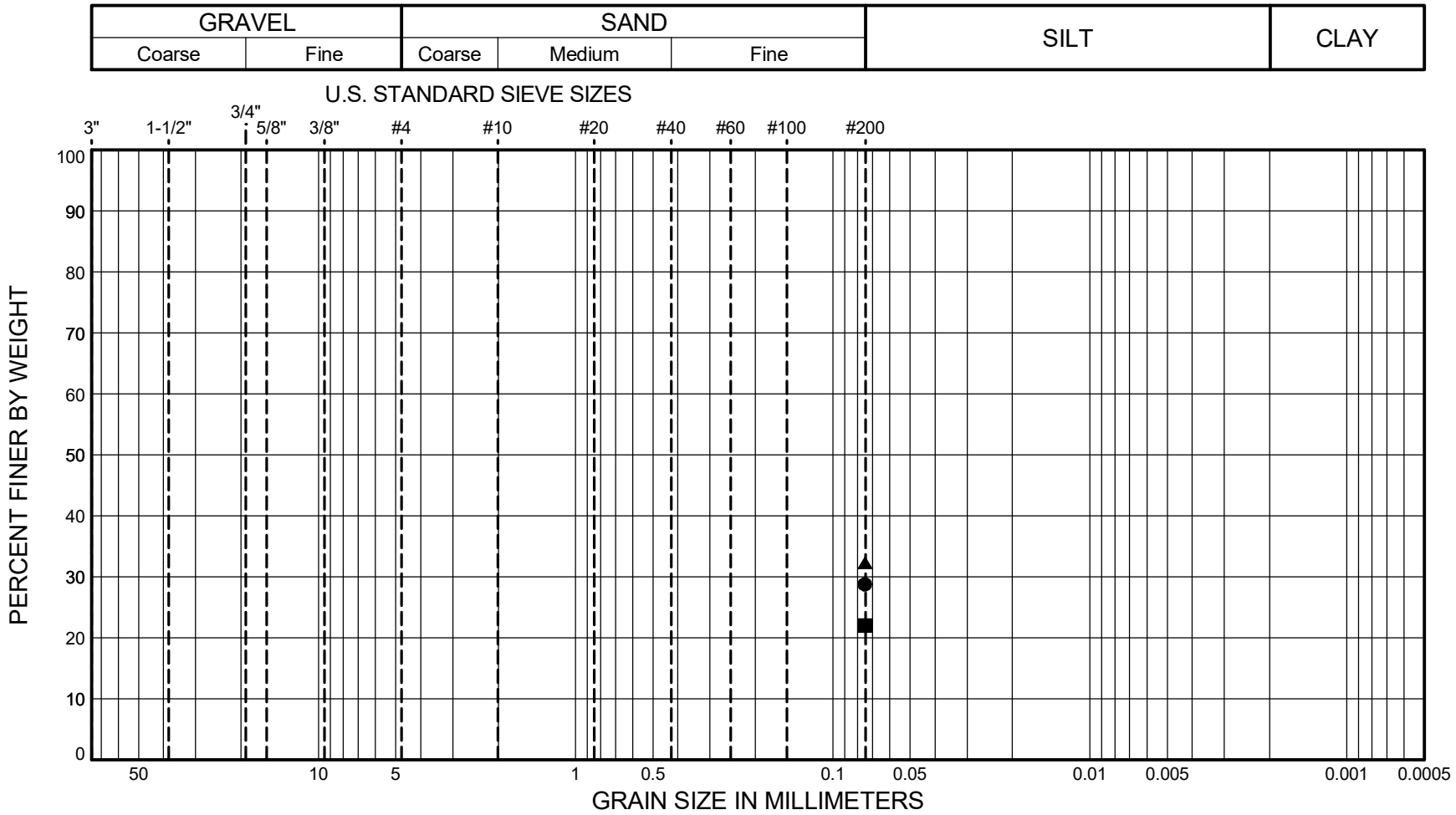
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-29	S-2B	6.0 - 6.5	(SM) Light olive-brown, silty SAND with gravel	4				37.3	47.6	15.2
■	BH-29	S-4	10.0 - 11.5	(ML) Light olive-brown, sandy SILT	14				6.0	42.2	51.8
▲	BH-29	S-8	30.0 - 31.5	(SP-SM) Dark olive-brown, poorly graded SAND with silt	8					93.8	6.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-40



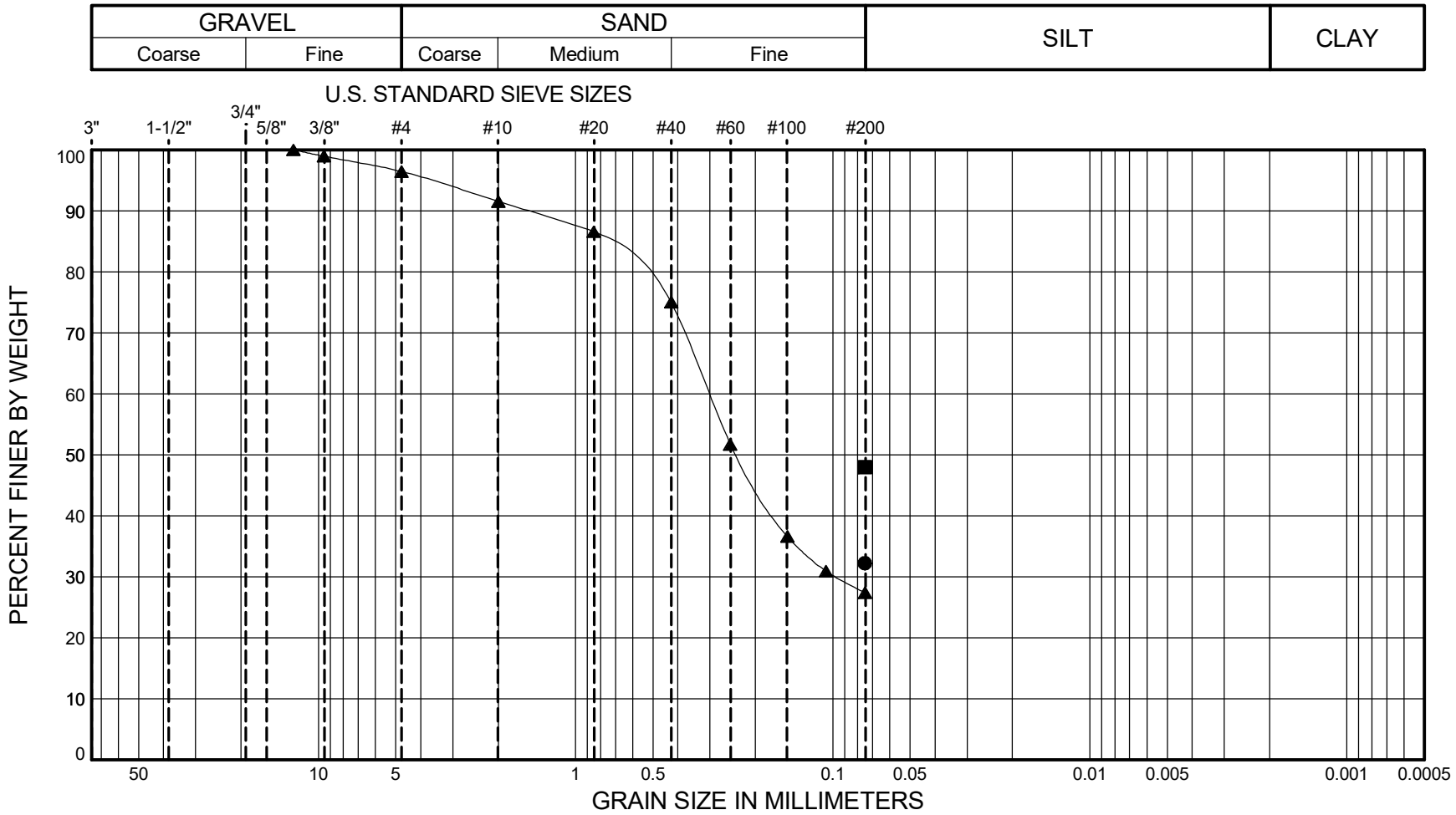
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-31	S-3	10.0 - 11.5	(SM) Olive-brown, silty SAND	11						28.8
■	BH-31	S-4	15.0 - 16.5	(SM) Dark yellowish-brown, silty SAND	9						22.0
▲	BH-31	S-5	20.0 - 21.5	(SM) Olive-brown, silty SAND	9						32.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-41



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-31	S-6	25.0 - 26.5	(SM) Olive-brown, silty SAND	14						32.2
■	BH-31	S-7	30.0 - 31.5	(SM) Light olive-brown, silty SAND	15						48.0
▲	BH-31	S-8	35.0 - 36.5	(SM) Very dark grayish-brown, silty SAND	16				3.6	69.0	27.4

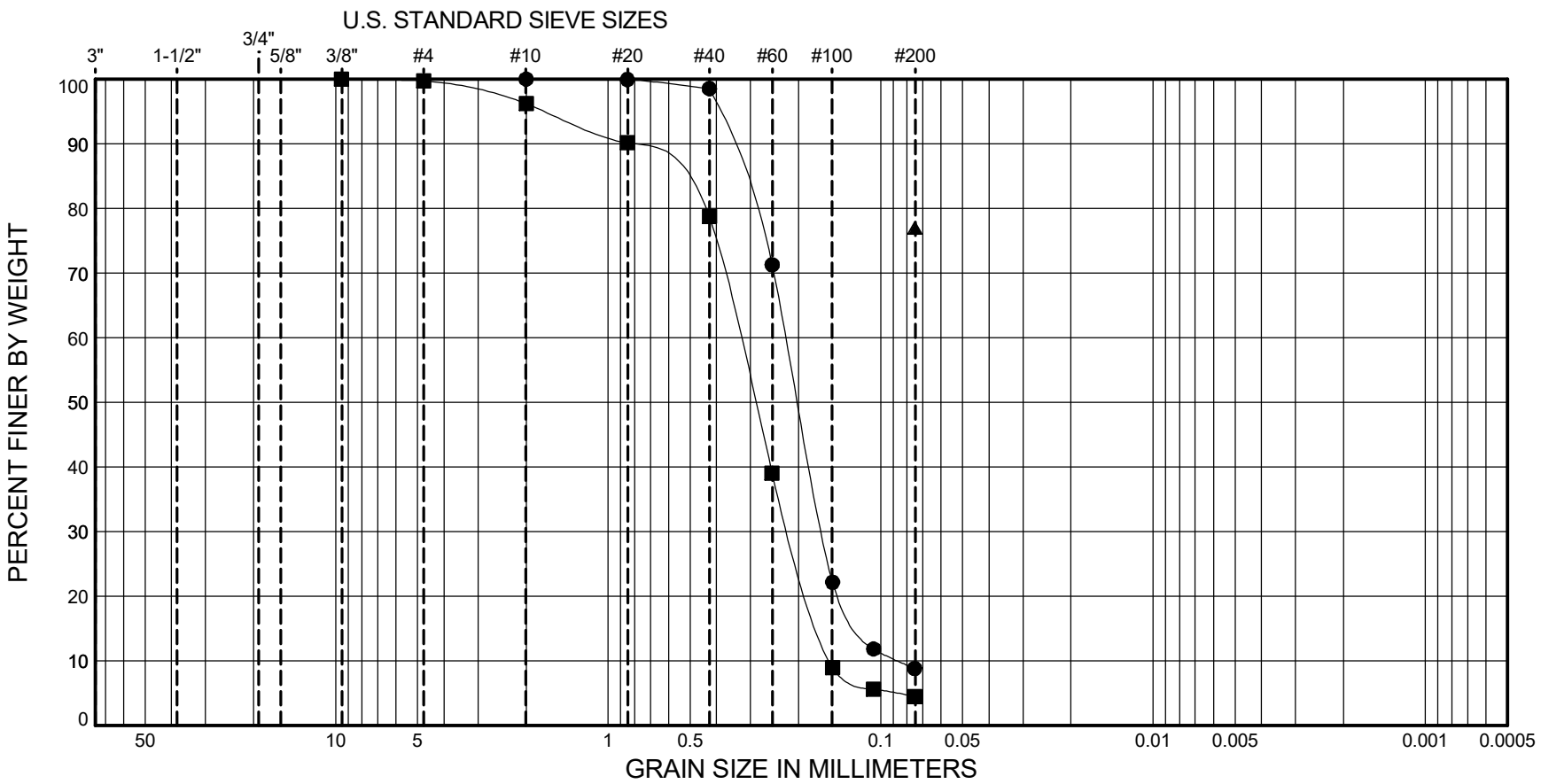
GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-42

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



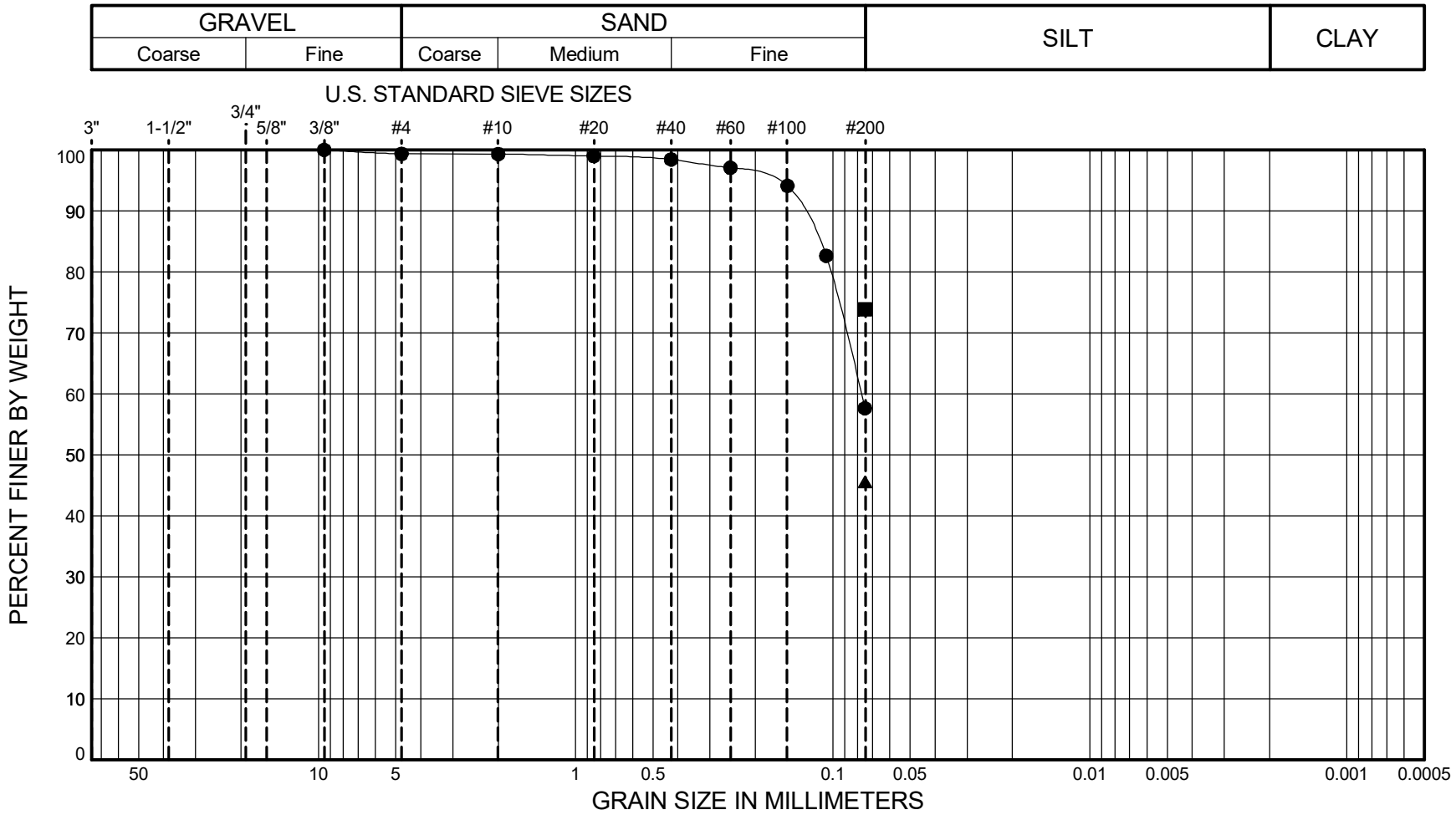
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-31	S-9c	41.0 - 41.5	(SP-SM) Olive, poorly graded SAND with silt	22					91.2	8.8
■	BH-31	S-10a	45.0 - 46.2	(SP) Very dark gray, poorly graded SAND	26				0.3	95.2	4.5
▲	BH-31	S-10b	46.2 - 46.5	(ML) Grayish-brown, SILT with sand	22						77.0

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-43



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-31	S-11	50.0 - 51.5	(ML) Olive, sandy SILT	28				0.7	41.7	57.6
■	BH-31	S-14b	65.5 - 66.0	(CL) Very dark gray, lean CLAY with sand	24	32	19	13			73.9
▲	BH-36A	S-3	5.0 - 6.5	(SM) Dark yellowish-brown, silty SAND	14						45.6

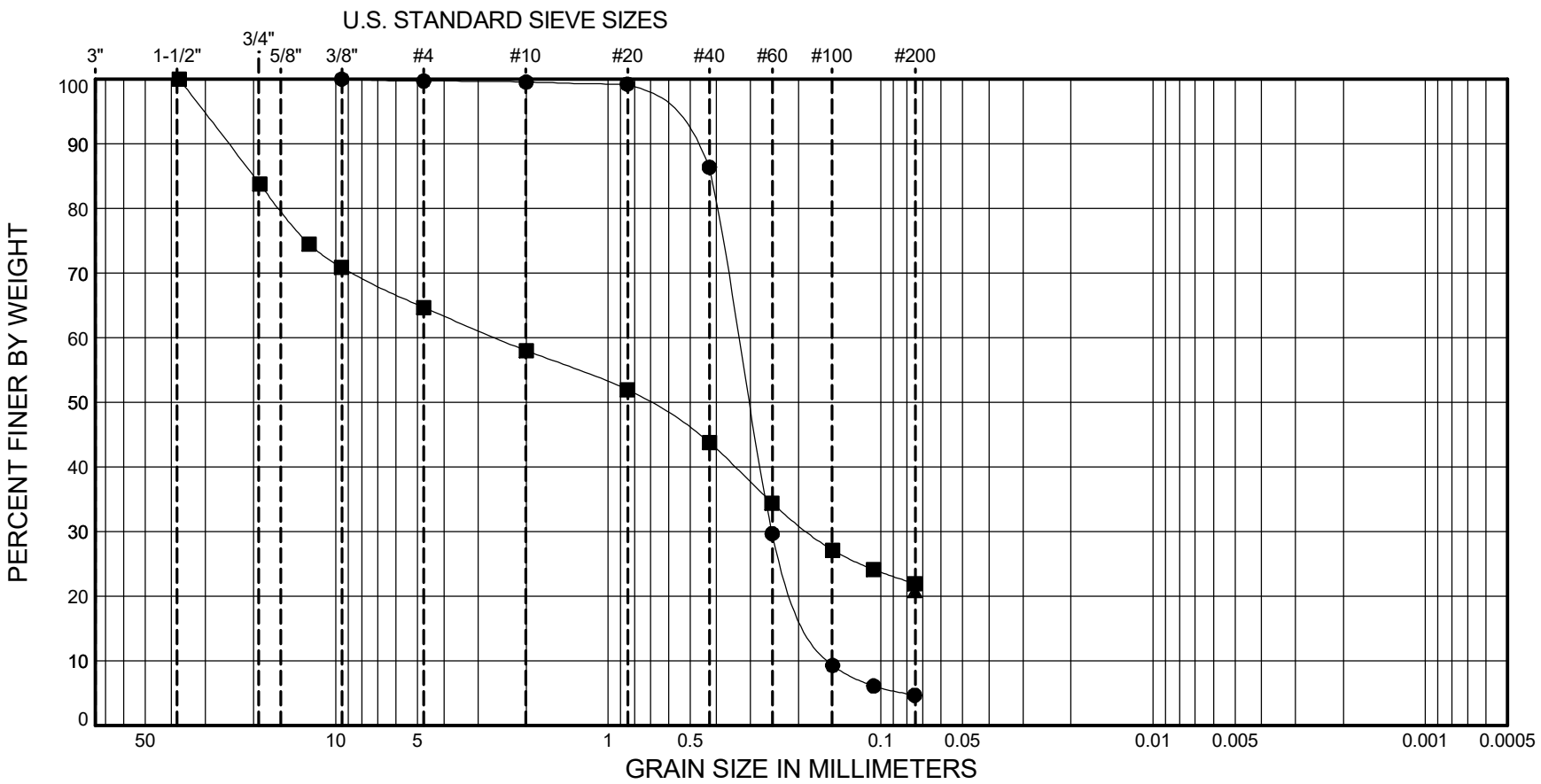
HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-44

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



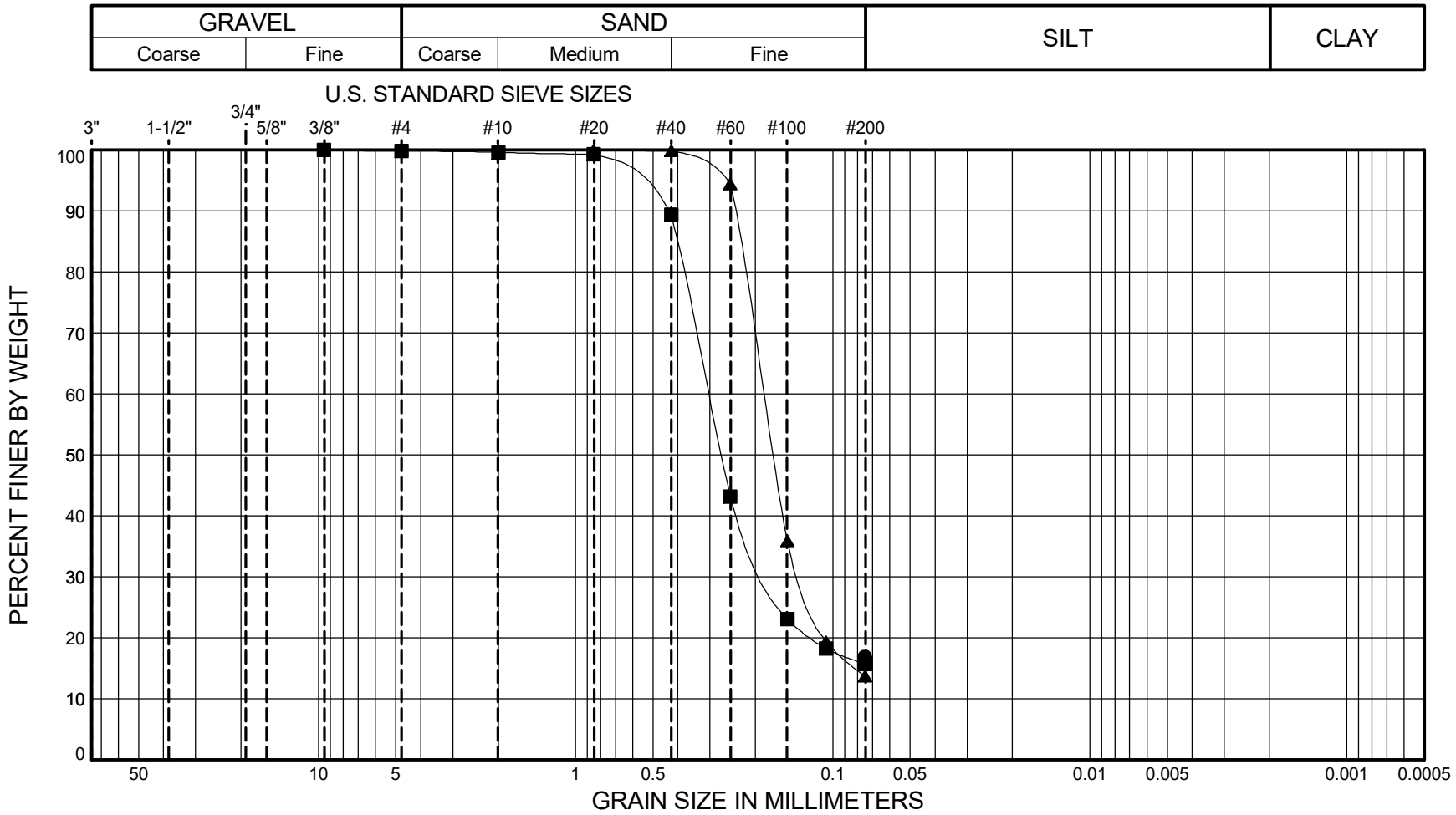
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-36A	S-11	30.0 - 31.5	(SP) Very dark gray, poorly graded SAND	27				0.3	95.0	4.7
■	BH-36B	S-2	2.5 - 4.0	(SM) Light olive-brown, silty SAND with gravel	5				35.3	42.7	21.9
▲	BH-37	S-3	7.5 - 9.0	(SM) Dark olive-gray, silty SAND	23						20.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-45



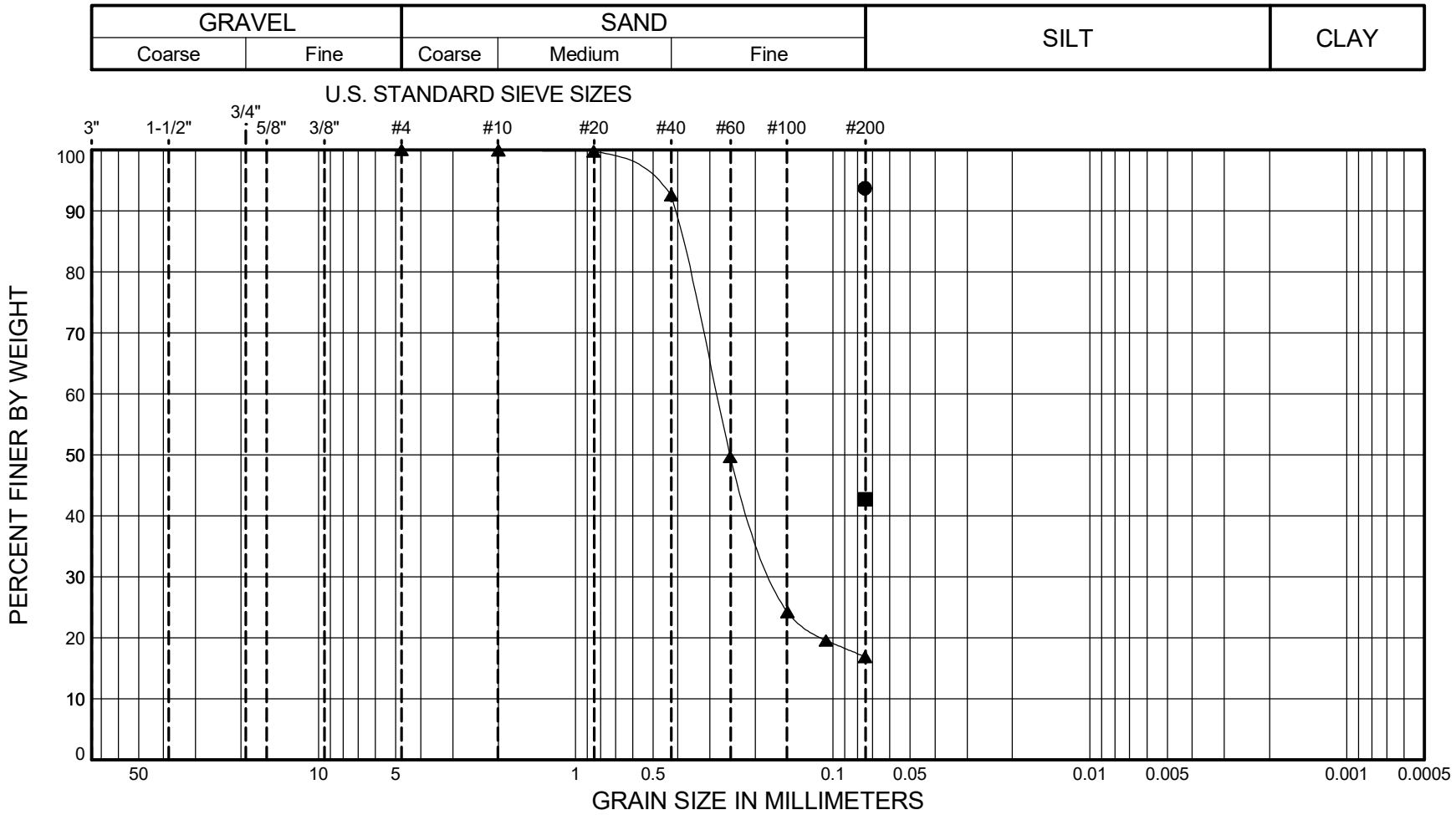
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-37	S-4	10.0 - 11.5	(SM) Dark olive-gray, silty SAND	25						16.9
■	BH-37	S-5	12.5 - 14.0	(SM) Dark gray, silty SAND	24				0.2	84.1	15.7
▲	BH-37	S-9	25.0 - 26.5	(SM) Dark gray, silty SAND	23					86.3	13.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-46



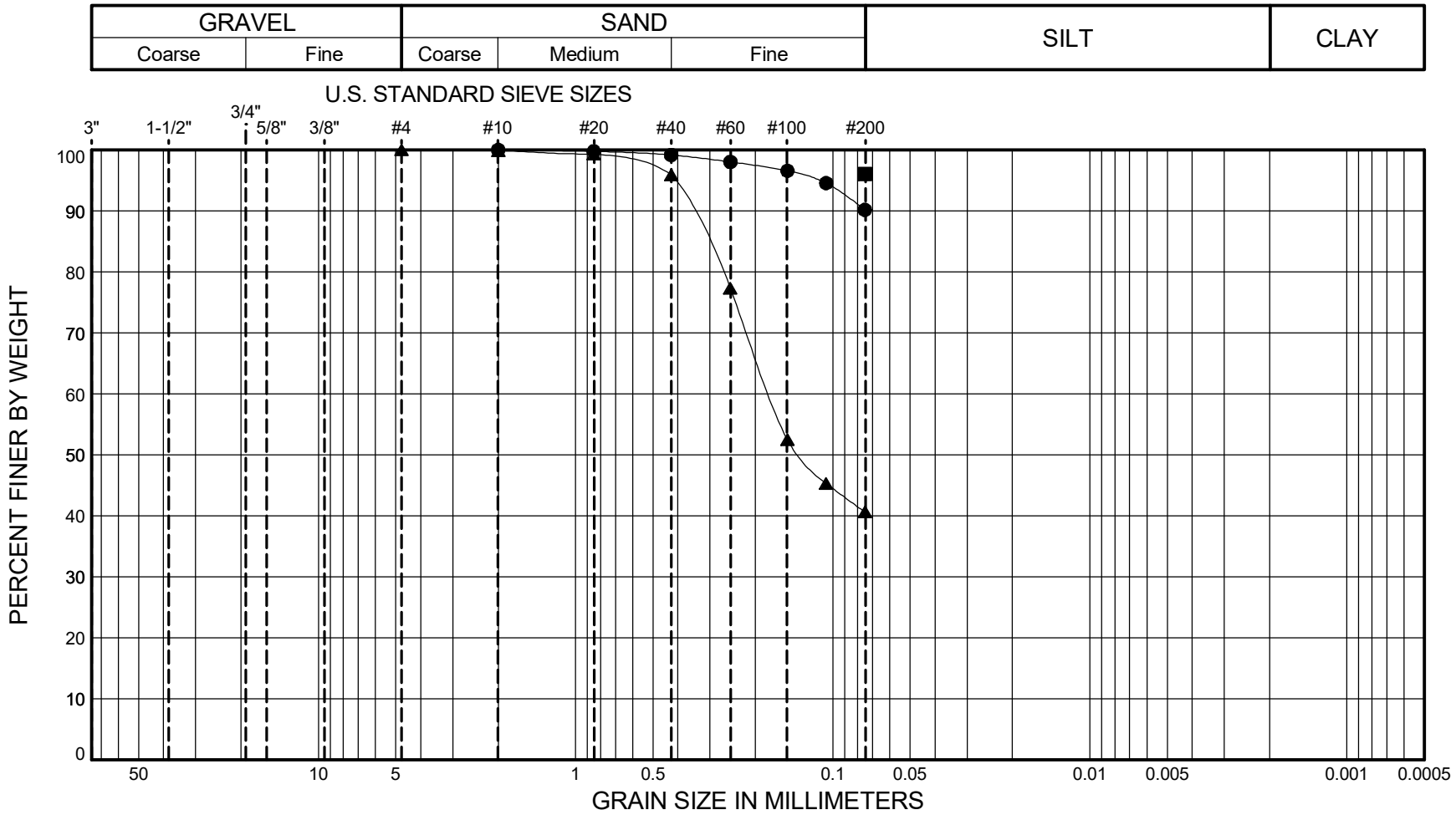
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-37	S-10b	31.0 - 31.5	(ML) Dark olive-brown, SILT	28						93.7
■	BH-37	S-11	35.0 - 36.5	(SM) Dark gray, silty SAND	22						42.7
▲	BH-39	S-4	10.0 - 11.5	(SM) Dark brown, silty SAND	23					83.1	16.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-47



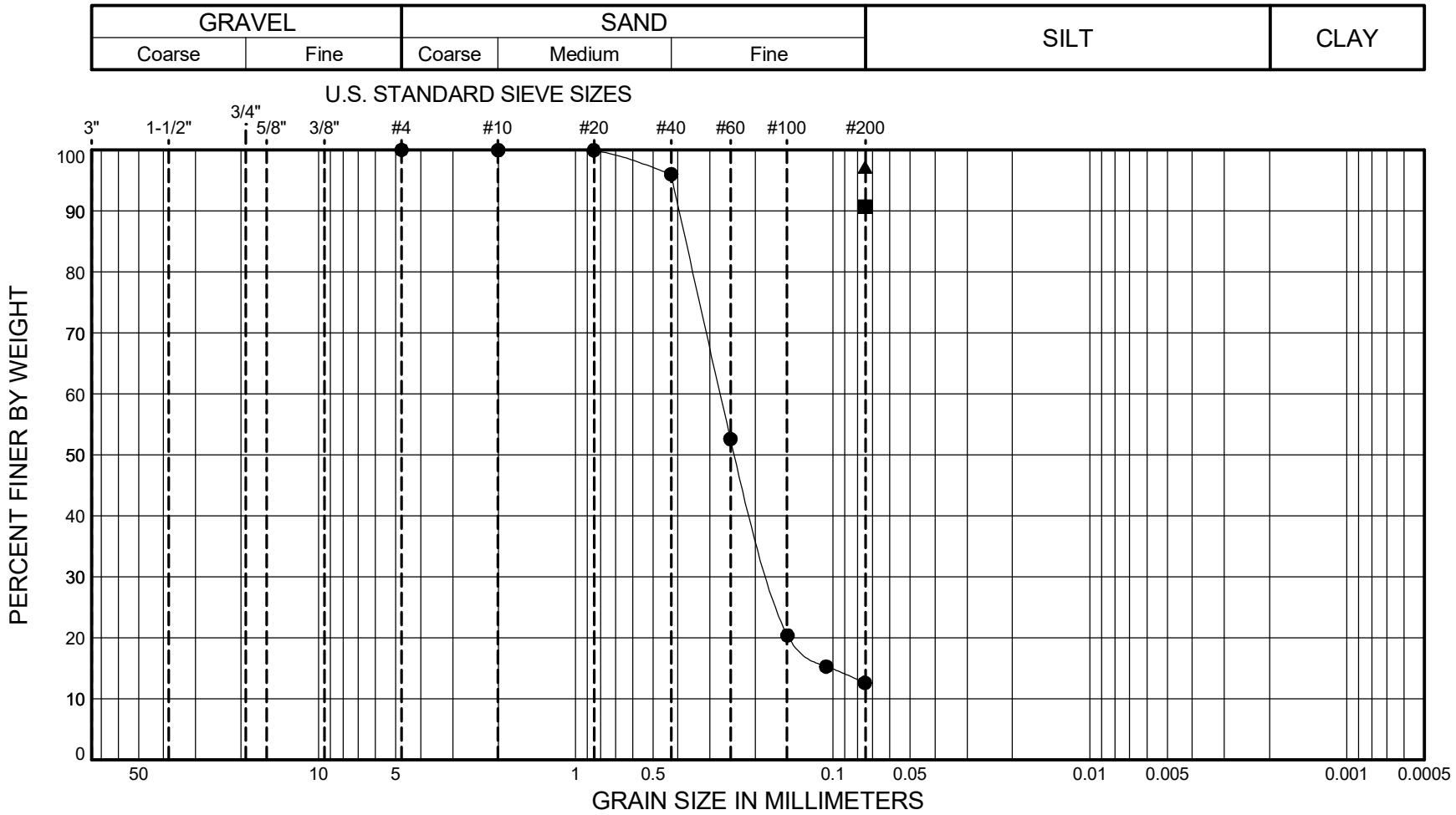
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-39	S-10	30.0 - 31.5	(ML) Grayish-brown, SILT	30					9.8	90.2
■	BH-39	S-12b	40.8 - 41.5	(ML) Dark gray, SILT	25	48	30	18			96.0
▲	BH-41	S-5	12.5 - 14.0	(SM) Olive-brown, silty SAND	22					59.4	40.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-48



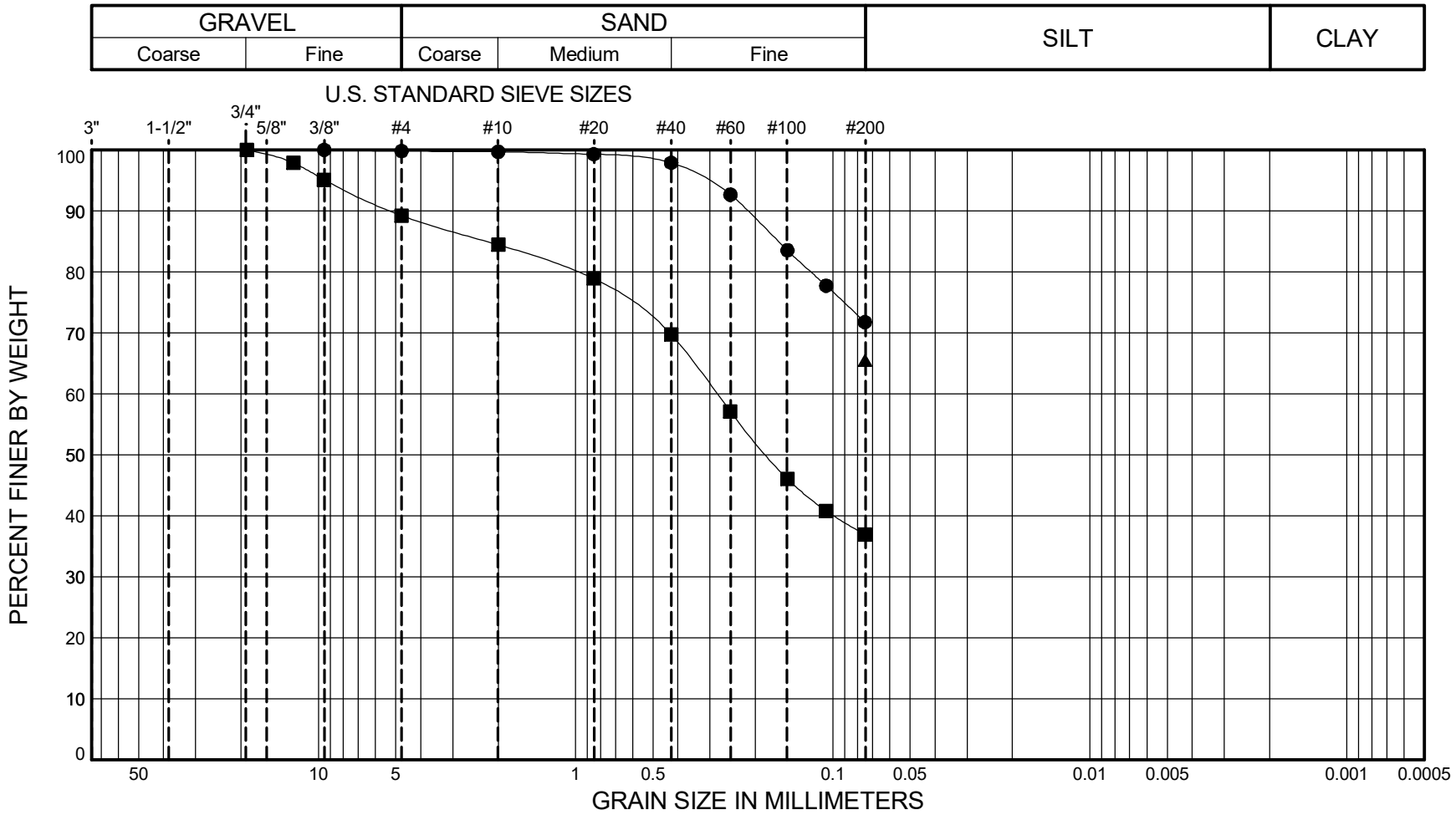
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-41	S-7	17.5 - 19.0	(SM) Olive-brown, silty SAND	22					87.4	12.6
■	BH-41	S-8	20.0 - 21.5	(CL) Olive-brown, lean CLAY	30	35	24	11			90.7
▲	BH-41	S-10	30.0 - 31.5	(CL) Very dark gray, lean CLAY	35	38	24	14			97.2

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-49



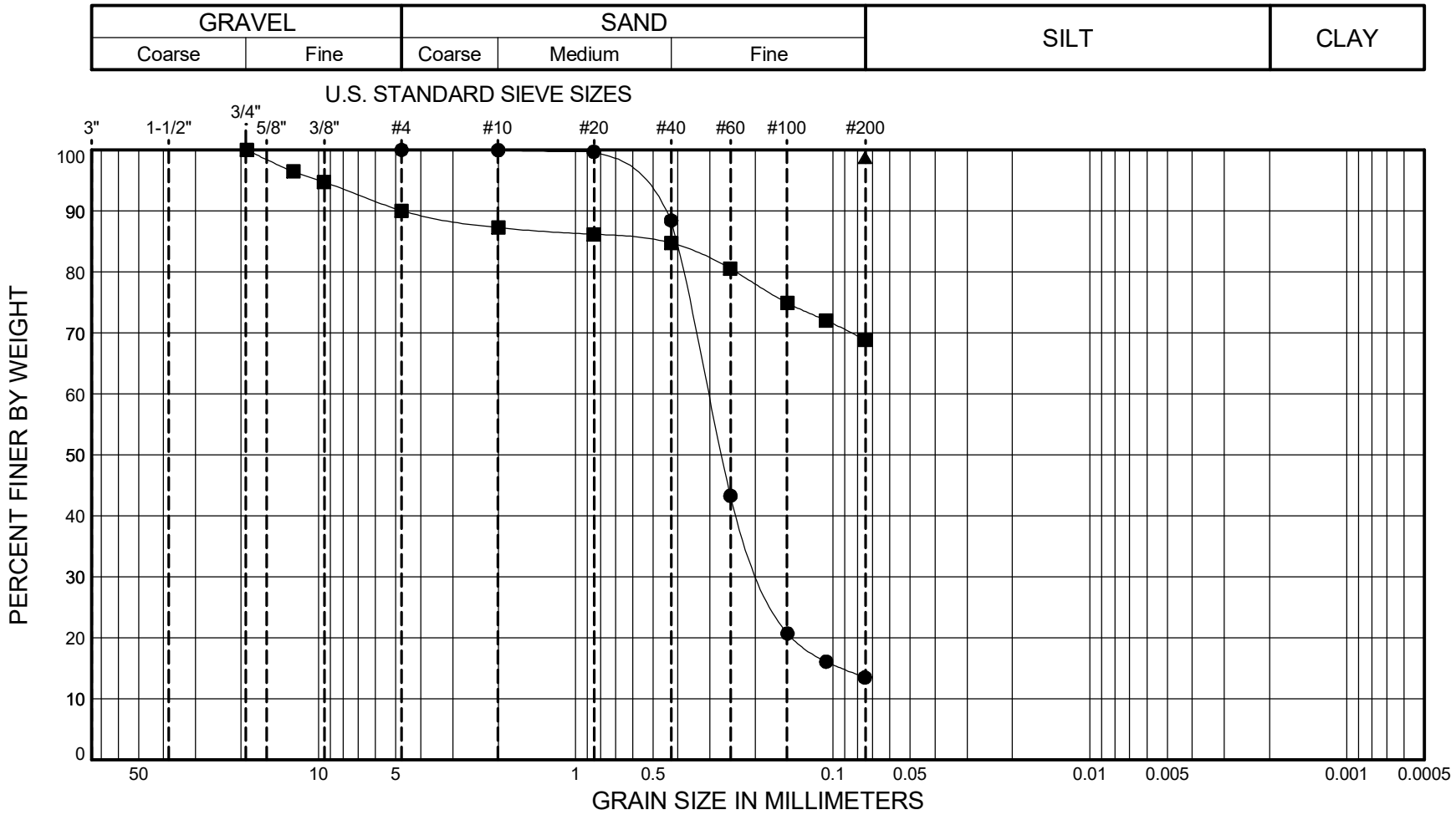
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-42	S-2	4.0 - 5.5	(ML) Yellowish-brown, SILT with sand	17				0.2	28.1	71.7
■	BH-43	S-6	15.0 - 16.5	(SM) Grayish-brown, silty SAND	14				10.8	52.3	36.9
▲	BH-43	S-8	20.0 - 21.5	(CL) Very dark gray, sandy lean CLAY	14	20	12	8			65.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-50



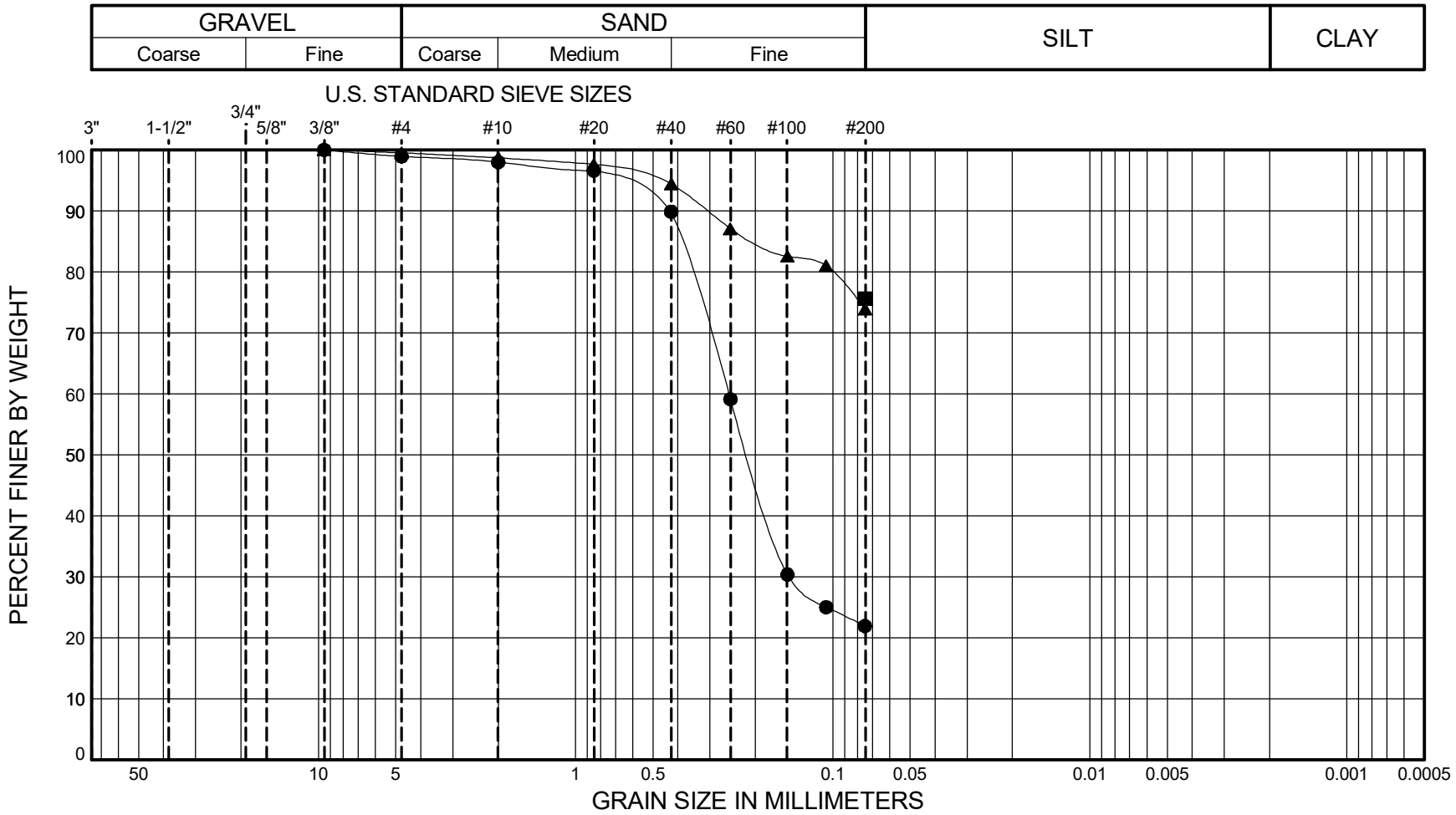
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-43	S-9	25.0 - 26.5	(SM) Very dark grayish-brown, silty SAND	20					86.5	13.5
■	BH-43	S-11	35.0 - 36.5	(ML) Dark gray, SILT with sand	26				10.0	21.1	68.9
▲	BH-43	S-12	40.0 - 41.5	(ML) Gray, SILT	35	40	26	14			98.7

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-51



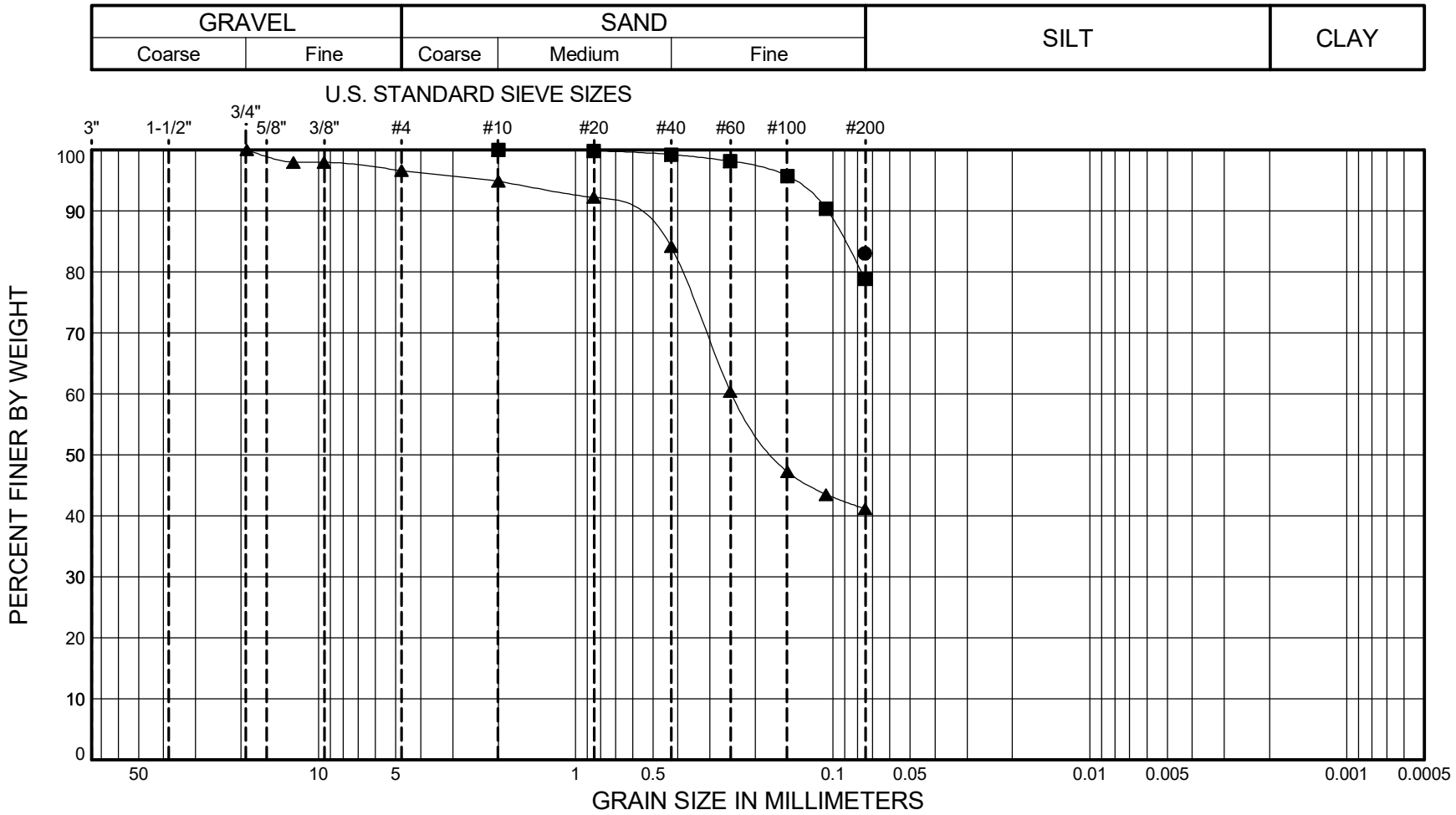
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-45	S-4	10.0 - 11.5	(SM) Dark grayish-brown, silty SAND	18				1.1	77.0	21.9
■	BH-45	S-7a	17.5 - 18.5	(CL) Gray, lean CLAY with sand	27	41	25	16			75.6
▲	BH-45	S-8a	20.0 - 20.8	(ML) Dark olive-gray, SILT with sand	25				0.5	25.6	73.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-52



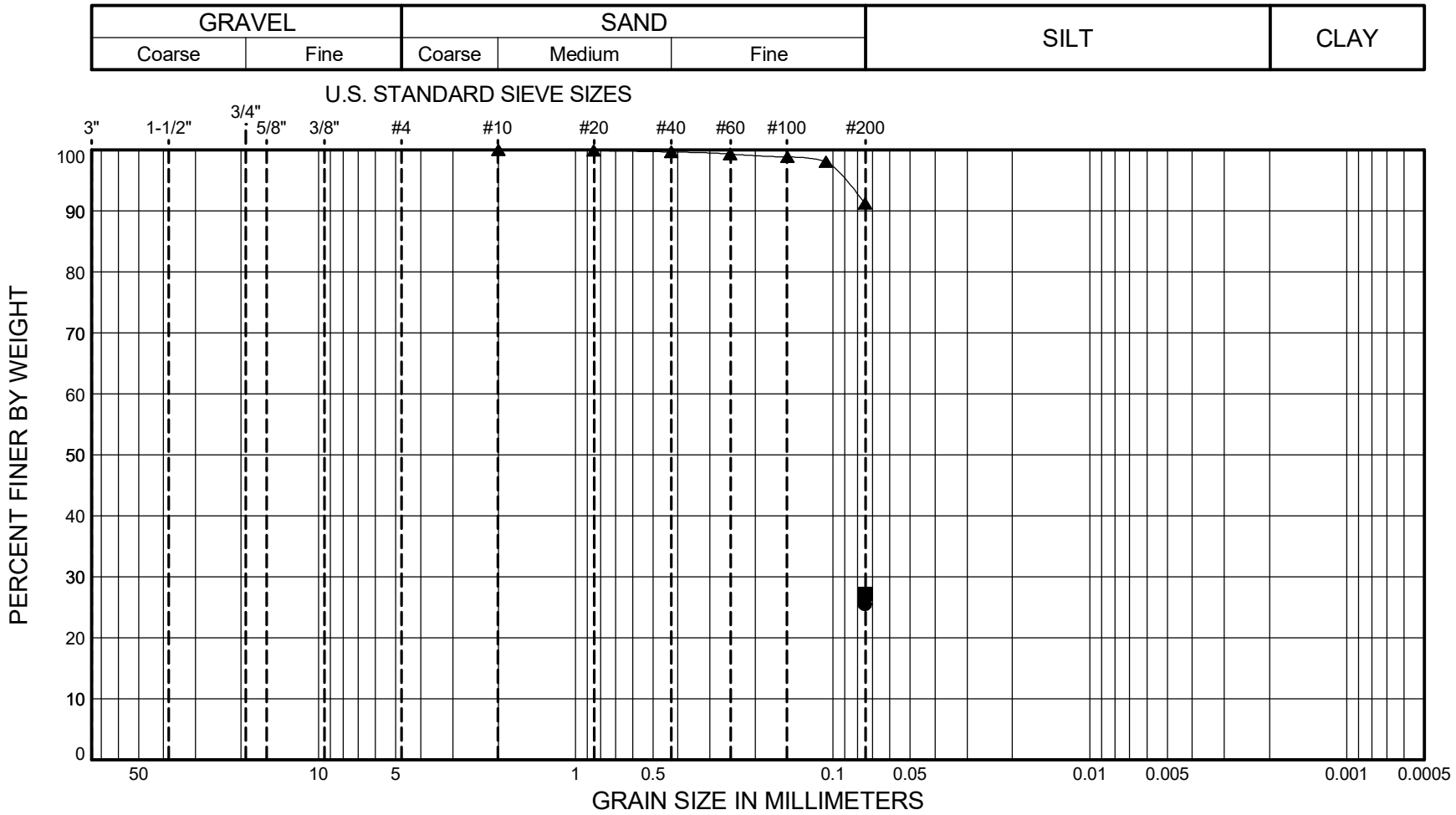
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-45	S-10	30.0 - 31.5	(CL) Dark gray, lean CLAY with sand	29	35	24	11			83.0
■	BH-45	S-12	40.0 - 41.5	(ML) Very dark gray, SILT with sand	24					21.2	78.8
▲	BH-46W	S-1	2.5 - 4.0	(SM) Dark yellowish-brown, silty SAND	15				3.4	55.5	41.1

HWA GEOSCIENCES INC.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-53



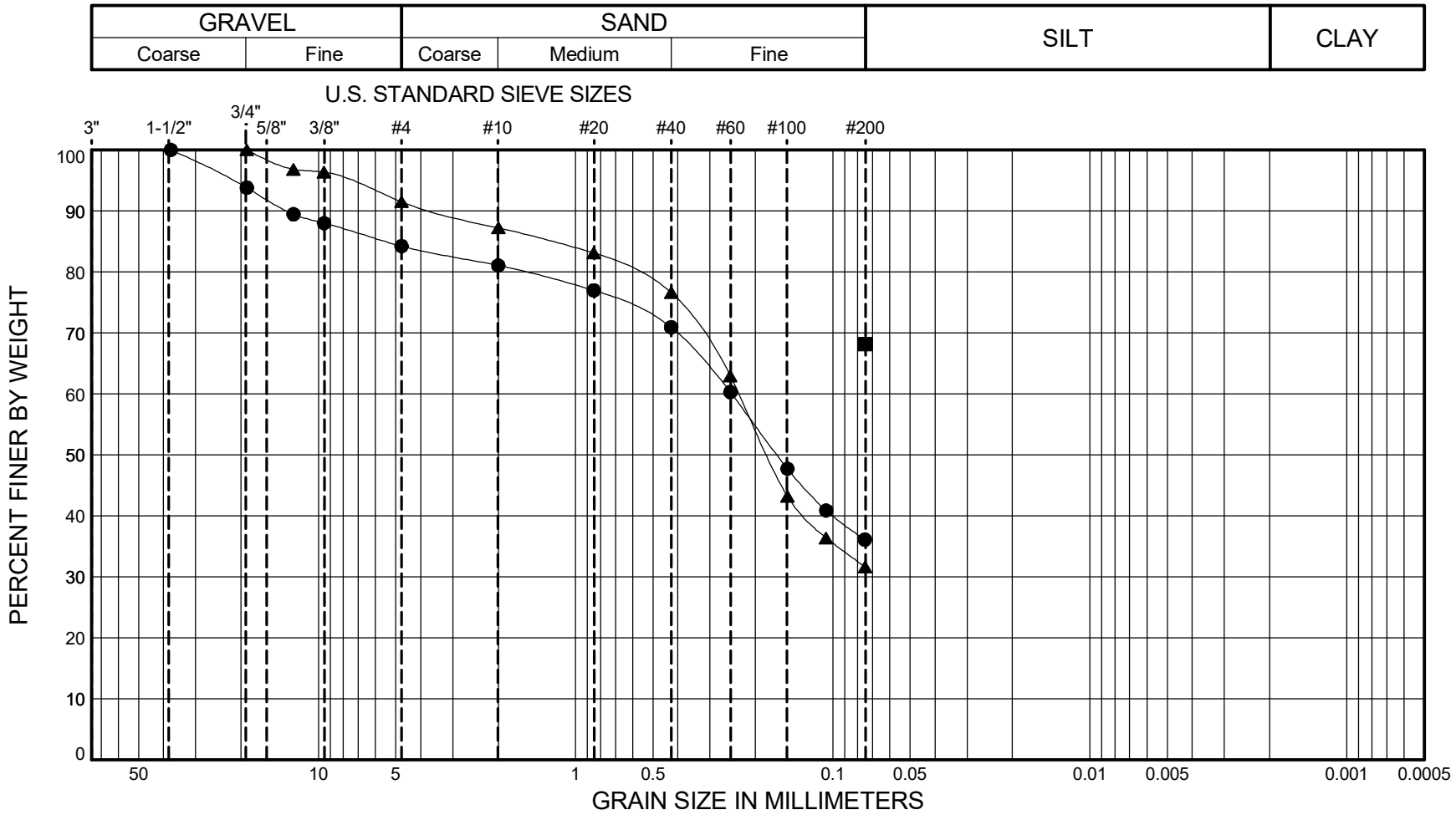
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-46W	S-3	7.5 - 9.0	(SM) Dark brown, silty SAND	16						25.5
■	BH-46W	S-6	15.0 - 16.5	(SM) Dark olive-brown, silty SAND	20						27.1
▲	BH-46W	S-8b	20.8 - 21.5	(ML) Olive-gray, SILT	26					8.8	91.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-54



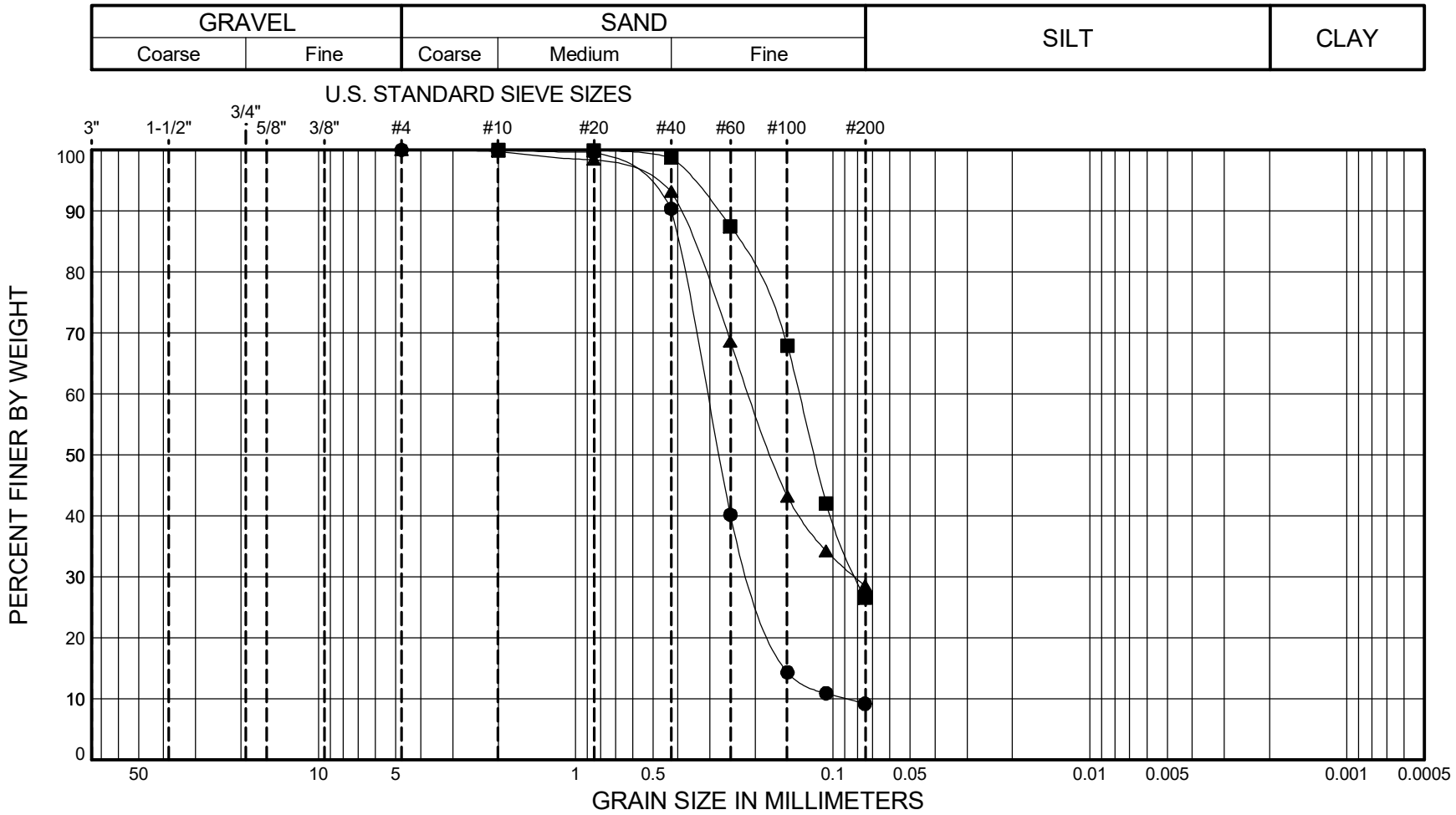
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-47	S-4	10.0 - 11.5	(SM) Olive-brown, silty SAND with gravel	12				15.8	48.1	36.1
■	BH-47	S-11b	35.5 - 36.5	(CL) Dark gray, sandy lean CLAY	27	36	21	15			68.2
▲	BH-48A	S-5	10.0 - 11.5	(SM) Olive-brown, silty SAND	11				8.5	59.8	31.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-55



