Alki Elementary School Addition and Renovation Project

Draft SEPA Checklist

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For questions and more information about this document, please contact the following:

Brian Fabella
Project Manager
brfabella@seattleschools.org

While the Alki Elementary School Addition and Renovation Project Draft State Environmental Policy Act (SEPA) Checklist is accessible and ADA compliant, the attached figures and appendices which support the checklist contain complex material that are not accessible. The following is a description of what is contained in the figures and appendices:

- Figure 1 – Alki Elementary School Site Vicinity Map
  Figure 1 is a vicinity map that shows the Alki Elementary School campus and the surrounding neighborhood in the site vicinity. The school campus site is outlined in red on the map.

- Figure 2 – Alki Elementary School Aerial Map
  Figure 2 is an aerial map of the Alki Elementary School campus and the surrounding neighborhood in the site vicinity. The school campus site is outlined in red on the map.

- Figure 3 – Proposed Site Plan
  Figure 3 is a site plan of the proposed project. The entire school campus is shown on the plan. The proposed new building and other proposed project site features are labeled on the site.

- Appendix A – Geotechnical Report
  Appendix A consists of the Geotechnical Report that was prepared by NV5. The report presents the results of the subsurface information review, subsurface explorations, summarizes groundwater conditions and potential geologic hazard critical areas, and provides geotechnical considerations and engineering recommendations. Figures are included in the report. Field exploration procedures and logs, laboratory testing procedures and results, cone penetration testing results, ReMI survey results, and a site-specific seismic hazard evaluation are included as appendices to this report.

- Appendix B – Construction Best Management Practices
  Appendix B consists of construction best management practices that could be implemented during the construction of the project.

- Appendix C – SEPA Greenhouse Gas Emissions Worksheet
  Appendix C consists of the Greenhouse Gas Emissions Worksheet that was prepared by EA Engineering, Science and Technology, Inc., PBC. This worksheet provides a calculation of the greenhouse gas emissions that would be anticipated to be generated with the development of the proposed project.

- Appendix D – Arborist Inventory Report
  Appendix D consists of the Arborist Report and Tree Inventory that was prepared for the project by Tree Solutions, Inc. The report provides an inventory of the existing trees on the site and trees on neighboring properties are also documented if they extend over the property line or may be affected by construction access. Recommendations and tree

protection measures are provided. A Table of Trees is included as part of the report which describes the characteristics and measurements for each tree. A map documenting the location of each tree is also provided.

- Appendix E – Limited Hazardous Building Materials Survey Report
  Appendix E consists of the Limited Hazardous Building Materials Survey Report that was prepared by EHSI. This report presents the results of hazardous materials sampling and testing in the existing building, including asbestos-containing materials, lead-containing paint, arsenic-containing materials, PCB light ballasts, mercury-containing light fixtures and lamps, and other regulated materials. Inspector and laboratory certifications, laboratory reports, and photographs are included as appendices.

- Appendix F – Landmark Nomination Determination, DAHP Governor's Executive Order 21-02 Determination, and Cultural Resources Assessment Report
  Appendix F consists of the Landmark Nomination Determination, the DAHP Governor's Executive Order 21-02 Determination, and the Cultural Resources Assessment Report for the project that was prepared by Perteet. The Landmark Nomination Determination summarizes the determination of the City of Seattle's Landmarks Preservation Board. The DAHP Governor's Executive Order 21-02 Determination summarizes DAHP's review and determination for the project. The Cultural Resources Assessment Report details the background research and onsite investigations that were completed as part of the assessment and provides recommendations for the project. Due to the confidential nature of archaeological materials discussed in the report, a full copy of the report is not included in this electronic version. However, a non-confidential version of the report is available upon request from Seattle Public Schools.

- Appendix G – Transportation Technical Report
  Appendix G consists of the Transportation Technical Report for the project that was prepared by Heffron Transportation, Inc. The report provides a description and analysis of background transportation conditions for the area surrounding the site, including traffic volumes, traffic operations (level of service), parking, transit, and non-motorized facilities. The report analyzes and addresses potential impacts with the proposed project on those same transportation conditions and provides recommendations and mitigation measures. The document includes level of service definitions and parking utilization study data as appendices to the report.

This concludes the description of the Draft SEPA Checklist figures and appendices for the Alki Elementary School Addition and Renovation Project.

DRAFT ENVIRONMENTAL CHECKLIST

for the proposed

Alki Elementary School Addition and Renovation Project

prepared by

SEATTLE
PUBLIC
SCHOOLS

July 2022

EA Engineering, Science, and Technology, Inc., PBC
NV5
Tree Solutions, Inc.
EHSI
Perteet
Heffron Transportation, Inc.

PREFACE

The purpose of this Draft Environmental Checklist is to identify and evaluate probable environmental impacts that could result from the ***Alki Elementary School Addition and Renovation Project*** and to identify measures to mitigate those impacts. The ***Alki Elementary School Addition and Renovation Project*** is intended to expand the capacity and upgrade the student learning environment of the school. Development of the project would require the demolition of the existing main school building and portable building to accommodate construction of the new, three-story, approximately 75,000 sq. ft. building addition. The existing fieldhouse which contains the school gymnasium and Alki Community Center would be retained and the gymnasium would be renovated as part of the project. The renovated and expanded school would have capacity for up to approximately 502 students in grades K-5, as well as up to 40 students in early learning (pre-school) programs.

The State Environmental Policy Act (SEPA)[1] requires that all governmental agencies consider the environmental impacts of a proposal before the proposal is decided upon. This Draft Environmental Checklist has been prepared in compliance with the State Environmental Policy Act; the SEPA Rules, effective April 4, 1984, as amended (Chapter 197-11, Washington Administrative Code); and the Seattle City Code (25.05), which implements SEPA.

This document is intended to serve as SEPA review for site preparation work, building construction, and operation of the proposed development comprising the ***Alki Elementary School Addition and Renovation Project.*** Analysis associated with the proposed project contained in this Environmental Checklist is based on plans for the project, which are on-file with Seattle Public Schools. While not construction-level detail, the plans accurately represent the eventual size, location and configuration of the proposed project and are considered adequate for analysis and disclosure of environmental impacts.

This Environmental Checklist is organized into three major sections. *Section A* of the Checklist (starting on page 1) provides background information concerning the *Proposed Action* (e.g., purpose, proponent/contact person, project description, project location, etc.). *Section B* (beginning on page 6) contains the analysis of environmental impacts that could result from implementation of the proposed project, based on review of major environmental parameters. This section also identifies possible mitigation measures. *Section C* (page 42) contains the signature of the proponent, confirming the completeness of this Environmental Checklist.

Appendices to this Environmental Checklist include: the *Geotechnical Engineering Report* (NV5, Inc., 2022), *Summary of Construction Best Management Practices*, the *Greenhouse Gas Emissions Worksheet* (EA Engineering, 2022), the *Tree Inventory and Arborist Report* (Tree Solutions, Inc., 2022), the *Limited Hazardous Building Materials Survey Report* (EHSI, 2022), the *Landmark Nomination Determination* (City of Seattle, 2022), the *DAHP Governor's Executive Order 21-02 Determination* (DAHP, 2022), the *Cultural Resources Assessment* (Perteet, 2022)[2], and the *Transportation Technical Report* (Heffron Transportation, Inc., 2022).

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[1] Chapter 43.21C. RCW

[2] The Cultural Resources Assessment is on-file with SPS and available upon request.

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PURPOSE

The State Environmental Policy Act (SEPA), Chapter 43.21 RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. The purpose of this checklist is to provide information to help identify impacts from the proposal (and to reduce or avoid impacts, if possible) and to help Seattle Public Schools to make a SEPA threshold determination.

A. BACKGROUND

1. Name of Proposed Project:

Alki Elementary School Addition and Renovation Project

2. Name of Applicant:

Seattle School District No. 1 (Seattle Public Schools)

3. Address and Phone Number of Applicant and Contact Person:

Brian Fabella
Project Manager
Seattle Public Schools
2445 3rd Avenue S
Seattle, WA 98134
206-252-0702

4. Date Checklist Prepared

July 1, 2022

5. Agency Requesting Checklist

Seattle School District No. 1
2445 – 3rd Avenue South
MS 22-332, P.O. Box 34165
Seattle, WA 98124-1165

6. Proposed Timing or Schedule (including phasing, if applicable):

The ***Alki Elementary School Addition and Renovation Project*** that is analyzed in this Draft Environmental Checklist involves site preparation work, construction, and operation of the project. Site preparation and construction would begin in approximately July 2023 with building occupancy in approximately July 2025.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No future plans for further development of the project site are proposed at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal:

The following environmental information has been prepared for the project and is included as appendices to this Checklist:

- *Geotechnical Engineering Report* (NV5, Inc., February 2022);
- *Greenhouse Gas Emission Worksheet* (EA Engineering, May 2022);
- *Draft Tree Inventory and Arborist Report* (Tree Solutions, February 2022);
- *Limited Hazardous Building Materials Survey Report* (EHSI, March 2022);
- *Landmark Nomination Determination* (City of Seattle, 2022)*;*
- *DAHP Governor's Executive Order 21-02 Determination* (DAHP, May 2022);
- *Cultural Resources Assessment* (Perteet, June 2022)[3];
- *Transportation Technical Report* (Heffron Transportation, June 2022).

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain:

There are no known other applications that are pending approval for the ***Alki Elementary School Addition and Renovation Project*** site.

10. List any government approvals or permits that will be needed for your proposal, if known:

City of Seattle

- <u>*Seattle Department of Construction and Inspections (SDCI)*</u>

  Permits/approvals associated with the proposed project, including:
    - Demolition Permit
    - Master Use Permit
    - Building Permit
    - Mechanical Permits
    - Electrical and Fire Alarm Permits
    - Drainage and Side Sewer Permit
    - Comprehensive Drainage Control Plan Approval
    - Drainage Control Plan with Construction Best Management Practices, Erosion and Sediment Control Approval

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[3] The Cultural Resources Assessment is on-file with SPS and available upon request.

  - Land Use Code Departure Approval (setbacks, onsite vehicle parking, onsite bicycle parking, on-street bus loading and unloading, changing-image sign)
  - Type I Decision Approval (waiver of LR1 zone height limits).

- *Seattle Department of Transportation (SDOT)*
  - Street Use and Construction Use Permit (temporary – construction related)
  - Street Use and Utility Permit
  - Street Improvement Permit

King County

- Plumbing Permit
- Sewer Treatment Capacity Charge Approval
- Health Department Approval

Puget Sound Clean Air Agency

- Air Quality Permit – Demolition

Washington State Department of Ecology

- NPDES Construction Stormwater General Permit

Washington State Department of Archaeology and Historic Preservation

- Governor's Executive Order 21-02 Review

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

Existing Site Conditions

The proposed ***Alki Elementary School Addition and Renovation Project*** site is located at 3010 59th Avenue SW within Seattle's Alki neighborhood (see **Figures 1 and 2**). The school campus is generally bounded by Alki Playground and Whale Tail Park to the north, existing residences and Schmitz Park/Trail to the east, existing residences to the south, and 59th Avenue SW to the west.

The existing two-story Alki Elementary main school building is located on the western portion of the site and contains approximately 46,330 sq. ft. of building space. An attached one-story fieldhouse building is located on the east side of the main school building and is located on both SPS and Seattle Parks and Recreation property. The fieldhouse building contains approximately 13,330 sq. ft. of building space and includes the school gymnasium and support spaces in the south portion, while the north portion is operated by Seattle Parks and Recreation and the Alki Community Center; the Community Center also utilizes the gymnasium and some support spaces for it's after-school and summer programs. A portable classroom building is also located to the north of the main school building within the SW Stevens Street right-of-way area that is fee-managed by Seattle Parks and Recreation.

A hard surface play area is located to the north of the main school building on Parks and Recreation property. As part of the existing joint-use agreement between Seattle Public Schools and Seattle Parks and Recreation, the school currently utilizes this area as part of its outdoor recreation space for recess and other activities.

A paved surface with room to park about 20 vehicles is located on the south side of the school buildings and is accessed from a driveway at the south edge of the site on 59th Avenue SW. Much of the parking lot striping has faded, but historical aerial images indicate the area has been used for parking 20 or more vehicles. This area is also used for trash and recycling container storage and pick up. The hard-surface area north of the building is signed for “Community Center Parking Only,” but is also used for school-event parking. Historical aerials indicate the surface can accommodate about 27 parked vehicles. The Parks property on the north side also has two parking stalls—one 15-minute load space and one disabled permit space. To the east of these stalls are six spaces signed for “Alki Community Center Permitted Staff Parking Only.”

Historic enrollment for Alki Elementary School reached its peak in 1958 with approximately 620 students in grades K-6. The school has an existing capacity for approximately 369 students (including the existing portable building). The enrollment for the 2021-22 school year is approximately 308 students, which is below the recent peak enrollment of approximately 413 students in 2015.

Proposed Project

The proposed ***Alki Elementary School Addition and Renovation Project*** is intended to expand the capacity of the school and upgrade the quality of the student learning environment. Development of the project would require the demolition of the existing main school building and portable building to accommodate construction of the new, three-story, approximately 75,000 sq. ft. building addition. The existing fieldhouse building would be retained and the school gymnasium portion of the building would be renovated as part of the project (see **Figure 3** for a site plan of the proposed project). During the construction process, student and staff would be temporarily housed at the Schmitz Park School site (5000 SW Spokane Street) until the proposed project is completed.

When complete, the addition and renovated fieldhouse building would include building space with approximately 24 classrooms for Grades K-5, 2 pre-school classrooms, a childcare classroom, a student commons/dining area, a library, an art room, a music room/stage area, learning commons areas, a renovated gymnasium, outdoor learning space, office/administrative uses, and other support spaces. The renovated and expanded school would have capacity for up to approximately 502 students in grades K-5, as well as up to 40 students in early learning (pre-school) programs. In total, the school would have capacity for approximately 542 students in grades Pre-K (pre-school) through 5th grade.

The proposed project would remove the existing, approximately 310 sq. ft. of fenced, paved recreation space and replace it with approximately 550 sq. ft. of fenced area for outdoor recreation with pavement, play turf surfacing, moveable play equipment, and mulched areas. Approximately 380 sq. ft. of paved school entry area would double as a flexible outdoor recreation area as well. A portion of the second level of the building would also contain outdoor learning and recreation space for use by the school (approximately 1,110 sq. ft.). As under existing conditions and per their agreement with the City of Seattle Parks and Recreation Department, the school would also continue to utilize the adjacent Alki Playfield, as well as the SW Stevens Street right-of-way that is fee-managed by Seattle Parks and Recreation for recreation uses.

The existing on-site parking lot would be eliminated, and no onsite parking is proposed with the project. The existing curb cut on 59th Avenue SW that provides access to the parking lot would be modified and reconstructed to provide access to the new onsite service / loading area. The on-street school-bus load/unload zone would be retained along the east side of 59th Avenue SW adjacent to the school building. The project would also retain the existing curb-side passenger-vehicle load/unload area along the east side of 59th Avenue SW north of the school and adjacent to Alki Playground.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any. If a proposal would occur over a range of area, provide the range or boundaries of the site(s).

The proposed ***Alki Elementary School Addition and Renovation Project*** site is located at 3010 59th Avenue SW within Seattle's Alki neighborhood (a portion of the SE Quarter of Section 10, Township 24, and Range 3). The school campus is generally bounded by Alki Playground and Whale Tail Park to the north, existing residences and Schmitz Park/Trail to the east, existing residences to the south, and 59th Avenue SW to the west (see **Figures 1** and **2**).

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one):
[✓ Flat,] rolling, hilly, steep slopes, mountainous, other:____

The **Alki Elementary School Addition and Renovation Project** site is generally flat with an elevation change of less than five feet across the majority of the site. A steep slope area is located in the southeastern corner of the site. See below for further details on this area.

b. What is the steepest slope on the site (approximate percent slope)?

The steepest slope on the site is located in the southeast corner of the site and has an elevation change of approximately 40 feet over a distance of 60 feet (approximately 67 percent). According to the City of Seattle's Environmentally Critical Areas (ECA) GIS Maps, this area is designated as a ECA steep slope area (*City of Seattle, 2022*). The slope area includes a two-tiered rockery to accommodate some of the grade change. See **Appendix A** for further details.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

A geotechnical report was completed for the project site by NV5, Inc. and included six site exploration borings as part of onsite investigations. Borings were completed to a depth of 26 to 41.5 feet deep. The soils encountered on the western portion site generally consisted of fill of varying thickness overlaying beach deposits that are underlain by very dense glacial advance outwash. Areas in the central and eastern portions of the site also contained fill of varying thickness overlaying wetland deposits and beach deposits that are underlain with very dense glacial advance outwash; a layer of peat was also identified in the central portion of the site, below the fill and underlying wetland deposits (see **Appendix A**).

The proposed project site does not contain agricultural land areas of commercial significance.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

There are no indications or history of unstable soils on the site or adjacent to the site and no evidence of landslide activity or unstable soils was observed during the preparation of the Geotechnical Report (see **Appendix A**).

e. Describe the purpose, type, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Approximately 3,000 cubic yards of material would be excavated from the site during construction activities and approximately 500 cubic yards of structural fill would be imported to the site. The specific source of fill material is not known at this time but would be obtained from a source approved by the City of Seattle.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Temporary erosion is possible in conjunction with any construction activity. Site work would expose soils on the site, but the implementation of a Temporary Erosion Sedimentation Control (TESC) plan that is consistent with City of Seattle standards and the implementation of best management practices (BMPs) during construction would mitigate any potential impacts.

Once the project is operational, no erosion is anticipated.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 86 percent of the school campus is currently covered with impervious surfaces, including buildings, paved play areas, walkways, parking areas and other impervious surfaces.

With the completion of the project, approximately 74 percent of the campus would be covered with impervious surfaces. New impervious surfaces would primarily consist of the proposed building addition and paved walkways, driveways and parking areas.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The proposed project would comply with City of Seattle regulations, including providing a Temporary Erosion and Sedimentation Control (TESC) Plan and Best Management Practices (BMPs). **Appendix B** also provides a summary of Construction BMPs that are typically utilized by Seattle Public Schools during the construction process. The following measures would be implemented during construction to control erosion:

- Design and construction of the proposed project shall comply with the recommendations of the Geotechnical Engineer (see **Appendix A**);
- Provide storm drain inlet protection;
- Route surface water away from work areas;
- Keep staging and travel areas clean and free of track-out;
- Cover work areas and stockpiled soils when not in use; and,
- Complete earthwork during dry weather and site conditions, if possible.

2. Air

a. What type of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Construction of the ***Alki Elementary School Addition and Renovation Project*** could result in temporary increases in localized air emissions associated with particulates and construction-related vehicles. It is anticipated that the primary source of temporary, localized increases in air quality emissions would result from particulates associated with demolition, on-site excavation and site preparation. While the potential for increased air quality emissions could occur throughout the construction process, the timeframe of greatest potential impact would be at the outset of the project in conjunction with the site preparation and excavation/grading activities. However, with the implementation of a TESC plan and construction BMPs, air quality emission impacts are not anticipated to be significant.

Temporary, localized emissions associated with carbon monoxide and hydrocarbons would result from diesel and gasoline-powered construction equipment operating on-site, construction traffic accessing the project site, and construction worker traffic. However, emissions from these vehicles and equipment would be small and temporary and are not anticipated to result in a significant impact.

Upon completion of the project, the primary source of emissions would continue to be from vehicles travelling to and from the site, including buses and commuter vehicles. Seattle Public Schools maintains an anti-idling policy for buses which minimizes potential emissions. As a result, significant adverse air quality impacts would not be anticipated.

Another consideration with regard to air quality and climate relates to Greenhouse Gas Emissions (GHG). In order to evaluate climate change impacts of the proposed project relative to the requirements of the City of Seattle, a Greenhouse Gas Emissions Worksheet has been prepared (see **Appendix C** of this Environmental Checklist).

This Worksheet estimates the emissions from the following sources: embodied emissions; energy-related emissions; and, transportation-related emissions. In total, the estimated lifespan emissions for the proposed new building addition would be approximately 78,411 $MTCO_2e$[4]. Based on an assumed building life of 62.5 years[5], the proposed building addition project would be estimated to generate approximately 1,255 $MTCO_2e$ annually. For reference, the Washington State Department of Ecology threshold for potential significant GHG emissions is 25,000 $MTCO_2e$ annually. The proposed project would not be anticipated to generate a significant amount of GHG emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

The primary source of emissions in the vicinity is vehicle traffic on surrounding roadways (59th Avenue SW, 58th Avenue SW, SW Stevens Way, SW Admiral Way, and Alki Avenue SW). There are no other offsite sources of air emissions or odors that may affect the project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The following measure would be provided to reduce/control air quality impacts during construction:

- Construction activities would be required to comply with Puget Sound Clean Air Agency (PSCAA) regulations, including Regulation I, Section 9.11 (prohibiting the emission of air contaminants that would be injurious to human health) and Regulation I, Section 9.15 (prohibiting the emission of fugitive dust, unless reasonable precautions are employed). Additional mitigation measures to minimize air quality impacts during construction are identified in **Appendix B**.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

There is no surface water body on or immediately adjacent to the

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[4] $MTCO_2e$ is defined as Metric Ton Carbon Dioxide Equivalent and is a standard measure of amount of CO_2 emissions reduced or sequestered.

[5] According to the Greenhouse Gas Emissions Worksheet, 62.5 years is the assumed building life for educational buildings.

Alki Elementary School Addition and Renovation Project site. The nearest surface water body is Schmitz Park Creek, which is located approximately 400 feet to the northwest of the project site (see **Figure 1**).

2) **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

   The proposed project would not require any work over, in, or adjacent (within 200 feet) to any water body.

3) **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

   No fill or dredge material would be placed in or removed from any surface water body as a result of the proposed project.

4) **Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.**

   The proposed project would not require any surface water withdrawals or diversions.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

   The proposed project site does not lie within a 100-year floodplain and is not identified as a flood prone area on the City of Seattle Environmentally Critical Areas map (*City of Seattle, 2022)*.

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

   There would be no discharge of waste materials to surface waters.

b. Ground:

1) **Will ground water be withdrawn, or will water be discharged to ground water? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.**

No groundwater would be withdrawn or water discharged to ground water as part of the proposed project. As part of the geotechnical investigations for the site, three groundwater monitoring wells were developed to measure groundwater levels at the site. Groundwater levels were measured between 10.5 feet and 15.1 feet below ground surface (*NV5, Inc., 2022)*. See **Appendix A** for further details on groundwater.

2) **Describe waste material that will be discharged into the ground from septic tanks or other sources; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

Waste material would not be discharged into the ground from septic tanks or other sources as a result of the proposed project.

c. **Water Runoff (including storm water):**

1) **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Approximately 86 percent of the existing Alki Elementary School campus is comprised of impervious surfaces, including existing buildings and paved surfaces (parking areas, play areas, walkways, etc.). The existing stormwater system for the school consists of a conventional tightlined conveyance system, including catch basins and piping, and is connected to the existing building downspouts and surface runoff. Offsite runoff that passes through the site is also connected into the existing system. The existing system outlets to sanitary sewer and stormwater mains in the 59th Avenue SW right-of-way.

With completion of the ***Alki Elementary School Addition and Renovation Project***, approximately 74 percent of the campus would be comprised of impervious surfaces. The site stormwater design for the project would be consistent with the City of Seattle's 2021 storm water manual. Flow control, onsite stormwater management and basic water quality treatment would all be required. Flow control would be provided with a below-grade concrete vault. Prior to outlet to the flow control vault, all roof, foundation drainage and surface runoff would be directed to proposed onsite stormwater management best management practices (BMPs) methods, including permeable pavement and non-infiltrating bioretention facilities. Water quality for pollution generating surfaces would be provided with non-infiltrating bioretention facilities. Offsite runoff that passes through the site will be collected and either flow through the flow control facility if volumes are acceptable or bypass the onsite stormwater management and be directed to the proposed stormwater drain main extension in the adjacent 59th Avenue SW right-of-way. With the implementation of the proposed stormwater improvements and measures, no significant stormwater runoff impacts would be anticipated.

2) Could waste materials enter ground or surface waters? If so, generally describe.

The proposed stormwater management system for the site would continue to ensure that waste materials would not enter ground or surface waters as a result of the proposed project.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? *If so, describe.*

The proposed project would not alter or otherwise affect drainage patterns in the site vicinity.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

The following measures would be implemented to control surface, ground and runoff water impacts:

- A Temporary Erosion and Sedimentation Control (TESC) Plan and Construction Best Management Practices (BMPs) would be implemented during construction to reduce erosion and minimize impacts to water resources.
- Stormwater management for the proposed project would comply with applicable City requirements, including the City's Stormwater Code (*SMC 22.800*).

4. Plants

a. Check or circle types of vegetation found on the site:

X_deciduous tree:
X_evergreen tree:
X_shrubs
X_ grass
__ pasture
__ crop or grain
__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
__ water plants: water lily, eelgrass, milfoil, other
_ other types of vegetation

A draft tree inventory and assessment (**Appendix D**) was completed for the project by Tree Solutions, Inc. Approximately 32 regulated trees (greater than six inches in diameter at standard height) are located on the school campus, including Bigleaf maple, Norway maple, Red alder, Wild cherry, Camellia, Red maple, Vine maple, Persian ironwood, English oak, Willow, Western hemlock, Sawara cypress, Incense cedar, and Common hawthorn. The trees range in size from 6 inches in diameter to 22.5 inches in diameter. One of the trees on the school campus, a vine maple, met the City of Seattle's criteria for an exceptional tree (*City of Seattle Director's Rule 16-2008*).

In addition, 31 trees located adjacent to the site were also documented, including 5 trees that are located in the public right-of-way and are regulated by the Seattle Department of Transportation (SDOT) and 18 trees that are located on Seattle Parks and Recreation Department property. Three of the trees located adjacent to the south and west of the site were identified as exceptional trees.

b. What kind and amount of vegetation will be removed or altered?

The existing site contains very minimal existing landscaping and vegetation. A narrow strip of plantings and trees is located on the west edge of the existing building and the southeast corner of the site contains a steep slope and unmanaged vegetated area that is primarily comprised of a mix of native and invasive/opportunistic tree and plant species. The majority of this vegetation would be removed, including the southeast area of the site to accommodate building construction and the construction of new retaining walls in the southeast corner of the site. A total of 26 existing trees would be removed from the project site as part of the ***Alki Elementary School Addition and Renovation Project***, including one exceptional tree. An additional seven trees that are below the regulated threshold (six inches in diameter) would also be removed. All five of the existing street trees would be retained with the project.

c. List threatened or endangered species known to be on or near the site.

No known threatened or endangered species are located on or proximate to the project site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

New landscaping would be provided on the site as part of the ***Alki Elementary School Addition and Renovation Project***, including non-infiltrating bioretention planting areas, low shrub and ground cover plantings with small trees near the proposed loading dock, a mulched tree planting area at the foot of the southeast slope area, and replanting of the southeast slope with native shrubs, groundcovers and trees. An occupiable roof area on the 2nd floor of the building would also be used as an outdoor learning area and contain landscape planters with shrubs and groundcovers.

The proposed project would comply with the City of Seattle's Tree Ordinance and all applicable requirements for tree removal and replacement. Since trees will be removed from the ECA steep slope area in the southeast corner of the site, the project would include revegetation of the slope in accordance with an ECA restoration plan and include revegetation with native shrubs, groundcovers and trees. One exceptional tree would be removed as part of the project. Consistent with City requirements, the project would replace the exceptional tree with a tree or group of trees that will provide an equal canopy coverage at maturity.

All retained trees on the school campus would be protected during construction by following tree protection measures that are outlined in **Appendix D**. The draft tree inventory and assessment (**Appendix D**) will also be finalized upon the completion of the construction plans for the project.

e. List all noxious weeds and invasive species known to be on or near the site.

Noxious weeds or invasive species that could be present in the vicinity of the site include giant hogweed, English Ivy and Himalayan blackberry.

5. Animals

a. Circle (underlined) any birds and animals that have been observed on or near the site or are known to be on or near the site:

birds: **songbirds,** hawk, heron, eagle**, other: seagulls, pigeons,**
mammals: deer, bear, elk, beaver**, other: squirrels, raccoons, rats, mice, opossum**
fish: bass, salmon, trout, herring, shellfish**, other: None.**

Birds and small mammals tolerant of urban conditions may use and may be present on and near the ***Alki Elementary School Addition and Renovation Project*** site. Mammals likely to be present in the site vicinity include: raccoon, eastern gray squirrel, mouse, rat, and opossum.

Birds common to the area include: European starling, house sparrow, rock dove, American crow, seagull, western gull, Canada goose, American robin, and house finch.

b. List any threatened or endangered species known to be on or near the site.

