**ADDENDUM NO. 1**

CONFEDERATED TRIBES OF THE CHEHALIS RESERVATION
ANDERSON ROAD RESTORATION

**DATE: MAY 4, 2026**

This addendum is issued for the purpose of clarification and/or revisions to the Project Manual, Drawings, and related Contract Documents. Receipt of addendum shall be noted on the Bid Form. The General Contractor and Subcontractors shall review each item of the addendum and provide the coordination, accessories, hook-ups, and other work necessary to have a complete and properly functioning installation of each addendum item. General Contractor and Subcontractors shall include in their bids all labor, materials, supervision, management, tools and equipment, incidental field design, goods and services and necessary incidentals for a complete and properly functioning installation of each addendum item.

**PROJECT MANUAL:**

1. **REPLACE:** Project Manual Table of Contents page i with revised Table of Contents, Attachment 1.
2. **REPLACE**: Form A: Bid Proposal/Schedule of Values page RFP-16 with revised Bid Proposal/Schedule of Values, Attachment 2.
3. **ADD**: Geotechnical Report by Sage Geotechnical, Attachment 3.

**CLARIFICATION QUESTIONS**:

1. Question: In the Bid Document page 21 of 133 Form A Bid Proposal, "Unit" of measurements are listed however no quantities are shown. Are we to put our total cost per bid item in the unit cost column?

   Answer: This is a lump sum bid. While the lump sum amount is the basis of award, bidders are required to provide a detailed breakdown of quantities, units, and unit costs on the bid form. This breakdown will be used for informational and comparative purposes, to assist with development of the Schedule of Values after award and may be referenced when evaluating pricing for change orders. The revised bid form includes a "quantity" column so that quantity multiplied by unit cost equals the total for each line item.

2. Question: For trenchless water main construction, could the steel casing be substituted with HDPE IPS SDR 11 (or approved equal) to allow the use of Directional Drilling?

   Answer: Yes, directional drilling would be allowed. If bidding the trenchless construction as directional drilling, please note as such next to item 14 on the bid form.

There are **24 Pages** to this addendum, including all attachments.

END OF ADDENDUM

# TABLE OF CONTENTS

**CONFEDERATED TRIBES OF THE CHEHALIS RESERVATION**

## ANDERSON ROAD RESTORATION

| ITEM # | WSDOT SPEC | DESCRIPTION | QTY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|---|
| | | **SECTION: 1 PREPARATION** | | | | |
| 1 | 1-09 | MOBILIZATION | | LS | | |
| 2 | 2-01 | CLEARING AND GRUBBING | | AC | | |
| 3 | 3-02/SPEC | PULVERIZE EXISTING ASPHALT SURFACE | | SY | | |
| | | **SECTION: 2 GRADING** | | | | |
| 4 | 3-03 | ROADWAY EXCAVATION INCL. HAUL | | CY | | |
| | | **SECTION: 7 WATER LINES** | | | | |
| 5 | 7-09 | BANK RUN GRAVEL FOR TRENCH BACKFILL | | CY | | |
| 6 | 7-09 | BLOWOFF ASSEMBLY | | EA | | |
| 7 | 7-09 | AIR AND VACUUM RELEASE VALVE 2 IN. | | EA | | |
| 8 | 7-12 | TAPPING SLEEVE & VALVE ASSEMBLY 8 IN. | | EA | | |
| 9 | 7-14 | FIRE HYDRANT ASSEMBLY | | EA | | |
| 10 | 7-09 | DUCTILE IRON PIPE FOR WATER MAIN 6 IN. DIAM | | LF | | |
| 11 | 7-09 | PVC PIPE FOR WATER MAIN 8 IN. DIAM | | LF | | |
| 12 | 7-11 | GATE VALVE 6 IN. | | EA | | |
| 13 | 7-12 | GATE VALVE 8 IN. | | EA | | |
| 14 | SPEC | TRENCHLESS CONSTRUCTION | | LF | | |
| | | **SECTION: 9 SURFACING** | | | | |
| 15 | 4-04 | CRUSHED SURFACING BASE COURSE | | TON | | |
| 16 | 4-04 | CRUSHED SURFACING TOP COURSE | | TON | | |
| | | **SECTION: 14 HOT MIX ASPHALT** | | | | |
| 17 | 5-04 | PLANING BITUMINOUS PAVEMENT | | SY | | |
| 18 | 5-04/SPEC | HMA CL. 1/2 IN. PG 58H-22 | | TN | | |
| | | **SECTION: 17 EROSION CONTROL AND ROADSIDE PLANTING** | | | | |
| 19 | 8-01 | EROSION CONTROL AND STORMWATER POLLUTION PREVENTION | | LS | | |
| | | **SECTION: 18 TRAFFIC** | | | | |
| 19 | 8-22 | PAINT LINE | | LF | | |
| 20 | 8-22 | PLASTIC CROSSWALK LINE | | SF | | |
| 21 | 8-22 | PAINTED STOP LINE | | LF | | |
| 22 | 8-20 | ILLUMINATION SYSTEM | | LS | | |
| 23 | SPEC | TRENCHLESS CONSTRUCTION | | LF | | |
| 24 | 2-04/SPEC | PROJECT TEMPORARY TRAFFIC CONTROL | | LS | | |
| | | **SECTION: 19 OTHER ITEMS** | | | | |
| 25 | 7-05 | ADJUST CATCH BASIN | | EA | | |
| 26 | 7-08 | GRAVEL BACKFILL FOR PIPE ZONE BEDDING | | CY | | |
| 27 | 1-05/SPEC | ROADWAY SURVEYING | | LS | | |
| 28 | 8-13 | ADJUST MONUMENT CASE AND COVER | | EACH | | |
| 29 | 1-07 | SPCC PLAN | | LS | | |
| 30 | SPEC | JOINT UTILITY TRENCH | | LS | | |
| 31 | 3-01 | ROADSIDE CLEANUP | | EST | | |
| 32 | 1-04 | MINOR CHANGE | 1 | LS | $10,000 | $10,000 |
| | | SUBTOTAL | | | | |

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DRAFT TECHNICAL MEMORANDUM

**TO:** Brandon Johnson, PE, Principal, JSA Civil, LLC

**FROM:** Lance Levine, PE

**DATE:** June 13, 2025

**RE:** Summary of Geotechnical Engineering Services
Anderson Road Restoration
Oakville, Washington
Sage Project No. 017016

## INTRODUCTION

This memorandum summarizes the results of geotechnical engineering services provided by Sage Geotechnical, LLC (Sage) in support of the Anderson Road Restoration project in Oakville, Washington (site; Figure 1). Services were performed in accordance with the scope outlined in the amended consultant agreement between Sage and JSA Civil, LLC (JSA, project civil engineer), dated April 15, 2025.

This memorandum has been prepared with information provided by JSA and with data collected during Sage's geotechnical field exploration and laboratory testing programs.

## PROJECT UNDERSTANDING

Sage understands that Chehalis Tribal Planning (Tribe, project owner) has requested an assessment of the pavement along Anderson Road Southwest. Cracks were observed in the segment of roadway between U.S. Highway 12 and 188th Avenue Southwest.

Anderson Road Southwest was paved in, or around, 2004; in 2017, a pavement overlay was applied to the southern stretch of the roadway. The roadway centerline forms the border between Thurston and Grays Harbor counties. The counties shared construction and maintenance responsibilities before ownership of the roadway was transferred to the Tribe.

The Tribe proposes to repair or replace pavement along Anderson Road Southwest, to bury overhead power lines, and to construct a waterline along the roadway. The waterline will be installed using trench and horizontal boring methods.

## SITE CONDITIONS

The segment of Anderson Road Southwest between U.S. Highway 12 and 188th Avenue Southwest measures approximately 4,200 feet (ft) long and crosses three concrete bridges. The roadway includes two travel lanes with shoulders and turn lanes at each end. The travel and turn lanes exhibit significant cracking and other indicators of pavement distress. Anderson Road Southwest is generally flat and level with the exception of its southern end, which rises approximately 18 ft above the rest of the roadway.

# GEOLOGIC SETTING

Geologic information for the site and the surrounding area was obtained from the *Geologic Map of the Oakville and Rainbow Falls 7.5-minute Quadrangles, Lewis, Thurston, and Grays Harbor Counties, Washington* (Polenz et al. 2020). Surficial deposits in the vicinity of the site are mapped as alluvium (Qa), a unit that typically consists of well-rounded, poorly to moderately sorted sand and gravel. Vashon proglacial outwash (Qgo) is mapped at the southern end of the site and typically consists of floodplain (e.g., sand, silt, clay, and peat) and channel sediments (e.g., pebbles, cobbles, boulders, sand, silt, clay, and peat). The peat deposits (Qp) mapped beneath the northernmost bridge typically consist of peat, muck, silt, clay, and sand.

The subsurface conditions observed in Sage's May 2025 explorations were generally consistent with the mapped geology.

# SUBSURFACE CONDITIONS

On May 7 and 8, 2025, Sage's drilling subcontractor advanced eight hollow-stem auger borings (B-1 through B-8) in the pavement of Anderson Road Southwest. The borings extended 6.5 to 31.5 ft below ground surface (bgs). The approximate locations of the explorations are shown on Figures 2a and 2b.

Sage coordinated and monitored the field investigation and maintained detailed logs of the subsurface soil and groundwater conditions observed. Subsurface conditions were described using the soil classification system shown on Figure 3, in general accordance with ASTM International (ASTM) standard D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).* Summary logs of the explorations are presented on Figures 4 through 11.

A standard penetration test split-spoon sampler was used to collect soil samples from the borings, in general accordance with ASTM standard test method D1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.* Soil samples were transported to Sage's geotechnical laboratory for further examination and testing. Laboratory test results are presented on Figures 12 through 14.