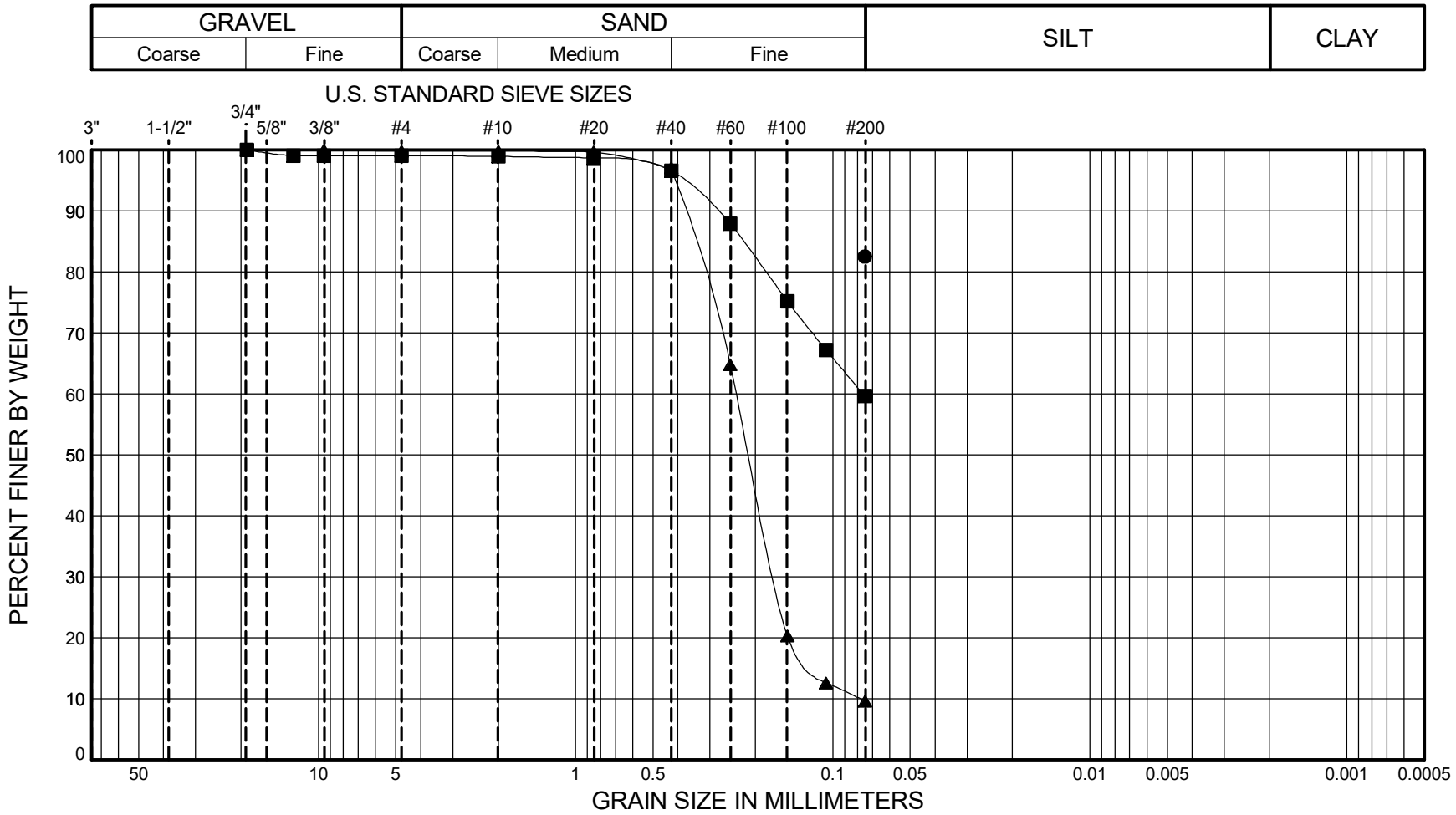
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-48B	S-6	12.5 - 14.0	(SP-SM) Olive-gray, poorly graded SAND with silt	13					90.8	9.2
■	BH-48B	S-12	40.0 - 41.5	(SM) Olive, silty SAND	26					73.4	26.6
▲	BH-49	S-3	7.5 - 9.0	(SM) Very dark gray, silty SAND	24					71.5	28.5

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-56



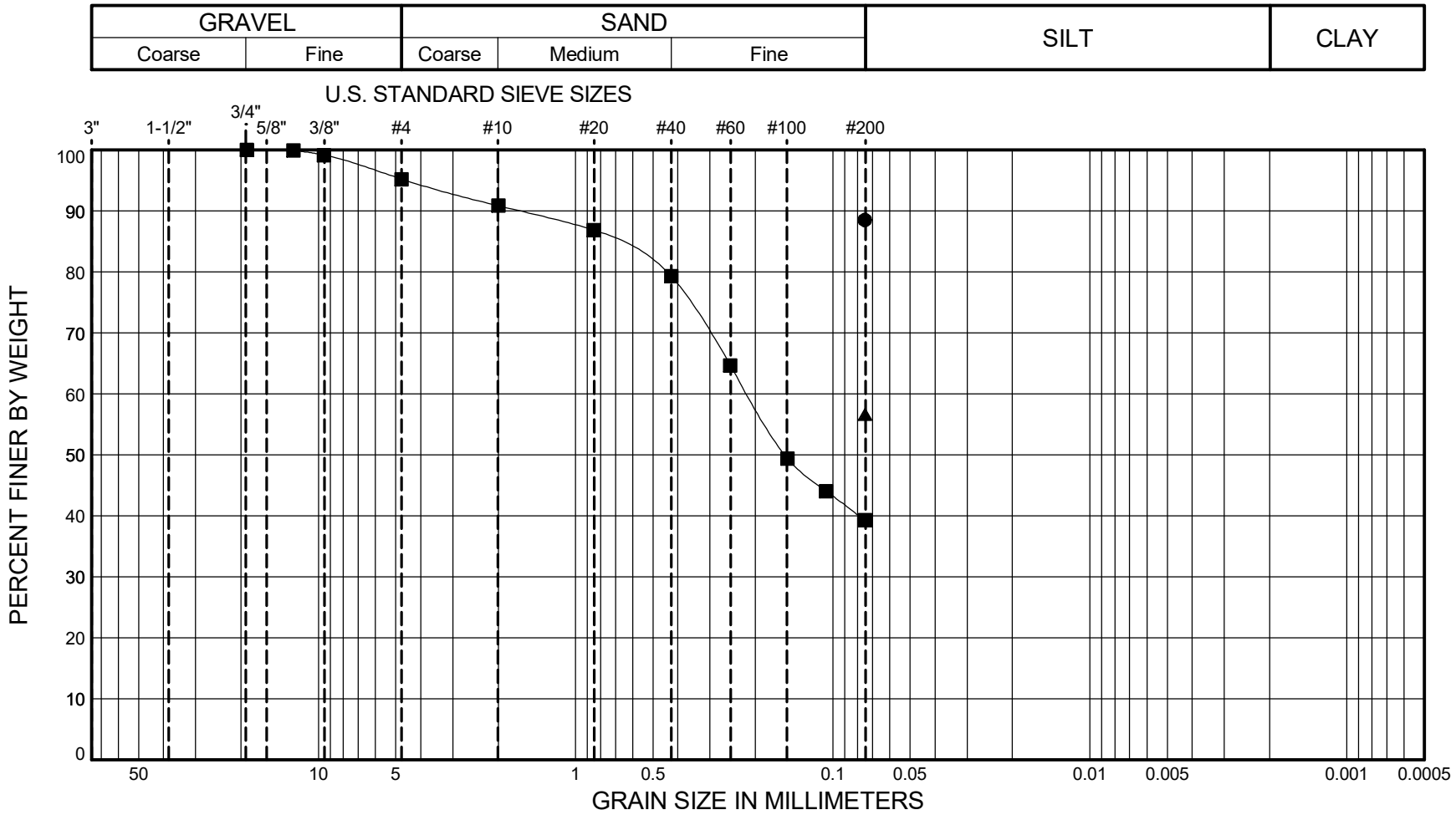
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-49	S-4	10.0 - 11.5	(CL) Very dark gray, lean CLAY with sand	29	32	22	10			82.5
■	BH-49	S-6	15.0 - 16.5	(ML) Dark gray, sandy SILT	27				1.0	39.4	59.6
▲	BH-49	S-9	25.0 - 26.5	(SP-SM) Dark gray, poorly graded SAND with silt	24				0.2	90.2	9.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-57



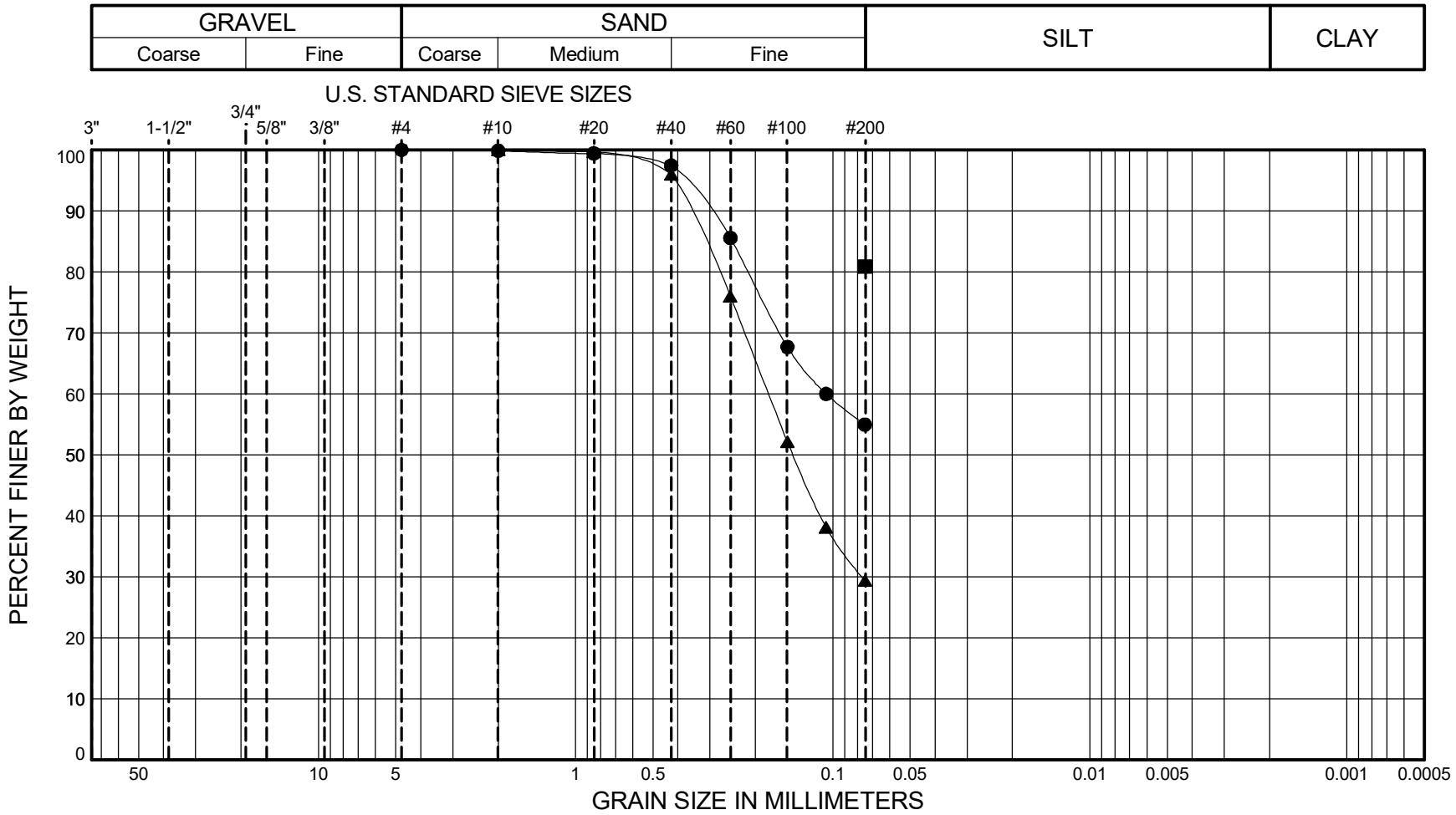
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-49	S-11b	35.8 - 36.5	(CL) Gray, lean CLAY	36	37	23	14			88.5
■	BH-50	S-2	2.5 - 4.0	(SM) Olive-brown, silty SAND	25	20	16	4	4.8	55.9	39.3
▲	BH-50	S-6	12.5 - 14.0	(CL) Olive, sandy lean CLAY	26	29	18	11			56.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-58



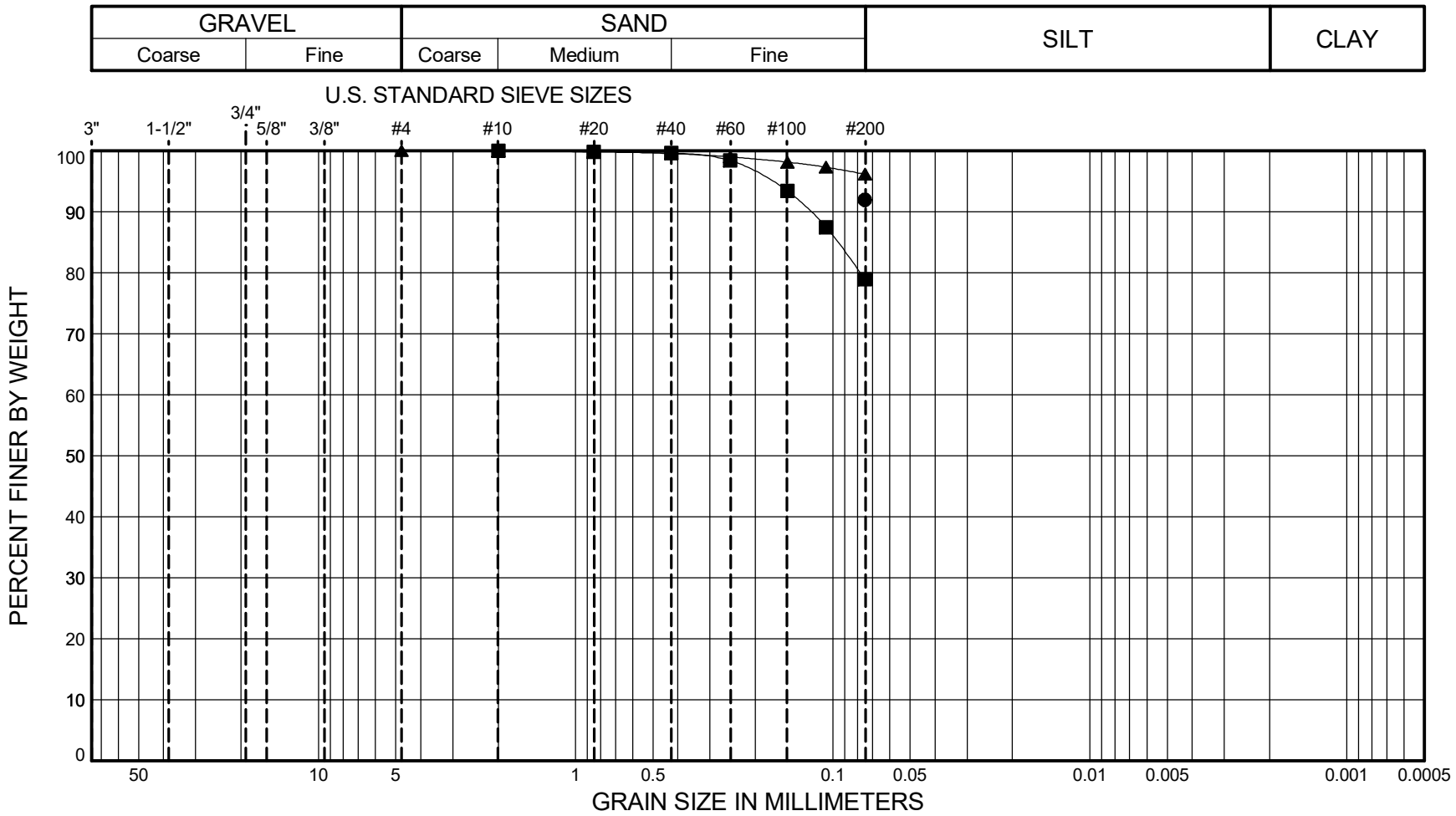
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-50	S-9	20.0 - 21.5	(ML) Dark gray, sandy SILT	23					45.1	54.9
■	BH-50	S-10	25.0 - 26.5	(ML) Dark gray, SILT with sand	26	41	27	14			80.8
▲	BH-51	S-3	7.5 - 9.0	(SM) Olive-brown, silty SAND	26					70.6	29.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-59



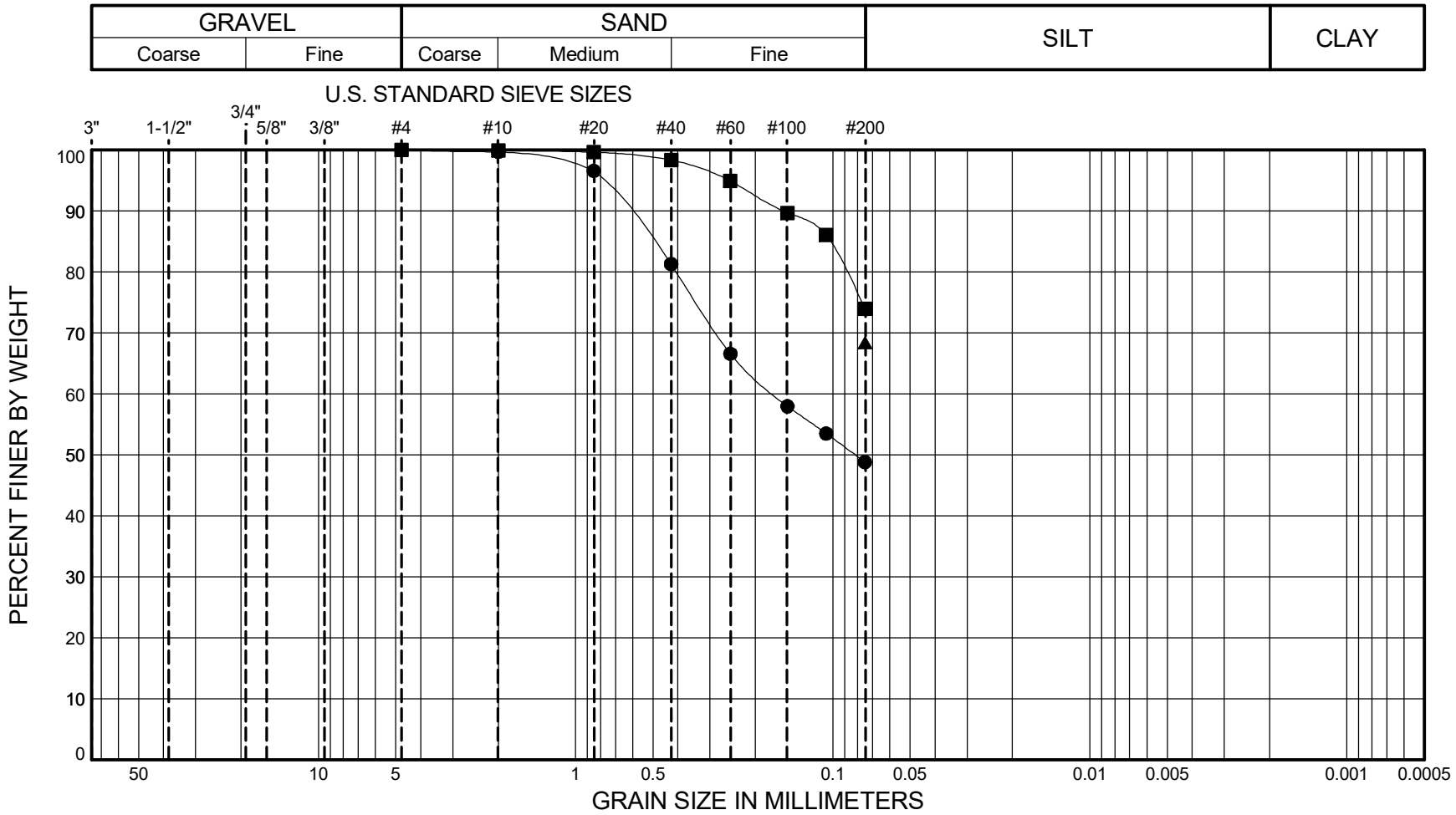
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-51	S-6	15.0 - 16.5	(CL) Dark gray, lean CLAY	29	34	23	11			91.9
■	BH-51	S-8	20.0 - 21.5	(ML) Very dark gray, SILT with sand	29					21.1	78.9
▲	BH-51	S-10	30.0 - 31.5	(ML) Very dark gray, SILT	32	39	28	11		3.9	96.1

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-60



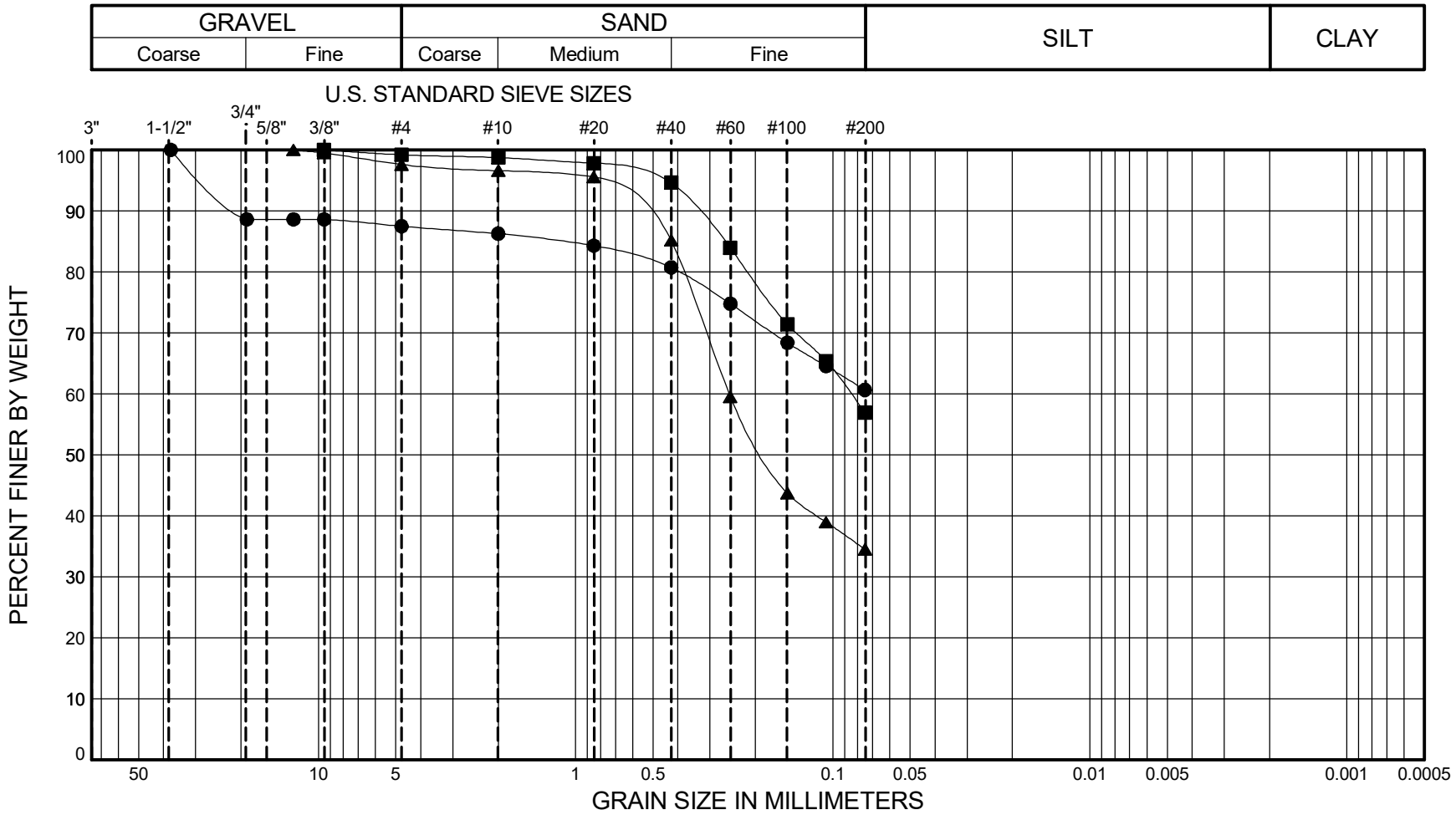
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-51	S-13b	45.3 - 46.5	(SM) Very dark gray, silty SAND	24					51.2	48.8
■	BH-52A	S-2a	5.0 - 6.0	(ML) Light olive-brown, SILT with sand	27					26.1	73.9
▲	BH-52A	S-2b	6.0 - 6.5	(CL) Light olive-brown, sandy lean CLAY	25						68.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-61



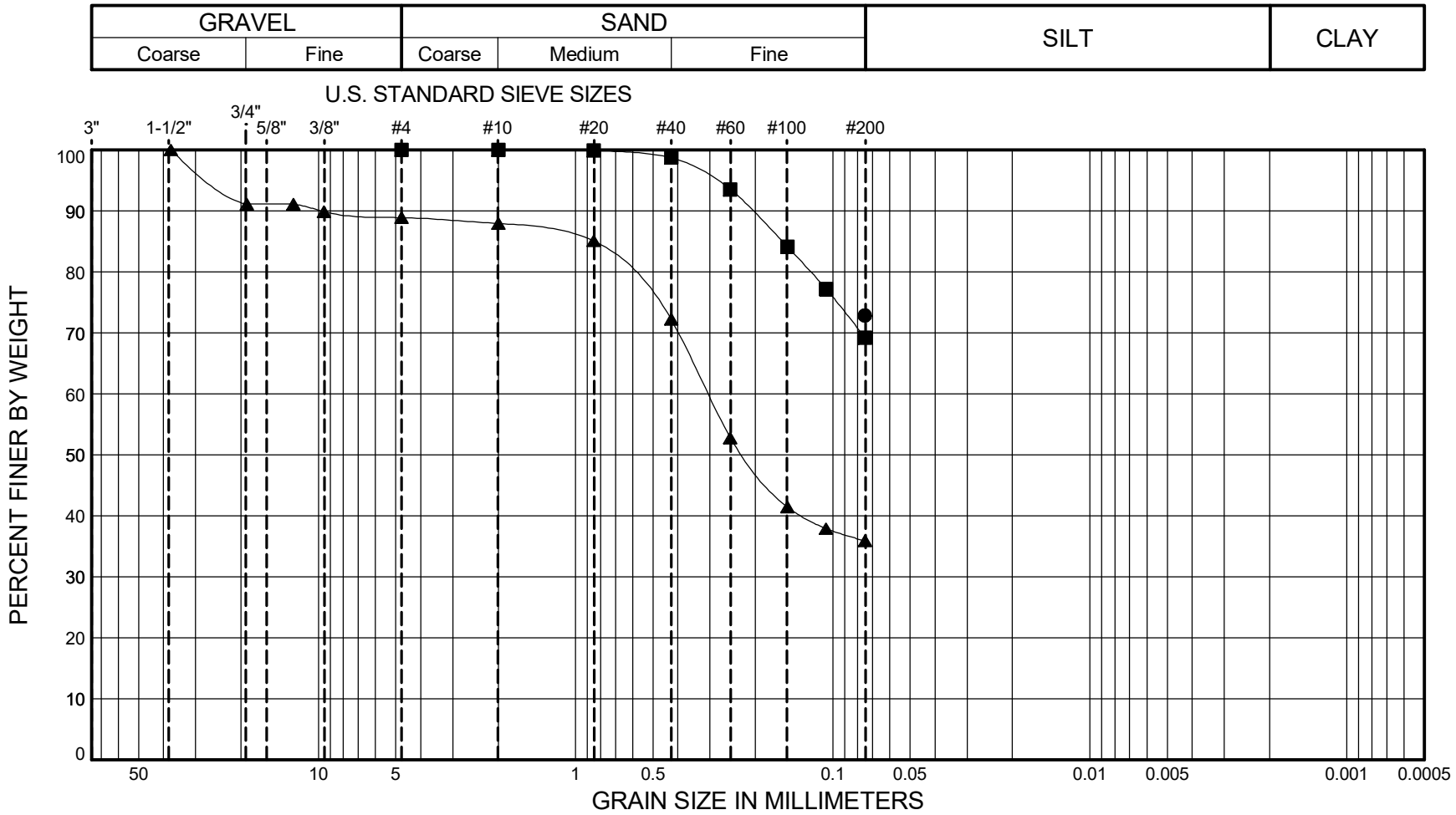
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-52B	S-4	10.0 - 11.5	(CL) Light olive-brown, lean CLAY with sand	20	29	19	10	12.5	26.8	60.6
■	BH-53	S-5a	12.5 - 13.5	(ML) Olive, sandy SILT	21				0.8	42.3	56.9
▲	BH-53	S-6a	15.0 - 15.8	(SM) Olive, silty SAND	19				2.4	63.1	34.5

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-62



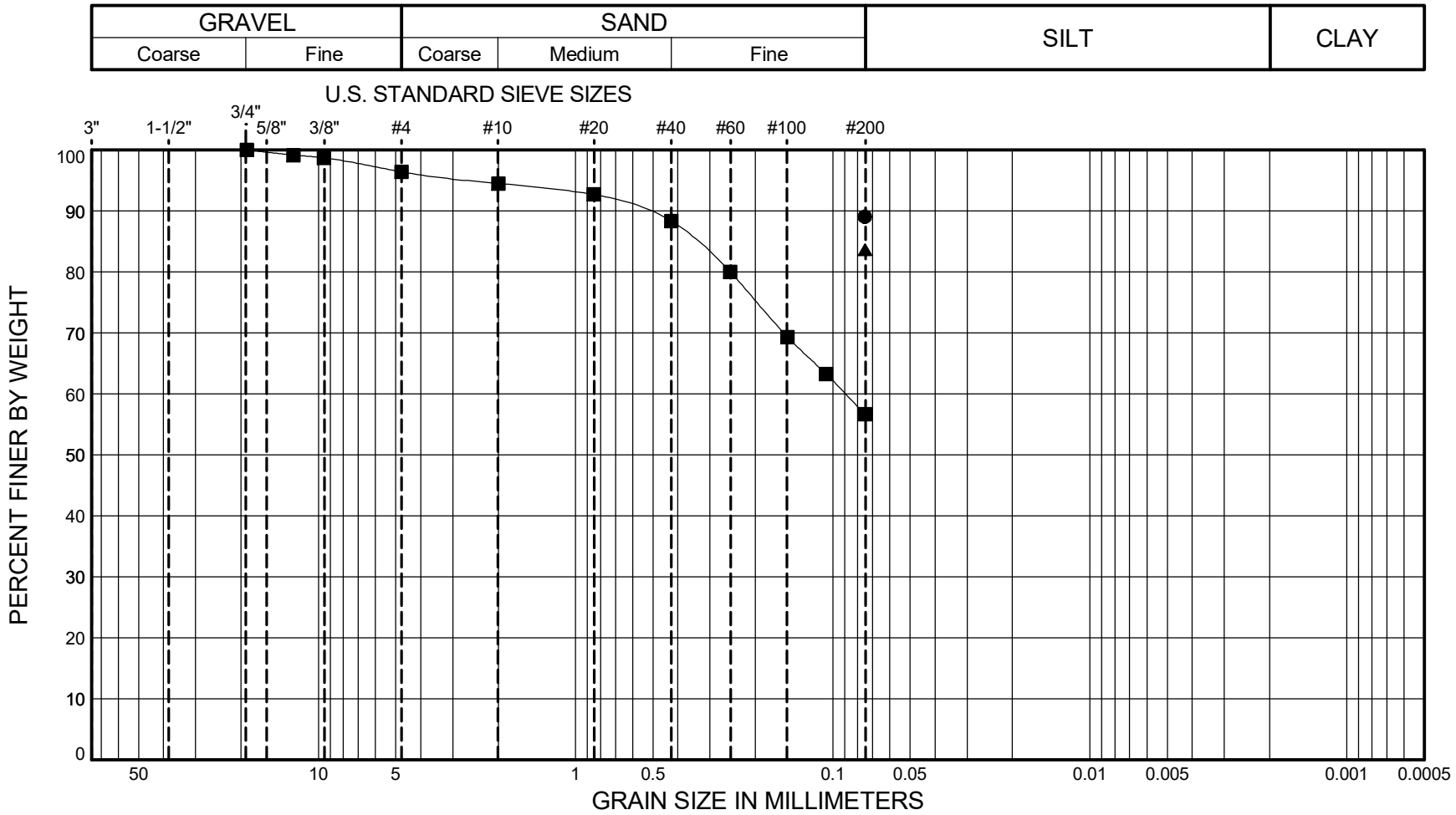
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-53	S-6b	15.8 - 16.5	(CL-ML) Olive-gray, silty CLAY with sand	22	24	19	5			72.8
■	BH-53	S-8	20.0 - 21.5	(CL-ML) Olive, silty CLAY with sand	24					30.8	69.2
▲	BH-53	S-12	40.0 - 41.5	(SM) Very dark gray, silty SAND	19				11.1	53.0	35.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-63



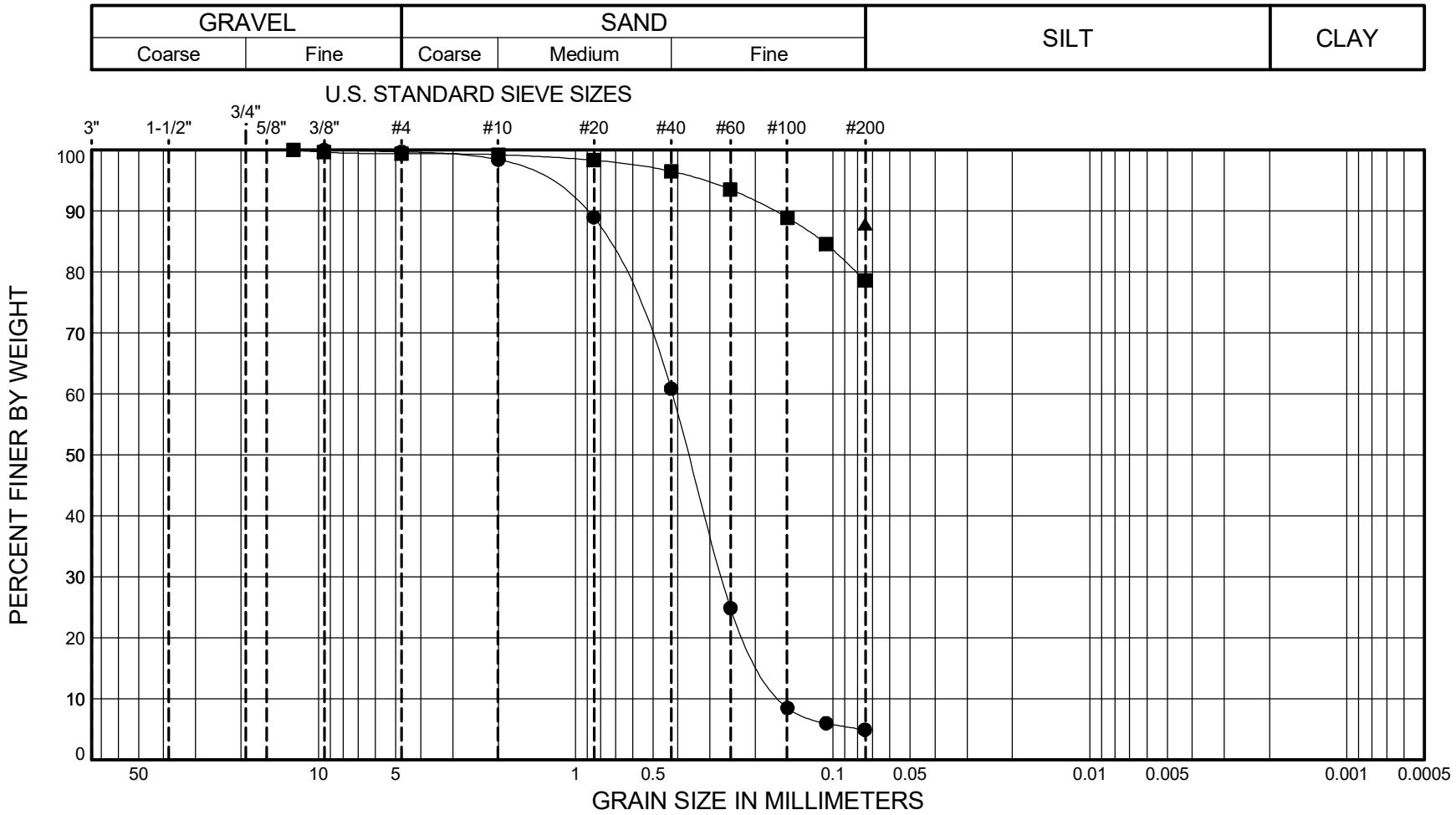
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-53	S-13	45.0 - 46.5	(CL-ML) Very dark gray, silty CLAY	26	28	22	6			89.0
■	BH-54A	S-3	7.5 - 9.0	(ML) Olive-brown, sandy SILT	19				3.6	39.7	56.6
▲	BH-54A	S-4b	10.5 - 11.5	(CL) Yellowish-brown, lean CLAY with sand	21	32	21	11			83.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-64



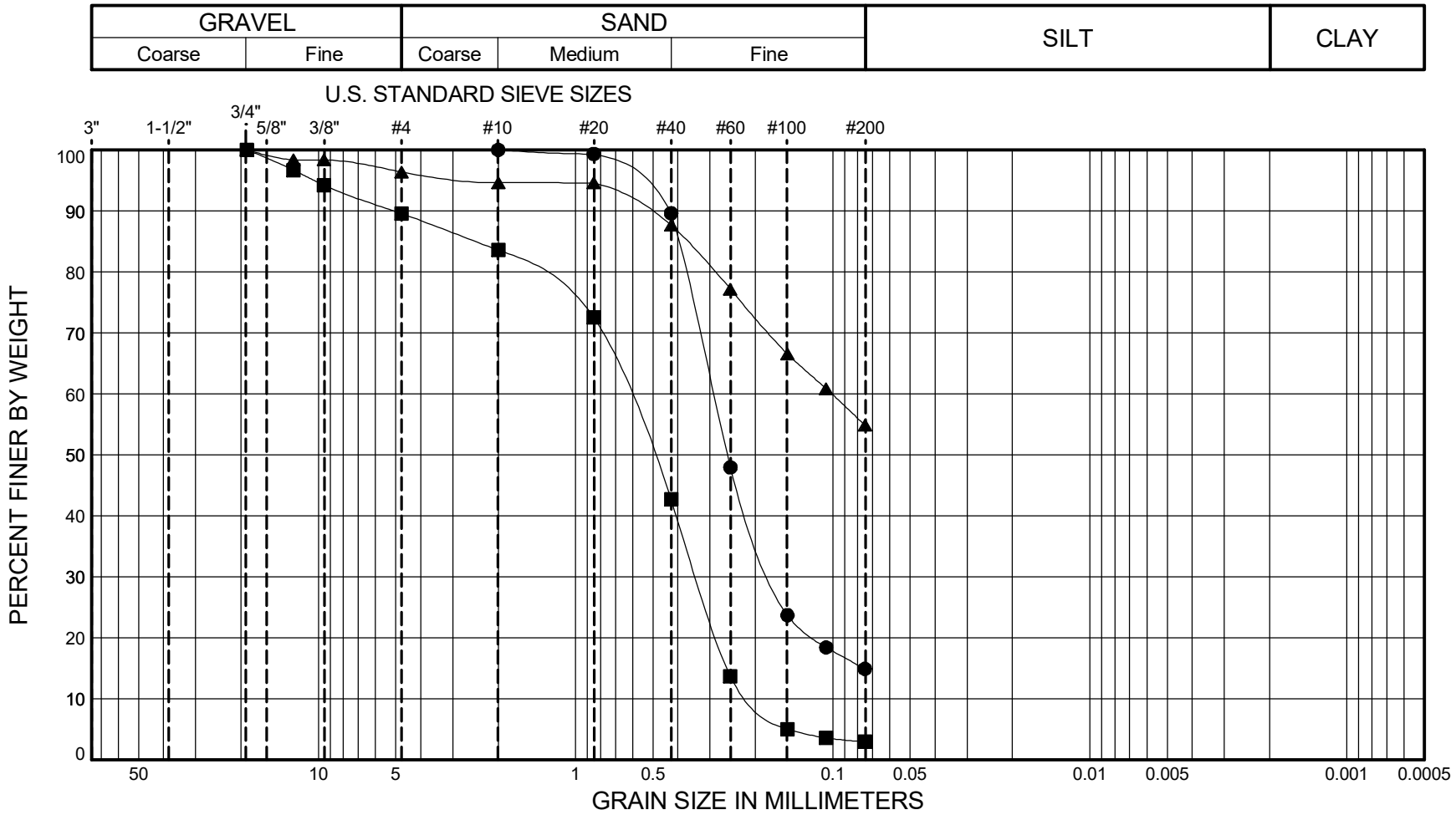
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-54B	S-4	7.5 - 9.0	(SP) Dark yellowish-brown, poorly graded SAND	6				0.3	94.8	4.9
■	BH-55W	S-3	7.5 - 9.0	(ML) Olive, SILT with sand	21				0.6	20.8	78.5
▲	BH-55W	S-7	17.5 - 19.0	(ML) Very dark gray, SILT	26	35	27	8			87.8

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-65



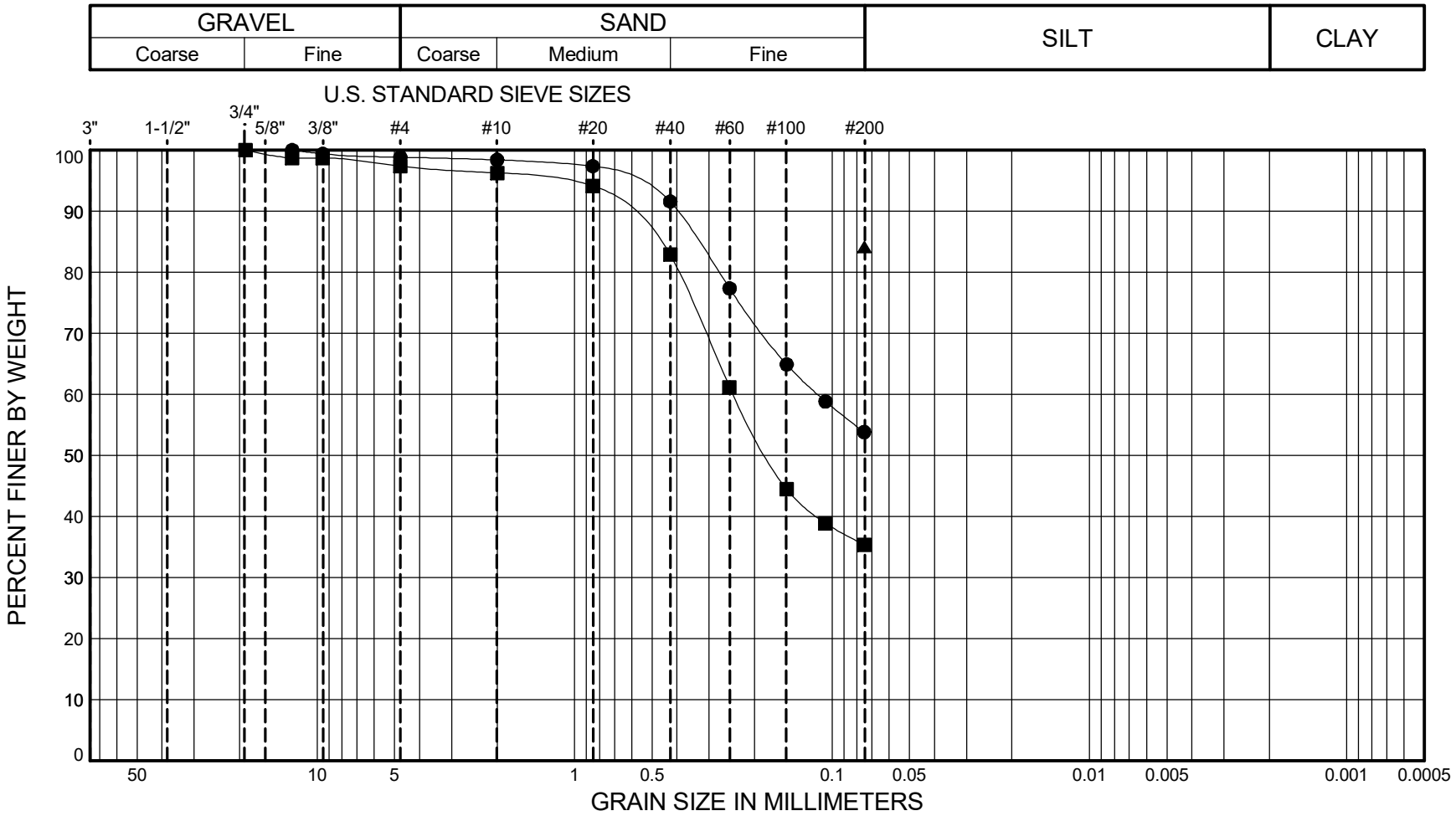
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-55W	S-12	40.0 - 41.0	(SM) Olive-gray, silty SAND	19					85.1	14.9
■	BH-56	S-3	7.5 - 9.0	(SP) Olive-brown, poorly graded SAND	5				10.5	86.6	2.9
▲	BH-56	S-5	12.5 - 13.9	(ML) Olive-brown, sandy SILT	16				3.6	41.5	54.8

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-66



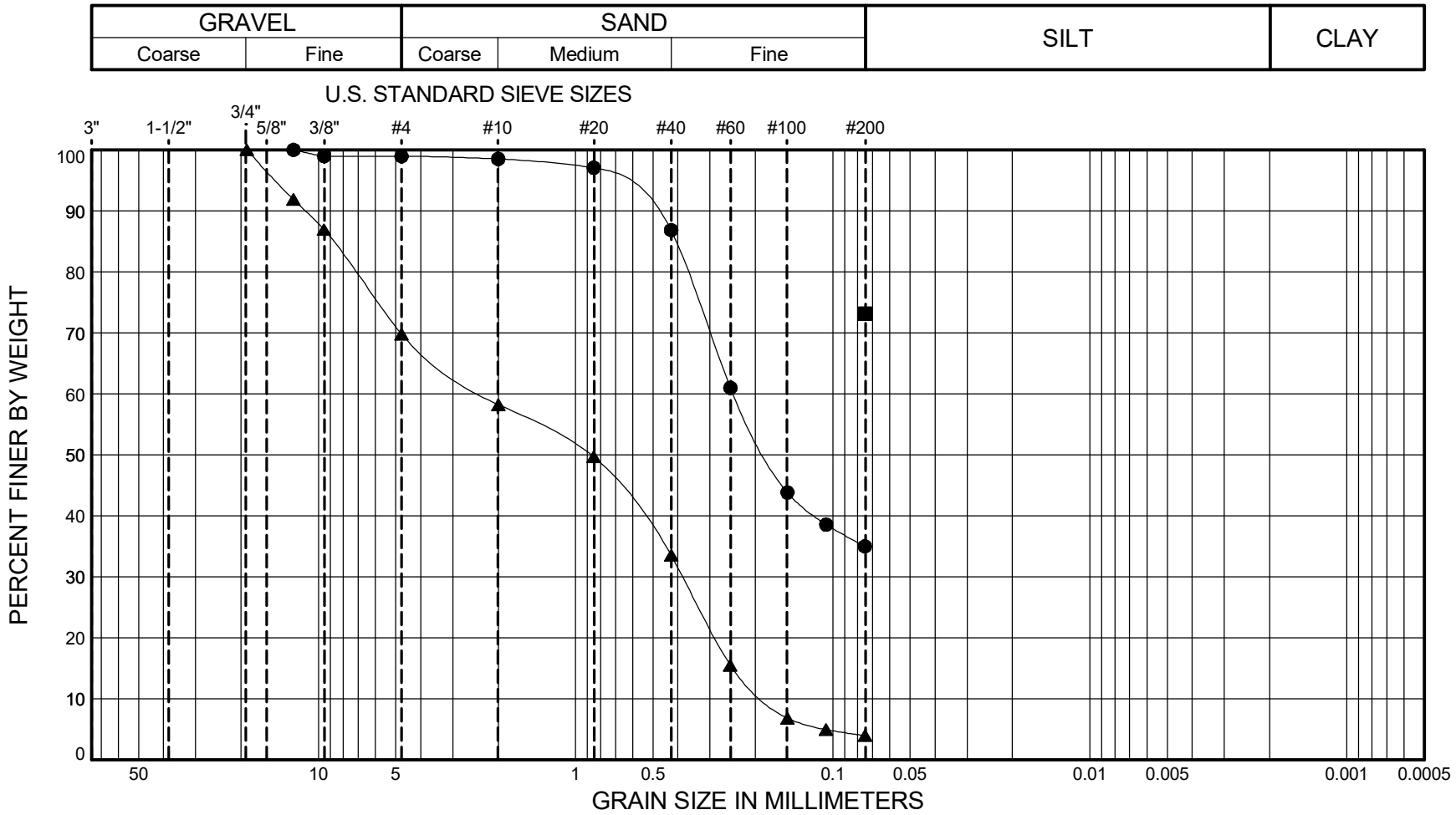
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-57	S-3	7.5 - 8.9	(ML) Olive-brown, sandy SILT	15				1.2	45.0	53.8
■	BH-57	S-9	25.0 - 26.5	(SM) Olive-gray, silty SAND	18				2.6	62.1	35.3
▲	BH-57	S-11	35.0 - 36.5	(MH) Olive, elastic SILT with sand	31	53	29	24			84.1

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-67



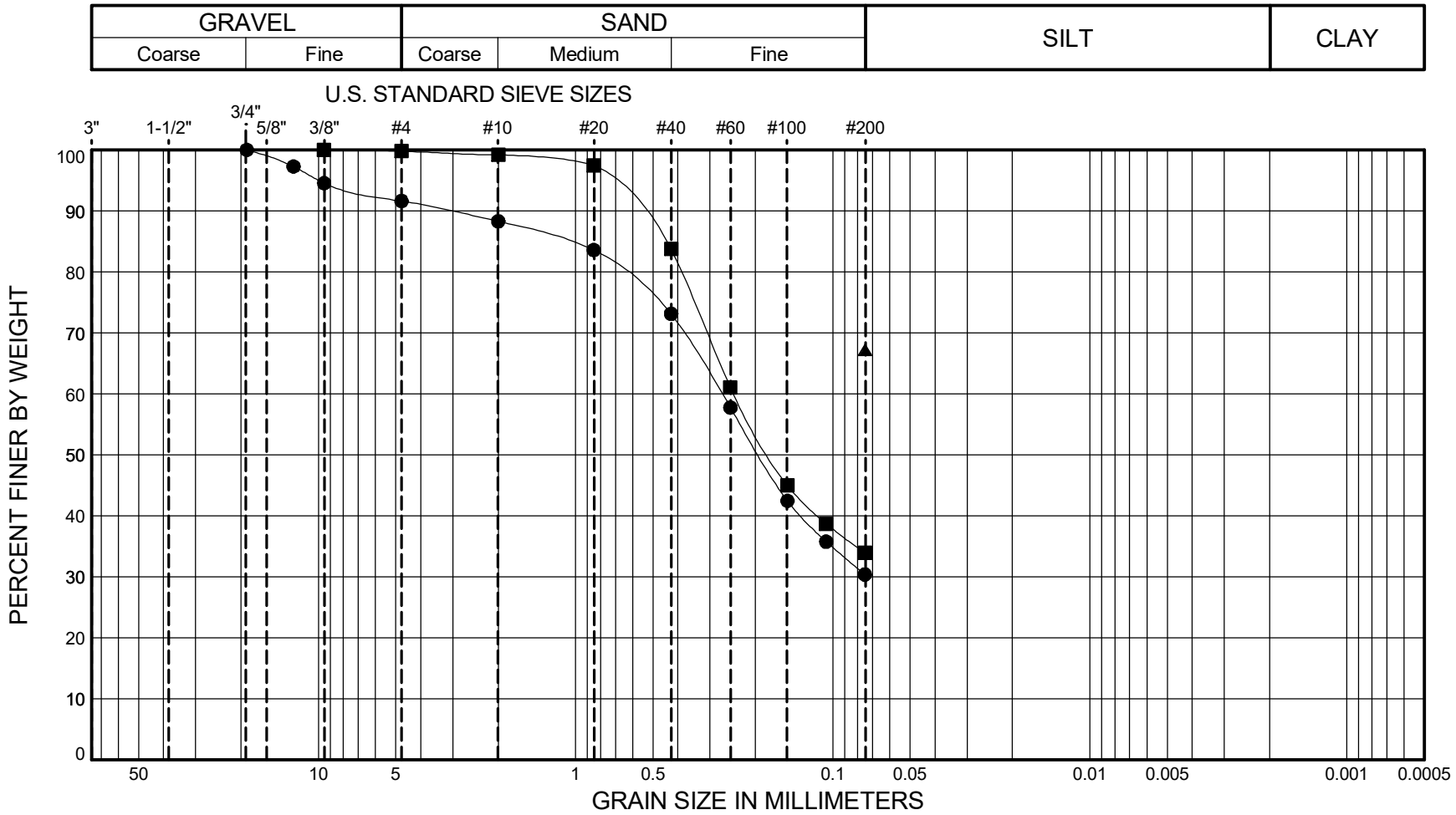
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-57	S-12	40.0 - 41.5	(SM) Olive, silty SAND	23				1.1	63.9	35.0
■	BH-57	S-13	45.0 - 46.5	(ML) Dark gray, SILT with sand	23						73.1
▲	BH-58	S-2	5.0 - 6.5	(SP) Olive-brown, poorly graded SAND with gravel	14				30.2	65.8	4.0

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-68



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-58	S-6	15.0 - 16.5	(SM) Olive-brown, silty SAND	18				8.4	61.2	30.4
■	BH-58	S-9b	25.5 - 26.5	(SM) Olive-brown, silty SAND	20				0.2	65.9	33.9
▲	BH-58	S-10a	30.0 - 31.0	(ML) Light olive-brown, sandy SILT	27						67.2

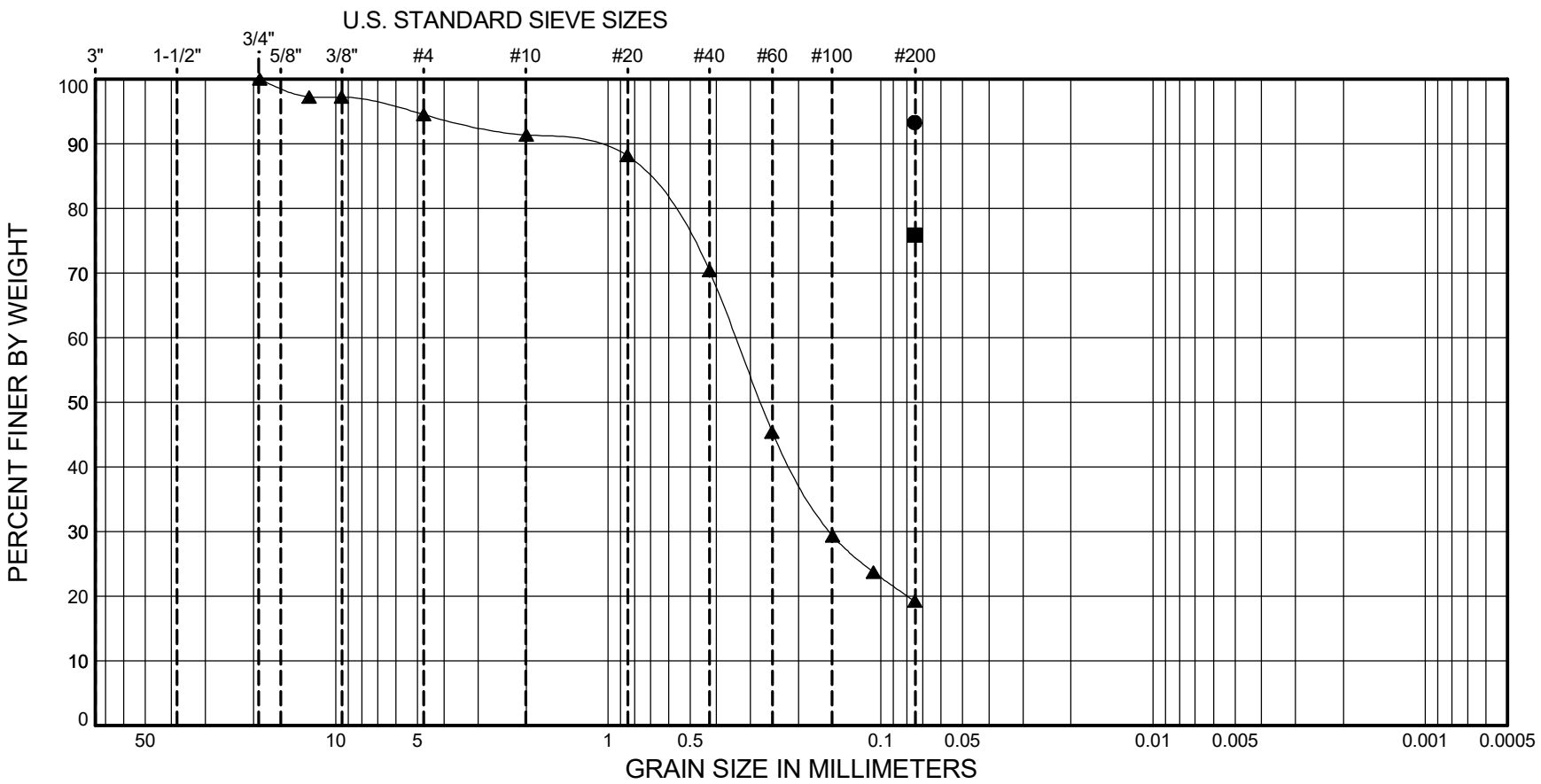
HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-69

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



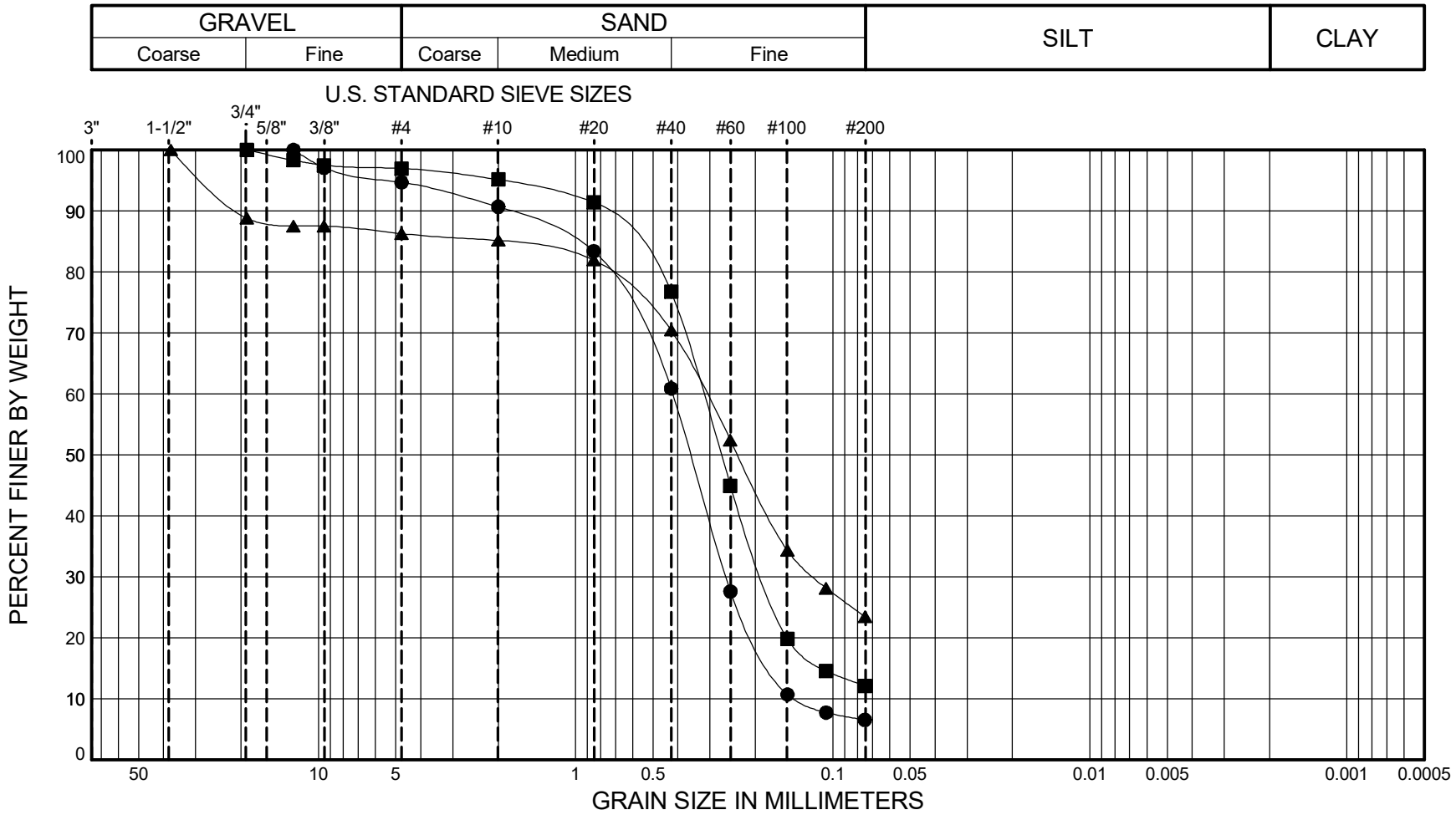
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-58	S-12b	41.0 - 41.5	(ML) Very dark grayish-brown, SILT	35	40	33	7			93.3
■	BH-58	S-13a	45.0 - 46.0	(ML) Olive-brown, SILT with sand	25						75.9
▲	BH-58	S-13b	46.0 - 46.5	(SM) Olive-brown, silty SAND	18				5.5	75.3	19.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-70



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-60	S-2	5.0 - 6.5	(SP-SM) Dark yellowish-brown, poorly graded SAND with silt	10				5.3	88.1	6.5
■	BH-60	S-5	15.0 - 16.5	(SM) Light olive-brown, silty SAND	12				3.0	84.8	12.1
▲	BH-60	S-8	25.0 - 26.5	(SM) Olive-brown, silty SAND	19				13.7	62.8	23.4

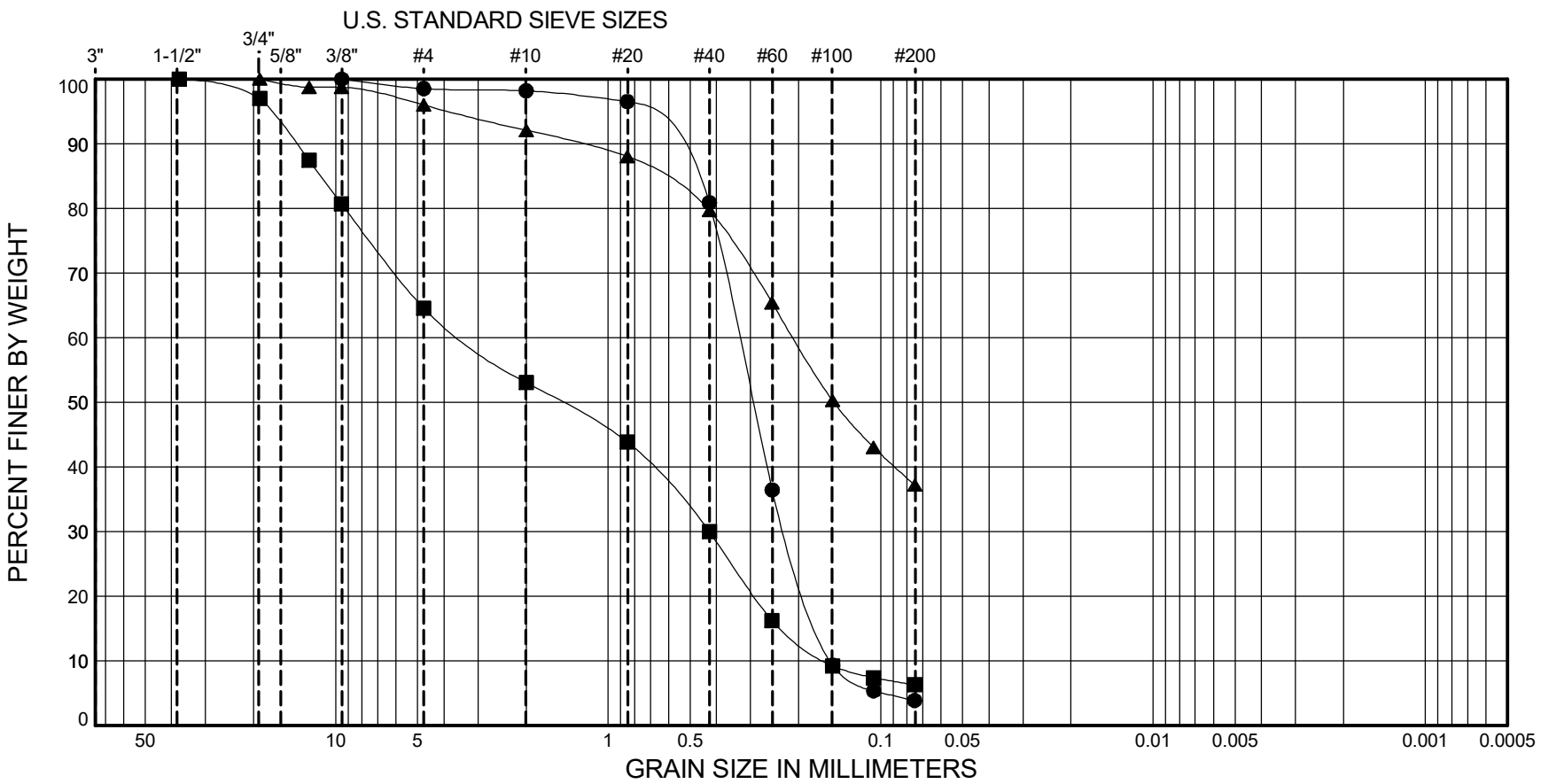
GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-71