The following are listed threatened species that could be affected by development on the site or surrounding vicinity based on data from the U.S. Fish and Wildlife Service: marbled murrelet, streaked horned lark, yellow-billed cuckoo, and bull trout; there are no endangered species known to be in the site vicinity[6]. However, it should be noted that none of these species have been observed at the site and due to the urban location of the site, it is unlikely that these animals are present on or near the site.

c. Is the site part of a migration route? If so, explain.

The proposed project site is not located within a specific migration route. However, in general, the entire Puget Sound area is within the Pacific Flyway, which is a major north-south flyway for migratory birds in America—extending from Alaska to Patagonia. Every year, migratory birds travel some or all of this distance both in spring and in fall, following food sources, heading to breeding grounds, or travelling to overwintering sites.

d. Proposed measures to preserve or enhance wildlife, if any:

New landscaping would be provided as part of the project within non-infiltrating bioretention planting areas, low shrub and groundcover plantings with small trees near the loading dock, a mulched tree planting area at the foot of the southeast slope, and replanting of the southeast slope once new retaining walls are constructed. The southeast slope will be replanted with native shrubs, groundcovers, and trees. The project is not anticipated to have a substantial impact on wildlife located in the vicinity of the site.

e. List any invasive animal species known to be on or near the site.

There are no known invasive animal species on or adjacent to the project site; however, invasive species known to be located in King County include European starling, house sparrow and eastern gray squirrel.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

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[6] U.S. Fish and Wildlife Service. IPaC. https://ecos.fws.gov/ipac/location/index. Accessed April 2022.

Electricity is currently utilized by the existing school buildings and would continue to be the primary source of energy that would serve the school. The proposed ***Alki Elementary School Addition and Renovation Project*** would utilize electricity for lighting and heating, as well as electronics.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The proposed project would not affect the use of solar energy by adjacent properties.

d. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The proposed project would be required to meet or exceed the requirements of the City of Seattle Energy Code, as well as the Washington Sustainable Schools Protocol. Energy conservation features that would be provided as part of the project include the following:

- north-south classroom orientation and skylights to optimize daylight and reduce electric lighting,
- high performance windows and continuous insulation on the exterior of the building to reduce heat/energy loss,
- solar readiness for future installation of solar panels,
- vacancy sensors in rooms and motion sensors on exterior driveway and parking lot lighting to automatically turn off or dim lighting,
- high efficiency LED lighting for all spaces,
- multi-zone dedicated outside air systems (DOAS) to provide ventilation throughout the building,
- passive heating for the majority of the building through the use of heating water radiant panels and baseboard convectors,
- central water to water heat plant pump with the use of geothermal heat for a heating source.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

The Washington State Department of Ecology (Ecology) website was reviewed to identify any potential contaminated soils on or in the vicinity of the site, as well as potential issues related to the former Tacoma Asarco Smelter Plume. There are no records of any contaminated soils on the project site. Based on Ecology's GIS mapping system, the site and surrounding area is predicted to have arsenic concentrations of 20 ppm to 40 ppm[7]. As part of their soil safety program, Ecology established a program to provide soil sampling and soil safety actions for schools, parks, camps and licensed childcares in areas of King County, Pierce County and Thurston County that could be affected by the Tacoma Asarco Smelter Plume. Portions of the West Seattle area, including the project site, were originally located within the service area. However, the site and surrounding areas of West Seattle were removed from the soil safety program area in 2010 due to the fact that almost all samples taken from this area of King County were found to be below the required cleanup threshold levels (*Washington State Department of Ecology, 2022*).

According to the Ecology website, there are no active or former cleanup sites in the vicinity of the project site (*Washington State Department of Ecology, 2022*).

As with any construction project, accidental spills of hazardous materials from equipment or vehicles could occur; however, a spill prevention plan would minimize the potential of an accidental release of hazardous materials into the environment.

1) Describe any known or possible contamination at the site from present or past uses.

A hazardous building materials survey was completed for the building in March 2022 by EHSI (*EHSI 2022*) and included inspections for asbestos-containing materials (ACM), lead-containing paint (LCP), polychlorinated biphenyl (PCB)-containing light ballasts, mercury-containing fluorescent light tubes, switches and thermostats, and other regulated materials. 150 samples of suspect ACM were collected from the existing building and 37 of those samples contained greater than one percent asbestos. In addition, several materials that do not contain asbestos are adhered to ACM and must also be assumed to contain asbestos in the event those materials are removed or disturbed during construction.

Lead was also detected during the hazardous building materials survey. Because the survey was limited and did not include a comprehensive paint color and substrate survey it is recommended to assume that paint coatings within the building contain at least detectable levels of lead. Arsenic samples were also collected from three paint chip samples and all three samples contained detectable levels of arsenic.

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[7] For reference, the threshold for Ecology to cleanup and remove soils on a property is arsenic concentrations greater than 100 ppm

The survey also included an inventory of PCB light ballasts and mercury-containing items such as fluorescent light tubes and fixtures, thermostats and switches. All identified magnetic light ballasts are assumed to contain PCBs. A similar assumption applies to mercury potentially present in fluorescent light tubes and fixtures (see **Appendix E** for details).

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

As described above, the existing building contains ACM, lead-containing materials/paint, PCB-containing light ballasts, and mercury-containing items (i.e., fluorescent light tubes and fixtures, etc.). These materials that would be impacted by the project would be removed and disposed of in accordance with applicable local, state and federal regulations.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

During construction, gasoline and other petroleum-based products would be used for the operation of construction vehicles and equipment.

During the operation of the school, chemicals that would be used on the site would generally be limited to cleaning supplies and would be stored in an appropriate and safe location.

4) Describe special emergency services that might be required.

No special emergency services are anticipated to be required as a result of the project. As is typical of urban development, it is possible that normal fire, medical, and other emergency services may, on occasion, be needed from the City of Seattle.

5) Proposed measures to reduce or control environmental health hazards, if any:

A spill prevention plan would be developed and implemented during construction to minimize the potential for an accidental release of hazardous materials into the environment.

An asbestos abatement contractor licensed in accordance with WAC 296-62-077 and PSCAA Regulation III, Article 4 must remove all ACM and asbestos contaminated materials within the building prior to disturbance. All personnel working with LCP (or other lead-containing materials) should be provided additional training concerning the health effects of lead, proper work methods, appropriate use of personal protective equipment, and regulations governing lead exposures. Air monitoring to assess lead exposure levels should also be performed for all personnel involved in the demolition process where LCP may be removed.

All light ballasts should be tracked, removed, handled and disposed of in accordance with appropriate regulations, including WAC 173-303. Mercury-containing items such as fluorescent light tubes and fixtures, thermostats and switches would be removed and disposed of in accordance with the Standards for Universal Waste Management (WAC 173-303-573). See **Appendix E** for further details.

b. Noise

1) What types of noise exist in the area that may affect your project (for example: traffic, equipment operation, other)?

Noise associated with traffic from adjacent roadways (59th Avenue SW, 58th Avenue SW, SW Stevens Way, SW Admiral Way, and Alki Avenue SW) is the primary source of noise in the vicinity of the project site. Existing noise in the site vicinity is not anticipated to adversely affect the proposed ***Alki Elementary School Addition and Renovation Project***.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from site.

Short-Term Noise

Temporary construction-related noise would occur as a result of on-site construction activities associated with the project. Construction activities including, excavation/grading, demolition, construction of the building addition, and construction/drilling for the associated geothermal wells would be the primary sources of construction noise during the development process. Construction of the geothermal wells would be anticipated to occur over an approximately four- to five-month duration. The primary source of noise during construction of the wells would be from the operation of the diesel engine during the installation process. Similar to other construction-related activities on the site, noise from construction of the geothermal wells would be temporary and is not anticipated to result in a significant impact.

Existing residential land uses surrounding the school would be the most sensitive noise receptors and could experience occasional noise-related impacts throughout the construction process.

Pursuant to Seattle's Noise Code (SMC, Chapter 25.08), maximum sound levels in residential communities shall not exceed 55 dBA. However, per SMC 25.08 and based on the LR1 (M) zoning for the site, construction activities are allowed to exceed the maximum noise levels between 7 AM and 7 PM on weekdays and 9 AM to 7 PM on weekends. Construction equipment may exceed the sound level limits during construction periods by 25 dB(A) and portable powered equipment may exceed the limits by 20 dB(A).

The proposed project would comply with provisions of Seattle's Noise Code (*SMC, Chapter 25.08*) as it relates to construction-related noise to reduce noise impacts during construction. Contractors are aware of the City of Seattle Noise Ordinance requirements and are contractually required by Seattle Public Schools to abide by them.

Long-Term Noise

The proposed ***Alki Elementary School Addition and Renovation Project*** and associated increase in student capacity would likely result in a potential minor increase in noise from human voices and vehicles travelling to and from the site, particularly during the school day and during student drop-off and pickup. The potential increase in noise is anticipated to be minor as a result, no significant noise impacts would be anticipated.

3) Proposed measures to reduce or control noise impacts, if any:

The following measures would be provided to reduce noise impacts:

- As noted, the project would comply with provisions of the City's Noise Ordinance (*SMC 25.08*); specifically: construction hours would be limited to standard construction hours (non-holiday) from 7 AM to 7 PM and Saturdays and Sundays from 9 AM to 7 PM.

- To reduce noise impacts during construction, contractors would comply with all local and state noise regulations. Contractors may also implement the following measures to further reduce or control noise impacts during construction:
    - Construction would likely occur between 7 AM and 5 PM on weekdays, although, per SMC 25.08, construction is allowed to occur between 7 AM and 7 PM on weekdays and 9 AM to 7 PM on weekends and holidays.
    - Minimize idling time of equipment and vehicle operation.
    - Operate equipment only during hours approved by the City of Seattle.

- Use well-maintained and properly functioning equipment and vehicles.
- Locate stationary equipment away from receiving properties.

The project would also include the installation of geothermal wells. The duration of work to install the wells is estimated to be approximately four to five months, depending on weather. The noise associated with the drilling of the wells would be within local and state regulations. The contractor would provide updates to nearby residents on the progress and duration of activities during the construction of the project. After construction, the site would continue to serve as a school and no significant changes in noise levels are anticipated over existing conditions. No additional mitigation would be required.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is currently utilized for the existing Alki Elementary School and would continue to be utilized as a school. The proposed project would not be anticipated to affect current land uses on adjacent properties.

The Alki Elementary School campus is comprised of the existing two-story, approximately 46,330 sq. ft. main school building which is located on the western portion of the site. A one-story fieldhouse building is situated to the east of the main school building and is located on both SPS and adjacent City of Seattle Parks and Recreation property. The fieldhouse building contains the existing school gymnasium while the north portion of the building is operated by the City of Seattle Parks and Recreation Department as the Alki Community Center. A portable classroom building and hard surface play areas are located to the north of the main school building, on Seattle Parks and Recreation property. A paved surface parking lot with room for approximately 20 vehicles is located to the south of the school building.

The proposed ***Alki Elementary School Addition and Renovation Project*** would demolish the existing main school building to create room for the development of the three-story addition. The existing fieldhouse building would be retained and the gymnasium would be renovated as part of the project (see **Figure 2** for an aerial photo of the existing site and **Figure 3** for the proposed site plan of the project).

The area to the north of the site is comprised of Seattle Parks and Recreation Department uses, including Alki Playground and Whale Tail Park. Further to the north are multifamily residential uses, commercial uses and Alki Beach Park. The area to the east of the includes single family and multifamily residences and Schmitz Preserve Park which contains the Schmitz Park to Alki Trail that connects to the southeast, including near the Schmitz Park School site. Areas to the south and west of the school are generally comprised of multifamily residential uses.

b. Has the site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The project site has no recent history of use as a working farmland or forest land.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The project site is located in an urban area and would not affect or be affected by working farm or forest land; no working farm or forest land is located in the vicinity of this urban site.

c. Describe any structures on the site.

The existing two-story Alki Elementary School building is located in the western and central portions of the site and is generally constructed of brick, glass and marblecrete panel. An existing fieldhouse building is located in the eastern portion of the site and contains the school gymnasium as well as the City of Seattle Parks and Recreation Department's Alki Community Center. A portable classroom building is also located to the north of the existing school building within the right-of-way area that is fee-managed by the Seattle Parks and Recreation Department.

d. Will any structures be demolished? If so, what?

The existing school building would be demolished to accommodate the proposed building addition. The existing portable classroom building that is located within the right-of-way area that is fee-managed by the Seattle Parks and Recreation Department would also be demolished. The fieldhouse building would be retained onsite and the gymnasium would be renovated as part of the project.

e. What is the current zoning classification of the site?

The site is currently zoned as LR1 (M) which is a multifamily residential zone which allows development such as townhouses, rowhouses and apartments. Public schools are also a permitted use in the LR1 (M) zone.

The surrounding areas to the immediate south and west of the campus are also currently zoned as LR1 (M). Areas to the immediate north and east of the site are zoned as SF 5000.

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation for the site is Multifamily Residential (*City of Seattle, 2022*).

g. If applicable, what is the current shoreline master program designation of the site?

The project site is not located within the City's designated shoreline boundary.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

As noted in Section 1b, according to the City of Seattle's Environmentally Critical Areas (ECA) GIS Maps, a portion of the southeast corner of the site is designated as a ECA steep slope area and also meets the Seattle Municipal Code (SMC 25.09.012) definition for a landslide-prone area (*City of Seattle, 2022*). The slope area includes a two-tiered rockery to accommodate some of the grade change.

The north edge of the project area is identified as a peat-settlement-prone area. As noted in the geotechnical report (**Appendix A**), a layer of peat was identified in this area during geotechnical investigations of the site. Deep foundations and ground improvement techniques are recommended for the proposed building addition and substantial dewatering activities are not anticipated. The proposed development is also not anticipated to lower existing groundwater levels and as such, would not significantly affect the peat-settlement-prone areas.

A large portion of the site is also identified as a liquefaction-prone area by the City's ECA GIS maps. As part of the geotechnical report, boring and cone penetrometer probes were utilized to explore the subsurface conditions and liquefaction analyses to determine the susceptibility of soils to liquefaction during a seismic event. Based on the results of the analysis, it was determined that the site would not be susceptible to liquefaction and should not be classified as a liquefaction-prone area (see **Appendix A**).

No other environmentally critical areas are located on or adjacent to the project site.

i. **Approximately how many people would reside or work in the completed project?**

The proposed ***Alki Elementary School Addition and Renovation Project*** would not provide any residential opportunities. Upon completion, the proposed project would create new classroom and associated school space to accommodate a student capacity of approximately 502 students in grades K-5; space would also be provided for approximately 40 students in early learning/pre-school programs (current capacity is approximately 313 students, including the existing portables).

Currently, Alki Elementary includes approximately 38 full-time and part-time employees. It is anticipated that with the proposed addition the total staffing for the school would be approximately 65 to 75 employees at the school.

j. **Approximately how many people would the completed project displace?**

The proposed project would not displace any people.

k. **Proposed measures to avoid or reduce displacement impacts, if any:**

No displacement impacts would occur and no mitigation measures are necessary.

l. **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:**

The proposed project would modernize the existing school building and construct an addition to the existing building, and as with most Seattle Public School facilities, it is located within a residential neighborhood. The proposed project would be compatible with existing land uses and plans.

The Seattle Municipal Code includes development standards for public schools in residential zones (SMC 23.51B.002) and includes procedures through which departures from the required development standards of the code can be granted for public school structures (SMC 23.79). Due to the existing site characteristics and project design goals, the project is requesting land use departures for the following:

(setbacks, onsite vehicle parking, onsite bicycle parking, on-street bus loading and unloading, changing-image sign)[8].

In addition, the existing site is so small that it necessitates that the project develop a taller building to accommodate the proposed building program for the school within the limited space of the site. The design of the project is intended to maximize the buildable area of the site in order to minimize the overall building height that is required to accommodate the proposed building program for the school. The new structure will be only one floor taller than the existing building. It is located as far north on the property as allowed by the building code to maximize distance from the neighboring residential properties to the south. Not building taller than the existing structure would require a property expansion into adjacent residential areas to meet the building program for the new school. As a result, the project is also requesting a Type I decision waiver of the LR1 maximum height limit for public schools pursuant to SMC 23.51B.002.D4 in order to develop the proposed project within the size constraints of the existing site. Seattle Public Schools is continuing to coordinate with the City of Seattle regarding the departures and Type I decision waiver for the project and would comply with the requirements of the City's process.

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

The project site is not located near agricultural or forest lands and no mitigation measures are necessary.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No housing units would be provided as part of the ***Alki Elementary School Addition and Renovation Project***.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing presently exists on the site and none would be eliminated.

c. Proposed measures to reduce or control housing impacts, if any:

No housing impacts would occur and no mitigation would be necessary.

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[8] A potential message board sign would be electronically lit but would have limited nighttime operation and would not include flashing or scrolling messages.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The existing two-story building is approximately 26 feet tall at its tallest point of the building; the existing retained gymnasium and community center building is approximately 30 feet tall. The proposed three-story addition would be taller than the existing building and approximately 56 feet tall at its highest point. The project design is intended to maximize the buildable area of the site in order to minimize the overall building height that is required to accommodate the proposed building program for the school within the limited space on the site. Not building taller than the existing structure would require a property expansion into adjacent residential areas to meet the building program for the new school. The new building addition would be only one floor taller than the existing and is located as far north on the property as allowed by the building code to maximize distance from the neighboring residential properties to the south.

The exterior building materials for the proposed ***Alki Elementary School Addition and Renovation Project*** would primarily include brick veneer and metal wall panels.

b. What views in the immediate vicinity would be altered or obstructed?

Views of the site would generally continue to be reflective of the existing school uses on the site. The proposed addition would increase the amount of building area on the site and views of the proposed addition would primarily be available from areas that are proximate to the boundaries of the school campus (see **Figure 3** for the proposed site plan).

Due the topography of the site and surrounding area, existing views across the site are generally limited from areas immediately adjacent to the site. Areas to the north, east, and west of the site are at a generally similar elevation as the Alki Elementary site and views from these areas are predominantly of the existing school building. With the proposed project, views from these areas would continue to be of the school but would be reflective of the proposed building addition. Areas to the south of the site are located at a higher elevation and certain locations contain views that extend across the site, beyond the existing school building. With the proposed project, these views from areas to the south would change to reflect portions the proposed taller building addition on the site. Existing, retained mature trees and proposed landscaping would provide a partial buffer/screen and enhance the visual appearance of the site.

The City's public view protection policies are intended to "protect public views of significant natural and human-made features: Mount Rainier, the Olympic and Cascade Mountains, the downtown skyline, and major bodies of water including Puget Sound, Lake Washington, Lake Union and the Ship Canal, from public places consisting of specified viewpoints, parks, scenic routes, and view corridors identified in Attachment 1 to the SEPA code[9]. There are no SEPA protected view sites on or adjacent to the ***Alki Elementary School Addition and Renovation Project*** site. The closest SEPA protected view site is Alki Beach Park which is located approximately 0.2 miles to the north of the project site. Views from that location are not anticipated to be affected by the proposed project. Schmitz Preserve Park (located to the east of the site) is also noted as a site in the SEPA protected view site inventory; however, the assessment for the site states that "the park contains no SEPA-defined views."

View protection from City-designated Scenic Routes is encouraged[10]. According to documentation from the City of Seattle, Alki Avenue SW (located to the north of the site) and SW Admiral Way (located to the south of the site) are designated as a scenic routes by the City. Building development from the proposed ***Alki Elementary School Addition and Renovation Project*** would be located over 300 feet from each of these streets and would not be anticipated to affect views from these scenic routes.

Views of designated historic structures are also a consideration[11]. However, there are no designated historic structures on or immediately adjacent to the ***Alki Elementary School Addition and Renovation Project*** site.

There are no designated views of the Space Needle on or adjacent to the project site[12].

c. Proposed measures to reduce or control aesthetic impacts, if any:

As part of the project design, the proposed building addition would be located as far north on the property as allowed by the building code to maximize distance from the neighboring residential properties to the south

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[9] Seattle Municipal Code Chap. 25.05.675 P.2.a.i. and the accompanying *Seattle Views: An Inventory of 86 Public View Sites Protected under SEPA (May 2002)* document.

[10] Ord. #97025 (Scenic Routes Identified by the Seattle Engineering Department's Traffic Division) and Ord. #114057 (Seattle Mayor's Recommended Open Space Policies).

[11] Seattle Municipal Code Chapter 25.05.675 P.2.b.i.

[12] Seattle Municipal Code Chap. 25.05.675 P. and Seattle DCLU, 2001

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Short-Term Light and Glare

At times during the construction process, area lighting of the job site (to meet safety requirements) may be necessary, which would be noticeable proximate to the project site. In general, however, light and glare from construction of the proposed project are not anticipated to adversely affect adjacent land uses.

Long-Term Light and Glare

Under the proposed ***Alki Elementary School Addition and Renovation Project***, there would be an increase in light and glare with the proposed building addition which would be proximate to the residential uses to the south and west of the site. Light and glare sources would primarily consist of interior and exterior building lighting, as well as lights from vehicles travelling to and from the site; glare from building materials (e.g., window glazing or other building materials) could also occur during certain times of day. Exterior building lighting would be designed to focus light on the site and minimize impacts to adjacent properties. Measures to further minimize light spillage on adjacent properties are also identified below and significant light and glare impacts would not be anticipated.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Light and glare associated with the proposed project would not be expected to cause a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

No off-site sources of light or glare are anticipated to affect the proposed project.

d. Proposed measures to reduce or control light and glare impacts, if any:

Interior and exterior building lighting would be programmed as part of the building facilities system to limit the amount of light utilized when the building is not in use and all exterior lighting would be shielded and directed toward the site to minimize light spillage. The proposed design for the proposed project is also intended to minimize lighting energy use through lighting controls, vacancy sensors, motion sensors, and other design features which would also minimize the amount of the light from the school. Evening activities/events currently occur periodically during the school year and increase light during the evening on those days; however, the number of evening events is not anticipated to substantially change with the proposed project and the amount of light would not be anticipated to result in a significant impact. Existing street trees and proposed new landscaping would also provide a partial buffer and screen to reduce light spillage from the proposed project.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Alki Elementary School campus includes approximately 310 square feet of fenced, paved recreation area that is currently utilized as an outdoor play space for students. The school also uses the existing adjacent SW Stevens Street right-of-way (which is fee-managed by Seattle Parks and Recreation) and Alki Playfield for recreation uses as part of SPS's existing joint use agreement with the City of Seattle Parks and Recreation Department. This agreement also allows Seattle Parks and Recreation and other community users to utilize the gymnasium when it is not in use by the school.

There are also several parks and recreation areas in the vicinity of the project site (approximately 1.0 mile), including:

- Alki Playfield and Whale Tail Park is located immediately to the north of the site.
- Schmitz Preserve Park and Trail is located immediately east of the site.
- Alki Beach Park is located approximately 0.2 miles to the north of the site.
- Bar-S Playground is located approximately 0.4 miles to the west.
- Constellation Park is located approximately 0.5 miles to the southwest.
- Nantes Park is located approximately 0.5 miles to the northeast.
- Cormorant Cove is located approximately 0.5 miles to the south.
- Alki Point is located approximately 0.6 miles to the west.
- Me-Kwa-Mooks Park and Natural Area is located approximately 0.8 miles to the south.
- Hiawatha Park is located approximately 1.0 miles to the east.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project would remove the existing, approximately 310 sq. ft. of fenced, paved recreation space and replace it with approximately 550 sq. ft. of fenced area for outdoor recreation with pavement, play turf surfacing, moveable play equipment, and mulched areas.

Approximately 380 sq. ft. of paved school entry area would double as a flexible outdoor recreation area as well. A portion of the second level of the building would also contain outdoor learning and recreation space for use by the school (approximately 1,110 sq. ft.).

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

As noted above, the proposed project would increase the amount of onsite recreation space on the campus when compared to the existing conditions. Approximately 550 sq. ft. of fenced area for outdoor recreation with pavement, play turf surfacing, moveable play equipment, and mulched areas. Approximately 380 sq. ft. of paved school entry area would double as a flexible outdoor recreation area as well. A portion of the second level of the building would also contain outdoor learning and recreation space for use by the school (approximately 1,110 sq. ft.). Recreation areas would offer a variety of spaces for different recreation activities such as group play and individual play. Landscaping would also be provided as part of the recreation areas to enhance these areas. The proposed project would also renovate the existing gymnasium to provide enhanced indoor recreation space for students.

As under existing conditions and per their joint use agreement with Seattle Parks and Recreation Department, the school would also continue to utilize the SW Stevens Street right-of-way (which is fee-managed by Seattle Parks and Recreation) and Alki Playfield for recreation uses. Seattle Parks and Recreation and other community users would also continue to be able to utilize the gymnasium when not in use by the school. No additional impacts to recreation would occur and no additional mitigation is necessary.

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

The Alki Elementary School building was originally constructed in 1913. However, the present makeup of the school consists of a 1953-1954 addition to the original building (which included the westernmost portion of the building and easternmost portion of the building) and a 1966-1968 addition which replaced the 1913 original building. The current makeup of the existing building was designed by Seattle architect Theo Damm. Alki Elementary School is not listed on any national or state historic registers. On November 30, 2021, SPS completed a Landmark Nomination Application for the existing building to the City of Seattle for review by the Landmarks Preservation Board. The Landmarks

Preservation Board met on April 20, 2022 to review the nomination and ultimately voted to deny the nomination (see **Appendix F** for details).

According to the City of Seattle Landmarks Map and Database (*City of Seattle, 2022*), the closest listed City of Seattle Landmarks are the Schmitz Park Bridge (located approximately 0.2 miles to the east), the Log House Museum Building (located approximately 0.2 miles to the west), and the Fir Lodge (located approximately 0.2 miles to the northwest).

According to the Washington State Department Archaeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD), the closest listed historic register properties are the Schmitz Park Bridge (located approximately 0.2 miles to the east and listed on the National Register of Historic Places [NRHP] and the Washington Heritage Register [WHR]), the Fir Lodge (located approximately 0.2 miles to the northwest and listed on the WHR and the NRHP), and the Alki Point and Duwamish Head (located approximately 0.2 miles to the northwest and listed on the WHR).

It should be noted that as part of the proposed project, SPS is participating in consultation and review with DAHP as part of the separate Governor's Executive Order 21-02 process which includes early outreach and consultation with DAHP and local Tribes. As part of the process, SPS met with DAHP and provided project details for their review. On May 11, 2022, DAHP determined that the proposed project would not impact any historic properties (see **Appendix F**). On May 12, 2022, SPS sent letters requesting comments via email and certified mail to the following Tribes: Tulalip, Suquamish, Snoqualmie, Muckleshoot, and Duwamish. Follow up emails and phones calls were also sent on May 26, May 27, May 31, and June 10, 2022 to local Tribes. As of June 30, 2022, SPS had received responses to its consultation outreach from the Duwamish, Snoqualmie, and Tulalip Tribes. SPS has also setup several meetings with the Duwamish Tribe, including March 3 and June 10, 2022 to the discuss the project and project design and will continue to meet with them and other interested Tribes as part of their consultation efforts for the project.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

A cultural resources assessment was completed for the project site (*Perteet, 2022*)[13] and included an analysis of the natural and cultural setting, a discussion of previous cultural resource investigations in the site vicinity, review of geotechnical investigations on the site, and an on-site investigation. Prior to conducting onsite field work, letters were sent on March 2, 2022 to local Tribes (including the Duwamish Tribe, Muckleshoot Tribe, Snoqualmie Tribe, Suquamish Tribe, and Tulalip Tribe) to solicit concerns and inform the Tribes of the upcoming onsite cultural resource investigation. A representative from the Snoqualmie Tribe was in attendance during all of the field work for the cultural resources assessment.

The onsite investigations were conducted on the project site, including a pedestrian survey of the site. Because the site area is comprised almost entirely of artificial terrain, buildings, impervious surfaces, and site amenities (e.g., fencing, decorative plantings, buried utilities, etc.), there were no suitable locations for subsurface archaeological probes or test pits on the site. Archaeological fieldwork relied upon the pedestrian survey and photographic documentation of the area. Surface visibility was generally poor due to the pervasiveness of paved surfaces and existing structures throughout the site. No potentially-significant archaeological materials were observed during the fieldwork.

The results of geotechnical testing review and archaeological research suggests that well-preserved cultural materials are unlikely to exist near the modern surface within the site area. Near surface contexts within the site area are likely to consist of thick anthropogenic fill related to preparation of the project area during the construction of the existing onsite buildings and facilities.

However, the cultural resource analysis also indicates an elevated risk that deeply-buried archaeological resources could lie within the site area. The vicinity represents an environmental and geographic context that has been intensively used by local populations for millennia, multiple historically important locations and events have been documented nearby, and human remains have also been previously found nearby. Further, available geotechnical, geomorphic and archaeological information suggest the project area lies atop a former coastal wetland and such contexts can contain historically-significant archaeological materials and contexts.