## Soil Conditions

The soils observed underlying existing surface conditions (i.e., asphalt pavement) were categorized into three units:

- **Fill:** Fill was observed beneath the asphalt pavement in all of the borings. The fill typically consisted of brown, sandy crushed gravel in a dense, moist condition.
- **Alluvium:** Alluvium was observed beneath the fill in all of the borings except for boring B-8. The alluvium typically consisted of gray, brown, and reddish-brown sand and gravel with variable silt content but also included reddish-brown, sandy silt with gravel. The alluvium was in a loose to very dense, moist to wet condition.
- **Glacial outwash:** Glacial outwash was observed beneath the alluvium in borings B-2 through B-7 and beneath the fill in boring B-8. The glacial outwash typically consisted of sand and gravel with variable silt content in a medium dense, moist condition.

### Groundwater Conditions

During Sage's May 2025 field investigation, groundwater was observed at the depths noted in Table 1.

**Table 1. Groundwater Observations at Time of Drilling**

| Boring | Depth Below Grade (ft bgs) |
|---|---|
| B-1 | Not Observed |
| B-2 | 10.0 |
| B-3 | 12.5 |
| B-4 | 13.5 |
| B-5 | 14.0 |
| B-6 | 15.0 |
| B-7 | 15.0 |
| B-8 | Not Observed |

bgs = below ground surface
ft = feet

The groundwater conditions reported herein are for the specific dates and locations indicated and may not be representative of other locations and/or times. Groundwater conditions will vary depending on local subsurface conditions, weather conditions, and other factors. Site groundwater levels are expected to fluctuate seasonally, with maximum levels occurring during late winter and early spring.

## PAVEMENT ASSESSMENT

On January 29, 2025, Sage completed a pavement assessment of Anderson Road Southwest; the assessment was completed when temperatures at the site were below freezing, limiting Sage's ability to observe pavement conditions. A second pavement assessment was performed on June 6, 2025.

During its assessments, Sage observed extensive alligator, longitudinal, and transverse cracks in the travel and turn lanes of Anderson Road Southwest. Most of the alligator and longitudinal cracks were located in the wheel wells of each lane. Patched asphalt in the travel and turn lanes appeared to be performing well. Fewer cracks were observed in the pavement overlay along the southern reach of Anderson Road Southwest. The roadway shoulders were generally in good condition with small areas of alligator, longitudinal, and transverse cracks.

The pavement south of U.S. Highway 12 was in good condition, while cracks were observed along almost all of the pavement joints at 188th Avenue Southwest. Rutting, bleeding, and surface wear were also observed at this intersection.

Sealant had been used to fill cracks along the deck of the southernmost bridge but was not observed elsewhere. At several locations, vegetation could be seen growing through cracks in the roadway pavement. No significant potholes were observed.

Based on the subsurface conditions observed in Sage's May 2025 explorations, the roadway consists of 3 to 5 inches of asphalt pavement over approximately 12 inches of sandy crushed gravel fill. The pavement performance appeared to be mostly uniform, regardless of pavement thickness.

## PAVEMENT ANALYSIS

Although traffic loading data was not available at the time of this writing, JSA recommended using an average daily traffic count of 2,000 vehicles. The parameters in Table 2 were used to assess the lifespan of the pavement.

**Table 2. Pavement Analysis Parameters**

| | |
|---|---|
| **Average Daily Traffic Count** | 2,000 vehicles |
| **California Bearing Ratio** | 5 percent |
| **Growth Rate** | 2 percent |
| **Equivalent Single-Axle Loads** | 815,000 |
| **Level of Reliability** | 85 percent |
| **Terminal Serviceability Index** | 2 |

Sage's pavement analysis indicates that Anderson Road Southwest reached the end of its design life several years ago. As the pavement continues to age, the number and severity of cracks will increase, and pothole repairs will become a regular maintenance concern. Still, with proper maintenance, the existing pavement might last for several more years.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the results of Sage's pavement assessment, Anderson Road Southwest is in moderate to poor condition and has surpassed its design life. Aside from an area near the southernmost bridge and a pavement overlay completed in 2017, the roadway does not appear to have received regular maintenance since it was paved in 2004.

During its assessment, Sage observed extensive alligator, longitudinal, and transverse cracks, indicative of a weak pavement subgrade. Weak subgrades are often the result of inadequate compaction, deteriorating aggregate, or stormwater/groundwater intrusion and flushing. Additionally, the longitudinal and transverse cracks in the pavement on the concrete bridge decks indicate that the pavement itself is failing. Failed pavements commonly are caused by inadequate and/or improper compaction (i.e., compacting when pavements are below the minimum acceptable temperature). Failure may also indicate that the pavement has reached the end of its design life.

In Sage's opinion, a mill and overlay will not significantly extend the service life of the pavement, as the underlying (i.e., existing) cracks will stress the overlay, causing it to crack in a similar pattern.

Sage recommends a full pavement section reclamation in which the existing pavement layer is removed and the base layer is scarified and recompacted prior to repaving. Subgrade improvements will reduce distress over the lifespan of the new pavement section. Following repaving, a maintenance program should be implemented.

## USE OF THIS TECHNICAL MEMORANDUM

Sage Geotechnical, LLC has prepared this technical memorandum for the exclusive use of JSA Civil, LLC; Chehalis Tribal Planning; and their designated representatives for specific application to the Anderson Road Restoration project in Oakville, Washington. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Sage Geotechnical. Reuse of the information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Sage Geotechnical, shall be at the user's sole risk.

Sage Geotechnical warrants that, within the limitations of scope, schedule, and budget, its services have been provided in a manner consistent with that level of skill and care ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. Sage Geotechnical makes no other warranty, either express or implied.

## CLOSING

We trust that this memorandum provides you with the information needed to proceed with the project. If you have questions or comments, or if we can be of further service, please contact Lance Levine at lancel@sagegeotechnical.com.

## SAGE GEOTECHNICAL, LLC

Lance Levine, PE
Senior Engineer

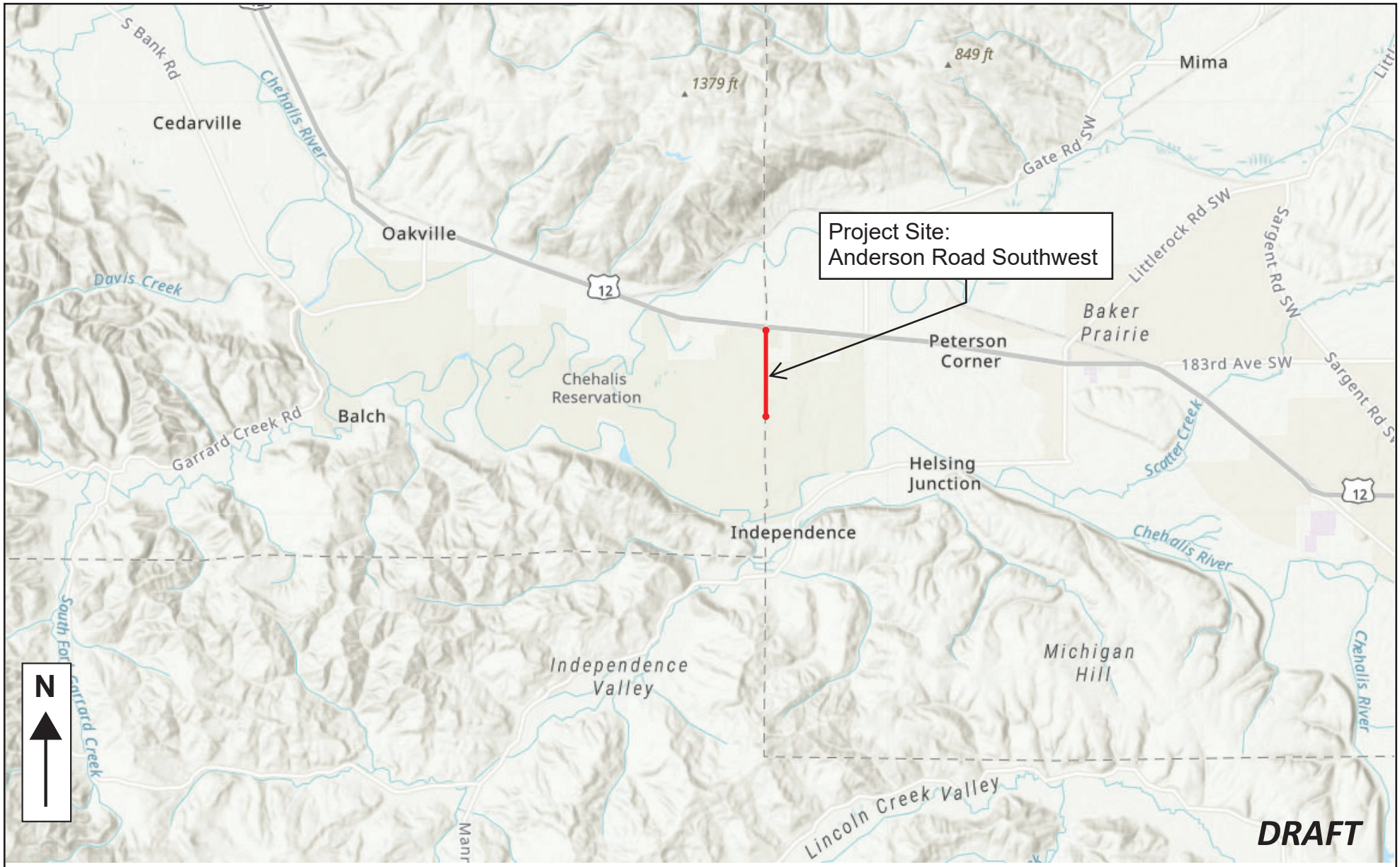
LGL/MCS/AMI

Attachments: Figure 1. Vicinity Map
Figures 2a and 2b. Site and Exploration Location Plans
Figure 3. Key to Boring Logs
Figures 4–11. Logs of Borings B-1 through B-8
Figures 12–14. Grain Size Analysis Results

# REFERENCES

ASTM. 2017. Annual Book of ASTM Standards. In: *Soil and Rock(I)*. West Conshohocken, PA: ASTM International.