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



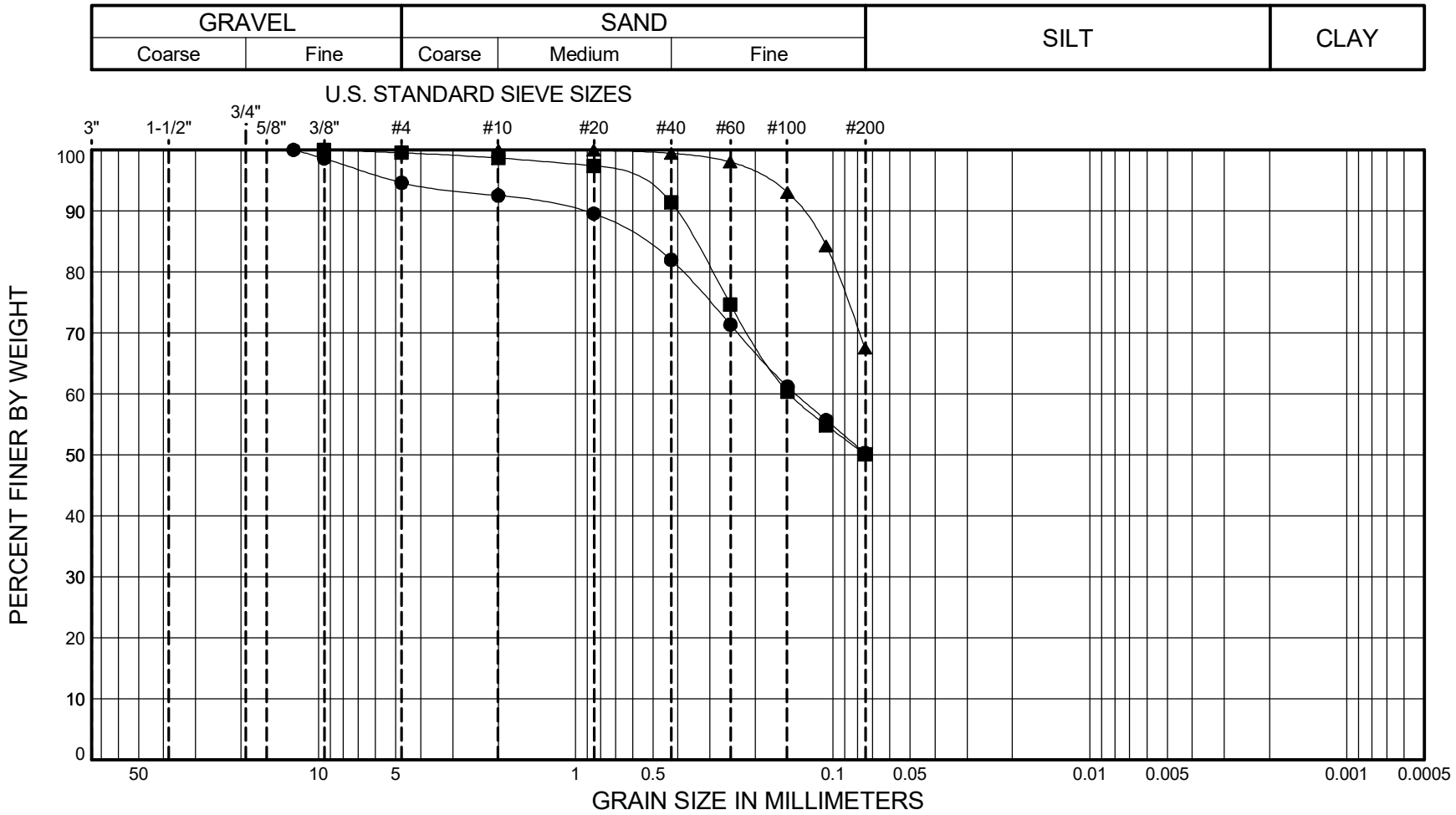
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-61	S-3	7.5 - 9.0	(SP) Olive, poorly graded SAND	5				1.5	94.7	3.9
■	BH-61	S-5	12.5 - 14.0	(SP-SM) Olive, poorly graded SAND with silt and gravel	4				35.4	58.3	6.3
▲	BH-61	S-8	20.0 - 21.5	(SM) Olive, silty SAND	12				4.0	58.8	37.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-72



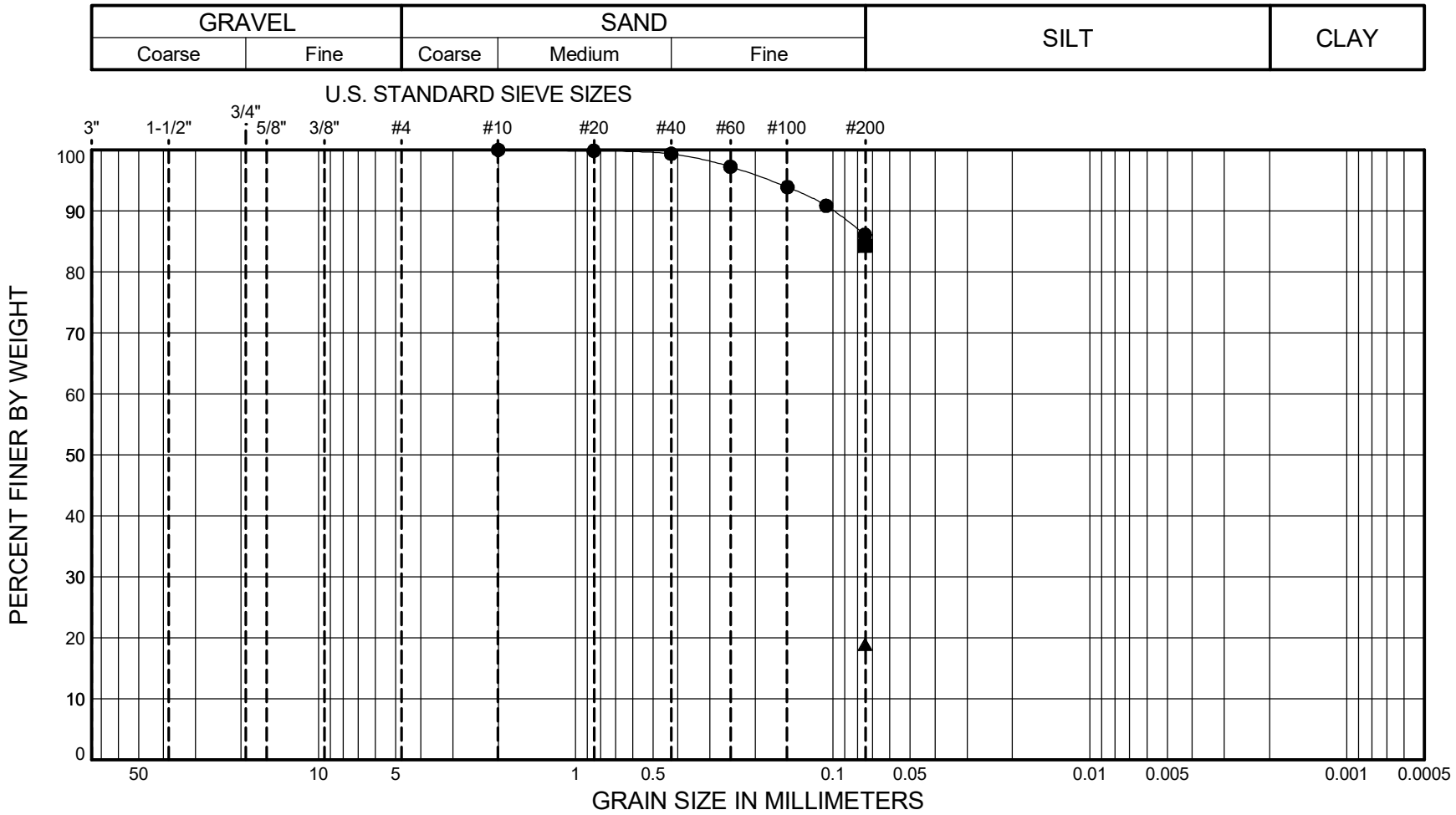
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-61	S-11a	35.0 - 35.7	(ML) Dark grayish-brown, sandy SILT	16				5.4	44.3	50.3
■	BH-62	S-1	2.5 - 4.0	(ML) Light olive-brown, sandy SILT	13				0.5	49.4	50.1
▲	BH-62	S-2b	5.8 - 6.5	(ML) Olive-brown, sandy SILT	24					32.6	67.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-73



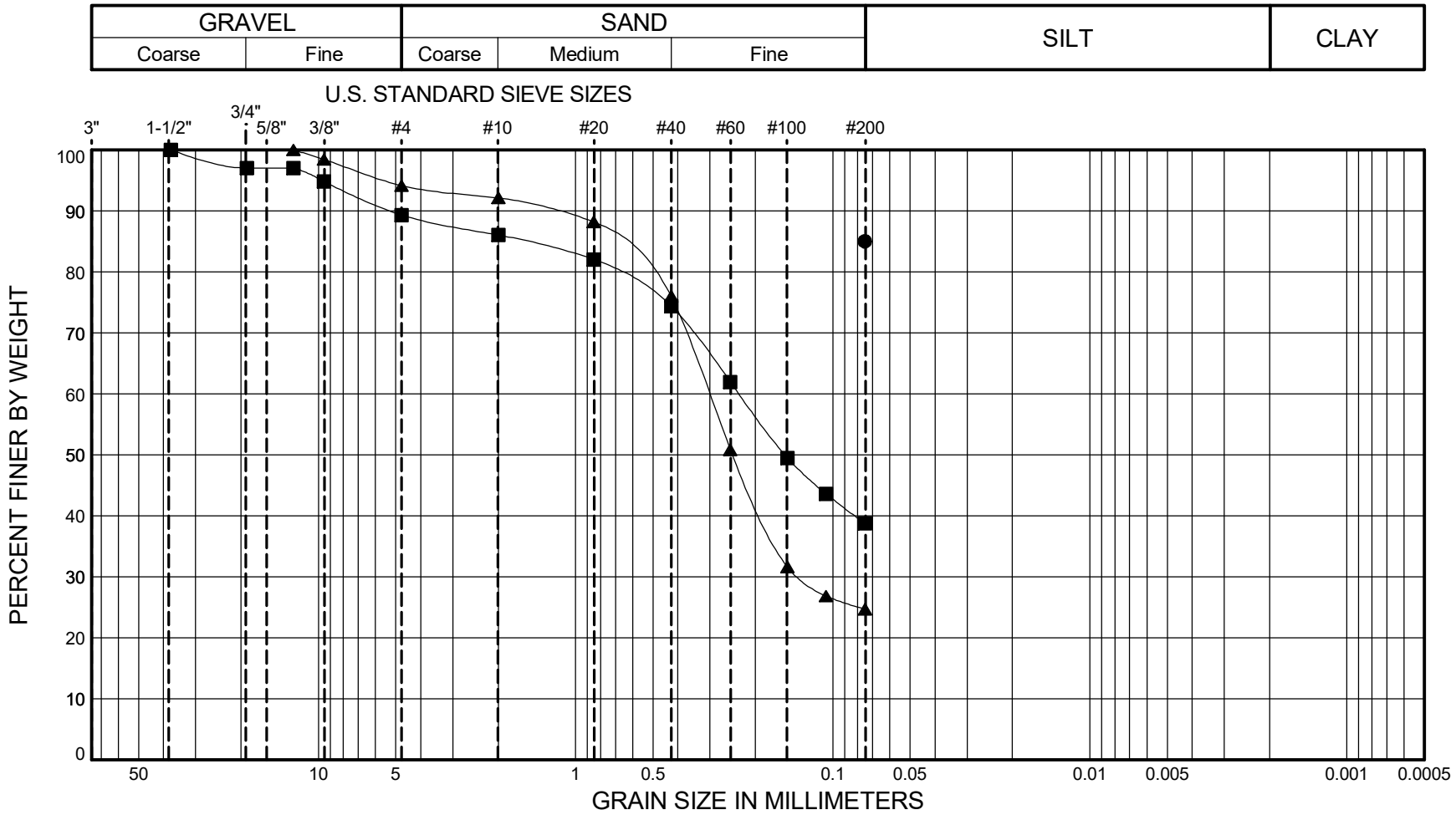
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-62	S-5	12.5 - 14.0	(ML) Olive-brown, SILT	30					13.9	86.1
■	BH-62	S-6	15.0 - 16.5	(ML) Light olive-brown, SILT with sand	23	33	24	9			84.3
▲	BH-62	S-7b	18.1 - 19.0	(SM) Dark yellowish-brown, silty SAND	25						18.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-74



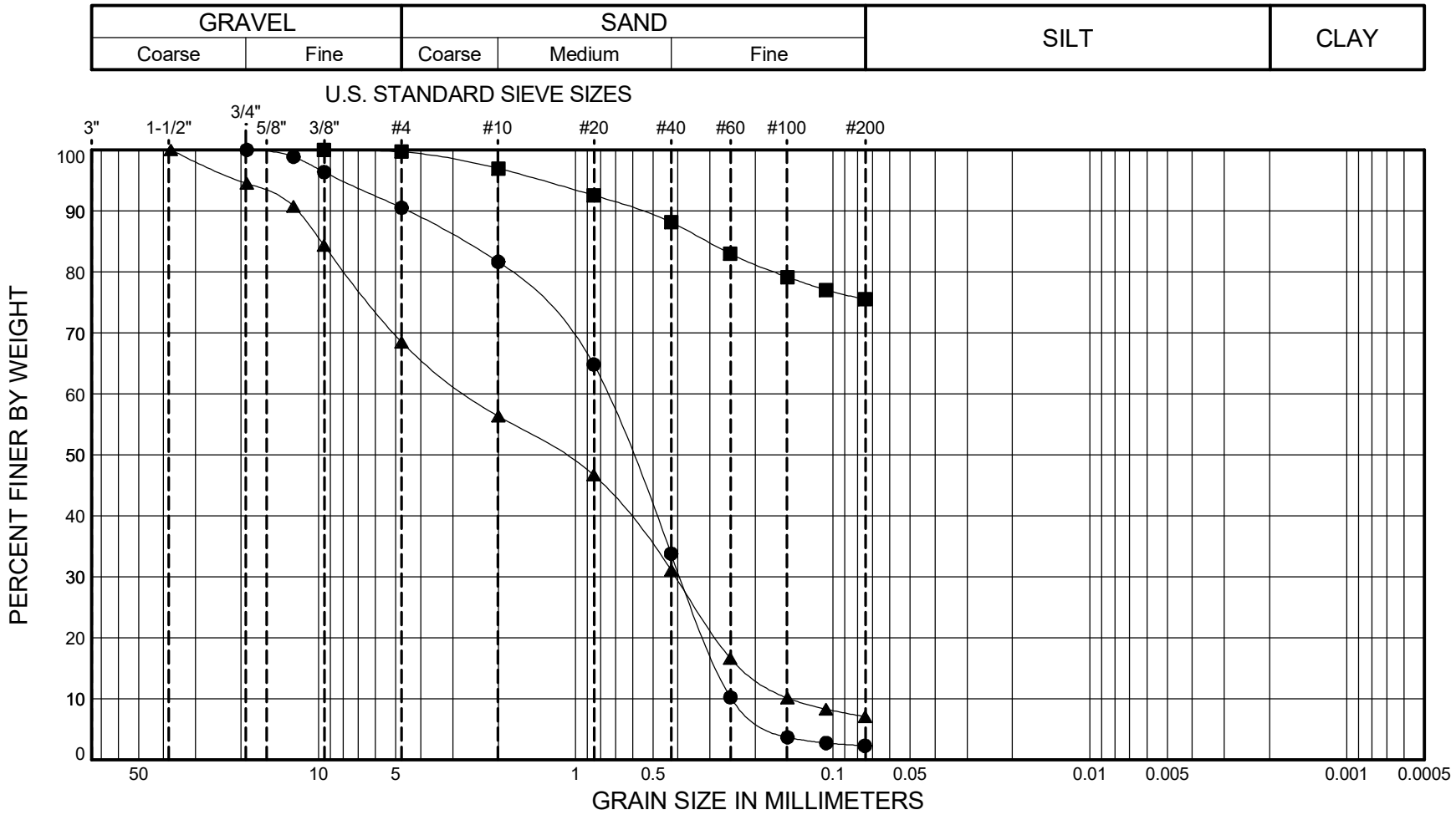
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-62	S-10	30.0 - 31.5	(ML) Very dark gray, SILT with sand	28	30	26	4			85.0
■	BH-63	S-2b	5.4 - 6.5	(SM) Light olive-brown, silty SAND	14				10.7	50.6	38.7
▲	BH-64A	S-5	12.5 - 14.0	(SM) Very dark brown, silty SAND with organics	42				5.9	69.4	24.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-75



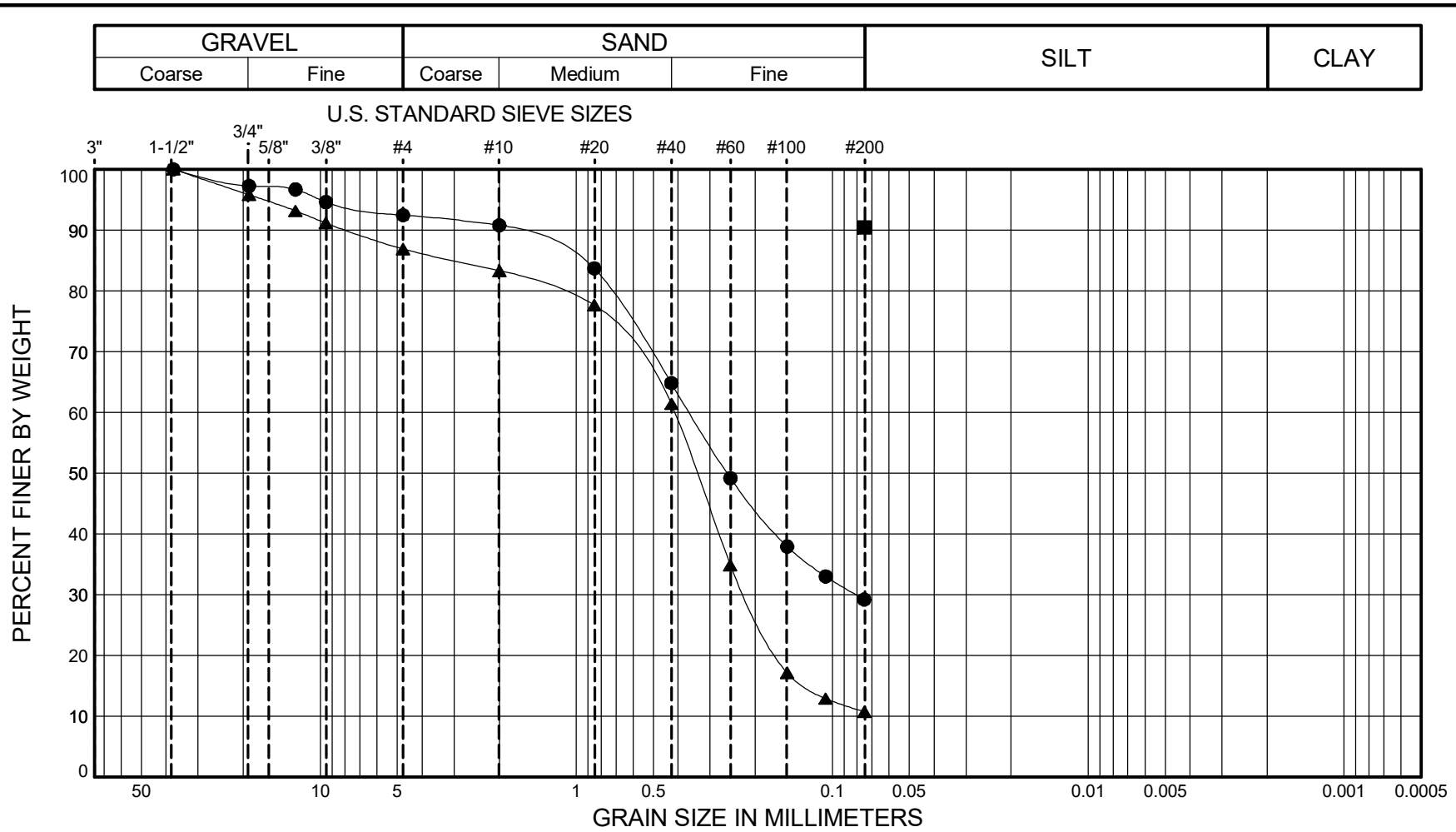
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-64A	S-8	20.0 - 21.5	(SP) Very dark grayish-brown, poorly graded SAND	16				9.5	88.2	2.3
■	BH-64B	S-3	7.5 - 9.0	(OH) Very dark brown, organic SILT with sand	273	284	213	71	0.3	24.2	75.5
▲	BH-64B	S-6	15.0 - 16.5	(SP-SM) Olive-brown, poorly graded SAND with silt and gravel	12				31.5	61.4	7.1

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-76



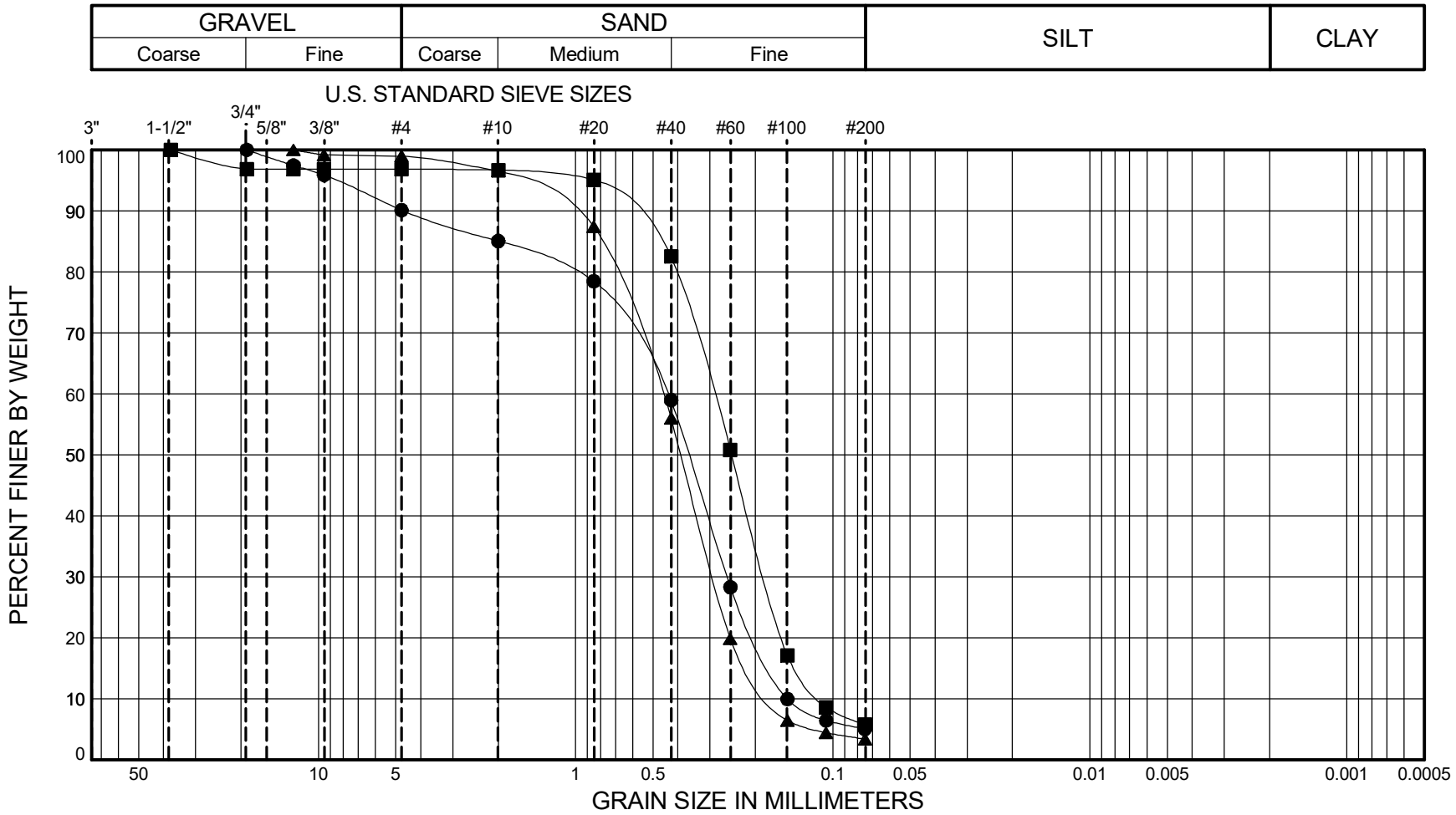
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-64B	S-10	30.0 - 31.5	(SM) Olive-brown, silty SAND	15				7.6	63.2	29.2
■	BH-64B	S-11	35.0 - 36.5	(ML) Dark gray, SILT	30	45	30	15			90.5
▲	BH-65	S-2	5.0 - 6.5	(SW-SM) Dark olive-gray, well-graded SAND with silt	20				13.1	76.2	10.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-77



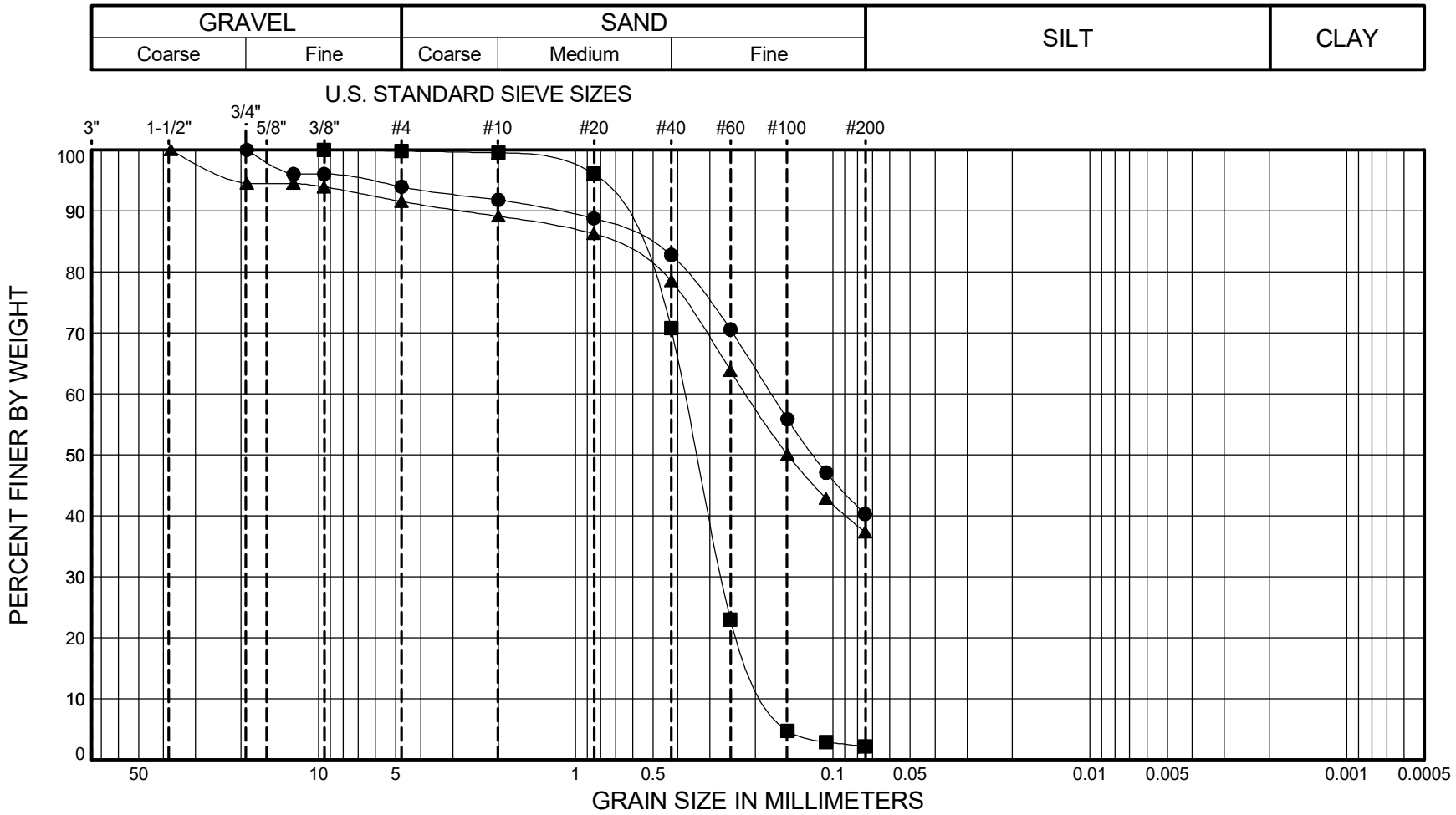
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-65	S-3	7.5 - 9.0	(SP-SM) Very dark gray, poorly graded SAND with silt	40				9.9	85.1	5.0
■	BH-65	S-6	20.0 - 21.5	(SP-SM) Olive-brown, poorly graded SAND with silt	23				3.1	91.1	5.7
▲	BH-66A	S-4	7.5 - 9.0	(SP) Olive-brown, poorly graded SAND	6				1.0	95.6	3.4

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-78



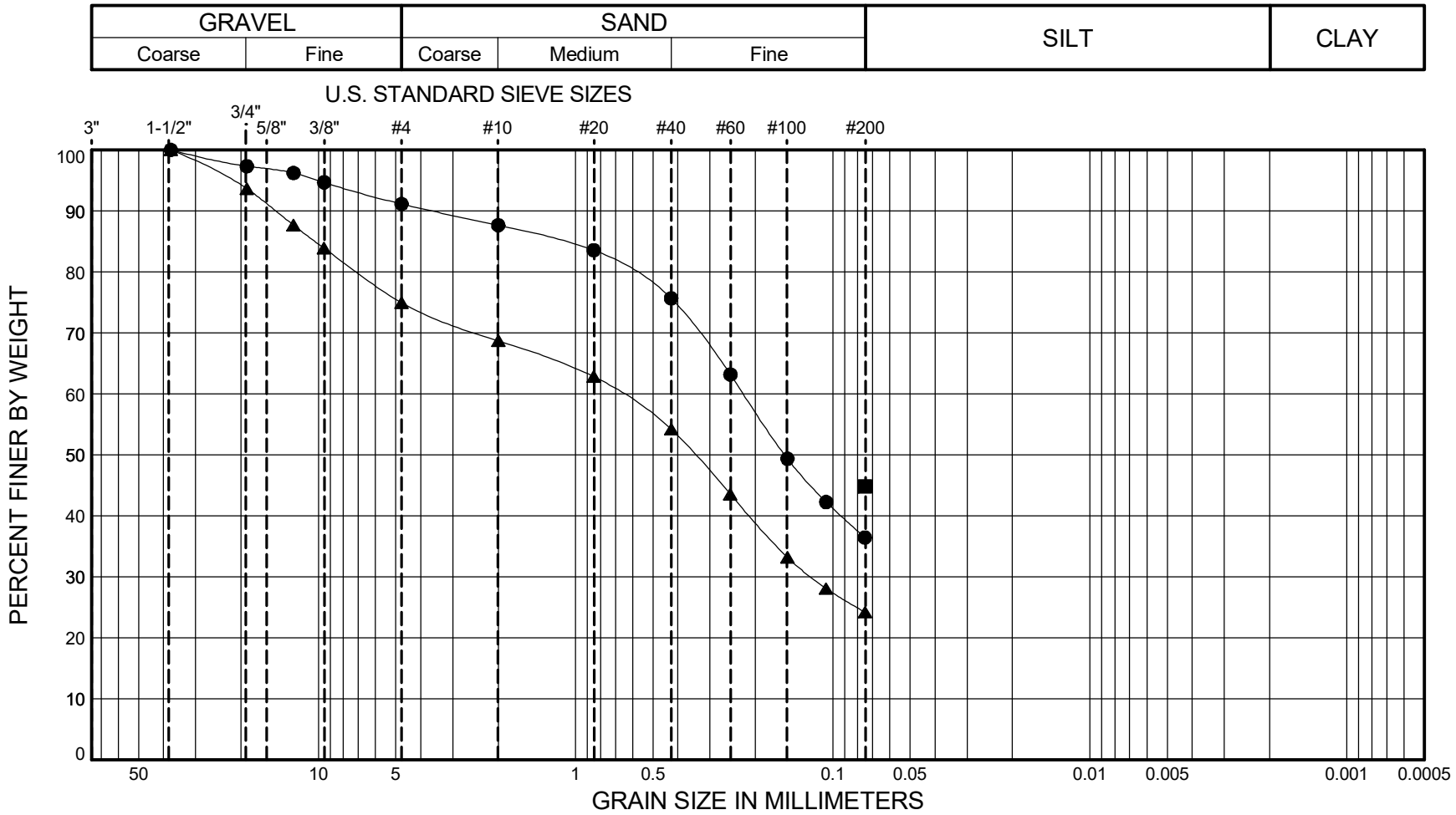
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-66A	S-7	15.0 - 16.0	(SM) Olive, silty SAND	11				6.1	53.7	40.3
■	BH-66B	S-3	5.0 - 6.5	(SP) Olive-brown, poorly graded SAND	5				0.2	97.6	2.2
▲	BH-66B	S-6	12.5 - 14.0	(SM) Olive, silty SAND	13				8.5	54.2	37.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-79



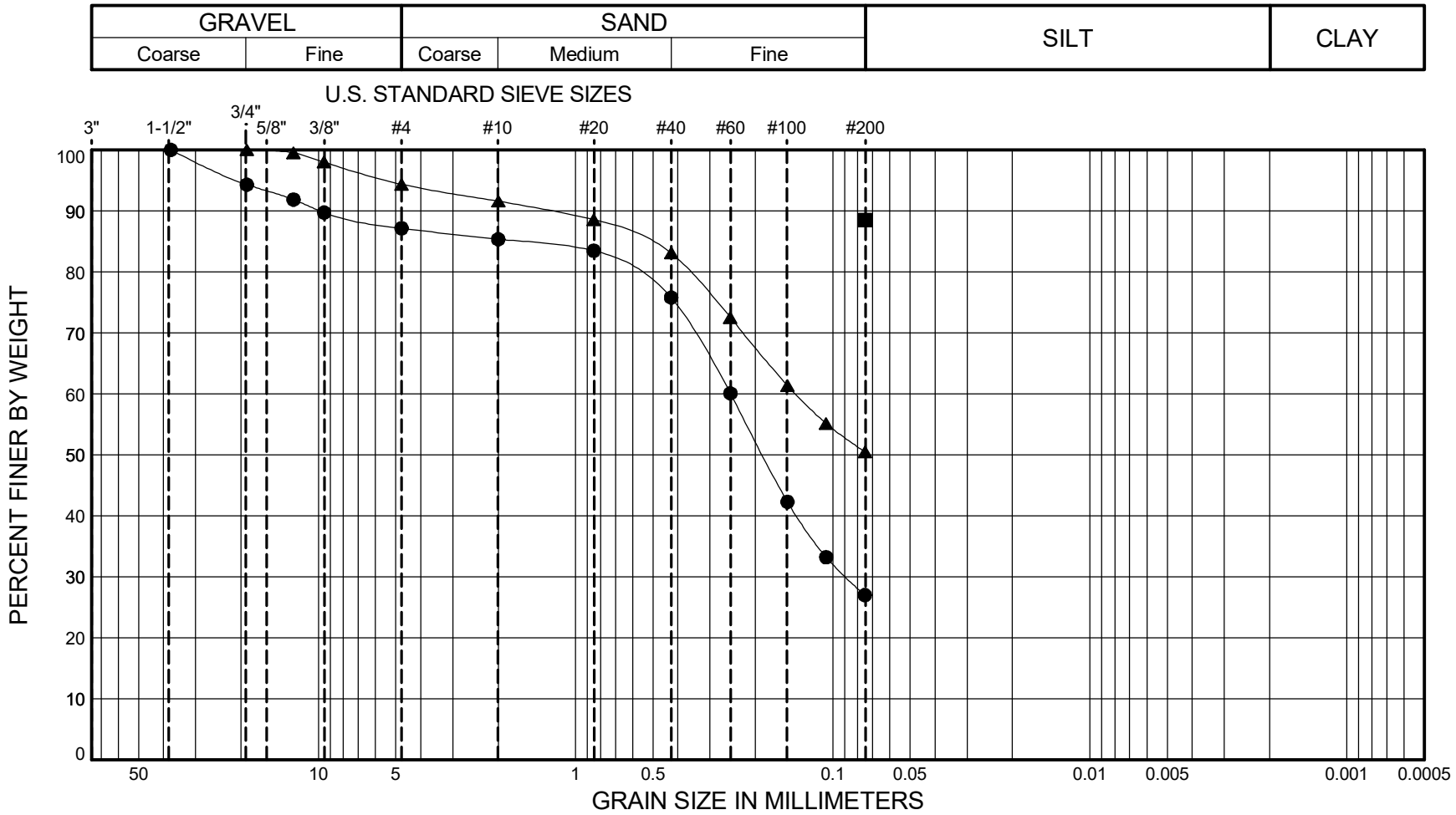
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-67	S-4	7.5 - 9.0	(SM) Olive-gray, silty SAND	16				8.9	54.7	36.4
■	BH-67	S-5	10.0 - 11.5	(SM) Dark olive-gray, silty SAND	12						44.8
▲	BH-67	S-6	15.0 - 15.8	(SM) Olive-gray, silty SAND with gravel	15				25.1	50.7	24.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-80



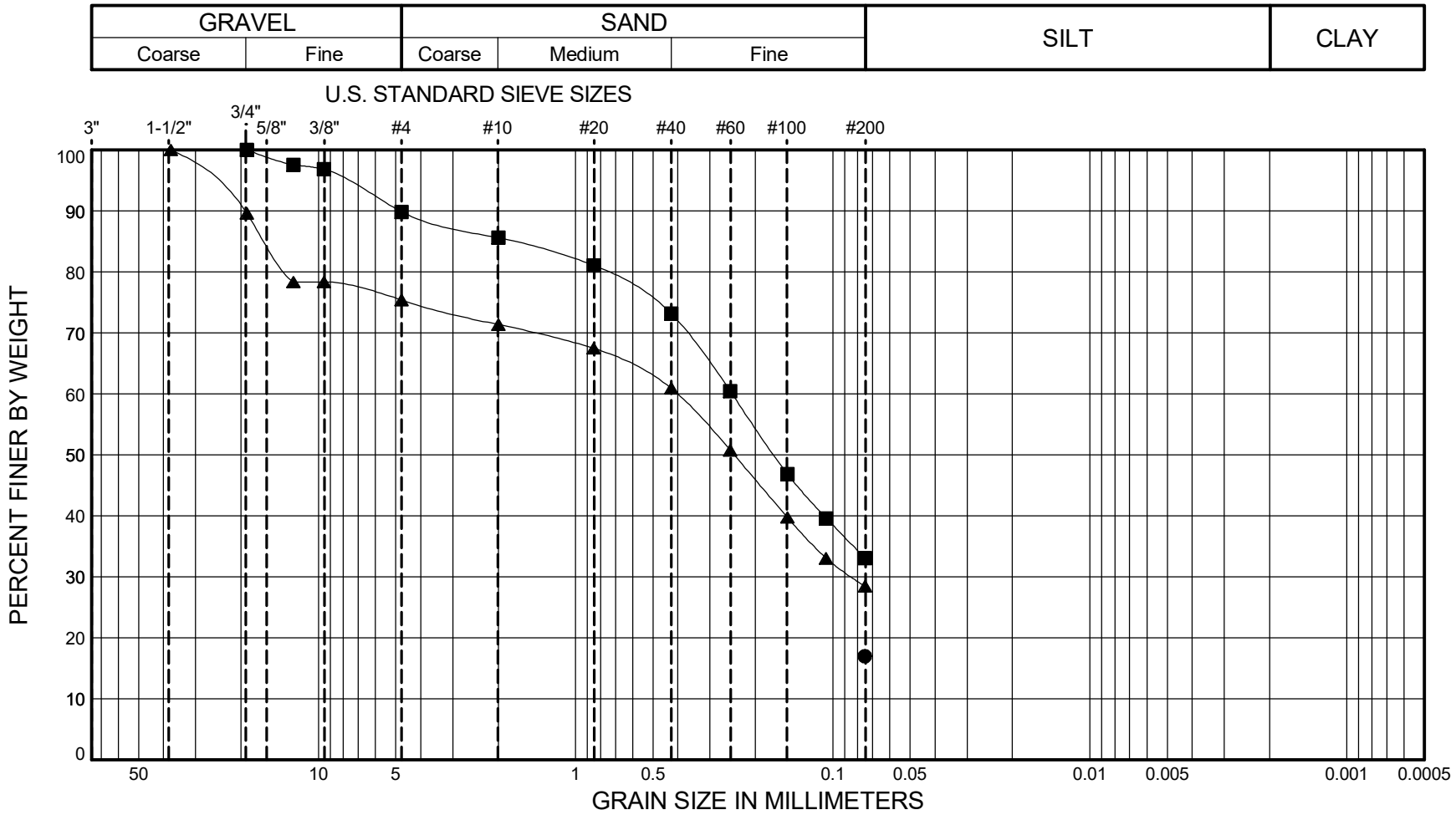
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-67	S-8	25.0 - 26.5	(SM) Very dark gray, silty SAND	16				12.9	60.2	27.0
■	BH-67	S-12	45.0 - 46.4	(ML) Very dark gray, SILT	29						88.5
▲	BH-68A	S-4	7.5 - 9.0	(ML) Dark grayish-brown, sandy SILT	13				5.6	43.9	50.5

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-81



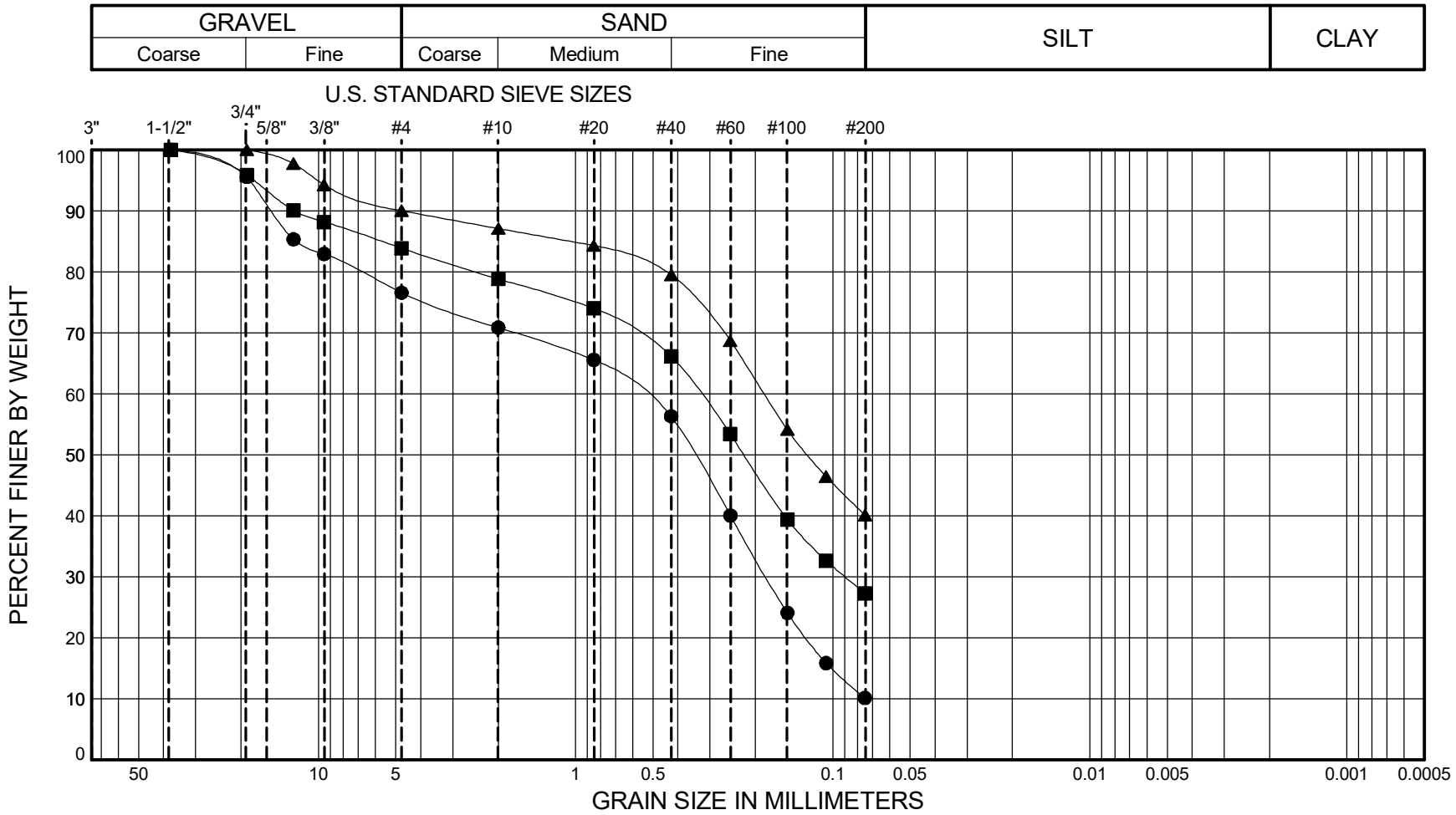
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-68A	S-6	12.5 - 14.0	(SM) Olive, silty SAND	13						17.0
■	BH-68A	S-9	20.0 - 20.4	(SM) Olive, silty SAND	9				10.1	56.8	33.1
▲	BH-68A	S-10	22.0 - 22.2	(SM) Olive, silty SAND with gravel	9				24.6	47.0	28.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-82



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-68B	S-4	7.5 - 9.0	(SP-SM) Grayish-brown, poorly graded SAND with silt and gravel	12				23.4	66.4	10.1
■	BH-69	S-1	1.3 - 2.8	(SM) Olive-gray, silty SAND with gravel	10				16.1	56.6	27.3
▲	BH-69	S-4	7.5 - 9.0	(SM) Olive-gray, silty SAND	18				10.0	49.9	40.1

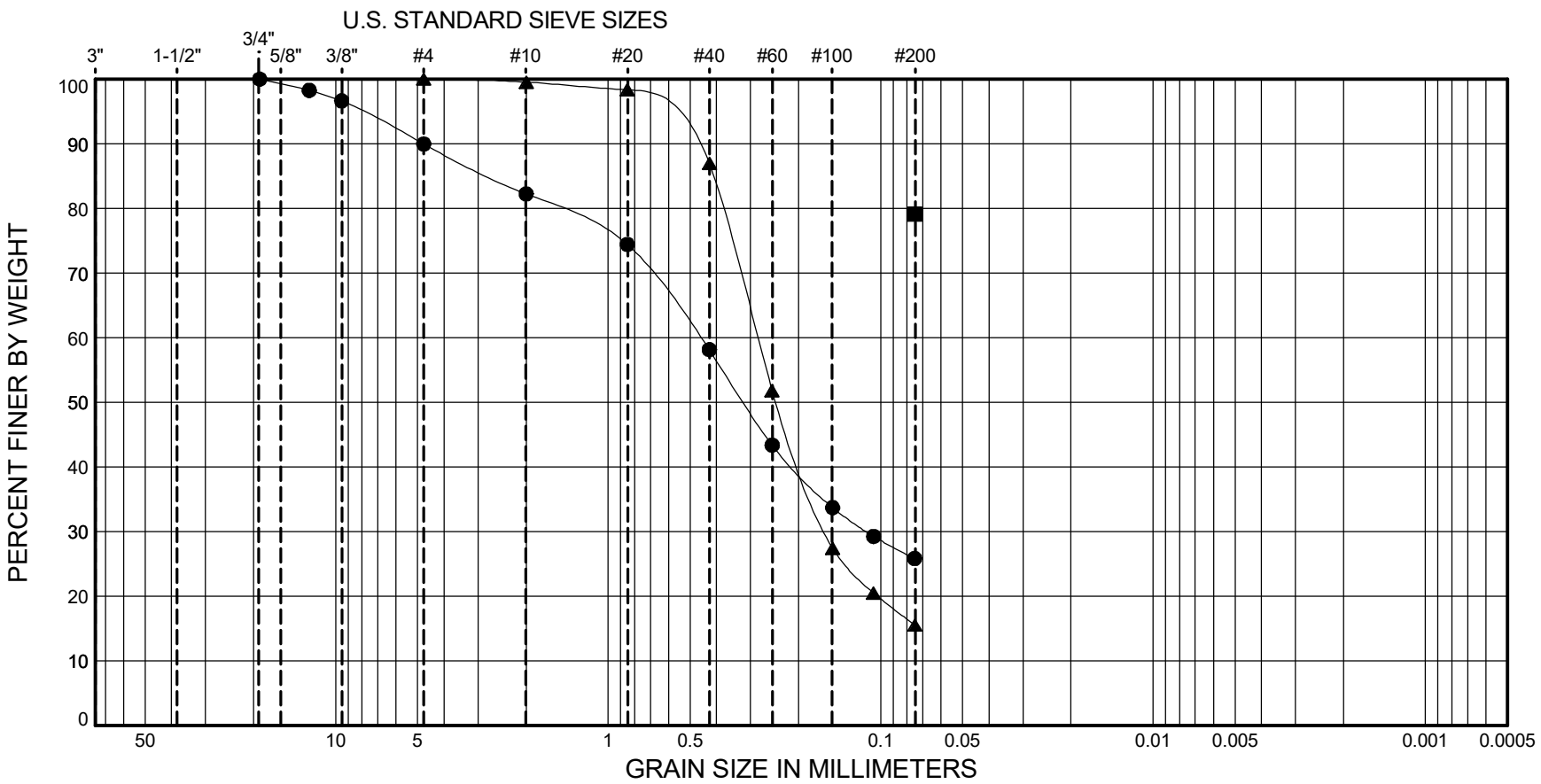
HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-83

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-69	S-8	25.0 - 25.8	(SM) Dark gray, silty SAND	19				10.0	64.1	25.8
■	BH-69	S-10	35.0 - 36.5	(ML) Dark gray, SILT with sand	27						79.1
▲	BH-70	S-2	5.0 - 6.5	(SM) Dark yellowish-brown, silty SAND	23					84.5	15.5

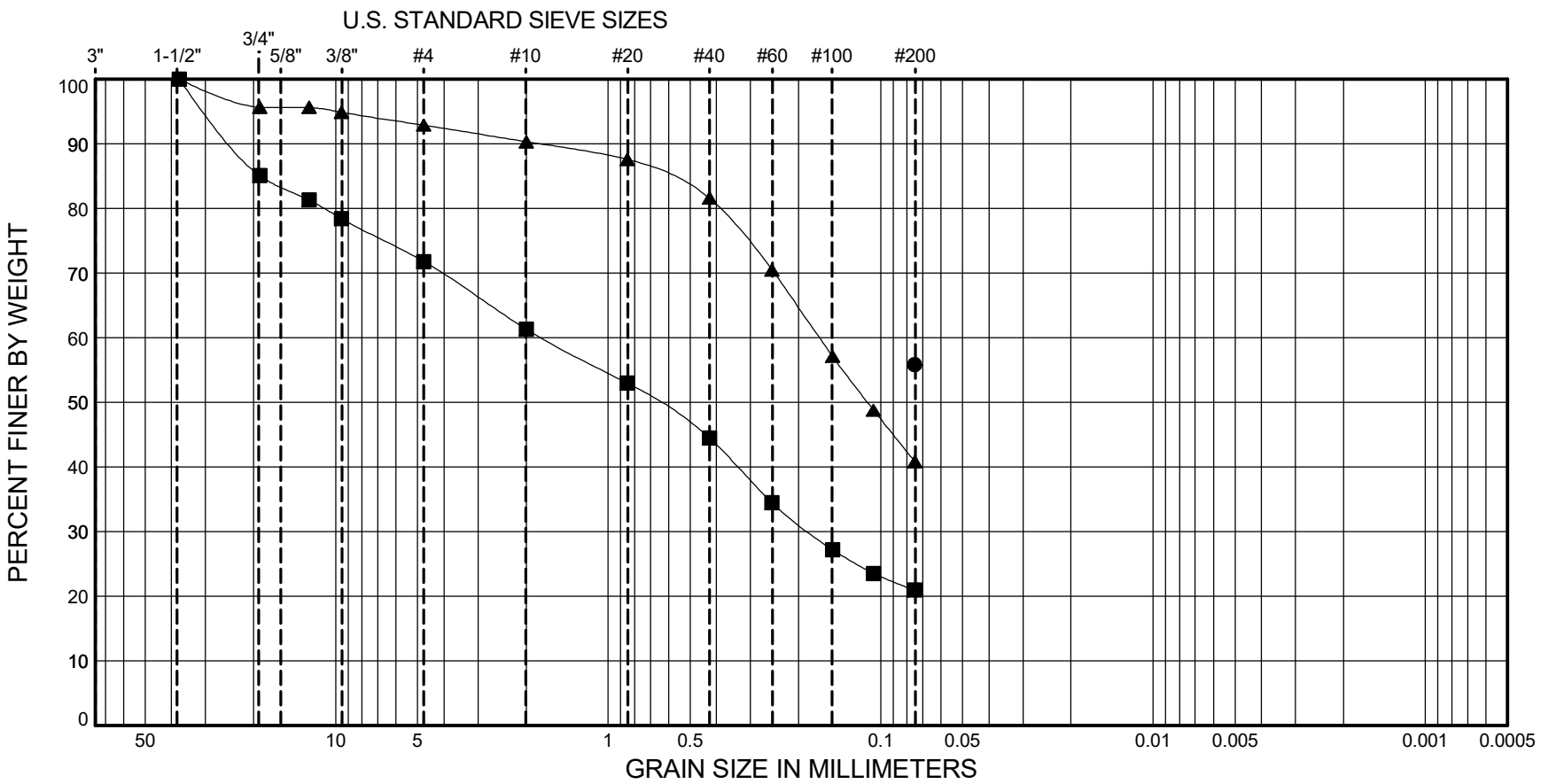
GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-84

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



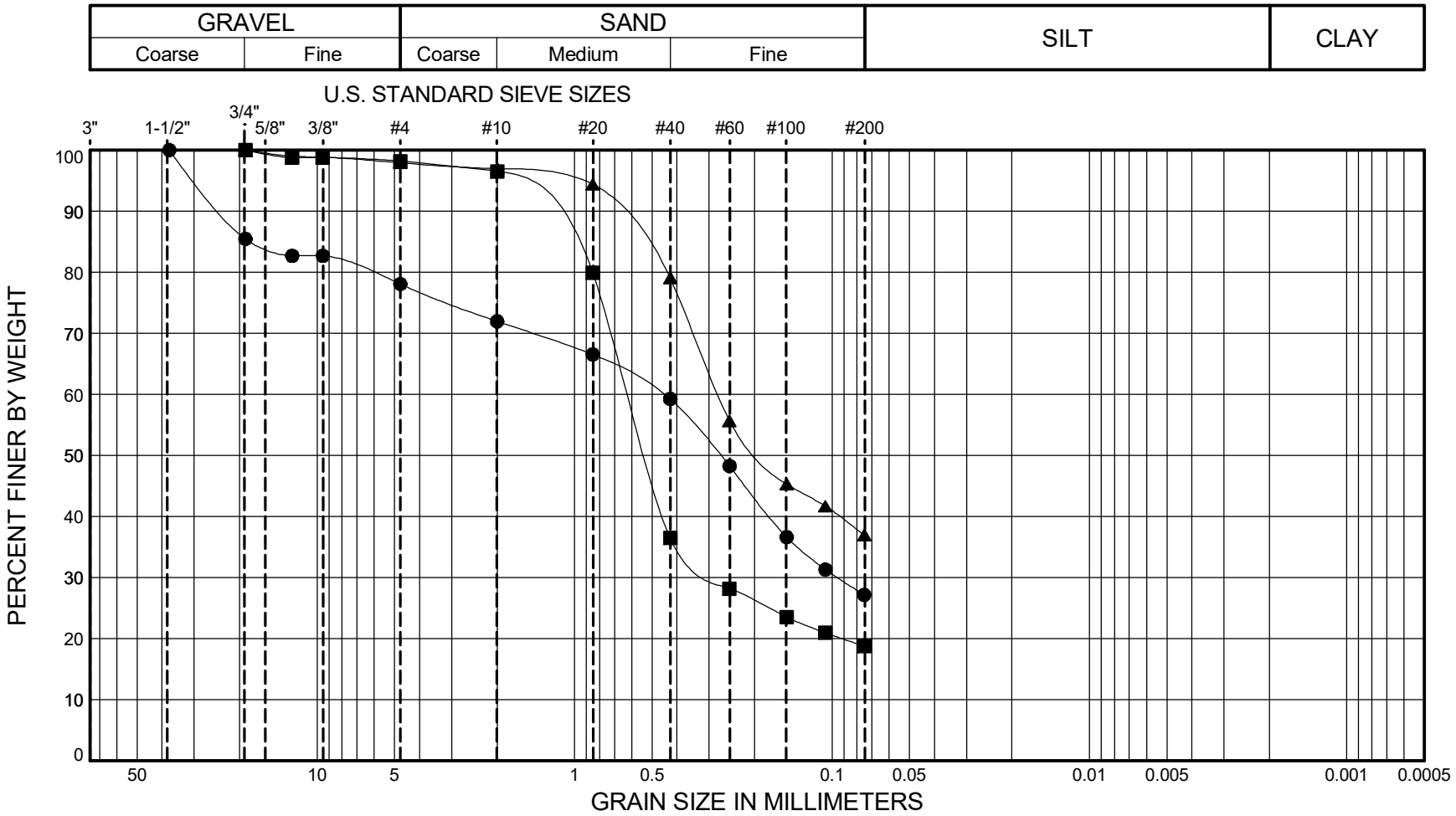
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-70	S-4b	11.0 - 11.5	(CL) Dark gray, sandy lean CLAY	28	30	18	12			55.8
■	BH-70	S-8	20.0 - 20.5	(SM) Very dark gray, silty SAND with gravel	9				28.2	50.8	20.9
▲	BH-71	S-3	7.5 - 9.0	(SM) Dark olive-gray, silty SAND	16				7.1	52.0	40.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-85



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-71	S-8	20.0 - 20.4	(SM) Very dark gray, silty SAND with gravel	12				21.9	50.9	27.2
■	BH-71	S-9	25.0 - 26.5	(SM) Very dark gray, silty SAND	16				1.8	79.5	18.7
▲	BH-72/BH-72W	S-3b	5.5 - 6.5	(SM) Olive-brown, silty SAND	21				2.1	61.0	36.9

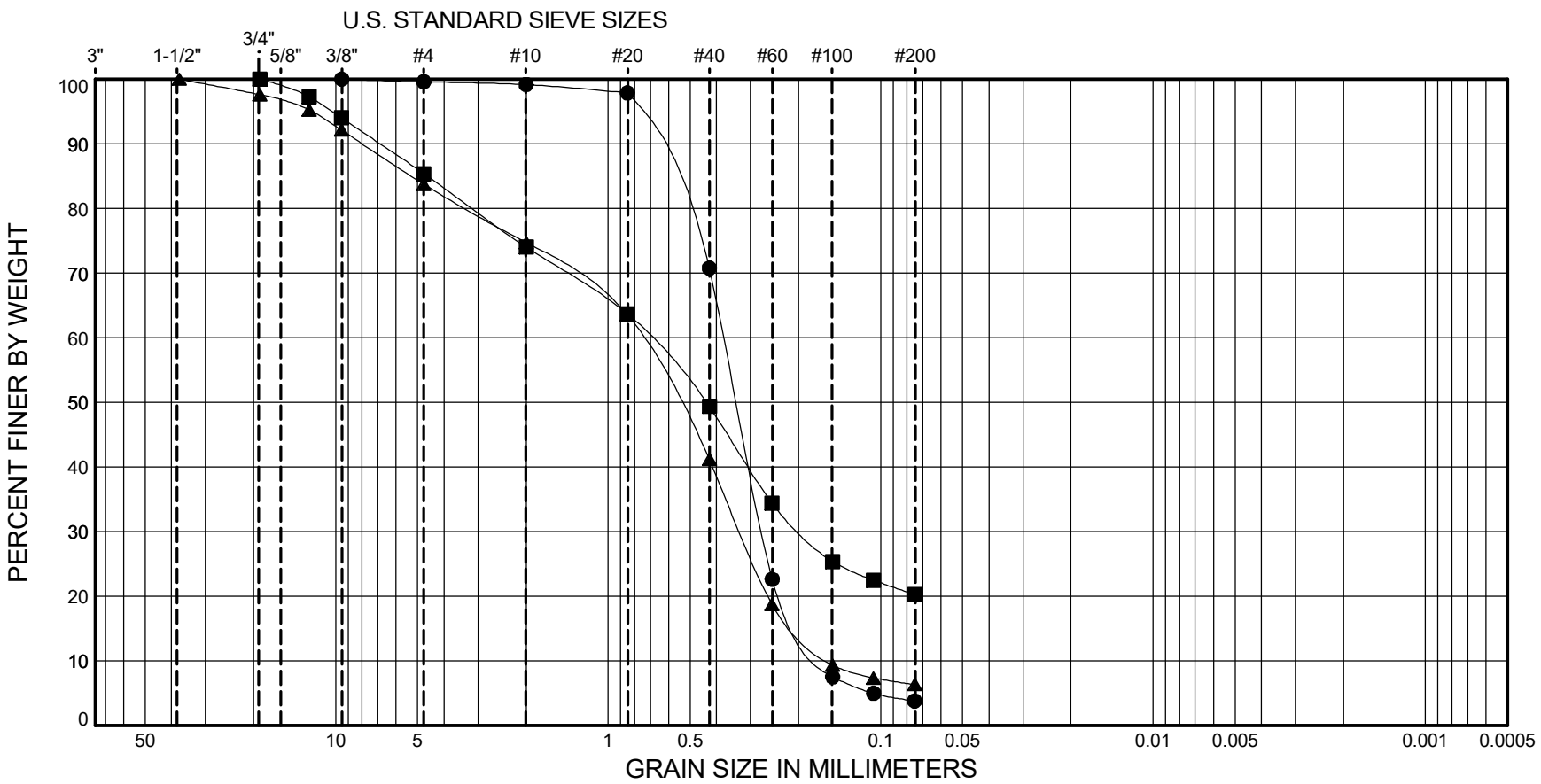
GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-86

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



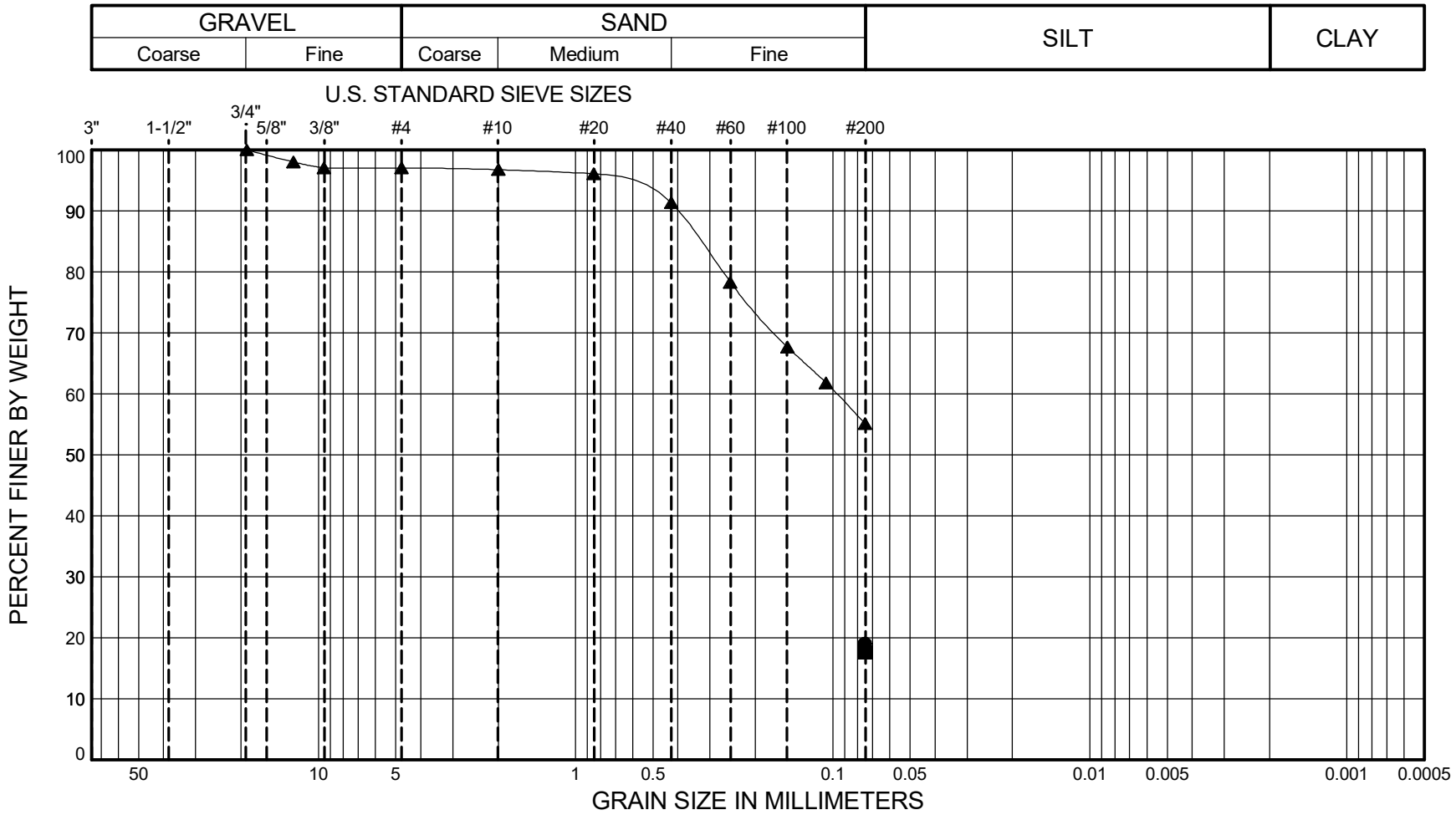
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-72/BH-72W	S-5	10.0 - 11.5	(SP) Dark grayish-brown, poorly graded SAND	26				0.4	95.8	3.8
■	BH-72/BH-72W	S-6	15.0 - 16.5	(SM) Light olive-brown, silty SAND	20				14.6	65.1	20.2
▲	BH-72/BH-72W	S-7a	20.0 - 21.2	(SP-SM) Very dark gray, poorly graded SAND with silt and gravel	14				16.3	77.4	6.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-87