Therefore, since subsurface investigations were not possible at this time due to the site being almost entirely covered with buildings, impervious surfaces and other site amenities, it is recommended that additional subsurface investigations be performed under the supervision of a qualified professional archaeologist prior to any construction undertaking that will affect native sediment underlying historical fill on the site. Remote sensor techniques are not likely to be

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[13] The Cultural Resources Assessment is on-file with SPS and available upon request.

effective at this site because electrical resistivity and magnetometry are limited in their depth of penetration and would not be able to detect below the fill at the Alki Elementary site. As a result, at minimum, additional subsurface investigations should target the location(s) where construction-related ground disturbance is most likely to affect well preserved wetland sediments as indicated by geotechnical data and its extent should be sufficient to allow direct visual examination of in situ stratigraphic contexts. Upon completion of the subsurface investigation, results and updated recommendations should be presented in an addendum report. If archaeological materials are encountered during investigations, further work may be necessary to ensure analysis and/or preservation of recovered materials. If materials are not encountered, additional archaeological monitoring of subsequent project area ground disturbance may nonetheless be recommended as a means of supporting preservation of archaeological remains in portions of the project area that were not sampled during investigations. See **Appendix F** for further details.[14]

As noted above, SPS is continuing to consult with local Tribes regarding the project. On May 12, 2022, SPS sent letters requesting comments via email and certified mail to the following Tribes: Tulalip, Suquamish, Snoqualmie, Muckleshoot, and Duwamish. Follow up emails and phones calls were also sent on May 26, May 27, May 31, and June 10, 2022 to local Tribes. As of June 30, 2022, SPS had received responses to its consultation outreach from the Duwamish, Snoqualmie, and Tulalip Tribes. SPS has also setup several meetings with the Duwamish Tribe, including March 3 and June 10, 2022 to the discuss the project and project design, as well as continued email and telephone communication regarding the project. SPS will continue to consult with and meet with the Duwamish and other interested Tribes as part of their consultation efforts for the project and is planning on additional meetings in July and August 2022.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

The DAHP website, WISAARD, and City of Seattle Landmarks website were consulted to identify any potential historic or cultural sites in the surrounding area, as well as the potential for encountering archaeological resources in the area.

In addition, a Cultural Resources Assessment was completed for the school site (*Perteet, 2022*). The assessment included a review of existing documentation on the natural, cultural and historic setting of

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[14] The Cultural Resources Assessment is on-file with SPS and available upon request.

the site and surrounding area; a review of previous studies that were conducted in the project area; and, on-site surface investigations. Because the site is comprised almost entirely of buildings, impervious surfaces, and site amenities (e.g., fencing, decorative plantings, buried utilities, etc.), there were no suitable locations for subsurface archaeological investigations on the site. SPS is also in the process of consultation with DAHP and local Tribes as part of the process for Governor's Executive Order 21-02. SPS is continuing their ongoing communications with local Tribes, which has included previous email and telephone outreach and meetings with Tribes; future consultation meetings with local Tribes are also anticipated to be held in July and August 2022.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The Cultural Resources Assessment (*Perteet, 2022*) included the recommendation for additional subsurface investigations prior to any construction activities that will affect native sediment underlying historic fill on the site. At minimum, this investigation should target the location(s) where construction-related ground disturbance is most likely to affect well preserved wetland sediments as indicated by geotechnical data and its extent should be sufficient to allow direct visual examination of in situ stratigraphic contexts. Upon completion of the subsurface investigation, results and updated recommendations should be presented in an addendum report. Additional archaeological monitoring may also be recommended as a means of supporting of supporting preservation of archaeological remains in portions of the project area that were not sampled during investigations. It is also recommended that SPS ensure that designated representatives of affected Tribes are notified in advance of any ground disturbing project activities and allow Tribal monitors the opportunities to observe those activities (see **Appendix F**).

In addition, as noted in Section 13a, DAHP indicated that they determined that the proposed project is not likely to have an adverse impact. SPS is also continuing ongoing consultation with local Tribes. On May 12, 2022, SPS sent consultation letters via email and certified mail to the Tulalip, Suquamish, Snoqualmie, Muckleshoot, and Duwamish Tribes. Follow up emails and phones calls were also sent on May 26, May 27, May 31, and June 10, 2022 to local Tribes. As of June 30, 2022, SPS had received responses to its consultation outreach from the Duwamish, Snoqualmie, and Tulalip Tribes. SPS also coordinated several meetings with the Duwamish Tribe, including March 3 and June 10, 2022 to the discuss the project and project design, including discussions on the potential to incorporate art work into the project. SPS will continue to consult with and meet with Duwamish and other interested Tribes as part of their consultation efforts for the project and is planning on additional meetings in July and August 2022.

14. Transportation

A Transportation Technical Report for the ***Alki Elementary School Addition and Renovation Project*** was prepared by Heffron Transportation, Inc. (*Heffron Transportation, 2022)*. Information from the technical report is summarized in this section. See **Appendix G** for the full technical report.

a. Identify public streets and highways serving the site or affected geographic area and describe the proposed access to the existing street system. Show on site plans, if any.

The existing Alki Elementary School site is bounded by 59th Avenue SW on the west, Seattle Parks and Recreation property to the north, and private residential properties to the east and south. A paved surface with room to park about 20 vehicles is located on the south side of the school buildings and is accessed from a driveway at the south edge of the site on 59th Avenue SW. The hard-surface area north of the building (referred to as a Parks Boulevard) has a gated access drive on 59th Avenue SW opposite SW Stevens Street. It is signed for “Community Center Parking Only,” but is also used for school-event parking. The Parks property on the north side has a curb cut extending from the south end of 58th Avenue SW. It provides access to two parking stalls—one 15-minute load space and one disabled permit space. To the east of these stalls are six spaces signed for “Alki Community Center Permitted Staff Parking Only.” East of these spaces, the Parks property extends east and becomes Schmitz Preserve Park. It contains the Schmitz-Park-to-Alki Trail with trail connections to SW Hinds Street to the southeast near the Schmitz Park School site and the SW Manning Street / 53rd Avenue SW intersection near the south end of the park.

The curb-side frontage on the east of 59th Avenue SW in front of the school building (between the site access driveway and SW Stevens Street) is signed for “School Bus Only (7-10 a.m. and 1-4 p.m.).” North of SW Stevens Street and adjacent to a portion of the Alki Playground, the east side of 59th Avenue SW (about 135 feet) is signed for “15-minute School Load Only (7-10 a.m. and 1-4 p.m.)” and “No Parking” during all other times.

The existing access driveway serving that lot would be modified to serve a new gated delivery / service area proposed on the southwest corner of the site. The project would improve its site’s frontage along 59th Avenue SW with new curb, sidewalk, street trees, and with a two-foot widened pull-out area to better accommodate school buses. It is anticipated that SPS will renew its code departure for the on-street school-bus load/unload zone along 59th Avenue SW. All frontage improvements will be coordinated with SDOT. The project would also retain the existing curb-side passenger-vehicle load/unload area along the east side of 59th Avenue SW north of the school and adjacent to Alki Playground. Figure 2 in the referenced Transportation Technical Report shows the proposed site elements, including the proposed modifications to the site access driveway on 59th Avenue SW to accommodate service and loading functions (see **Appendix G**).

b. Is site or affected geographic area currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

King County Metro Transit (Metro) provides bus service in the site vicinity. The closest bus stop is located about 450 feet to the south on SW Admiral Way at 59th Avenue SW and serves eastbound buses; a stop serving westbound buses is located about 1,000 feet away on SW Admiral Way at 61st Avenue SW. These stops are served by Metro Routes 50, 56, and 775, which are described below.

- **Route 56** provides daily, peak period service between the Alki and Downtown Seattle with stops in the Admiral District. On weekdays, the route operates with eight trips inbound to Downtown Seattle in the morning between 5:50 and 9:00 a.m.; it operates with seven trips outbound from Downtown in the afternoon between about 3:00 and 6:45 p.m.
- **Route 50** provides daily service between the Alki and Othello Station with stops in the Admiral District, Alaska Junction, SODO, VA Medical Center, Beacon Hill, Columbia City and Seward Park. On weekdays, the route operates with inbound trips to Othello Station with headways (time between consecutive buses) of 15 to 45 minutes between about 5:30 a.m. and 12:00 a.m.; it operates outbound trips to Alki with 30- to 45-minute headways between about 5:00 a.m. and 12:00 a.m.
- **Route 775** provides weekday, peak period service in one direction between Seacrest Park and Alki with a stop in the Admiral District. On weekdays, the route operates with six trips between about 6:30 and 9:00 a.m.; it operates outbound seven trips between about 3:15 and 7:00 p.m. There are also stops located about 0.2 mile to the north on Alki Avenue SW at 59th Avenue SW.

c. How many additional parking spaces would the completed project have? How many would the project or proposal eliminate?

There is one existing on-site parking lot with an estimated parking supply of 20 spaces.

The project would eliminate the on-site parking and the vehicles that currently park there (observations found 17 to 19 vehicles in school days) would be displaced to on-street parking in the site vicinity. The school would continue to have less off-street parking than would be required by Seattle land use code. As part of the building permit approval process for the project, Seattle Department of Construction and Inspections (SDCI) is anticipated to initiate a Development Standard Departure process with the Seattle Department of Neighborhoods to review this and any other code departures requested.

The school's frontage along 59th Avenue SW that prohibits parking but allows school load/unload activities during peak periods on school days, would not substantially change with project.

A detailed study of parking conditions was prepared and is presented in the referenced *Transportation Technical Report* (**Appendix G**). As presented in that report, the expanded school with the enrollment capacity and staffing increases could generate an additional parking demand of 26 to 45 vehicles; demand would vary somewhat depending on the number of part-time staff and volunteers on site at any one time. With the elimination of the on-site parking lot, the project could increase demand for on-street parking on school days by 45 to 64 vehicles. As detailed in that analysis, on-street parking within the site vicinity averages between 50% and 56% occupied on school days with between 157 and 180 unused spaces across four day-time observation periods. Therefore, the increase in school-generated demand could be accommodated by unused supply and typical utilization is estimated to remain between 64% and 73%.

The school is expected to continue hosting evening events periodically throughout the school year. In general, evening events are held between about 5:30 or 6:00 p.m. and 8:00 p.m. Evening events typically occur about once per month or once every other month with attendance that can range from 50 to over 300 people. For larger events, there are usually between 3.0 and 3.5 persons attending for each parked vehicle (the higher rate is more common for larger events). This rate accounts for higher levels of carpooling (parents and children in a single vehicle) as well as drop-off activity that does not generate parked vehicles. At these rates, the larger events (those other than Curriculum Night) could generate parking demand between 45 and 120 vehicles. With continued use of the Park Boulevard for evening school event parking (about 27 vehicles may be accommodated) combined unused on-street spaces (found to be more than 150 spaces as presented previously), the on-street parking in the study area is expected to remain below 85% during these events. Due to the relative infrequency of those events (one per month or every other month), the increase in demand associated with the addition would not represent a significant adverse impact.

With the expanded school at its planned capacity, the largest event—Curriculum Night—is likely to cause on-street parking within the study area to be full or to have demand that extends beyond the 800-foot study area. In addition, Curriculum Night typically occurs in late September or early October when seasonal use of the Alki Beach front is higher and background on-street parking occupancy can be much higher (see **Appendix G** for further details).

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The existing access driveway serving that lot would be modified to serve a new gated delivery / service area proposed on the southwest corner of the site. The project would improve its site's frontage along 59th Avenue SW with new curb, sidewalk, street trees, and with a two-foot widened pull-out area to better accommodate school buses. All frontage improvements will be coordinated with SDOT.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project would not use or occur in the immediate vicinity of water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The traffic analysis conducted for this SEPA Checklist reflected conditions with the school addition and increased enrollment capacity up to 542 students (a net increase of 234 students compared to the school's 2021-22 enrollment level). Based on daily trip generation rates published for elementary schools by the Institute of Transportation Engineers, the proposed Alki Elementary School could generate a net increase of about 530 trips per day (265 in, 265 out). The peak traffic volumes would continue to occur in the morning before school begins (between 7:15 and 8:15 a.m.) and in the afternoon around dismissal (between 1:45 and 2:45 p.m.).

School bus transportation is typically made available to transportation-eligible students attending Alki Elementary. According to District staff, Alki Elementary was served by two full-size buses and one smaller SPED school bus prior to the COVID-19 pandemic. Due to ongoing driver shortages and other factors resulting from the pandemic, no school buses were serving the site during the counts and analysis performed in November and December 2021. School bus service is expected to resume with the proposed project, and as noted previously, no change to the number of school buses that have historically served the site is anticipated with the addition and renovation project. Other truck trips expected to continue serving the site include deliveries of food and supplies, trash and recycling pick-up, and occasional maintenance. Overall, school buses and small trucks likely represent about 2% to 3% of the total daily traffic.

For more information about the anticipated school traffic generation, refer to **Appendix G**.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

There are no agricultural or forest product uses in the immediate site vicinity and the project would not interfere with, affect or be affected by the movement of agricultural or forest products.

h. Proposed measures to reduce or control transportation impacts, if any.

Although the proposed Alki Elementary School Addition project would not adversely affect the transportation system in the site vicinity, the following measures have been incorporated into the proposal to reduce the traffic and parking impacts with the project.

A. **Construction Transportation Management Plan (CTMP):** The District would require the selected contractor to develop a Construction Transportation Management Plan (CTMP) that addresses traffic and pedestrian control during construction of the new facility. It would define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP would direct trucks along the shortest route to arterials and away from residential streets to avoid unnecessary conflicts with resident and pedestrian activity. The CTMP may also include measures to keep adjacent streets clean on a daily basis at the truck exit points (such as street sweeping or on-site truck wheel cleaning) to reduce tracking dirt offsite.

B. **Develop Plan for Large-Events:** For the one or two largest events each year expected to attract 400 or more attendees (such as Curriculum Night), the school would develop a large-event plan that modifies the event to reduce total peak demand by separating it into two sessions or into two nights based on grade levels (as occurs at some other Seattle elementary schools).

C. **Develop Neighborhood Communication Plan for School Events:** The District and school administration would develop a neighborhood communication plan to inform nearby neighbors of large events (those expected to draw 400 people or more) each year. The plan would be updated annually (or as events are scheduled) and would provide information about the dates, times, and rough magnitude of attendance. The communication would be intended to allow neighbors to plan for the occasional increase in on-street parking demand that would occur with large events.

D. **Update right-of-way and curb-side signage:** The District would work with SDOT to confirm the locations, extents, and signage (such as times of restrictions) of the school-bus and/or school load zones along adjacent streets.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

While the ***Alki Elementary School Addition and Renovation Project*** would add student capacity to the school site, it is not anticipated to generate a significant increase in the need for public services since these students would be temporarily relocated to the site from other schools within the southeast portion of the school district. To the extent that emergency service providers have planned for gradual increases in service demands, no significant impacts are anticipated.

b. Proposed measures to reduce or control direct impacts on public services, if any.

The increase in capacity of the school and number of students and staff on the site may result in incrementally greater demand for emergency services; however, it is anticipated that adequate service capacity is available within the South Beacon Hill area to preclude the need for additional public facilities/services.

16. Utilities

a. Circle utilities currently available at the site: [✓ electricity], [✓ natural gas], [✓ water], [✓ refuse service], [✓ telephone], [✓ sanitary sewer], septic system, other.

All utilities are currently available at the site.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in immediate vicinity that might be needed.

Water service is currently provided to the site by Seattle Public Utilities. The site is currently served by a four-inch combination domestic/fire water service from 59th Avenue SW which would be demolished. A proposed six-inch combination domestic/fire water service would be constructed from 59th Avenue SW to serve the proposed project. A two-inch domestic water service would also be constructed from 58th Avenue SW to serve the existing community center that would be retained.

Sewer service is also provided by Seattle Public Utilities and existing service is provided by a 10-inch combined side storm/sewer that serves the school and community center. This service would be capped at the main and demolished and the proposed project would separate sewer and stormwater services. The school would be served by a separate six-inch sewer service while the community center would be served by separate six-inch sewer service. Both side sewer services would tie into the existing 10-inch sewer main located within the 59th Avenue SW right-of-way.

Electricity to the site is provided by Seattle City Light. A new electrical connection would be provided for the proposed addition and renovation project and would be coordinated with Seattle City Light.

Natural gas is provided by Puget Sound Energy. No new gas service is proposed for the school. The community center has a separate gas meter that would remain with the project.

Telephone, cable and internet services would also continue to be provided to the new building and SPS would work with its providers to coordinate the service needs for the proposed project.

C. SIGNATURES

The above answers are true and complete to the best of my knowledge. I understand the lead agency is relying on them to make its decision.

Signature:

Brian Fabella

Name of Signee:

Brian Fabella

Position and Agency/Organization:

Project Manager, Seattle Public Schools

Date:

July 1, 2022

REFERENCES

City of Seattle. *City of Seattle 2035 Comprehensive Plan and Future Land Use Map*. Amended August 2021.

City of Seattle. *City of Seattle Department of Neighborhoods Landmarks Website and Map: https://www.seattle.gov/neighborhoods/programs-and-services/historic-preservation/landmarks.* Accessed May 2022.

City of Seattle. *City of Seattle GIS website: http://web1.seattle.gov/dpd/maps/dpdgis.aspx*. Accessed May 2022.

City of Seattle. *City of Seattle Municipal Code*. Accessed May 2022.

City of Seattle. *Ordinance No. 97025*. August 26, 1958.

City of Seattle. *Ordinance No. 114057*. July 11, 1988.

City of Seattle. *Seattle Views: An Inventory of 86 Public View Sites Protected under SEPA.* May 2002.

EHSI. *Limited Hazardous Building Materials Survey – Alki Elementary School*. March 2022.

Heffron Transportation, Inc. *Transportation Technical Report for the Alki Elementary School Project*. June 27, 2022.

NV5. *Report of Geotechnical Engineering Services – Alki Elementary Modernization Project*. March 21, 2022.

Perteet. *Cultural Resources Assessment for the Alki Elementary School.* June 16, 2022.

Tree Solutions. *Tree Inventory and Assessment: Alki Elementary School*. February 15, 2022.

U.S. Fish and Wildlife Service. *IPaC. https://ecos.fws.gov/ipac/location/index*. Accessed May 2022.

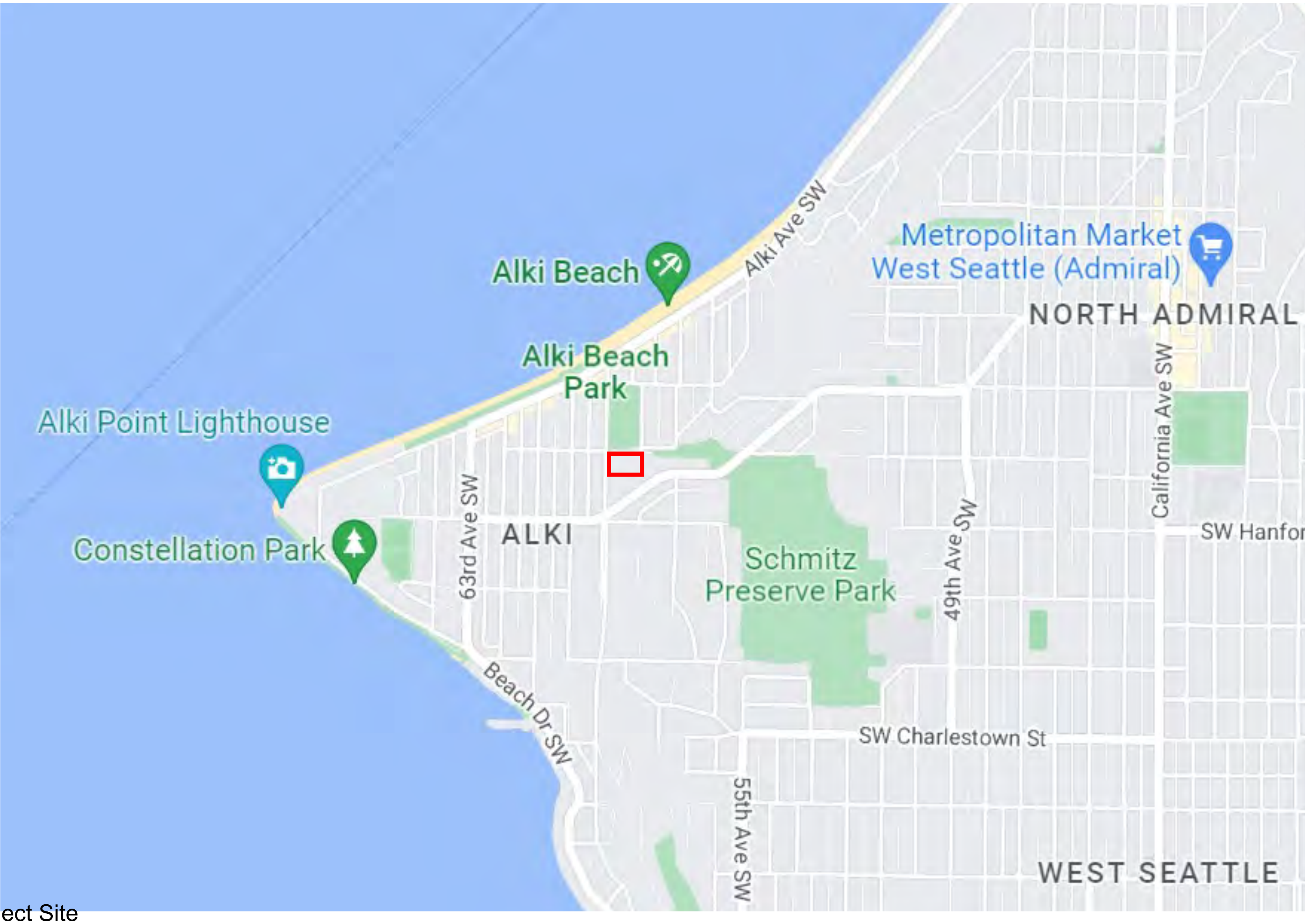
Washington State Department of Archaeology and Historic Preservation. *Washington Information System for Architectural and Archaeological Records Data*. Accessed May 2022.

Washington State Department of Ecology. *Washington State Department of Ecology Website: Cleanup Sites* https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites. Accessed May 2022.

Washington State Department of Ecology. *Tacoma Smelter Soil Safety Program: https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Tacoma-smelter/Soil-safety-program.* Accessed June 2022.

Figures

Alki Elementary School Addition and Renovation Project
Environmental Checklist



🟥 Project Site

Note: This figure is not to scale.

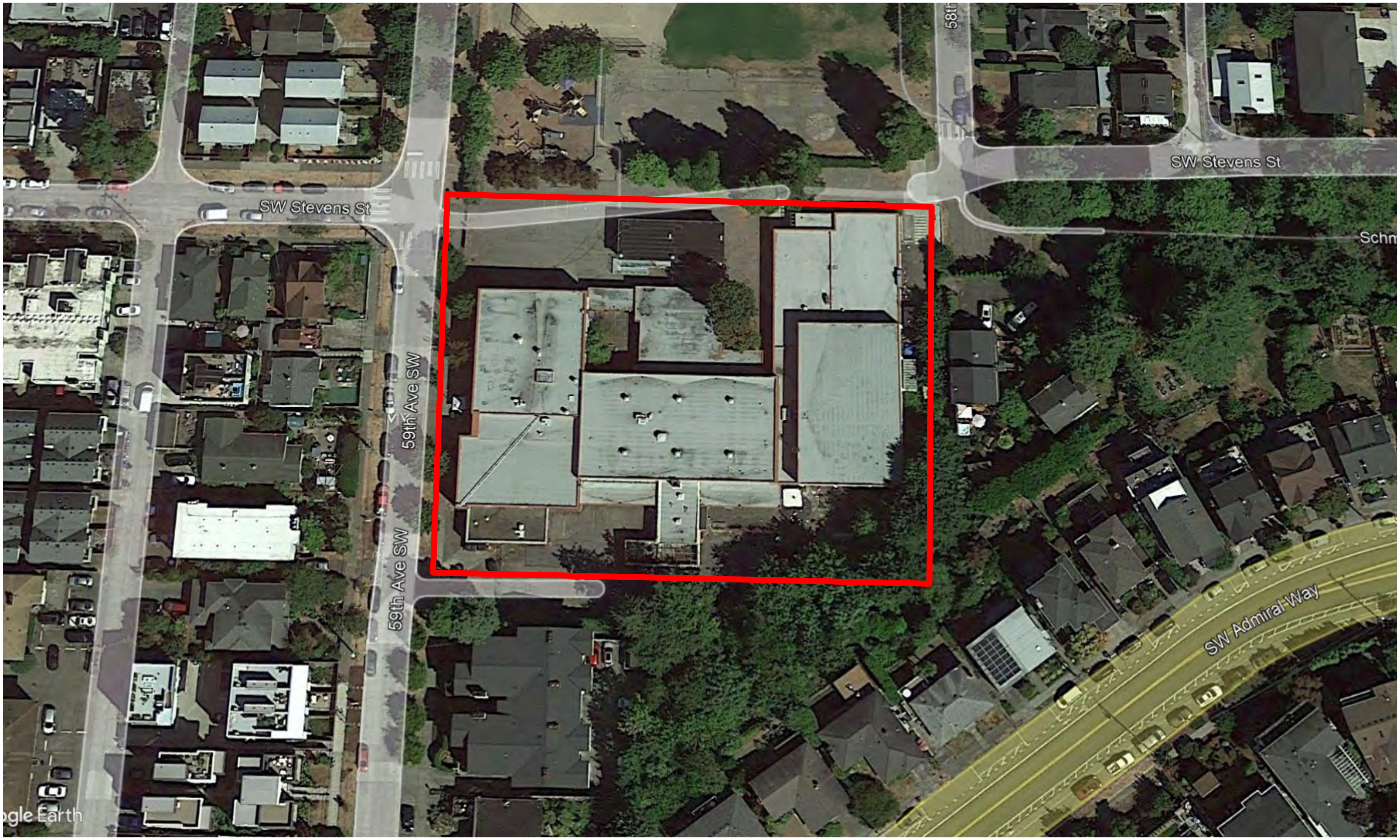
Source: Google Maps and EA Engineering, 2022

EA Engineering, Science, and Technology, Inc., PBC

Figure 1

Vicinity Map

Alki Elementary School Addition and Renovation Project
Environmental Checklist



🟥 Project Site

Note: This figure is not to scale.

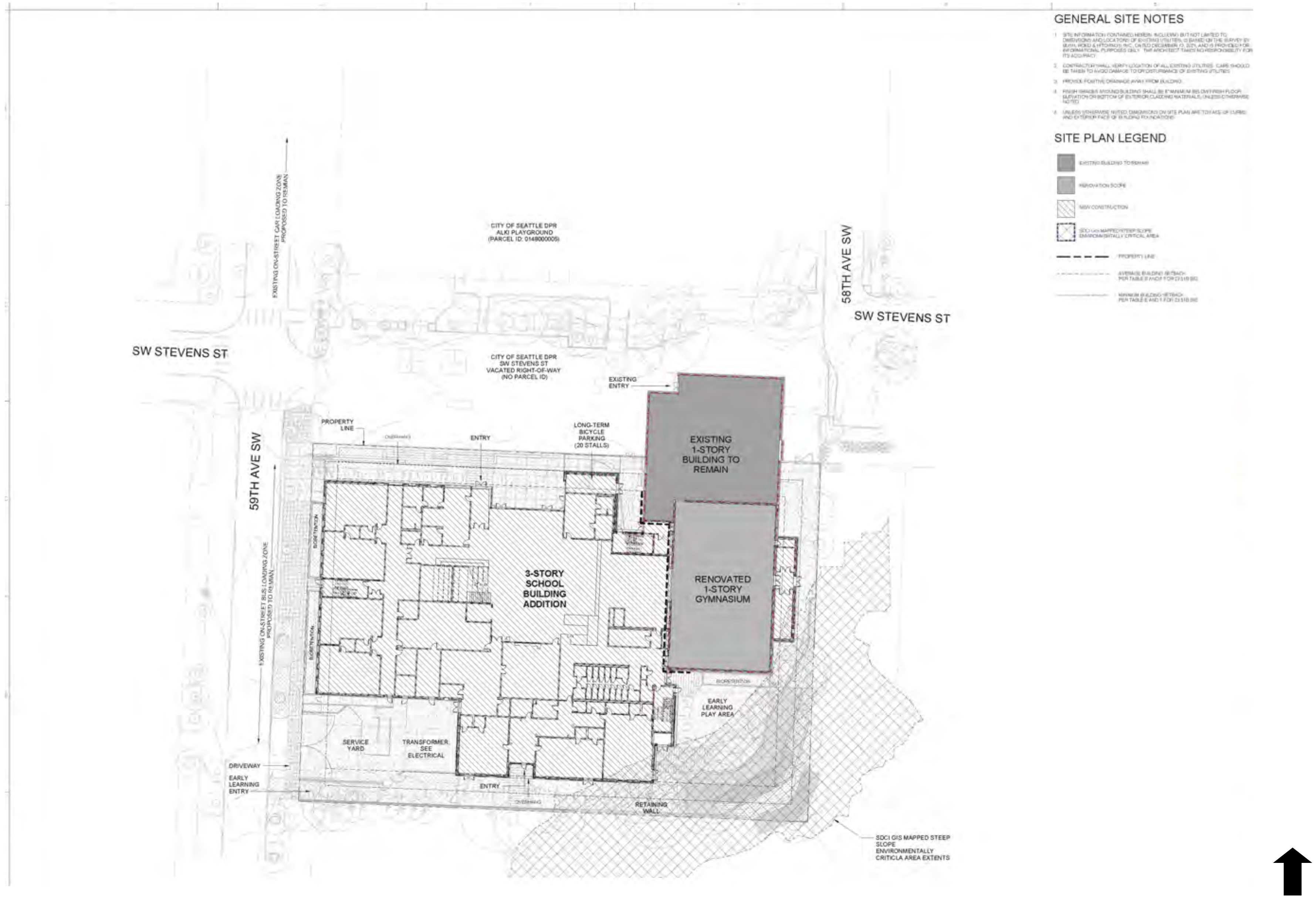
North

Source: Google Earth and EA Engineering, 2022

EA Engineering, Science, and Technology, Inc., PBC

Figure 2

Aerial Map



Note: This figure is not to scale.