Polenz, M., C. Samson, T. Reedy, W. von Dassow, W.C. Duckworth, T.R. Lau, M.L. Anderson, E.A. Nesbitt, J.H. Tepper, S.A. DuFrane, G. Legorreta Paulin. 2020. *Geologic Map of the Oakville and Rainbow Falls 7.5-minute Quadrangles, Lewis, Thurston, and Grays Harbor Counties, Washington*. Washington Geological Survey Map Series 2020-02.




1.00 mi

Source: ESRI 2025

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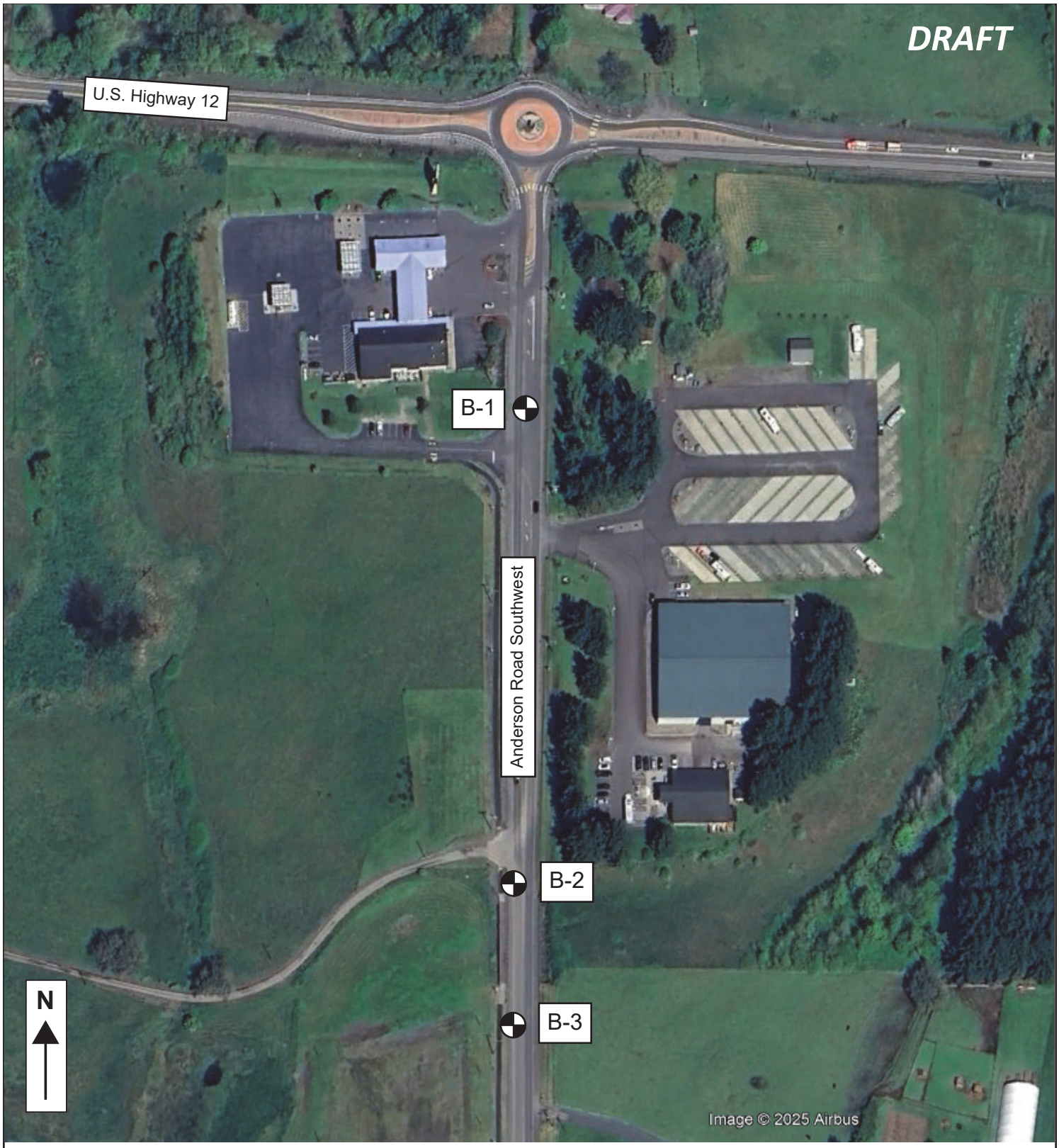
| Vicinity Map | |
|---|---|
| Anderson Road Restoration | |
| Oakville, Washington | Figure 1 |




Legend

B-1 Approximate Boring Location and Designation

Source: Google Earth 2025

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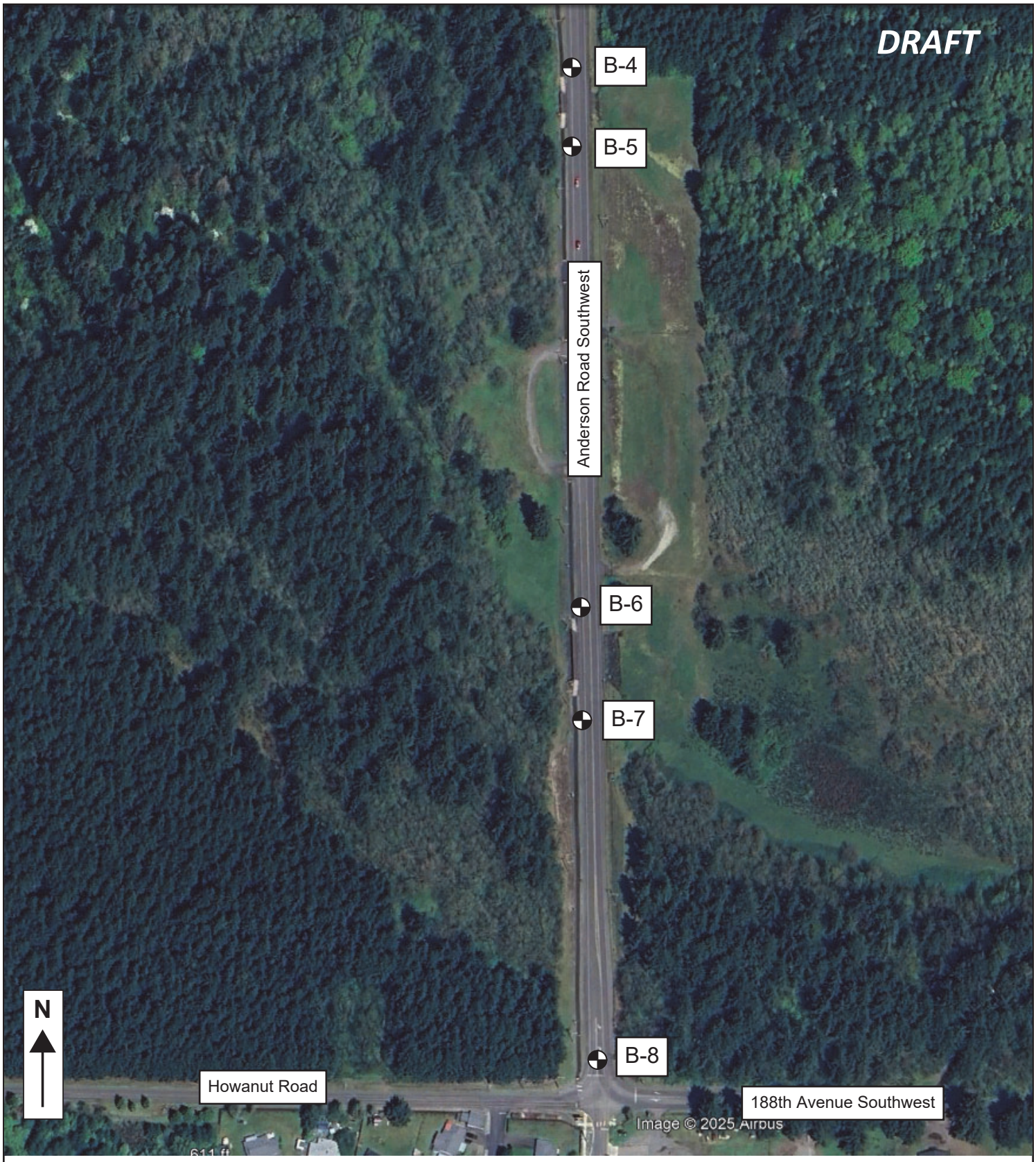
400 ft

| Site and Exploration Location Plan | |
|---|---|
| Anderson Road Restoration | |
| Oakville, Washington | Figure 2a |




Legend

B-4 Approximate Boring Location and Designation

Source: Google Earth 2025

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400 ft

Site and Exploration Location Plan

Anderson Road Restoration

Oakville, Washington

Figure 2b

Project: **Anderson Road Restoration**
Project Location: **Oakville, Washington**
Project Number: **017016**

# Key to Boring Logs

**Sheet 1 of 1**

| Elevation (feet) | Depth (feet) | Sample Type | Sample Number | Sampling Resistance, blows/ft | Material Type | Graphic Log | MATERIAL DESCRIPTION | REMARKS AND OTHER TESTS |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

## COLUMN DESCRIPTIONS

**1** Elevation (feet): Elevation (MSL, feet).
**2** Depth (feet): Depth in feet below the ground surface.
**3** Sample Type: Type of soil sample collected at the depth interval shown.
**4** Sample Number: Sample identification number.
**5** Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
**6** Material Type: Type of material encountered.
**7** Graphic Log: Graphic depiction of the subsurface material encountered.
**8** MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
**9** REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

## FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
GS: Grain size analysis
w: Gravimetric water content
-200: Wash sieve (percent passing No. 200 Sieve)

## MATERIAL GRAPHIC SYMBOLS

Asphaltic Concrete (AC)
Silty GRAVEL (GM)
Poorly graded GRAVEL (GP)
Poorly graded GRAVEL with Silt (GP-GM)
Well graded GRAVEL (GW)
Well graded GRAVEL with Silt (GW-GM)
SILT, SILT w/SAND, SANDY SILT (ML)
Silty SAND (SM)
Poorly graded SAND (SP)
Poorly graded SAND with Silt (SP-SM)

## TYPICAL SAMPLER GRAPHIC SYMBOLS

Auger sampler
Bulk Sample
3-inch-OD California w/ brass rings
CME Sampler
Drill-stem core barrel
3.25" OD split spoon (Dames & Moore) w/o liners
Grab Sample
2.5-inch-OD Modified California w/ brass liners
Pitcher Sample
2-inch-OD unlined split spoon (SPT)
Shelby Tube (Thin-walled, fixed head)

## OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)
Water level (after waiting, AW)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
Queried contact between strata

## GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

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**Figure 3**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-1<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/7/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **6.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **Groundwater Not Observed** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.826074, -123.160548** | |

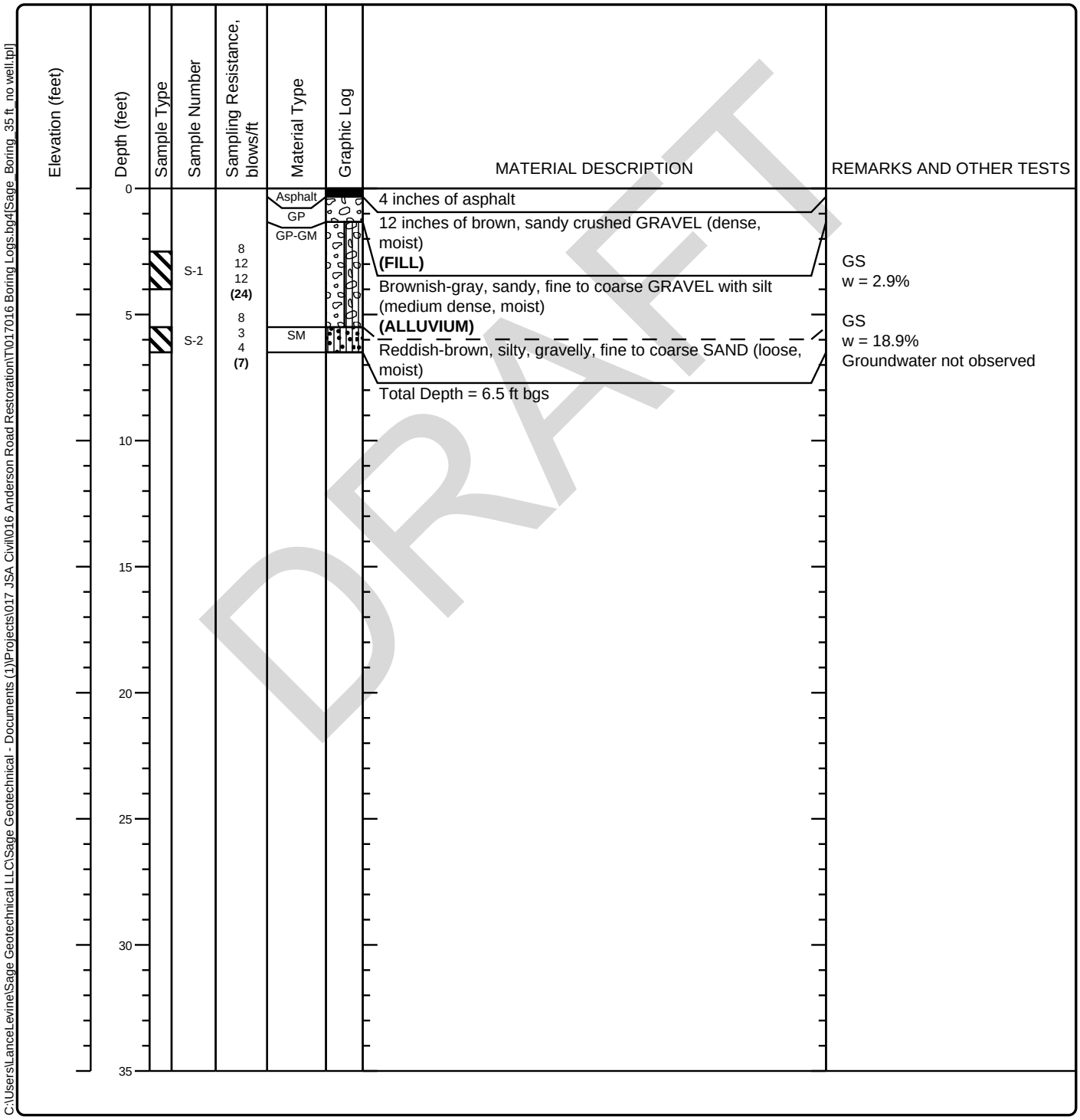






**Figure 4**

| | |
|---|---|
| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-2<br>**Sheet 1 of 1** |

| | | |
|---|---|---|
| Date(s) Drilled **5/7/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **31.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **10.0 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.824373, -123.160636** | |

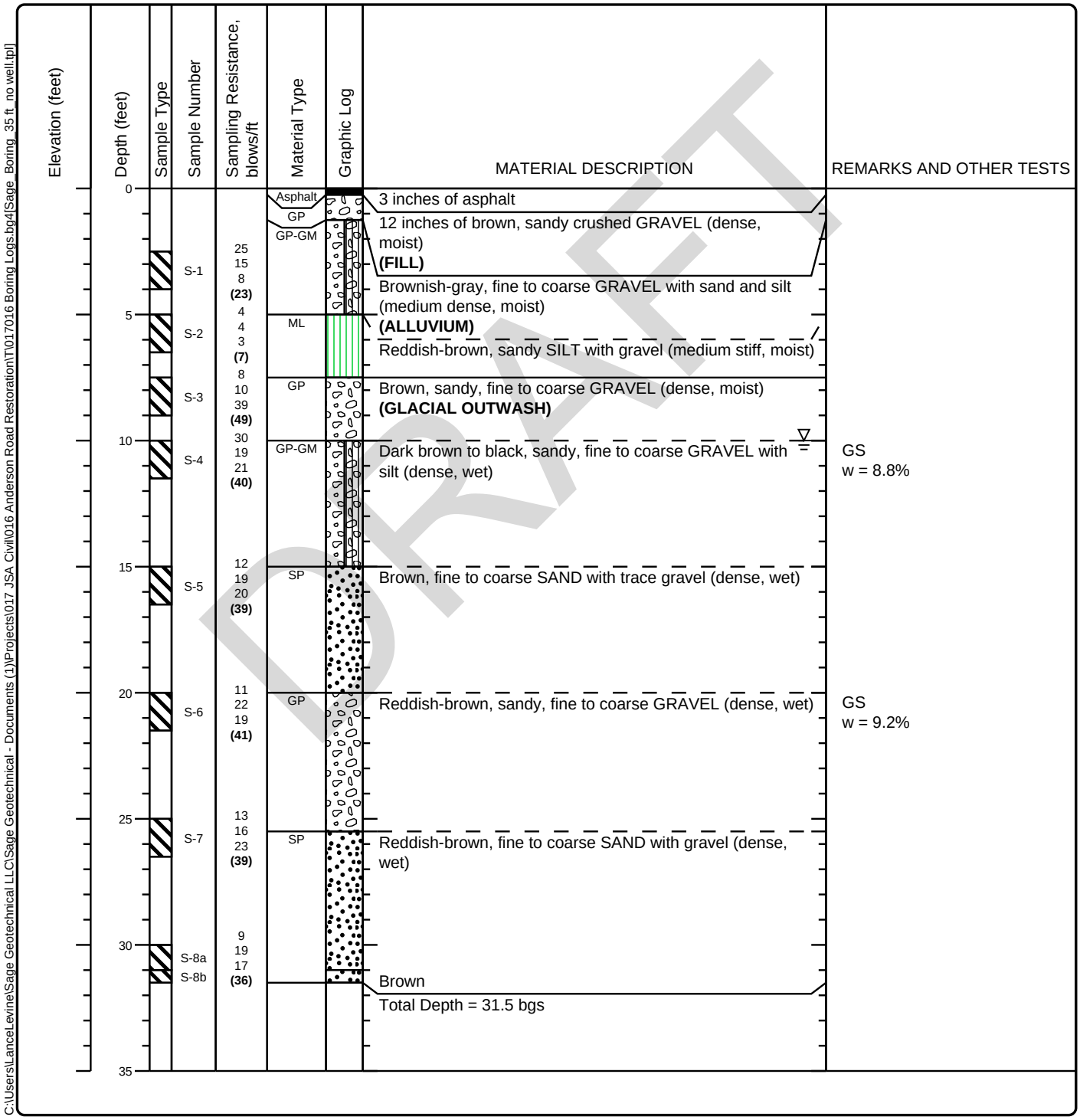




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**Figure 5**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-3<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/7/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **31.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **12.5 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.823966, -123.160646** | |