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-72/BH-72W	S-8	25.0 - 25.5	(SM) Dark gray, silty SAND with gravel	10						19.0
■	BH-72/BH-72W	S-13a	50.0 - 51.0	(SM) Dark gray, silty SAND	12						17.6
▲	BH-73	S-4	10.0 - 11.5	(ML) Light olive-brown, sandy SILT	16				3.0	41.9	55.1

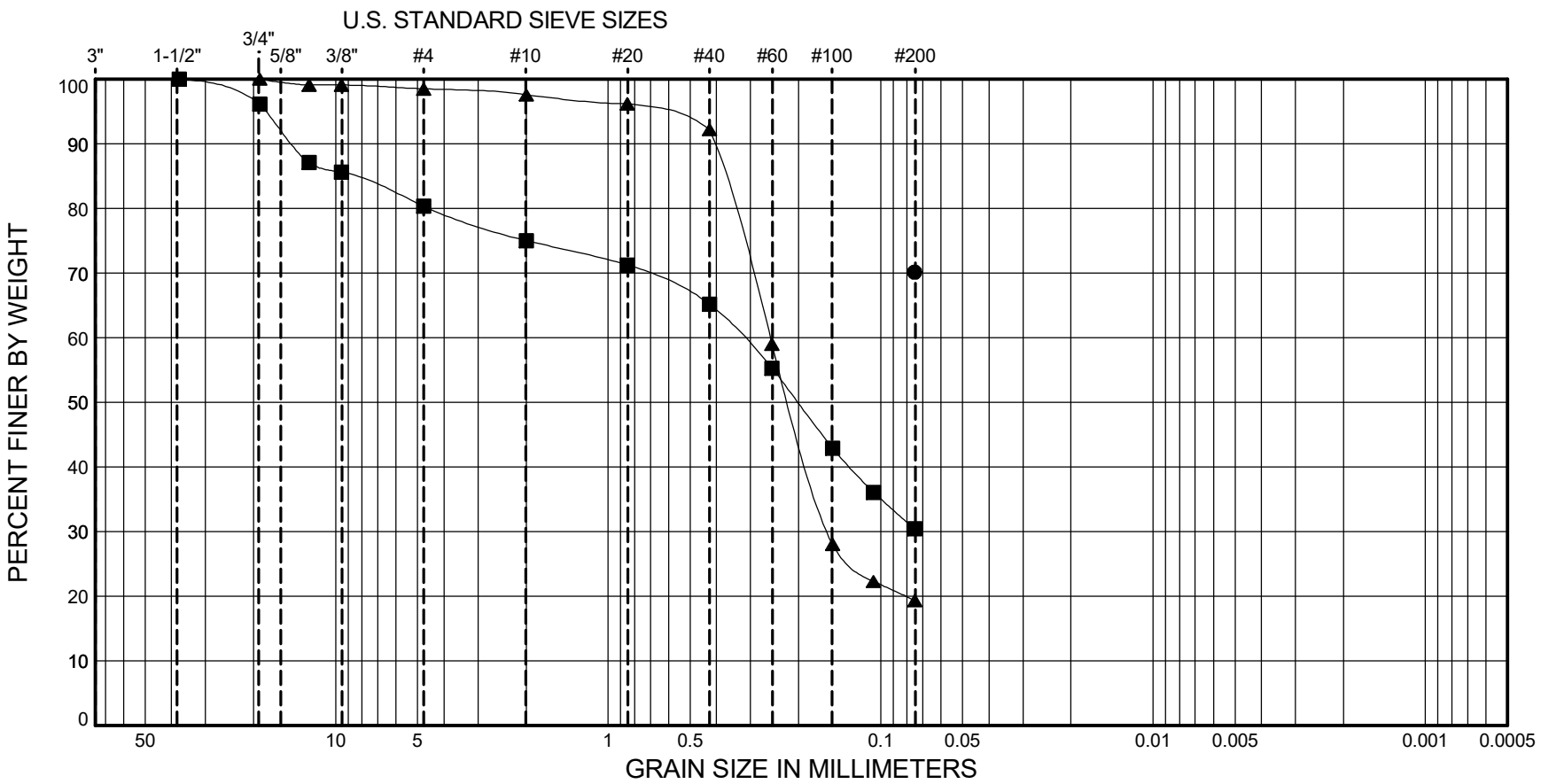
HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-88

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



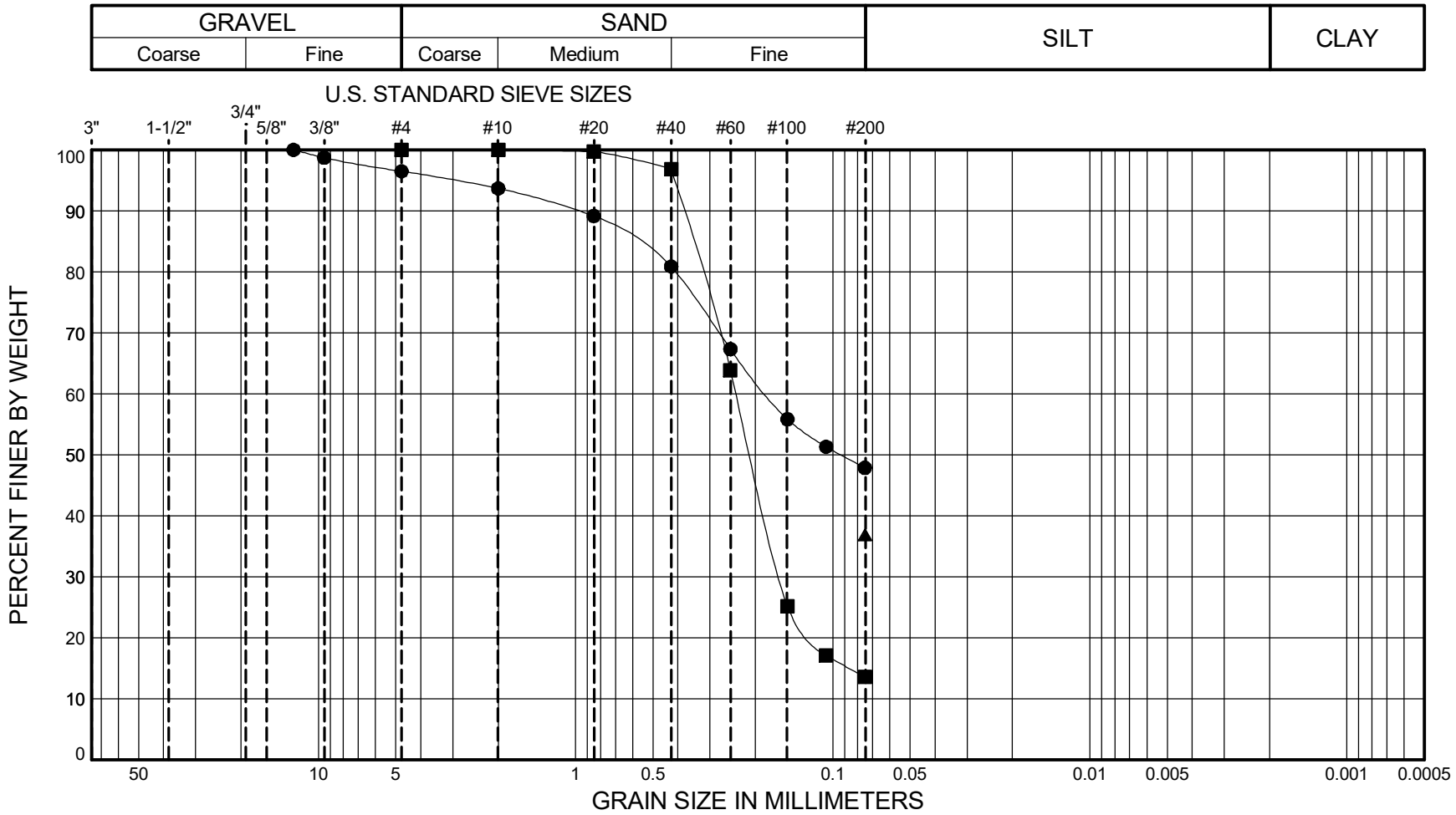
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-73	S-8	20.0 - 21.5	(CL) Dark yellowish-brown, lean CLAY with sand	35	35	21	14			70.1
■	BH-73	S-9	25.0 - 26.5	(SM) Dark gray, silty SAND with gravel	12				19.7	49.9	30.4
▲	BH-74	S-2	7.5 - 9.0	(SM) Olive-brown, silty SAND	19				1.5	79.2	19.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-89



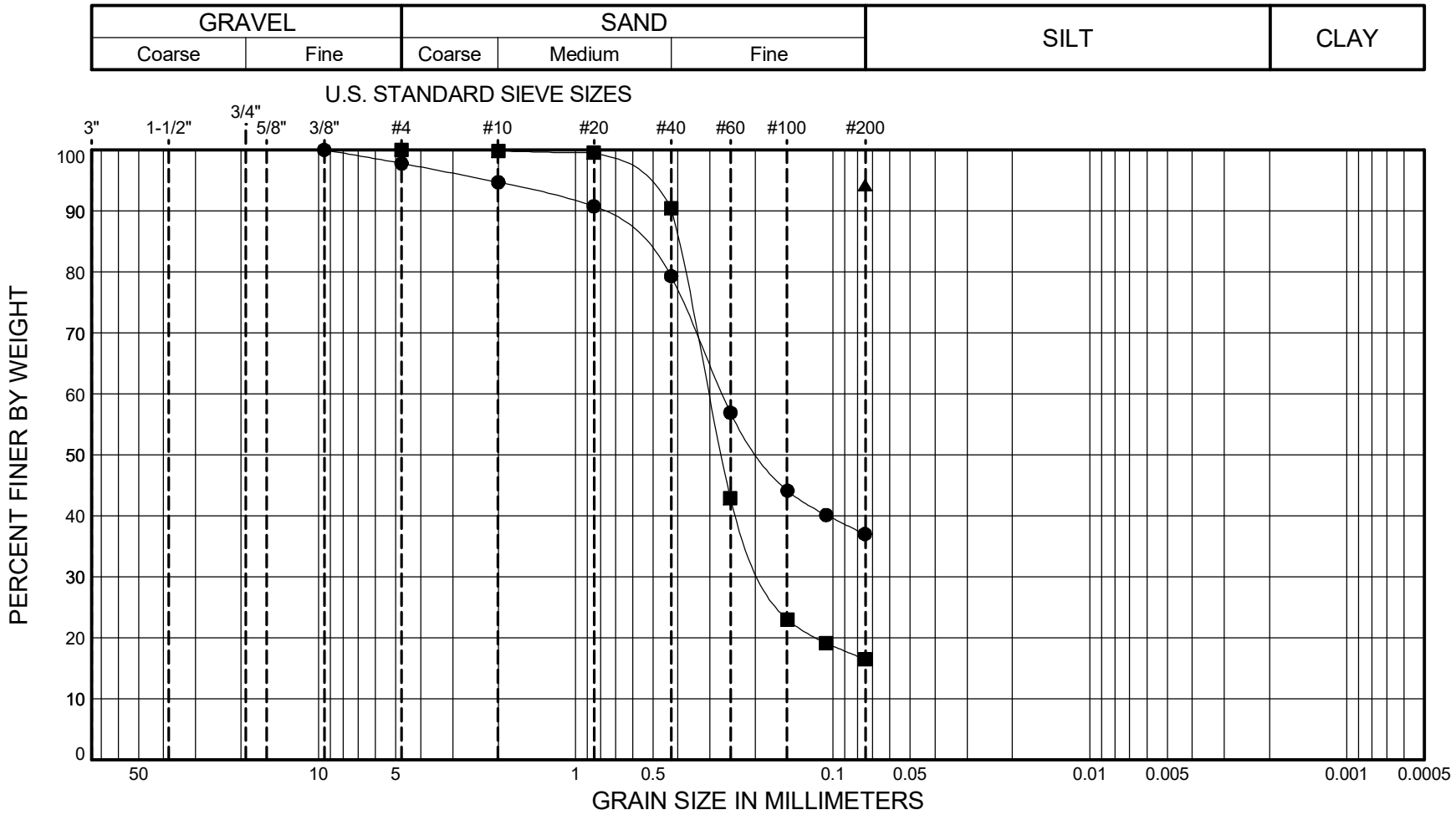
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-74	S-6	17.5 - 18.3	(SM) Grayish-brown, silty SAND	15				3.5	48.6	47.9
■	BH-74	S-9	30.0 - 31.5	(SM) Dark gray, silty SAND	24					86.4	13.6
▲	BH-74	S-12	45.0 - 46.5	(SM) Dark gray, silty SAND	27						36.8

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-90



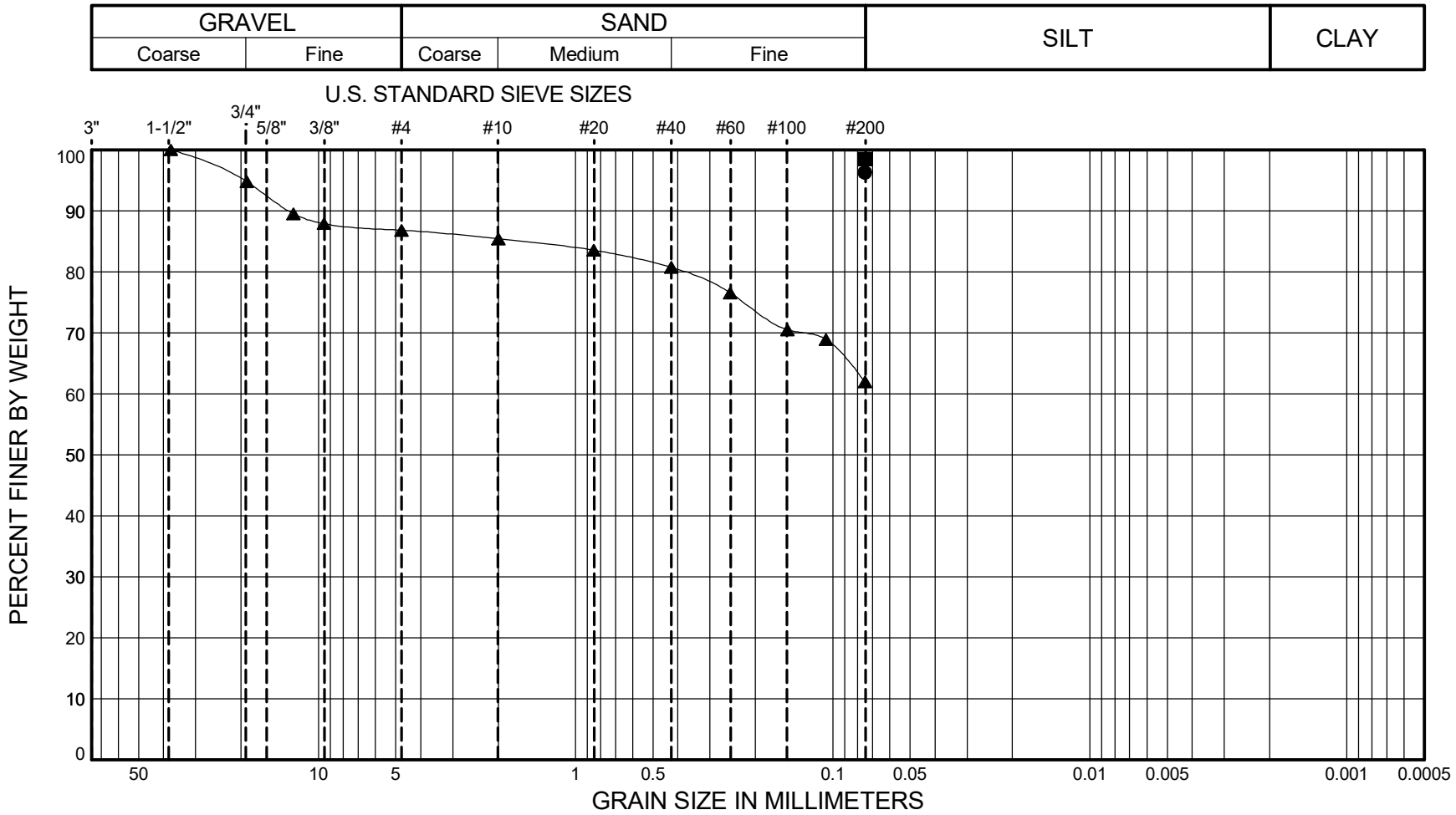
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-75	S-6	15.0 - 16.5	(SM) Dark gray, silty SAND	16				2.2	60.8	37.0
■	BH-75	S-9	25.0 - 26.5	(SM) Dark gray, silty SAND	20					83.5	16.5
▲	BH-75	S-11	35.0 - 36.5	(ML) Olive, SILT	31	45	31	14			94.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-91



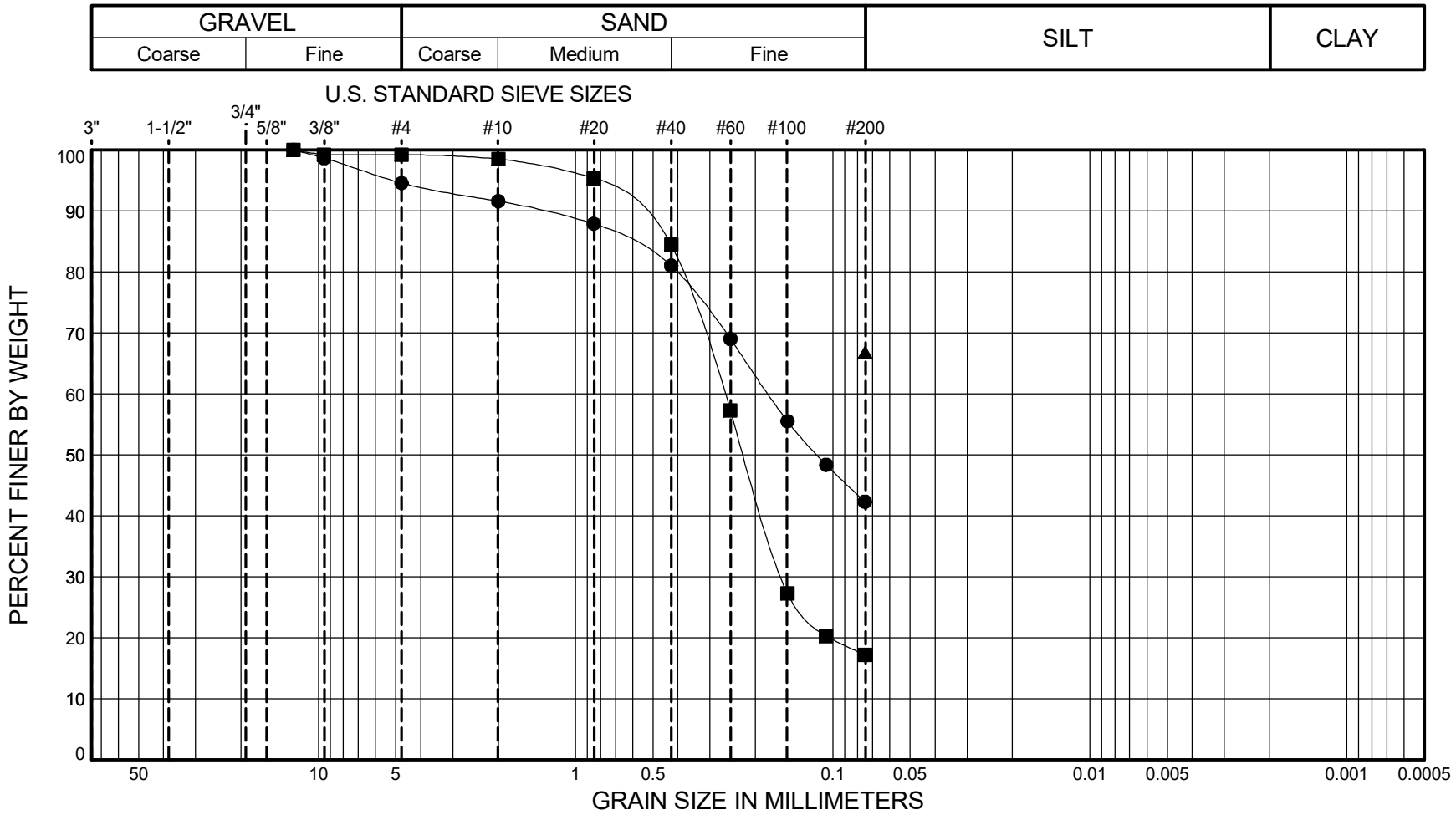
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-75	S-12a	40.0 - 40.6	(ML) Gray, SILT	26						96.3
■	BH-75	S-13b	45.5 - 46.5	(CH) Gray, fat CLAY	35	51	27	24			98.5
▲	BH-76	S-2	5.0 - 6.5	(ML) Olive-brown, SILT with sand	32				13.2	24.9	61.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-92



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-77	S-2	5.0 - 6.5	(SM) Grayish-brown, silty SAND	12				5.4	52.2	42.3
■	BH-77	S-7	17.5 - 19.0	(SM) Olive-brown, silty SAND	20				0.8	82.0	17.2
▲	BH-77	S-9	25.0 - 26.5	(CL) Dark olive-brown, sandy lean CLAY	20	31	20	11			66.8

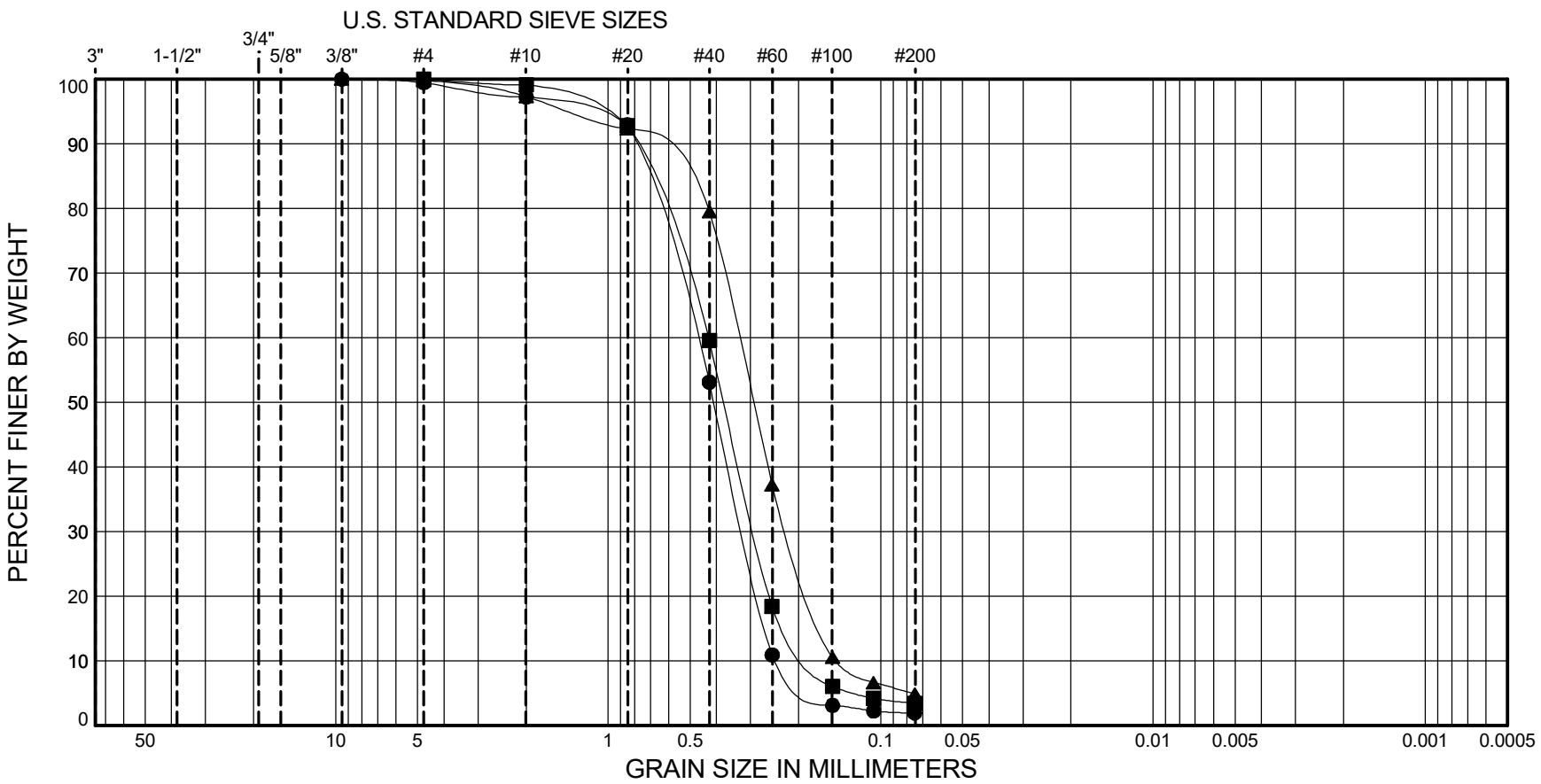
HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-93

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



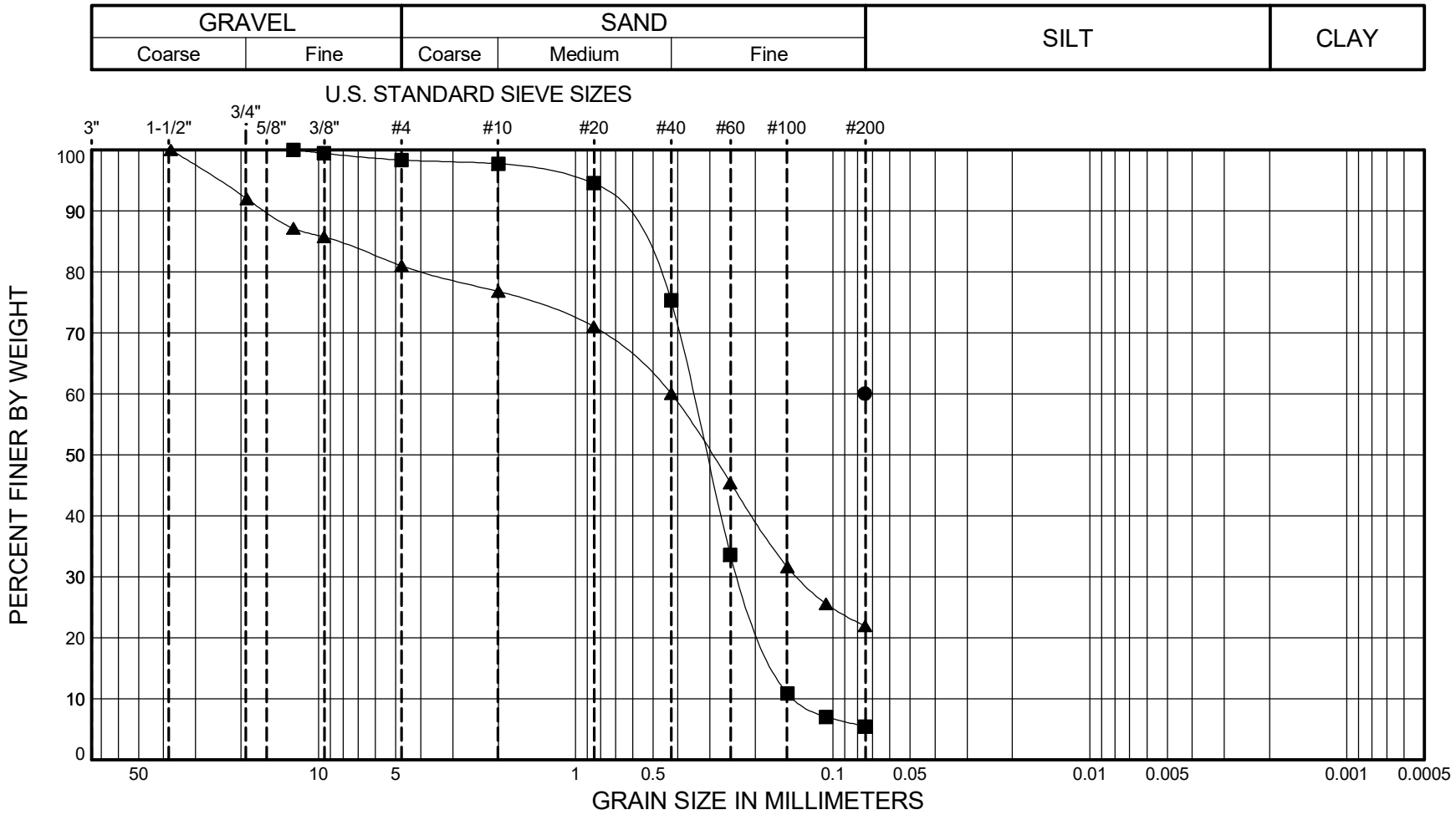
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-79	S-2	5.0 - 6.5	(SP) Yellowish-brown, poorly graded SAND	5				0.6	97.5	1.9
■	BH-79	S-5	12.5 - 14.0	(SP) Yellowish-brown, poorly graded SAND	5					96.6	3.4
▲	BH-79	S-6b	16.0 - 16.5	(SP) Yellowish-brown, poorly graded SAND	9				0.3	94.8	4.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-94



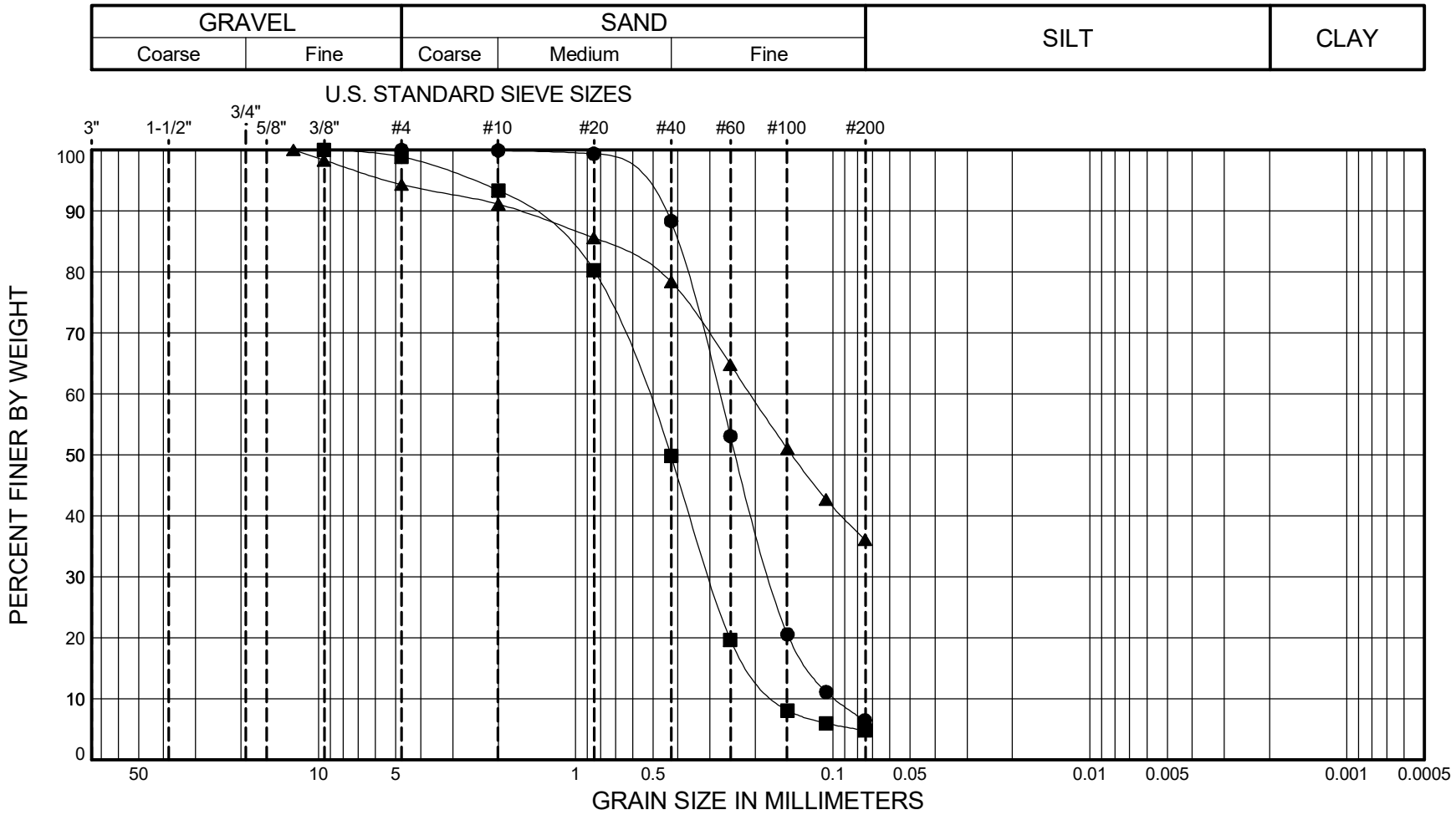
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-80A	S-4a	10.0 - 10.7	(CL) Light olive-brown, sandy lean CLAY	28	28	20	8			60.0
■	BH-80A	S-5	12.5 - 14.0	(SP-SM) Olive-brown, poorly graded SAND with silt	25				1.7	92.9	5.5
▲	BH-80A	S-8	25.0 - 26.5	(SM) Dark gray, silty SAND with gravel	15				19.0	59.1	21.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-95



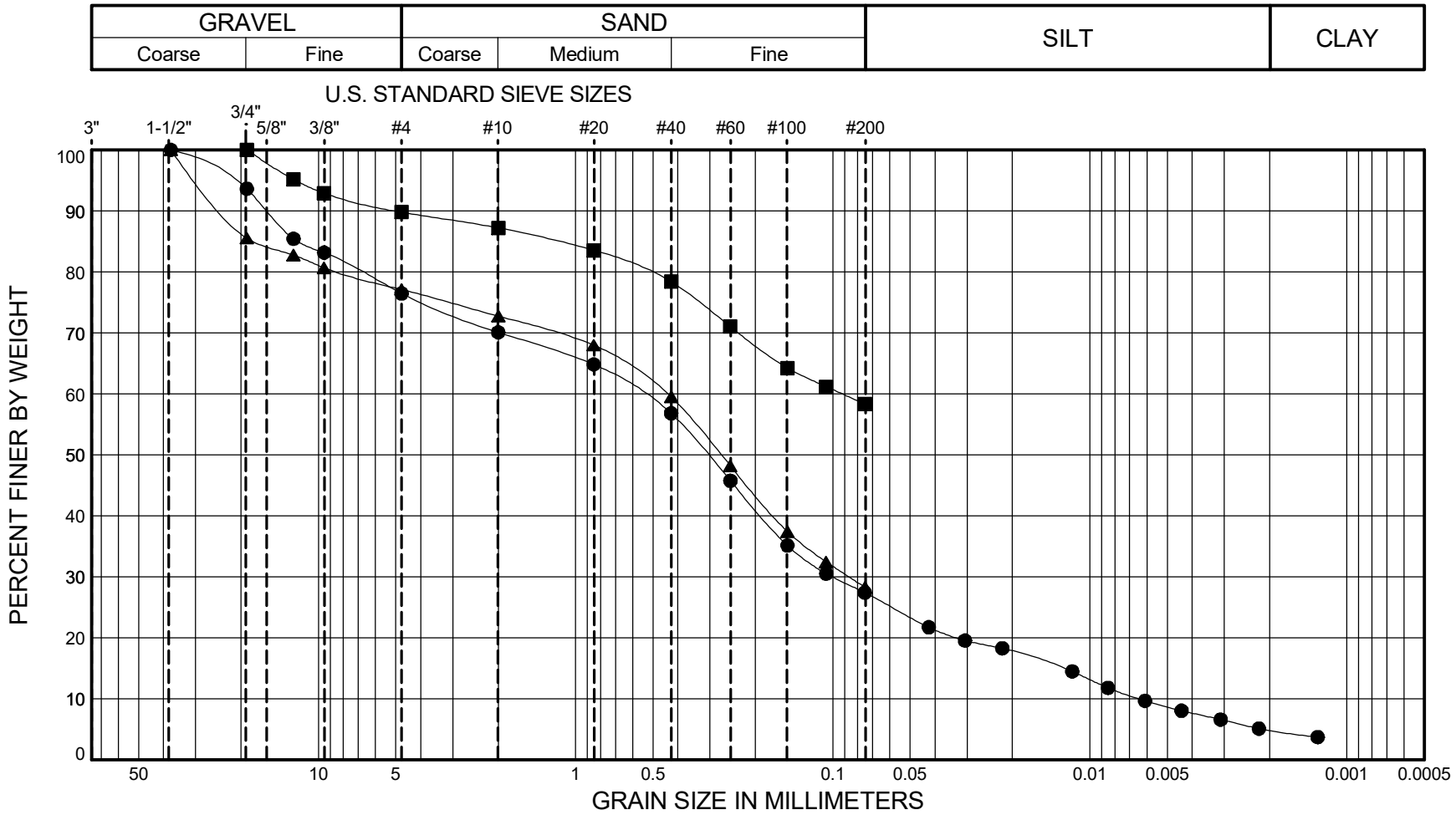
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-80B	S-3	5.0 - 6.5	(SP-SM) Yellowish-brown, poorly graded SAND with silt	9					93.6	6.4
■	BH-80B	S-7a	15.0 - 16.3	(SP) Very dark gray, poorly graded SAND	16				1.2	94.0	4.8
▲	BH-80B	S-9	20.0 - 20.3	(SM) Dark gray, silty SAND	11				5.7	58.2	36.1

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-96



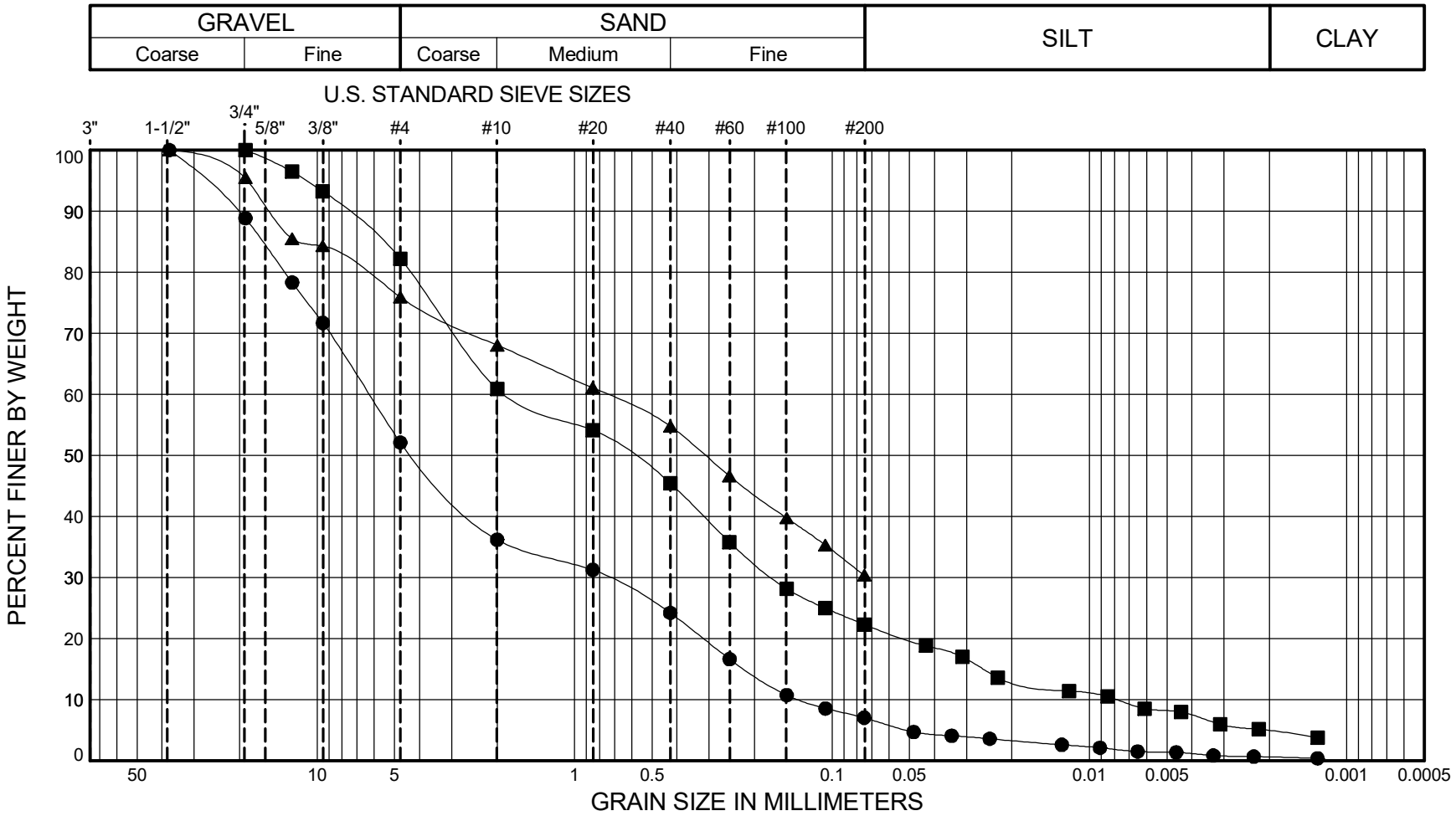
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-81W	S-1	2.5 - 4.0	(SM) Dark grayish-brown, silty SAND with gravel	10				23.6	49.1	27.4
■	BH-81W	S-2	4.2 - 5.0	(ML) Olive, sandy SILT	25	25	21	4	10.2	31.5	58.3
▲	BH-81W	S-5	12.5 - 13.8	(SM) Dark gray, silty SAND with gravel	7				22.9	48.8	28.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-97



SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-82	S-1	2.5 - 4.0	(GP-GM) Grayish-brown, poorly graded GRAVEL with silt and sand	10				47.9	45.1	7.0
■	BH-82	S-2	5.0 - 6.5	(SM) Dark yellowish-brown, silty SAND with gravel	12				17.8	59.9	22.3
▲	BH-82	S-6	15.0 - 16.5	(SC) Gray, clayey SAND with gravel	8	21	12	9	24.1	45.5	30.4

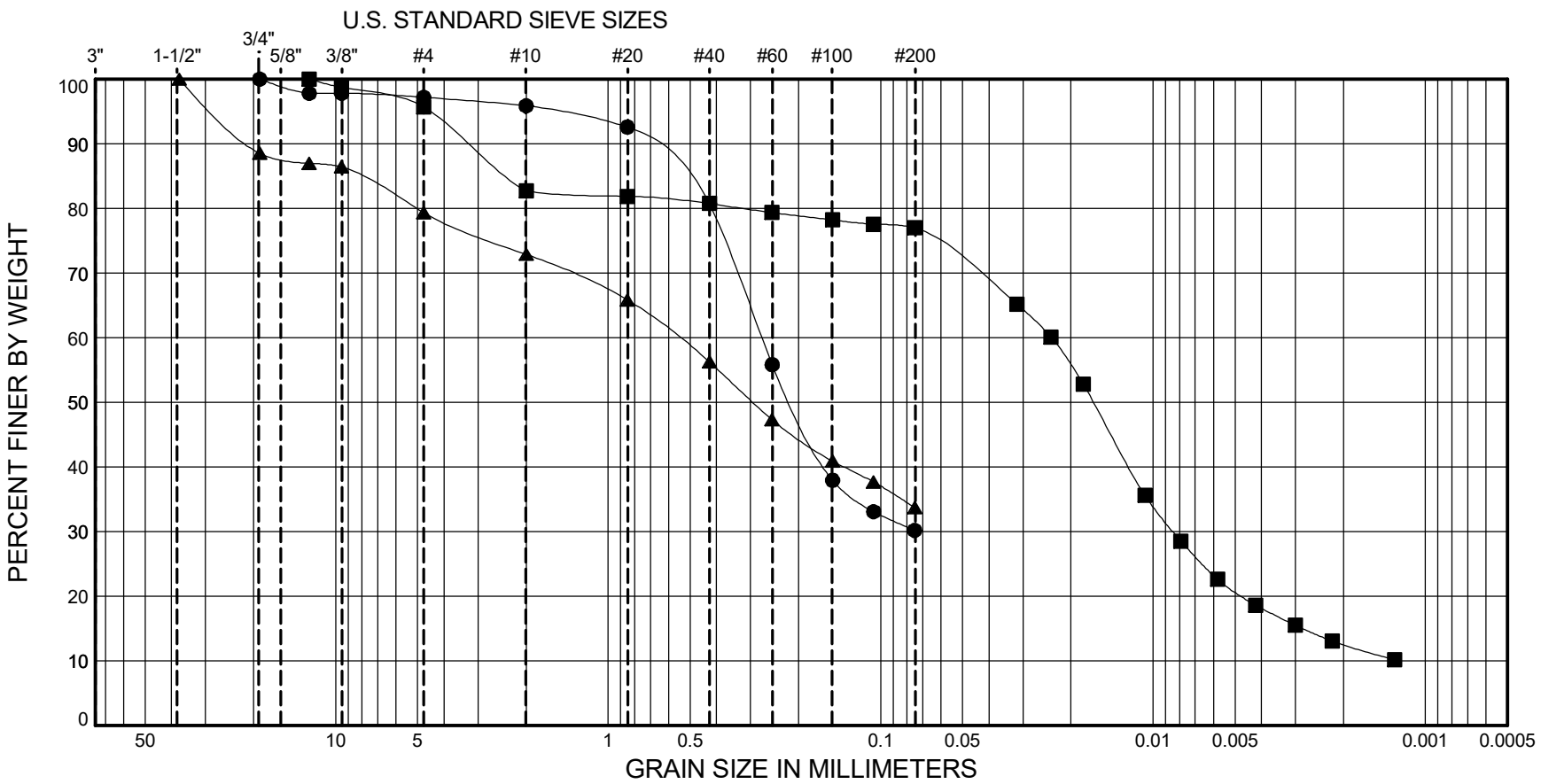
GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-98

GRAVEL		SAND			SILT	CLAY
Coarse	Fine	Coarse	Medium	Fine		



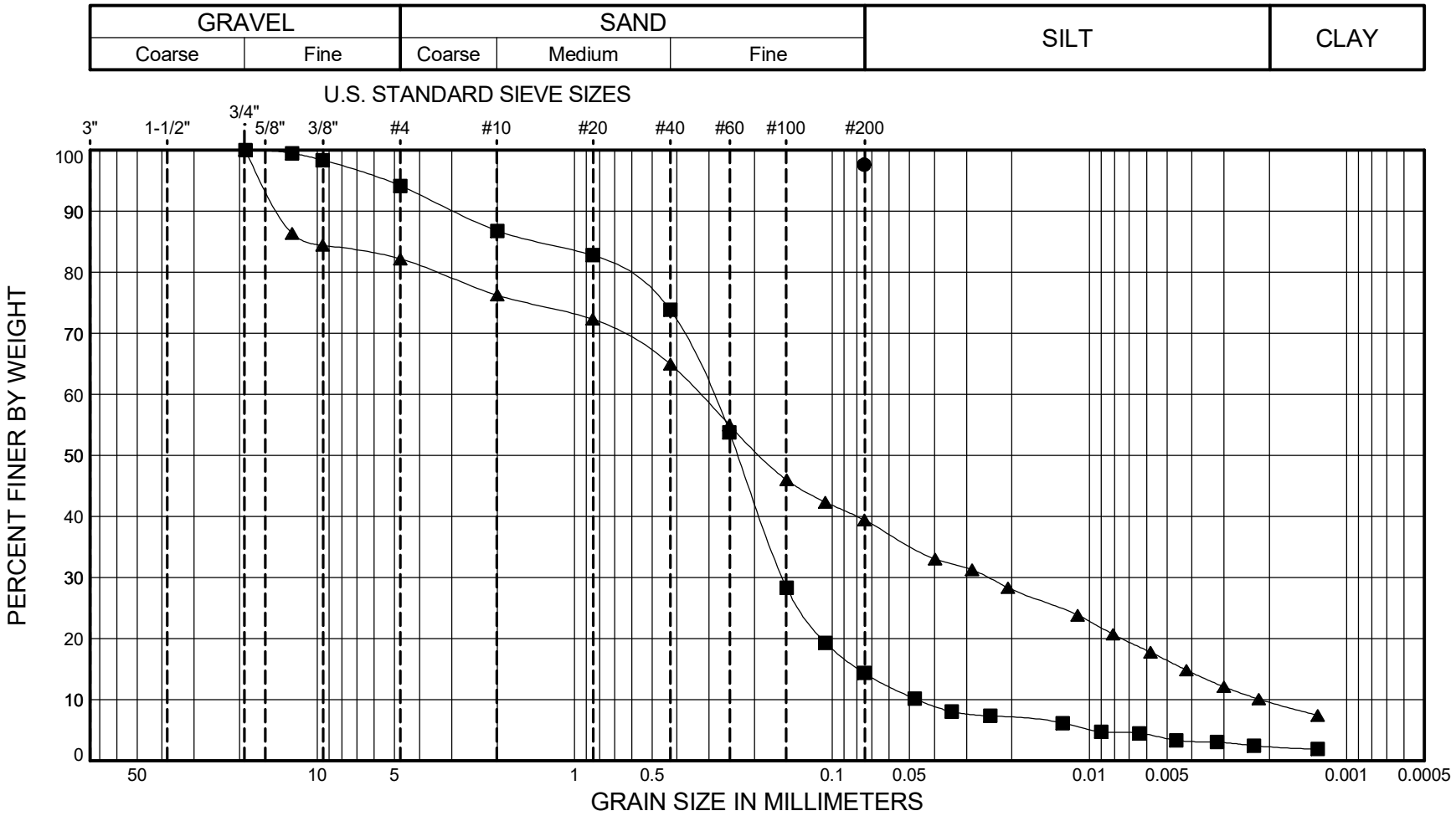
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-82	S-8	20.0 - 21.5	(SM) Gray, silty SAND	18				2.8	67.0	30.2
■	BH-83W	S-2	2.8 - 4.3	(ML) Dark yellowish-brown, SILT with sand	18				4.3	18.7	77.0
▲	BH-83W	S-5	10.0 - 11.5	(SM) Dark gray, silty SAND with gravel	9				20.7	45.7	33.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-99



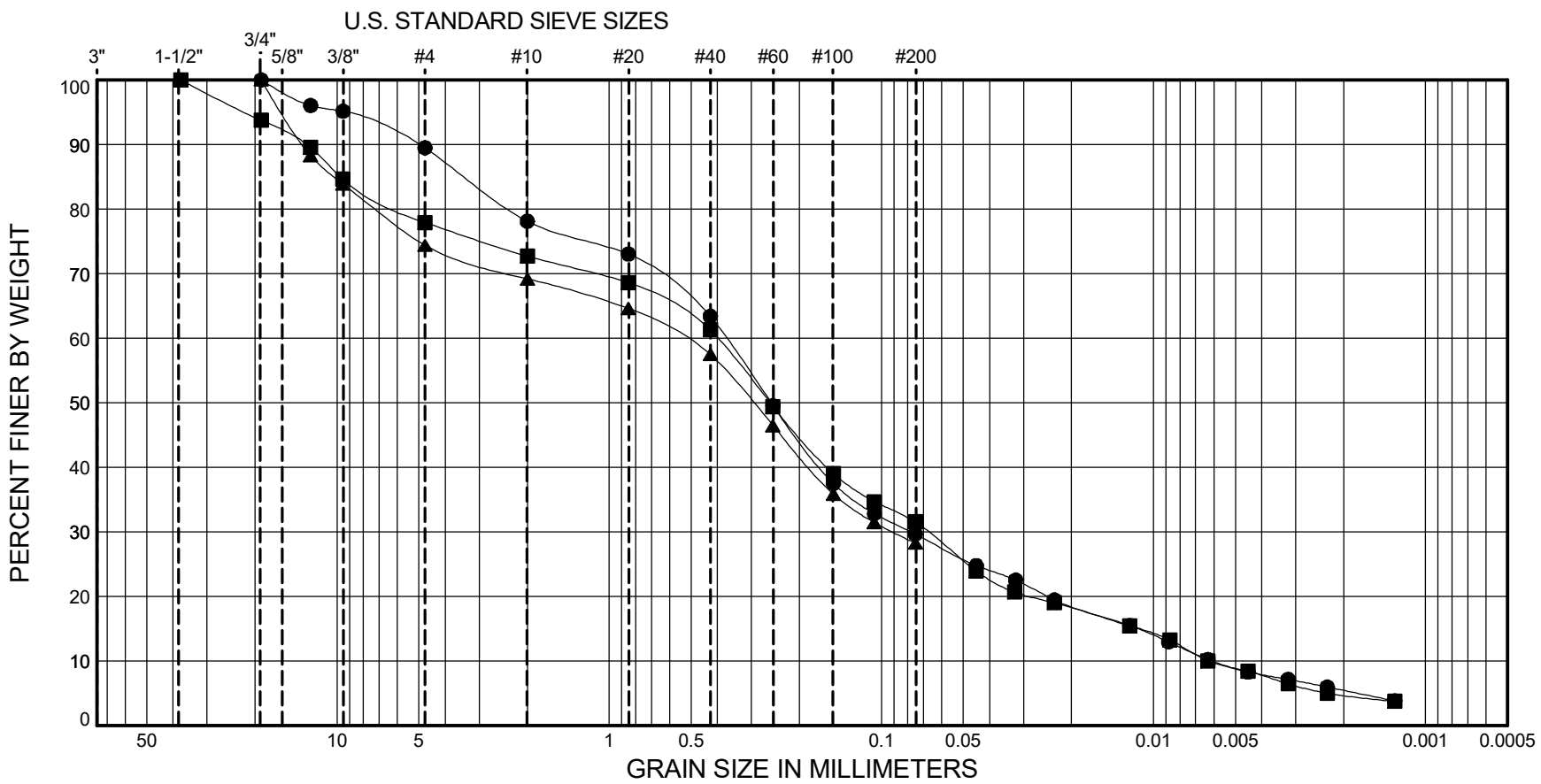
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-84	S-4	10.0 - 11.5	(CH) Olive-brown, fat CLAY	32	54	28	26			97.6
■	BH-85W	S-1	1.2 - 2.7	(SM) Dark yellowish-brown, silty SAND	9				5.9	79.8	14.4
▲	BH-85W	S-3b	5.8 - 6.5	(SM) Light olive-brown, silty SAND with gravel	11				17.8	42.7	39.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-100



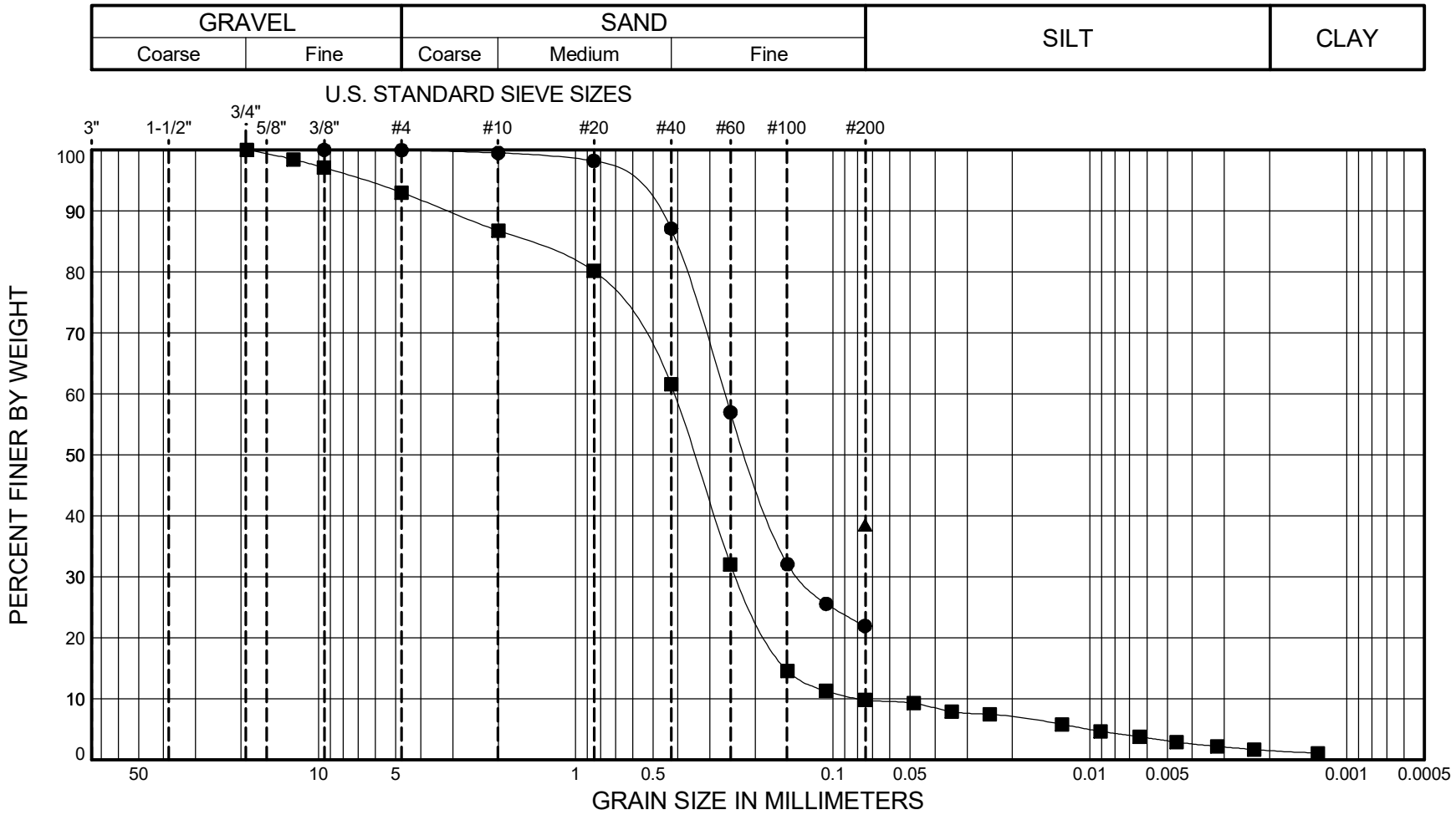
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-86	S-2	4.7 - 6.2	(SM) Dark yellowish-brown, silty SAND	15				10.5	59.8	29.6
■	BH-86	S-3	7.5 - 9.0	(SM) Yellowish-brown, silty SAND with gravel	8				22.1	46.4	31.5
▲	BH-86	S-4	10.0 - 11.5	(SM) Yellowish-brown, silty SAND with gravel	8				25.6	46.1	28.2

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-101



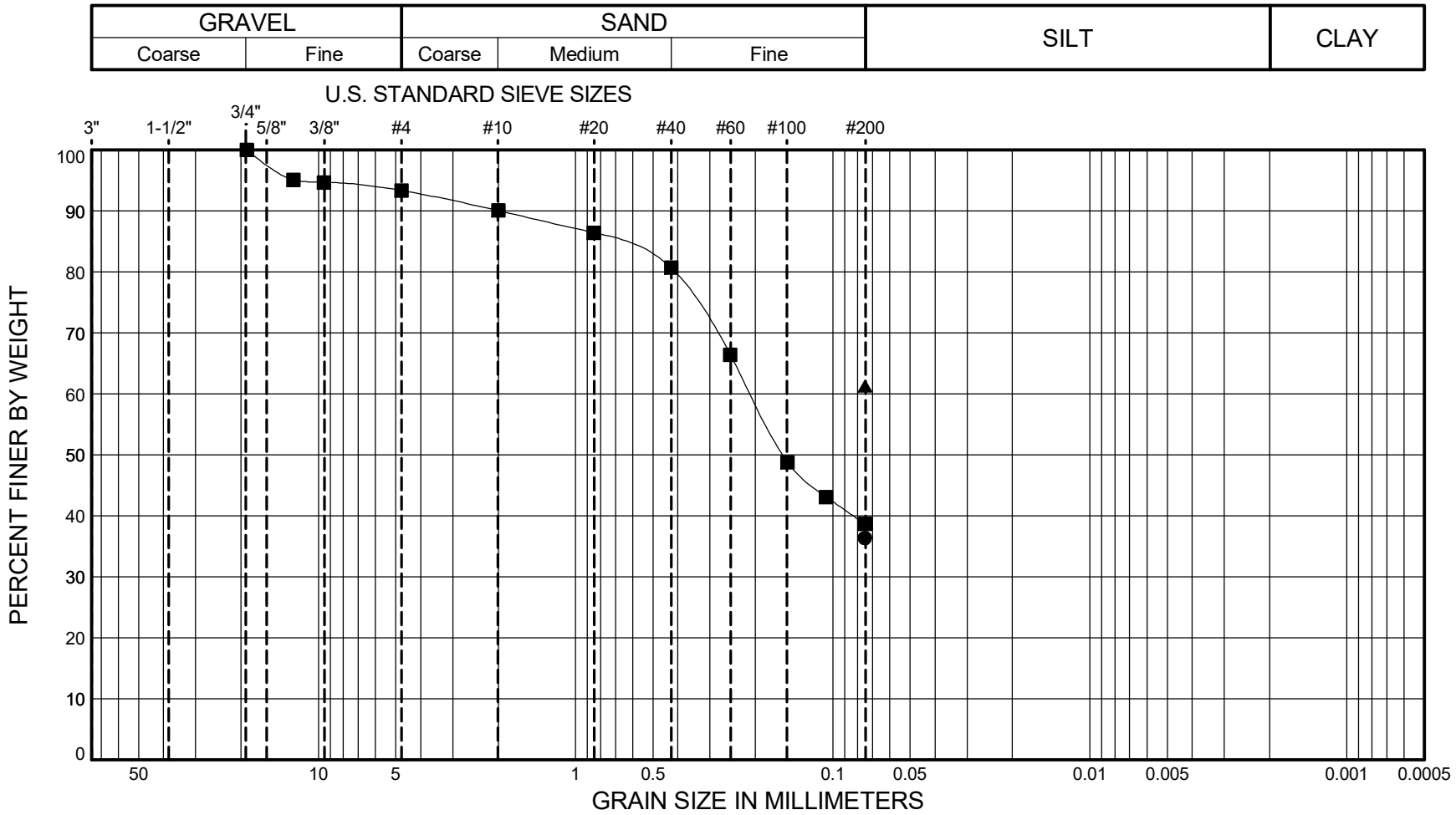
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-86	S-7	17.5 - 19.0	(SM) Dark grayish-brown, silty SAND	11				0.1	78.0	21.9
■	BH-87	S-2	5.0 - 6.5	(SP-SM) Dark yellowish-brown, poorly graded SAND with silt	6				7.0	83.2	9.8
▲	BH-87	S-4	10.0 - 11.5	(SM) Dark yellowish-brown, silty SAND with gravel	17						38.5

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-102



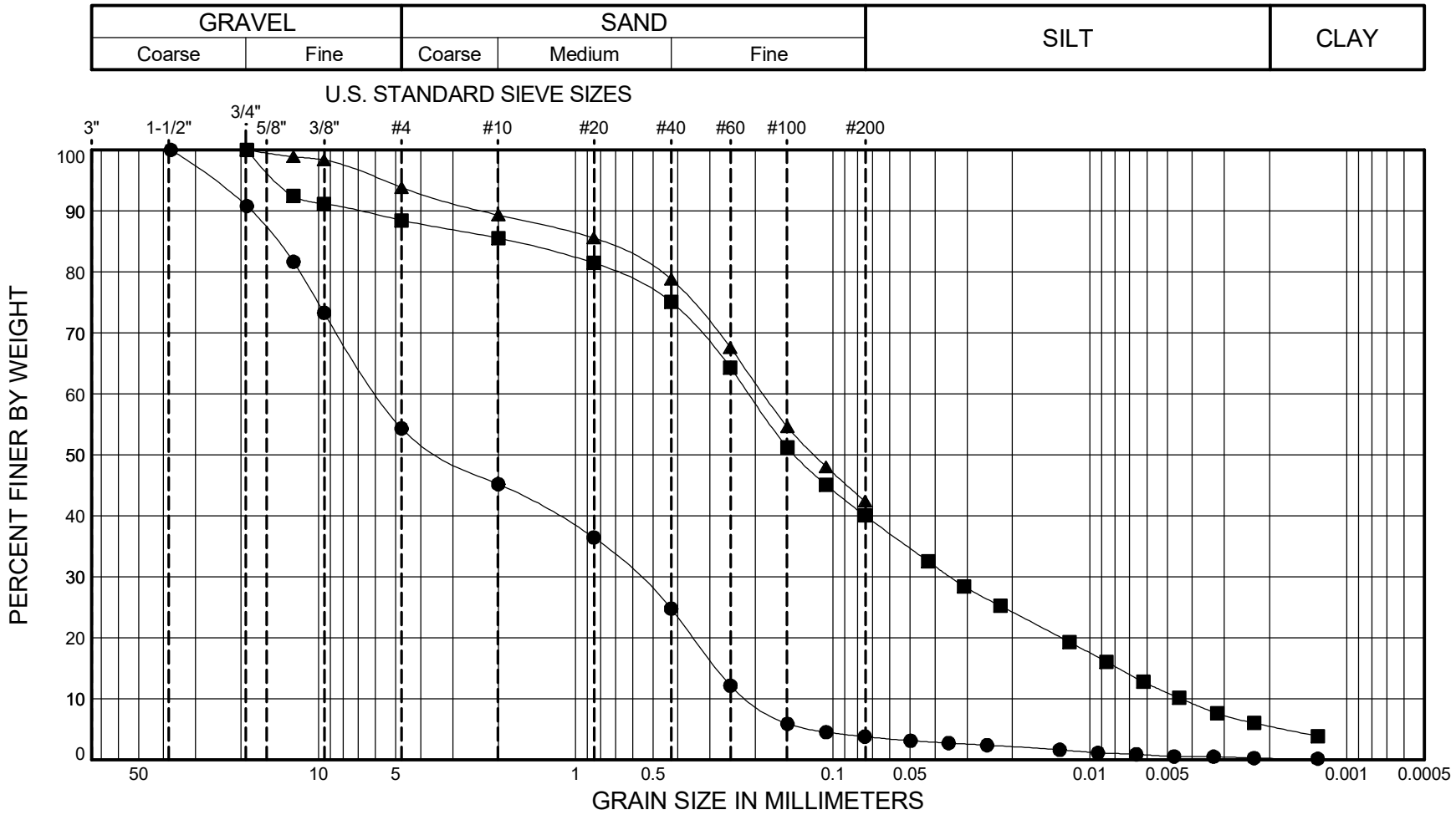
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-87	S-6	15.0 - 16.5	(SM) Very dark gray, silty SAND	27						36.4
■	BH-87	S-7	17.5 - 19.0	(SM) Dark brown, silty SAND	23				6.7	54.7	38.6
▲	BH-87	S-8	20.0 - 21.5	(CL-ML) Dark yellowish-brown, sandy silty CLAY	21	24	18	6			61.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-103