Source: Mahlum, 2022

EA Engineering, Science, and Technology, Inc., PBC

Figure 3

Site Plan

Appendix A

GEOTECHNICAL REPORT

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Alki Elementary Modernization Project
3010 59th Avenue SW
Seattle, Washington

For
Seattle Public Schools
March 21, 2022

Project: SeattlePS-15-01

March 21, 2022

Seattle Public Schools
Department of Capital Projects and Planning
2445 3rd Avenue South
Seattle, WA 98134

Attention: Brian Fabella, LEED AP

Report of Geotechnical Engineering Services
Alki Elementary Modernization Project
3010 59th Avenue SW
Seattle, Washington
Project: SeattlePS-15-01

NV5 is pleased to submit this report of geotechnical engineering services for the proposed Alki Elementary Modernization Project located at 3010 59th Avenue SW in Seattle, Washington. This report has been prepared in accordance with the Professional Services Contract Modification dated October 29, 2021.

We appreciate the opportunity to be of service to you. Please contact us if you have questions regarding this report.

Sincerely,

NV5

DRAFT

Kevin J. Lamb, P.E.
Principal Engineer

EIL:KJL:kt
Attachments
One copy submitted (via email only)
Document ID: SeattlePS-15-01-032122-geor-DRAFT.docx

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACI	American Concrete Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
ATB	asphalt-treated base
ATPB	asphalt-treated permeable base
BGS	below ground surface
BMP	Best Management Practice
CMU	concrete masonry unit
CPT	cone penetration test
CSZ	Cascadia subduction zone
DSHA	deterministic seismic hazard analysis
ECA	Environmental Critical Area
fps	feet per second
g	gravitational acceleration (32.2 feet/second^2)
GIS	geographic information system
GMPE	ground motion prediction equation
GPS	global positioning system
GSP	General Special Provisions
H:V	horizontal to vertical
HMA	hot mix asphalt
IBC	International Building Code
km	kilometers
km/s	kilometers per second
ksf	kips per square foot
LID	low-impact development
LiDAR	light detection and ranging
MCE	maximum considered earthquake
MCE_R	risk-targeted maximum considered earthquake
MRC	maximum rotated component
OSHA	Occupational Safety and Health Administration
PCC	portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
PG	performance grade
PGA_M	maximum considered earthquake geometric mean peak ground acceleration adjusted for site effects
psf	pounds per square foot
PSHA	probabilistic seismic hazard analysis
PVC	polyvinyl chloride
ROW	right-of-way
SDCI	City of Seattle Department of Construction & Inspection
SFZ	Seattle fault zone

SMC	Seattle Municipal Code
SPT	standard penetration test
UST	underground storage tank
Vs_{30}	shear wave velocity for the upper 100 feet (30 meters)
WSDOT	Washington State Department of Transportation
WSS	Washington Standard Specifications for Road, Bridge, and Municipal Construction (2022)
$Z_{1.0}$	depth below ground surface corresponding to a shear wave velocity of 1,000 meters per second
$Z_{2.5}$	depth below ground surface corresponding to a shear wave velocity of 2,500 meters per second

1.0 INTRODUCTION

This report presents the results of NV5's geotechnical investigation for the Alki Elementary Modernization Project. The school is located at 3010 59th Avenue SW in Seattle, Washington. The northeast side of the school is connected to the Seattle Parks and Recreation Alki Community Center with which it shares a gymnasium.

The project includes replacing the existing Alki Elementary School with a new, approximately 75,000-square-foot, multi-story school. The existing Alki Community Center and the shared gymnasium to the south will remain in place and will not be demolished. The existing school portion of the building will be demolished west of the gymnasium. ROW frontage improvements along 59th Avenue SW will likely be included. Students will be located off site during construction.

The location of the site relative to surrounding physical features is shown on Figure 1. Existing conditions and approximate exploration locations are shown on Figure 2. Explorations logs and laboratory test results are presented in Appendix A.

Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to gather and review available subsurface information, conduct field explorations to evaluate subsurface conditions at the site, and provide geotechnical conclusions and engineering recommendations for the proposed improvements. Our scope of services included conducting a site reconnaissance, conducting two CPTs, drilling and sampling six exploration locations, performing laboratory testing, and completing engineering analyses to develop the geotechnical conclusions and recommendations presented in this report. Specifically, we performed the following:

- Reviewed the conceptual plans for the proposed development and reviewed geotechnical and geologic information for the site and adjacent areas
- Coordinated and managed the field explorations, including public and private utility locates and scheduling of contractors and NV5 staff.
- Drilled six borings to depths between 26 and 41.5 feet BGS to evaluate the subsurface conditions at the site.
- Standpipe piezometers were installed in three of the borings and a groundwater monitoring program was completed to measure groundwater levels.
- Performed two CPTs to depths between 17.6 and 23.3 feet BGS.
- Completed laboratory analyses on select disturbed soil samples collected from the borings to determine certain index properties of the on-site soil.
- Performed engineering analysis and evaluated data derived from the subsurface investigation and laboratory testing program.
- Provide this geotechnical report that summarizes our findings and provides recommendations to support design of the new school campus.

3.0 SITE CONDITIONS

3.1 GENERAL

The proposed Alki Elementary Modernization Project will include replacement of the existing school with a new multi-story building. The eastern portion of the existing building that houses the Alki Community Center and a shared gymnasium will remain in place and not be demolished.

The existing parcel is rectangular in shape with an approximate area of 61,000 square feet. The site is bordered to the north by the Seattle Parks and Recreation Alki Playground and Whale Tail Park, to the west by 59th Avenue SW, and to the east and south by residential developments.

Based on available mapping from the SDCI online GIS tool, two environmentally critical areas are present at the site. A Steep Slope (40 percent average) (ECA1) environmentally critical area is present along the southeast corner of the parcel. In addition, the City defines the majority of the site as a Liquefaction-Prone Area (ECS5).

Surficial conditions were determined from observations during several visits to the site, and subsurface conditions were evaluated by completing subsurface explorations.

3.1.1 Environmental Considerations

Based on observations made during site visits, the existing Alki Elementary School has a UST located in the central portion of the parking area on the south side of the building. Fill port covers are present in the pavement, indicating the UST location, and vent pipes are attached to the south side of the adjacent building. Details, including UST geometry and condition, are unknown at the time of this report. We understand that Seattle Public Schools has an environmental consultant addressing the UST and its potential impacts to the project. During our exploration program, we did not observe or detect sheens or odors indicative of petroleum contamination in any of the borings.

3.2 SURFACE CONDITIONS

The site is mostly developed with the school building, community center, gymnasium, and surrounding hardscape areas, except at the southeast corner where the ground surface is vegetated and slopes up to the adjacent residential properties.

The majority of the site is relatively flat-lying with an elevation change of less than approximately 5 feet across the developed portion of the site. The steep slope in the southeast corner of the site has an elevation change of approximately 40 feet over a distance of approximately 60 feet. The slope includes a two-tiered rockery to accommodate some of the grade change. The rockeries are overgrown with vegetation, including trees up to approximately 10 inches in diameter. A short concrete retaining wall less than 3 feet in height extends along the west half of the southern property line between the AC-paved parking area south of the building and the adjacent apartments.

AC-paved areas are north and south of the existing school building and a landscaped area is present between the building and adjacent PCC sidewalk and 59th Avenue SW on the west side.

3.3 SUBSURFACE CONDITIONS

Subsurface conditions were explored across the site by drilling six borings (B-1 through B-6) to depths between 26 and 41.5 feet BGS, completing two CPTs (CPT-1 and CPT-2) to depths between 17.6 and 23.3 feet BGS, and by hand probing the ground surface in the sloped are in the southeast corner of the site. The exploration locations are shown on Figure 2. A description of the field explorations and the exploration logs are presented in Appendix A.

Subsurface conditions are generally similar in the western portion of the site between borings B-1 and B-3 and in the central and eastern portions of the site between borings B-2, B-4, B-5, and B-6. The difference between these areas is the presence of wetland deposits between the fill and underlying beach deposits.

Borings B-1 and B-3 completed on the west side of the site encountered variable thicknesses of fill directly overlying beach Deposits that are underlain by very dense glacial advance outwash.

Borings B-2, B-4, B-5, and B-6 completed in the central and east portions of the site encountered wetland deposits between the fill and the underlying beach deposits. A layer of peat was also encountered within the wetland deposits in B-2.

The materials encountered in the explorations are described below.

3.3.1 AC Pavement

AC pavement is present at all boring and CPT locations. The pavement section encountered in the borings ranged from 1 inch to 2.5 inches thick, except at B-1 where it is 4 inches thick. Crushed surfacing base course was only encountered at B-2 where it is 1 inch thick. Elsewhere the AC pavement is underlain by fill material composed of silty sand to sand with silt and gravel.

3.3.2 Construction Debris/Previous Surfacing

At boring location B-2, green porcelain tile and a 5.5-inch-thick concrete slab is present beneath the pavement section. The slab appeared to be intact and extended beyond the boring location. We understand that historical information indicates that the original school in this area was demolished and reconstructed, but that surfacing material and perhaps foundations were left in place.

3.3.3 Fill

Fill is present directly beneath the AC and/or construction debris at all borings and extends to depths between 1.5 and 9.5 feet BGS at the boring locations. The fill is variable in composition but is generally composed of sand and gravel with variable silt content. Locally, silt lenses and organic debris, including wood, is present. Based on SPT blow counts, the coarse-grained fill is generally loose to medium dense and the fine-grained fill is generally soft to very stiff.

3.3.4 Peat

A layer of soft, fibrous peat is present in boring B-2 below the surficial fill. The peat is up to approximately 4.5 feet thick. Interbeds of organic silt are present within the peat. The peat layer was not encountered at other nearby exploration locations.

3.3.5 Wetland Deposits

Wetland deposits are present beneath fill or peat (B-2) in borings B-2, B-4, B-5, and B-6 at depths between 1.5 and 12.5 and extend to depths between 10.5 and 23 feet BGS. The wetland deposits generally consist of silty sand, silt, clay with organics and fibrous wood debris, peat, and logs. The peat within the wetland deposits typically occurs as thin discontinuous lenses and is interbedded within the silty sand , silt, and clay. Based on SPT blow counts, the coarse-grained wetland deposits are typically loose and the fine-grained wetland deposits vary from soft to very stiff.

3.3.6 Beach Deposits

Beach deposits underlie the fill at borings B-1 and B-3 and the wetland deposits in the remaining borings. The beach deposits extend to depths between 14.5 and 29 feet BGS. The beach deposits generally consist of sand and gravel with variable silt content. Wood debris was observed within these deposits in boring B-2. Based on SPT blow counts, these deposits are medium dense to very dense.

3.3.7 Glacial Advance Outwash

Glacial advance outwash is present below the beach deposits and all of the borings were completed within the deposit. The glacial advance outwash generally consists of sand and gravel with variable silt content. Based on SPT blow counts, the glacial advance outwash is dense to very dense.

3.4 GROUNDWATER

Groundwater was encountered in all the borings during drilling. At borings B-1 and B-2, heaving conditions were also encountered in the beach deposits and glacial advance outwash during drilling below the groundwater table. Groundwater monitoring wells were installed in borings B-2, B-3, and B-4.

Initial groundwater observations during drilling of the borings and as measured in the three monitoring wells on January 10, 2022, are summarized in Table 1.

Table 1. Groundwater Observations

Location	Ground Surface Elevation	Bottom of Boring Elevation	Groundwater Depth (feet BGS)	
			During Drilling[1]	January 10, 2022
B-1	27	-14.5	15	Boring backfilled
B-2 – well	27	-13.8	12	15.1
B-3 – well	23	-18.5	12	10.5
B-4 – well	24	-2.0	18	11.4
B-5	25	-1.4	18	Boring backfilled
B-6	23	-3.0	13.5	Boring backfilled

1. Groundwater levels measured during drilling may be inaccurate.

The three monitoring wells were developed by bailing a minimum of 4 well volumes from the well. Groundwater levels were allowed to stabilize prior to measuring groundwater levels on January 10, 2022. The wells are instrumented with a combination of a pressure transducer and data logger, and automated groundwater measurements are being collected. The results of the groundwater level monitoring to date are presented on Figure 3.

3.5 ReMi SURVEY

Our subcontractor, Atlas Technical Consultants, performed a ReMi survey of the site along two survey lines oriented approximately perpendicular to each other. The purpose of the survey was to develop a one-dimensional shear wave velocity profile for use in determining an appropriate site classification for the site in accordance with ASCE 7-16. The shear wave velocity profile developed from the survey extends from the ground surface to a depth of 100 feet BGS. The shear wave velocities measured indicate a Seismic Site Class of D is appropriate for the site. The results of the survey are presented in Appendix C.

3.6 SEISMICITY

Washington State is situated at a convergent continental margin and is susceptible to subduction zone, intraplate, and shallow crustal source earthquakes. We reviewed published geologic maps for the site vicinity (Johnson et al., 1999; Sherrod et al., 2004) to evaluate seismic hazards. The site is located within the SFZ, which is a result of shallow crustal faulting.

The SFZ represents a 2- to 4-mile-wide zone, extending from the Kitsap Peninsula near Bremerton to the Sammamish Plateau. Within the SFZ are several east- to west-trending fault splays of the Seattle fault (Johnson et al., 1999). The Seattle fault is thought to be a reverse fault, with the south side “shoved up.” The SFZ is considered an active major fault and is capable of producing earthquakes of Magnitude ~7 with associated surface rupture and ground motions, posing a significant hazard to the Puget Sound Region (Sherrod et al., 2004). Geologic evidence indicates at least three episodes of movement on the fault within the last 10,000 years, with the most recent earthquake with surface rupture approximately 1,100 years ago (Nelson et al., 2000).

4.0 LABORATORY TESTING

Laboratory testing was conducted on specific soil samples selected from the borings to assist in the characterization of certain physical parameters of the soil. Index tests that were performed included the determination of natural water content, fines content analysis, and grain-size distribution analysis. All tests were conducted in general accordance with appropriate ASTM standards (ASTM, 2016). A discussion of laboratory test methodology and the test results are presented in Appendix A. Test results are also displayed where appropriate on the exploration logs presented in Appendix A.

5.0 ENVIRONMENTAL CRITICAL AREAS

The SDCI online GIS mapping application identifies three types of Environmentally Critical Areas on or adjacent to the site:

- Steep Slope ECA1: This geologic critical area includes the slope at the southeast corner of the property that extends up to the residential houses facing SW Admiral Way.
- Liquefaction-Prone Area – ECA5: This geologic critical area includes the level portion of the site that encompasses the building area and surrounding AC-paved areas as well as adjacent off-site areas to the north and west.
- Peat Settlement-Prone Area – ECA11: This geologic critical area consists of the adjacent Seattle Parks and Recreation properties to the north of the site that includes the Seattle Parks, SW Stevens Street ROW, and Whale Tail Park.

The proposed project will demolish the existing school building and replace it with a new school and associated perimeter hardscape areas within the site boundaries. The existing Alki Community Center and shared gymnasium on the east side of the school will remain. The redevelopment activity will generally be confined to the existing developed portion of the site. There is a possibility of encroachment into the unimproved southeast corner of the site to provide additional parking or loading dock space. If construction extends into the vegetated sloped area at the southeast corner, it will impact the Steep Slope ECA1 area.

The SDCI online GIS mapping applications provides general information based on LiDAR imaging and photogrammetry data with regards to slope and landslide critical areas. Site-specific data and analysis is required to determine/confirm the presence of environmentally critical areas exist on site. As part of our investigation, we performed site reconnaissance and completed subsurface explorations to identify and characterize areas of the site that meet the SMC Subsection 25.09.012 definition for environmentally critical areas. Based on our reconnaissance, review of topographic plans, exploration logs, and engineering analyses, the geologic environmentally critical areas identified on site are shown on Figure 4. The results of our geologic hazard study are presented below.

5.1 STEEP SLOPE EROSION HAZARDS AND LANDSLIDE-PRONE AREAS

As indicated above, the Alki Elementary School site is relatively flat, except for the southeast corner of the parcel where a northwest-facing slope extends up to the neighboring residential properties. The slope has approximately 40 feet of elevation change from the paved play area at the southeast corner of the school up to the residential properties over a distance of approximately 60 feet (Figure 4). A pair of tiered rockeries extend across the mid and upper portion of the slope to accommodate some of the grade change. The lower rockery is approximately 10- to 15 feet in height and the upper rockery is approximately 10 to 12 feet in height. The rockeries are constructed with two- to four-man stones ranging in size from approximately 18 to 40 inches in diameter. The slope and rockeries are vegetated primarily with blackberries and vine maples. The vine maples are growing from spaces between the stones and are wedging the stones apart.

SMC Subsection 25.09.012 defines landslide-prone areas as:

> *a.) Known landslide areas identified by documented history, or areas that have shown significant movement during the last 10,000 years or are underlain by mass wastage debris deposited during this period; or*

b. Potential landslide areas:

- *1) Those areas that are described as potential slide areas in "Seattle Landslide Study" (Shannon & Wilson, 2000 and 2003).*
- *2) Areas with indications of past landslide activity, such as landslide head scarps and side scarps, hummocky terrain, areas with geologic conditions that can promote earth movement, and areas with signs of potential landsliding, such as springs, groundwater seepage, and bowed or back tilted trees.*
- *3) Areas with topographic expression of runout zones, such as fans and colluvial deposition at the toes of hillsides.*
- *4) Setbacks at the top of very steep slopes or bluffs, depending on soil conditions.*
- *5) Slopes with an incline of 40 percent or more within a vertical elevation change of at least 10 feet. For the purpose of this definition, a slope is measured by establishing its toe and top and averaging the inclination over at least 10 feet of elevation difference. Also for the purpose of this definition:*
  - *a) The "toe" of a slope means a distinct break in slope that separates slopes inclined at less than 40 percent from slopes inclined at 40 percent or more. Where no distinct break exists, the "toe" of a slope is the lower-most limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet; and*
  - *b) The "top" of a slope is a distinct topographic break in slope that separates slopes inclined at less than 40 percent from slopes inclined at 40 percent or more. Where no distinct break exists, the "top" of a slope is the upper-most limit of the area where the ground surface drops 10 feet or more vertically within a horizontal distance of 25 feet.*
- *6) Areas that would be regulated under one of subsections 25.09.012.A.3.b.2 through 25.09.012.A.3.b.5, but where the topography has been previously modified through the provision of retaining walls or non-engineered cut and fill operations;*
- *7) Any slope area potentially unstable as a result of rapid stream incision or stream bank erosion.*

We observed the sloped areas on and adjacent to the site and did not observe indications of past or existing slope instability. Evidence of past landslide activity (such as scarps, hummocky terrain, and/or bowed trees) was not observed anywhere on the site. We did not observe any springs or groundwater seepage on the slope, although the ground surface at the base of the lower rockery is wet and saturated. The existing rockery is overgrown with vegetation, including trees up to approximately 10 inches in diameter growing from the spaces between the boulders at several locations. We did not observe any bulging or ground surface deformation that would be indicative of recent slope movement.

Based on our review of the site topography, a portion of the slope area southeast of the proposed Alki Elementary Modernization site meets the SMC definition for steep slope erosion hazards and landslide-prone areas, as identified on Figure 4.

At this time anticipated proposed development does not extend into the steep slope erosion hazards and landslide-prone areas in the southeast corner. As such, the proposed construction will not impact the area and mitigation should not be required. The proposed development activities will not impact slope stability on or adjacent to the property.

The current condition of the rockeries is concerning as the vegetation growing from the spaces between the rockery boulders will decrease the interlocking between the boulders and subject the rockery to movement and deformation, impacting slope stability. The rockeries are nearing the end of their design life and consideration should be given to replacing them or addressing potential isolated failures where rocks become dislodged. A potential method to address future risk of isolated failures includes replacing the rockeries with retaining or shoring walls. With regards to the replacement of the rockeries, a retaining structure along or in front of the existing rockery alignments would improve slope stability of the area and support could be engineered to support re-grading the area. We anticipate applicable retaining structures include large-block CMU gravity walls (similar to Ultrablock or Redi-Rock products) or cantilever soldier pile walls with heights of approximately 12 to 15 feet. Replacing the existing deteriorating rockeries will increase slope stability and mitigate impacts associated with disturbance or re-grading of the area below the toe of the slope, if it is included in the project plans.

5.2 PEAT SETTLEMENT-PRONE AREAS

The Seattle Parks Department property Whale Tail Park, immediately north of the site, is identified as a Category II Peat Settlement-Prone Area on the SDCI online GIS application. The areas do not extend into the site (Figure 4). Peat settlement-prone areas are defined by SMC Subsection 25.09.012, as:

> *5.) Peat settlement-prone areas. Peat settlement-prone areas consist of Category I and Category II peat settlement-prone areas that are delineated on Maps A1 through A26, Peat Settlement-prone Area Boundaries Maps, codified at the end of this Chapter 25.09. This parcel-specific delineation is based on the location of the relevant bog or bogs identified in City of Seattle Identified Bogs (Troost 2007) plus a buffer of 50 feet for Category I peat settlement-prone areas or a buffer of 25 feet for Category II peat settlement-prone areas. On parcels larger than 50,000 square feet, the Director may consider a parcel-specific delineation, provided by the applicant, of the peat settlement-prone area boundary on a parcel. Where a parcel-specific delineation conflicts with the Peat Settlement-prone Area Boundaries Maps, the parcel-specific delineation shall apply*

A layer of peat is present at boring B-2 between 8 and 12.5 feet BGS and is above the groundwater table. Other explorations completed on site did not encounter significant peat similar to what is present at boring B-2.

Groundwater is present below the site at depths between 12 and 18 feet BGS based on the monitoring well measurements. Peat deposits are susceptible to load-induced settlement and settlement associated with dewatering. At this time, significant below-grade excavations or structures, in excess of 12 feet, are not planned as part of the development. Deep foundations and ground improvement techniques are recommended in this report to support the new school building and to mitigate settlement concerns associated with the peat encountered in B-2 and new building loads.

We do not anticipate significant dewatering activities will be associated with the project. The existing site area is covered with impervious surfacing, as such additional impervious area is not anticipated. The proposed development will not lower existing groundwater levels and will not significantly impact the peat settlement-prone area adjacent to the site.

Infiltration of stormwater is typically required on sites within peat settlement-prone areas. As indicated above, the site is not within a peat settlement-prone area; however, infiltration of stormwater is planned to be included as a stormwater BMP. Infiltration on site is acceptable. It should be noted that there are USTs on site. If environmental contaminants associated with the USTs are present in the soil or groundwater, infiltration would need to be avoided in these areas. Except for the northeast corner, the site is impervious; any additional infiltration will help maintain groundwater levels beneath and adjacent to the site.

Infiltration on site through permeable pavement or other infiltrative BMPS that concentrate flow is acceptable.

5.3 LIQUEFACTION-PRONE AREAS

Except for the sloped area at the southeast corner, the site is designated by the SDCI online GIS application as a Liquefaction-Prone Area. Liquefaction-prone areas are defined by SMC Subsection 25.09.012 as:

> *2.) Liquefaction-prone areas. Liquefaction-prone areas are areas typically underlain by cohesionless soils of low density, usually in association with a shallow groundwater table, that lose substantial strength during earthquakes.*

Liquefaction is caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. In general, loose, saturated sand with low silt and clay content is most susceptible to liquefaction. Silty soil with low plasticity is also susceptible to liquefaction or strain softening under relatively higher levels of ground shaking.

We completed borings and CPTs to explore the subsurface conditions and conduct liquefaction analyses to determine the susceptibility of the soil underlying the site to liquefaction during a seismic event.

The two major sources of ground shaking that can lead to liquefaction and lateral spreading at the site are ruptures of the SFZ and CSZ. We used a magnitude of 7.0 for the SFZ and a magnitude of 9.0 for the CSZ. PGA_M values of 0.72 and 0.4 were used for the SFZ and the CSZ, respectively. Based on our analyses, the soil encountered in our explorations underlying the site is not susceptible to liquefaction. Table 2 provides the liquefaction settlement predictions below the Alki Elementary School site.

Table 2. Liquefaction Settlements at the Ground Surface

Location	Total Liquefaction Settlement Estimate (inches)
CPT-1	Negligible
CPT-2	Negligible
B-2	Negligible

Based on the results or our analysis, the site is not considered to be susceptible to liquefaction and should not be classified as a Liquefaction-Prone Area; the revised extent of the liquefaction-prone area based on our analysis is shown on Figure 4. Mitigation of liquefaction potential is not required based on the conditions encountered in the explorations and our analysis.

6.0 DESIGN RECOMMENDATIONS

6.1 GENERAL

Based on our review of available information; the development history of the site; and the results of our explorations, laboratory testing, and analyses, it is our opinion that the site is suitable for construction of the proposed school and associated facilities.

- Variable thicknesses of loose to medium dense sand fill and soft to very stiff fill and wetland deposits, including an area underlain by peat, is present at the site. These deposits are generally not suitable for supporting the proposed multi-story building.
- Shallow spread footing foundations bearing on an improved subgrade or rammed aggregate piers are recommended for foundation support in areas where excavation and vibratory compaction are acceptable. We recommend using drilled micropiles for foundation support adjacent to the existing Alki Community Center and shared gymnasium.
- Over-excavation and replacement of fill is possible along the west edge of the site; however, we anticipate it will be more efficient and cost/schedule beneficial to plan on using rammed aggregate piers rather than over-excavation and replacement.
- The building floor slabs can be supported on grade, provided the subgrade is prepared as recommended below.
- The near-surface soil generally consists of locally derived fill composed of silty sand with a fines content generally in excess of 15 percent, and it will be susceptible to deterioration during wet weather. Construction debris, including concrete slabs and foundations, may be encountered beneath the existing building. We anticipate that some of the on-site soil will not be suitable for use as fill. Excavated material containing debris, peat, and wetland deposits should be disposed of off site.
- Based on our explorations, significant groundwater seepage is not anticipated during excavation for foundations or utilities to a depth of 12 feet BGS. Groundwater should be expected below 12 feet BGS.
- The Puget Sound area is a seismically active region. The soil and groundwater conditions underlying the site have a low susceptibility for liquefaction and are not susceptible to lateral spreading. Dense soil is present at relatively shallow depth and the site is not susceptible to

amplified earthquake ground motions. The site is within the southern extent of the SFZ; as such, the probability of surface rupture is low. We have provided appropriate seismic design recommendations based on the ASCE 7-16 criteria.

- The near-surface soil generally consists of loose to medium dense fill, except at boring B-3 where beach deposits are present at a depth of 2 feet BGS. A preliminary infiltration rate of 0.5 inch per hour is recommended for these deposits, pending the results of in-situ testing.

Our specific recommendations and design guidelines for development of the site are presented in the following sections. These should be incorporated into the design and implemented during construction of the proposed development.