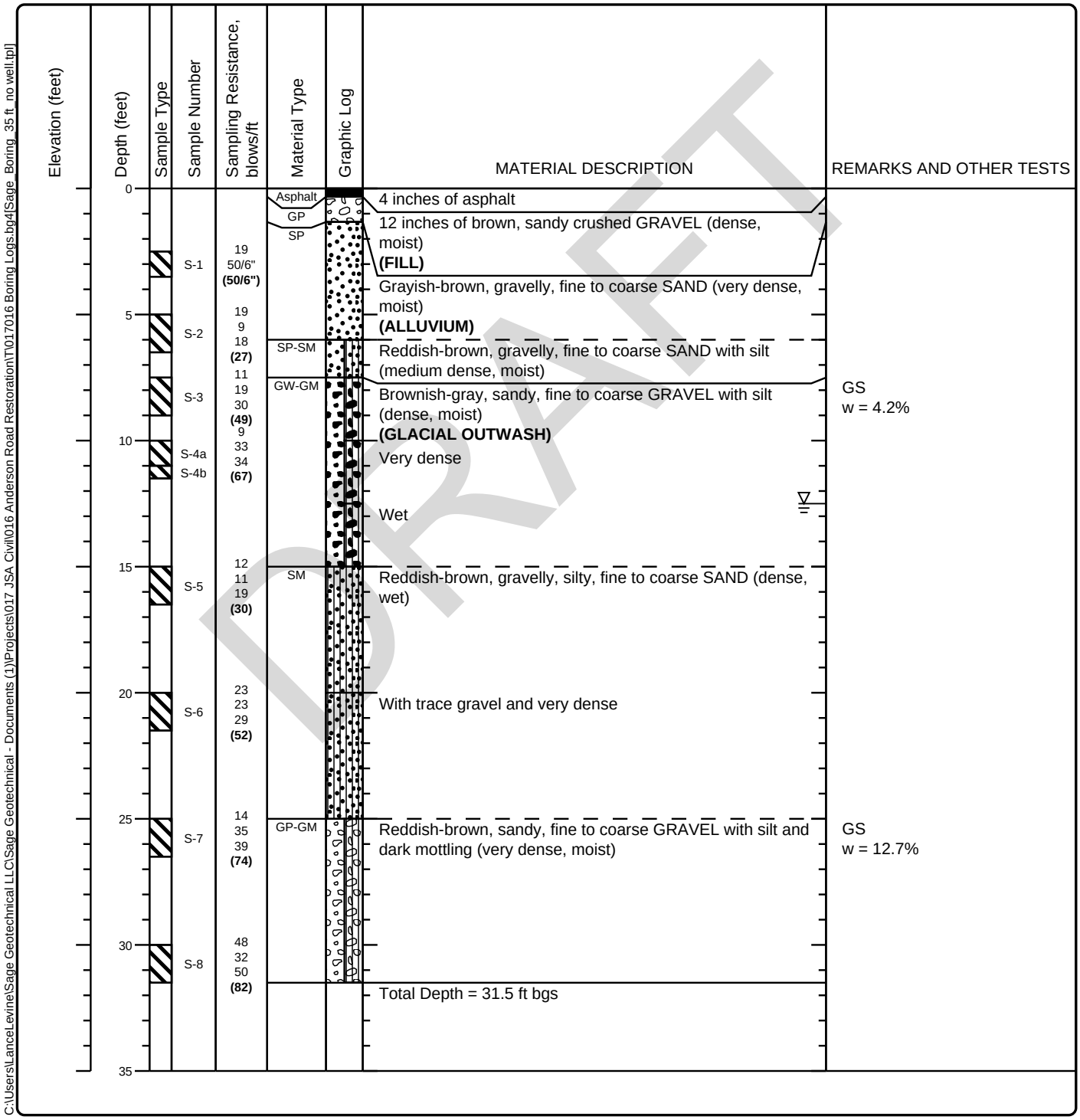


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**Figure 6**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-4<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/7/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **22.0 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **13.5 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.820251, -123.160640** | |

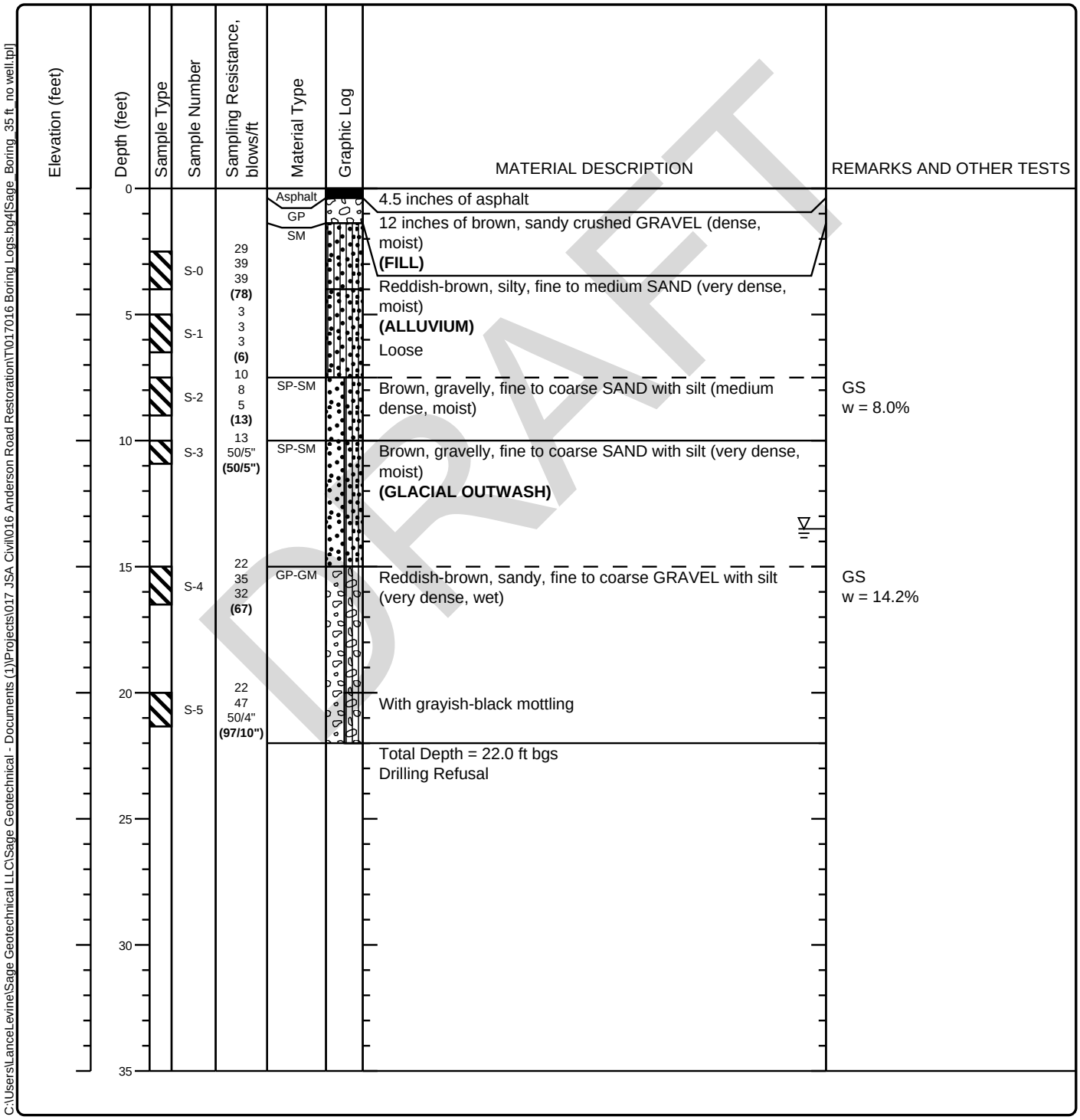




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**Figure 7**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-5<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/7/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **31.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **14.0 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.820037, -123.160631** | |