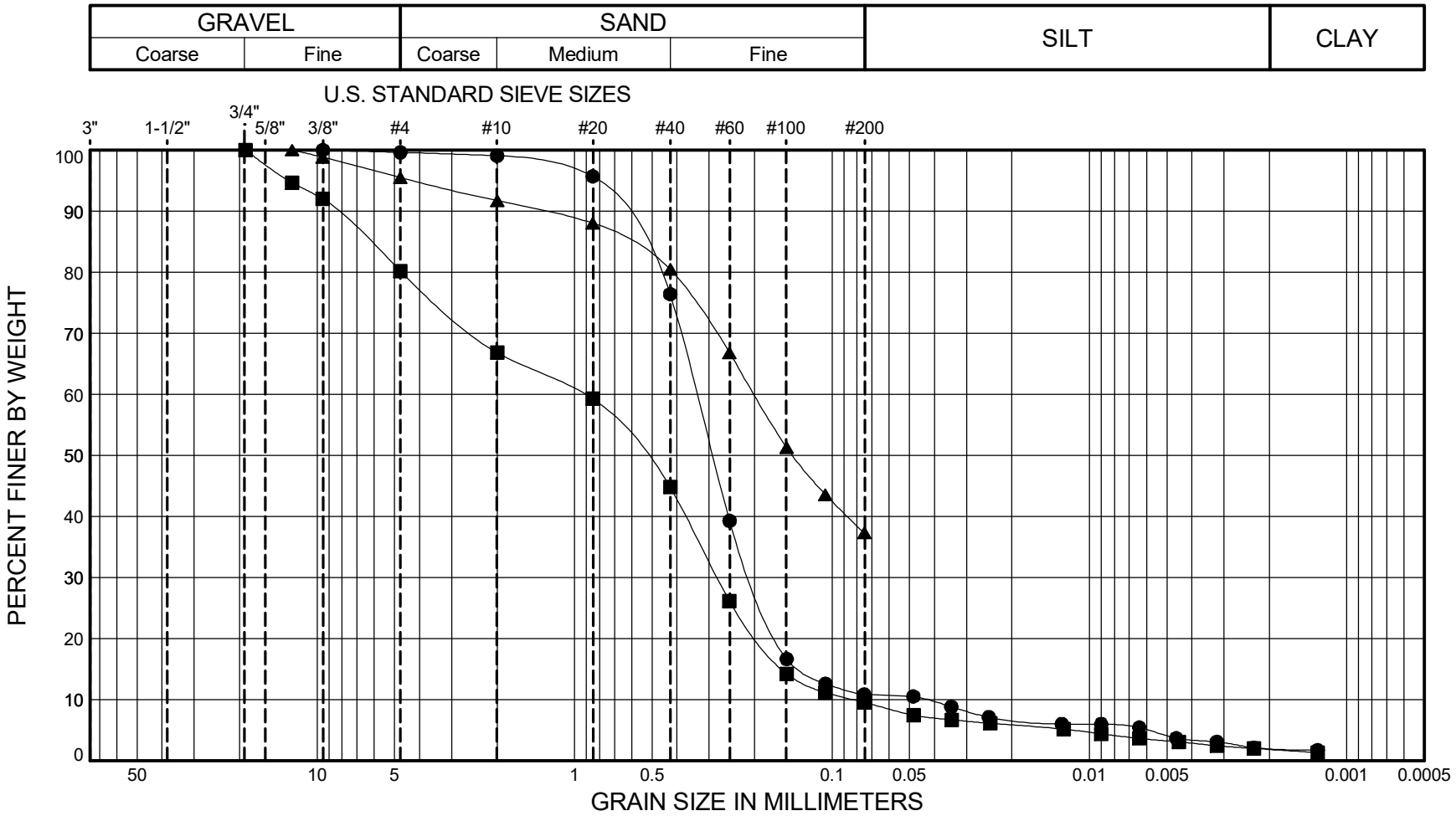
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-88	S-2	5.0 - 6.5	(SP) Olive, poorly graded SAND with gravel	3				45.7	50.5	3.8
■	BH-88	S-3b	7.9 - 9.0	(SM) Olive-gray, silty SAND	13				11.5	48.4	40.0
▲	BH-88	S-7	17.5 - 19.0	(SM) Olive, silty SAND	10				6.2	51.5	42.4

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-104



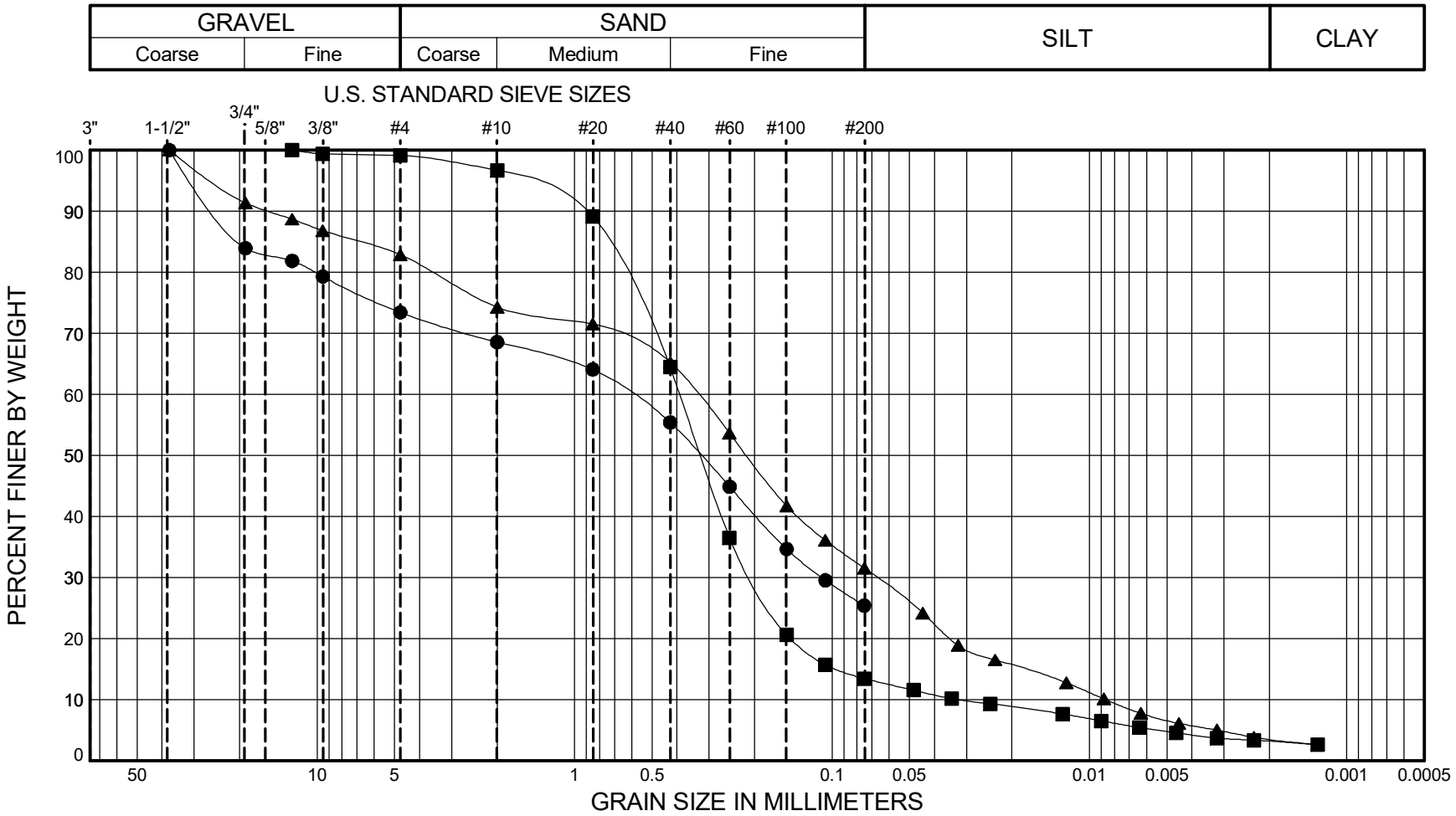
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-89	S-1	2.5 - 4.0	(SW-SM) Yellowish-brown, well-graded SAND with silt	6				0.4	88.8	10.8
■	BH-89	S-2	5.0 - 6.5	(SW-SM) Dark yellowish-brown, well-graded SAND with silt and gravel	8				19.8	70.6	9.5
▲	BH-89	S-5	12.5 - 14.0	(SM) Olive-brown, silty SAND	13				4.5	58.2	37.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-105



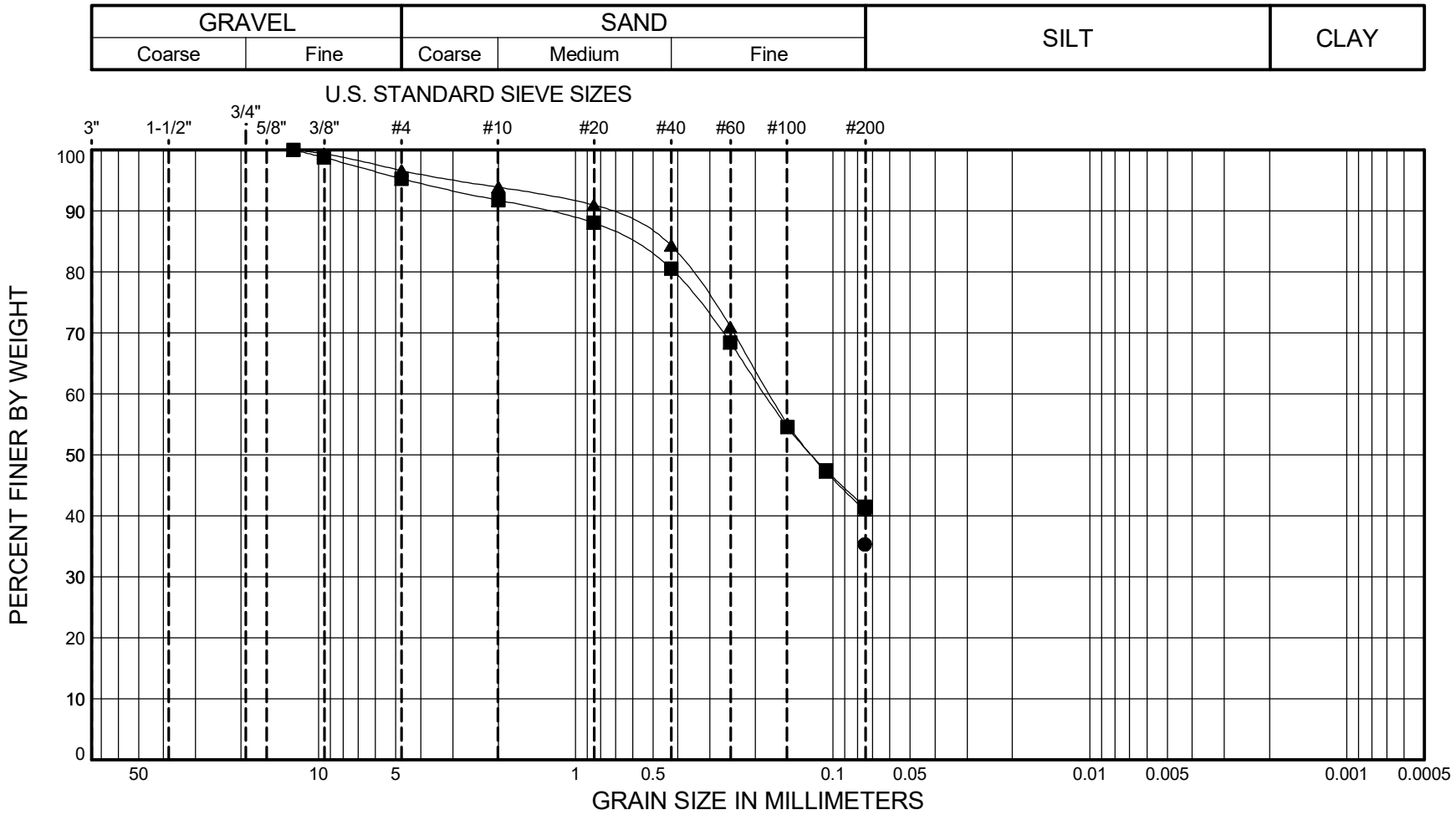
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-89	S-8	20.0 - 21.5	(SM) Dark olive-brown, silty SAND with gravel	11				26.6	48.0	25.4
■	BH-90	S-1	2.5 - 4.0	(SM) Dark yellowish-brown, silty SAND	11				0.9	85.7	13.4
▲	BH-90	S-2b	5.3 - 6.5	(SM) Olive-brown, silty SAND with gravel	15				17.2	51.3	31.5

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-106



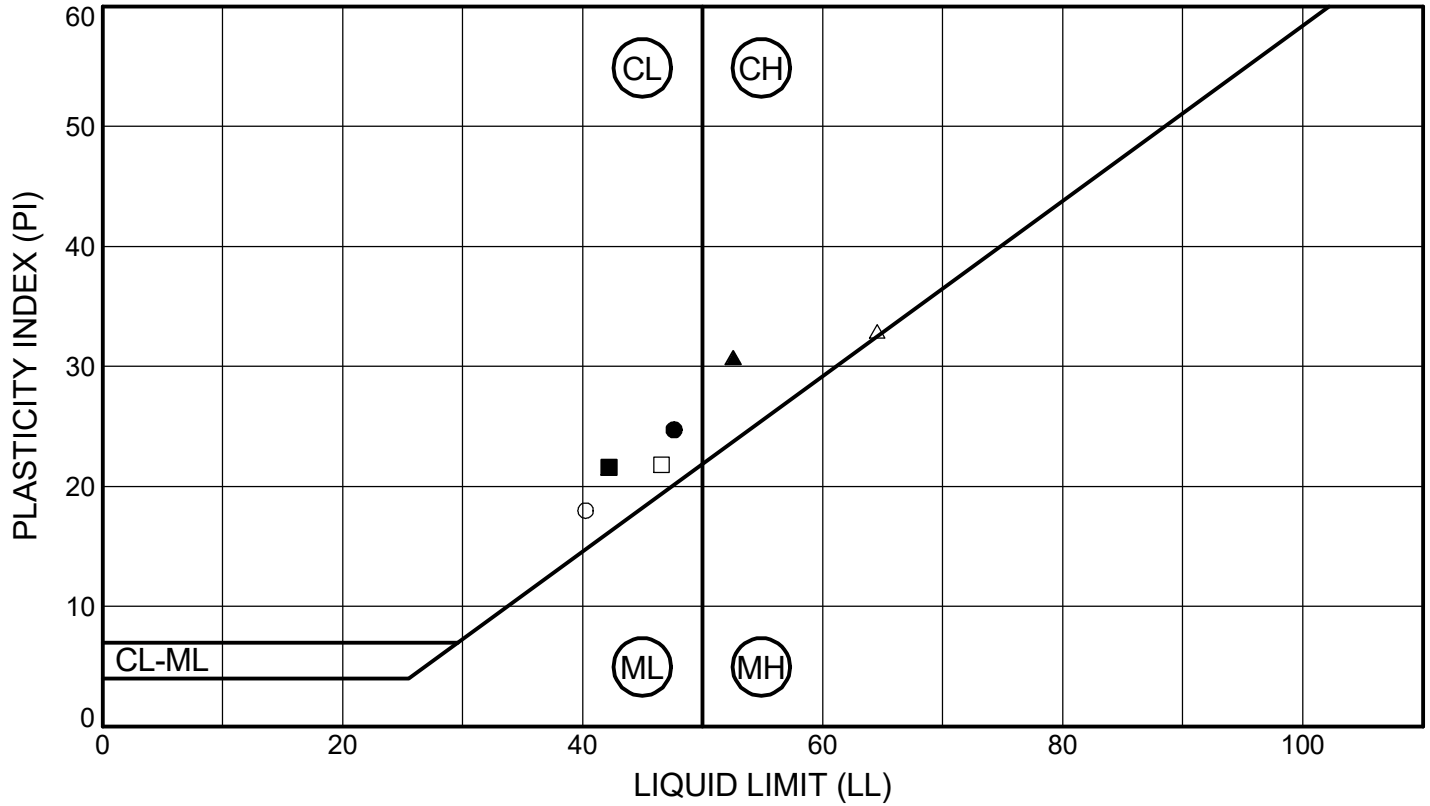
SYMBOL	SAMPLE		DEPTH (ft.)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	BH-90	S-3	7.5 - 9.0	(SM) Olive, silty SAND	16						35.3
■	BH-90	S-6	15.0 - 16.5	(SM) Olive-brown, silty SAND	15				4.7	53.8	41.5
▲	BH-90	S-8	20.0 - 20.9	(SM) Dark grayish-brown, silty SAND	11				3.4	55.7	40.9

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D6913

PROJECT NO.: 2021-133-21 FIGURE: B-107



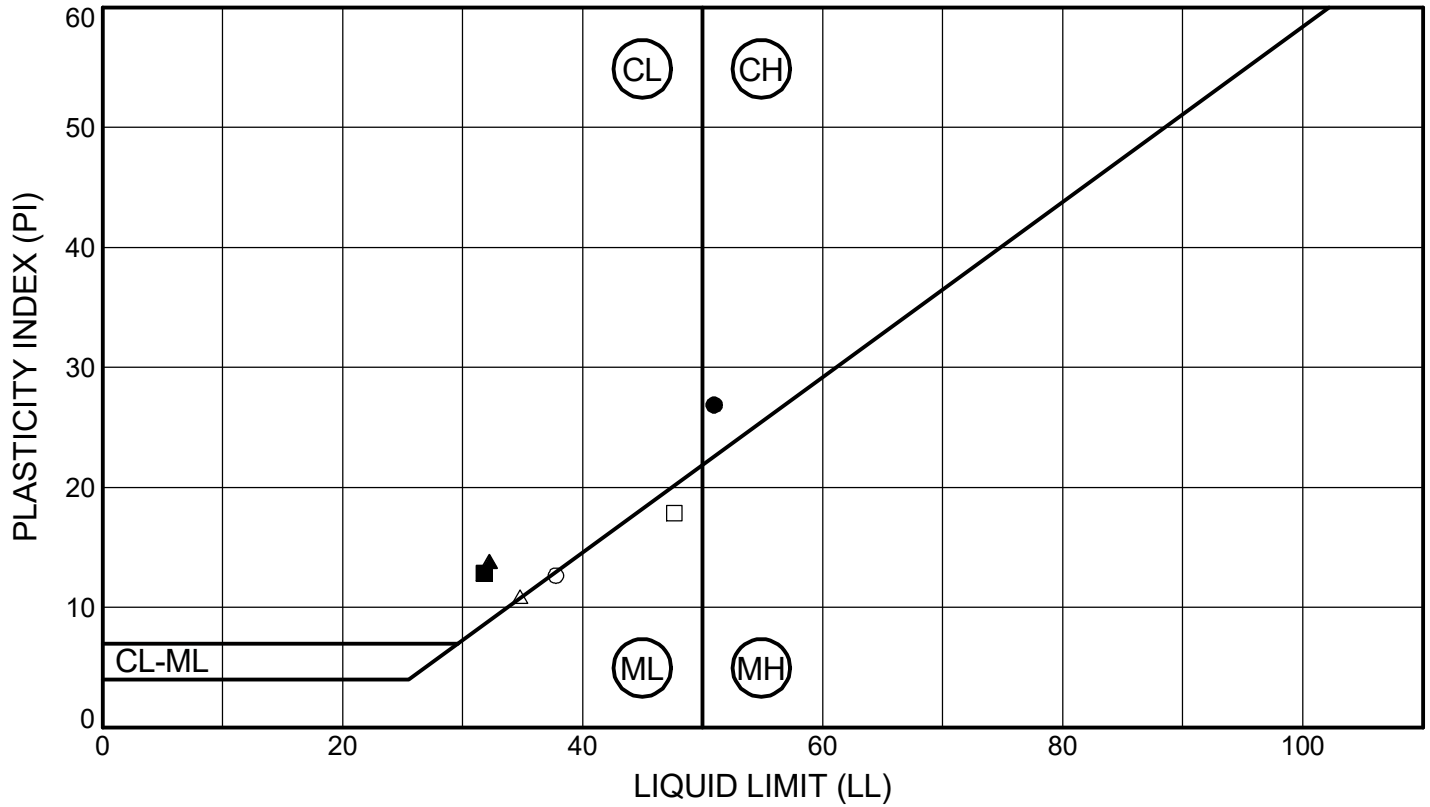
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-25	S-6a	12.5 - 13.7	(CL) Dark gray, lean CLAY	20	48	23	25	
■	BH-25	S-8	17.5 - 19.0	(CL) Gray, lean CLAY with sand	17	42	21	21	76.5
▲	BH-26	S-9	20.0 - 21.5	(CH) Dark gray, fat CLAY	34	53	22	31	97.8
○	BH-27	S-4	10.0 - 11.5	(CL) Dark yellowish-brown, lean CLAY	31	40	22	18	95.2
□	BH-27	S-5	12.5 - 14.0	(CL) Very dark gray, lean CLAY	32	47	25	22	99.4
△	BH-28	S-1	2.5 - 4.0	(MH) Olive, elastic SILT	37	65	32	33	95.1

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-108



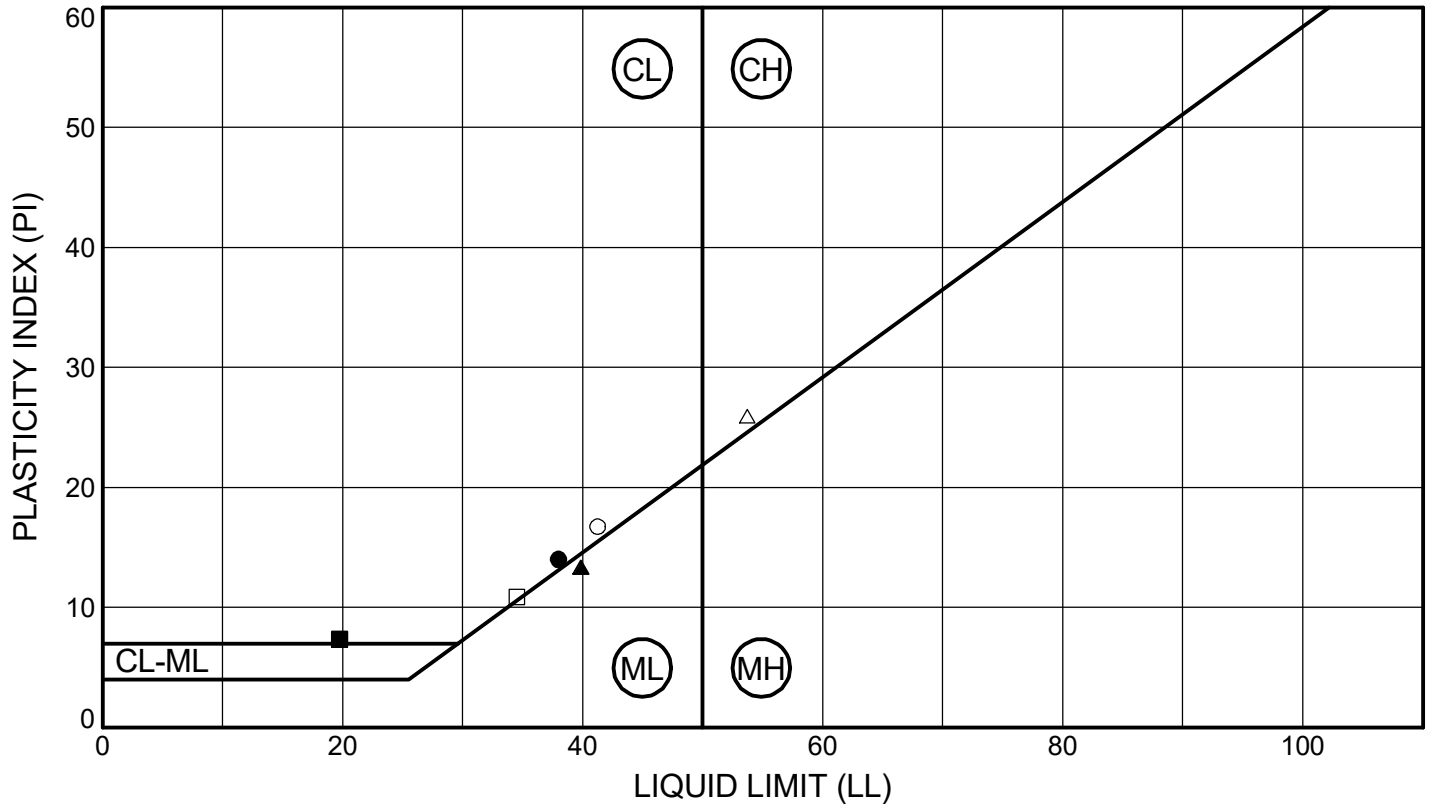
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-28	S-5	12.5 - 14.0	(CH) Very dark gray, fat CLAY	35	51	24	27	99.7
■	BH-31	S-14b	65.5 - 66.0	(CL) Very dark gray, lean CLAY with sand	24	32	19	13	73.9
▲	BH-36A	S-6b	13.0 - 14.0	(CL) Olive-brown, lean CLAY	19	32	18	14	
○	BH-37	S-12	40.0 - 40.8	(ML) Very dark gray, SILT	26	38	25	13	
□	BH-39	S-12b	40.8 - 41.5	(ML) Dark gray, SILT	25	48	30	18	96.0
△	BH-41	S-8	20.0 - 21.5	(CL) Olive-brown, lean CLAY	30	35	24	11	90.7

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-109



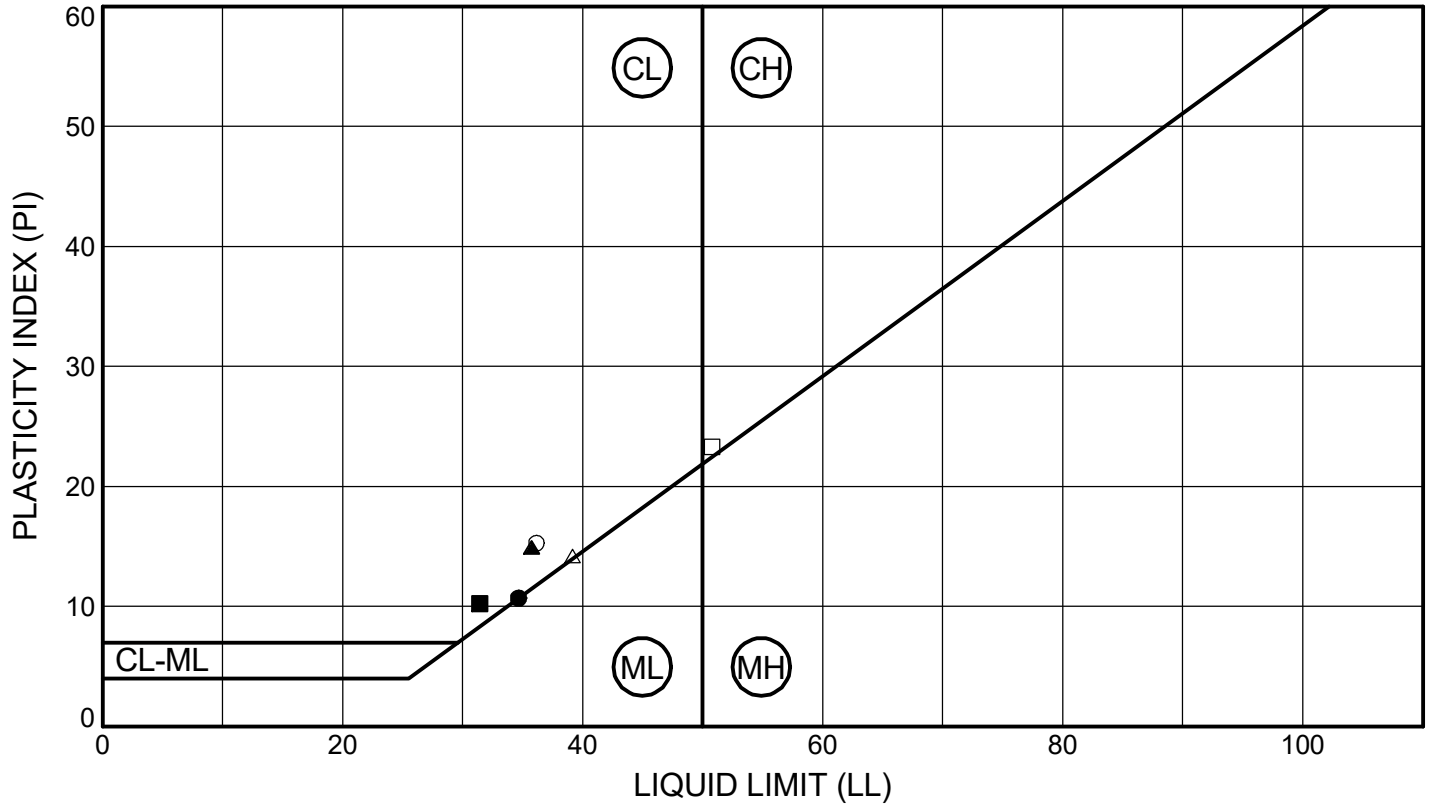
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-41	S-10	30.0 - 31.5	(CL) Very dark gray, lean CLAY	35	38	24	14	97.2
■	BH-43	S-8	20.0 - 21.5	(CL) Very dark gray, sandy lean CLAY	14	20	12	8	65.4
▲	BH-43	S-12	40.0 - 41.5	(ML) Gray, SILT	35	40	26	14	98.7
○	BH-45	S-7a	17.5 - 18.5	(CL) Gray, lean CLAY with sand	27	41	25	16	75.6
□	BH-45	S-10	30.0 - 31.5	(CL) Dark gray, lean CLAY with sand	29	35	24	11	83.0
△	BH-46W	S-7	17.5 - 19.0	(CH) Dark grayish-brown, fat CLAY	32	54	28	26	

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-110



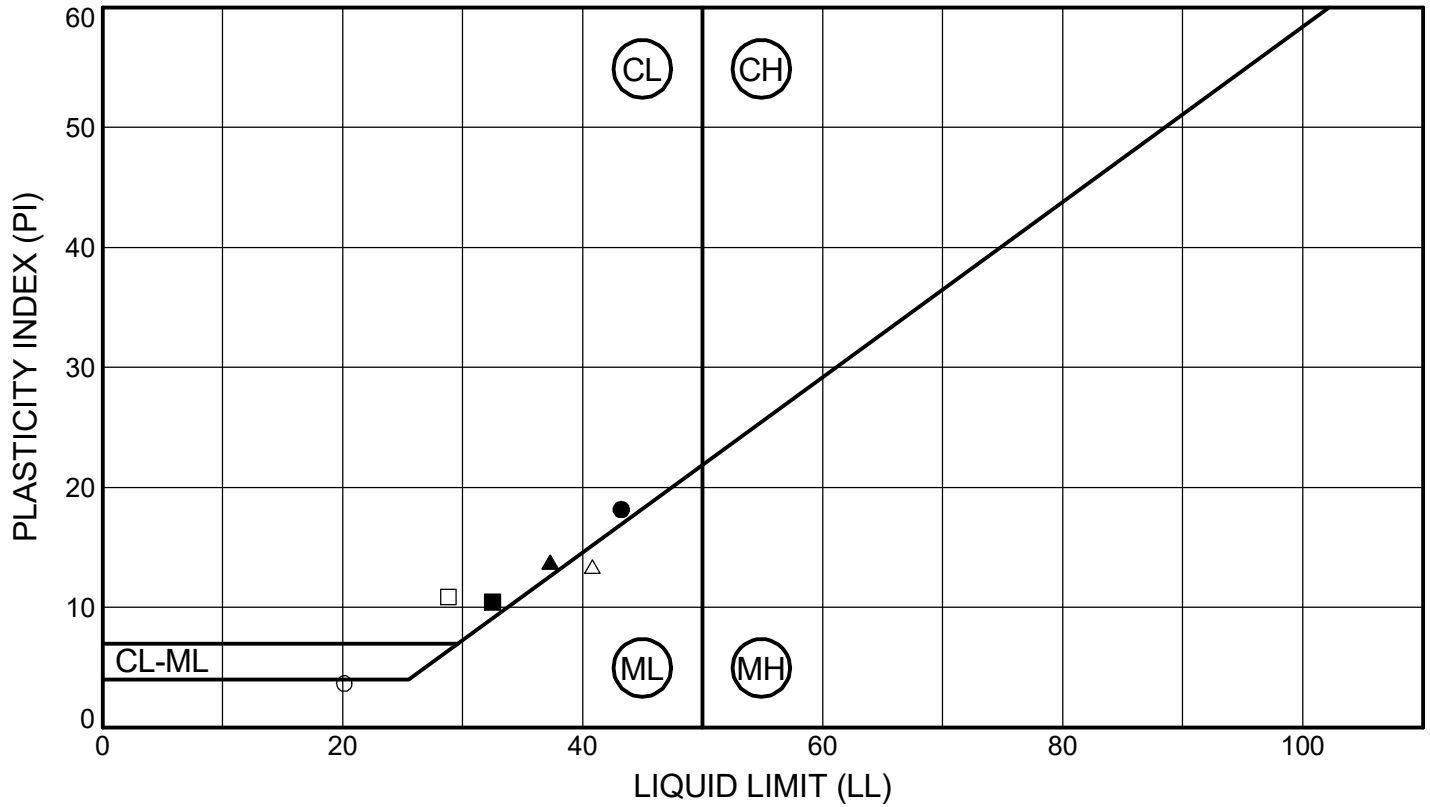
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-46W	S-12	40.0 - 41.5	(CL) Dark gray, lean CLAY	30	35	24	11	
■	BH-46W	S-14	50.0 - 51.5	(CL) Very dark gray, lean CLAY with sand	31	31	21	10	
▲	BH-47	S-11b	35.5 - 36.5	(CL) Dark gray, sandy lean CLAY	27	36	21	15	68.2
○	BH-48B	S-8'	21.0 - 21.5	(CL) Olive-gray, lean CLAY with sand	33	36	21	15	
□	BH-48B	S-9a	25.0 - 25.5	(CH) Gray, fat CLAY	34	51	27	24	
△	BH-48B	S-9b	25.5 - 26.5	(CL) Olive-gray, lean CLAY	31	39	25	14	

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-111



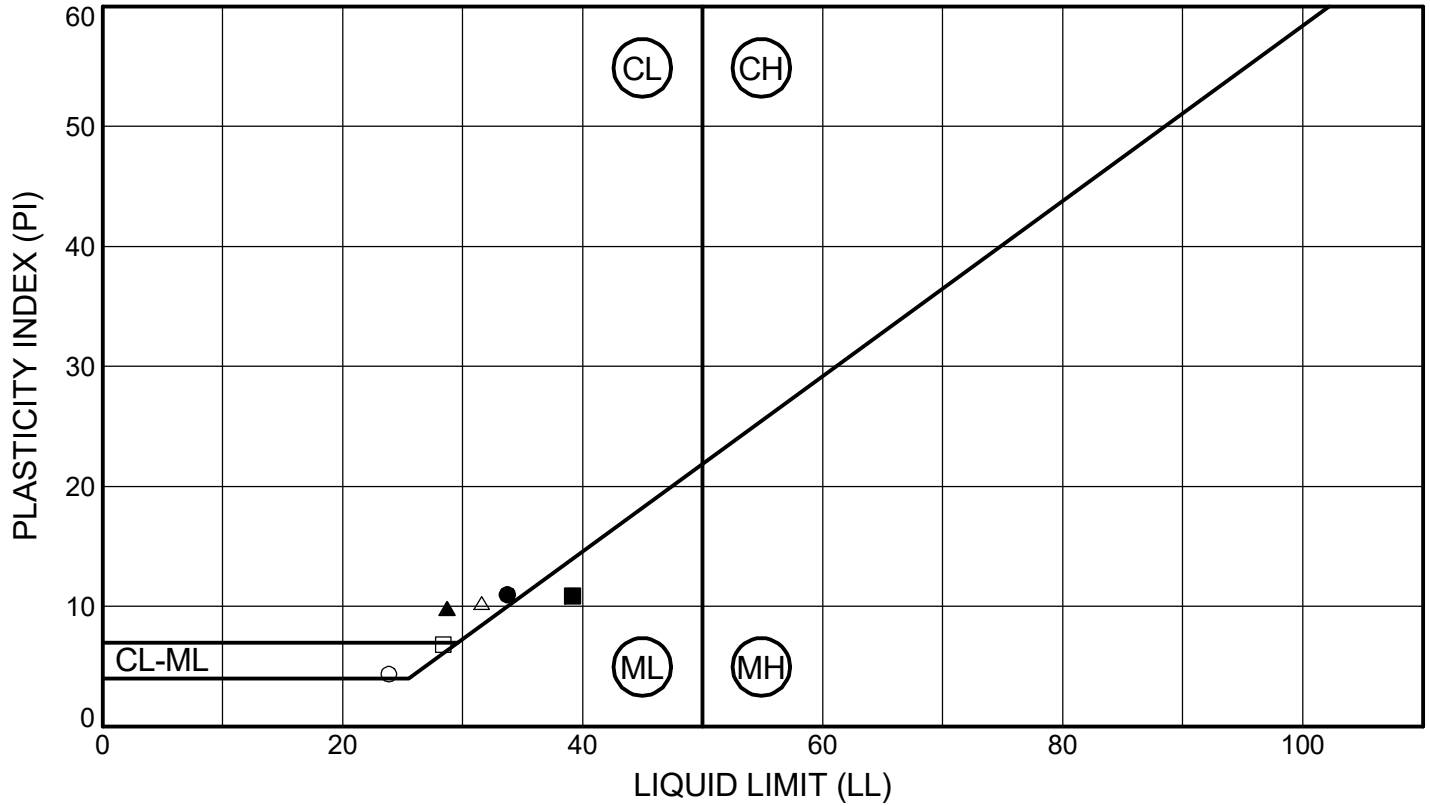
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-48B	S-10	30.0 - 31.5	(CL) Olive-gray, lean CLAY with sand	35	43	25	18	
■	BH-49	S-4	10.0 - 11.5	(CL) Very dark gray, lean CLAY with sand	29	32	22	10	82.5
▲	BH-49	S-11b	35.8 - 36.5	(CL) Gray, lean CLAY	36	37	23	14	88.5
○	BH-50	S-2	2.5 - 4.0	(SM) Olive-brown, silty SAND	25	20	16	4	39.3
□	BH-50	S-6	12.5 - 14.0	(CL) Olive, sandy lean CLAY	26	29	18	11	56.6
△	BH-50	S-10	25.0 - 26.5	(ML) Dark gray, SILT with sand	26	41	27	14	80.8

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-112



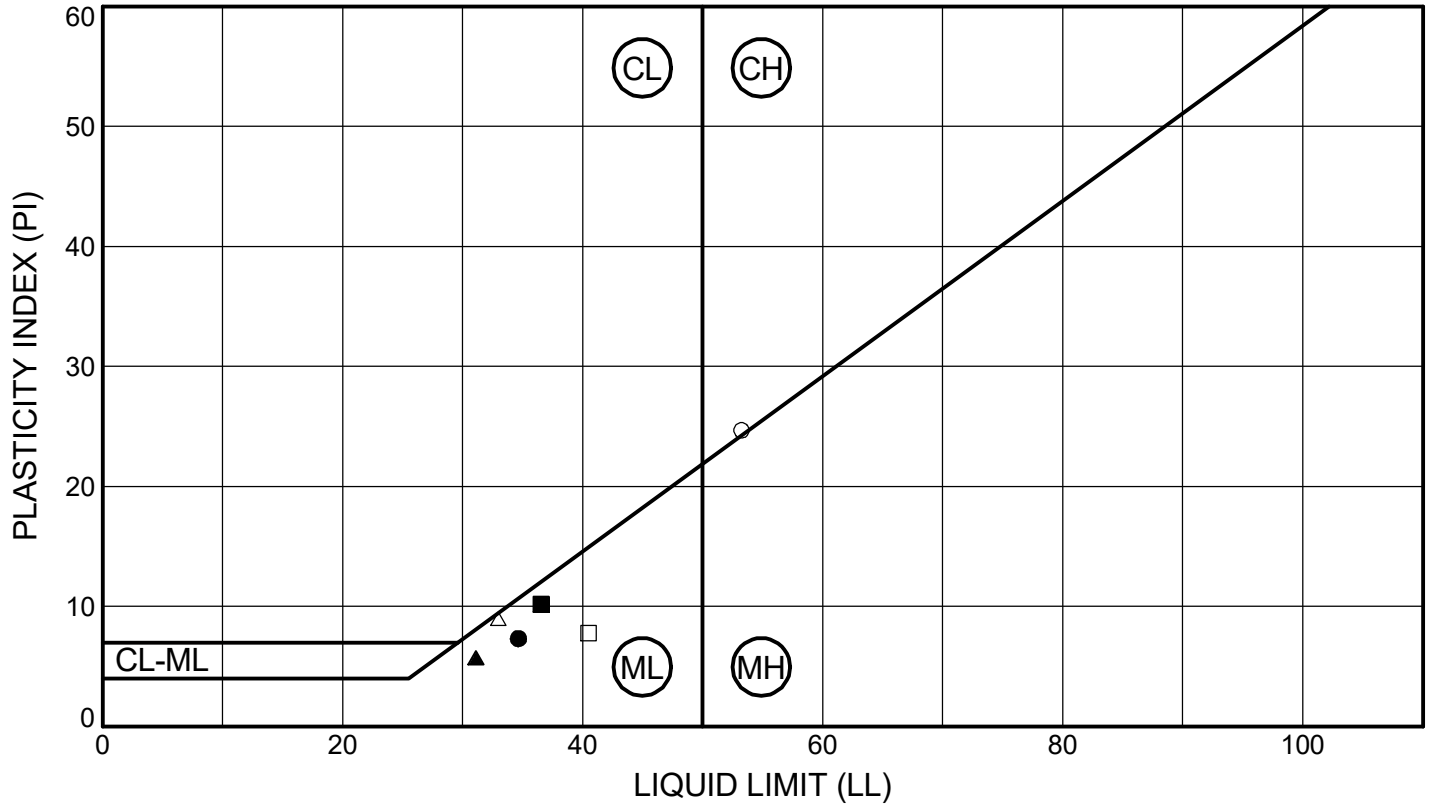
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-51	S-6	15.0 - 16.5	(CL) Dark gray, lean CLAY	29	34	23	11	91.9
■	BH-51	S-10	30.0 - 31.5	(ML) Very dark gray, SILT	32	39	28	11	96.1
▲	BH-52B	S-4	10.0 - 11.5	(CL) Light olive-brown, lean CLAY with sand	20	29	19	10	60.6
○	BH-53	S-6b	15.8 - 16.5	(CL-ML) Olive-gray, silty CLAY with sand	22	24	19	5	72.8
□	BH-53	S-13	45.0 - 46.5	(CL-ML) Very dark gray, silty CLAY	26	28	22	6	89.0
△	BH-54A	S-4b	10.5 - 11.5	(CL) Yellowish-brown, lean CLAY with sand	21	32	21	11	83.6

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-113



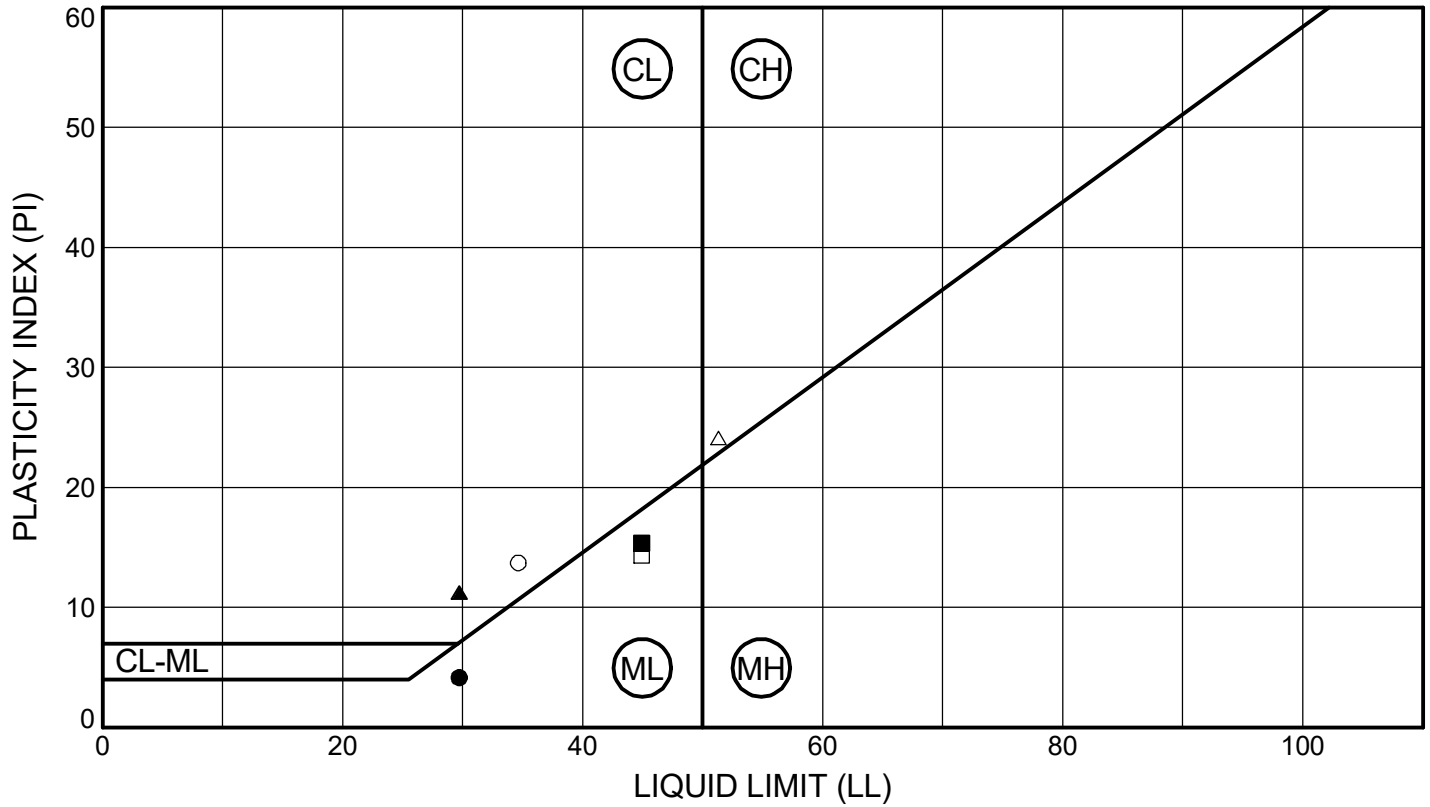
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-55W	S-7	17.5 - 19.0	(ML) Very dark gray, SILT	26	35	27	8	87.8
■	BH-55W	S-9	25.0 - 26.5	(ML) Very dark gray, SILT	27	37	26	11	
▲	BH-55W	S-13b	45.8 - 46.5	(ML) Very dark gray, SILT	34	31	25	6	
○	BH-57	S-11	35.0 - 36.5	(MH) Olive, elastic SILT with sand	31	53	29	24	84.1
□	BH-58	S-12b	41.0 - 41.5	(ML) Very dark grayish-brown, SILT	35	40	33	7	93.3
△	BH-62	S-6	15.0 - 16.5	(ML) Light olive-brown, SILT with sand	23	33	24	9	84.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-114



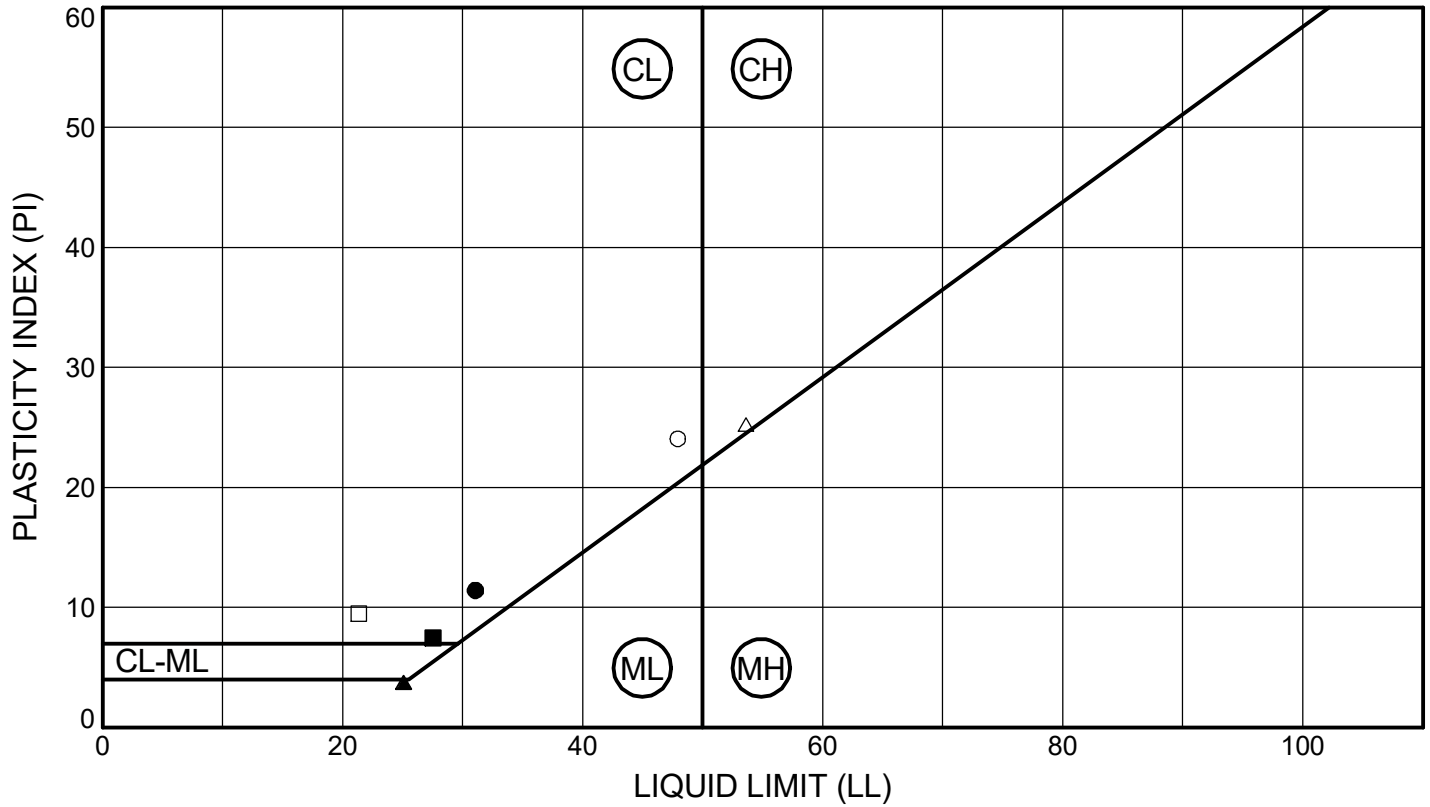
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-62	S-10	30.0 - 31.5	(ML) Very dark gray, SILT with sand	28	30	26	4	85.0
■	BH-64B	S-11	35.0 - 36.5	(ML) Dark gray, SILT	30	45	30	15	90.5
▲	BH-70	S-4b	11.0 - 11.5	(CL) Dark gray, sandy lean CLAY	28	30	18	12	55.8
○	BH-73	S-8	20.0 - 21.5	(CL) Dark yellowish-brown, lean CLAY with sand	35	35	21	14	70.1
□	BH-75	S-11	35.0 - 36.5	(ML) Olive, SILT	31	45	31	14	94.2
△	BH-75	S-13b	45.5 - 46.5	(CH) Gray, fat CLAY	35	51	27	24	98.5

GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-115



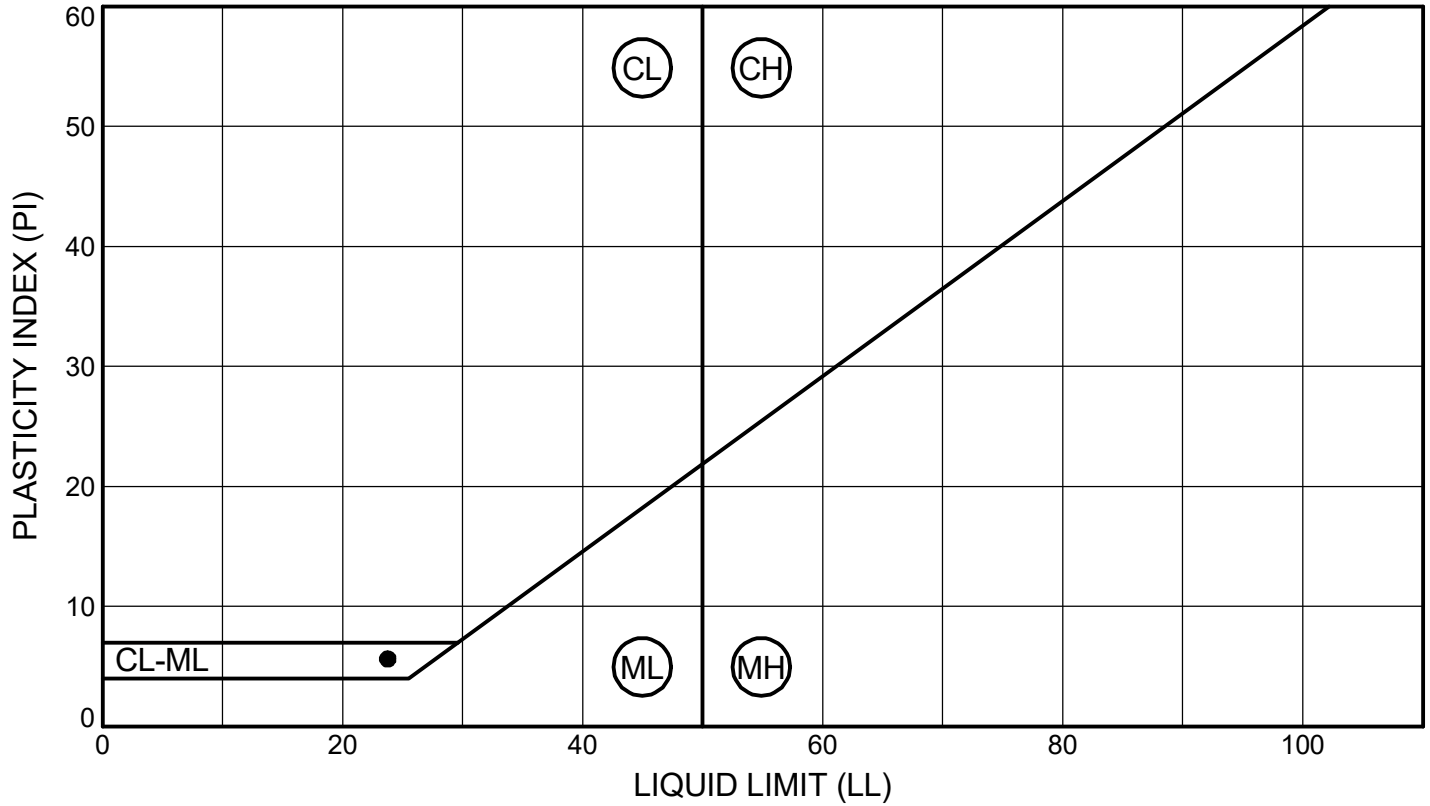
SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-77	S-9	25.0 - 26.5	(CL) Dark olive-brown, sandy lean CLAY	20	31	20	11	66.8
■	BH-80A	S-4a	10.0 - 10.7	(CL) Light olive-brown, sandy lean CLAY	28	28	20	8	60.0
▲	BH-81W	S-2	4.2 - 5.0	(ML) Olive, sandy SILT	25	25	21	4	58.3
○	BH-81W	S-7	17.5 - 19.0	(CL) Very dark gray, lean CLAY	23	48	24	24	
□	BH-82	S-6	15.0 - 16.5	(SC) Gray, clayey SAND with gravel	8	21	12	9	30.4
△	BH-84	S-4	10.0 - 11.5	(CH) Olive-brown, fat CLAY	32	54	28	26	97.6

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-116



SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION	% MC	LL	PL	PI	% Fines
●	BH-87	S-8	20.0 - 21.5	(CL-ML) Dark yellowish-brown, sandy silty CLAY	21	24	18	6	61.3

HWA GeoSciences Inc.