6.2 SEISMIC DESIGN CRITERIA

Moderate to high levels of earthquake shaking should be anticipated during the design life of the building, and it should be designed to resist earthquake loading in accordance with the appropriate code-based methodology described in ASCE 7-16 2018. The recommended seismic design parameters are presented in Table 3.

Table 3. IBC Seismic Design Parameters*
(ASCE 7-16 2018)

Seismic Design Parameter	Short Period	1 Second Period
MCE Spectral Acceleration	S_s = 1.519 g	S_1 = 0.53 g
Site Class	D	
Site Coefficient	F_a = 1.0	F_v =1.77
Adjusted Spectral Acceleration	S_{MS} = 1.519 g	S_{M1} = 0.938 g
Design Spectral Response Acceleration Parameters	S_{DS} = 1.013 g	S_{D1} = 0.625 g

* The structural engineer should evaluate code requirements and exceptions to determine if these parameters can be used for design.

Seismic design criteria for this project will be based on ASCE 7-16. Based on the results of our subsurface explorations and shear wave velocity testing, the site is classified as Site Class D.

ASCE 7-16 Section 11.4.8 requires a ground motion hazard study in accordance with Section 21.2 for structures on Site Class D sites with S_1 greater than or equal to 0.2 g (S_1 at the site is 0.53 g). Exception 2 of ASCE 7-16 Section 11.4.8 indicates a ground motion hazard study is not required for structures on Site Class D sites with S_1 greater to or equal 0.2 g, provided the value of the seismic response coefficient C_S is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$. If the above conditions are not met, refer to the Site-Specific Seismic Hazard Evaluation presented in Appendix D.

6.2.1 Liquefaction

As discussed in the “Groundwater” section, groundwater was measured in boring B-3 as shallow approximately 10 feet BGS. The groundwater is generally within the beach deposits and underlying deposits.

Liquefaction analysis was performed using the information collected from our borings and CPTs, laboratory test results, and earthquake hazard mapping. Liquefaction triggering was evaluated in accordance with Boulanger and Idriss (2014). Settlement was determined in accordance with Ishihara and Yoshimine (1992) and Tokimatsu and Seed (1987). The analysis was completed for subsurface conditions encountered in boring B-2 and CPT-1 and CPT-2.

Based on our analysis and laboratory test results, the site is not susceptible to liquification. Our analysis indicates that liquefaction is unlikely during the design-level earthquake.

6.3 FOUNDATION SUPPORT

6.3.1 General

The site in underlain by a variable thickness of fill and wetland deposits that also vary in consistency. The existing fill and wetland deposits are generally not suitable for foundation support due to variable density and compressibility. Suitable support for shallow or deep foundations will be provided by the medium dense to very dense beach deposits and the dense to very dense glacial advance outwash that underlies the site at depths from 2 to 23 feet BGS.

Ground improvement through over-excavation and replacement is generally not suitable given the variability in depth to the dense soil deposits across the site. We recommend using rammed aggregate piers to support shallow foundations over most of the site. Rammed aggregate piers are installed using a vibratory probe that displaces the surrounding soil during insertion and then compacts the aggregate material as the pier is constructed. The probe produces ground vibrations that are significant adjacent to the pier location but that dissipate with increasing distance from the probe.

Current plans indicate that the existing Alki Community Center and the shared gymnasium will not be demolished and will remain in operation during this project. We recommend limiting the installation of rammed aggregate piers to a distance of 25 feet from the community center and gymnasium to reduce the risk associated with vibration-induced ground deformation below the building. For new foundations within 25 feet of the community center building and gymnasium, we recommend supporting them on drilled micropiles installed into the dense glacial advance outwash material.

The recommended foundation support methods involve drilling or inserting probes into the soil. We encountered a concrete floor slab at boring B-2 and understand that other slabs or concrete debris may be encountered within the building area. Contractors should be made aware of this and the potential to encounter obstructions during drilling should be addressed in the bid documents.

6.3.2 Rammed Aggregate Piers

Rammed aggregate piers bearing in the glacial advance outwash deposits underlying the site will provide suitable support for shallow foundations and mitigate the settlement concerns associated with the loose surficial fill and soft wetland deposits. The piers are required in order to address seismic hazards.

The aggregate piers will provide for a shorter earthwork schedule during foundation construction compared to other alternatives. We anticipate installation depths will vary from 5 to 25 feet BGS. The anticipated shortened construction schedule and cost compared to over-excavation and replacement make them a feasible alternative. In addition, the potential for change orders associated with unaccounted for unsuitable over-excavation is significantly reduced.

Aggregate piers, either rammed aggregate piers (developed by GeoPier) or vibro piers (developed by Hayward Baker), are a proprietary ground improvement method that replaces or displaces the existing soil with columns of compacted gravel. The columns stiffen the surrounding soil during installation, can be used to support shallow foundations, and, if necessary, can be used to stabilize areas for floor slab support and embankment fill to mitigate excessive settlement.

Aggregate piers are typically placed beneath perimeter and interior footings and floor slabs to support the anticipated loads. Beneath foundation walls, aggregate piers are typically placed at 6 to 12 feet on-center, depending on loads, soil conditions, and design requirements. Aggregate piers supporting floor slabs or embankment fills are typically placed on a grid pattern with a spacing of approximately 10 to 15 feet on-center. The actual sizing and spacing required will be established by the aggregate pier contractor. We anticipate that the subgrade supporting the concrete slab areas will not require rammed aggregate piers for support.

Typically, foundations can be designed as conventional shallow foundations where they are supported on the aggregate pier-reinforced soil. We expect improvement to the site soil so that an allowable bearing pressure of 5,000 psf can be used for design of the shallow spread footings supported on aggregate piers. The actual allowable capacity design value will need to be established by the aggregate pier contractor.

We anticipate the aggregate piers will be 24 or 30 inches in diameter and will extend through the fill and wetland deposits and recommend embedding them in the underlying dense beach deposits and/or glacial advance outwash. On this basis, we anticipate that the aggregate pier elements will extend to depths to between 5 and 25 feet BGS in the building area. We recommend installing the aggregate piers after site grading is completed. We estimate settlement of foundations supported on aggregate piers will be less than ½ inch.

We anticipate that the aggregate piers will be placed on a center-to-center spacing of approximately 8 feet beneath the perimeter bearing walls. A group of approximately four pier elements is typically used to support interior column foundations. Actual spacing of the pier elements should be provided in a design submittal by the aggregate pier contractor. The submitted design should be based on providing an allowable foundation bearing pressure of at least 5,000 psf, total settlement of 1 inch, and differential settlement of ½ inch between foundation elements or maximum distance of 50 feet.

The submittal should provide a detailed design (which includes an aggregate pier layout plan); installation and load testing specifications; and a cover letter that will document recommendations that are provided and address geotechnical aspects of the supported foundations, floor slab, and fill. The project geotechnical and structural engineers should review the submittal; however, the responsibility of the design rests solely with aggregate pier subcontractor.

6.3.3 Micropiles

We understand that the existing Alki Community Center will remain in place throughout construction. As discussed above, installation of rammed aggregate piers causes ground vibrations. The magnitude of the vibrations dissipates with increasing distance to the equipment. At distances of 25 to 40 feet, ground vibrations are typically just discomforting to occupants and are below levels that can cause architectural or structural damage. Micropiles offer a suitable low-impact alternative for supporting the new school foundations where new foundations are within 25 feet of the existing structure. Drilled micropiles are a type of deep foundation element that are less than 12 inches in diameter and are constructed using high-strength cement grout and high-strength hollow threaded bar or small-diameter steel casing and/or threaded bar. Drilled installations are the most typical and are completed by advancing hollow threaded bars fitted with a sacrificial bit or drill casing to the design depth. Where drill casing is used, reinforcing steel in the form of a solid all-thread bar is inserted inside the casing and then filled with high-strength cement grout. The casing may extend to the full depth or terminate above the bond zone with the reinforcing bar extending to the full depth. Grout can be placed by gravity or pumped under pressure to increase capacity. Pressure grouting and post-grouting techniques can also be used to increase capacity.

Casing should be required on this project to avoid impacting support under adjacent existing building foundations and to address heaving conditions associated with the beach sand and glacial advance outwash.

Micropiles may be used to resist axial, uplift, and overturning loads if required. These elements will achieve the majority of their capacity through skin friction in the underlying dense glacial advance outwash encountered below depths of 14.5 to 23 feet BGS. Depending on the construction technique and anchor type, we anticipate that an ultimate skin friction of 5 to 10 ksf is achievable in the glacial advance outwash deposits. We recommend a minimum embedment of 10 feet into the glacial advance outwash and anticipate minimum pile lengths will vary from 23 to 31 feet. We anticipate an ultimate capacity of up to 200 tons can be achieved in the subsurface soil. A minimum center-to-center spacing of 3 micropile diameters should be maintained to avoid group effects for micropiles embedded into the very dense gravel as recommended.

The anticipated ultimate capacity does not include a factor of safety. A factor of safety of 2 is typical for compressive loads and a factor of safety of 1.5 is typical for tensile loads if the anchors or micropiles are load tested.

While some lateral load can be carried by micropiles, the magnitude is expected to be small such that it should be ignored in the evaluation of how lateral loads are resisted at foundation locations. Other options for resisting lateral loads include providing a thick pile cap and/or grade beam, up to approximately 3.5 feet deep, that will generate passive earth pressure resistance or to install steeply battered micropiles of soil anchors connected to the pile cap and angled downward.

A minimum of two verification tests should be completed prior to installation of production micropiles. Verification micropiles should be tested to 200 percent of the design load. Performance testing should be completed on 10 percent of production piles. The performance testing should be completed to 150 percent of the design load. All testing should be completed in accordance with the procedures in ASTM D3689.

Design and construction of anchor systems are typically completed by specialty contractors who are responsible for selection of the appropriate depth, bond length, and grouting methods based on the loads provided by the structural engineer. Due to variable construction techniques and anchor types, we recommend the contractor be responsible for selecting the length and appropriate design skin friction.

6.4 CONCRETE SLAB-ON-GRADE

Satisfactory subgrade support for floor slabs at the existing site grade will require over-excavation to a depth of 8 inches below the bottom of the proposed slab, scarifying the exposed subgrade, moisture conditioning, and compacting it to a dense and unyielding condition. An 8-inch-thick layer of floor slab base rock, as defined in the “Fill Materials” section, should then be placed to establish the bottom of floor slab elevation. A 4-inch-thick layer of capillary break material should be placed over the floor slab base rock.

Where concrete slabs are designed as beams on an elastic foundation, the properly prepared subgrade should be assumed to have a modulus of subgrade reaction of 200 pci.

A vapor barrier product (such as Vapor Block BB-10 or VB-15) should be placed directly over the floor slab base rock. Edges of the vapor barrier, between adjoining pieces, should be properly sealed.

We recommend that exterior slabs, such as those for walkways, be structurally independent from the foundation of the structures. This will allow minor movement of the slabs to occur as a result of vehicular loading, tree root growth, seasonal soil shifting, and other factors, while reducing the potential for slab cracking around the perimeter. Interior slabs may be tied to the foundation system of the structures.

6.5 BELOW-GRADE WALLS AND RETAINING WALLS

6.5.1 General

The following recommendations should be used for design of retaining walls or below-grade walls, including temporary shoring or shielding. Our retaining wall design recommendations are based on the following assumptions: (1) the walls consist of conventional, cantilevered or gravity walls, (2) the walls are less than 15 feet in height, (3) the backfill is drained and consists of imported granular material, and (4) the backfill has a slope flatter than 4H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

Walls located in level ground areas should be founded at a depth of 18 inches below the adjacent grade. If the ground descends in front of the wall up to 2H:1V, a minimum embedment depth of 4 feet is required.

6.5.2 Design Parameters

Lateral earth pressures for design of retaining structures within or adjacent to the building should be estimated using an equivalent fluid density of 35 pcf, provided the walls will not be restrained against rotation when backfill is placed. If the walls will be restrained from rotation (i.e., basement walls internally braced by first floor slab), we recommend using an equivalent fluid density of 50 pcf. Walls are assumed to be restrained if top movement during backfilling is less than H/1,000, where H is the wall height. Recommended lateral pressure distributions are shown on Figure 5.

Lateral earth pressures for design of retaining structures at the southeast corner to provide additional support or to replace the existing lower rockery should be estimated using an equivalent fluid density of 55 pcf.

Static lateral earth pressures acting on walls should also be increased to account for seismic loading. The seismic pressure should be estimated as follows:

- For yielding retaining walls and active soil conditions, a value of six times the height of the wall: 6H (psf)
- For rigid, non-yielding walls and at-rest soil conditions, a value of nine times the height of the wall: 9H (psf)

The height of the wall used in the above equations should be measured from the finished ground surface in front of the wall to the top of the wall. The seismic pressure for cantilever retaining walls should be applied as a uniform rectangular pressure from the top of the wall to the elevation of the finished ground surface in front of the wall and the resultant should be applied at 0.6H of the exposed wall height.

The recommended lateral earth pressures do not account for surcharges. If surcharges (e.g., building foundations, vehicles, terraced walls, etc.) are located within a horizontal distance from the back of a wall equal to the height of the wall, additional pressures will need to be accounted for in the wall design. An additional 2 feet of fill, representing a typical traffic surcharge, should be included in the design if vehicles are allowed to operate a horizontal distance equal to the height of the wall. Other surcharge conditions can be determined based on Figure 6.

These recommendations are based on the assumption that adequate drainage will be provided behind below-grade walls and retaining structures, as discussed below. The values for soil bearing, frictional resistance, and passive resistance presented above for foundation design are applicable to retaining wall design.

6.5.3 Retaining Wall Foundations

The bearing surface for retaining wall foundations located outside of the building area should be prepared through over-excavation and replacement of loose material to a depth of 4 feet and then backfilled with stabilization material. The fill should be placed in lifts and compacted to a firm, unyielding condition. Retaining wall foundations may be designed using an allowable bearing pressure of 2,500 psf, provided bearing surfaces are prepared as recommended. Estimated settlement of the wall will be less than ¾ inch, with differential settlement of up to ½ inch along the wall alignment.

6.5.4 Drainage

Positive drainage should be provided behind below-grade walls and retaining walls by placing a minimum 1.5-foot-wide zone of free-draining backfill directly behind the wall. The free-draining backfill should meet the criteria for WSS 9-03.12(4) – Gravel Backfill for Drains. The free-draining backfill zone should extend from the base of the wall to within 2 feet of the finished ground surface. The top 2 feet of fill should consist of relatively impermeable or native soil to prevent infiltration of surface water into the wall drainage zone.

A minimum 4-inch-diameter, perforated drainpipe should be installed within the free-draining material at the base of each wall. The drainpipe should consist of smooth-walled, perforated or slotted PVC pipe. The pipes should be laid with minimum slopes of 0.5 percent and routed to a suitable discharge location. The pipe installations should include a cleanout riser with cover located at the upper end of each pipe run. The cleanouts could be placed in flush-mount access boxes. We recommend against discharging roof downspouts into the perforated pipe providing wall drainage. Collected downspout water should be routed to appropriate discharge points in separate pipe systems.

For exterior walls where seepage at the face of a wall is not objectionable, the walls can be provided with weep holes to discharge water from the free-draining wall backfill material. The weep holes should be a minimum of 3 inches in diameter and spaced approximately every 8 feet center-to-center along the base of the walls. The weep holes should be backed with galvanized heavy wire mesh to help prevent loss of the backfill material.

6.5.5 Retaining Wall Backfill

Backfill should be placed and compacted as recommended for structural fill and retaining wall select backfill, with the exception of backfill placed immediately adjacent to walls. Backfill adjacent to walls should be compacted to a lesser standard to reduce the potential for generation of excessive pressure on the walls. Backfill located within a horizontal distance of 3 feet from the retaining walls should be compacted to approximately 92 percent of the maximum dry density, as determined by ASTM D1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as a jumping jack or vibratory plate compactor). If flatwork (slabs, sidewalk, or pavement) will be placed adjacent to the wall, we recommend that the upper 2 feet of fill be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

6.5.6 Settlement

Settlement of up to 1 percent of the wall height commonly occurs immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of flatwork within a horizontal distance equal to the height of the wall be postponed at least four weeks after construction, unless survey data indicates that settlement is complete prior to that time.

6.6 PAVEMENT DESIGN – DENSE AC

6.6.1 General

We anticipate dense AC pavement will be used to construct parking areas and access driveways. Due to the site constraints, bus traffic will be kept to 59th Avenue SW. The exposed subgrade beneath paved areas should be prepared as recommended in the “Subgrade Preparation” section.

The dense AC for constructing parking or driveways should be Class B PG 58V-22, with ½-inch aggregate, gradation, and asphalt requirement in accordance with the specifications provided in WSS 9-03.8(6) – HMA Proportions of Materials and compacted to 91 percent of the maximum specific gravity of the mix, as determined by ASTM D2041. Minimum lift thickness for ½-inch HMA is 1.5 inches. Asphalt binder should be performance graded and conform to PG 58V-22. The aggregate base material should meet the specifications for aggregate base rock provided in the “Fill Materials” section. The subgrade should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557.

These recommendations are based on general assumptions regarding anticipated traffic and assume adequate subgrade and drainage conditions. Pavement materials and placement should conform to the WSS (2022). We recommend the following pavement sections.

6.6.2 Heavy-Duty Pavement

We recommend a pavement section consisting of 4 inches of AC over 6 inches of 1¼-inch-minus crushed rock in accordance with WSS 9-03.9(3) – Crushed Surfacing. Alternatively, an applicable pavement section using ATB would consist of 4 inches of ATB and 4 inches of AC.

6.6.3 Light-Duty Pavement

In areas limited to automobile traffic only, we recommend a pavement section consisting of 2.5 inches of AC over 4 inches of 1¼-inch-minus crushed rock in accordance with WSS 9-03.9(3) – Crushed Surfacing. Alternatively, an applicable section using ATB would consist of 3 inches of ATB and 2.5 inches of AC.

6.7 PAVEMENT DESIGN – PERMEABLE PAVEMENT

We understand porous HMA or pervious PCC pavement may be incorporated into hardscape areas to address stormwater management. Provided below are recommendations for the use of permeable pavement in walkway or light-duty parking areas.

6.7.1 Recommended Pavement Section

Appropriate permeable pavement sections composed of pervious PCC or permeable HMA, based on the assumed traffic loading for parking areas, are provided in Table 4.

Table 4. Permeable Pavement Sections

Layer	Porous HMA Section (inches)	Alternate Porous HMA Section (inches)
Permeable HMA		
Porous Asphalt Wearing Layer	2[1]	3[1]
ATPB	3	--
Choker	--	2 maximum
Storage Aggregate	6 minimum	8 minimum
Pervious PCC		
Pervious Concrete Slab	7	–
Storage Aggregate	5 minimum	–

1. For driveway areas, the recommended thickness shown in the table should be increased by a minimum of 1 inch.

The use of a choker course is provided under "Alternate Porous HMA Section" in Table 4. A choker course layer will facilitate grading; without it the exposed storage aggregate is susceptible to rutting under dump trucks and may require hand grading during paving operations. The thickness of the storage aggregate layer is a minimum thickness required for structural support of the pavement. The thickness may need to be increased based on hydraulic storage requirements.

6.7.2 Subgrade Preparation

The subgrade below permeable pavement areas can be sloped up to approximately 2 percent but should be relatively flat, if possible, to prevent uneven ponding of water within the storage aggregate. On sloping sites, the subgrade can be stepped, and the lowest step should be flat or sloped back into the slope 1 to 2 percent to help decrease downslope seepage from the storage aggregate layer.

The native subgrade should be protected to limit construction traffic over it. If construction traffic is routed over the exposed subgrade, prior to placing the storage aggregate, it should be scarified to a depth of 12 inches and compacted to a firm condition under the direction of the geotechnical engineer. We recommend compacting the exposed subgrade to between 90 and 92 percent of the maximum dry density, as determined by ASTM D1557.

If soft areas are identified during subgrade preparation or areas deflect under construction equipment traffic, the material should be excavated and replaced with storage aggregate.

Utilities within the parking area should be backfilled with storage aggregate or alternatively clean sand and gravel fill meeting WSS 9-03.12(2) – Gravel Backfill for Walls. Trench dams should be placed intermittently to reduce lateral flow within the pipe bedding. The trench dams can be constructed using native silty sand and gravel, controlled density fill, or lean-mix concrete.

Exposed subgrades will be moisture sensitive and deteriorate under construction traffic loading during wet conditions. If earthwork construction is expected to extend into the wet season, we recommend limiting the size of the work area and stabilizing the exposed surface by placing the storage aggregate to protect the subgrade. Construction traffic should be minimized or restricted from trafficking over the permeable pavement subgrade.

A geotextile should be placed between the storage aggregate and the underlying subgrade for separation. Beneath the roadway, a heavy-duty geotextile with high permittivity and flow rate should be used, as specified in the "Permeable Pavement Materials" section.

After subgrade preparation measures are completed, the infiltration rate of the prepared subgrade should be verified through in-situ infiltration tests using small-scale pilot infiltration tests in accordance with test procedures provided in Puget Sound Partnership (2012). We can provide an average short-term rate that the verification tests should meet after we complete in-situ infiltration tests to support the design of LID BMP elements.

6.7.3 Permeable Pavement Materials

6.7.3.1 Pervious PCC

Pervious concrete typically consists of a near-zero-slump concrete consisting of portland cement, coarse aggregate with little to no fines, various admixtures, and water. The design of the mix should conform to ACI 522.1-08 specification (ACI, 2013). We recommend a maximum of ½-inch aggregate for roadway applications; however, other aggregate sizes may be preferred depending on the desired surface texture.

6.7.3.2 Porous HMA

AC used for porous asphalt pavement should be designed as a ½- to ¾-inch, nominal, open-graded HMA. Selection of the preferred aggregate size should be based on the desired surface texture and the required layer thickness limitations. Approximate "broad band" gradations for recommended aggregate gradation for porous asphalt are provided in Table 5.

Table 5. Porous HMA Gradation (3/8 inch)

Sieve Size	3/8 inch Percent Passing	½ inch Percent Passing	¾ inch Percent Passing
1 inch	--	--	99 – 100
¾ inch	--	100	85 – 96
½ inch	99 – 100	90 – 98	55 – 71
3/8 inch	90 – 100	55 – 90	--
#4	22 – 40	10 – 40	10 – 24
#8	5 – 15	0 – 13	6 – 16
#200	0 – 3	0 – 3	0 – 3
Recommended Maximum Layer Thickness (inches)	2.5	3	4

The actual mix design should be completed under the direction of a competent mix design technician familiar with the WSDOT mix design procedures. The asphalt binders to construct porous asphalt pavement should be PG 70-22ER.

The preferred and recommended asphalt binder is PG 70-22ER (polymer modified); however, its availability can be limited because some of the local asphalt suppliers limit their on-hand binder to PG 64-22. PG 70-22ER is available but is typically stocked by asphalt suppliers for a specific project, which requires pre-ordering it so that it is available when needed. Suppliers prefer a project size of approximately 600 tons of asphalt in order to use a complete tanker volume of the binder. Its availability and use is further restricted to the warm months of the year because of its stiffness, so it is not readily available between October and May. Projects specifying PG 70-22ER should be scheduled accordingly and specifications should address supplier availability.

The binder should be between 6.0 and 6.5 percent of the pavement section by weight of total (dry aggregate) mix.

Warm-mix asphalt technology with a proper mix design and appropriate additives can be used to construct the porous asphalt. Use of the warm-mix additives may require a longer curing time for the asphalt prior to allowing cars to traffic over the surface.

Compaction of the porous asphalt should consist of approximately two to four complete passes by an 8-ton, dual-steel roller compactor working in static mode only. Compaction of the porous asphalt should be to a target air voids content of 15 to 18 percent (82 to 85 percent of maximum theoretical [Rice] density). A nuclear density gage should be used to monitor compaction.

We recommended that porous asphalt specifications are prepared in conformance with those approved by the APWA-WA Construction Materials Committee. The specifications have now been integrated into the WSDOT Local Agency GSPs and are now available at http://www.wsdot.wa.gov/partners/apwa/Division_5_Page.htm.

6.7.3.3 Choker Aggregate

Imported granular material used as choker aggregate beneath permeable pavements should be clean crushed rock that meets a No. 57 size gradation according to AASHTO M 43, as provided in Table 6.

Table 6. Permeable Pavement Choker Aggregate (AASHTO No. 57)

Sieve Size	Percent Passing
1½ inches	100
1 inch	95 – 100
½ inch	25 – 60
No. 4	0 – 10
No. 8	0 – 5

The percent fracture should be a minimum of 75 percent and a minimum of two fracture faces.

Alternatively, aggregate for bituminous surface treatment [WSS 9-03.4(2) – Grading and Quality], 5/8-inch or 3/4-inch washed crushed rock, which is available from local suppliers, will also be suitable. The aggregate should have at least two mechanically fractured faces.

6.7.3.4 Storage Aggregate

Imported granular material used as storage aggregate beneath pervious pavement should be clean crushed rock or crushed gravel and sand that meets a No. 2 or No. 3 size gradation according to AASHTO M 43 or clean crushed rock that conforms to WSS 9-03.9(2) – Permeable Ballast. Recommended gradations for acceptable storage aggregate are provided in Table 7.

Table 7. Storage Aggregate

Sieve Size	AASHTO No. 2 Percent Passing	AASHTO No. 3 Percent Passing	WSS 9-03.9(2) – Permeable Ballast Percent Passing
2 ½ inches	100	100	90 – 100
2 inches	35 – 70	90 – 100	65 – 100
1 ½ inches	0 – 15	35 – 70	--
1 inch	--	0 – 15	40 – 80
¾ inch	0 – 5	--	--
½ inch	--	0 – 5	--
No. 4	--	--	0 – 5

“Rail ballast” or “clean ballast” products available from local quarries will typically meet the AASHTO gradation criteria. The percent fracture should be greater than 75 percent to improve interlocking between fragments, and the aggregate should have a minimum WSS degradation value of 30. We anticipate that the storage aggregate gradations specified above will have between 35 and 40 percent voids compaction in the field.

The storage aggregate should be placed in one lift and compacted to a firm and unyielding condition. Over-compaction and construction traffic should be avoided.

6.7.4 Subgrade Geotextile

A layer of geotextile fabric should be placed as a barrier between the native soil subgrade and the pavement storage aggregate. Beneath drive lanes a heavy-duty geotextile, such as Mirafi RS380i, should be used and equivalent products should conform to WSS 9-33.2(1) – Geotextile Properties, Table 4, Permanent Erosion Control, High Survivability, Woven and Table 5, Class A. Elsewhere the geotextile should conform to the specifications for non-woven separation material provided in WSS 9-33.2(1) – Geotextile Properties, Table 3, Geotextile for Separation. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

6.8 DRAINAGE

6.8.1 Temporary

During work at the site, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the site, the contractor should keep all pads and subgrade free of ponding water.

6.8.2 Surface

The ground surface at finished pads should be sloped away from their edges at a minimum 2 percent gradient for a distance of at least 5 feet. Roof drainage from the building should be directed into solid, smooth-walled drainage pipes that carry the collected water to the storm drain system.

6.8.3 Subsurface

Perimeter footing drains should be installed around the building. Drains should consist of a filter fabric-wrapped, drain rock-filled trench that extends at least 12 inches below the lowest adjacent grade (i.e., slab subgrade elevation). A perforated pipe should be placed at the base to collect water that gathers in the drain rock. The drain rock and filter fabric should meet specifications outlined in the “Fill Materials” section. Discharge for footing drains should not be tied directly into the stormwater drainage system, unless mechanisms are installed to prevent backflow.

6.8.4 Stormwater Infiltration Systems

Infiltration testing was not completed during this phase of the project. Based on observed soil conditions, infiltration rates are anticipated to be variable. Infiltration is likely feasible across the site. A preliminary infiltration rate of 0.5 inch per hour is recommended over the east and central portions of the site. Along the west edge of the site where granular fill and beach deposits are present, an infiltration rate of 1 inch per hour is recommended. Groundwater is present at approximately 10 feet BGS, so adequate separation should be maintained below infiltrative BMPs.

7.0 SITE DEVELOPMENT

7.1 SITE PREPARATION

Site preparation activities will include demolishing the existing school building, utilities, and pavement; removing vegetation and undesirable material; site grading; and subgrade preparation. Recommendations for these activities are discussed in the following sections.

7.1.1 Removal of Existing Pavement, Building Slabs, Foundations, and Utilities

We understand the existing structure and areas to be improved will be demolished to prepare the site for construction of the proposed development. The existing improved surfaces (which include AC and PCC) along with building slabs and foundations should be removed as necessary for construction. Removal of existing pavement should be completed or scheduled so that it can be left in place during construction for as long as possible to protect the underlying subgrade from deterioration during wet weather.