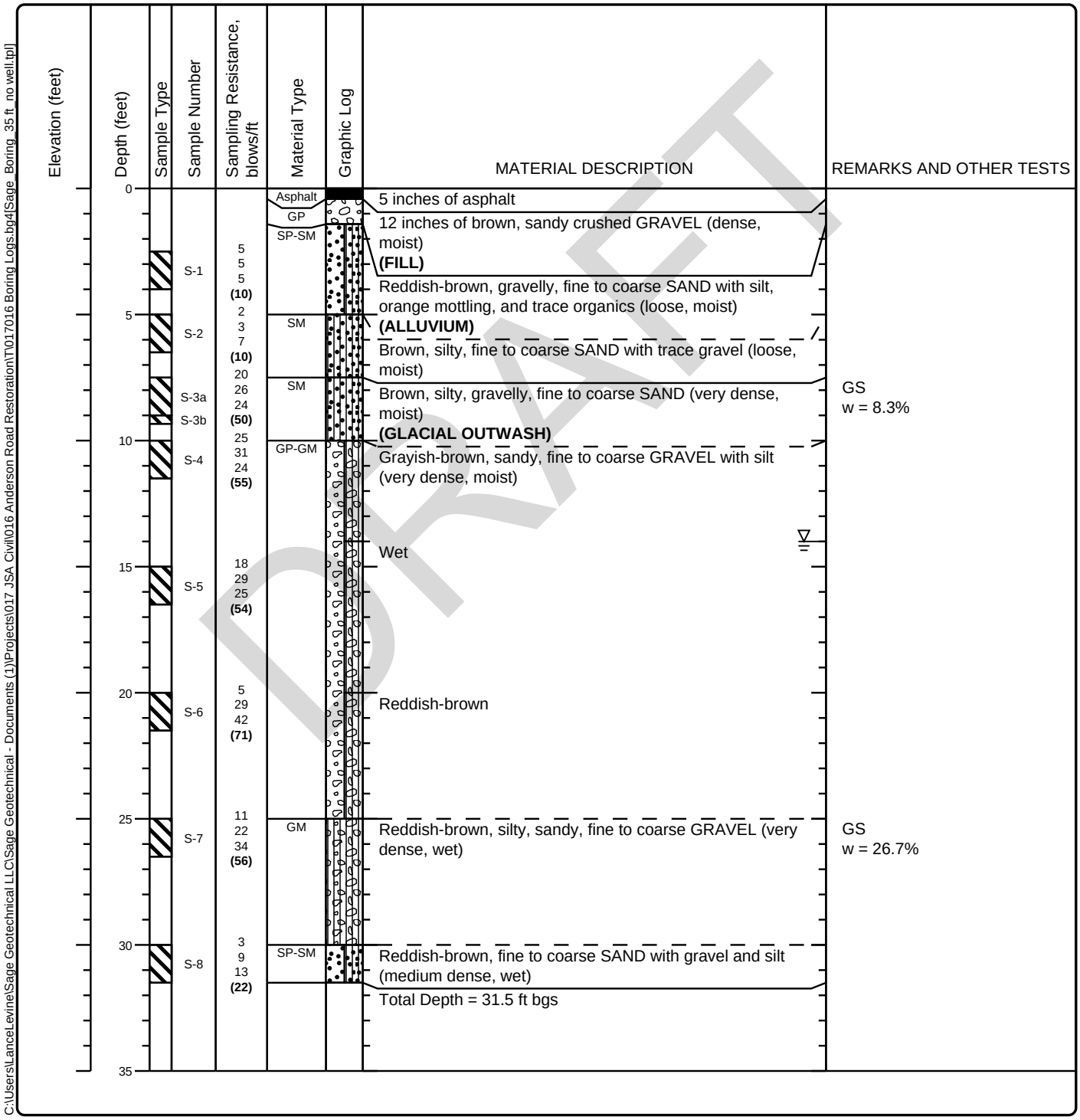




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**Figure 8**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-6<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/8/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **31.5** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **15.0 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.817658, -123.160556** | |

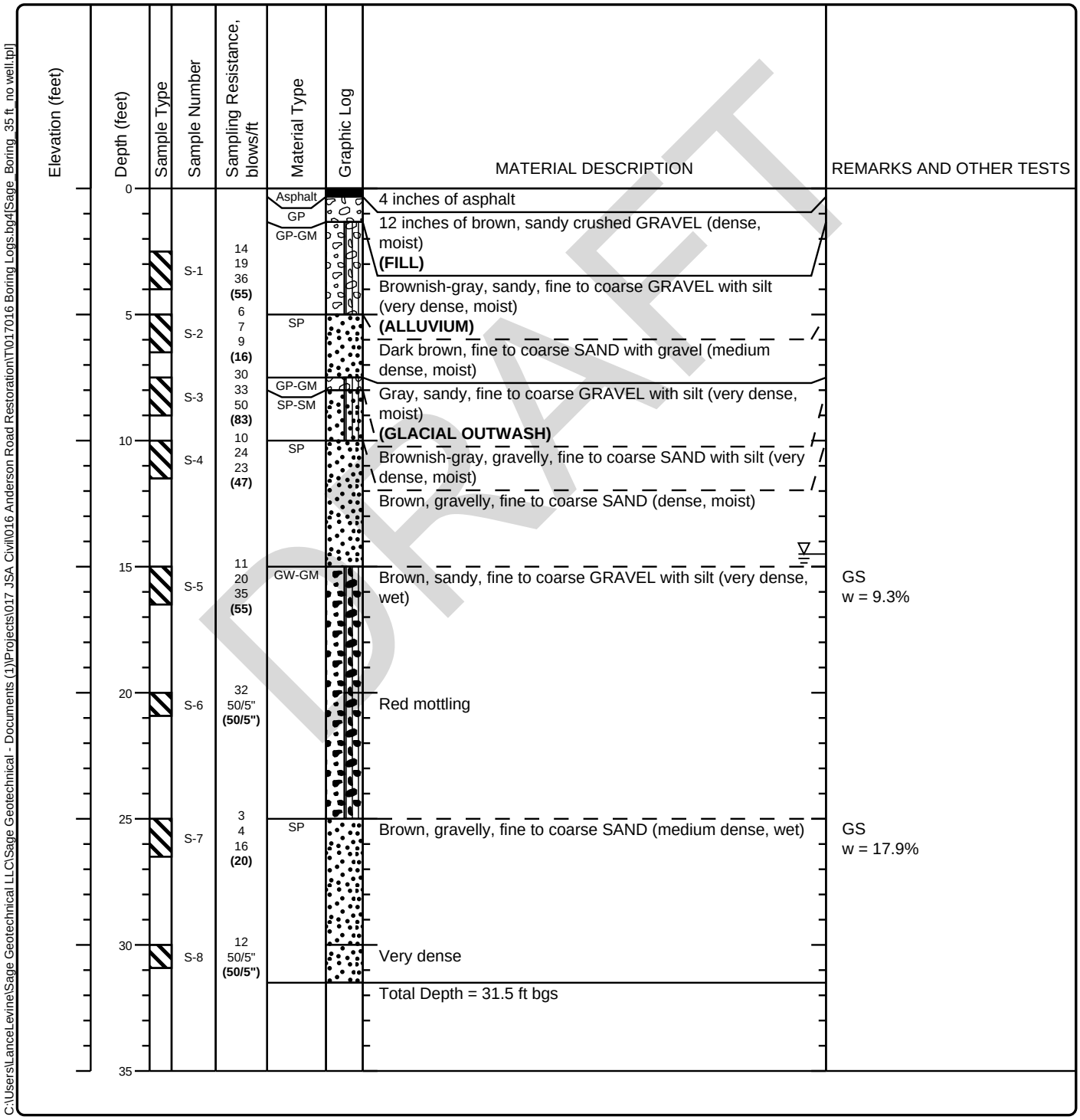




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**Figure 9**

| | |
|---|---|
| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-7<br>**Sheet 1 of 1** |

| | | |
|---|---|---|
| Date(s) Drilled **5/8/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **31.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **15.0 ft bgs** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.817288, -123.160548** | |

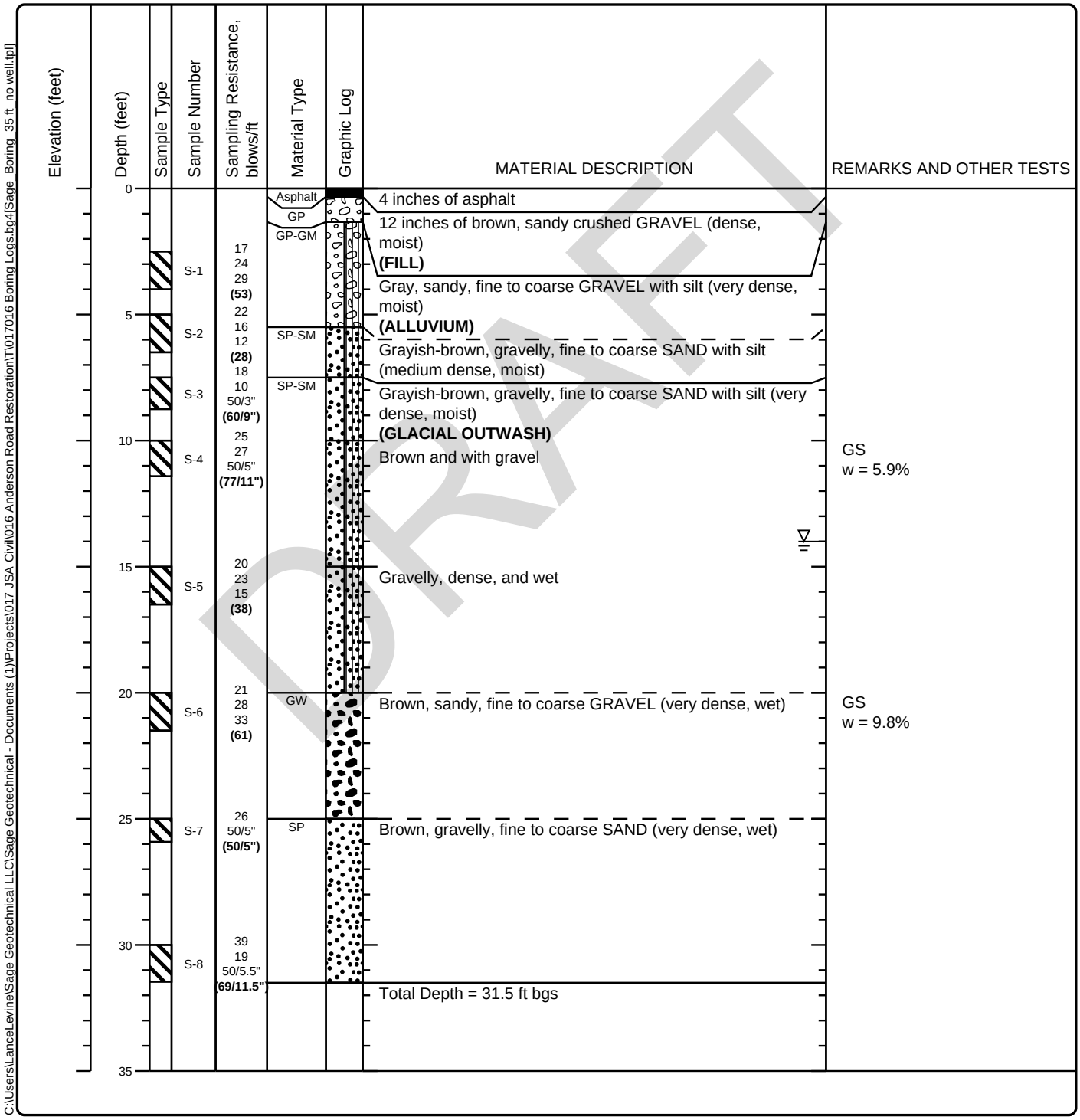







**Figure 10**

| Project: **Anderson Road Restoration**<br>Project Location: **Oakville, Washington**<br>Project Number: **017016** | Log of Boring B-8<br>**Sheet 1 of 1** |
|---|---|

| | | |
|---|---|---|
| Date(s) Drilled **5/8/2025** | Logged By **KAM** | Checked By **LGL** |
| Drilling Method **HSA** | Drill Bit Size/Type **6 inches** | Total Depth of Borehole **6.5 ft bgs** |
| Drill Rig Type **Diedrich D-50** | Drilling Contractor **Holocene Acquisition Company, LLC** | Approximate Surface Elevation **Not Measured** |
| Groundwater Level and Date Measured **Groundwater Not Observed** | Sampling Method(s) **SPT** | Hammer Data **140 lb/30 in Drop** |
| Borehole Backfill **Bentonite** | Location **46.815534, -123.160451** | |