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE)
ROADWAY & STATIONS

LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX OF SOILS
METHOD ASTM D4318

PROJECT NO.: 2021-133-21 FIGURE: B-117

HWA GeoSciences Inc. Materials Testing Laboratory

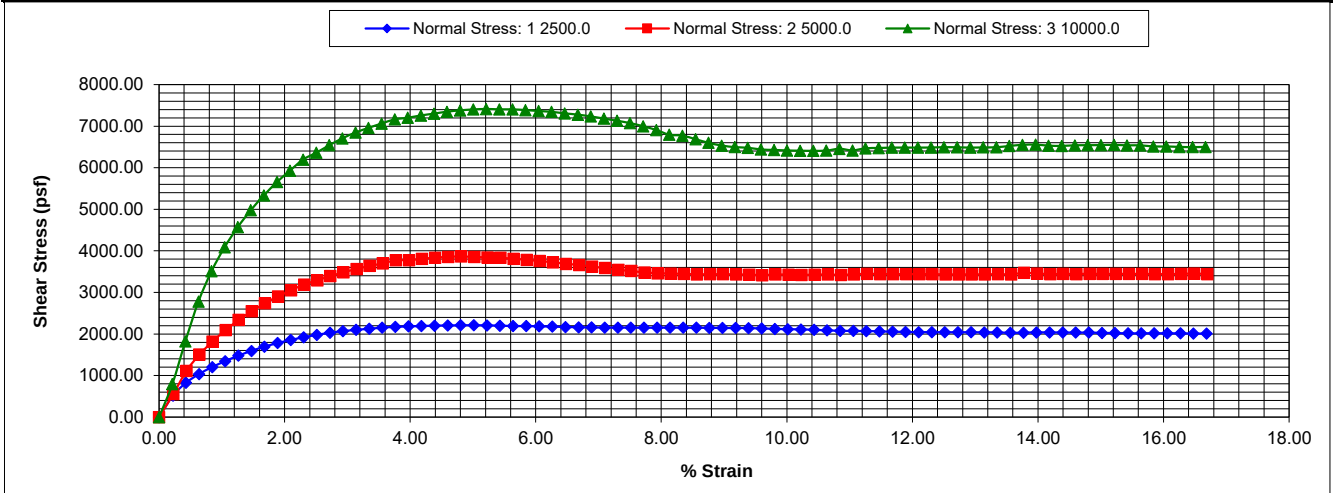
Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D 3080)

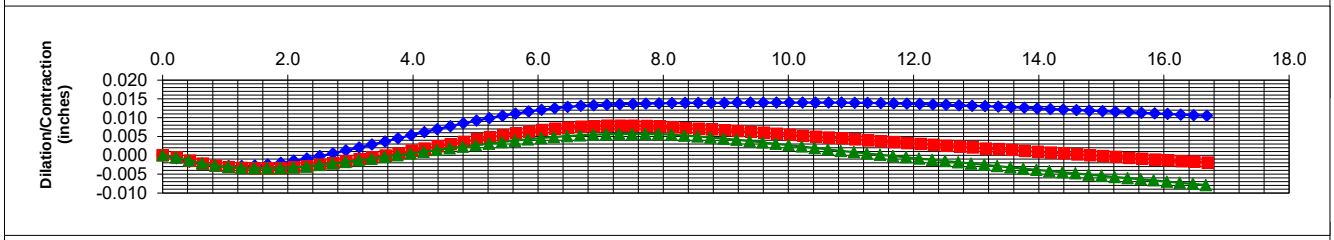
Project Name:	SR 522	**Project Number:**	2021-133 BT306
Sample Point:	BH-31 **Sample No.:** S-9c	**Sample Depth:**	41.0-41.5
Soil Description:	Olive, poorly graded SAND with silt		
Soil Color:	Olive	Average Strain Rate:	0.6 % per min.
Soil Group Symbol:	SP-SM	Soil Specific Gravity:	2.65 (assumed)

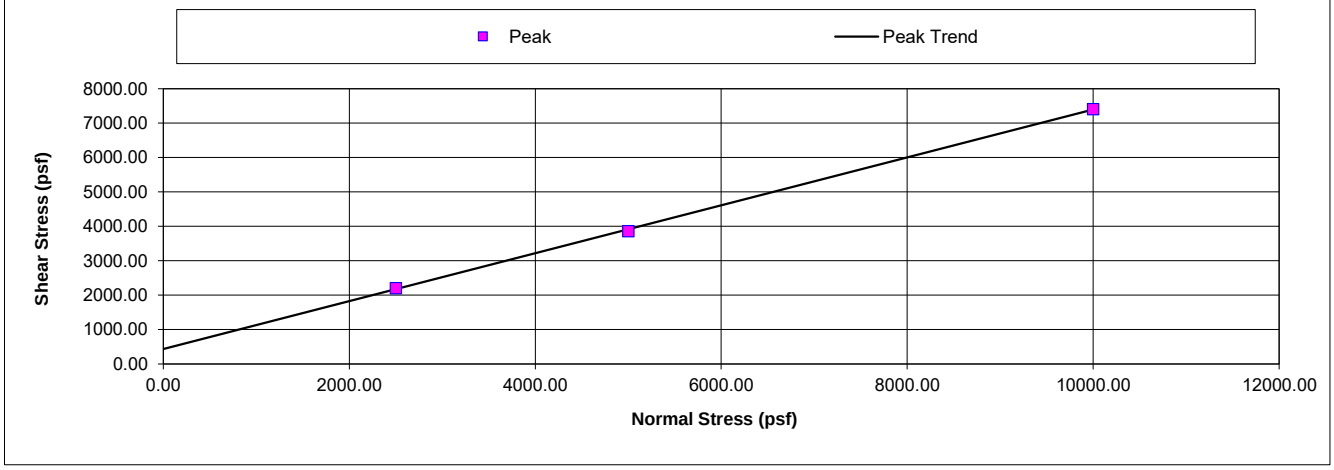
Normal Stress (psf)	2500.00	5000.00	10000.00	**Average**
Peak Stress (psf)	2209.44	3865.28	7413.64	
Initial Moisture Content (%):	22.1	22.1	22.1	22.1
Wet Unit Weight (pcf):	130.5	130.1	129.7	130.1
Dry Unit Weight (pcf):	106.9	106.6	106.2	106.6
Calculated Void Ratio	0.547	0.551	0.556	0.552
Calculated Porosity	0.354	0.355	0.357	0.356
Calculated Saturation (%)	107.0	106.2	105.3	106.2
Final Moisture Content (%)	23.9	24.2	24.6	24.2

Indicated Strength Parameters

	Cohesion psf	phi Angle (degrees)
Peak	435.3	34.8







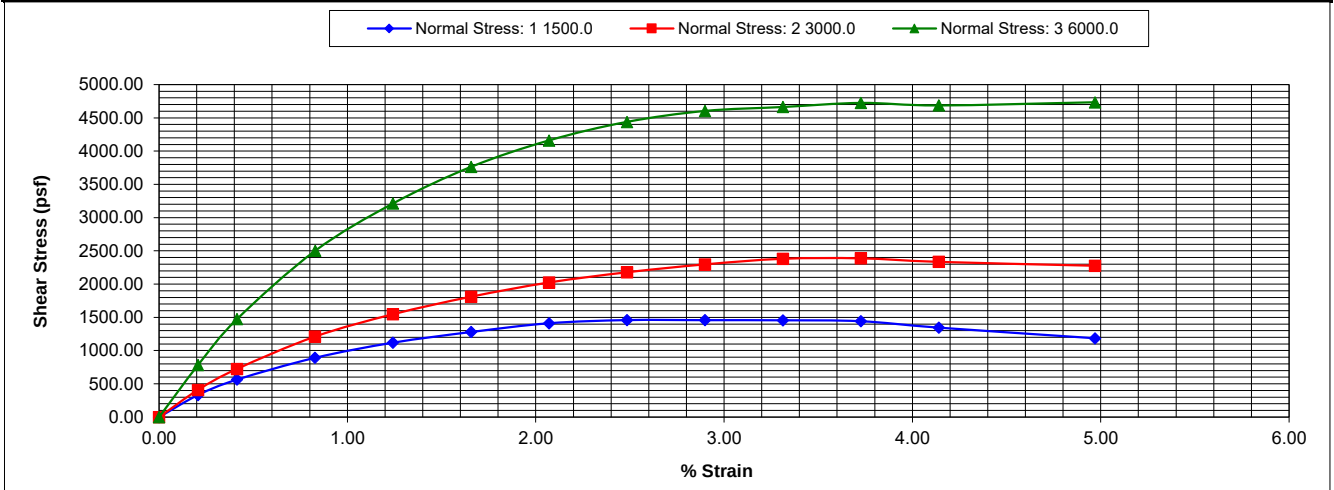
Checked By: _____ Figure 6

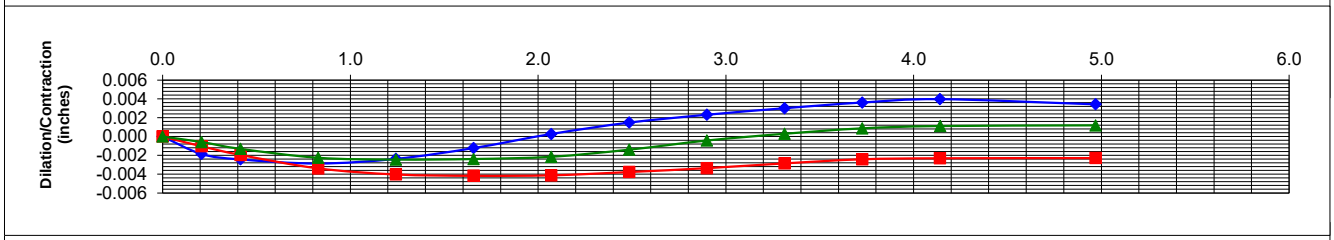
HWA GeoSciences Inc. Materials Testing Laboratory

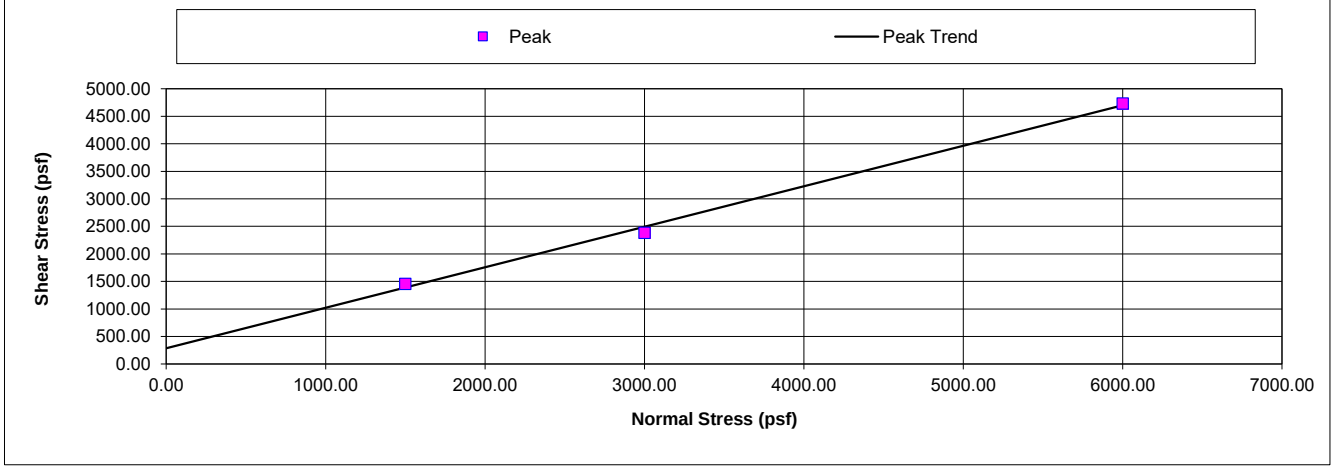
Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D 3080)

Project Name:	SR 522 BRT			**Project Number:**	2021-133
Sample Point:	BH-49	**Sample No.:**	S-14 a/b	**Sample Depth:**	50.0'-51.0'
Soil Description:	Gray, poorly graded SAND				
Soil Color:	Gray			Average Strain Rate:	0.1 % per min.
Soil Group Symbol:	SP			Soil Specific Gravity:	2.65 (assumed)

					Indicated Strength Parameters		
Normal Stress (psf)	1500.00	3000.00	6000.00	**Average**			
Peak Stress (psf)	1458.80	2387.08	4734.33			Cohesion psf	phi Angle (degrees)
Initial Moisture Content (%):	32.7	32.7	32.7	32.7			
Wet Unit Weight (pcf):	117.6	116.5	120.3	118.1			
Dry Unit Weight (pcf):	88.6	87.8	90.6	89.0	Peak	285.2	36.3
Calculated Void Ratio	0.866	0.884	0.825	0.858			
Calculated Porosity	0.464	0.469	0.452	0.462			
Calculated Saturation (%)	100.1	98.0	105.1	101.1			
Final Moisture Content (%)	35.3	35.2	31.9	34.2			







Checked By: SEG Figure 1

HWA GeoSciences Inc. Materials Testing Laboratory

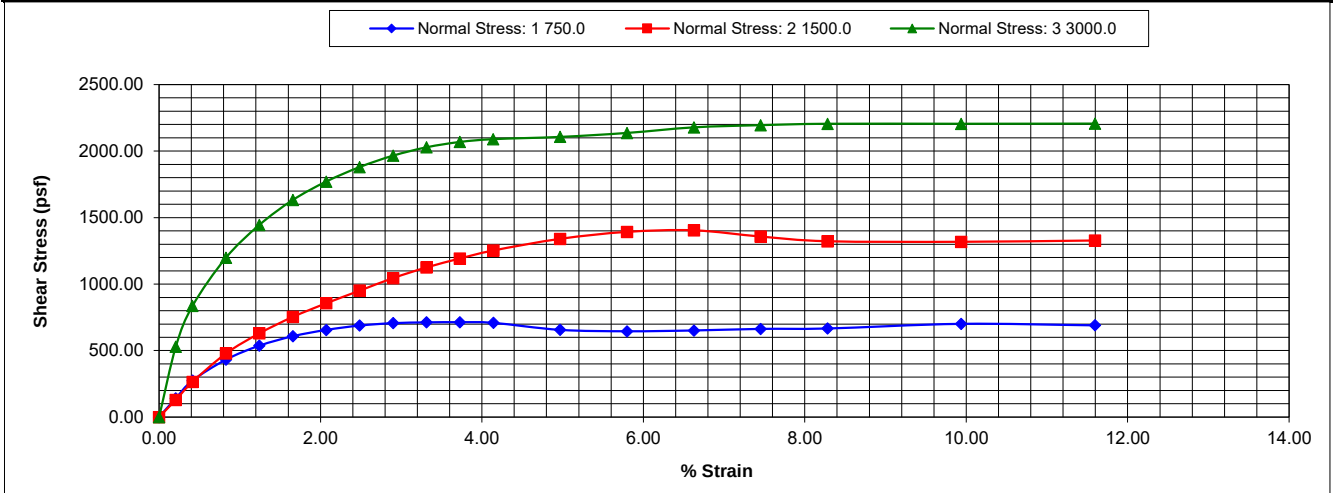
Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D 3080)

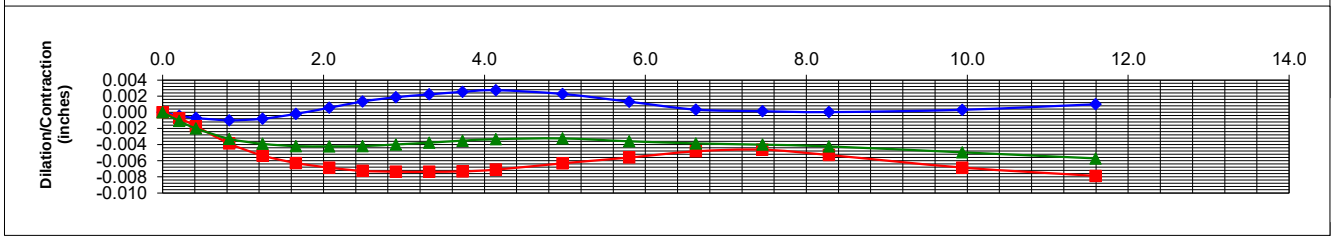
Project Name:	SR 522 BRT	**Project Number:**	2021-133
Sample Point:	BH-57 **Sample No.:** S-4b	**Sample Depth:**	10.5'
Soil Description:	Olive-brown, sandy, lean CLAY with gravel		
Soil Color:	Olive-brown	Average Strain Rate:	0.4 % per min.
Soil Group Symbol:	CL	Soil Specific Gravity:	2.65 (assumed)

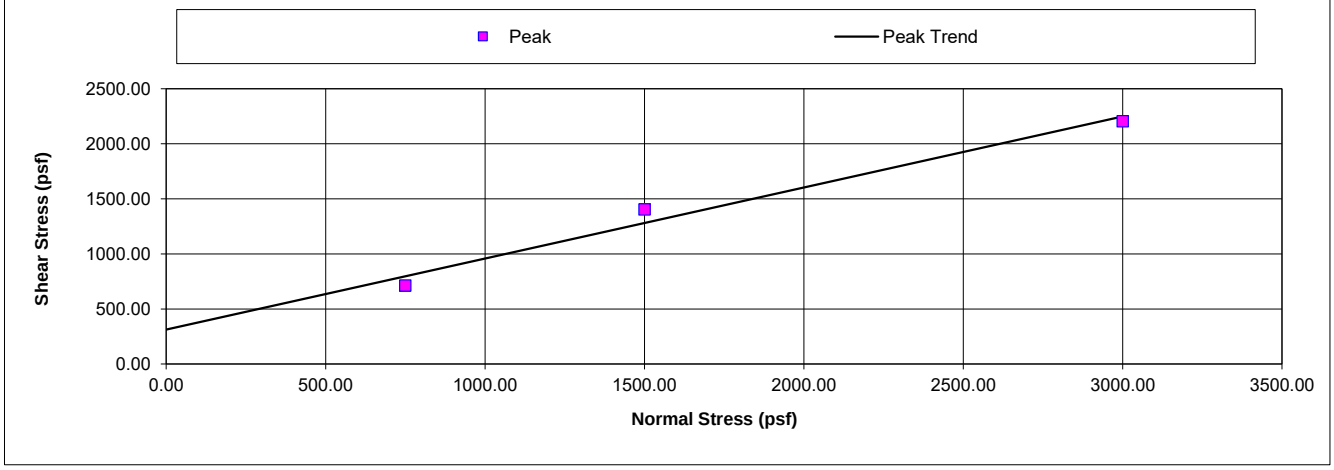
Normal Stress (psf)	750.00	1500.00	3000.00	**Average**
Peak Stress (psf)	713.71	1404.27	2206.77	
Initial Moisture Content (%):	13.3	13.3	13.3	13.3
Wet Unit Weight (pcf):	127.9	127.7	131.5	129.0
Dry Unit Weight (pcf):	112.9	112.7	116.0	113.9
Calculated Void Ratio	0.465	0.467	0.425	0.452
Calculated Porosity	0.317	0.318	0.298	0.311
Calculated Saturation (%)	75.9	75.5	83.0	78.1
Final Moisture Content (%)	19.5	20.5	17.0	19.0

Indicated Strength Parameters

	Cohesion psf	phi Angle (degrees)
Peak	312.5	32.8







Checked By: SEG Figure 2

Appendix C

HAMMER EFFICIENCY TEST RESULTS

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

January 26, 2024

Mr. Jon Root
Holocene Drilling
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Track Mounted Rig No. 129, Diedrich D-70, 140lb Auto Hammer
Bore Hole: Yard Test Hole, December 29, 2023
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 23F49

Mr. Root:

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On December 29, 2023, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a track mounted D-70 unit manufactured by Diedrich Drill and referred to as Rig No. 129 by the operator. The D-70 unit drilled to five depth intervals ranging from 10 to 29 ft below ground surface and SPT tests were completed through hollow-stem augers at each depth. The rod used to advance the spoon at

each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

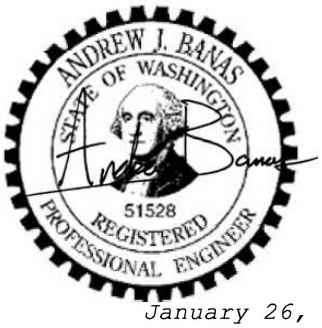
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
10 ft	15/1ft	14	247	71	49
15 ft	50/5in	50	244	70	45
20 ft	50/5in	50	236	67	43
25 ft	50/4in	45	252	72	48
29 ft	50/2in	50	249	71	52
Average for Split Spoon Samples:			**246**	**70**	**47**

Five sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 70 percent and 47 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



January 26, 2024

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

August 9, 2018

Mr. Jon Root
Holocene Drilling, Inc.
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Track Mounted Rig No. 26, Diedrich D50, 140lb Auto Hammer
Bore Hole: Yard Test Hole, July 2, 2018
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 18F25

Dear Mr. Root

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D 4633-16 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On July 2, 2018, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a track mounted D-50 unit manufactured by Diedrich Drill and referred to as Rig No. 26 by the operator. The D-50 unit drilled to four depth intervals ranging from 20 to 40 ft below ground surface and SPT tests were completed through hollow-stem augers at each depth. The rod used to advance the spoon at

each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

Due to the relatively high penetration resistances experienced during energy measurements with this rig, a higher degree of uncertainty is associated with the acceleration records than is commonly expected. Data review indicated select depth intervals required our analysis consider the records of only one accelerometer rather than the customary approach of averaging records from both accelerometers.

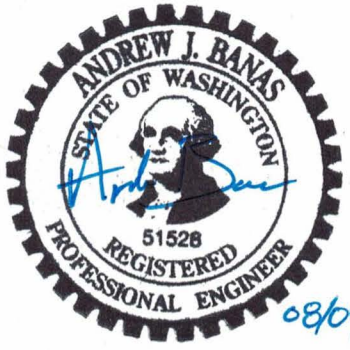
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
20 ft	50/1 in	47	295	84	50
25 ft	37/1 in	34	319	91	50
30 ft	15/3 in	15	314	90	49
40 ft	28/3 in	27	317	91	49
Average for Split Spoon Samples:			**311**	**89**	**50**

Four sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 89 percent and 50 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling, Inc. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



08/09/2018

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

November 19, 2020

Mr. Jon Root
Holocene Drilling, Inc.
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Track Mounted Rig No. 107, Diedrich D-50, 140lb Auto Hammer
Bore Hole: Yard Test Hole, June 30, 2020
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 20F29

Dear Mr. Root

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On June 30, 2020, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a track mounted D-50 unit manufactured by Diedrich Drill and referred to as Rig No. 107 by the operator. The D-50 unit drilled to five depth intervals ranging from 15 to 35 ft below ground surface and SPT tests were completed through hollow-stem augers at each depth. The rod used to advance the spoon at

each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
15 ft	30/1 ft	29	330	94.2	41
20 ft	30/3 in	28	330	94.2	49
25 ft	33/7 in	28	343	98.1	49
30 ft	28/3 in	23	344	98.2	49
35 ft	35/9 in	29	337	96.2	48
Average for Split Spoon Samples:			**337**	**96**	**47**

Five sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 96 percent and 47 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling, Inc. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,

11/19/2020

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

January 26, 2024

Mr. Jon Root
Holocene Drilling
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Track Mounted Rig No. 124, Diedrich D-70, 140lb Auto Hammer
Bore Hole: Yard Test Hole, December 29, 2023
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 23F49

Mr. Root:

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On December 29, 2023, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a track mounted D-70 unit manufactured by Diedrich Drill and referred to as Rig No. 124 by the operator. The D-70 unit drilled to seven depth intervals ranging from 10 to 40 ft below ground surface and SPT tests were completed through hollow-stem augers at each depth. The rod used to advance the spoon

at each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

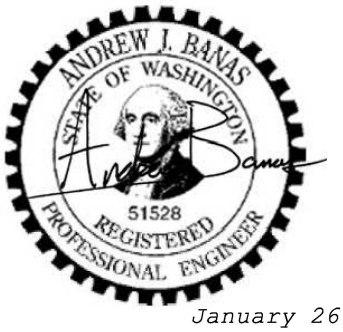
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
10 ft	33/1ft	32	324	93	43
15 ft	50/3in	45	314	90	47
20 ft	50/4in	48	303	87	44
25 ft	50/5in	50	314	90	43
30 ft	50/5in	50	313	90	46
35 ft	50/6in	50	326	93	43
40 ft	51/1in	51	317	91	42
Average for Split Spoon Samples:			**316**	**90**	**44**

Seven sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 90 percent and 44 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



January 26, 2024

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

January 26, 2024

Mr. Jon Root
Holocene Drilling
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Truck Mounted Rig No. 92, Foremost Mobile B-58, 140lb Auto Hammer
Bore Hole: Yard Test Hole, December 29, 2023
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 23F49

Dear Mr. Root

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\ v(t)\ dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On December 29, 2023, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a truck mounted B-58 unit manufactured by Foremost Mobile and referred to as Rig No. 92 by the operator (Washington Licence Plate No. C93096E). The B-58 unit drilled to eight depth intervals ranging from 10 to 45 ft below ground surface and SPT tests were completed through hollow-stem augers at each depth. The rod used to advance the spoon at each sample depth had a diameter matching that

of NW rod. The automatic hammer in use during our testing was manufactured by Foremost Mobile and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

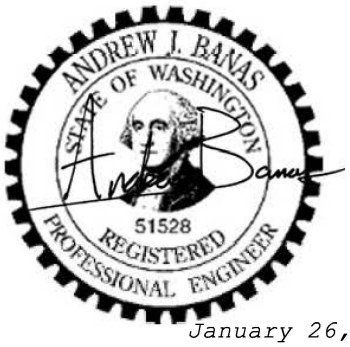
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
10 ft	50/6in	49	318	91	27
15 ft	50/6in	49	320	91	32
20 ft	78/7in	78	326	93	27
25 ft	50/5in	47	340	97	30
30 ft	50/4in	50	338	96	33
35 ft	50/3in	49	341	97	33
40 ft	50/2in	48	343	98	29
45 ft	50/5in	49	333	95	32
Average for Split Spoon Samples:			**332**	**95**	**30**

Eight sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 95 percent and 30 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Foremost Mobile auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



January 26, 2024

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

November 19, 2020

Mr. Jon Root
Holocene Drilling, Inc.
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Truck Mounted Rig No. 96, Diedrich D-90, 140lb Auto Hammer
Bore Hole: Yard Test Hole, June 30, 2020
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 20F29

Dear Mr. Root

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On June 30, 2020, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a truck mounted D-90 unit manufactured by Diedrich Drill and referred to as Rig No. 96 by the operator (Washington Licence Plate No. C39729K). The D-90 unit drilled to five depth intervals ranging from 15 to 35 ft below ground surface and SPT tests were completed through hollow-stem augers at each

depth. The rod used to advance the spoon at each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

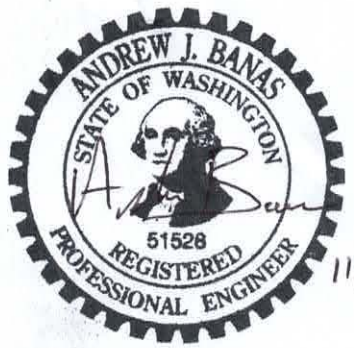
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
15 ft	28/1 ft	28	299	85.4	39
20 ft	22/1 in	21	296	84.6	42
25 ft	32/6 in	31	302	86.2	44
30 ft	30/5 in	29	322	92.0	44
35 ft	24/3 in	26	303	86.4	40
Average for Split Spoon Samples:			**304**	**87**	**42**

Five sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 87 percent and 43 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling, Inc. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



11/19/2020

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Robert Miner Dynamic Testing, Inc.
Dynamic Measurements and Analyses for Deep Foundations

November 19, 2020

Mr. Jon Root
Holocene Drilling, Inc.
11412 62nd Ave E
Puyallup, WA 98373

Re: Penetration Test Energy Measurements
Truck Mounted Rig No. 113, Diedrich D-120, 140lb Auto Hammer
Bore Hole: Yard Test Hole, June 30, 2020
Holocene Drilling Yard, Puyallup, Washington

RMDT Job No. 20F29

Dear Mr. Root

This letter presents energy transfer measurements made during Standard Penetration Tests for the drill hole and drill rig referenced above. Robert Miner Dynamic Testing, Inc. (RMDT) made dynamic measurements with a Pile Driving Analyzer® as a hammer advanced the NW rod during sampling with a split spoon sampler.

The purpose of RMDT's testing was the measurement of energy transferred to the drill rods. Measurements were made on a section of NW gauge rod at the top of the drill string. Strain gages and accelerometers on the rod were connected to a Pile Driving Analyzer® (PDA) which generally processed acceleration and strain measurements from each hammer blow and stored both the measurements and computed results. Measurements and data processing generally followed the ASTM D4633 standard. Energy transfer past the gage location, EFV, was computed by the PDA using force and velocity records as follows:

$$EFV = \int_a^b F(t)\, v(t)\, dt$$

The value "a" corresponds to the start of the record which is when the energy transfer begins and *"b"* is the time at which energy transferred to the rod reaches a maximum value. Appendix A contains more information on our measurement equipment and methods of analysis. The EFV energy calculation is identical to the EMX energy result discussed in Appendix A. The EFV and EMX values apply to the sensor location near the top of the rod.

TEST DETAILS

On June 30, 2020, a boring was advanced near the maintenance yard of Holocene Drilling in Puyallup, Washington. The drill rig used during sampling was a truck mounted D-120 unit manufactured by Diedrich Drill and referred to as Rig No. 113 by the operator (Washington Licence Plate No. C60862N). The D-120 unit drilled to five depth intervals ranging from 15 to 40 ft below ground surface and SPT tests were completed through hollow-stem augers at each

depth. The rod used to advance the spoon at each sample depth had a diameter matching that of NW rod. The automatic hammer in use during our testing was manufactured by Diedrich Drill and appeared to use a chain drive powered by a hydraulic motor, with the ram and chain drive enclosed within an outer casing.

RESULTS

A summary of testing and monitoring results is given in Table 1. The tabulated results include the starting sample depth, the penetration resistance, the number of hammers blows in our data set, measured energy transfer, EFV, the computed transfer efficiency, ETR, and the hammer blow rate, BPM. Appendix B contains detailed numeric results for each individual test.

Energy measurements must be divided by the theoretical free fall energy of the hammer to obtain an efficiency. A 140 lb ram raised 30 inches above an impact surface has 350 lb-ft of potential energy. Thus, the transfer energy results for sampling with the 140 lb ram may be divided by 350 lb-ft to yield the ratio of the delivered energy to the nominal potential energy. This efficiency ratio, ETR, is given for each sample interval as a percent efficiency.

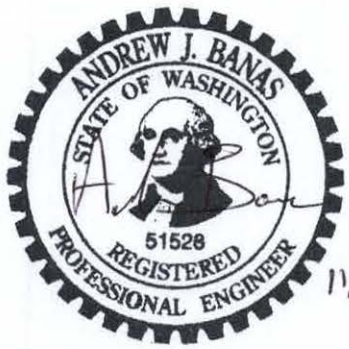
Table 1. Summary of Test Details and Results for the 140-lb ram and Split Spoon Sampler

Sample Starting Depth	Penetration Resistance (Blow/Set)	Number of Blows in Data Set	Average Transfer Energy EFV (lb-ft)	Average Transfer Efficiency ETR (percent)	Average Hammer Blow Rate BPM (blow/min)
15 ft	22/6 in	21	300	85.8	40
20 ft	15/1ft	14	307	87.8	38
25 ft	22/3 in	21	316	90.4	39
30 ft	23/2 in	22	316	90.4	38
40 ft	30/2 in	29	323	92.2	38
Average for Split Spoon Samples:			**312**	**89**	**39**

Five sample returns were monitored while the 140 lb ram and standard split spoon sampler were in use. The overall average ETR and hammer blow rate was 89 percent and 39 blows per minute, respectively. In our opinion, these overall average energy measurement values are consistent with our expectations for Diedrich auto hammers operating in similar conditions.

It was a pleasure to assist you and to participate on this project with the staff of Holocene Drilling, Inc. Please do not hesitate to contact us if you or other project participants have any questions about this report.

Sincerely,



11/19/2020

Andrew J. Banas, P.E.

Robert Miner Dynamic Testing, Inc.

Acker Drill Company
P.O. Box 830
Scranton, PA 18501 USA
P: (800) 752-2537 ext. 106
E: mdicindio@ackerdrill.com

May 10, 2023

Geologic Drill Partners
36702 SE 34th St.
Fall City, WA 98024

Ref: Acker Automatic SPT Hammer

Dear Mr. Gibson:

The Acker Automatic SPT Hammer conforms to the standards set forth in Section 5.4, "Drive-Weight Assembly" of ASTM Standard D1586-08a, 2009, "Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils," ASTM International, West Conshohocken, PA, 2009, www.astm.org.

To summarize the above ASTM specifications quoted on the manufacturing and parts used in the 140 lb. Acker Automatic SPT Hammer is as follows. The 140 lb weight is manufactured within the tolerances' set forth in the ASTM Standards. The thirty inch (30") drop that is required is met with the use of a chain drive and an automatic drop mechanism on the drive weight. The required drop can be recognized in the site window machined through the body of the hammer. There is also a machined line around the outside of the body that is highlighted with paint for easy viewing. Thus, the weight can be seen reaching the required thirty inch (30") drop and when automatically released. With all of these requirements being met, our hammer conforms to the ASTM Standards' for the Automatic SPT Hammer.

Along with the description above stating the standards we meet in the manufacturing of our Automatic hammer. We also follow a testing/setting protocol on all installed hammers on our rigs. It is as follows:

1.) The auto hammer is set at an estimated 52 Beats Per Minute at a 30-inch drop at the machined line in the window (as stated in above standards). That is the optimum efficiency with the 140 lb. weight at the 30" drop for the SPT testing. It has been our experience that after our factory setting; when calibrated our hammers are running in the 90% efficiency after being set at above.

acker
DRILL COMPANY

2.) The potential energy produce from the auto hammer is as follows:

A.) 140 lb., weight dropped from 30" has the potential energy producing value of 474.53 Joules or 350-foot pounds (both the same/different values). That would be the energy numbers at 100% efficiency. The full potential of Energy.

As stated above it is not reality to think with all the variables any hammer is going to run at 100%.

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

Sincerely,

Michael D. DiCindio

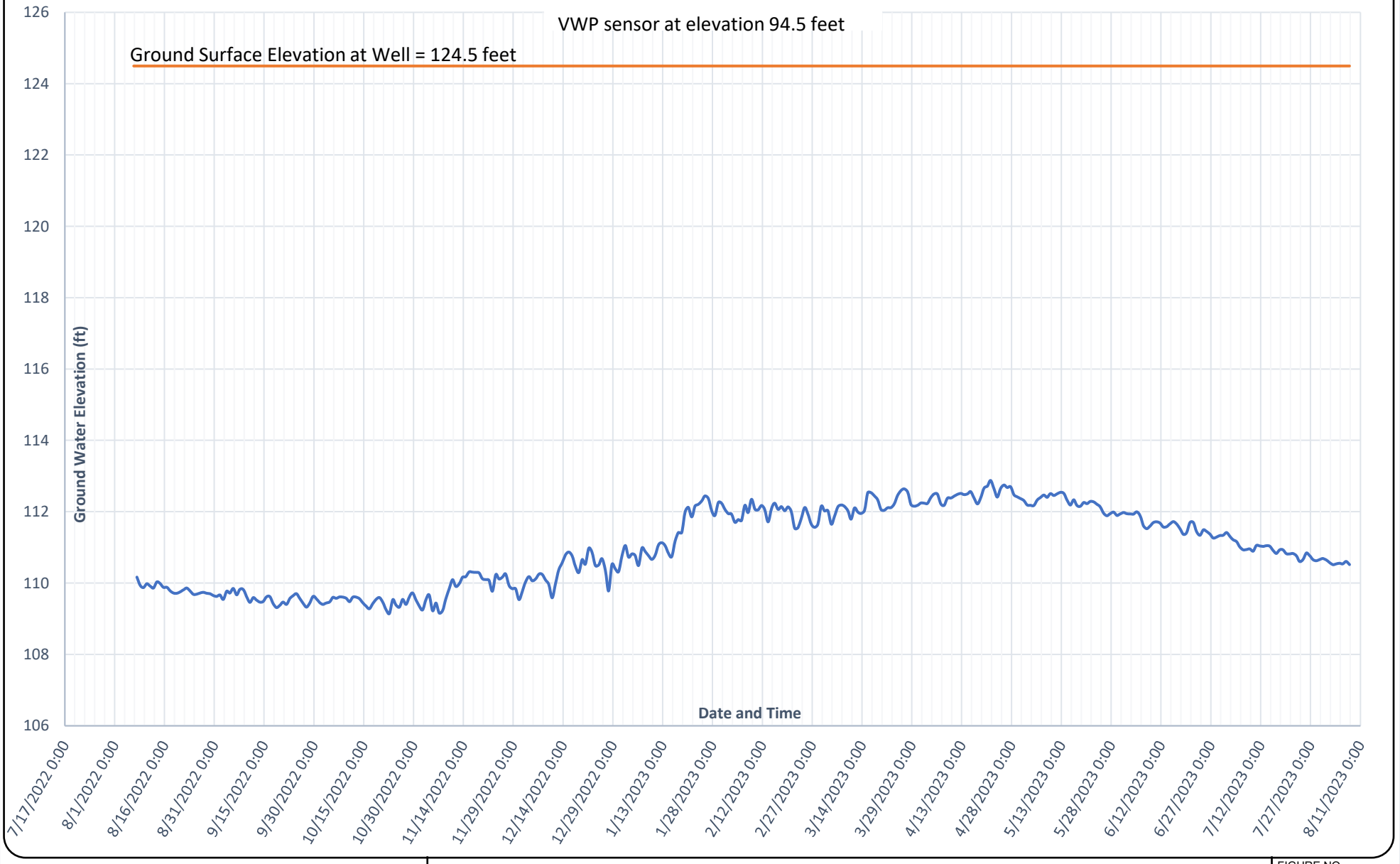
Michael D. DiCindio, Vice President
Acker Drill Company

P.O. Box 830, Scranton. PA 18501 USA
Phone: 570-586-2061 Fax: 570-586-2659
Toll Free: 800-752-2537

Appendix D

GROUNDWATER MONITORING DATA

BH-46W VWP Ground Water Elevation



HWA GeoSciences Inc.

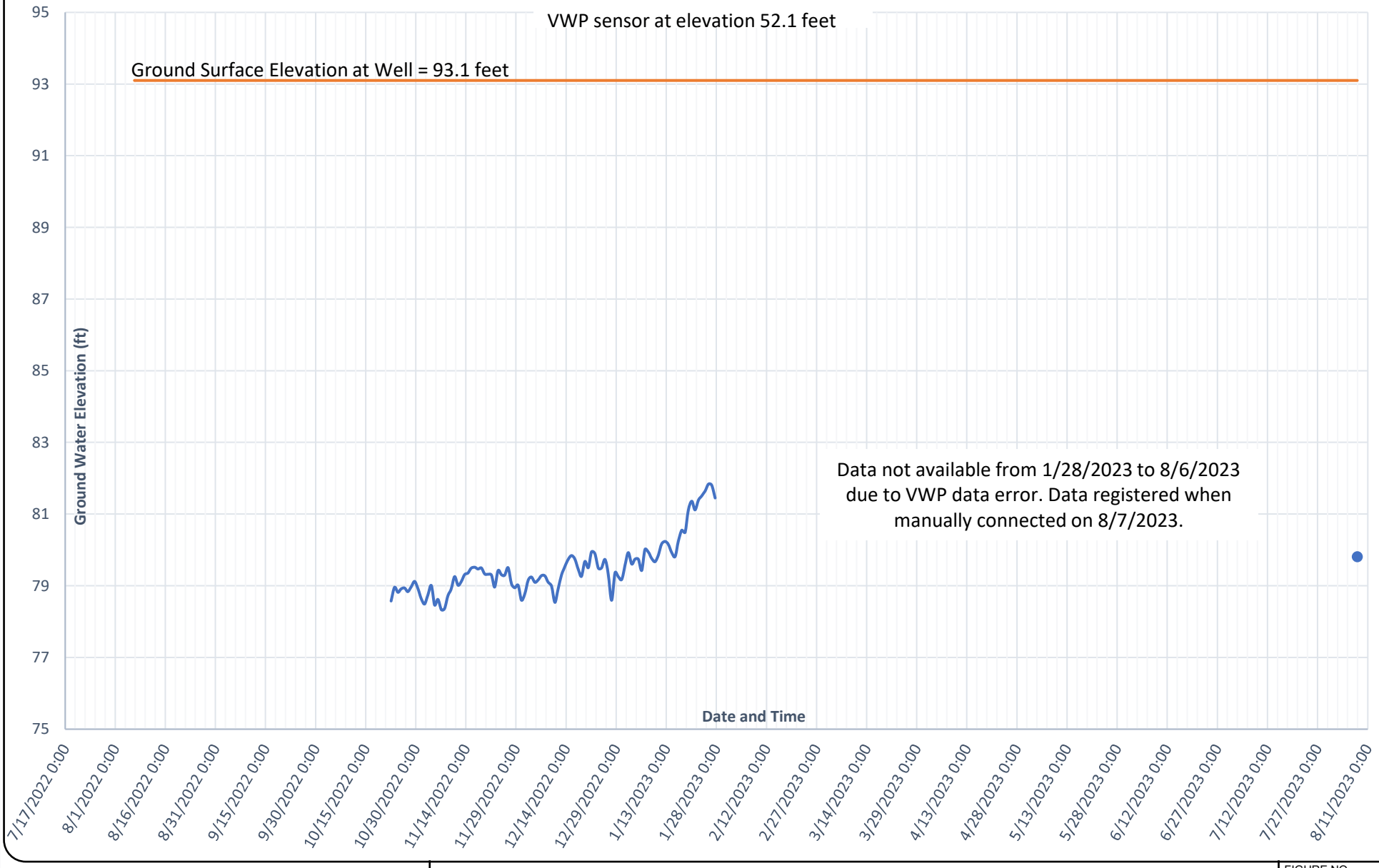
BH-46W WATER LEVEL DATA

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.
D-1

PROJECT NO.
2021-133-21

BH-55W VWP Ground Water Elevation



HWA GeoSciences Inc.

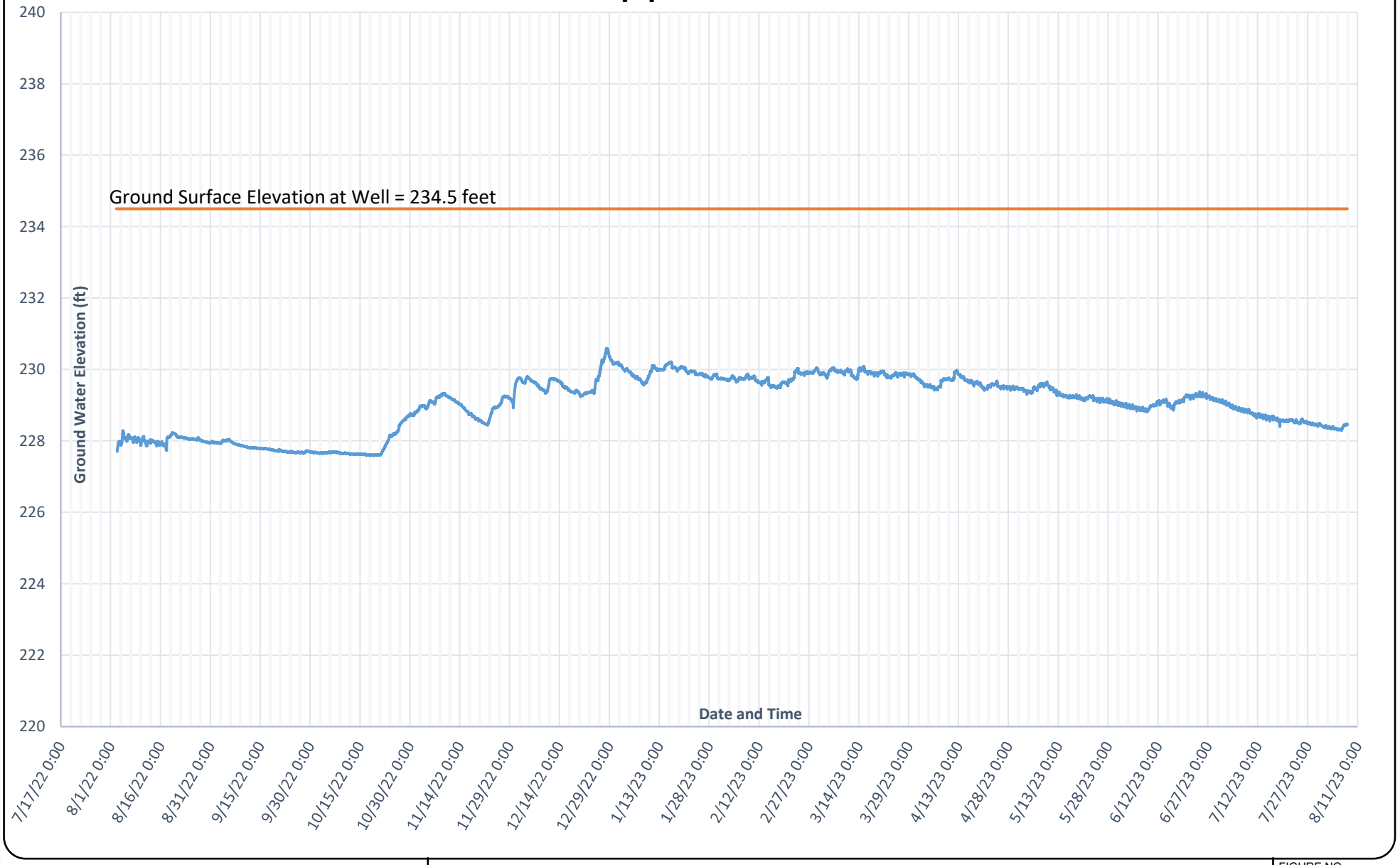
BH-55W WATER LEVEL DATA

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.
D-2

PROJECT NO.
2021-133-21

BH-81W Standpipe Ground Water Elevation



HWA GeoSciences Inc.

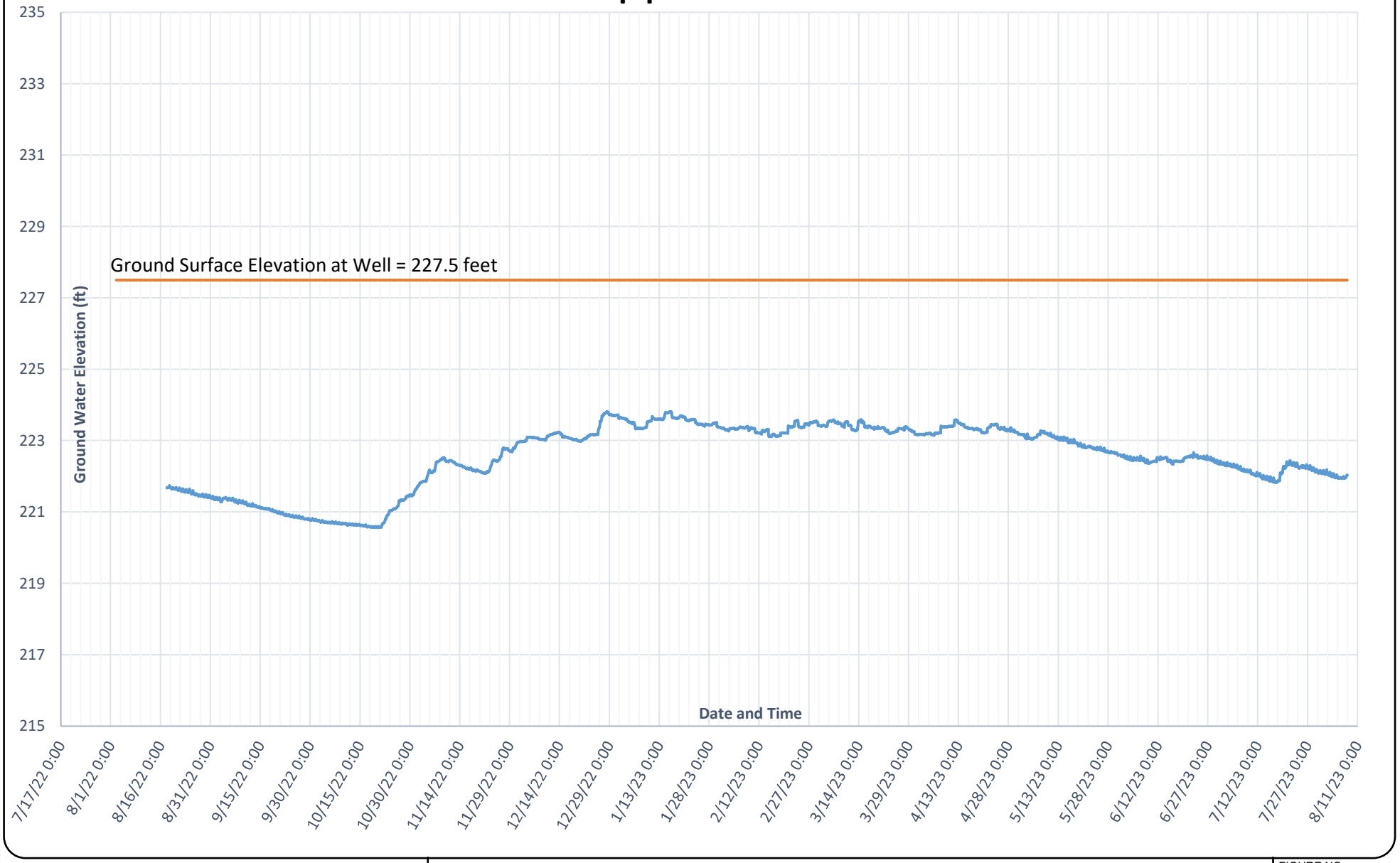
BH-81W WATER LEVEL DATA

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.
D-3

PROJECT NO.
2021-133-21

BH-83W Standpipe Ground Water Elevation



HWA GeoSciences Inc.

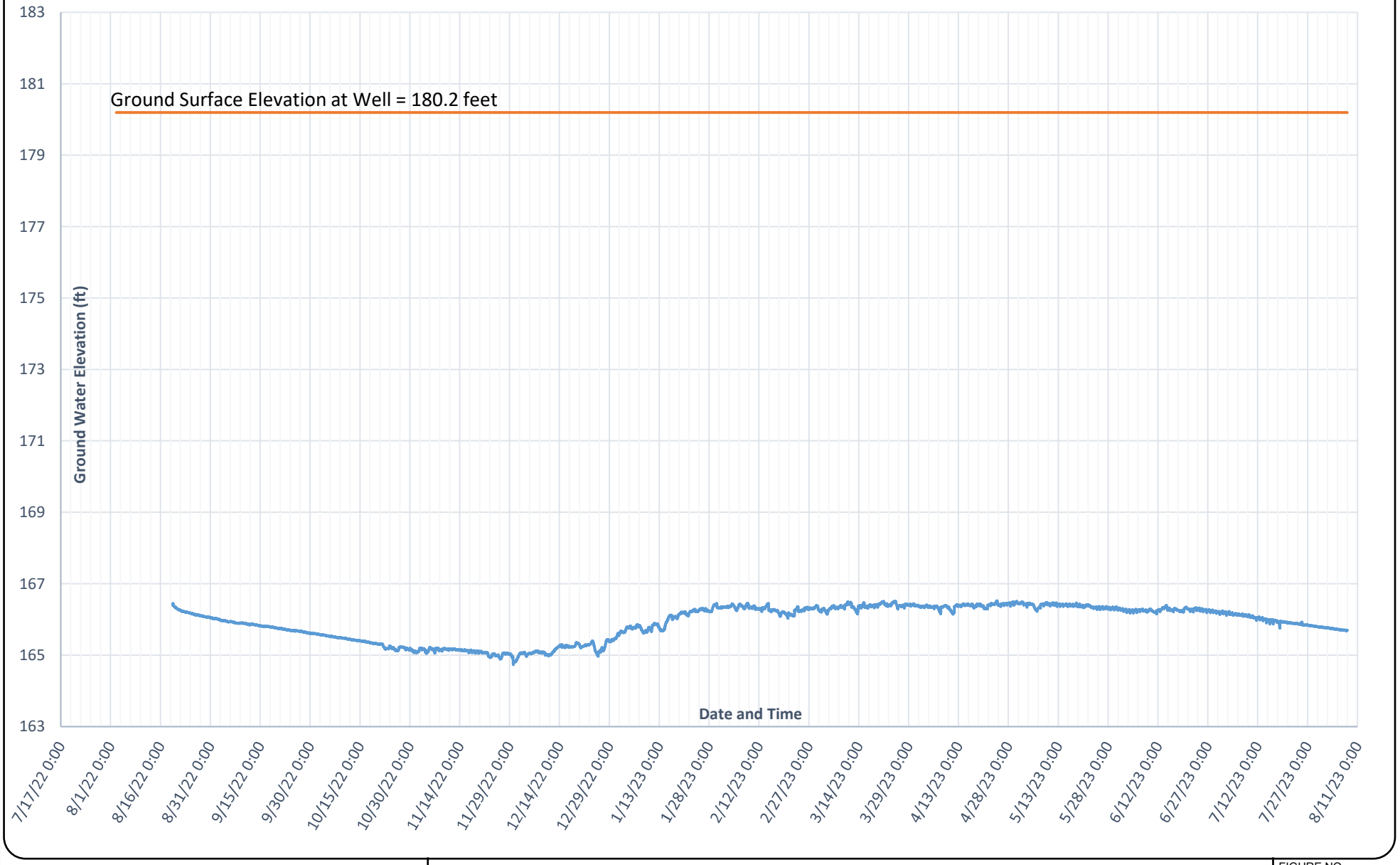
BH-83W WATER LEVEL DATA

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.
D-4

PROJECT NO.
2021-133-21

BH-85W Standpipe Ground Water Elevation



HWA GeoSciences Inc.

BH-85W WATER LEVEL DATA

STRIDE BUS RAPID TRANSIT
BT306 - LAKE FOREST PARK
SR 522 (BOTHELL WAY NE) ROADWAY & STATIONS

FIGURE NO.
D-5

PROJECT NO.
2021-133-21

Appendix E

PREVIOUS INVESTIGATIONS

Lake Forest Park

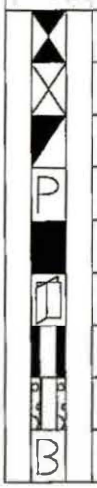
Company	Year	Boring Designation	Depth of Exploration (bgs)	Depth to Water (bgs)
WSDOT	2006	H-1-05	41.5	40
		H-2-05	41.5	40
		H-3-05	31.5	18
		H-4-05	36.0	17.5
S/B H-5-06?		H-5-05	76.0	23.5
		PP-1-05	9.5	Not Observed
		PP-2-05	8.5	Not Observed
		PP-3-05	8.5	Not Observed
		PP-4-05	8.5	Not Observed
		PP-5-05	10.5	Not Observed
HWA GeoSciences, Inc.	2021	BH-1	91.5	Not Observed
		BH-2	100.5	Not Observed
		BH-3	41.5	7
		BH-3b	21.5	20
		BH-4	41.5	25
		BH-5	101.5	10
		BH-6	51.5	Not Observed
		BH-8	76.0	-2
		HH-1	10	Not Observed
		HH-2	9.7	Not Observed
Earth Analysis	1985	SL-1	9.7	Not Observed
		SL-2	7.0	Not Observed
`		SL-3	8.0	Not Observed
		SL-4	7.5	Not Observed
		SL-5	10.0	Not Observed
Nelson-Couvrette and Associates, Inc.	1997	HA-1	4.7	Not Observed
		HA-2	2.5	Not Observed
		HA-3	7.0	Not Observed
		HA-4	8.0	Not Observed
GeoEngineers, Inc.	1993	B-4	54.0	7.4
Wasatch Environmental, Inc.	2001	DDC1	25.0	3.0
		DDC2	25.0	3.0
		DDC3	25.0	3.0
		DDC4	25.0	3.0
		DDC5	25.0	4.5
		DDC6	25.0	4.5
		DDC7	25.5	5.0

Company	Year	Boring Designation	Depth of Exploration (bgs)	Depth to Water (bgs)
ZZA-Terracon	2008	B-1	61.5	8.0
		B-2	36.5	7.0

Washington State Department of Transportation

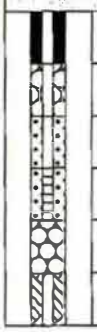
Test Boring Legend

Sampler Symbols



Standard Penetration Test
Oversized Penetration Test (Dames & Moore, California)
Shelby Tube
Piston Sample
Washington Undisturbed
Vane Shear Test
Core
Becker Hammer
Bag Sample

Well Symbols



Cement Surface Seal
Piezometer Pipe in Granular Bentonite Seal
Piezometer Pipe in Sand
Well Screen in Sand
Granular Bentonite Bottom Seal
Inclinometer Casing in Concrete Bentonite Grout

Laboratory Testing Codes

UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
UC	Unconfined Compression Test
DS	Direct Shear Test
CN	Consolidation Test
GS	Grain Size Distribution
MC	Moisture Content
SG	Specific Gravity
OR	Organic Content
DN	Density
AL	Atterberg Limits
PT	Point Load Compressive Test
SL	Slake Test
DG	Degradation
LA	LA Abrasion
HT	Hydrometer Test

Soil Density Modifiers

Gravel, Sand & Non-plastic Silt		Elastic Silts and Clay	
SPT Blows/ft	Density	SPT Blows/ft	Consistency
0-4	Very Loose	0-1	Very Soft
5-10	Loose	2-4	Soft
11-24	Medium Dense	5-8	Medium Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

Angularity of Gravel & Cobbles

Angular	Coarse particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Coarse grained particles are similar to angular but have rounded edges.
Subrounded	Coarse grained particles have nearly plane sides but have well rounded corners and edges.
Rounded	Coarse grained particles have smoothly curved sides and no edges.

Soil Moisture Modifiers

Dry	Absence of moisture; dusty, dry to touch
Moist	Damp but no visible water
Wet	Visible free water

Soil Structure

Stratified	Alternating layers of varying material or color at least 6mm thick; note thickness and inclination.
Laminated	Alternating layers of varying material or color less than 6mm thick; note thickness and inclination.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, somtimes striated.
Blocky	Cohesive soil that can be broken down into smaller angular lumps which resist further breakdown.
Disrupted	Soil structure is broken and mixed. Infers that material has moved substantially - landslide debris.
Homogeneous	Same color and appearance throughout.

HCL Reaction

No HCL Reaction	No visible reaction.
Weak HCL Reaction	Some reaction with bubbles forming slowly.
Strong HCL Reaction	Violent reaction with bubbles forming imediately.

Degree of Vesicularity of Pyroclastic Rocks

Slightly Vesicular	5 to 10 percent of total
Moderately Vesicular	10 to 25 percent of total
Highly Vesicular	25 to 50 percent of total
Scoriaceous	Greater than 50 percent of total

Washington State Department of Transportation

Test Boring Legend

Grain Size

Fine Grained	< 1mm	Few crystal boundaries/grains are distinguishable in the field or with hand lens.
Medium Grained	1mm to 5mm	Most crystal boundaries/grains are distinguishable with the aid of a hand lens.
Coarse Grained	> 5mm	Most crystal boundaries/grains are distinguishable with the naked eye.

Weathered State

Term	Description	Grade
Fresh	No visible sign of rock material weathering; perhaps slight discoloration in major discontinuity surfaces.	I
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than its fresh condition.	II
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a continuous framework or as core stones.	III
Highly Weathered	More than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as discontinuous framework or as core stone.	IV
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.	V
Residual Soil	All rock material is converted to soil. The mass structure and material fabric is destroyed. There is a large change in volume, but the soil has not been significantly transported.	VI

Relative Rock Strength

Grade	Description	Field Identification	Uniaxial Compressive Strength approx
R1	Very Weak	Specimen crumbles under sharp blow from point of geological hammer, and can be cut with a pocket knife.	150-3500 psi
R2	Moderately Weak	Shallow cuts or scrapes can be made in a specimen with a pocket knife. Geological hammer point indents deeply with firm blow.	3500-7500 psi
R3	Moderately Strong	Specimen cannot be scraped or cut with a pocket knife, shallow indentation can be made under firm blows from a hammer.	7500-15000 psi
R4	Strong	Specimen breaks with one firm blow from the hammer end of a geological hammer.	15000-30000 psi
R5	Very Strong	Specimen requires many blows of a geological hammer to break intact sample.	Greater than 30000 psi

Discontinuities

Spacing

Very Widely	Greater than 3 m
Widely	1 m to 3 m
Moderately	0.3 m to 1 m
Closely	50 mm to 300 mm
Very Closely	Less than 50 mm

RQD (%)

$$\frac{100(\text{length of core in pieces} > 100\text{mm})}{\text{Length of core run}}$$

Condition

Excellent	Very rough surfaces, no separation, hard discontinuity wall
Good	Slightly rough surfaces, separation less than 1 mm, hard discontinuity wall.
Fair	Slightly rough surfaces, separation greater than 1 mm, soft discontinuity wall.
Poor	Slickensided surfaces, or soft gouge less than 5 mm thick, or open discontinuities 1 to 5 mm.
Very Poor	Soft gouge greater than 5 mm thick, or open discontinuities greater than 5 mm.

Fracture Frequency (FF) is the average number of fractures per 300 mm of core.
Does not include mechanical breaks caused by drilling or handling.

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01034

HOLE No. H-1-05

Job No. XL-2222 SR 522 Elevation 181.0 ft (55.2 m)

Sheet 1 of 2

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic#. 2637

Site Address

Inspector Brian M Breck

Start April 18, 2005 Completion April 18, 2005 Well ID#

Equipment CME 45 w/ autohammer

Station 193+70 Offset 46' Rt. Casing HQ x 42

Method Wet Rotary

Northing Easting Latitude Longitude

County King Subsection NW 1/4 of the NW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				1 2 2 (4)		D - 1		Poorly graded SAND with gravel, very loose, brown , moist, Homogeneous. Length Recovered 0.7 ft		
5	1			2 3 6 (9)		D - 2		Poorly graded SAND with gravel, loose, brown, wet, Homogeneous. Length Recovered 1.5 ft		
	2			5 6 10 (16)		D - 3		Silty SAND with gravel, medium dense, gray, moist, Homogeneous. Length Recovered 1.5 ft		
10	3			5 8 7 (15)		D - 4		Silty SAND with gravel, medium dense, gray, moist, Homogeneous. Length Recovered 1.5 ft		
	4									
15	5			2 3 3 (6)		D - 5		Well graded GRAVEL with sand, subangular, loose, gray, wet, Homogeneous. Length Recovered 0.2 ft		
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,9:10:12 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01034

HOLE No. H-1-05

Job No. XL-2222 SR 522 Elevation 181.0 ft (55.2 m)

Sheet 2 of 2

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic# 2637

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				2 3 5 (8)		D - 6		Silty SAND with gravel, loose, brown, moist, Homogeneous. Length Recovered 1.0 ft		
25	7			3 4 4 (8)		D - 7		Well graded SAND with gravel, loose, brown, wet, Homogeneous. Length Recovered 1.0 ft		
30	8 9			2 3 3 (6)		D - 8		Poorly graded SAND, loose, brown, moist, Homogeneous. Length Recovered 1.5 ft		
35	10 11			3 5 6 (11)		D - 9		Silty SAND with gravel, medium dense, gray, moist, Homogeneous. Length Recovered 1.1 ft		
40	12			3 5 6 (11)		D - 10		Silty SAND with gravel, medium dense, gray, wet, Homogeneous. Length Recovered 1.5 ft 04/18/2005	▽	
	13							End of test hole boring at 41.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
45										

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 9:10:12 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01034

HOLE No. H-2-05

Job No. XL-2222 SR 522 Elevation 183.0 ft (55.8 m)

Sheet 1 of 2

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic#. 2637

Site Address (Note: H-2-05 not listed anywhere else except Map PG)

Inspector Brian M Breck

Start April 19, 2005 Completion April 20, 2005 Well ID#

Equipment CME 45 w/ autohammer

Station 194+60 Offset 45' Rt. Casing HQ x 42 Method Wet Rotary

Northing Easting Latitude Longitude

County King Subsection NW 1/4 of the NW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				3 4 3 (7)		D - 1		Silty SAND with gravel, and some organics, loose, brown, moist, Homogeneous. Length Recovered 1.5 ft		
	1			1 2 3 (5)		D - 2		Sandy SILT with gravel, loose, brown, moist, Homogeneous. Length Recovered 0.7 ft		
5				2 2 2 (4)		D - 3		Silty SAND with gravel, very loose, brown, moist, Homogeneous. Length Recovered 1.5 ft		
	2			3 4 7 (11)		D - 4		Silty SAND with gravel, medium dense, gray, moist, Homogeneous. Length Recovered 1.5 ft		
10	3			4 7 5 (12)		D - 5		Silty SAND with gravel, medium dense, gray, moist, Homogeneous. Length Recovered 1.5 ft		
	4									
15				2 2 2 (4)		D - 6		Silty SAND with gravel, very loose, gray, moist, Homogeneous. Length Recovered 1.5 ft		
	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,9:10:16 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01034

Job No. XL-2222 SR 522 Elevation 183.0 ft (55.8 m)

HOLE No. H-2-05

Sheet 2 of 2

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic# 2637

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				3 4 5 (9)		D - 7		Silty SAND with gravel, loose, gray, moist, Homogeneous. Length Recovered 1.5 ft		
25	7			2 3 3 (6)		D - 8		Silty SAND with gravel, loose, gray, moist, Homogeneous. Length Recovered 1.5 ft		
30	9			2 4 3 (7)		D - 9		Silty SAND with gravel, loose, gray, moist, Homogeneous. Length Recovered 0.9 ft		
35	10			2 3 4 (7)		D - 10		Poorly graded SAND with gravel, loose, gray, moist, Homogeneous. Length Recovered 1.5 ft		
40	11 12			2 3 3 (6)		D - 11		Silty SAND with gravel, loose, grat, wet, Homogeneous. Length Recovered 0.9 ft 04/20/2005	▽	
	13							End of test hole boring at 41.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
45										

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,8:10:16 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE-01161

HOLE No. H-3-05 (On West side PG)

Sheet 1 of 2

Job No. XL-2222 SR 522 Elevation ft (m)

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Site Address Inspector Dan Reed

Start August 22, 2005 Completion August 22, 2005 Well ID# Equipment CME 45 w/ autohammer

Station 195+30 Offset 43' Lt. Casing HW-4.5 / HQ-3.5 Method Wet Rotary

Northing Easting Latitude Longitude

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				10 8 9 9 (17)		D-1		Silty SAND with gravel, dense, gray, moist, Stratified, Silt lenses. Length Recovered 2.0 ft, Length Retained 2.0 ft Silty SAND with gravel, dense, gray, moist, Homogeneous, With large gravel as indicated by drilling process. Silt lenses. Length Recovered 2.0 ft, Length Retained 2.0 ft		
5	1			12 9 11 12 (20)		D-2				
	2			9 15 17 20 (32)		D-3		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 1.4 ft, Length Retained 1.4 ft		
				23 19 21 25 (40)		D-4		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, Length Recovered 1.7 ft, Length Retained 1.7 ft		
10	3			25 27 29 35 (46)		D-5		Silty SAND with gravel, dense, gray, moist, Homogeneous, Length Recovered 1.8 ft, Length Retained 1.8 ft		
	4									
15	5			17 21 27 35 (48)		D-6		Poorly graded SAND, slightly silty, dense, gray, moist, Homogeneous, Length Recovered 2.0 ft, Length Retained 2.0 ft	▽ 08/22/2005 08/22/2005	
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 9:10:18 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE-01161

Job No. XL-2222 SR 522 Elevation ft (m)

HOLE No. H-3-05

Sheet 2 of 2

Project SR 522 Corridor Improvements

Driller Sean Verlo Lic# 2615

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				13 18 19 21 (37)		D-7		Poorly graded SAND with gravel, dense, gray, moist, Homogeneous, Length Recovered 2.0 ft, Length Retained 2.0 ft		
25	7		>>	17 19 35 42 (54)		D-8		Silty SAND with gravel, very dense, gray, moist, Homogeneous, With large gravel as indicated by drilling process. Water table stabilized at 18.1'. Length Recovered 1.3 ft, Length Retained 1.3 ft		
30	8 9		>>	33 48 55 (103)		D-9		Silty SAND with gravel, dense, gray, moist, Stratified, Silt lenses. Length Recovered 2.0 ft, Length Retained 2.0 ft		
35	10 11							End of test hole boring at 31.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
40	12									
45	13									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 8:10:18 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE-01161

HOLE No. H-4-05

Sheet 1 of 2

Job No. XL-2222 SR 522 Elevation ft (m)

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Site Address Inspector Dan Reed

Start August 22, 2005 Completion August 22, 2005 Well ID# Equipment CME 45 w/ autohammer

Station 196+10 Offset 43' Lt. Casing HW-4.5 / HQ-3.5 Method Wet Rotary

Northing Easting Latitude Longitude

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
			7 10 13 14 (23)		D-1		Silty SAND with gravel, angular, medium dense, gray, moist, Homogeneous, Length Recovered 1.8 ft, Length Retained 1.8 ft Silty SAND with gravel, angular, medium dense, gray, moist, Homogeneous, Length Recovered 1.3 ft, Length Retained 1.3 ft		
5	1		10 8 5 5 (13)		D-2				
	2		3 5 6 9 (11)		D-3		Poorly graded SAND, slightly silty, medium dense, gray, moist, Homogeneous, Length Recovered 2.0 ft, Length Retained 2.0 ft		
10	3		9 16 26 23 (42)		D-4		Silty SAND with gravel, angular, dense, gray, wet, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 1.8 ft, Length Retained 1.8 ft		
			18 23 25 28 (48)		D-5		Silty SAND with gravel, angular, dense, gray, moist, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 2.0 ft, Length Retained 2.0 ft		
15	4 5		18 20 25 31 (45)		D-6		Silty SAND with gravel, angular, dense, gray, moist, Homogeneous, Silt lenses. Length Recovered 2.0 ft, Length Retained 2.0 ft	▽ 08/22/2005 08/22/2005	
20	6								

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 9:10:21 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE-01161

HOLE No. H-4-05

Job No. XL-2222 SR 522 Elevation ft (m)

Sheet 2 of 2

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				18 23 25 28 (48)		D-7		Silty SAND with gravel, subangular, dense, gray, wet, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 2.0 ft, Length Retained 2.0 ft		
25	7			21 50/5 (50)		D-8		Silty SAND with gravel, angular, very dense, gray, wet, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 1.0 ft, Length Retained 1.0 ft		
30	9		>>	40 59/5 (59)		D-9		Silty SAND with gravel, subangular, very dense, gray, wet, Homogeneous, With large gravel as indicated by drilling process. Length Recovered 1.0 ft, Length Retained 1.0 ft		
35	11		>>	39 59/5 (59)		D-10		Silty SAND with gravel, angular, dense, gray, wet, Homogeneous, With large gravel as indicated by drilling process. Water table stabilized at 17.4' after bailing and recharge. Length Recovered 1.0 ft, Length Retained 1.0 ft End of test hole boring at 36 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
40	12									
	13									
45										

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 9:10:21 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01323

Job No XL-2222 SR 522 Elevation 180.0ft 0.0 ft (0.0 m) HOLE No. H-5-06

Sheet 1 of 4

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Site Address Inspector Dan Reed

Start February 28, 2006 Completion March 1, 2006 Well ID# Equipment CME 45 w/ autohammer

Station 194+25 Offset 46' RT CL Casing HQ 3.5 Method Wet Rotary

Northing Easting Latitude Longitude

County King Subsection NW 1/4 of the NW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				5 9 10 10 (19)		D-1		Well graded SAND with gravel, medium dense, gray, moist, Stratified, HCl reaction not tested, trace of organics 0.0' to 0.5' Length Recovered 1.4 ft, Length Retained 1.4 ft		
	1			5 6 7 7 (13)		D-2		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, HCl reaction not tested Length Recovered 0.5 ft, Length Retained 0.5 ft		
5										
	2			6 12 5 5 (17)		D-3		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, HCl reaction not tested Length Recovered 2.0 ft, Length Retained 2.0 ft		
				10 8 9 8 (17)		D-4		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, HCl reaction not tested Length Recovered 2.0 ft, Length Retained 2.0 ft		
10	3			9 10 10 10 (20)		D-5		Silty SAND with gravel, medium dense, gray, moist, Homogeneous, HCl reaction not tested Length Recovered 1.3 ft, Length Retained 1.3 ft		
	4									
15				7 5 6 6 (11)		D-6		Silty SAND with gravel, medium dense, gray, wet, Homogeneous, HCl reaction not tested, trace of asphalt Length Recovered 1.3 ft, Length Retained 1.3 ft		
	5									
20	6									

SOIL XL-2222.GPJ SOIL.GDT 3/6/06 10:27 16 A3

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01323

HOLE No. H-5-06

Job No. XL-2222 SR 522 Elevation 0.0 ft (0.0 m)

Sheet 2 of 4

Project SR 522 Corridor Improvements

Driller Sean Verlo Lic# 2615

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				5 3 5 7 (8)		D-7		Silty SAND with gravel, loose, gray, wet, Homogeneous, HCl reaction not tested Length Recovered 2.0 ft, Length Retained 2.0 ft		
	7								2/28/06	
25				3 3 4 5 (7)		D-8		Silty SAND with gravel, loose, gray, wet, Disrupted, HCl reaction not tested, mixed soil colors and types Length Recovered 2.0 ft, Length Retained 2.0 ft		
	8									
	9									
30				3 4 5 5 (9)		D-9		Silty SAND with gravel, loose, gray, wet, Homogeneous, HCl reaction not tested Length Recovered 1.3 ft, Length Retained 1.3 ft		
	10									
35				5 5 6 5 (11)		D-10		Silty SAND with gravel, medium dense, gray, wet, Homogeneous, HCl reaction not tested Length Recovered 2.0 ft, Length Retained 2.0 ft		
	11									
	12									
40				4 5 7 6 (12)		D-11		Silty SAND with gravel, medium dense, gray, wet, Homogeneous, HCl reaction not tested Length Recovered 1.7 ft, Length Retained 1.7 ft		
	13									
45										

SOIL XL-2222.GPJ SOIL.GDT 3/6/06 10:27:17 A3

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01323

Job No. XL-2222 SR 522 Elevation 0.0 ft (0.0 m) HOLE No. H-5-06

Sheet 3 of 4

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	14			4 5 4 4 (9)		D-12		Silty SAND with gravel, loose, gray, ~~wet~~, Homogeneous, HCl reaction not tested Length Recovered 0.9 ft, Length Retained 0.9 ft		
	15									
50				8 8 9 8 (17)		D-13		Silty SAND with gravel, medium dense, gray, ~~wet~~ Stratified, HCl reaction not tested, with large gravel as indicated by drilling ~~process~~, 75% drilling fluid loss Length Recovered 1.3 ft, Length Retained 1.3 ft	03/01/2006 ~~03/01/2006~~	
	16									
55				10 8 6 4 (14)		D-14		Silty SAND with gravel, medium dense, gray, ~~wet~~ Homogeneous, HCl reaction not tested, trace of organics, 100% drilling fluid loss Length Recovered 2.0 ft, Length Retained 2.0 ft		
	17									
	18									
60				5 12 7 9 (19)		D-15		Silty SAND with gravel, medium dense, gray, ~~wet~~ Stratified, HCl reaction not tested, silt lenses, 100% drilling fluid loss Length Recovered 2.0 ft, Length Retained 2.0 ft		
	19									
65				13 14 18 20 (32)		D-16		SILT with sand, dense, gray, moist, Homogeneous, HCl reaction not tested, slightly elastic, 100% drilling fluid loss Length Recovered 2.0 ft, Length Retained 2.0 ft		
	20									
	21									
70										

SOIL XL-2222.GPJ SOIL.GDT 3/6/06 10:27:17 A3

Washington State Department of Transportation

LOG OF TEST BORING

Start Card SE01323

Job No XL-2222 SR 522 Elevation 0.0 ft (0.0 m) HOLE No. H-5-06

Sheet 4 of 4

Project SR 522 Corridor Improvements Driller Sean Verlo Lic# 2615

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				17 13 18 24 (31)		D-17		SILT with sand, dense, gray, moist, Stratified, HCl reaction not tested, sand lenses, slightly elastic Length Recovered 2.0 ft, Length Retained 2.0 ft		
75	22									
	23			11 16 19 25 (35)		D-18		SILT with sand, dense, gray, moist, Stratified, HCl reaction not tested, sand lenses, slightly elastic, bail and recharge test data, test #1 at end of day 2-28-06, bore hole depth 47.0', bore hole water level before bailing 26.4', bailed bore hole water level to 45.5', water level at 15 minutes 39.5', water level at 30 minutes 33.3', water level at 45 minutes 30.0', water level at 60 minutes 25.9', water table stabilized at 23.5' overnight, bail and recharge test data #2 at end of day on 3-1-06, bore hole depth 77.0', bore hole water level before bailing 58.0', bailed bore hole water level to 72.4', water level at 15 minutes 67.5', water level at 30 minutes 62.5', water level at 45 minutes 55.9', water level at 60 minutes 53.3', water level stabilized in overnight in casing at 51.9' Length Recovered 2.0 ft, Length Retained 2.0 ft End of test hole boring at 77 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
80	24									
	25									
85	26									
	27									
90	28									
95										

Bail and Recharge Test Results

Date: 2/28/06

Depth of casing = 47 ft

Water Level Depth (ft)	Time
26.4	Before Bailing
45.5	After Bailing
39.5	15 min
33.3	30
30.0	45
25.9	60
23.5	Overnight

Date: 3/01/06

Casing Depth = 77 ft

Water Level Depth (ft)	Time
58.0	End of Drilling
72.4	After Bailing
67.5	15 min
62.5	30
55.9	45
53.3	60
51.9	Overnight

SOIL_XL-2222.GPJ SOIL.GDT 3/6/06.10.27.17 A3

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

HOLE No. PP-1-05

Job No. XL-2222 SR 522 Elevation ft (m)

Sheet 1 of 1

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic# 2537

Site Address _____

Inspector Mike Brun

Start March 7, 2005 Completion March 7, 2005 Well ID# _____

Equipment Hand Tools

Station 181+50 Offset 50.0' Rt Casing Open Hole

Method Portable Penetrometer

Northing _____ Easting _____ Latitude _____ Longitude _____

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				5 10 15 (25)		D-1		Silty SAND with gravel, dense, light brown, dry, Homogeneous.		
	1			6 11 15 (26)		D-2		Sandy SILT with gravel, and few cobbles, dense, light brown, dry, Homogeneous.		
5				6 15 17 (32)		D-3		SILT with sand, dense, light brown, dry, Homogeneous.		
	2			8 17 17 (34)		D-4		SILT with sand, dense, light brown, moist, Homogeneous.		
			>>	15 25 26 (51)		D-5		SILT with sand, very dense, light brown, moist, Homogeneous.		
10	3							End of test hole boring at 9.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Blow per foot are equivalent to standard penetrometer values.		
	4									
15	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,9:10:23 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

Job No. XL-2222 SR 522 Elevation ft (m) HOLE No. PP-2-05

Sheet 1 of 1

Project SR 522 Corridor Improvements Driller Jody Dickson Lic# 2537

Site Address _____ Inspector Mike Brun

Start March 7, 2005 Completion March 7, 2005 Well ID# _____ Equipment Hand Tools

Station 182+70 Offset 50.0' Rt Casing Open Hole Method Portable Penetrometer

Northing _____ Easting _____ Latitude _____ Longitude _____

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				1 2 3 (5)		D-1		Sandy SILT with gravel, loose, light brown, dry, Homogeneous. Length Recovered 1.0 ft, Length Retained 0.0 ft Sandy SILT with gravel, loose, light brown, dry, Homogeneous.		
	1			5 10 14 (24)		D-2		Sandy SILT with gravel, and trace of cobbles, medium dense, light brown, dry, Homogeneous.		
5				7 13 17 (30)		D-3		SILT, dense, light brown, moist, Homogeneous.		
	2		>>	12 25 26 (51)		D-4		SILT, very dense, light brown, moist, Homogeneous.		
10	3							End of test hole boring at 8.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Blow per foot are equivalent to standard penetrometer values.		
	4									
15	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,9:10:24 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

HOLE No. PP-3-05

Job No. XL-2222 SR 522 Elevation ft (m)

Sheet 1 of 1

Project SR 522 Corridor Improvements

Driller Jody Dickson Lic# 2537

Site Address _____

Inspector Mike Brun

Start March 7, 2005 Completion March 7, 2005 Well ID# _____

Equipment Hand Tools

Station 184+40 Offset 50.0' Lt Casing Open Hole

Method Portable Penetrometer

Northing _____ Easting _____ Latitude _____ Longitude _____

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				4 10 14 (24)		D-1		Silty SAND with gravel, and trace of cobbles, medium dense, brown, dry, Homogeneous. Silty SAND with gravel, and trace of cobbles, medium dense, brown, dry, Homogeneous.		
	1			5 14 17 (31)		D-2		Sandy SILT with gravel, and little cobbles, dense, brown , moist, Homogeneous.		
5				1 2 3 (5)		D-3		SILT with sand, some gravel and little cobbles, loose, brown - grey, moist, Homogeneous.		
	2			3 9 15 (24)		D-4		SILT, medium dense, grey, moist, Homogeneous.		
10	3							End of test hole boring at 8.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Blow per foot are equivalent to standard penetrometer values.		
	4									
15	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06,9:10:25 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

Job No. XL-2222 SR 522 Elevation ft (m) HOLE No. PP-4-05

Sheet 1 of 1

Project SR 522 Corridor Improvements Driller Jody Dickson Lic# 2537

Site Address _____ Inspector Mike Brun

Start March 7, 2005 Completion March 7, 2005 Well ID# _____ Equipment Hand Tools

Station 190+30 Offset 50.0' Lt Casing Open Hole Method Portable Penetrometer

Northing _____ Easting _____ Latitude _____ Longitude _____

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								Poorly graded SAND with gravel, and trace of cobbles, loose, light brown , dry, Homogeneous.		
				1. 3 4 (7)		D-1		Poorly graded SAND with gravel, and trace of cobbles, loose, light brown , dry, Homogeneous.		
	1			6 9 14 (23)		D-2		Silty SAND with gravel, and trace of cobbles, medium dense, light brown - grey, moist, Homogeneous.		
5				2 4 5 (9)		D-3		SILT with sand, and few gravels, loose, light brown, moist, Homogeneous.		
	2			3 7 11 (18)		D-4		SILT, medium dense, brown - grey, moist, Homogeneous.		
								End of test hole boring at 8.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data. Blow per foot are equivalent to standard penetrometer values.		
10	3									
	4									
15										
	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/06 9:10:27 A2

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

Job No. XL-2222 SR 522 Elevation ft (m) HOLE No. PP-5-05

Sheet 1 of 1

Project SR 522 Corridor Improvements Driller Jody dickson Lic# 2537

Site Address _____ Inspector Mike Brun

Start March 8, 2005 Completion March 8, 2005 Well ID# _____ Equipment Hand Tools

Station 197+80 Offset 55.0' Lt Casing Open Hole Method Portable Penetrometer

Northing _____ Easting _____ Latitude _____ Longitude _____

County King Subsection SW 1/4 of the SW 1/4 Section 15 Range 4E Township 26

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								Riprap		
				4 6 9 (15)		D-1		Poorly graded SAND with gravel, medium dense, light brown , dry, Homogeneous.		
	1			12 13 20 (33)		D-2		Poorly graded SAND with gravel, and few cobbles, dense, brown, wet, Homogeneous.		
5				2 3 5 (8)		D-3		Sandy SILT with gravel, and some cobbles, loose, light brown, wet, Homogeneous.		
	2			15 14 10 (24)		D-4		Well graded GRAVEL with sand, mostly cobbles, subangular, medium dense, brown, dry, Homogeneous.		
				4 6 9 (15)		D-5		Silty SAND with gravel, and few cobbles, medium dense, light brown, moist, Homogeneous.		
10	3							Blow per foot are equivalent to standard penetrometer values.		
								End of test hole boring at 10.5 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	4									
15										
	5									
20	6									

SOIL XL-2222 SR522.GPJ SOIL.GDT 2/1/05,8:10:28 A2

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve		GP	Poorly-graded GRAVEL
		Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
More than 50% Retained on No. 200 Sieve Size	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve		SP	Poorly-graded SAND
		Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines
AL	Atterberg Limits: PL = Plastic Limit, LL = Liquid Limit
CBR	California Bearing Ratio
CN	Consolidation
DD	Dry Density (pcf)
DS	Direct Shear
GS	Grain Size Distribution
K	Permeability
MD	Moisture/Density Relationship (Proctor)
MR	Resilient Modulus
OC	Organic Content
pH	pH of Soils
PID	Photoionization Device Reading
PP	Pocket Penetrometer (Approx. Comp. Strength, tsf)
Res.	Resistivity
SG	Specific Gravity
CD	Consolidated Drained Triaxial
CU	Consolidated Undrained Triaxial
UU	Unconsolidated Undrained Triaxial
TV	Torvane (Approx. Shear Strength, tsf)
UC	Unconfined Compression

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- Non-standard Penetration Test (3.0" OD Split Spoon with Brass Rings)
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- 3-1/4" OD Split Spoon

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation.
Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

GeoSciences Inc.