Existing building foundations should be removed. Voids or depressions created during removal of foundations that will be below planned finish grades should be filled with material appropriate for the location (i.e., structural fill and within all building, pavement, and hardscape areas.

Existing utilities that will be abandoned should be removed or abandoned in place by filling with a flowable mixture of PCC and sand grout. Excavations resulting from the removal of existing utilities should be backfilled and properly compacted in accordance with the appropriate specifications for the location.

Abandonment and remediation of the existing UST will likely result in a deep excavation. After remediation is completed, the excavation should be backfilled in lifts using structural fill or stabilization material. The fill should be placed in lifts and compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

7.1.2 Subgrade Preparation

After demolition, site grading should be completed to the required elevations. Based on the results of our explorations, we anticipate the existing fill encountered in the explorations will be exposed across the site. The fill has a variable fines content but will be susceptible to deterioration under construction traffic and wet weather.

Over-excavation and replacement of the fill, floor slab aggregate, or stabilization material will likely be necessary to stabilize the subgrade to support construction equipment and maintain a stable working surface. Given the limited site area, we recommend stabilizing the site by over-excavating the area and constructing a 12-inch-thick gravel pad.

Subgrade preparation beneath floor slab, dense AC pavement, and hardscape areas should consist of scarifying to a depth of 12 inches, moisture conditioning, and compacting the subgrade. The subgrade should be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557. Based on soil moisture contents observed in samples collected from the explorations, this will require moisture conditioning of the subgrade. Soil moisture should be maintained within 2 percent of the optimum moisture content to achieve the required compaction.

7.1.3 Site Grading

Fill required to increase site grades in improved areas should consist of structural fill as defined in the “Fill Materials” section. The use of on-site excavation spoils as structural fill will be dependent on the material composition and weather conditions. We anticipate that some of the on-site material will be suitable for use but will be limited to use during the dry season. It will be prudent to provide a 12-inch-thick cap of imported structural fill over areas where on-site soil is used as fill to protect it against deterioration during wet weather.

Fill in unimproved areas, with slopes less than 3H:1V, may consist of common fill or on-site excavation spoils. Common fill placed in landscape of unimproved areas should be placed in lifts with a maximum uncompacted thickness of 8 to 12 inches and compacted to not less than 90 percent of the maximum dry density, as determined by ASTM D1557.

7.1.4 Subgrade Verification

Exposed subgrades should be evaluated by a representative from NV5 to verify conditions are as anticipated and will provide the required support. Where pavement or hardscaped areas will be constructed, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similar heavy, rubber tire construction equipment to identify soft, loose, or unsuitable areas. Beneath foundations and during wet weather, subgrade evaluation should be performed by probing with a foundation probe. If soft or loose zones are identified, these areas should be excavated to the extent indicated by the engineer or technician and replaced with structural fill or stabilization material.

7.2 EXCAVATION

7.2.1 Shallow Excavation

The soil at the site can be excavated with conventional earthwork equipment. Excavations should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the trench walls.

Open excavation techniques may be used to excavate utility trenches with depths greater than 4 feet, provided the walls of the excavation are cut at appropriate cut slopes determined by the contractor. Approved temporary shoring is recommended where sloping is not possible. If a conventional shield is used, the contractor should limit the length of open trench. If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation and the subsurface conditions. All excavations should be made in accordance with applicable OSHA, local, and state regulations.

7.2.2 Excavations Adjacent to Existing or New Foundations

Utility and new foundation excavations should be planned to avoid excavation within the zone of influence beneath adjacent foundation elements. The zone of influence generally extends downward from the foundation edges at a 1.5H:1V inclination. Excavations within this area should be avoided; if necessary, they should be backfilled with controlled density fill and should be completed before installing the foundation.

7.2.3 Excavation Dewatering

We anticipate groundwater will be encountered in excavations that extend below a depth of 12 feet. We recommend that the contractor be responsible for selecting the appropriate temporary dewatering systems.

7.3 FILL MATERIALS

We anticipate fill material will be required for site grading, backfilling over-excavations, pavement support, installation of utilities, and drainage. The recommended fill materials are discussed below.

7.3.1 On-Site Soil

On-site material encountered in our explorations includes fill, wetland deposits, beach deposits, and glacial advance outwash. The on-site soil typically has a fines content that makes it sensitive to changes in moisture content and will deteriorate when exposed to wet weather.

We anticipate that some of the excavation spoils can be used as structural fill, provided construction is completed during the dry season, moisture conditioning is performed, and deleterious material (such as wood, organic material, and man-made material) is removed. The use of on-site soil as fill should be subject to review and approval by NV5. During the wet season, exposed native material will deteriorate. We recommend capping the on-site material with at least 12 inches of structural fill, hardscape base course, or stabilization material.

The on-site material free of man-made material may be used as common fill in non-structural areas, such as planter areas or unimproved areas. Moderate moisture conditioning efforts of the on-site soil may be required, depending on the weather, in order to achieve proper compaction.

7.3.2 Off-Site Recycled Fill Materials

Off-site-generated recycled material should not be used on site without approval from the geotechnical engineer and acceptance by Seattle Public Schools. The use of recycled material will be subject to performance criteria, gradation requirements, and hazardous material testing in conformance with WSS 9-03.21(1) – General Requirements. Recycled material is not recommended for use beneath building foundations or floor slabs. Recycled material may be suitable for use beneath hardscape areas outside of the building footprints, provided performance, gradation, and hazardous material testing results are acceptable.

7.3.3 Structural Fill

Structural fill placed for general site grading in improved areas should consist of clean, free-draining granular soil (sand and gravel) that is free from organic material or other deleterious and man-made materials, with a maximum particle size of approximately 3 inches and a maximum fines content of 5 percent by dry weight passing the U.S. Standard No. 200 sieve. The use of granular, free-draining material will increase the workability of the material during the wet season and the likelihood that the material can be placed and adequately compacted.

Imported granular material used for structural fill should be naturally occurring pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in WSS 9-03.14(1) – Gravel Borrow, with the exception that the percentage passing the U.S. Standard No. 200 sieve does not exceed 5 percent by dry weight. Structural fill should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

7.3.4 Common Fill

Fill placed in areas of the site where structural support is not required (such as planters, landscaped areas, and detention ponds) is defined as “common fill.” Common fill may contain a higher concentration of fines and organic material than structural fill but should be free of man-made material. Imported common fill should meet the specifications provided in WSS 9-03.14(3) – Common Borrow. On-site material used for common fill should have an organic material content less than 20 percent. Fill placed in non-structural areas should be compacted to a minimum of 90 percent of the maximum dry density, as determined by ASTM D1557.

7.3.5 Hardscape and Pavement Base Course

Imported granular material used as aggregate base for pavement and beneath hardscape areas should consist of 1½-inch-minus material meeting the specifications provided in WSS 9-03.9(3) – Crushed Surfacing, with the exception that the aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve and at least two mechanically fractured faces. The imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

7.3.6 Trench Backfill

Trench backfill for utility trenches should consist of and be compacted in accordance with the specifications for structural fill in improved areas and for common fill in non-structural areas. Trenches within the ROW should be bedded and backfilled with 5/8-inch-minus screened crushed rock meeting the specifications provided in WSS 9-03.9(3) – Crushed Surfacing.

Trench backfill within the zone of influence of adjacent or overlying foundations should be backfilled with controlled density fill.

Trench bedding material should also consist of 5/8-inch-minus screened crushed rock meeting the specifications provided in WSS 9-03.9(3) – Crushed Surfacing.

7.3.7 Stabilization Material

Stabilization material to backfill over-excavations or to stabilize soft subgrade areas may consist of either of the following:

- WSS 9-03.9(2) – Permeable Ballast
- WSS 9-13.7(2) – Backfill for Rock Wall
- WSS 9-03.9(3) – Crushed Surfacing Base Course

The initial lift of stabilization material used to fill over-excavations should be 18 inches thick and compacted to a firm condition. Successive lifts should be 12 inches thick and compacted to a dense, unyielding condition.

7.3.8 Drain Rock

Drain rock used in infiltration systems, subsurface drains, or against retaining walls should consist of granular material with a maximum particle size of 1 inch and should meet the specifications provided in WSS 9-03.12(4) – Gravel Backfill for Drains. The material should be free of roots, organic material, and other unsuitable material and should have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis).

7.3.9 Retaining Wall Select Backfill

Backfill material placed behind retaining walls and extending a horizontal distance of ½H, where H is the height of the retaining wall, should consist of select granular material that meets the specifications provided in WSS 9-03.12(2) – Gravel Backfill for Walls. We recommend the select granular wall backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the specifications provided in WSS 9-33.2 – Geosynthetic Properties for drainage geotextiles.

7.3.10 Floor Slab Base Rock

Imported granular material placed beneath building floor slabs should be clean, crushed rock or crushed gravel and sand that is fairly well graded between coarse and fine. The granular material should contain no deleterious material, should have a maximum particle size of 1½ inches and less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, should have at least two mechanically fractured faces, and should meet the specifications provided in WSS-9-03.9(3) – Crushed Surfacing. The imported granular material should be placed in one lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

7.4 GEOSYNTHETICS

We have recommended the use of geotextiles for stabilizing the base of over-excavations when wet or saturated soil conditions are encountered and as a separator between subsurface drainage material and native material or fill. The geotextiles should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

7.4.1 Stabilization Geotextile

We recommend using a woven geotextile stabilization material at the base of over-excavations and to stabilize the exposed subgrade beneath paved areas if construction is completed during the wet season. The geotextile should conform to the specifications for woven soil stabilization material provided in WSS 9-33.2(1) – Geotextile Properties, Table 3, Geotextile for Separation or Soil Stabilization.

Beneath permeable pavement areas subject to vehicular traffic, we have recommended the use of a geotextile to reinforce the subgrade and act as a barrier between the native soil subgrade and the pavement storage aggregate. The recommended geotextile is a heavy-duty geotextile, such as Mirafi RS380i, or equivalent and should conform to WSS 9-33.2(1) – Geotextile Properties, Table 4, Permanent Erosion Control, High Survivability, Woven and Table 5, Class A.

7.4.2 Separation and Drainage Geotextile

We recommend using a non-woven geotextile drainage material around subsurface drains to separate drain rock from adjacent materials. The geotextile should conform to the specifications for non-woven separation material provided in WSS 9-33.2(1) – Geotextile Properties, Table 3, Geotextile for Separation or Soil Stabilization.

7.5 CONSTRUCTION STORMWATER CONSIDERATIONS

Appropriate BMPs and stormwater quality treatment will be necessary to prevent discharging stormwater to adjacent properties. Grading during construction should be completed so that water drains back onto the site and is not allowed to flow down the slope to neighboring properties and/or become concentrated.

The soil encountered on site is high in silt, which will be difficult to remove from stormwater using passive systems, such as sediment traps and ponds. Exposed native soil should be stabilized as soon as possible to prevent erosion and sedimentation.

7.6 WET WEATHER CONSIDERATIONS

This section describes additional recommendations with potential budget and schedule impacts that may affect the owner and site contractor if earthwork occurs during the wet season. These recommendations are based on the site conditions and our experience on previous construction projects completed in the area.

- The near-surface soil encountered in the explorations is typically silty sand. The fines content of the material is high and the soil will be susceptible to deterioration during wet weather. If construction is completed or extends into the wet season, we recommend stabilizing the areas of the site where construction traffic is anticipated using a gravel working pad
- Earthwork should be accomplished in small sections to minimize exposure to wet weather.
- Excavation or the removal of unsuitable soil should be followed promptly by the placement and compaction of clean structural fill.
- The size of construction equipment and access to the area should be limited to prevent soil disturbance.
- The ground surface in the construction area should be sloped and sealed with a smooth-drum roller to promote rapid runoff of precipitation, to prevent surface water from flowing into excavations, and to prevent puddles from forming.
- The building pads should be surfaced with a 12-inch-thick gravel pad consisting of stabilization material as described in the “Fill Materials” section. This layer will help protect the pads from deterioration under construction traffic during wet weather. The protected area should also extend outward from the building pads a sufficient distance to provide stabilized access for construction equipment around the perimeter of the building.
- Additional excavation below planned foundation subgrades should be anticipated in order to construct a 2-inch-thick lean-mix concrete rat slab or to install a 6-inch-thick layer of crushed surfacing base course to protect the foundation subgrade from deterioration.
- Installation of sumps within excavations may be necessary to remove accumulated stormwater. The sumps should be located outside of the footing footprint and be installed to a depth sufficient to lower the water to below the excavated subgrade elevation.
- Construction of stabilized access roads using non-moisture-sensitive materials and geotextile fabric to provide separation from underlying soil should be expected.
- Increased handling, excavation, and disposal of wet and disturbed surface material should be expected.
- Protection of exposed soil subgrades and stockpiles will be required.
- Heavy rainfall can occur during winter months and can compromise earthwork schedules in this region.
- In general, snowfall is not dramatically high; however, frozen ground should not be proof rolled or compacted, and fill should not be placed over frozen ground.

8.0 CONSTRUCTION OBSERVATION

Recommendations provided in this report assume that NV5 will be retained to provide geotechnical consultation and observation services during construction. Satisfactory earthwork and foundation performance depends to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions requires experience with the site conditions and an understanding of the geotechnical recommendations; therefore, NV5 personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated and to verify that the work is completed in accordance with the construction drawings and specifications.

Observation and laboratory testing of the proposed fill materials should be completed to verify that proposed fill materials are in conformance with our recommendations. Observation of the placement and compaction of the fill should be performed to verify it meets the required compaction and will be capable of providing the structural support for the proposed infrastructure and buildings. A sufficient number of in-place density tests should be performed as the fill is placed to verify the required relative compaction is being achieved.

9.0 LIMITATIONS

We have prepared this report for use by Seattle Public Schools and its consultants in design of this project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other nearby building sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary. The site development plans and design details were preliminary at the time this report was prepared. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

The scope of our services does not include services related to construction safety precautions and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time the report was prepared. No warranty, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to be of continued service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

NV5

DRAFT

Eric I. Larson, E.I.T.
Geotechnical Staff

DRAFT

Kevin J. Lamb, P.E.
Principal Engineer

REFERENCES

ACI, 2013, American Concrete Institute, ACI522.1-13, Specifications for Pervious Concrete Pavement, prepared by ACI Committee 522, 7p.

ASTM, 2016. *Annual Book of ASTM Standards*, Vol. 4.08, Soil and Rock (1): D420-D4914, Philadelphia: American Society for Testing and Materials.

Boulanger, R. W., and Idriss, I. M., 2014, "CPT and SPT based liquefaction triggering procedures." Report No. UCD/CGM-14/01, Center for Geotechnical Modeling, Department of Civil and Environmental Engineering, University of California, Davis, CA, 134 pp. Boulanger_Idriss_CPT_and_SPT_Liq_triggering_CGM-14-01_2014.

International Building Code, 2018.

K. Ishihara, M. Yoshimine, 1992. Evaluation of settlements in sand deposits following liquefaction during earthquakes, Soils Found., Jpn. Geotech. Soc., 32 (1) (1992), pp. 173-188.

Johnson, S.Y., S.V. Dadisman, J.R. Childs, and W.D. Stanley, 1999*, Active Tectonics of the Seattle Fault and Central Puget Sound, Washington: Implications for earthquake hazards*: GSA Bulletin, v. 111, no. 7, p. 1042-1053.

Nelson, A.R., S.Y. Johnson, S.K. Pezzopane, R.E. Wells, H.M. Kelsey, B.L. Sherrod, R.D. Koehler, R.C. Buckman, W.T. Laprade, J.W. Cox, and C.F. Narwolds, 2000. Postglacial and Late Holocene earthquakes on the Toe Jam Strand of the Seattle Fault, Bainbridge Island, Washington. Poster, GSA Cordilleran Section Meeting, Vancouver, Canada.

Puget Sound Partnership, 2012, Low Impact Development, Technical Guidance Manual for Puget Sound, December 2012, 365p.

Sherrod, B.L., T.M. Brocher, C.S. Weaver, R.C. Bucknam, R.J. Blakely, H.M. Kelsey, A.R. Nelson, and R. Haugerud, 2004, *Holocene fault scarps near Tacoma, Washington*, *Geology*, 32, p. 9-12.

Tokimatsu, K. and Seed, H.B. 1987. Evaluation of settlements in sand due to earthquake shaking. J. of Geotechnical Engineering, ASCE. Vol. 113(8): 861-878.

Troost, K.G., D.B. Booth, A.P. Wisher and S.A. Shimel, 2005, The Geologic Map of Seattle – A Progress Report. Map, U.S. Geological Survey.

Washington State Department of Transportation, 2022. Standard Specifications for Road, Bridge and Municipal Construction. M 41-10.

FIGURES

DRAFT

VICINITY M
PHOTOGRAPH O
GOOGLE EARTH PRO

SEATTLEPS-15-01	**VICINITY MAP**	
MARCH 2022	ALKI ELEMENTARY MODERNIZATION PROJECT SEATTLE, WA	**FIGURE 1**

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File Name: J:\S-Z\seattleps\seattleps-15\seattleps-15-01\Figures\CAD\SeattlePS-15-01-VM01.dwg | Layout: FIGURE 1

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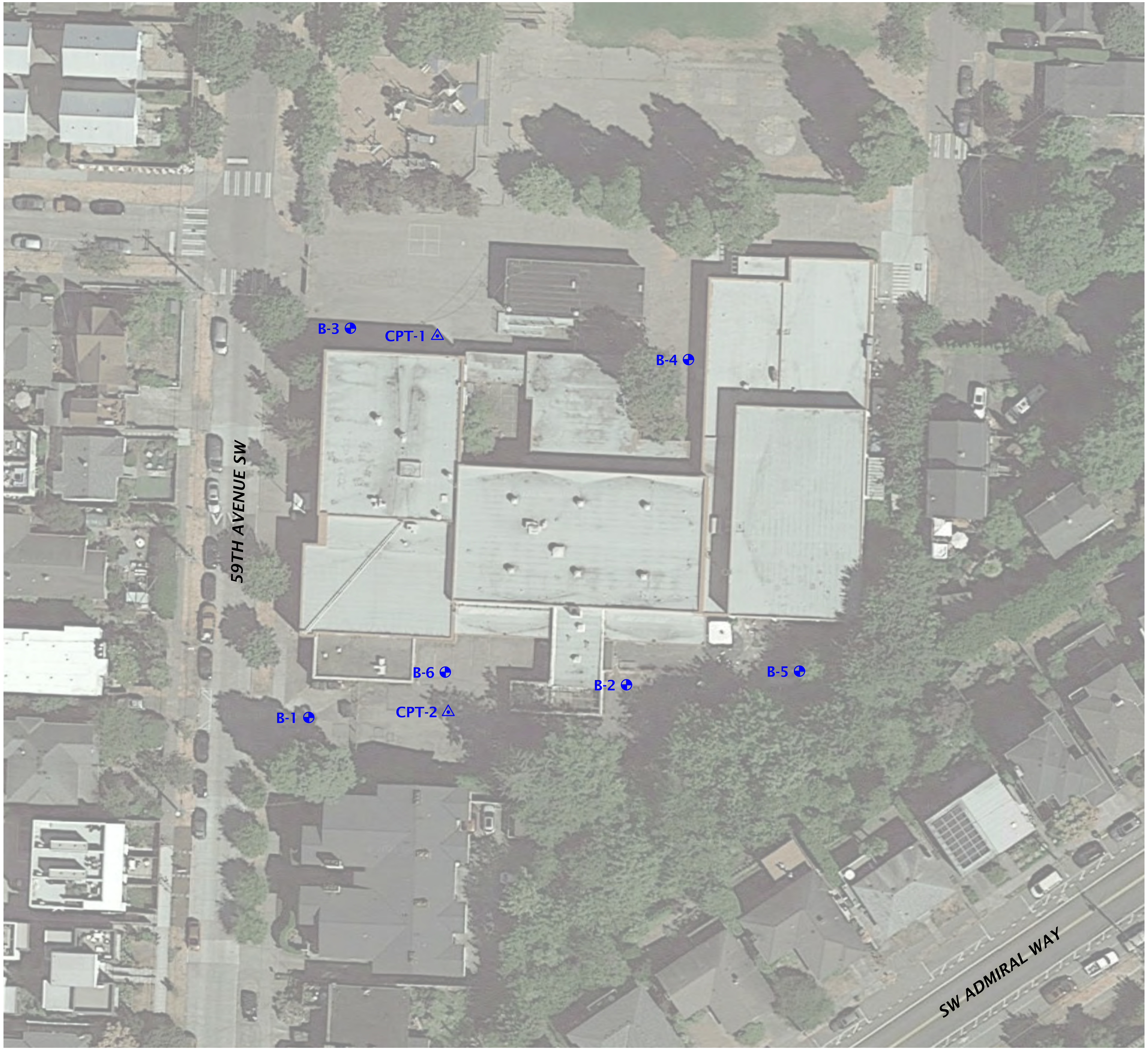
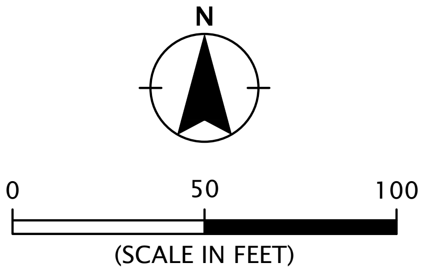


LEGEND:

B-1 ⊕	BORING
CPT-1 △	CPT



SITE PLAN BASED ON AERIAL PHOTOGRAPH
OBTAINED FROM GOOGLE EARTH PRO®
DECEMBER 22, 2021

SITE PLAN

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

SEATTLEPS-15-01

MARCH 2022

FIGURE 2

NV5

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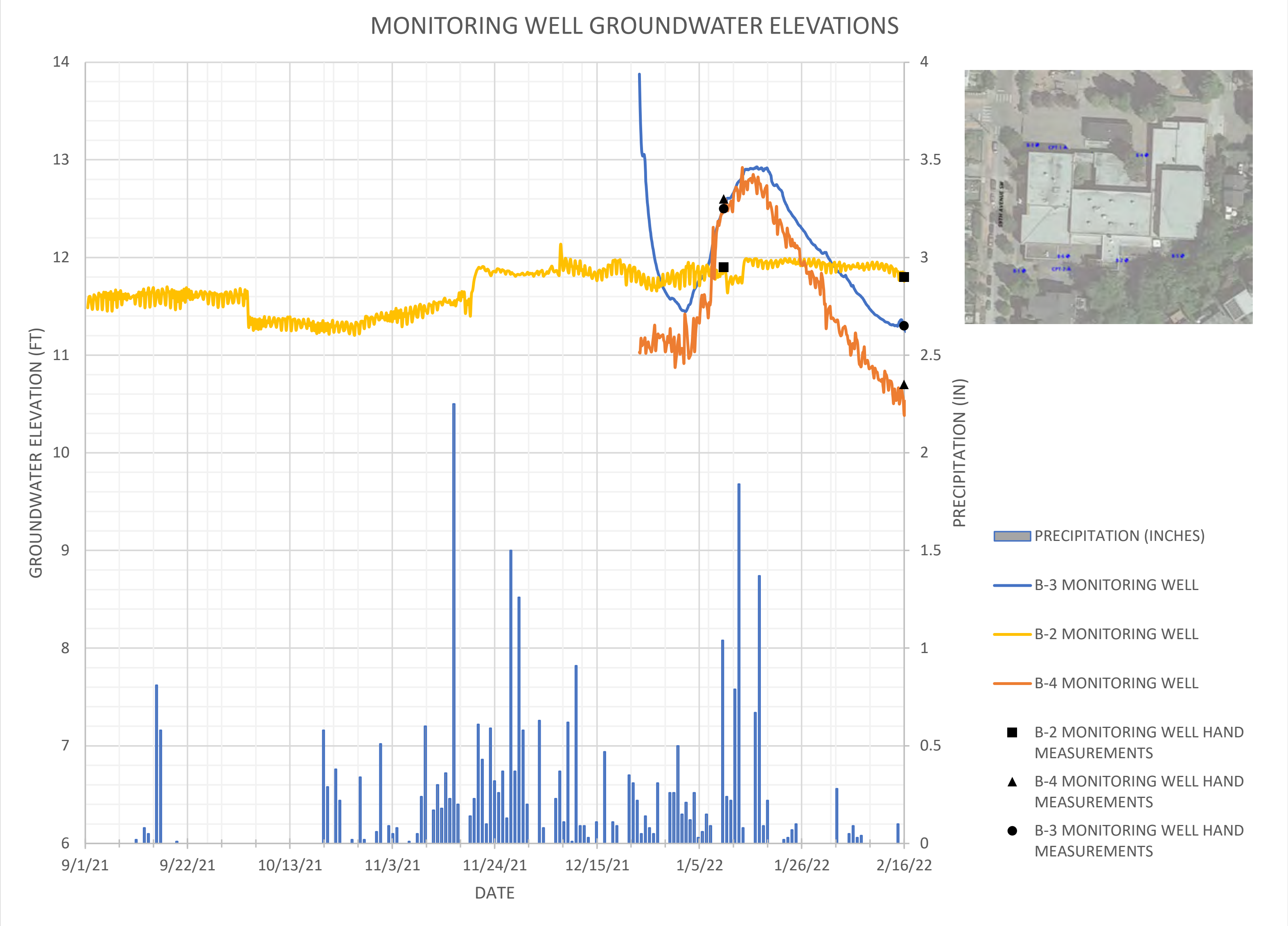


SEATTLEPS-15-01

MARCH 2022

GROUNDWATER LEVEL MONITORING DATA

ALKI ELEMENTARY MODERNIZATIOIN PROJECT
SEATTLE, WA

FIGURE 3

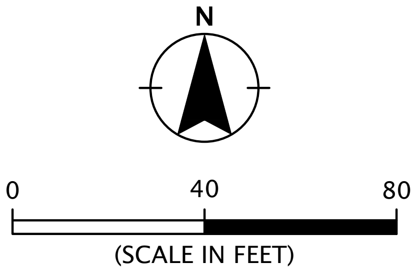
DRAFT

LEGEND:

▨ CATEGORY II PEAT SETTLEMENT AREA (SMC 25.09 MAP A15)

🟨 REVISED LIQUEFACTION-PRONE AREA (BASED ON LIQUIFACTION ANALYSIS AND CITY OF SEATTLE ENVIRONMENTAL CRITICAL AREA MAPS)

– – AREA MEETS SMC SUBSECTION 25.09.012 DEFINITION OF STEEP SLOPE GEOLOGIC HAZARD AREA



SITE PLAN BASED ON DRAWING OBTAINED FROM SEATTLE PUBLIC SCHOOLS ON DECEMBER 13, 2021

FIGURE 4

CONFIRMED ENVIRONMENTAL CRITICAL AREAS

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

SEATTLEPS-15-01

MARCH 2022

NV5

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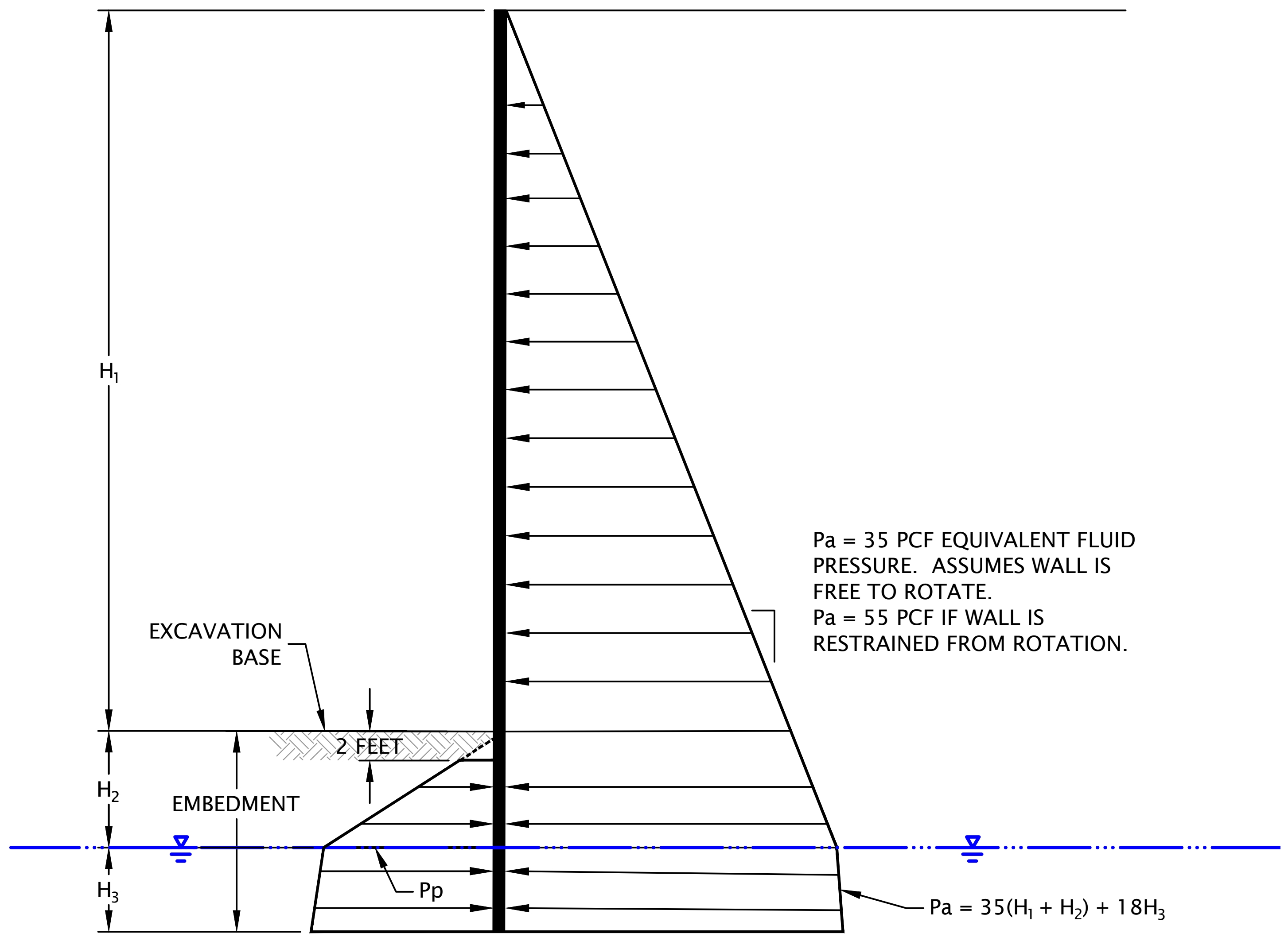
DRAFT

RECOMMENDED DESIGN PARAMETERS FOR CANTILEVERED WALL



Pa = 35 PCF EQUIVALENT FLUID PRESSURE. ASSUMES WALL IS FREE TO ROTATE.
Pa = 55 PCF IF WALL IS RESTRAINED FROM ROTATION.