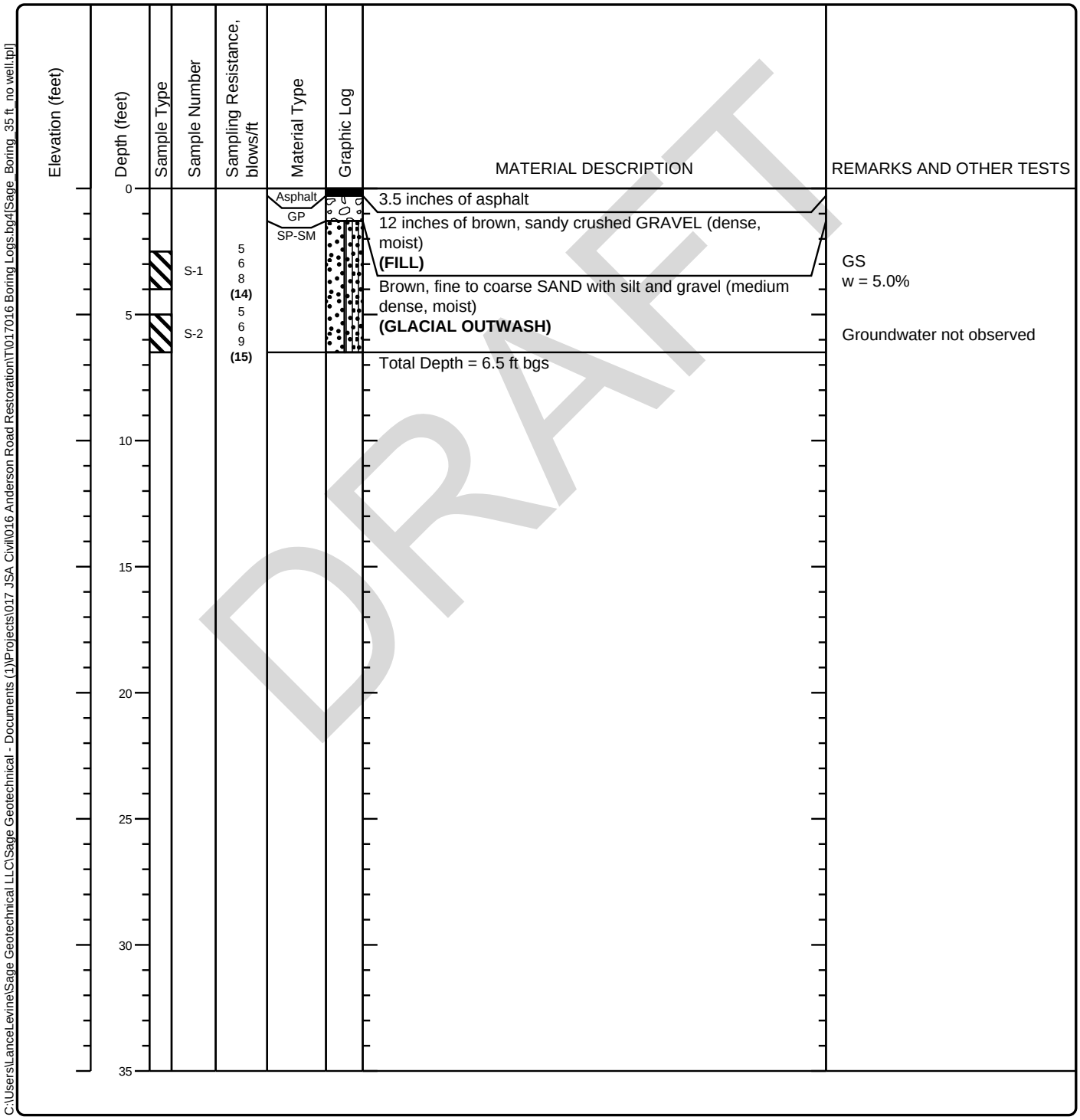
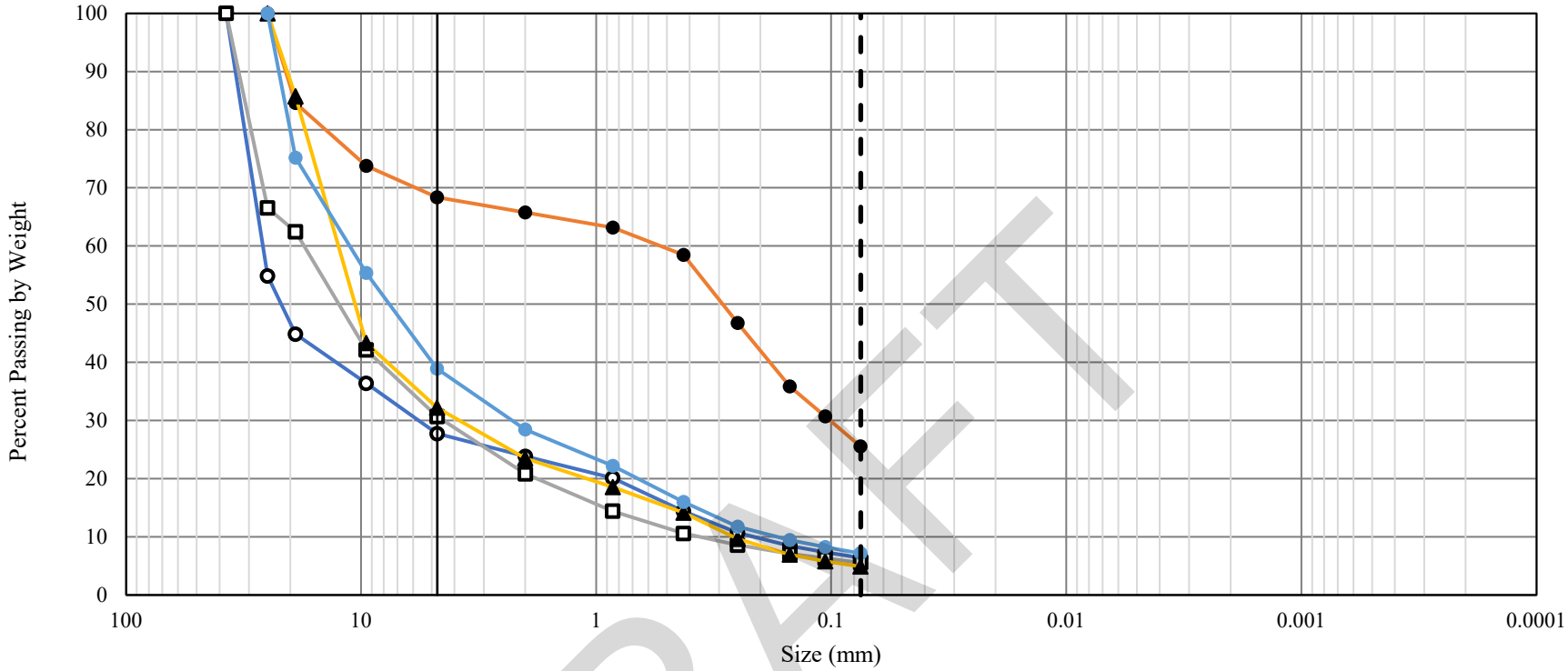







**Figure 11**






| | Depth | w | D90 | D60 | D30 | D10 | Cu | Cc | % G | % S | % F | USCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ft) | (%) | (mm) | (mm) | (mm) | (mm) | - | - | (%) | (%) | (%) | - |
| B-1 S-1 | 2.5 | 2.9% | 34.28 | 26.18 | 5.70 | 0.21 | 122.1 | 5.8 | 72.3 | 21.3 | 6.4 | GP-GM |
| B-1 S-2 | 5.0 | 18.9% | 20.93 | 0.53 | 0.10 | - | - | - | 31.6 | 42.8 | 25.5 | SM |
| B-2 S-4 | 10.0 | 8.8% | 33.22 | 17.47 | 4.48 | 0.37 | 47.8 | 3.1 | 69.3 | 25.1 | 5.5 | GP-GM |
| B-2 S-6 | 20.0 | 9.2% | 20.62 | 12.48 | 3.82 | 0.26 | 47.9 | 4.5 | 67.8 | 27.3 | 4.9 | GP |
| B-3 S-3 | 7.5 | 4.2% | 22.38 | 11.17 | 2.28 | 0.17 | 65.8 | 2.7 | 61.1 | 31.8 | 7.2 | GW-GM |

w = as-received moisture content
% G = percent gravel and larger
% S = percent sand
% F = percent fines
USCS = Unified Soil Classification System group symbol
To be well-graded: 1 < Cc < 3, Cu > 4 for GW, Cu > 6 for SW