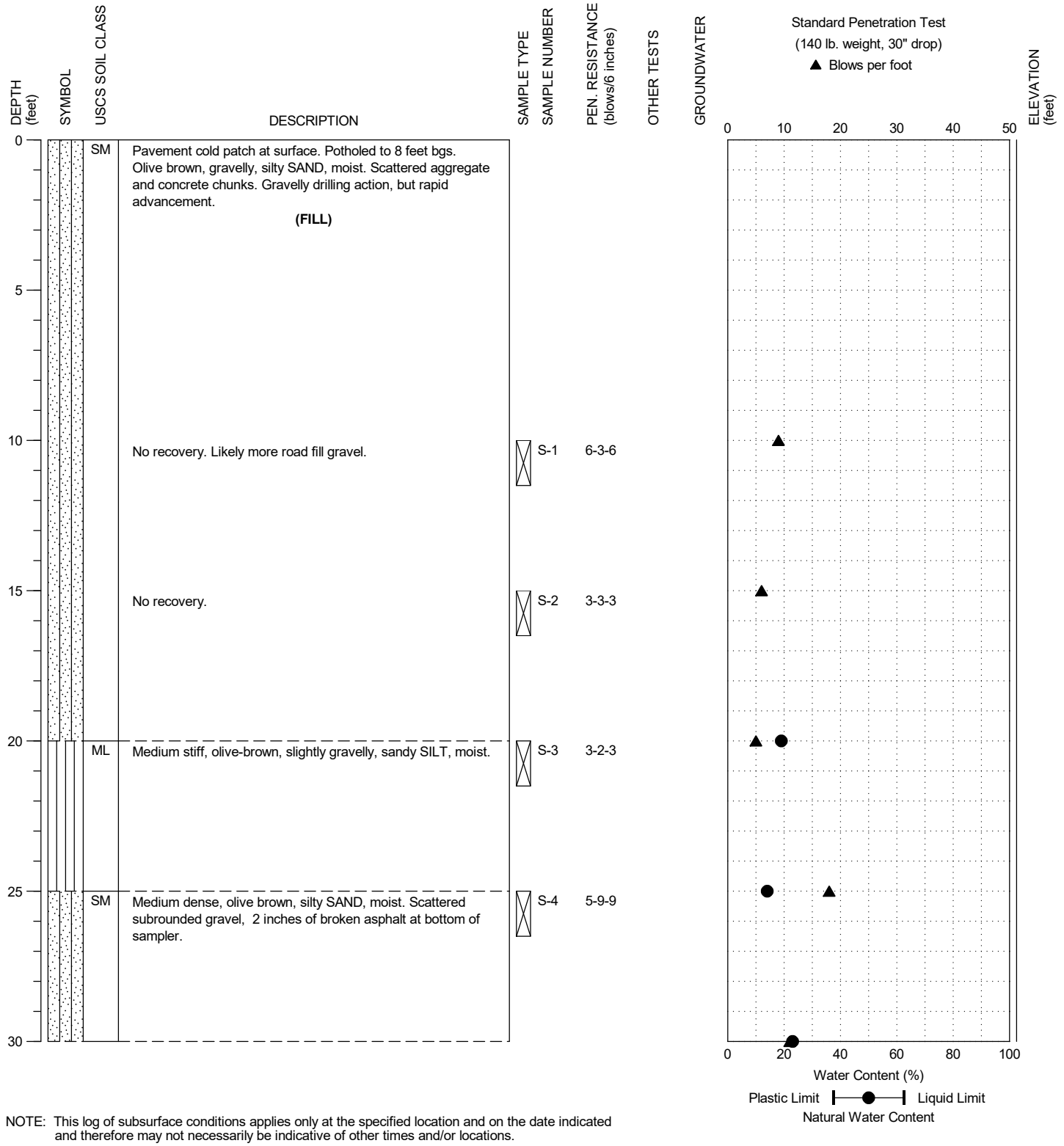
Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 2017-134-21 FIGURE: A-1

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich Mobile B-58
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

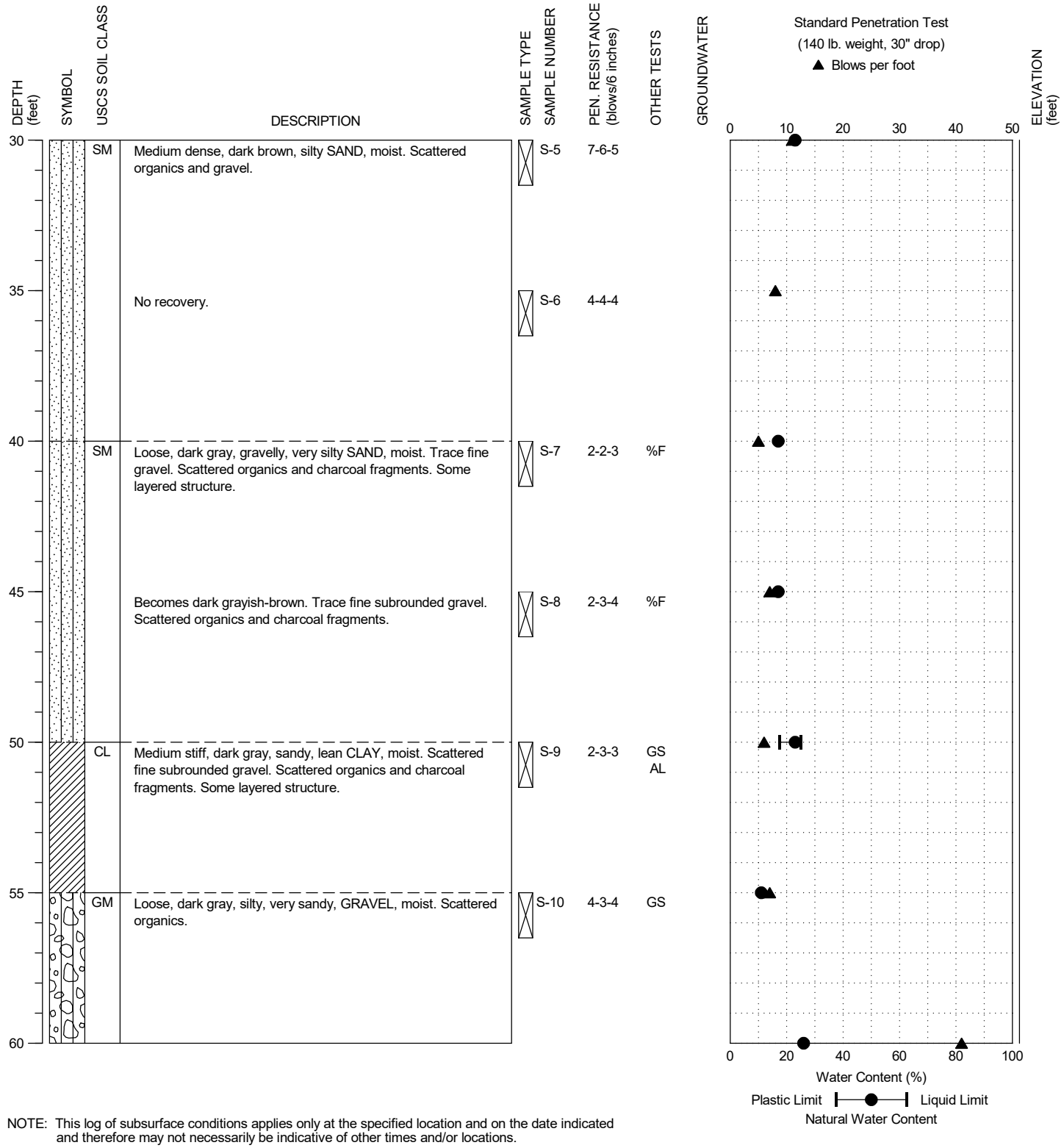
DATE STARTED: 1/31/2021
DATE COMPLETED: 1/31/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich Mobile B-58
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

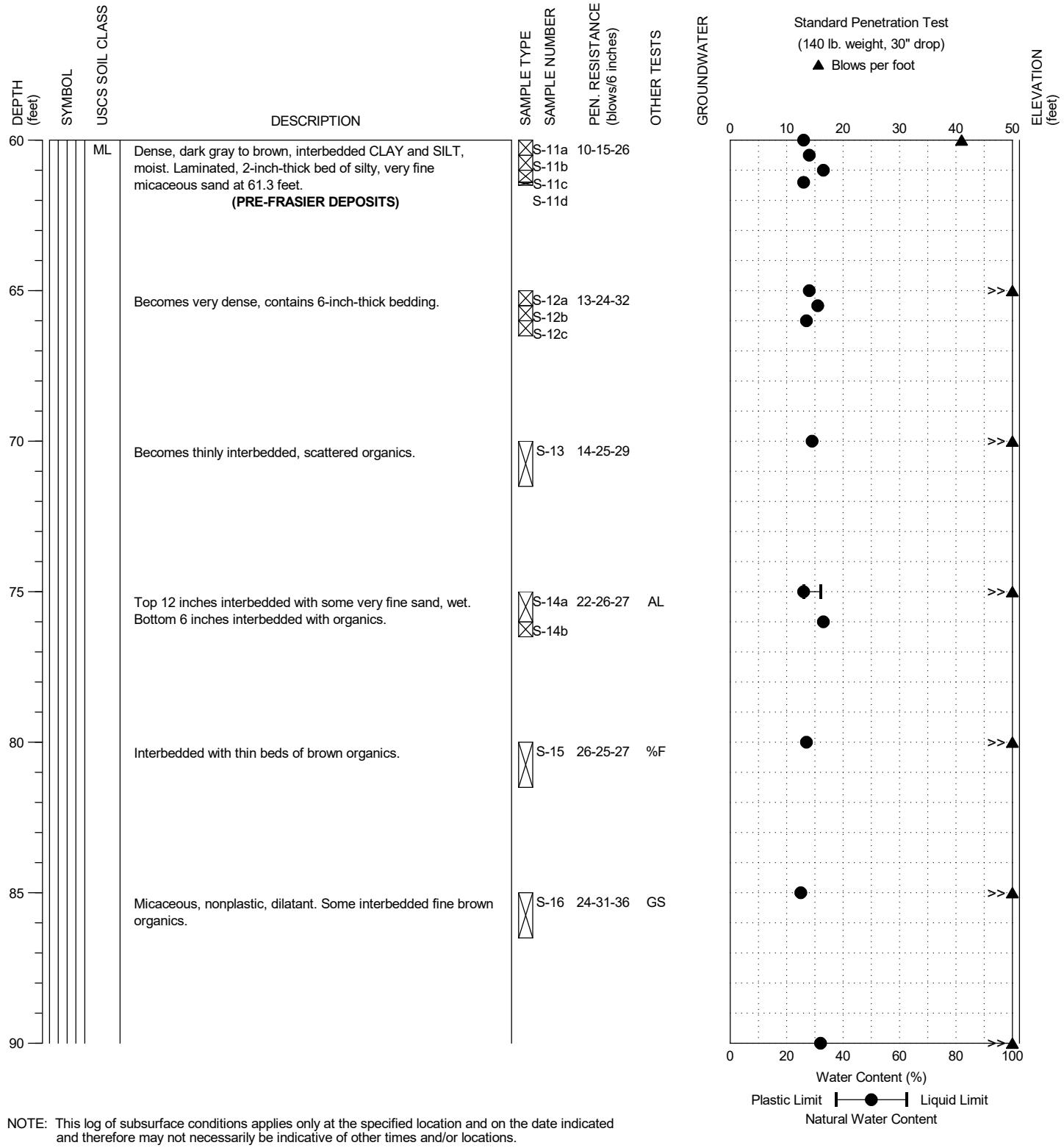
DATE STARTED: 1/31/2021
DATE COMPLETED: 1/31/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich Mobile B-58
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 1/31/2021
DATE COMPLETED: 1/31/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich Mobile B-58
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 1/31/2021
DATE COMPLETED: 1/31/2021
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
90			Becomes slightly sandy. Micaceous, dilatant, interbedded with trace fine brown organics.		S-17	24-26-28	%F	
			Borehole terminated to 91.5 feet below ground surface (bgs). Groundwater seepage not encountered during drilling. Borehole abandoned with grout to 5 feet bgs, bentonite to 2 ft bgs, concrete to 1ft bgs, and Aquaphalt permanent asphalt patch to the surface.					
95								
100								
105								
110								
115								
120								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

ELEVATION (feet)

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-1

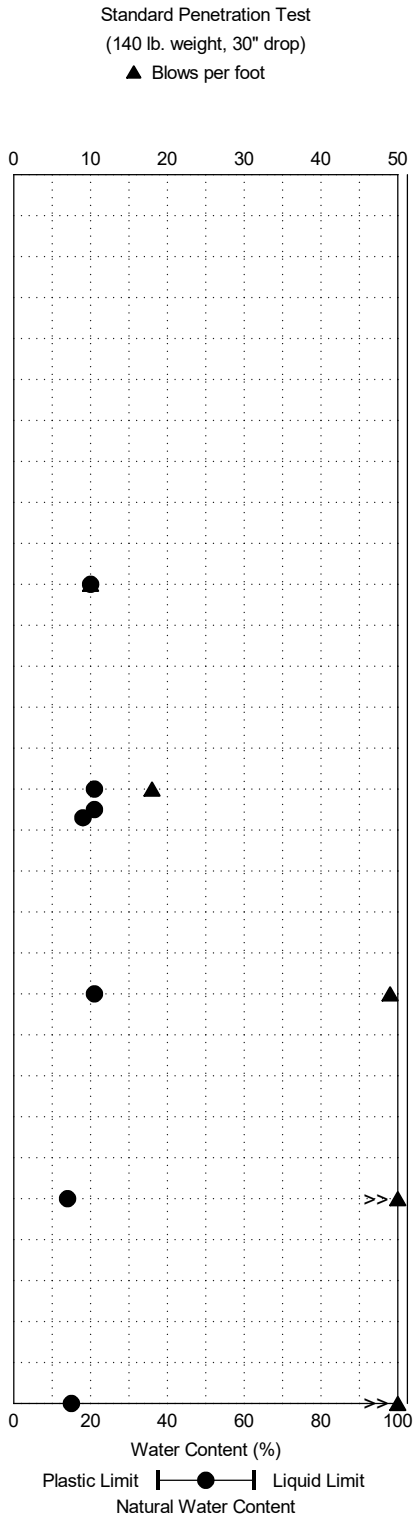
PROJECT NO.: 2017-134-21 FIGURE: A-2

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 1/17/2021
DATE COMPLETED: 1/17/2021
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		SM	Cold patch cap at surface, previously potholed to 7 feet bgs, backfilled with bentonite and pea gravel. Primarily sand and gravel, base course road fill. Medium-large rounded cobbles at 7 feet bgs. Drilled straight to 10 feet bgs. **(FILL)**			
10		SM	Medium dense, olive-brown, slightly gravelly, silty, fine to medium SAND, moist. Trace gravel.	S-1	6-6-4	GS
15		SM	Medium dense, olive-brown, slightly gravelly, silty very fine SAND, wet. Thinly bedded to laminated. 4-inch-thick sandy clay lens at 15.5 feet. Brief gravelly drilling after 15 foot sample.	S-2a S-2b S-2c	6-6-12	%F
20		SM	Dense, olive-brown, interbedded silty very fine SAND and very fine sandy SILT, moist. Scattered gravel. Fine lens of dark brown organic silt at 20.5 feet. **(PRE-FRASIER DEPOSITS)**	S-3	22-24-25	
25			Becomes very dense, light olive-brown. Lenses of slightly silty to clean medium sand. Scattered gravel.	S-4	50/6"	
30						

GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-2

PROJECT NO.: 2017-134-21 FIGURE: A-3

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

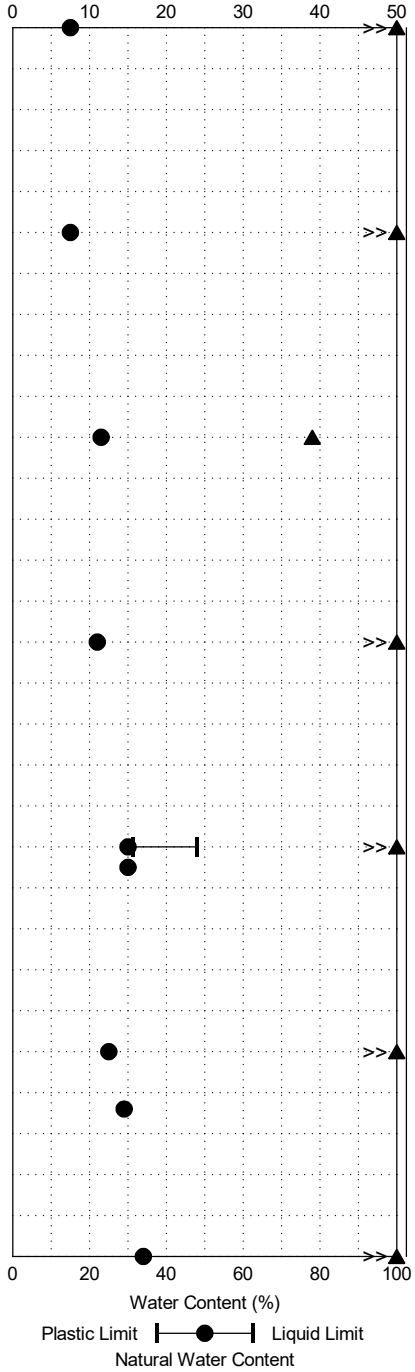
DATE STARTED: 1/17/2021
DATE COMPLETED: 1/17/2021
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
30		ML	Hard, rust-mottled olive-brown, very sandy SILT, moist. Scattered gravel. Laminated, sand fraction very fine.		S-5	28-50/3"	GS
35		ML	Hard, rust-mottled light olive-brown, laminated to finely-interbedded, very silty very fine SAND and very fine sandy SILT, moist. Scattered gravel. Brief gravelly drilling after 35 foot sample.		S-6	22-50/5"	
40		SM	Dense, olive-brown, silty very fine SAND, moist. Laminated.		S-7	7-21-18	
45			Becomes very dense, thinly bedded.		S-8	43-26-26	GS
50		ML	Hard, light olive-brown, SILT, moist. Laminated. Becomes rust-mottled at 51.3 feet.		S-9a S-9b	18-26-41	AL
55		SM	Very dense, dark olive-brown, silty very fine SAND, moist. Thinly bedded, micaceous.		S-10a S-10b	27-37-35	
60							

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

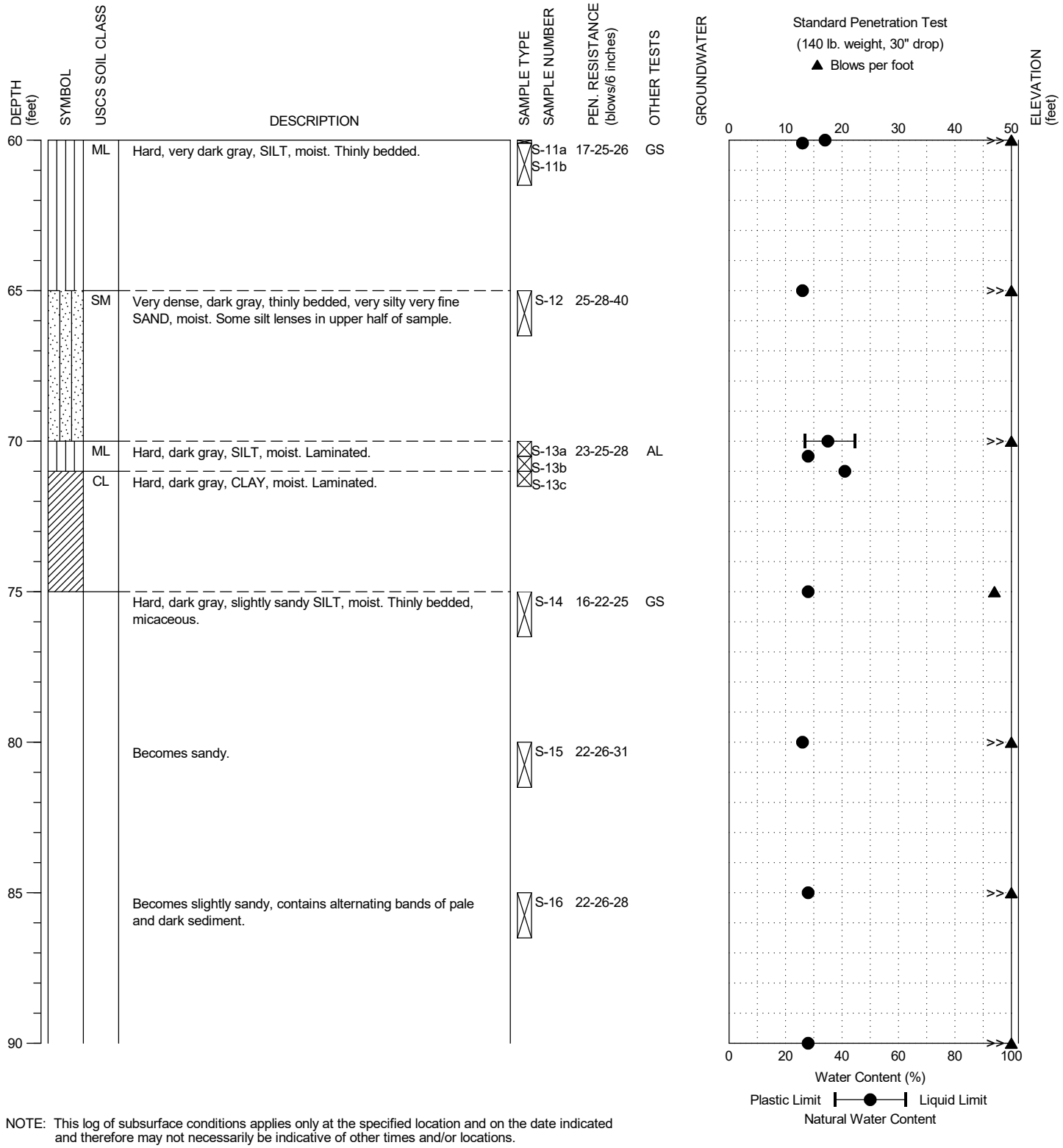
ELEVATION (feet)



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

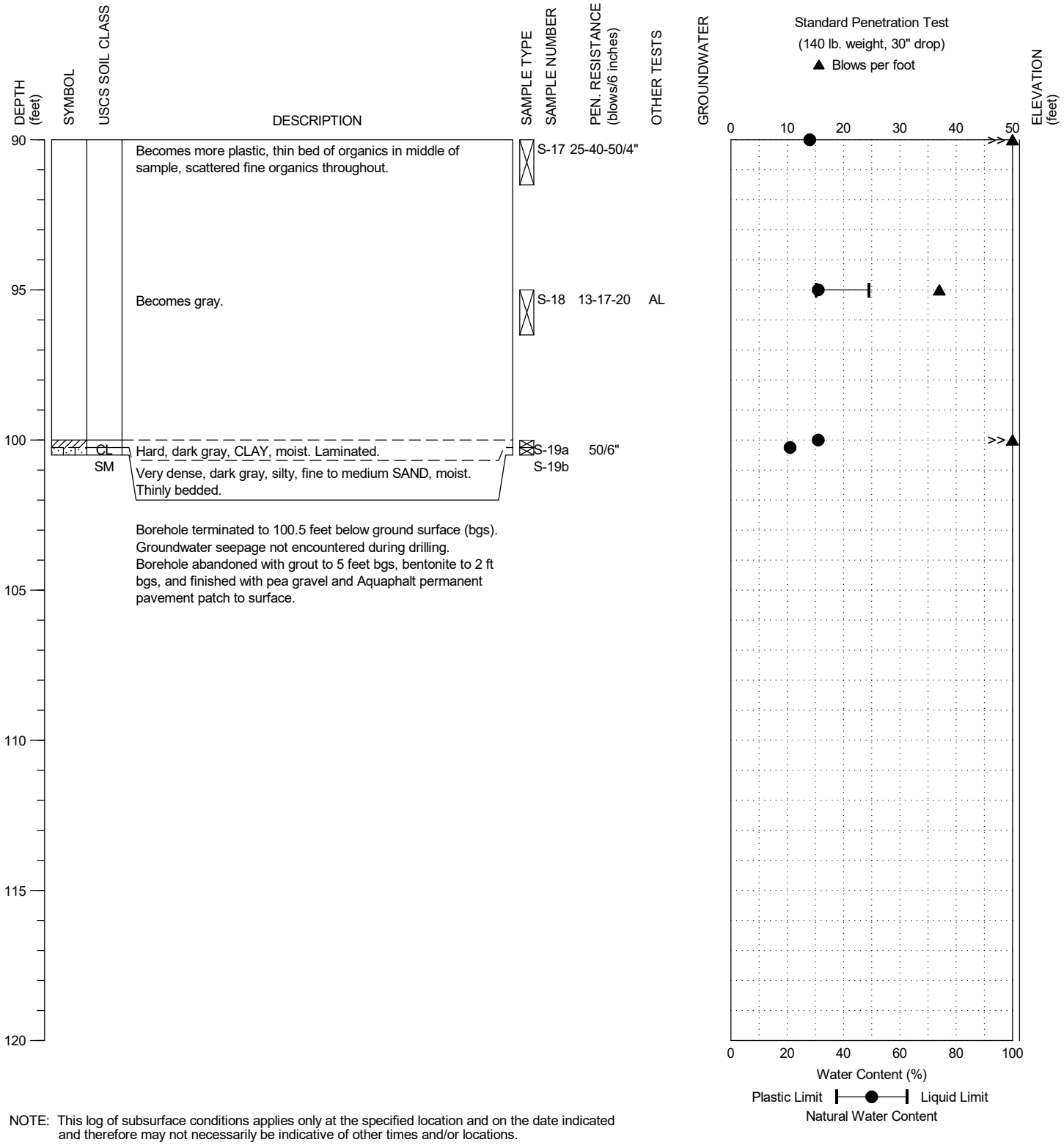
DATE STARTED: 1/17/2021
DATE COMPLETED: 1/17/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 1/17/2021
DATE COMPLETED: 1/17/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

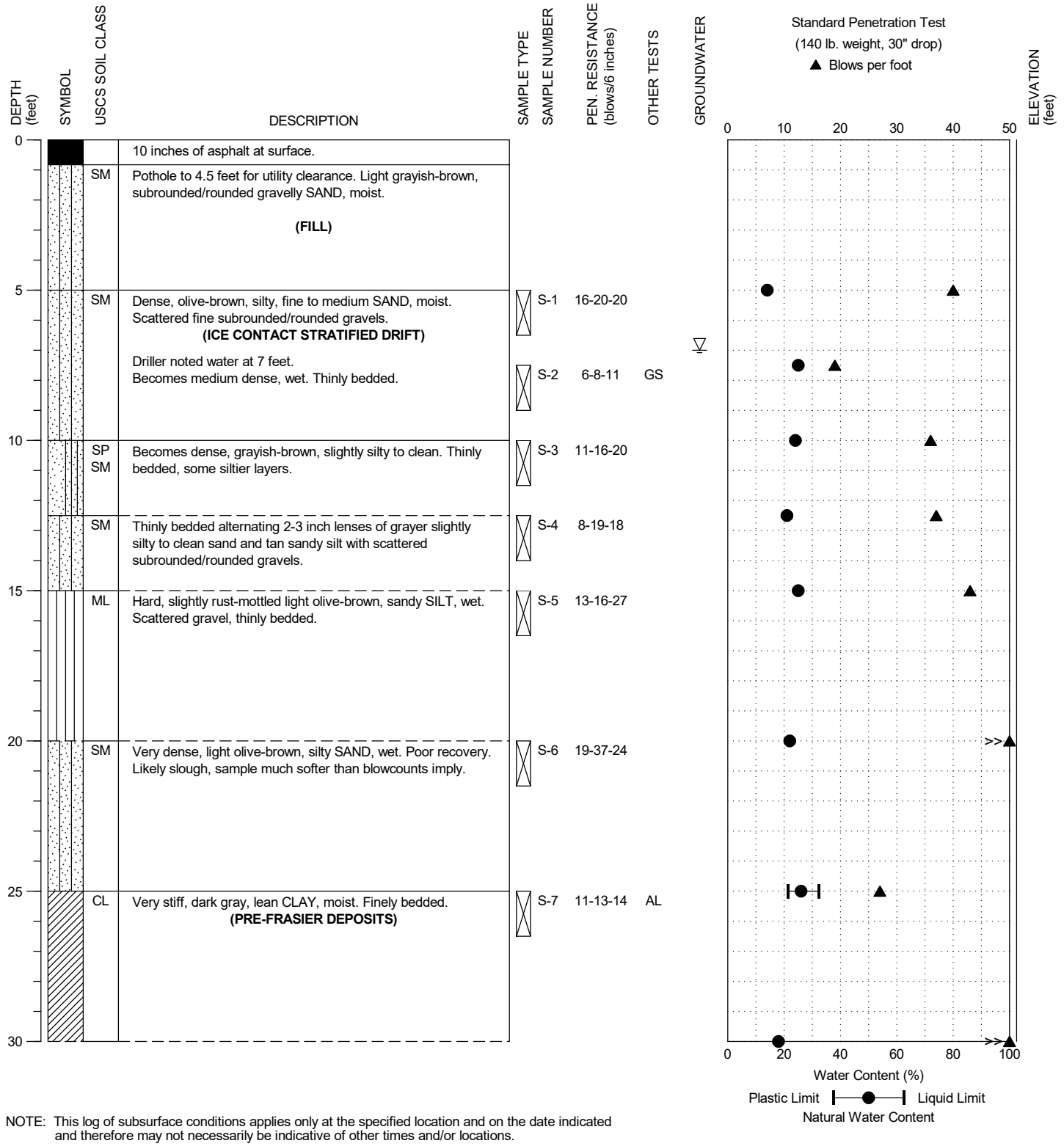
BORING: BH-2

PROJECT NO.: 2017-134-21 FIGURE: A-3

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/ Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/15/2020
DATE COMPLETED: 12/15/2020
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-3

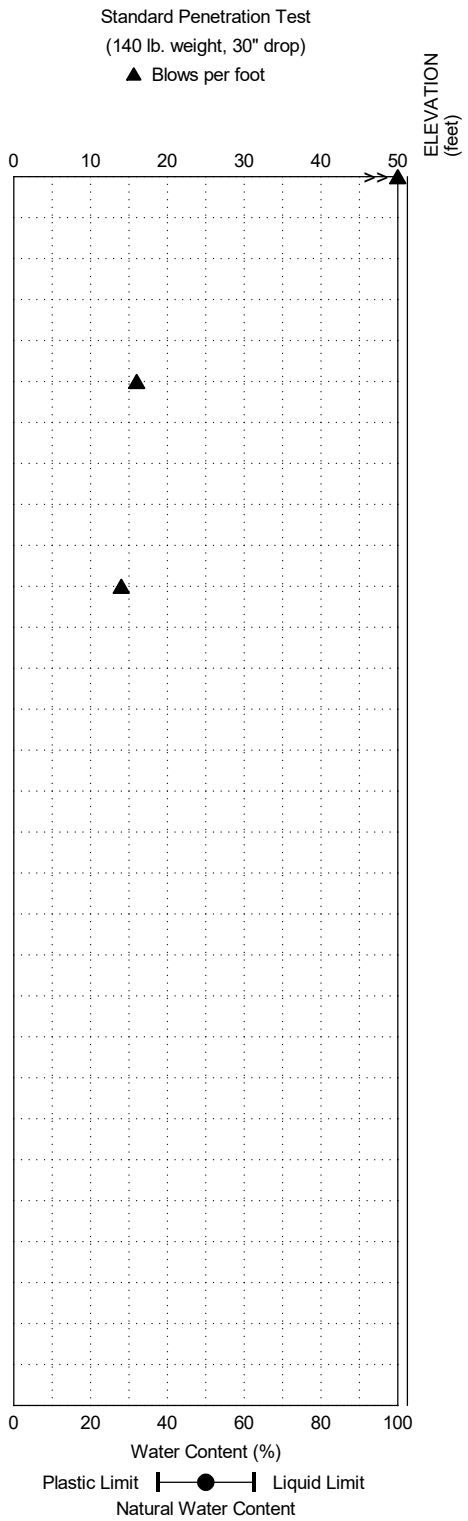
PROJECT NO.: 2017-134-21 FIGURE: A-4

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/ Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/15/2020
DATE COMPLETED: 12/15/2020
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30		SM	Very dense, gray, silty, medium to coarse SAND, wet. Silt lenses in upper and lower three inches of sampler.		S-8	17-25-34	GS	
35		SP	Becomes medium dense, clean. Poor recovery, likely heave sample. Blowcounts likely understated.		S-9	4-8-8		
40			No recovery. Driller noted heave at 35 feet and 40 feet, sand washing out of hole.		S-10	4-5-9		
45			Borehole terminated at 41.5 feet below ground surface (bgs). Groundwater seepage encountered at 7 feet bgs during drilling. Borehole abandoned with bentonite to 4 feet bgs, pea gravel to 2 feet bgs, and finished with Aquaphalt permanent pavement patch to surface.					
50								
55								
60								



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

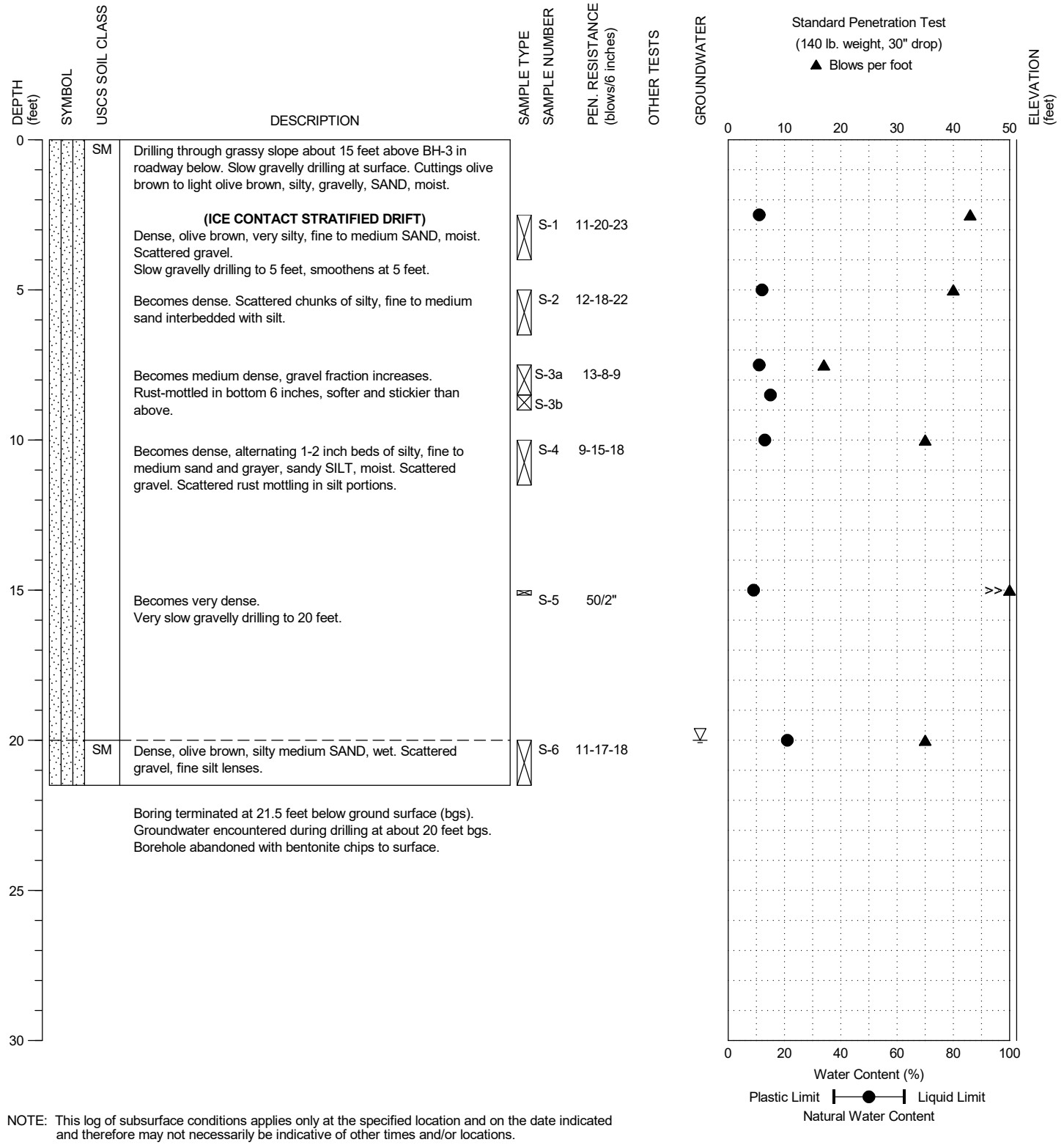
BORING: BH-3

PROJECT NO.: 2017-134-21 FIGURE: A-4

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Geologic Drill Partners, Inc.
DRILLING METHOD: Mini Bobcat Track Rig
SAMPLING METHOD: SPT w/Cathead
LOCATION: See Figure 2

DATE STARTED: 2/24/2021
DATE COMPLETED: 2/24/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-3b

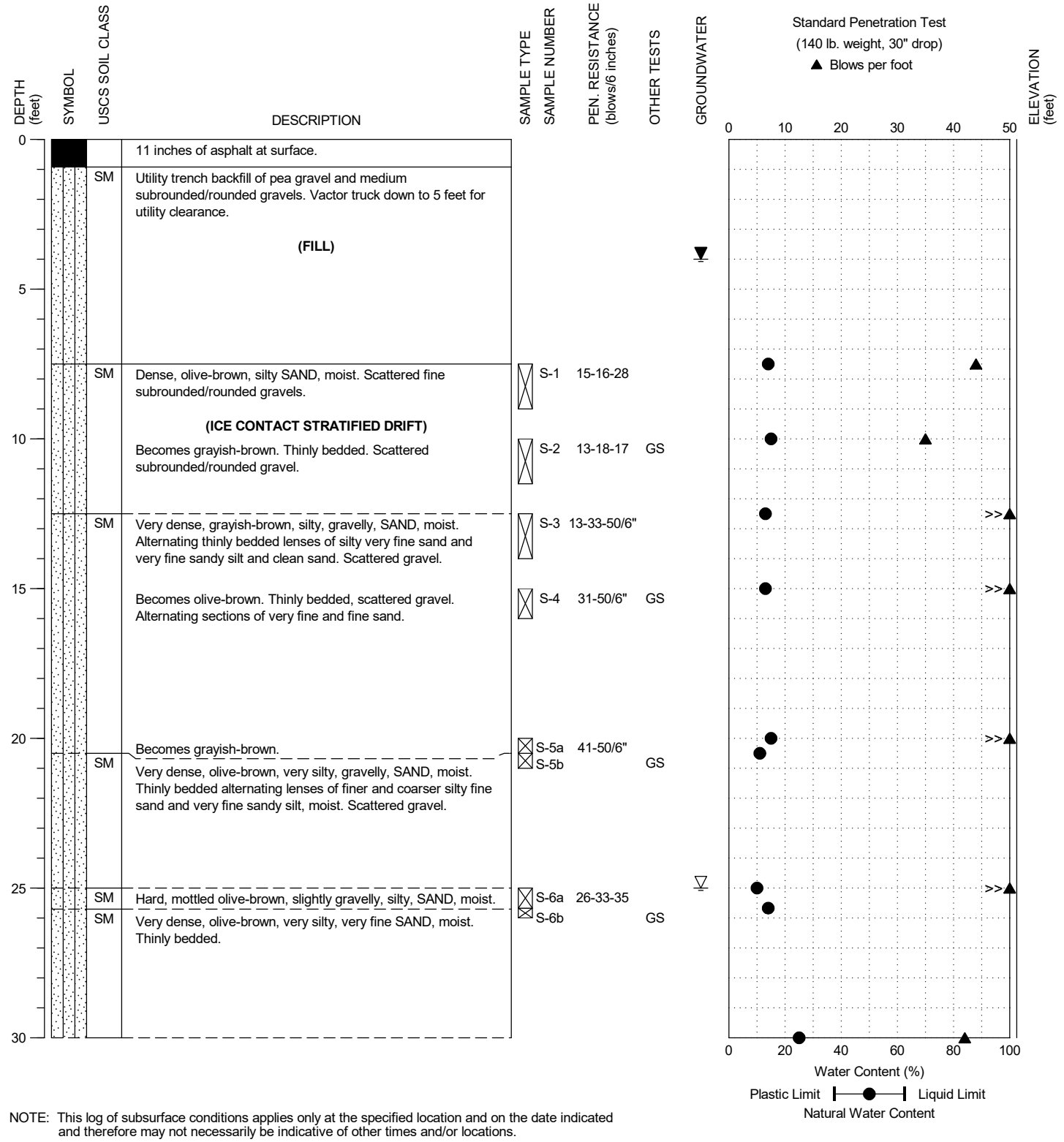
PAGE: 1 of 1

PROJECT NO.: 2017-134-21 FIGURE: A-5

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/14/2020
DATE COMPLETED: 12/14/2020
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

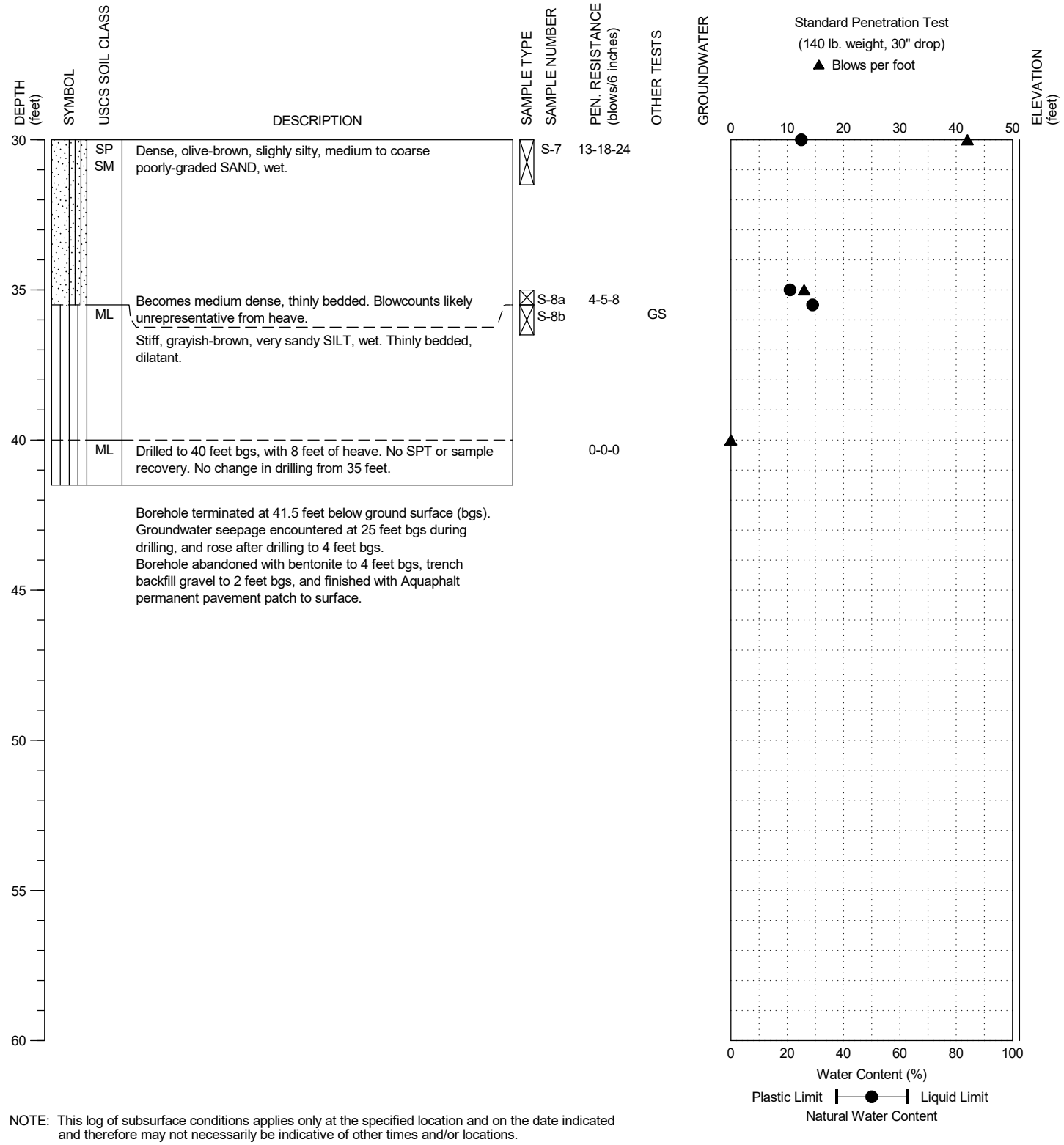
BORING: BH-4

PROJECT NO.: 2017-134-21 FIGURE: A-6

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: HSA, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/14/2020
DATE COMPLETED: 12/14/2020
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

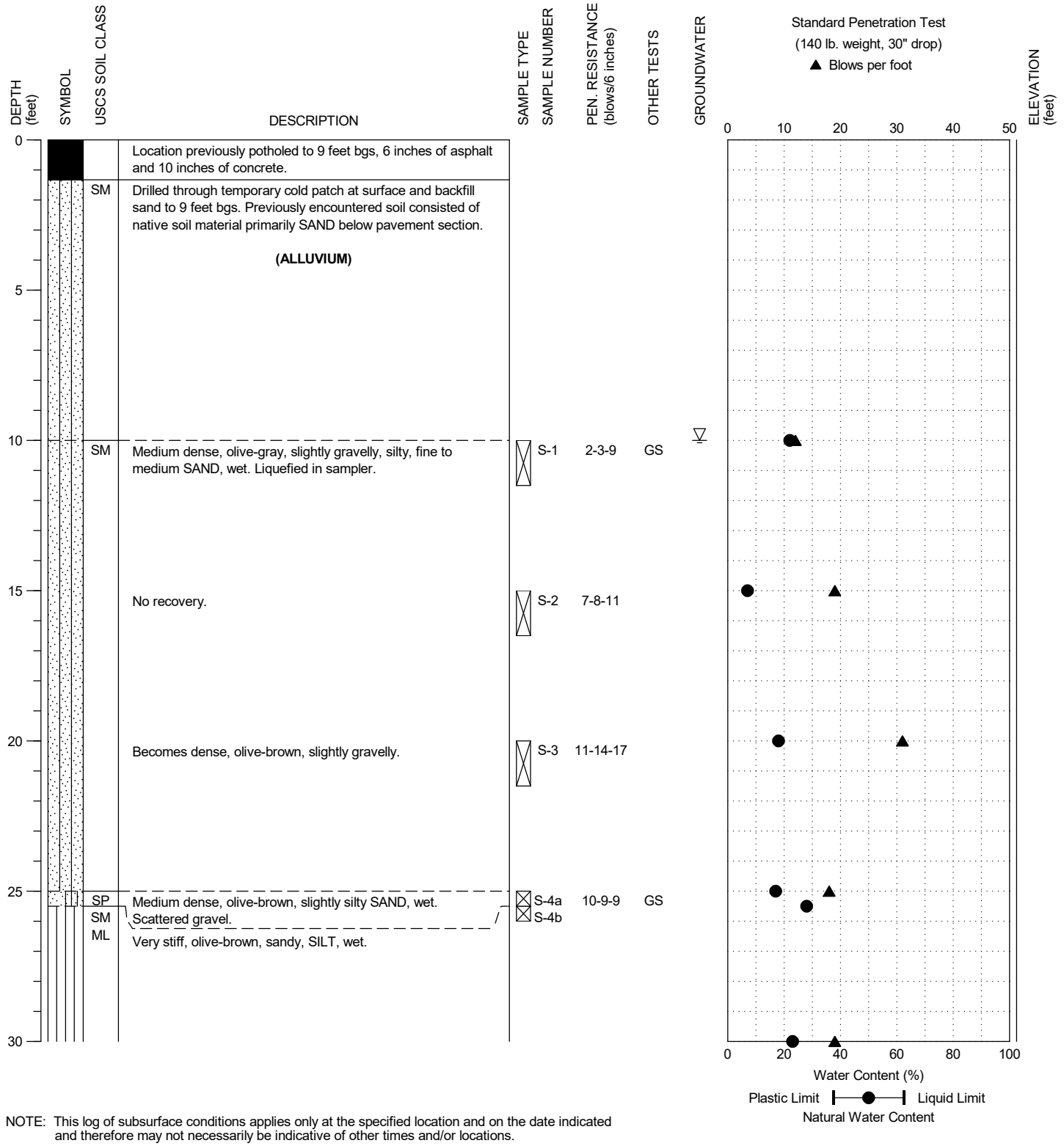
BORING: BH-4

PROJECT NO.: 2017-134-21 FIGURE: A-6

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer; California
LOCATION: See Figure 2

DATE STARTED: 1/10/2021
DATE COMPLETED: 1/10/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

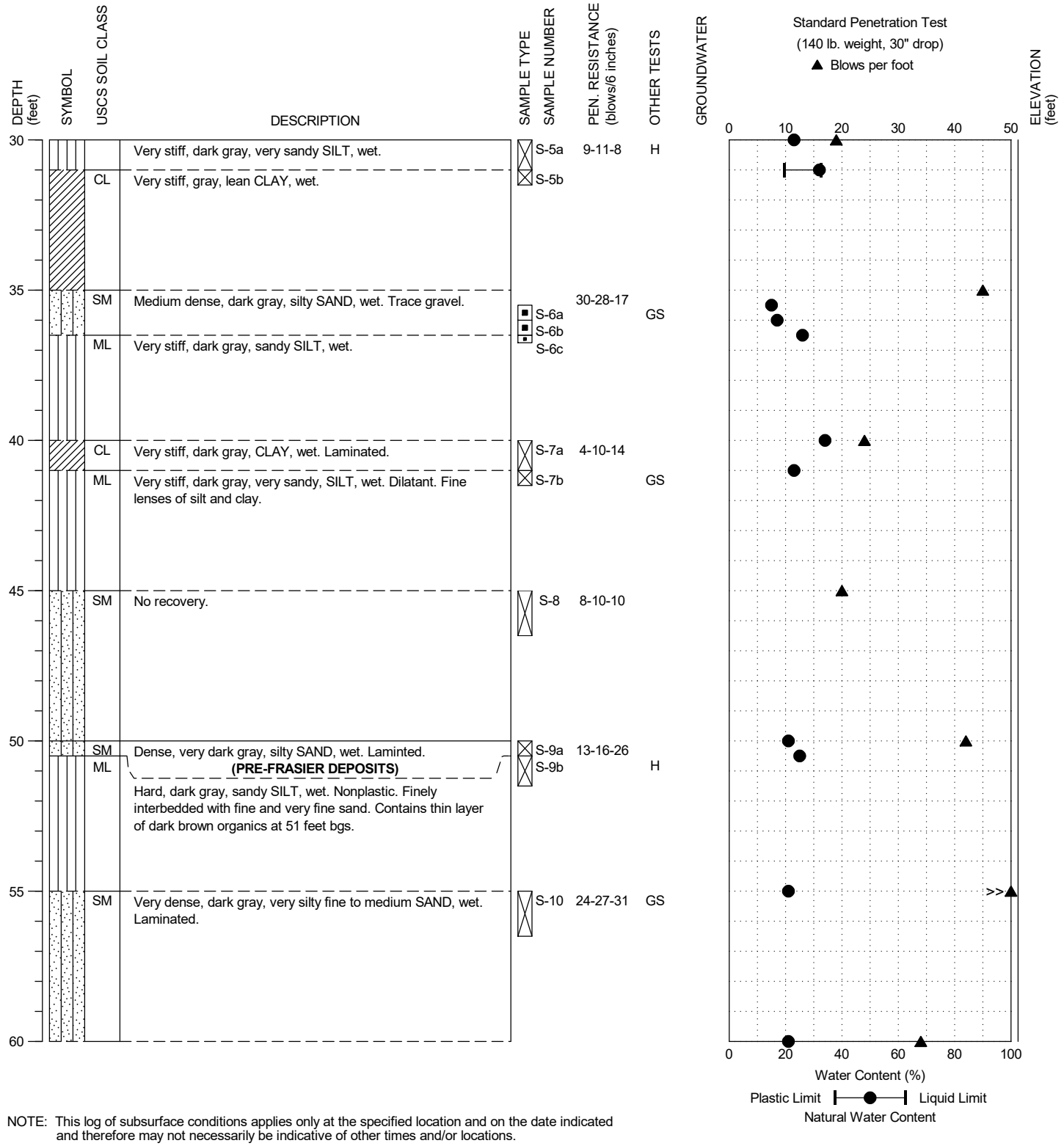
Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-5

PROJECT NO.: 2017-134-21 FIGURE: A-7

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer; California
LOCATION: See Figure 2

DATE STARTED: 1/10/2021
DATE COMPLETED: 1/10/2021
LOGGED BY: A. Ong



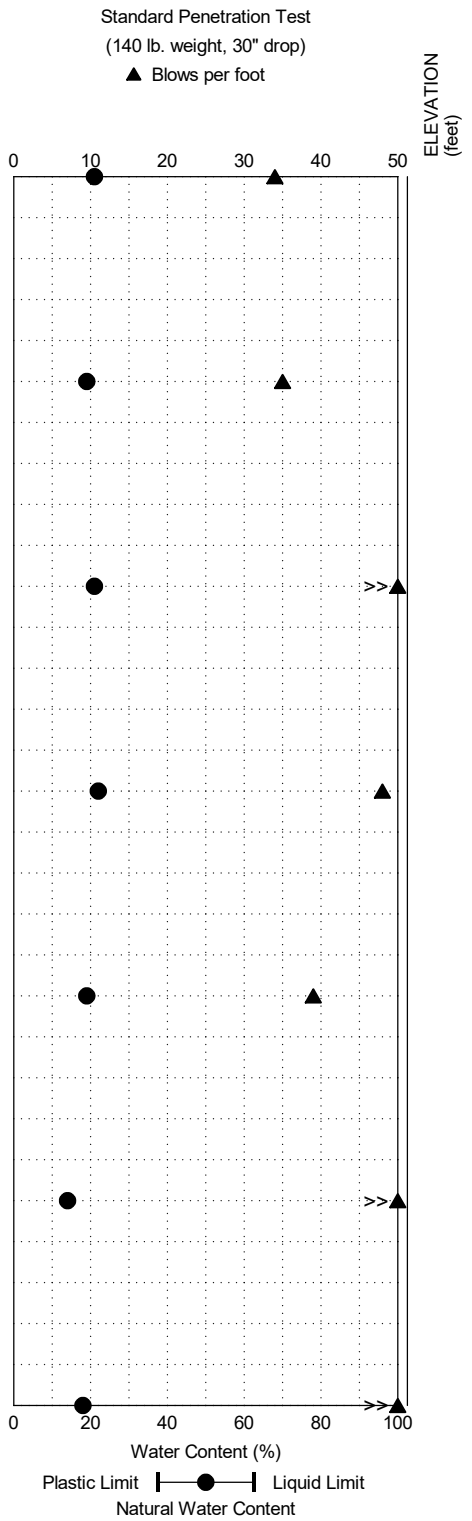
NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer; California
LOCATION: See Figure 2

DATE STARTED: 1/10/2021
DATE COMPLETED: 1/10/2021
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
60		SM	Dense, very dark gray, silty, fine to coarse SAND, wet. Thinly bedded.		S-11	14-18-16	
65		SP SM	Dense, dark gray, slightly silty, fine-coarse SAND, wet. Thinly bedded, scattered small chunks of silt or clay. Gravelly drilling at 67 - 68 feet bgs.		S-12	17-16-19	
70			Becomes very dense, moist.		S-13	24-25-29	GS
75					S-14	23-23-25	
80			Observed silty sand at top 1 inch of sample. Trace fine gravel.		S-15	17-20-19	
85		SM	Very dense, dark gray, gravelly, silty, medium to coarse SAND, wet. Scattered gravel. Drove rock, blow count likely overstated. Gravelly drilling at 88 - 89 feet bgs.		S-16	22-28-24	GS
90							