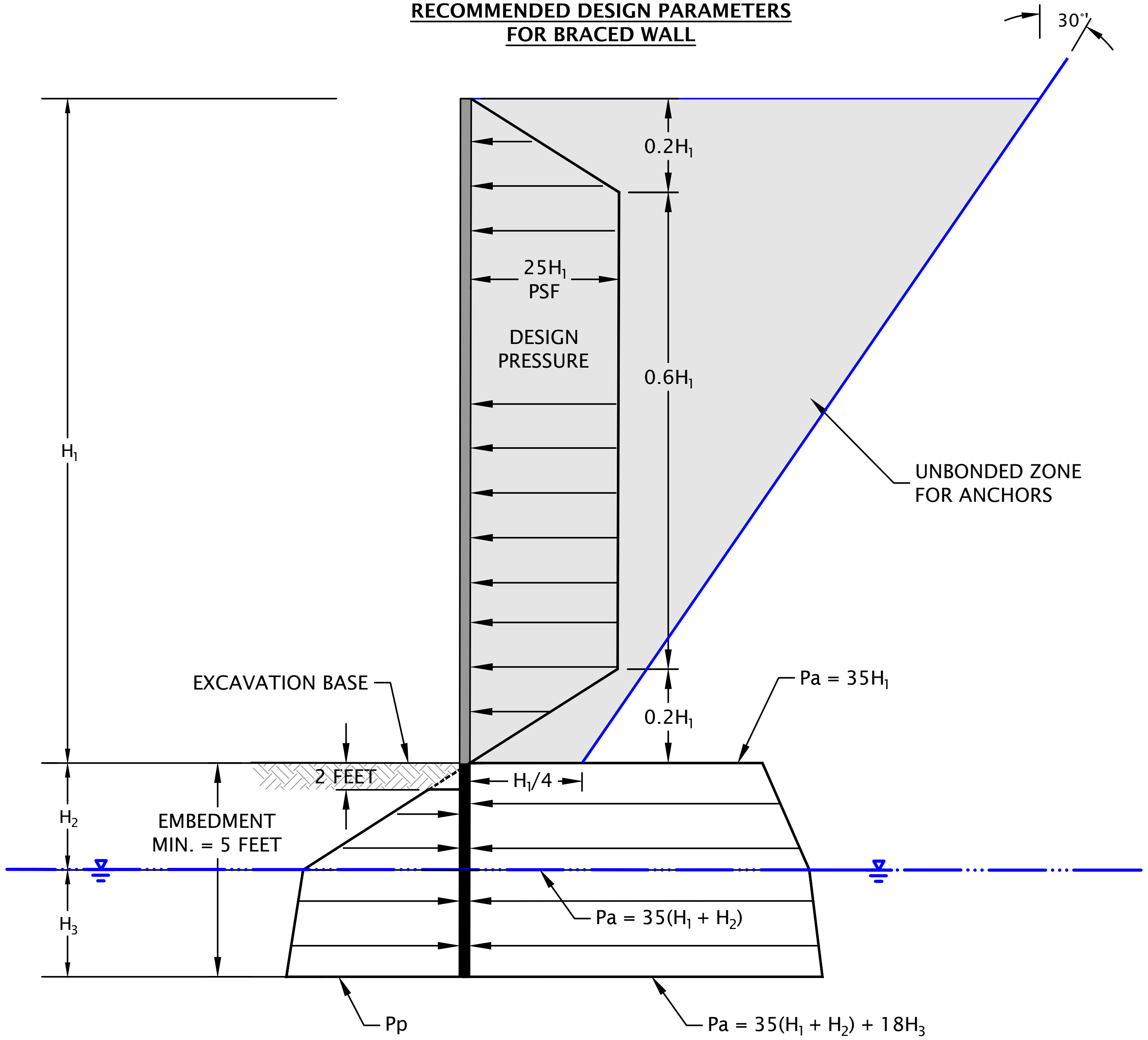
EXPLANATION:

Pp = 450H_2 PCF FOR GLACIAL TILL ABOVE WATER TABLE
H_1 = HEIGHT OF EXPOSED SOLDIER PILE IN FEET
H_2 = EMBEDMENT DEPTH IN FEET ABOVE GROUNDWATER
H_3 = EMBEDMENT DEPTH IN FEET BELOW GROUNDWATER
PASSIVE PRESSURE ACTS OVER 3X THE PILE DIAMETER
ACTIVE PRESSURE ACTS OVER 1X THE PILE WIDTH BELOW EXCAVATION BASE
ASSUMED DEPTH TO WATER TABLE (H_1 + H_2) = 15 FEET

NOTES:

1. FIGURE DOES NOT INCLUDE SURCHARGE OR SEISMIC LOADS.
2. LATERAL EARTH PRESSURE ASSUMES WATER WILL BE MAINTAINED BELOW THE BASE OF THE EXCAVATION.
3. THE LATERAL EARTH PRESSURES ARE UNFACTORED.
4. PASSIVE PRESSURE RESISTANCE SHOULD BE NEGLECTED 2 FEET BELOW THE BOTTOM OF THE EXCAVATION.
5. REFER TO THE GEOTECHNICAL REPORT FOR APPROPRIATE GROUNDWATER ELEVATION.

RECOMMENDED DESIGN PARAMETERS FOR BRACED WALL



EXPLANATION:

Pp = 450H_2 PCF FOR GLACIAL TILL ABOVE WATER TABLE
H_1 = HEIGHT OF EXPOSED SOLDIER PILE IN FEET
H_2 = EMBEDMENT DEPTH IN FEET ABOVE GROUNDWATER
H_3 = EMBEDMENT DEPTH IN FEET BELOW GROUNDWATER
PASSIVE PRESSURE ACTS OVER 2X THE PILE IN SILT AND SAND AND 3X IN GRAVEL
ACTIVE PRESSURE ACTS OVER 1X THE PILE WIDTH BELOW EXCAVATION BASE

NOTES:

1. DOES NOT INCLUDE SURCHARGE OR SEISMIC LOADS.
2. TIEBACKS SHOULD BE LOCKED OFF AT 100 PERCENT OF DESIGN LOAD.
3. THE LATERAL EARTH PRESSURES ARE UNFACTORED.
4. PASSIVE PRESSURE RESISTANCE SHOULD BE NEGLECTED 2 FEET BELOW THE BOTTOM OF THE EXCAVATION.
5. REFER TO THE GEOTECHNICAL REPORT FOR APPROPRIATE GROUNDWATER ELEVATION.
6. SEISMIC LOAD OF 8H SHOULD BE INCLUDED IN PERMANENT WALL DESIGN.

FIGURE 5

CANTILEVERED AND BRACED WALLS DESIGN CRITERIA

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SEATTLE, WA

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MARCH 2022

NV5

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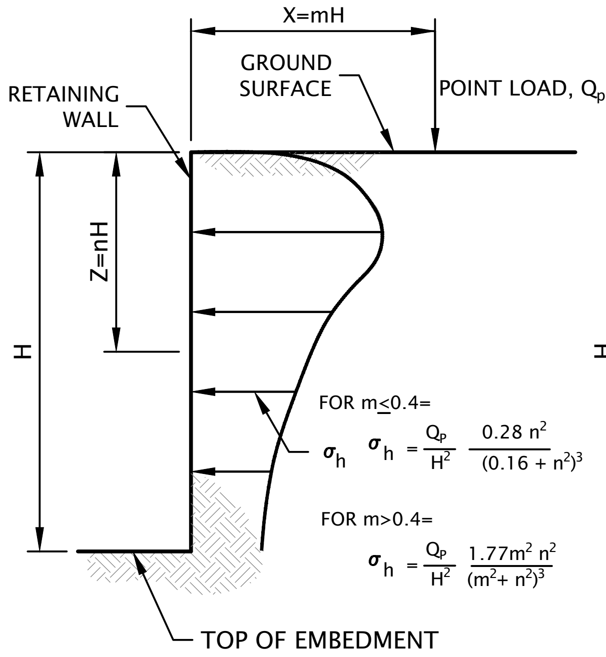
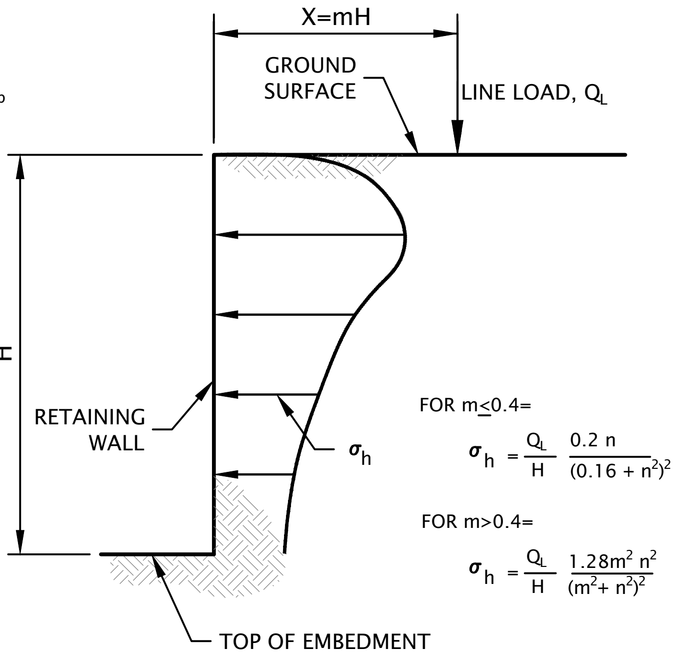
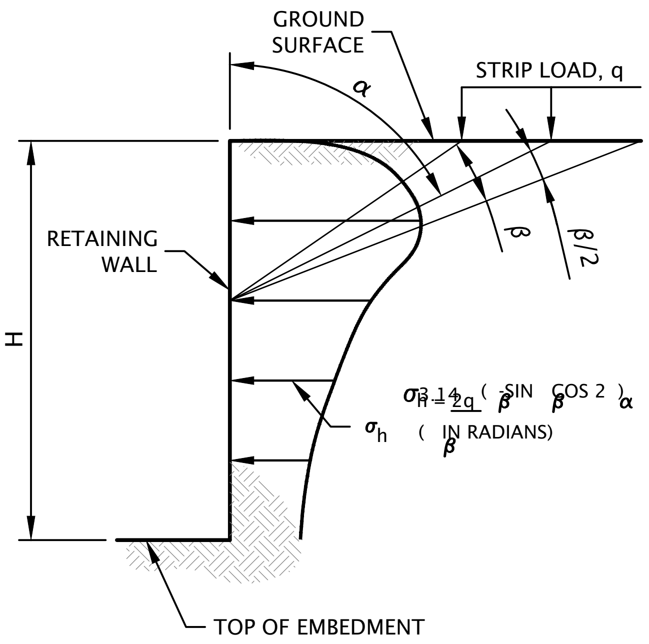
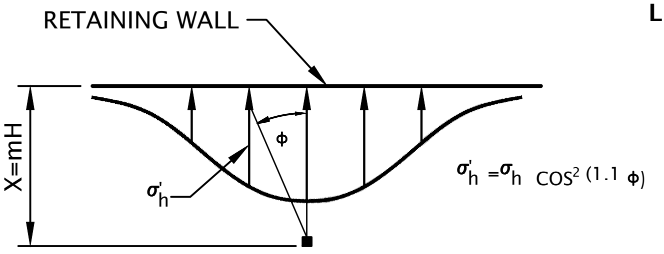




LINE LOAD PARALLEL TO WALL



STRIP LOAD PARALLEL TO WALL



DISTRIBUTION OF HORIZONTAL PRESSURES

VERTICAL POINT LOAD

NOT TO SCALE

NOTES:

1. FIGURE SHOULD BE USED IN CONJUNCTION WITH REPORT TEXT.
2. THESE GUIDELINES APPLY TO RIGID WALLS WITH POISSON'S RATIO ASSUMED TO BE 0.5 FOR BACKFILL MATERIALS.
3. LATERAL PRESSURES FROM ANY COMBINATION OF ABOVE LOADS MAY BE DETERMINED BY THE PRINCIPLE OF SUPERPOSITION.

SEATTLEPS-15-01

MARCH 2022

SURCHARGE-INDUCED LATERAL EARTH PRESSURES

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE 6

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

Subsurface conditions at the site were explored by drilling six borings (B-1 through B-6) to depths between 26 and 41.5 feet BGS and by conducting two CPTs (CPT-1 and CPT-2) to depths between 17.6 and 23.3 feet BGS. The CPTs were conducted by In Situ Engineering on December 20, 2021, using a truck-mounted CPT. Borings B-1 and B-2 were drilled on August 23, 2021, by BoreTec1, Inc. of Valleyford, Washington, using a mini track drill rig and excavator-mounted drill rig and hollow-stem auger drilling techniques. Borings B-3 through B-6 were drilled on December 20 and 21, 2021, by Holt Services, Inc. of Edgewood, Washington, using a CME 85 truck-mounted drill using hollow-stem auger and mud rotary techniques.

The boring logs are presented in this appendix. The CPT logs are presented in Appendix B. The locations of the explorations were determined in the field by using hand-held GPS equipment. This information should be considered accurate to the degree implied by the methods used.

SOIL SAMPLING

We collected representative samples of the various soils encountered in the explorations for geotechnical laboratory testing. Samples were collected from the borings using a 1½-inch-inside diameter, split-spoon sampler (SPT sampler). The split-spoon sampling was conducted in general accordance with ASTM D1586. The 1½-inch-inside diameter, split-spoon samplers were driven into the soil with 140-pound hammer free falling 30 inches. The samplers were driven a total distance of 18 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the boring logs, unless otherwise noted. Sampling methods and intervals are shown on the boring logs.

The hammer used to conduct the SPTs by BoreTec1, Inc. was lifted using a rope and cathead system. The hammer was raised using two wraps of the rope around the cathead to conduct the SPTs.

The average efficiency of the automatic SPT hammer used by Holt Services, Inc. was 88.0 percent. The calibration testing results are presented at the end of this appendix.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the “Exploration Key” (Table A-1) and “Soil Classification System” (Table A-2), which are presented in this appendix. The boring logs indicate the depths at which the soils or their characteristics change, although the change could be gradual. A horizontal line between soil types indicates an observed change. If the change was gradual the change is indicated using a dashed line. Classifications are shown on the boring logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the boring logs if those classifications differed from the field classifications.

GRAIN-SIZE ANALYSIS

We completed grain-size testing on select soil samples in order to determine the distribution of soil particle sizes. The testing was completed in general accordance with ASTM C136 and ASTM C117. The test results are presented in this appendix.

ORGANIC CONTENT

We tested the organic content of select soil samples in general accordance with ASTM D2974. The organic content is a ratio of the weight of the solid particles in soil and combustible organic particles in a test sample and is expressed as a percentage. The test results are presented in this appendix.

MOISTURE CONTENT

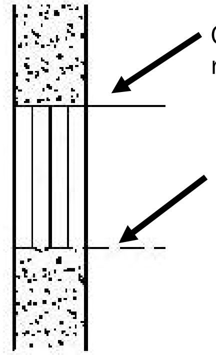
We tested the moisture content of select soil samples in general accordance with ASTM D2216. The moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

FINES CONTENT

We completed fines content testing on select soil samples in order to determine the soil characteristics. The testing was completed in general accordance with ASTM D1140. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
◨	Location of sample collected in general accordance with ASTM D1586 using Standard Penetration Test (SPT) with recovery
◨	Location of sample collected using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D1587 with recovery
▥	Location of sample collected using Dames & Moore sampler and 300-pound hammer or pushed with recovery
▥	Location of sample collected using Dames & Moore sampler and 140-pound hammer or pushed with recovery
◩	Location of sample collected using 3-inch-outside diameter California split-spoon sampler and 140-pound hammer with recovery
⊠	Location of grab sample
▮	Rock coring interval
▽	Water level during drilling
▼	Water level taken on date shown

Graphic Log of Soil and Rock Types



Observed contact between soil or rock units (at depth indicated)

Inferred contact between soil or rock units (at approximate depths indicated)

GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	P	Pushed Sample
CBR	California Bearing Ratio	PP	Pocket Penetrometer
CON	Consolidation	P200	Percent Passing U.S. Standard No. 200 Sieve
DD	Dry Density		
DS	Direct Shear	RES	Resilient Modulus
HYD	Hydrometer Gradation	SIEV	Sieve Gradation
MC	Moisture Content	TOR	Torvane
MD	Moisture-Density Relationship	UC	Unconfined Compressive Strength
NP	Non-Plastic	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

NIV5

EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOIL

Relative Density	Standard Penetration Test (SPT) Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very loose	0 – 4	0 – 11	0 – 4
Loose	4 – 10	11 – 26	4 – 10
Medium dense	10 – 30	26 – 74	10 – 30
Dense	30 – 50	74 – 120	30 – 47
Very dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOIL

Consistency	Standard Penetration Test (SPT) Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 – 4	3 – 6	2 – 5	0.25 – 0.50
Medium stiff	4 – 8	6 – 12	5 – 9	0.50 – 1.0
Stiff	8 – 15	12 – 25	9 – 19	1.0 – 2.0
Very stiff	15 – 30	25 – 65	19 – 31	2.0 – 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVEL WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SAND (<5% fines)	SW or SP	SAND
		SAND WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SAND WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOIL (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOIL			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.					
Percent	Silt and Clay In:		Percent	Sand and Gravel In:	
	Fine-Grained Soil	Coarse-Grained Soil		Fine-Grained Soil	Coarse-Grained Soil
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

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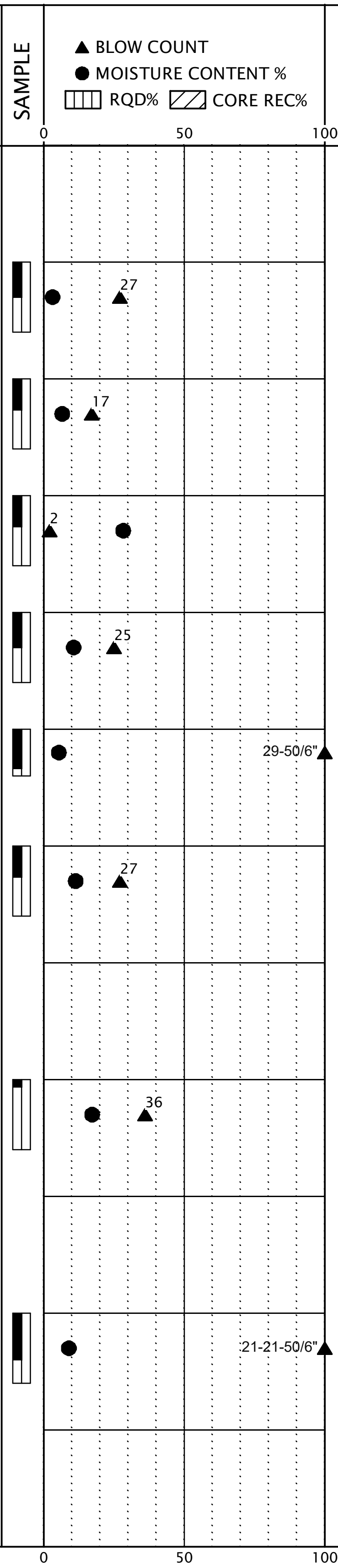
SOIL CLASSIFICATION SYSTEM

TABLE A-2

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION	DEPTH	TESTING	INSTALLATION AND COMMENTS
0.0		27.0			
	ASPHALT CONCRETE (4.0 inches).	26.7	0.3		
	Medium dense, brown, silty SAND (SM), some gravel; moist, sand is fine to medium, gravel is fine to coarse - **FILL**.				
2.5				P200	P200 = 8%
5.0					
	Very loose, gray, silty SAND with organics (SM); moist, sand is fine to medium, organics are fibrous wood pieces/fragments and leaves, organic odor - **FILL**.	20.0	7.0		
7.5					
	Medium dense, brown, silty SAND with gravel (SM); moist, sand is medium to coarse, gravel is fine to coarse - **BEACH DEPOSITS**.	17.5	9.5		
10.0					
12.5	very dense at 12.5 feet				
15.0	Medium dense, gray SAND with gravel (SP); moist, sand is medium to coarse, gravel is fine to coarse - **BEACH DEPOSITS**.	12.0	15.0		▽ 15.0 feet, during drilling
17.5					
20.0	dense at 20.0 feet				
22.5					
	Very dense, gray SAND with silt and gravel (SP-SM); moist, sand is medium to coarse, gravel is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	4.0	23.0		
25.0					
27.5					
30.0					



DRILLED BY: Boretec1

LOGGED BY: E. Larson

COMPLETED: 08/23/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

NV5

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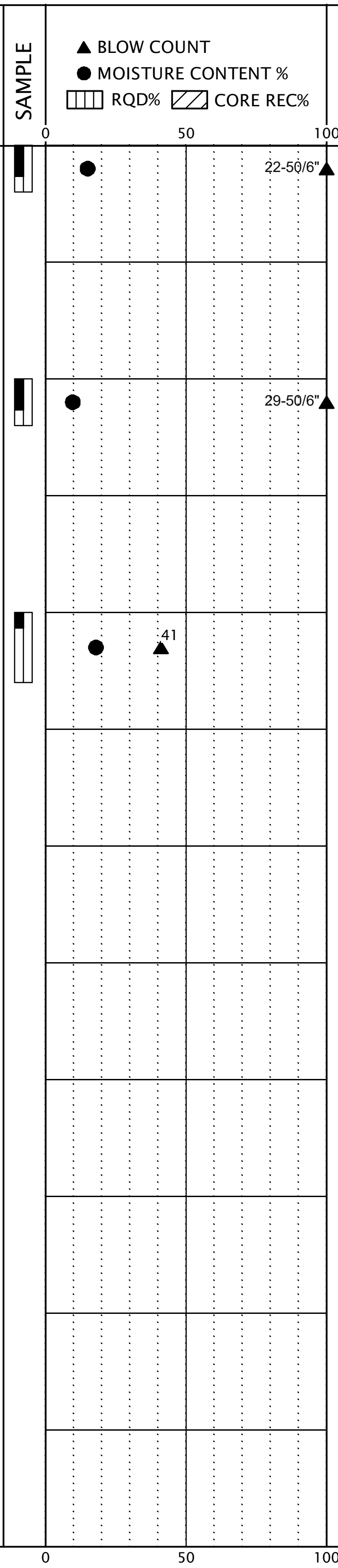
BORING B-1

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-1

DRAFT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	INSTALLATION AND COMMENTS
30.0	(continued from previous page)			
32.5				
35.0	Very dense, brown-gray SAND with silt and gravel (SP-SM); moist, sand is medium to coarse, gravel is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	-8.0 35.0		
37.5				
40.0	dense at 40.0 feet layer of brown SILT (4 inches thick) at 41.0 feet	-14.5 41.5		Heave at 40.0 feet.
42.5	Exploration completed at a depth of 41.5 feet. SPT completed using two wraps with a cathead.			
45.0				
47.5				
50.0				
52.5				
55.0				
57.5				
60.0				



DRILLED BY: Boretec1

LOGGED BY: E. Larson

COMPLETED: 08/23/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

NV5

SEATTLEPS-15-01

MARCH 2022

BORING B-1
(continued)

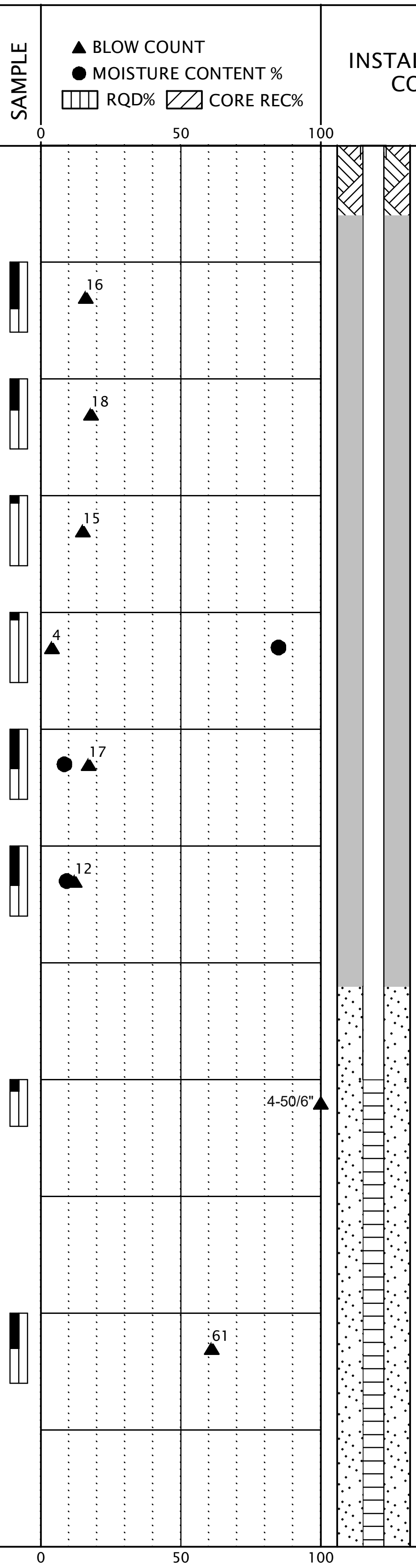
ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-1

DRAFT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH
0.0		27.0
	ASPHALT CONCRETE (1.5 inches).	26.9 / 0.1
	CRUSHED ROCK (1.0 inch).	26.8 / 0.2
	Green PORCELAIN (0.3 inch).	26.8 / 0.2
	CONCRETE SLAB (5.5 inches).	26.3 / 0.7
2.5	Loose, brown, silty SAND with gravel (SM); moist, sand is fine to medium, gravel is fine to coarse - **FILL**.	24.5 / 2.5
5.0	Interbedded lenses to layers of: Very stiff, black SILT with sand (ML); medium dense, brown SAND (SP) and silty SAND (SM); and medium dense, gray GRAVEL with silt and sand (GP-GM); moist, sand is fine to medium, gravel is fine to coarse - **FILL**.	19.0 / 8.0
7.5 / 10.0	Soft, dark brown-black PEAT (PT), trace sand and gravel; moist, peat is fibrous - **PEAT**.	14.5 / 12.5
12.5 / 15.0 / 17.5 / 20.0 / 22.5	Interbedded lenses to layers of: Stiff to very stiff, dark brown PEAT (PT); wet, peat is fibrous; dark brown, sandy SILT to SILT with organics (ML); wet; and very stiff to stiff, dark brown CLAY with organic bits (CL); wet, clay has low plasticity - **WETLAND DEPOSITS**. log at 20.5 feet	4.0 / 23.0
25.0 / 27.5	Very dense, gray SAND (SP), trace organics (fibrous wood pieces); wet, sand is fine to medium - **BEACH DEPOSITS**.	-2.0 / 29.0
30.0	Very dense, gray GRAVEL with sand (GP), trace organics (fibrous wood	