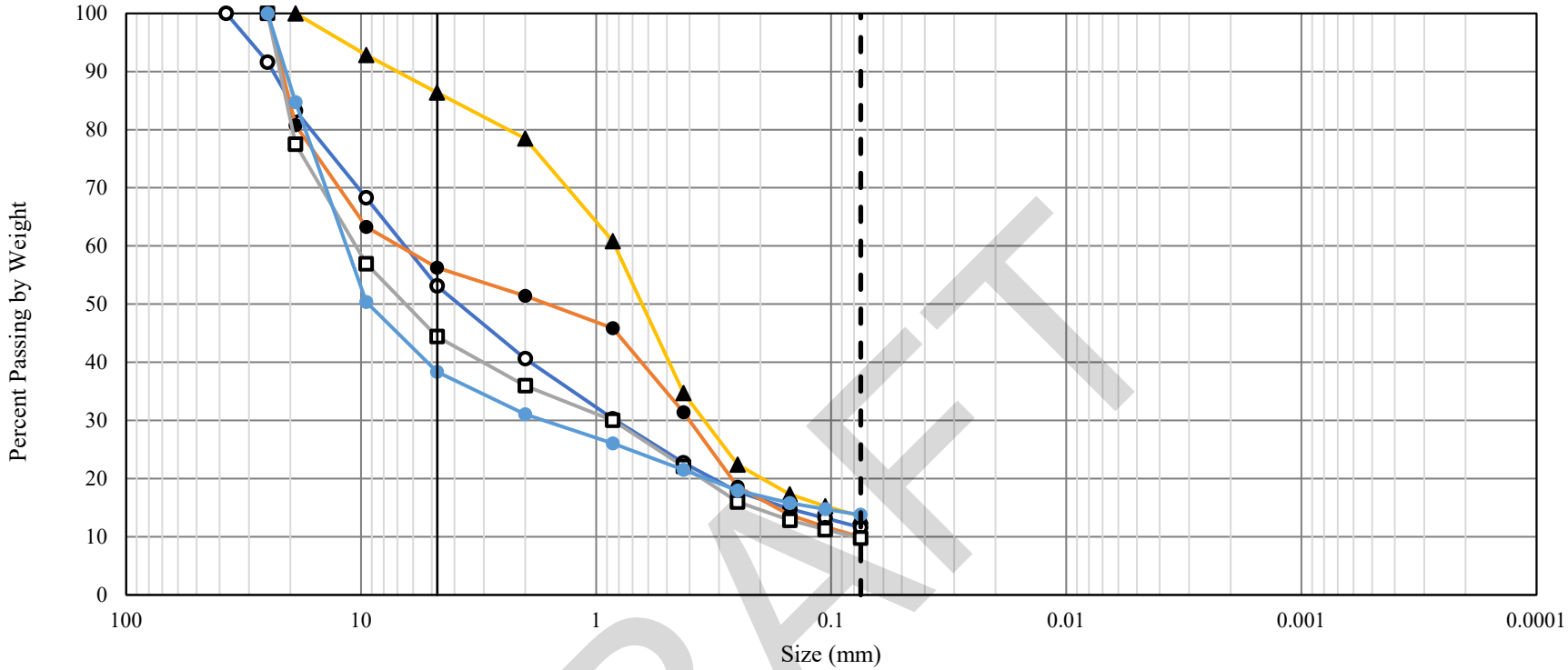
SAGE GEOTECHNICAL

# Grain Size Analysis Results
# ASTM D422

Anderson Road Restoration

Oakville, Washington

Figure 12






| | Depth | w | D90 | D60 | D30 | D10 | Cu | Cc | % G | % S | % F | USCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ft) | (%) | (mm) | (mm) | (mm) | (mm) | - | - | (%) | (%) | (%) | - |
| B-3 S-7 | 25.0 | 12.7% | 23.70 | 6.50 | 0.83 | - | - | - | 46.9 | 41.5 | 11.6 | GP-GM |
| B-4 S-2 | 7.5 | 8.0% | 21.67 | 6.89 | 0.40 | 0.08 | 90.5 | 0.3 | 43.8 | 46.3 | 9.9 | SP-SM |
| B-4 S-4 | 15.0 | 14.2% | 22.13 | 10.53 | 0.85 | 0.08 | 132.8 | 0.9 | 55.6 | 34.6 | 9.8 | GP-GM |
| B-5 S-3A | 7.5 | 8.3% | 7.02 | 0.83 | 0.35 | - | - | - | 13.6 | 72.8 | 13.5 | SM |
| B-5 S-6 | 25.0 | 26.7% | 20.89 | 11.54 | 1.68 | - | - | - | 61.7 | 24.6 | 13.8 | GM |

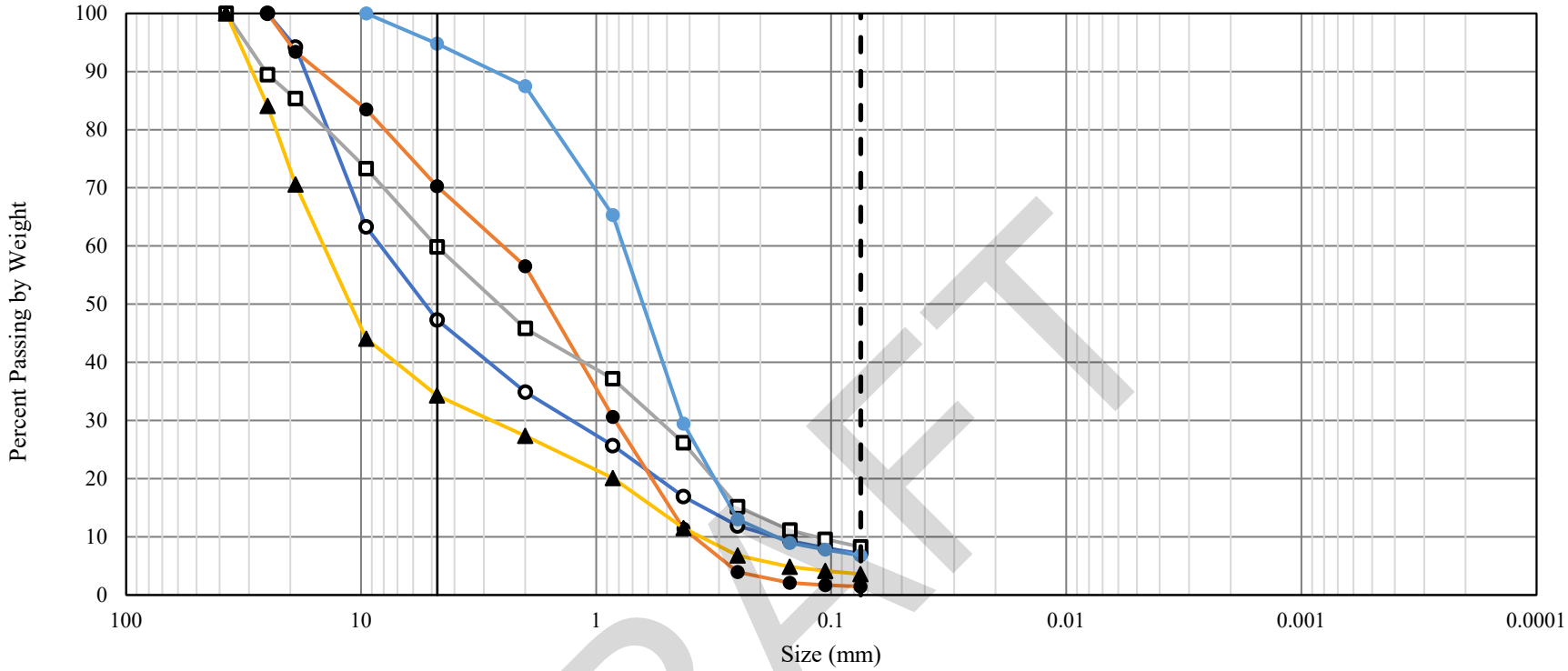
w = as-received moisture content
% G = percent gravel and larger
% S = percent sand
% F = percent fines
USCS = Unified Soil Classification System group symbol
To be well-graded: 1 < Cc < 3, Cu > 4 for GW, Cu > 6 for SW

SAGE GEOTECHNICAL

Grain Size Analysis Results
ASTM D422

Anderson Road Restoration

Oakville, Washington | Figure 13






| | Depth | w | D90 | D60 | D30 | D10 | Cu | Cc | % G | % S | % F | USCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (ft) | (%) | (mm) | (mm) | (mm) | (mm) | - | - | (%) | (%) | (%) | - |
| B-6 S-5 | 15.0 | 9.3% | 17.29 | 8.24 | 1.27 | 0.17 | 47.7 | 1.1 | 52.7 | 40.2 | 7.1 | GW-GM |
| B-6 S-7 | 25.0 | 17.9% | 14.99 | 2.49 | 0.83 | 0.39 | 6.5 | 0.7 | 29.7 | 68.8 | 1.4 | SP |
| B-7 S-4 | 10.0 | 5.9% | 25.52 | 4.79 | 0.54 | 0.12 | 41.1 | 0.5 | 40.1 | 51.6 | 8.3 | SP-SM |
| B-7 S-6 | 20.0 | 9.8% | 29.07 | 14.42 | 2.79 | 0.36 | 40.0 | 1.5 | 65.7 | 30.7 | 3.6 | GW |
| B-8 S-1 | 2.5 | 5.0% | 2.70 | 0.77 | 0.43 | 0.17 | 4.5 | 1.4 | 5.2 | 88.0 | 6.8 | SP-SM |

w = as-received moisture content
% G = percent gravel and larger
% S = percent sand
% F = percent fines
USCS = Unified Soil Classification System group symbol
To be well-graded: 1 < Cc < 3, Cu > 4 for GW, Cu > 6 for SW

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Grain Size Analysis Results
ASTM D422

Anderson Road Restoration

Oakville, Washington | Figure 14