GROUNDWATER



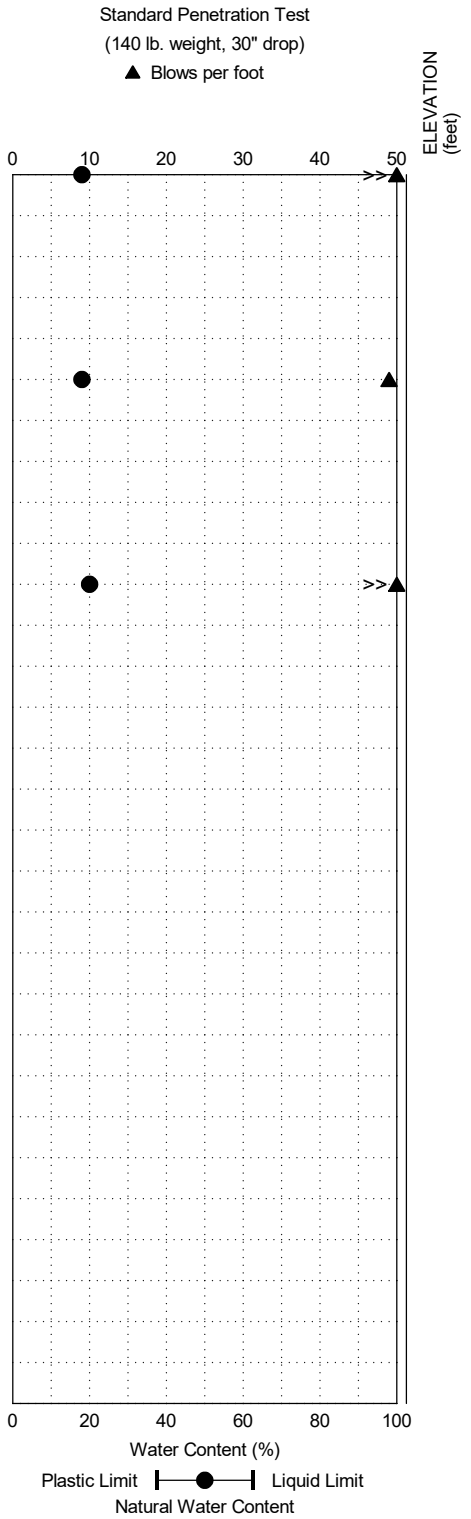
NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer; California
LOCATION: See Figure 2

DATE STARTED: 1/10/2021
DATE COMPLETED: 1/10/2021
LOGGED BY: A. Ong

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
90		SM	Very dense, dark gray, silty, fine to medium SAND, wet. Laminated, some silt and very fine sandy beds. Trace gravel.		S-17	33-37-42	GS
95		SP SM	Dense, dark gray, slightly silty, fine to medium SAND, wet. Thinly bedded, 1 inch lens of laminated clay.		S-18	19-21-28	
100			Becomes very dense, sand content coarser at top of sampler.		S-19	26-30-36	
105			Borehole terminated at 101.5 feet below ground surface (bgs). Groundwater seepage encountered at about 10 feet bgs during drilling. Borehole abandoned with bentonite to 5 feet bgs, pea gravel to 3 feet bgs, and finished with Aquaphalt permanent pavement patch to surface.				
110							
115							
120							

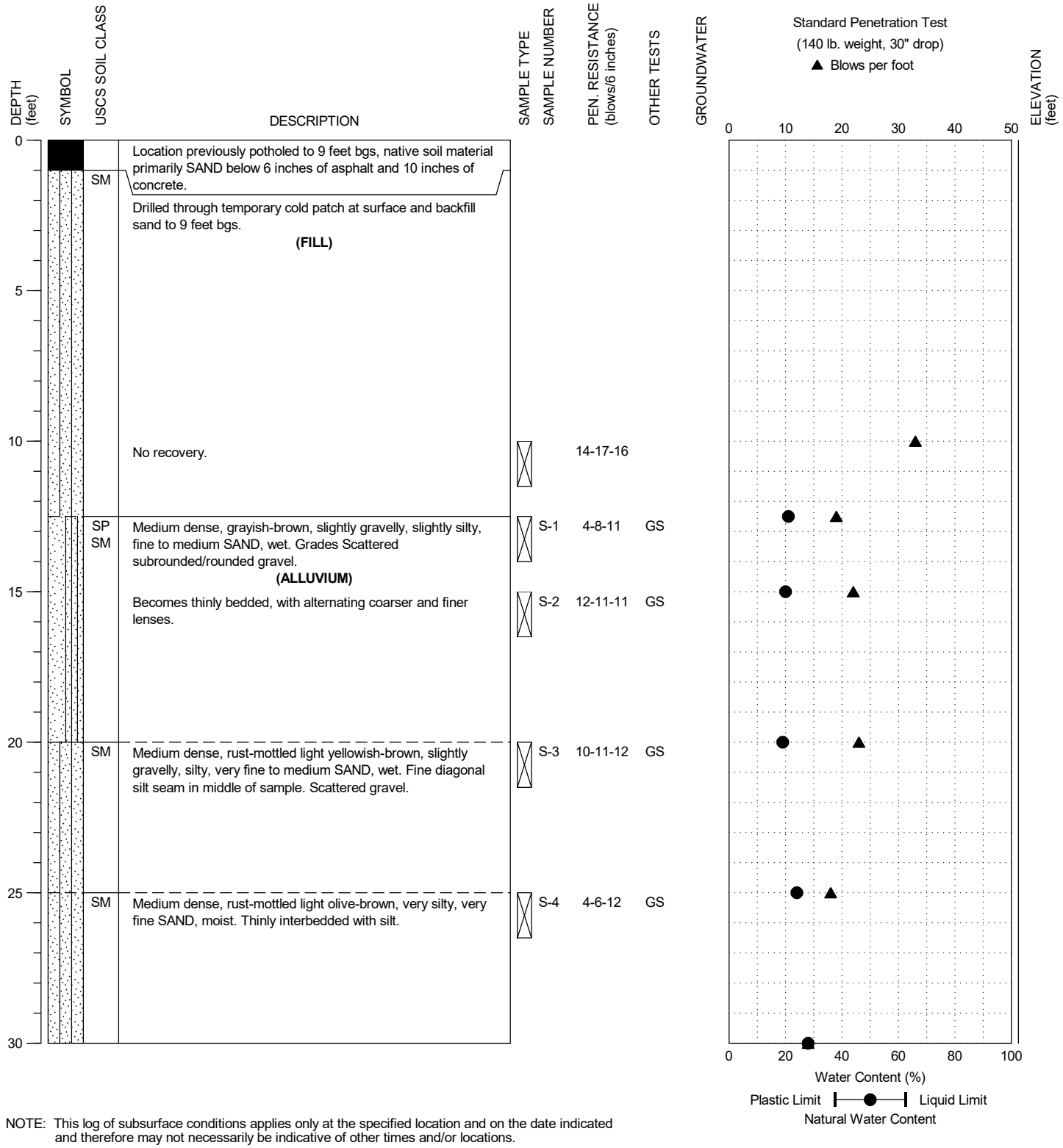
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/20/2020
DATE COMPLETED: 12/20/2020
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

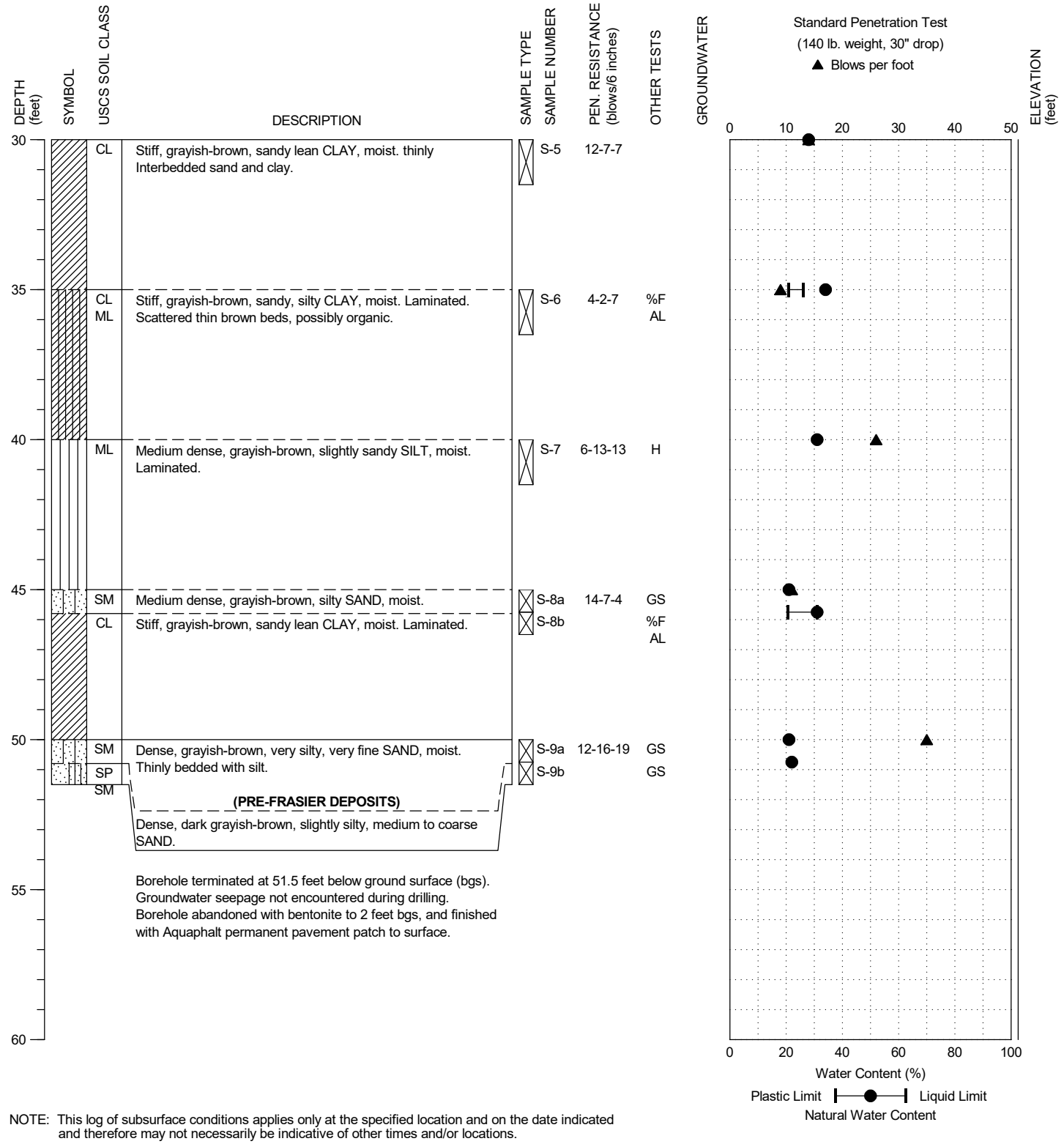
Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
BH-6

PROJECT NO.: 2017-134-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 12/20/2020
DATE COMPLETED: 12/20/2020
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

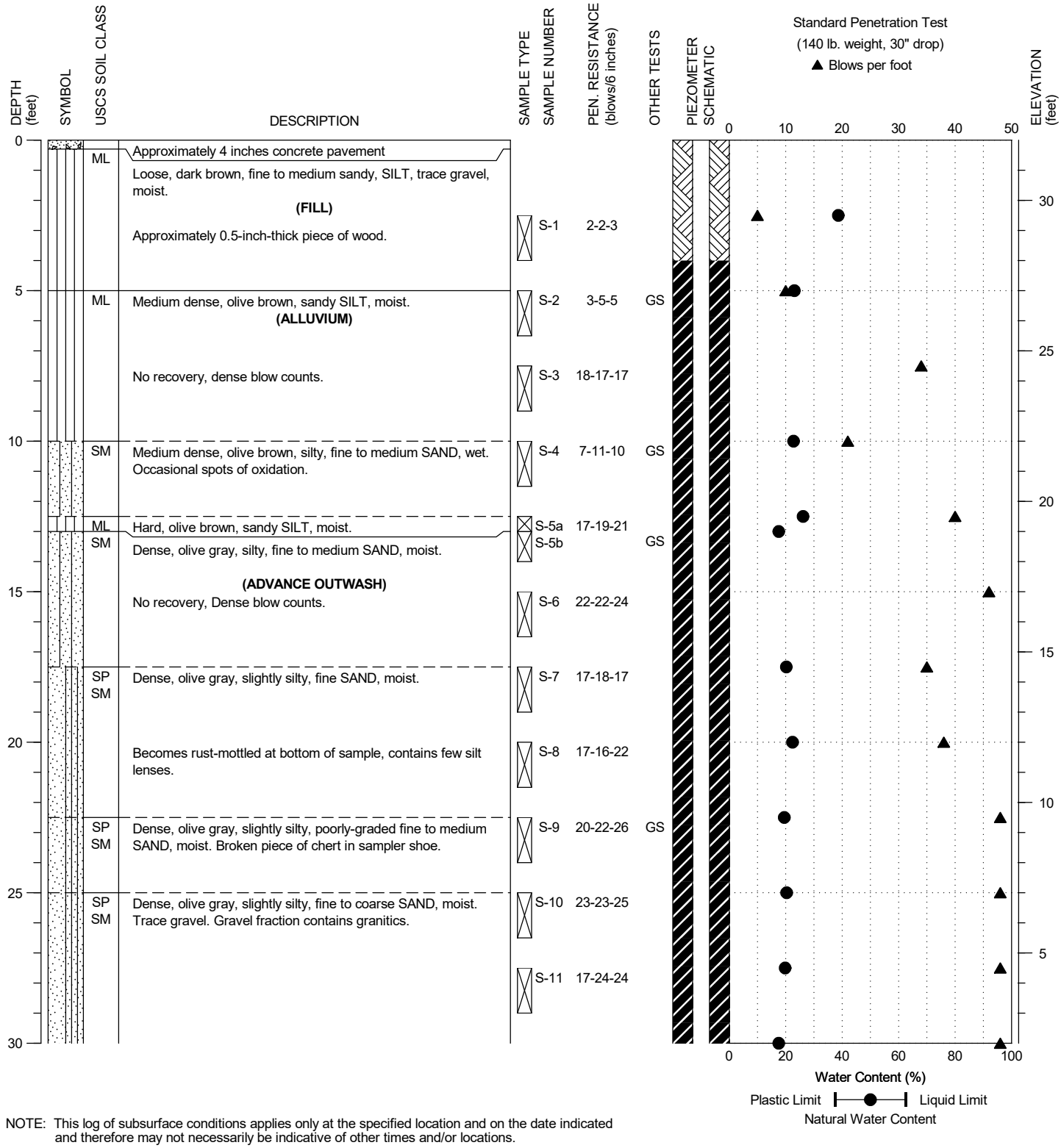
BORING:
BH-6

PROJECT NO.: 2017-134-21 FIGURE: A-8

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

DATE STARTED: 7/6/2020
DATE COMPLETED: 7/6/2020
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 32.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

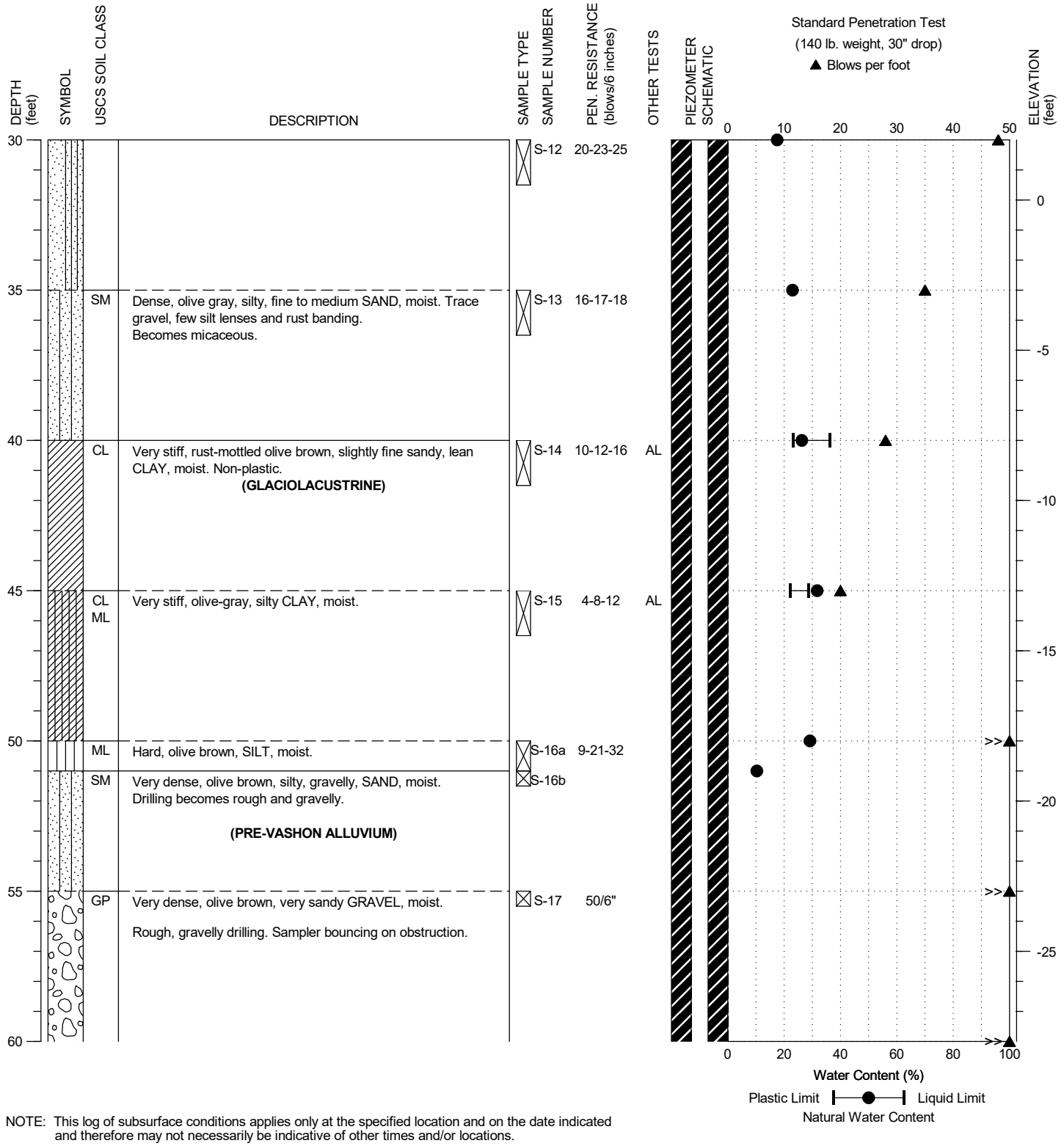
BORING:
BH-8

PROJECT NO.: 2017-134-21 FIGURE: A-10

PZO-DSM 2017-134.GPJ 5/14/21

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

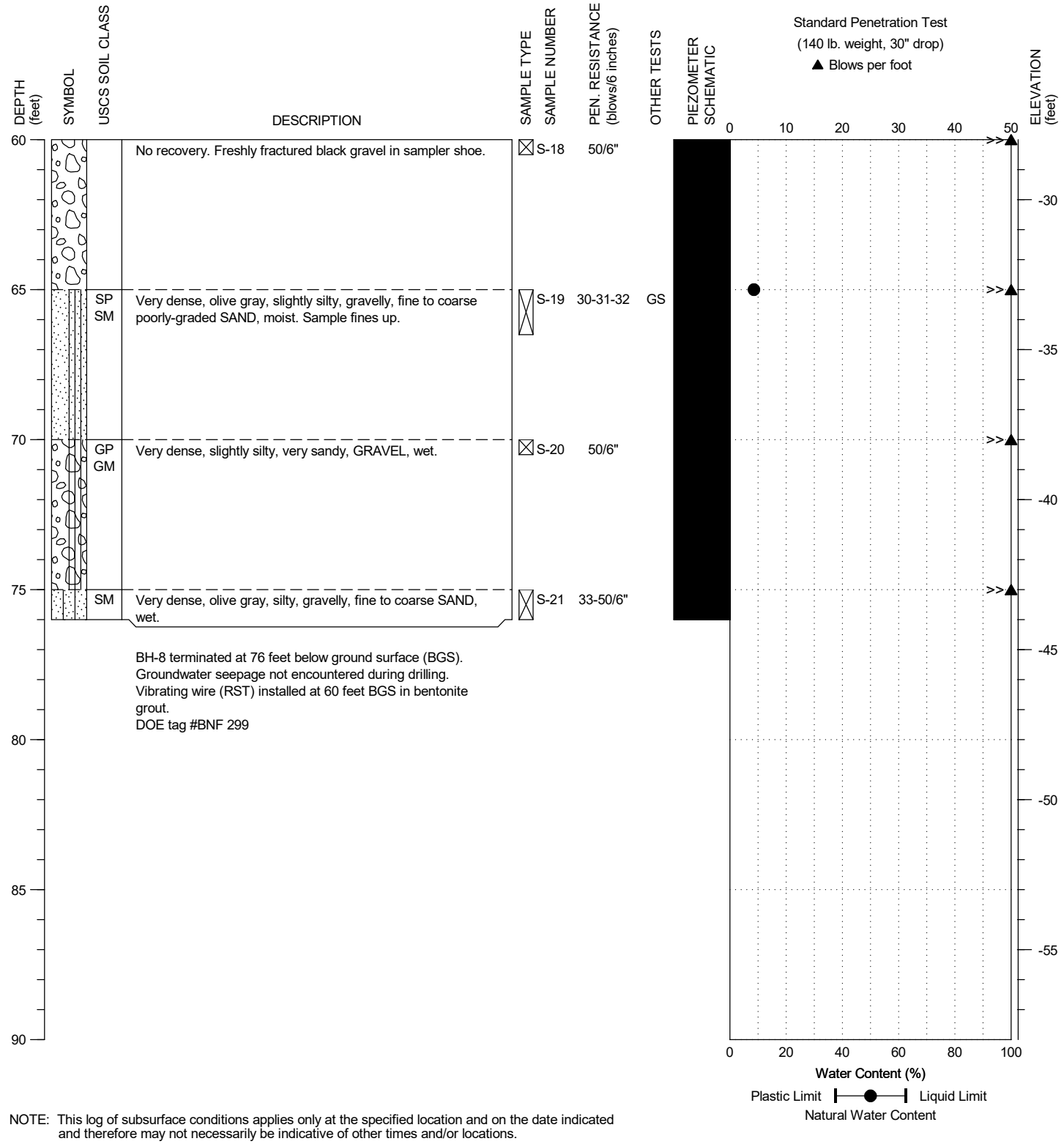
DATE STARTED: 7/6/2020
DATE COMPLETED: 7/6/2020
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 32.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: Mud Rotary, Diedrich D-120 Truck Rig
SAMPLING METHOD: SPT w/Autohammer
LOCATION: See Figure 2

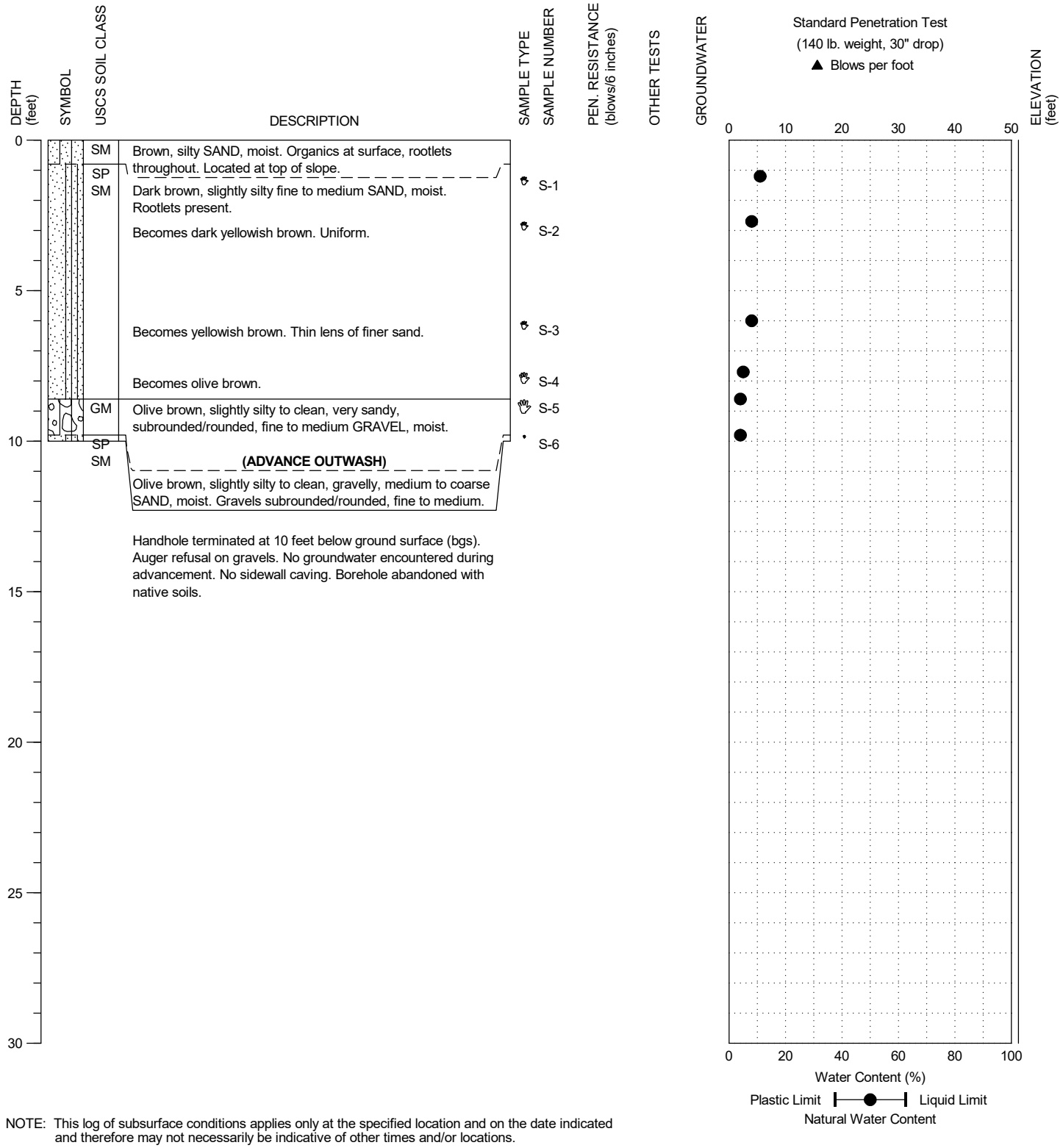
DATE STARTED: 7/6/2020
DATE COMPLETED: 7/6/2020
LOGGED BY: M.A. Benson
SURFACE ELEVATION: 32.0 ± feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

DRILLING COMPANY: HWA GeoSciences Inc.
DRILLING METHOD: Hand Auger
SAMPLING METHOD: Grab Sample
LOCATION: See Figure 2

DATE STARTED: 2/25/2021
DATE COMPLETED: 2/25/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

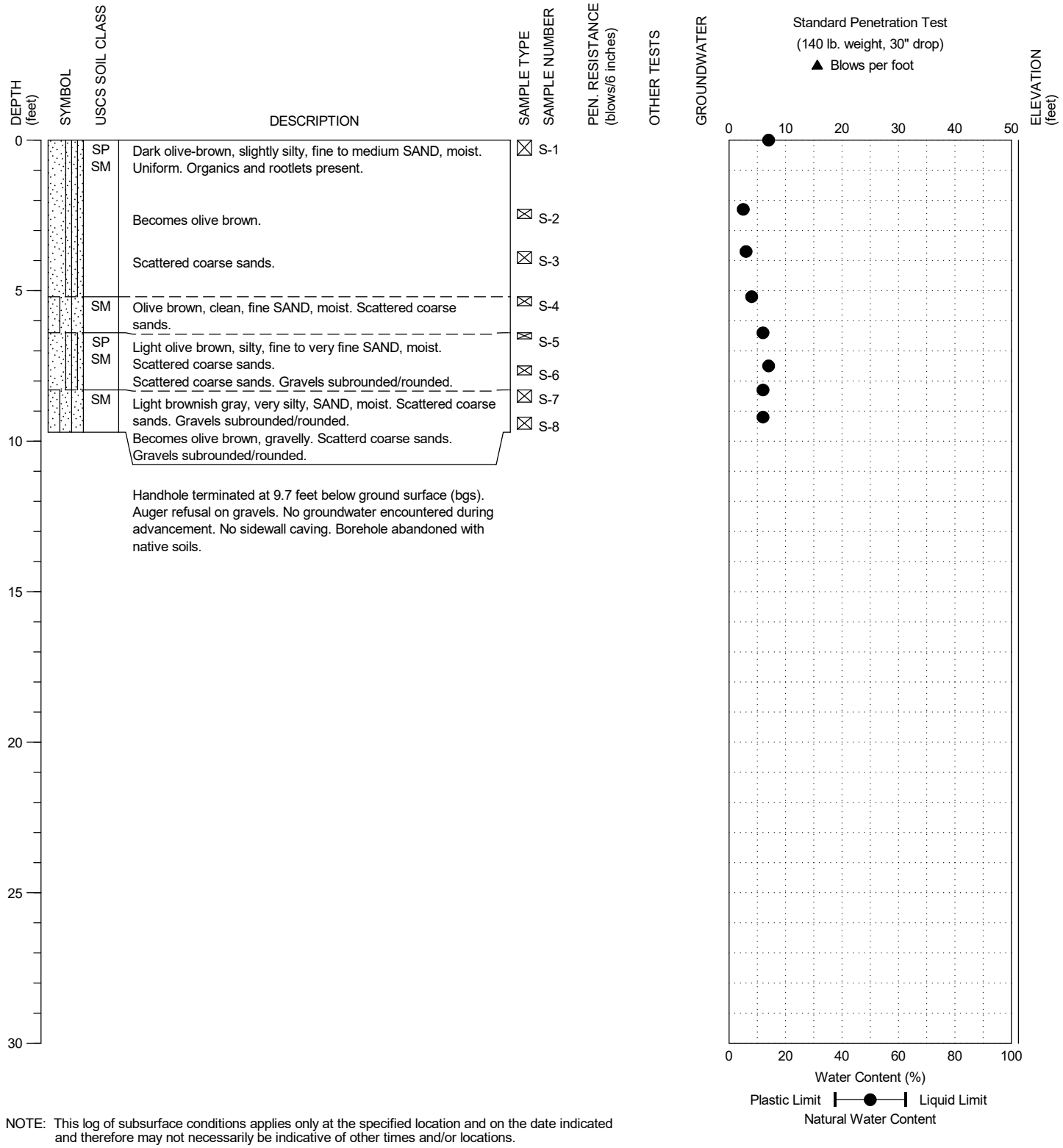
BORING:
HH-1

PROJECT NO.: 2017-134-21 FIGURE: A-13

BORING-DSM 2017-134.GPJ 3/1/24

DRILLING COMPANY: HWA GeoSciences Inc.
DRILLING METHOD: Hand Auger
SAMPLING METHOD: Grab Sample
LOCATION: See Figure 2

DATE STARTED: 2/25/2021
DATE COMPLETED: 2/25/2021
LOGGED BY: A. Ong



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

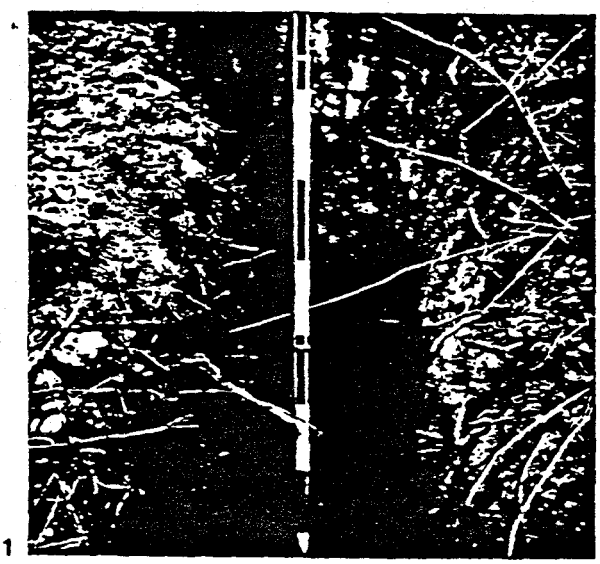
GeoSciences Inc.

Sound Transit - SR-522 / NE 145th BRT - Phase 2
King County, Washington

BORING:
HH-2

PROJECT NO.: 2017-134-21 FIGURE: A-14

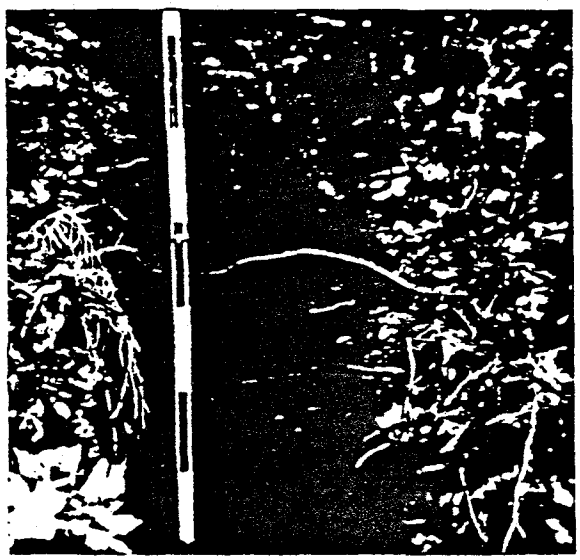
SOIL LOG ONE



Rod interval = 1 ft.

ELEV.	TEST NO.	DEPTH	STRATIGRAPHY ENCOUNTERED
	1		
104.6'		0-1.9'	Fill, some trash and construction debris, mostly silt loam, gray, plastic.
		1.9-4.0'	Gravelly sandy loam, moderately compact, cobbly, light brown.
		4.0'	Root mat.
		4.0-6.5'	Gravelly sandy loam, firmly aggregated peds, friable, mottled zones, reddish brown.
100.0'			
		6.5-9.7'	Gravelly sandy loam grading to loamy sand, grayish brown, structure grades from firmly aggregated peds to hard and massive.
			All soil in test pit stands at a high angle when cut. No ground water encountered.
95.0'			
94.9'	TH2		
94.0'		0-0.5'	Duff
		0.5-3.0'	Loamy sand and gravel, medium brown, somewhat loose, occasional cobble, dry, does not slough into hole.
			Hand dug pit on sideslope.
91.0'	TH1		
78.0'		0-2.0'	Loamy fine sand, light brown to buff, moderately compact, does not slough into hole. No ground water. Hand pit at slope base.
76.0'			

SOIL LOG TWO



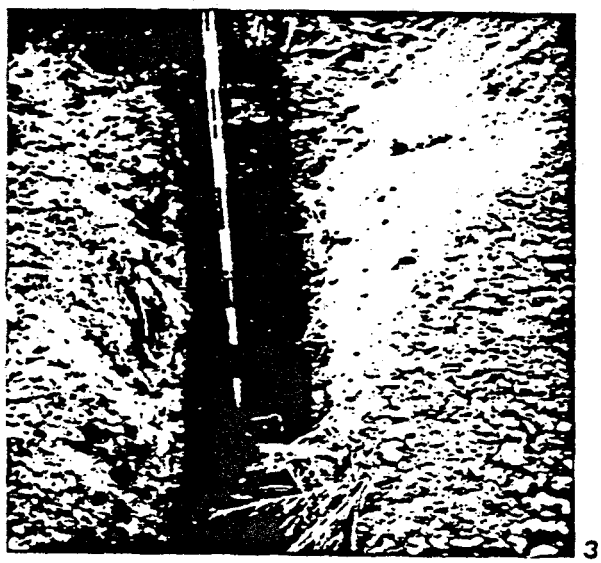
Rod interval = 1 ft.

ELEV.	TEST NO. 2	DEPTH	STRATIGRAPHY ENCOUNTERED
84.4'		0-3.0'	Fill, some trash and construction debris, mostly silt loam, plastic, gray.
		3.0-4.7'	Loamy sand and gravel, brown, loose, but held in place by extensive root mat.
		4.7-7.0'	Loamy sand and gravel, light brown, very loose, dry (dusty), sand is medium to coarse with cobbles and gravel (approx. 40%). Caves to low angle under root mat (≃ 45°).
80.0'			Soil horizons intersect topography, indicating amount of bank cut.
77.4'			

Silty sand

hole bottom

SOIL LOG THREE



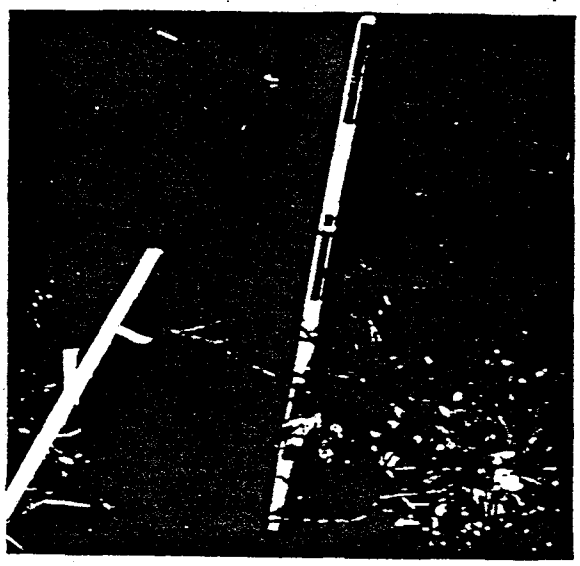
Rod interval = 1 ft.

ELEV.	TEST NO.	DEPTH	STRATIGRAPHY ENCOUNTERED
93.4'	3	0-2.7'	Loam, light grayish brown, slightly plastic, moderately compact.
		2.7-3.7'	Stratigraphy varies; east side of pit exposes silt loam, gray, plastic, compact, lens. west side of pit exposes gravelly sandy loam, light brown, moderately compact, with mottled coarse sand lenses containing ground water.
90.0'		3.7-5.5'	Gravelly sandy loam, moderately compact, grayish brown with interbedded mottled sand lenses.
		5.5-7.0'	Gravelly sandy loam grading to loamy sand, gray, grades grom moderately compact to firm friable peds.
85.4'		7.0-8.0'	Loamy fine sand, gray, firm, friable, massive.

Upper soil horizons absent from pit, indicating previous grading.

Ground water enters pit as minor seepage, and forms small slurries.

SOIL LOG FOUR

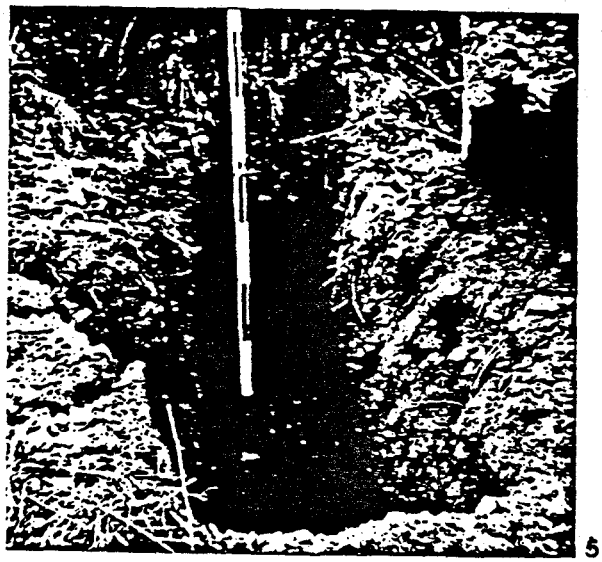


4

Rod interval = 1 ft.

ELEV.	TEST NO.	DEPTH	STRATIGRAPHY ENCOUNTERED
	4		
88.5'		0-3.0'	Loamy fine sand with medium sand interbedded, loose, light brown, spalls into pit, forms ~75° cut.
		3.0-5.0'	Silt loam, moist, slightly plastic, gray with mottled areas, loamy fine sand interbedded.
85.0'		5.0-7.5'	Gravelly sandy loam, medium brown, grades from friable peds to massive firm to very firm unweathered sediment, few large cobbles.
			Roots extend to 6 ft., no water enters test pit.
81.0'			
	TH3		
76.0'		0-2.0'	Silt loam and silty clay loam, fractured aggregated peds, slightly plastic, gray, looser soils form thin wire, dilatent.
75.0'			
74.0'			

SOIL LOG FIVE



Rod interval = 1 ft.

ELEV.	TEST NO.	DEPTH	STRATIGRAPHY ENCOUNTERED
105.3' 105.0'	5	0-4.9'	Fill, silt loam, moist, structure varies from loose to friable peds, uncompacted, forms tight cast, dilatent.
		4.9-7.0'	Silt loam, slightly gravelly, reddish brown with mottled areas, semi-compact with compact aggregated peds, non plastic, forms hackly fracture.
100.0'		7.0-10.0'	Silt loam, grades from fractured friable aggregates to massive and compact at base, lens of sand and gravel exposed on north side of pit at 8.8', gray with distinct mottles, few rounded cobbles, roots extend to 8.2'.
95.3'			

LOG OF EXPLORATION

DEPTH	USC	SOIL DESCRIPTION
HAND AUGER ONE		
0.0 - 0.5	SM	DARK BROWN SILTY FINE TO MEDIUM SAND WITH ORGANICS AND GRAVEL (LOOSE, DAMP) (TOPSOIL)
0.5 - 4.7	SP-SM	BROWN FINE TO MEDIUM SAND WITH GRAVEL, SILT, TRACE ORGANICS AND OCCASIONAL ASPHALT PIECES (~4"-8"), ONE PIECE OF BRICK (LOOSE, WET) (FILL)
		SAMPLES WERE COLLECTED AT 1.0-1.5, 2.0-2.5 AND 3.0-3.5 FEET PROBES TO 4.5 FEET AT 2 FEET NO GROUND WATER SEEPAGE WAS ENCOUNTERED HAND AUGER WAS COMPLETED AT 4.7 FEET DUE ASPHALT PIECE ON 5/8/97
HAND AUGER TWO		
0.0 - 2.5	SP-SM	BROWN FINE TO MEDIUM SAND WITH SILT, GRAVEL AND COBBLES (3"-5") (MEDIUM DENSE, MOIST) (FILL)
		SAMPLE COLLECTED AT 0.5-1.0 FEET PROBES TO 4 FEET AT 2 FEET NO GROUND WATER SEEPAGE WAS ENCOUNTERED HAND AUGER CAVING WAS ENCOUNTERED AT 2 FEET HAND AUGER COMPLETED AT 2.5 FEET DUE TO CAVING ON 5/8/97
HAND AUGER THREE		
0.0 - 2.6	ML	BROWN SILT WITH VERY FINE SAND WITH ROOTS AND OCCASIONAL ROUND COBBLES (SOFT, MOIST TO WET) (FILL)
2.6 - 4.0	ML	BROWN SILT WITH VERY FINE SAND AND TRACE ORGANICS (SOFT, MOIST TO WET)
4.0 - 7.0	SP-SM	GRAY FINE TO MEDIUM SAND WITH SILT AND OCCASIONAL ROOT ZONES (LOOSE TO MEDIUM DENSE, WET)
		SAMPLES COLLECTED AT 2.0-2.5, 3.3-3.6, 4.2-4.6, 5.3-5.6, AND 6.6-7.0 FEET GROUND WATER OBSERVED AT 5.3 FEET HAND AUGER COMPLETED AT 7.0 FEET DUE TO ROOT ON 5/8/97
HAND AUGER FOUR		
0.0 - 2.0	SM	BROWN SILTY FINE SAND WITH GRAVEL AND COBBLES (LOOSE, MOIST) (FILL)
2.0 - 3.0	SP-SM	LIGHT BROWN AND ORANGE FINE SAND WITH SILT (LOOSE, MOIST) ZONES OF BROWN SILT WITH TRACE ORGANICS
3.0 - 5.0	SM/ML	BROWN SILTY FINE SAND TO SANDY SILT (LOOSE TO MEDIUM STIFF, MOIST)
5.0 - 6.5	SM	BROWN SILTY SAND WITH TRACE ORGANICS (LOOSE TO MEDIUM DENSE, WET)
6.5 - 7.0	SP-SM	GRAY FINE TO MEDIUM SAND WITH SILT (LOOSE TO MEDIUM DENSE, WET)
7.0 - 8.0	SW	REDDISH-GRAY FINE TO COARSE SAND WITH GRAVEL AND TRACE SILT (LOOSE TO MEDIUM DENSE, WET)
		SAMPLES COLLECTED AT 1.5-2.0, 2.0-2.5, 3.0-3.5, 5.0-5.5, 6.3-6.8, AND 7.0-7.5 FEET GROUND WATER OBSERVED AT 5.5 FEET HAND AUGER COMPLETED AT 8.0 FEET ON 5/8/97

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS MORE THAN 50% PASSES NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY LIQUID LIMIT 50 OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-90.
2. Soil classification using laboratory tests is based on ASTM D2487-90.
3. Descriptions of soil density or consistency are based on interpretation of blowcount data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp, but no visible water

Wet - Visible free water or saturated, usually soil is obtained from below water table

GeoEngineers

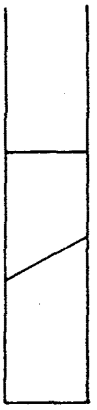
SOIL CLASSIFICATION SYSTEM

FIGURE A-1

LABORATORY TESTS:

AL	Atterberg limits
CP	Compaction
CS	Consolidation
DS	Direct shear
GS	Grain – size
%F	Percent fines
HA	Hydrometer analysis
SK	Permeability
SM	Moisture content
MD	Moisture and density
SP	Swelling pressure
TX	Triaxial compression
UC	Unconfined compression
CA	Chemical analysis

SOIL GRAPH:



SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

BLOW-COUNT/SAMPLE DATA:

Blows required to drive a 2.4-inch I.D. split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches.

22 ■ Location of relatively undisturbed sample

12 ⊠ Location of disturbed sample

17 □ Location of sampling attempt with no recovery

Blows required to drive a 1.5-inch I.D. (SPT) split-barrel sampler 12 inches or other indicated distances using 140-pound hammer falling 30 inches.

10 ◨ Location of sample obtained in general accordance with Standard Penetration Test (ASTM D-1586) procedures

26 ◫ Location of SPT sampling attempt with no recovery

Location of grab sample

"P" indicates sampler pushed with weight of hammer or against weight of drill rig.

NOTES:

1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.

2. Soil classification system is summarized in Figure A-1.

GEI 86-88 Rev. 6/90

Geo Engineers

KEY TO BORING LOG SYMBOLS

FIGURE A-2

TEST DATA

BORING B-4

Lab Tests	Moisture Content (%)	Dry Density (pcf)	Blow Count	Samples	Group Symbol	DESCRIPTION
						Surface Elevation (ft.) : 29.0 Elevations based on datum used in Figure 2
					SP–SM	3 inches asphalt concrete Black fine to medium sand with silt and gravel (loose, moist) (fill)
			4	■	ML/SM	Brown silt with fine sand and brown silty fine sand with occasional gravel (soft/loose, moist)
MD, DS, GS	28	98	13	■	SP	Gray fine to medium sand with occasional gravel and a trace of silt (medium dense, wet)
					SP	Grayish brown fine to medium sand with a trace of silt (loose, wet)
MD	29	92	6	■		
					SP/SM	Grayish brown fine to medium sand with pockets of brown silty fine sand (medium dense, wet)
MD	22	105	24	■		
					SP–SM	Brown fine to medium sand with silt (medium dense, wet)
			17	■	SM	Gray silty fine sand (medium dense, wet)
			16	■	SM/SP	Gray silty fine sand with lenses of gray fine to medium sand (medium dense, wet)
					ML	Gray silt (medium stiff, wet)
			9	■		
						Gray fine sand with silt interbedded with gray silt with fine sand (loose/soft, wet)
MD	26	100	4	■		

DEPTH IN FEET: 0, 5, 10, 15, 20, 25, 30, 35, 40

Note: See Figure A-2 for explanation of symbols

:SBM:CMS 3/11/93

0146-060-R02

Geo Engineers

LOG OF BORING

FIGURE A-6

TEST DATA

BORING B-4
(Continued)

Lab Tests	Moisture Content (%)	Dry Density (pcf)	Blow Count	Samples	Group Symbol	DESCRIPTION
			11	⊠	SP	Gray fine to medium sand with a trace of silt (medium dense, wet)
MD	20	108	16	■	SP/ML	Gray fine to medium sand with a trace of silt interbedded with gray silt with fine sand (medium dense/stiff, wet)
			33	■	SP	Gray fine to medium sand (dense, wet)

Boring completed at 54.0 feet on 02/16/93
Ground water encountered at 7.4 feet during drilling

DEPTH IN FEET

40 45 50 55 60 65 70 75 80

Note: See Figure A-2 for explanation of symbols

Geo Engineers

LOG OF BORING

FIGURE A-6

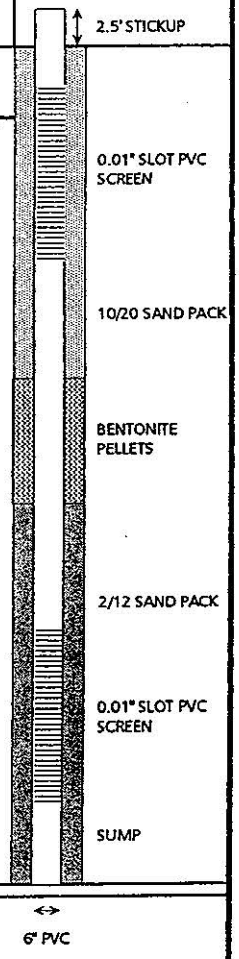
SBM:CMS 3/11/93

0146-060-102

DATE DRILLED:	8/14/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA
DEPTH TO GROUNDWATER:	≅ 3' Below Ground Surface

DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE
Concrete 3"			
SAND, fine to coarse with minor silt, minor Gravel, moist	Brown		Fill
SAND, fine to medium, minor Gravel, wet, high % is fine Sand, wet	Brown		SP

DEPTH (FEET)	SAMPLER	BLOWS/FOOT	OVM (ppm)	WATER LEVEL
2	*		NT	
4	*		NT	
6				
8				
10	*		1.7	
12				
14				
16	*		2	
18				
20	*		1	
22				
24	*		0	



PIEZOMETER CONSTRUCTION

BOTTOM OF WELL @ 25'

* Indicates Grab Sample

WASATCH ENVIRONMENTAL, INC.

WELL LOG

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 1

S:\1404.drw

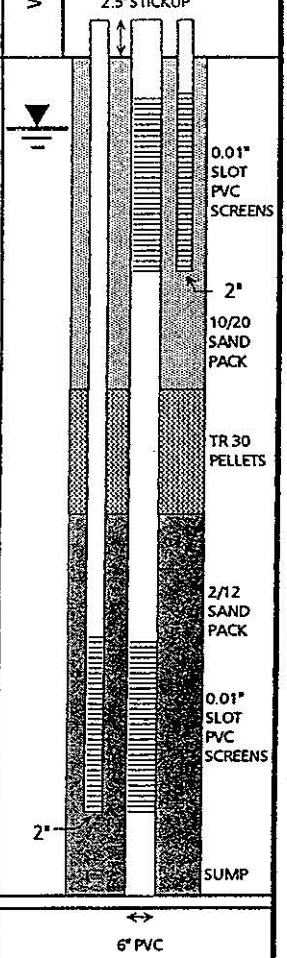
DATE DRILLED:	8/14/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA; Pilot with 4.25" HSA and 2" Spoons
DEPTH TO GROUNDWATER:	≅ 3' Below Ground Surface

DESCRIPTION AND CLASSIFICATION

DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE	DEPTH (FEET)	SAMPLER	BLOWS/FOOT	OVM (ppm)
Concrete 6"							
SAND, with Silt, Gravel, moist to wet	Brown		Fill	2			
SAND, fine to medium with minor Gravel, wet, high % is fine Sand	Brown	Medium Dense	SP	4		6 6 7	0
				6			
				8			
		Very Dense		10		20 30+ -	0
				12			
				14			
				16		24 30+ -	0
				18			
slightly higher % medium grained Sand than above				20		19 30+ -	0
				22			
SAND, fine to coarse with Gravel, wet	Dark Brown	Very Dense	SW	24		11 30+ -	0

WATER LEVEL

PIEZOMETER CONSTRUCTION



BOTTOM OF WELL @ 25'

Indicates split-spoon sampler

WASATCH ENVIRONMENTAL, INC.

WELL LOG

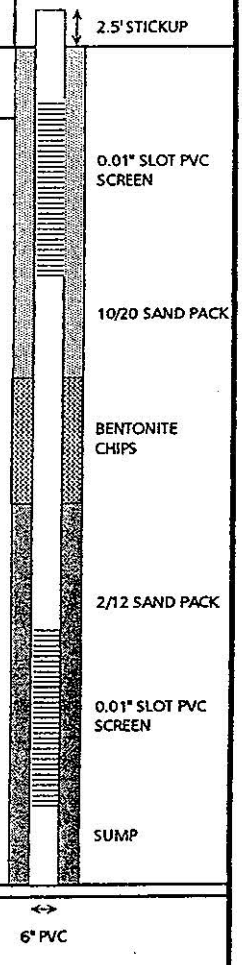
MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 2

S:\1404.drw

DATE DRILLED:	8/13/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA
DEPTH TO GROUNDWATER:	≅ 3' Below Ground Surface

DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE	DEPTH (FEET)	SAMPLER	BLOWS/FOOT	OVM (ppm)
Concrete 6"							
SAND, fine to coarse with Gravel, moist to wet	Brown		Fill	2			
SAND, fine to medium, with Gravel and minor % silt, wet, large % is fine Sand	Brown		SP	4	*		0
				6			
				8	*		1.2
				10			
				12			
				14	*		1.8
				16			
				18			
				20			
				22	*		0
Clayey SILT, wet, observed on bottom 2' of lead auger	Dark Brown		ML	24			



BOTTOM OF WELL @ 25'

* Indicates Grab Sample

Some heaving when pulling augers from 25-20 feet

WASATCH ENVIRONMENTAL, INC.

WELL LOG

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 3

S:\1404.drw

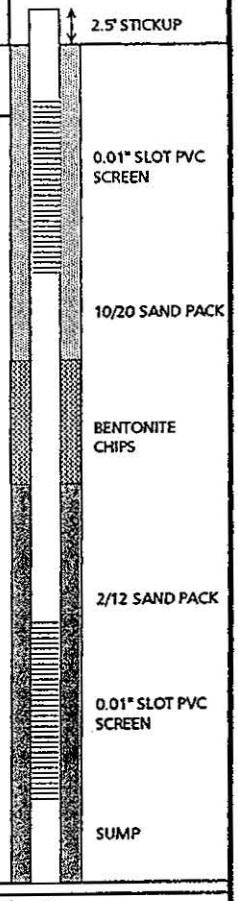
DATE DRILLED:	8/13/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA; Pilot with 4.25" HSA and 2" Spoons
DEPTH TO GROUNDWATER:	≅ 3' Below Ground Surface

DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE	DEPTH (FEET)	SAMPLER	BLOWS/FOOT	OVM (ppm)
Concrete 6"				2			
SAND, fine to medium, minor Gravel, moist to wet, 2" of rounded pea gravel at bottom of split spoon	Brown	Medium Dense	Fill	4		3 5 7	0.5
SAND, fine to medium, minor Gravel, wet, large % is fine Sand	Brown	Very Dense	SP	6 8 10		27 23+ -	0
no Gravel present		Medium Dense		12 14 16		7 11 6	0
SAND, fine to coarse with Gravel, wet	Dark Brown	Very Dense	SW	18 20		30 20+ -	0.5
Clayey SILT, wet, observed on bottom 2' of lead auger	Gray		ML	22 24			
BOTTOM OF WELL @ 25'							

Indicates split-spoon sampler

WATER LEVEL

PIEZOMETER CONSTRUCTION



WELL LOG

WASATCH ENVIRONMENTAL, INC.

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 4

S:\1404.drw

DATE DRILLED:	8/16/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA; Pilot with 4.25" HSA and 2" Spoons
DEPTH TO GROUNDWATER:	≅ 4.5' Below Ground Surface

DESCRIPTION AND CLASSIFICATION

DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE
Grass SAND, fine to coarse, with Gravel and Cobble	Brown		Fill
SAND, fine, with lenses of silt, wet	Gray Brown (lenses)		SP ML (lenses)
SAND, fine to coarse, with Gravel, wet	Dark Brown Gray		SW
SAND, fine to coarse, with minor Gravel, wet large % is fine Sand	Gray		SP
BOTTOM OF WELL @ 25'			

DEPTH (FEET): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

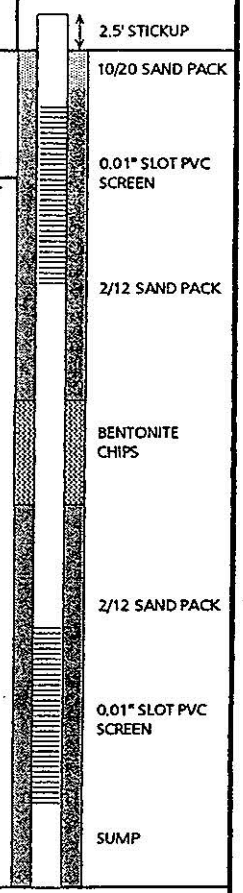
SAMPLER

BLOWS/FOOT: 3, 5, 5, 14, 15, 19, 10, 11, 13

OVM (ppm)

WATER LEVEL

PIEZOMETER CONSTRUCTION



Indicates split-spoon sampler

WASATCH ENVIRONMENTAL, INC.

WELL LOG

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 5

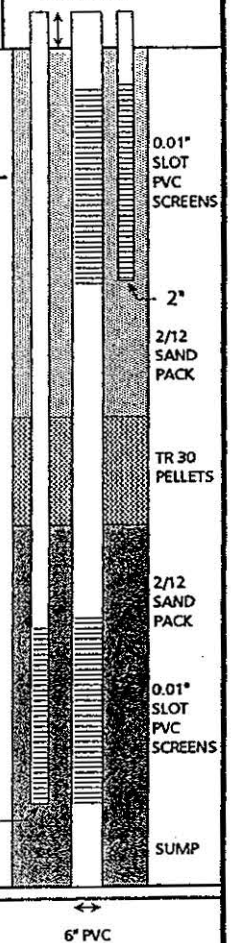
S:\1404.drw

DATE DRILLED:	8/15/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA; Pilot with 4.25" HSA and 2" Spoons
DEPTH TO GROUNDWATER:	≅ 4.5' Below Ground Surface

DESCRIPTION AND CLASSIFICATION

DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE	DEPTH (FEET)	SAMPLER	BLOWS/FOOT	OVM (ppm)	WATER LEVEL
Asphalt 2"								
GRAVEL, with Sand	Brown		Fill	2				
SAND, fine to medium, with Gravel, and Cobble, wet, large % is fine Sand	Brown		SW	4				
				6		15 18 20		
SAND, fine with minor Silt, wet	Gray		SM	8				
SAND, fine, wet	Gray		SP	10		11 11 11		
				12				
				14				
SAND, fine to medium, wet						15 35+ -		
				16				
GRAVEL, with medium to coarse Sand, wet	Gray		GW					
SAND, fine to coarse, with Gravel, wet	Brown to Black		SW	18				
				20		23 27+ -		
				22				
				24		27 23+ -		2"

PIEZOMETER CONSTRUCTION



BOTTOM OF WELL @ 25'

Indicates split-spoon sampler

WASATCH ENVIRONMENTAL, INC.

WELL LOG

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 6

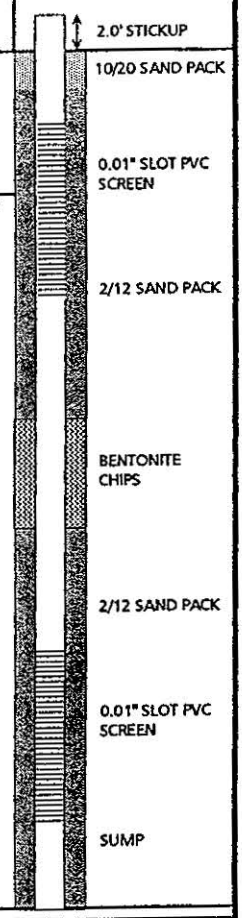
S:\1404.drw

DATE DRILLED:	8/15/01
LOGGED BY:	LBB
REFERENCE ELEVATION:	
DRILL RIG:	CME 75
BORING DIAMETER:	15" 10.25" ID HSA
DEPTH TO GROUNDWATER:	≅ 5' Below Ground Surface

DESCRIPTION AND CLASSIFICATION			
DESCRIPTION AND REMARKS	COLOR	CONSIST.	TYPE
SAND, fine to coarse, with Gravel and Cobble, moist, large % is fine Sand	Brown		Fill
SAND, fine to coarse, with Gravel and Cobble, wet			SW
SAND, fine to coarse, with minor Gravel, wet, large % is fine Sand	Brown		SP
SAND, fine to coarse, wet	Brown		SW

DEPTH (FEET): 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

SAMPLER | BLOWS/FOOT | OVM (ppm) | WATER LEVEL



BOTTOM OF WELL @ 25.5'

Indicates split-spoon sampler

WASATCH ENVIRONMENTAL, INC.

WELL LOG

MAGIC CLEANERS
LAKE FORREST PARK, WASHINGTON

PROJECT NO.: 1494-02 | WELL NO.: DDC 7

S:\1404.drw

LOG OF BORING NO. B-1

CLIENT: **MacLeod Reckord**

SITE: **Lake Forest Park, Washington**

PROJECT: **Burke Gilman Trail**

Boring Location: Lyon's Creek Bridge

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS	TESTS
	0.5 Grass over **SILTY SAND,** with abundant roots, dark brown, loose, moist to wet (Topsoil)										
	SILTY SAND, dark brown, loose, moist to wet (Probable Fill)										
	5.5 grades to black	5	SP	1	SS	12	11	13			
	POORLY GRADED SAND, fine to medium with trace coarse, with silt, trace gravel, brown, medium dense, moist ▽										
	grades to saturated, silty	10	SM	2	SS	6	22				
	grades to trace silt, no gravel, dense	15	SP	3	SS	12	37				
	grades to with silt, trace gravel, medium dense	20	SP	4	SS	12	26	17			
	25	25									

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 8.0	WD	▼
WL	▼		▼
WL	WD - While Drilling		

ZZA-Terracon
18905 33rd Avenue West, Ste. 117
Lynnwood, WA 98036
T: (425) 771-3304 F: (425) 771-3549

BORING STARTED	5-21-07		
BORING COMPLETED	5-21-07		
RIG	Volvo	CO.	Boretec
LOGGED	BAG	JOB #	81052367

LOG OF BORING NO. B-1

CLIENT: **MacLeod Reckord**

SITE: **Lake Forest Park, Washington**

PROJECT: **Burke Gilman Trail**

DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf
grades to gravelly, dense		SP	5	SS	12	33		
	30							
30.5								
31 **SILTY CLAY,** with fine sand laminae, gray, very stiff, saturated		CL	6	SS	18	19		
SILTY SAND, fine to medium, brown, medium dense, saturated								
grades to trace gravel, dense	35	SM	7	SS	12	38		
grades to medium dense	40	CL	8	SS	12	13		
41								
41.5 **SILTY CLAY,** laminated with fine sand, gray, stiff, saturated								
SILTY SAND, brown, medium dense, saturated								
	45	CL	9	SS	12	17		
46								
46.5 **SILTY CLAY,** laminated with fine to coarse sand, gray, very stiff, saturated								
SILTY SAND, brown, medium dense, saturated								
	50							

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 8.0	WD	▼
WL	▼		▼
WL	WD - While Drilling		

ZZA-Terracon
18905 33rd Avenue West, Ste. 117
Lynnwood, WA 98036
T: (425) 771-3304 F: (425) 771-3549

BORING STARTED	5-21-07		
BORING COMPLETED	5-21-07		
RIG	Volvo	CO.	Boretec
LOGGED	BAG	JOB #	81052367

LOG OF BORING NO. B-1

CLIENT
MacLeod Reckord

SITE
Lake Forest Park, Washington

PROJECT
Burke Gilman Trail

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf
	51		SM	10	SS	18	15	20	
	SILTY CLAY, gray, stiff to very stiff, saturated	55	CL	11	SS	18	23		
	61	60	SM	12	SS	12	46		
	61.5 **SILTY SAND,** fine, gray and brown, dense, saturated **BOTTOM OF BORING**								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 8.0	WD	▼
WL	▼		▼
WL	WD - While Drilling		

ZZA-Terracon
18905 33rd Avenue West, Ste. 117
Lynnwood, WA 98036
T: (425) 771-3304 F: (425) 771-3549

BORING STARTED			5-21-07
BORING COMPLETED			5-21-07
RIG	Volvo	CO.	Boretec
LOGGED	BAG	JOB #	81052367

LOG OF BORING NO. B-2

CLIENT
MacLeod Reckord

SITE
Lake Forest Park, Washington

PROJECT
Burke Gilman Trail

Boring Location: Lyon's Creek Bridge

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS	TESTS
	0.3 3 inches **ASPHALT**										
	POORLY GRADED SAND WITH GRAVEL AND SILT, brown, loose, moist to wet (Probable Fill)										
	6	5	SP SM	1	SS	12	6	12			
	POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium with trace coarse, brown, loose, saturated ▽										
	grades to medium dense	10	SP SM	2	SS	18	24	19			
	grades to trace silt, trace gravel	15	SP	3	SS	18	26				
		20	SP	4	SS	12	25				
	25	25									

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 7.0	WD	▼
WL	▼		▼
WL	WD - While Drilling		

ZZA-Terracon
18905 33rd Avenue West, Ste. 117
Lynnwood, WA 98036
T: (425) 771-3304 F: (425) 771-3549

BORING STARTED			5-21-07
BORING COMPLETED			5-21-07
RIG	Volvo	CO.	Boretec
LOGGED	BAG	JOB #	81052367

LOG OF BORING NO. B-2

CLIENT: **MacLeod Reckord**

SITE: **Lake Forest Park, Washington**

PROJECT: **Burke Gilman Trail**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS	TESTS
	grades to silty, gray, dense		SM	5	SS	18	33				
	grades to with silt, brown	30	SP SM	6	SS	18	49				
	35.5	35	ML	7	SS	12	31				
	36.5 **CLAYEY SILT,** with trace sand, brown, very stiff, saturated										
	BOTTOM OF BORING										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 7.0	WD	▼
WL	▼		▼
WL	WD - While Drilling		

ZZA-Terracon
18905 33rd Avenue West, Ste. 117
Lynnwood, WA 98036
T: (425) 771-3304 F: (425) 771-3549

BORING STARTED			5-21-07
BORING COMPLETED			5-21-07
RIG	Volvo	CO.	Boretec
LOGGED	BAG	JOB #	81052367