TESTING: OC (10.0–12.5 ft sample); OC (12.5–15.0 ft sample); OC (15.0–17.5 ft sample)



INSTALLATION AND COMMENTS

- Flush-mount monument with 1.5 feet of concrete surface seal
- 2-inch Schedule 80 PVC well casing
- Bentonite chips
- OC = 19.9%
- OC = 0.8%
- OC = 0.8%
- 10/20 filter pack sand
- Wood in tip of sample at 20.0 feet. Drove sampler through log and retrieved core. Undecomposed wood is 4 inches long.
- 2-inch Schedule 80 PVC screen, 0.010-inch slot width
- Heave at 25.0 feet
- Well #BMR 551 set at 30.0 feet

◁ 15.0 feet, during drilling

DRILLED BY: Boretec1

LOGGED BY: E. Larson

COMPLETED: 08/23/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

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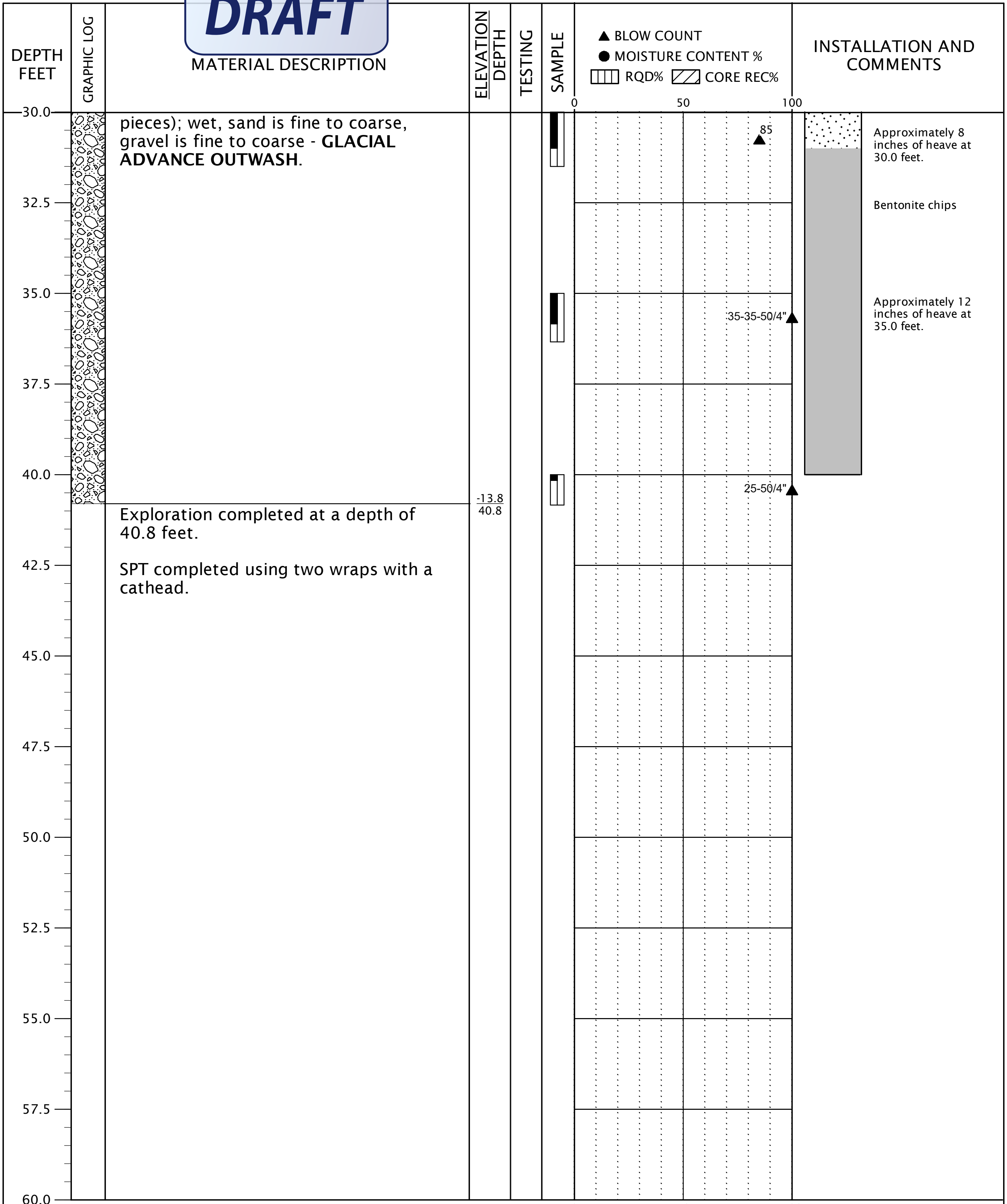
BORING B-2

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-2



pieces); wet, sand is fine to coarse, gravel is fine to coarse - **GLACIAL ADVANCE OUTWASH**.

Exploration completed at a depth of 40.8 feet.

SPT completed using two wraps with a cathead.

Approximately 8 inches of heave at 30.0 feet.

Bentonite chips

Approximately 12 inches of heave at 35.0 feet.

DRILLED BY: Boretec1

LOGGED BY: E. Larson

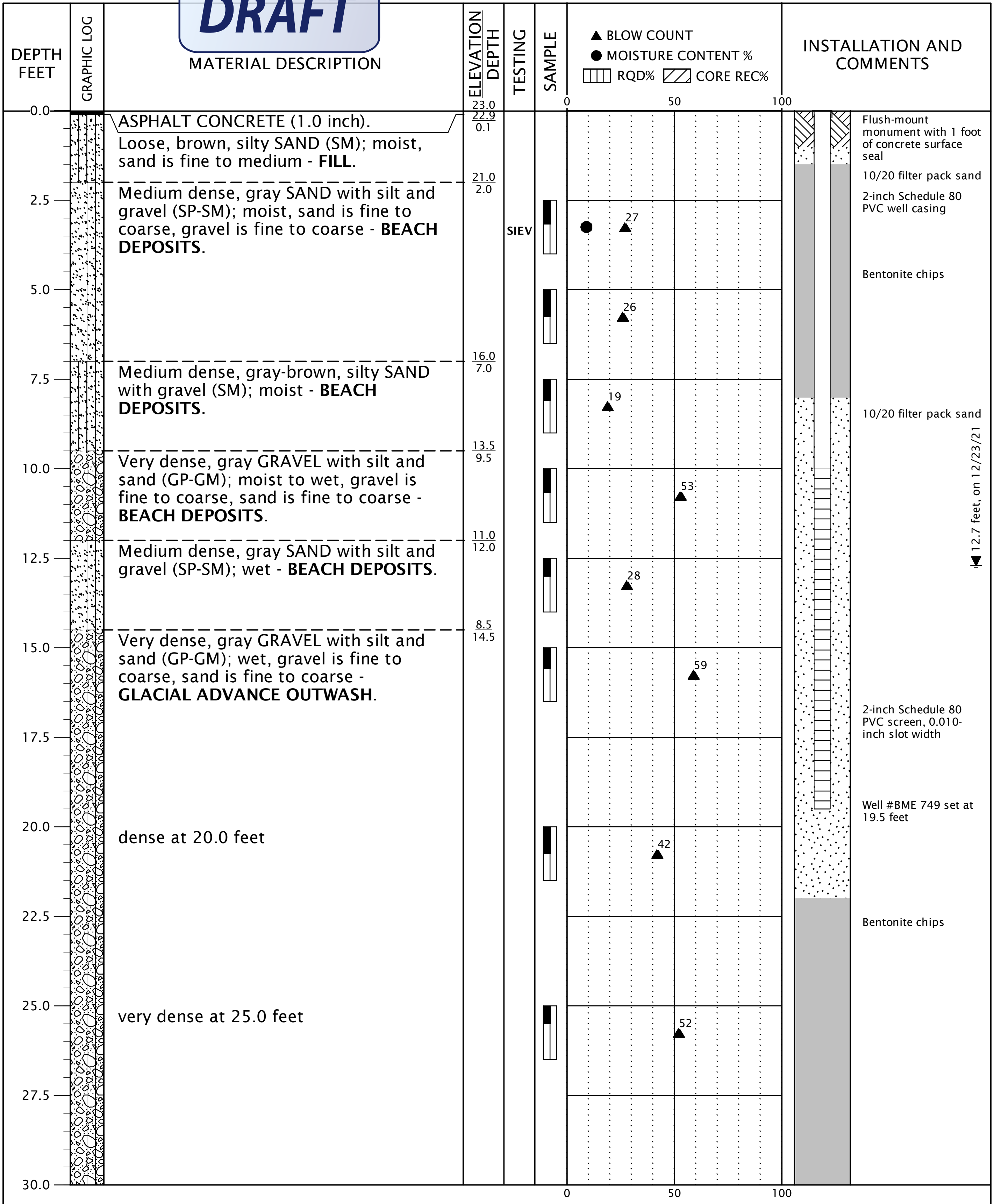
COMPLETED: 08/23/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

NV5	SEATTLEPS-15-01	**BORING B-2** (continued)
	MARCH 2022	ALKI ELEMENTARY MODERNIZATION PROJECT SEATTLE, WA — **FIGURE A-2**

DRAFT



DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH
0.0	ASPHALT CONCRETE (1.0 inch).	23.0 22.9 / 0.1
	Loose, brown, silty SAND (SM); moist, sand is fine to medium - **FILL**.	
2.0	Medium dense, gray SAND with silt and gravel (SP-SM); moist, sand is fine to coarse, gravel is fine to coarse - **BEACH DEPOSITS**.	21.0 / 2.0
7.0	Medium dense, gray-brown, silty SAND with gravel (SM); moist - **BEACH DEPOSITS**.	16.0 / 7.0
9.5	Very dense, gray GRAVEL with silt and sand (GP-GM); moist to wet, gravel is fine to coarse, sand is fine to coarse - **BEACH DEPOSITS**.	13.5 / 9.5
12.0	Medium dense, gray SAND with silt and gravel (SP-SM); wet - **BEACH DEPOSITS**.	11.0 / 12.0
14.5	Very dense, gray GRAVEL with silt and sand (GP-GM); wet, gravel is fine to coarse, sand is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	8.5 / 14.5
20.0	dense at 20.0 feet	
25.0	very dense at 25.0 feet	

TESTING	BLOW COUNT
SIEV	27
	26
	19
	53
	28
	59
	42
	52

INSTALLATION AND COMMENTS

- Flush-mount monument with 1 foot of concrete surface seal
- 10/20 filter pack sand
- 2-inch Schedule 80 PVC well casing
- Bentonite chips
- 10/20 filter pack sand
- 2-inch Schedule 80 PVC screen, 0.010-inch slot width
- Well #BME 749 set at 19.5 feet
- Bentonite chips

DRILLED BY: Holt Services, Inc.
LOGGED BY: E. Larson
COMPLETED: 12/20/21

BORING METHOD: mud rotary (see document text)
BORING BIT DIAMETER: 6 inches

NV5

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BORING B-3

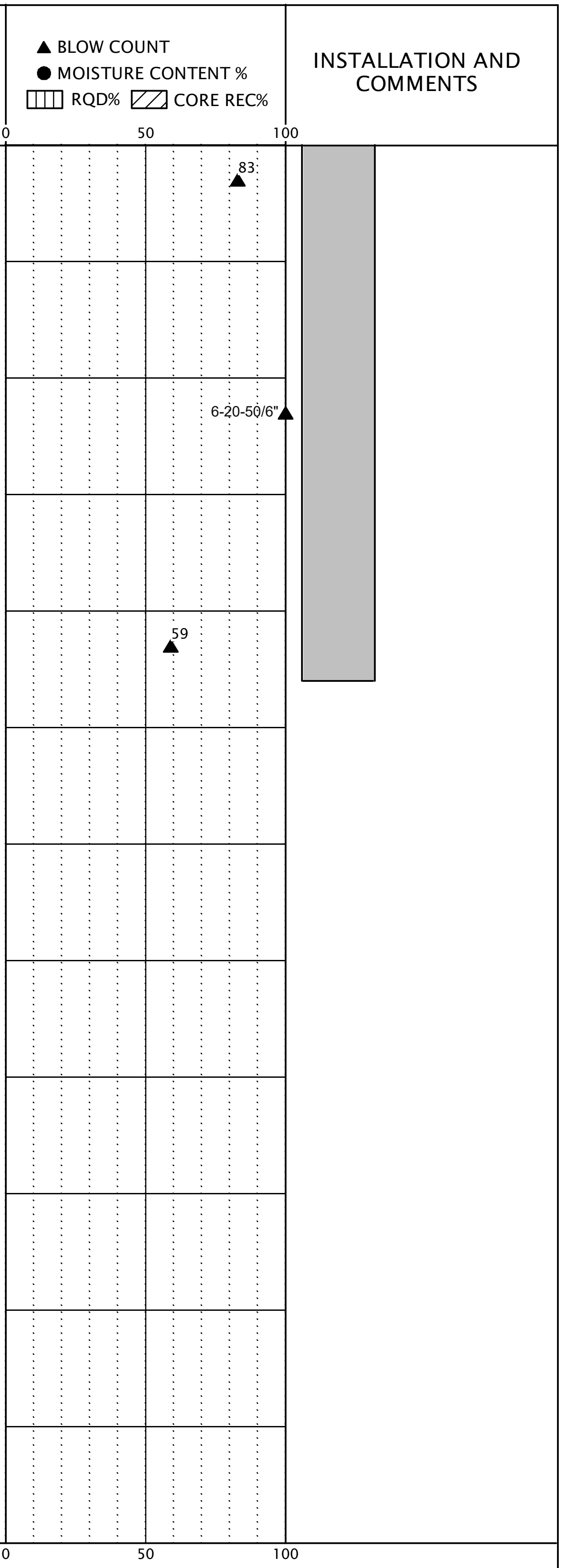
ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-3

BORING LOG - NV5 - 1 PER PAGE SEATTLEPS-15-01-B1_6.GPJ GDI_NV5.GDT PRINT DATE: 3/4/22:KT

DRAFT

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE
30.0	(continued from previous page)			
33.0	Very dense, gray, silty SAND (SM); wet, sand is fine to medium - **GLACIAL ADVANCE OUTWASH**.	-10.0 33.0		
37.0	Very dense, gray SAND with silt and gravel (SP-SM); wet, sand is fine to coarse, gravel is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	-14.0 37.0		
41.5	Exploration completed at a depth of 41.5 feet. Hammer efficiency factor is 88.0 percent.	-18.5 41.5		



DEPTH FEET: 30.0, 32.5, 35.0, 37.5, 40.0, 42.5, 45.0, 47.5, 50.0, 52.5, 55.0, 57.5, 60.0

DRILLED BY: Holt Services, Inc.
LOGGED BY: E. Larson
COMPLETED: 12/20/21

BORING METHOD: mud rotary (see document text)
BORING BIT DIAMETER: 6 inches

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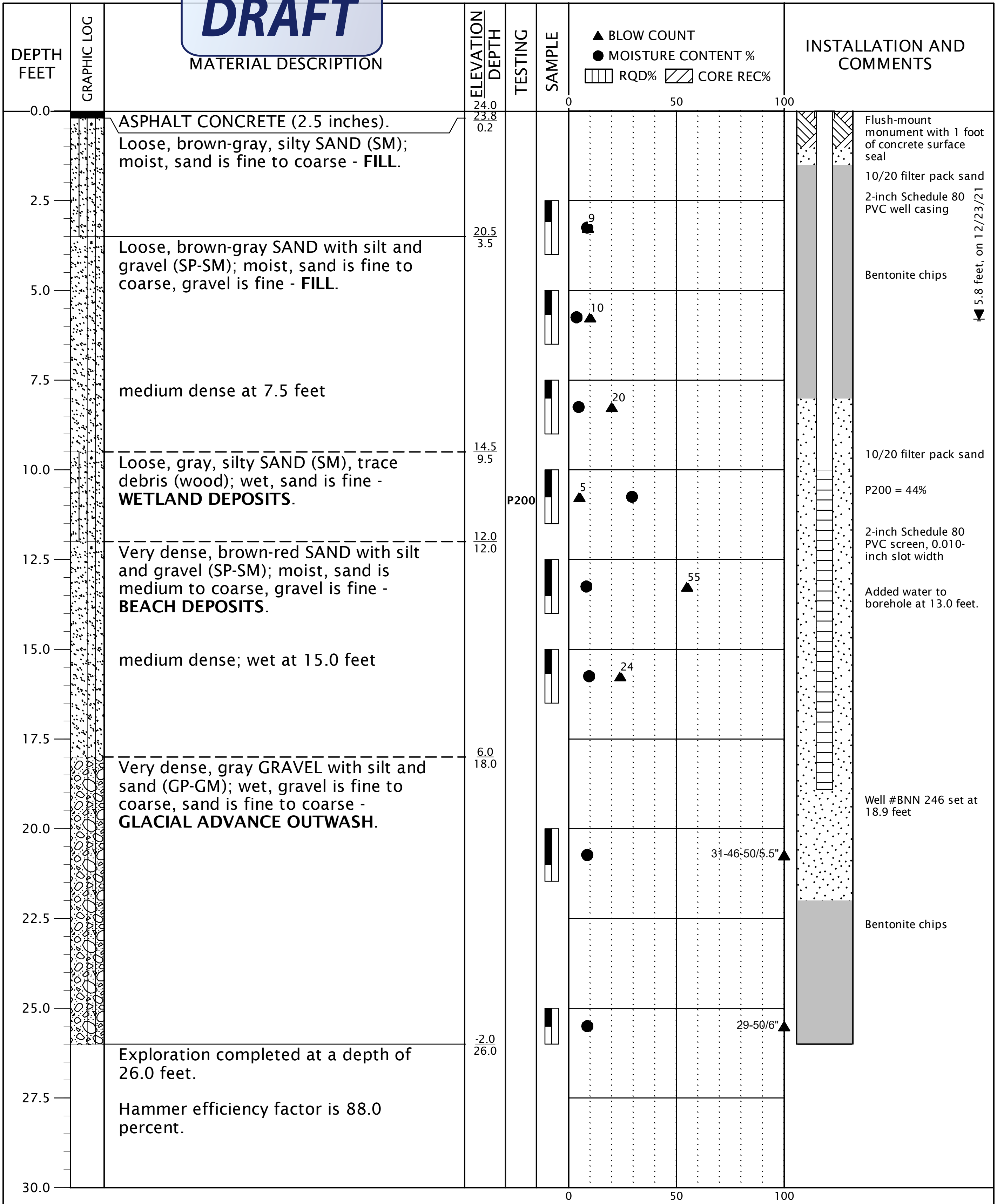
BORING B-3
(continued)

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-3



DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION / DEPTH
0.0	ASPHALT CONCRETE (2.5 inches).	24.0
0.2	Loose, brown-gray, silty SAND (SM); moist, sand is fine to coarse - **FILL**.	23.8 / 0.2
3.5	Loose, brown-gray SAND with silt and gravel (SP-SM); moist, sand is fine to coarse, gravel is fine - **FILL**. medium dense at 7.5 feet	20.5 / 3.5
9.5	Loose, gray, silty SAND (SM), trace debris (wood); wet, sand is fine - **WETLAND DEPOSITS**.	14.5 / 9.5
12.0	Very dense, brown-red SAND with silt and gravel (SP-SM); moist, sand is medium to coarse, gravel is fine - **BEACH DEPOSITS**. medium dense; wet at 15.0 feet	12.0 / 12.0
18.0	Very dense, gray GRAVEL with silt and sand (GP-GM); wet, gravel is fine to coarse, sand is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	6.0 / 18.0
26.0	Exploration completed at a depth of 26.0 feet. Hammer efficiency factor is 88.0 percent.	-2.0 / 26.0

Installation and comments:

Flush-mount monument with 1 foot of concrete surface seal

10/20 filter pack sand

2-inch Schedule 80 PVC well casing

Bentonite chips

10/20 filter pack sand

P200 = 44%

2-inch Schedule 80 PVC screen, 0.010-inch slot width

Added water to borehole at 13.0 feet.

Well #BNN 246 set at 18.9 feet

Bentonite chips

DRILLED BY: Holt Services, Inc.

LOGGED BY: E. Larson

COMPLETED: 12/21/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

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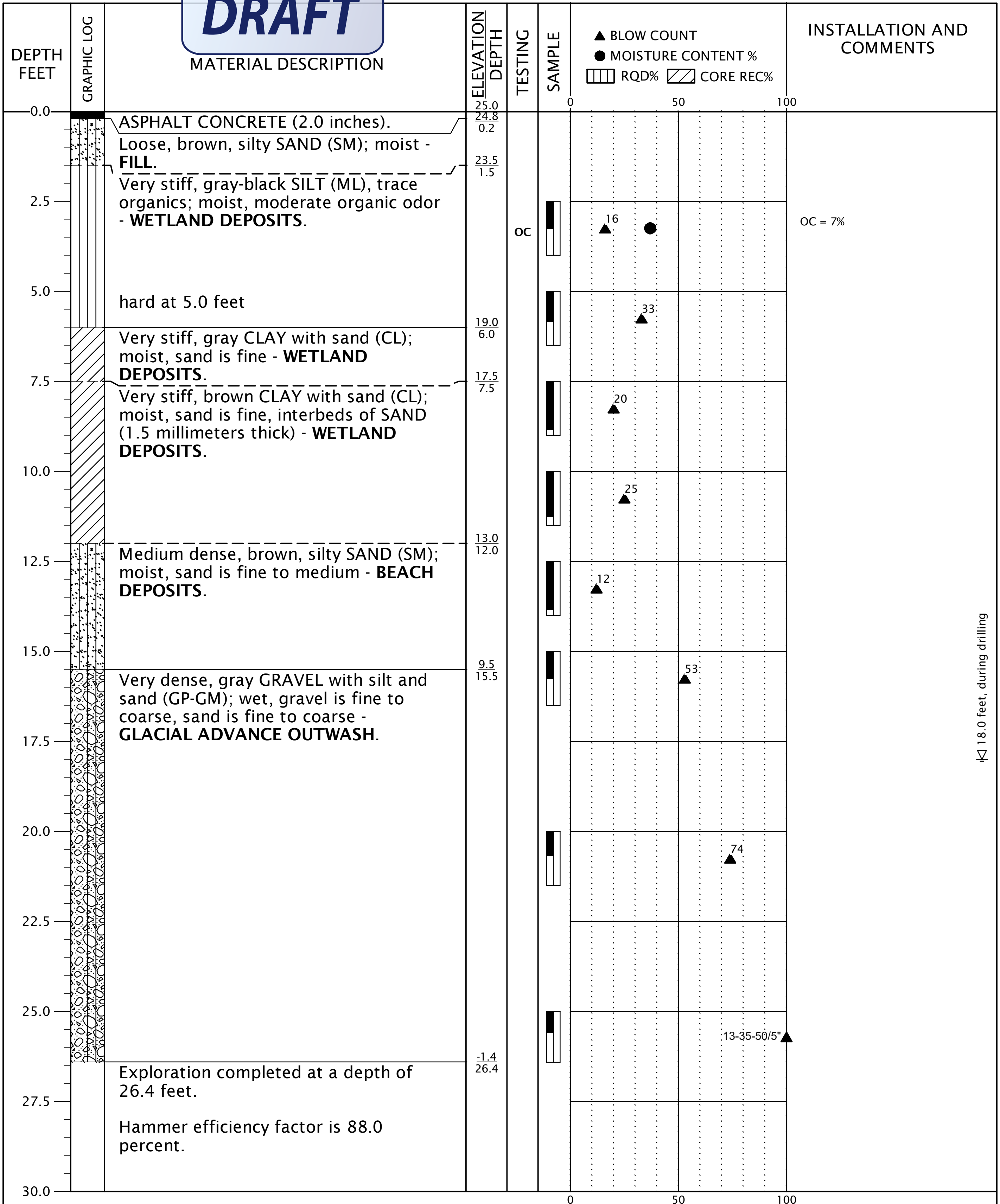
BORING B-4

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-4

DRAFT



MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	BLOW COUNT	INSTALLATION AND COMMENTS
ASPHALT CONCRETE (2.0 inches).	25.0			
Loose, brown, silty SAND (SM); moist - **FILL**.	24.8 0.2			
Very stiff, gray-black SILT (ML), trace organics; moist, moderate organic odor - **WETLAND DEPOSITS**. hard at 5.0 feet	23.5 1.5	OC	16 33	OC = 7%
Very stiff, gray CLAY with sand (CL); moist, sand is fine - **WETLAND DEPOSITS**.	19.0 6.0			
Very stiff, brown CLAY with sand (CL); moist, sand is fine, interbeds of SAND (1.5 millimeters thick) - **WETLAND DEPOSITS**.	17.5 7.5		20 25	
Medium dense, brown, silty SAND (SM); moist, sand is fine to medium - **BEACH DEPOSITS**.	13.0 12.0		12	
Very dense, gray GRAVEL with silt and sand (GP-GM); wet, gravel is fine to coarse, sand is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	9.5 15.5		53 74 13-35-50/5"	⊻ 18.0 feet, during drilling
Exploration completed at a depth of 26.4 feet. Hammer efficiency factor is 88.0 percent.	-1.4 26.4			

DRILLED BY: Holt Services, Inc.

LOGGED BY: E. Larson

COMPLETED: 12/21/21

BORING METHOD: hollow-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

NV5

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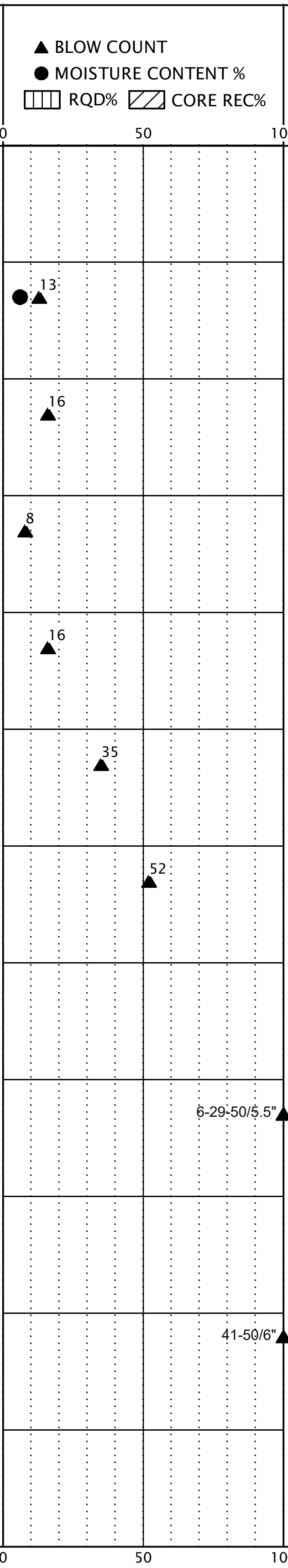
BORING B-5

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-5

DEPTH FEET	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	INSTALLATION AND COMMENTS
0.0	ASPHALT CONCRETE (1.0 inch).	23.0 22.9 0.1		
	Loose, brown, silty SAND (SM); moist, sand is fine to coarse - **FILL**.			
2.5	Medium dense, brown-gray SAND with silt and gravel (SP-SM); moist, sand is fine to coarse, gravel is fine to coarse - **FILL**.	20.5 2.5	SIEV	
5.0				
7.5	Loose, dark gray, silty SAND (SM), trace debris (wood); wet, sand is fine to medium, moderate organic odor - **WETLAND DEPOSITS**.	16.0 7.0		
10.0	Medium dense, brown SAND with silt and gravel (SP-SM); wet, sand is coarse, gravel is fine - **BEACH DEPOSITS**.	12.5 10.5		
12.5	dense at 12.5 feet			⊻ 13.5 feet, during drilling
15.0	very dense at 15.0 feet			
17.5	Very dense, gray, silty GRAVEL with sand (GM); wet, gravel is fine to coarse, sand is fine to coarse - **GLACIAL ADVANCE OUTWASH**.	5.0 18.0		
20.0				
22.5	Very dense, gray SAND with silt and gravel (SP-SM); wet, sand is coarse, gravel is fine - **GLACIAL ADVANCE OUTWASH**.	0.0 23.0		
25.0				
	Exploration completed at a depth of 26.0 feet. Hammer efficiency factor is 88.0 percent.	-3.0 26.0		
27.5				
30.0				



DRILLED BY: Holt Services, Inc.
LOGGED BY: E. Larson
COMPLETED: 12/21/21

BORING METHOD: hollow-stem auger (see document text)
BORING BIT DIAMETER: 6 inches

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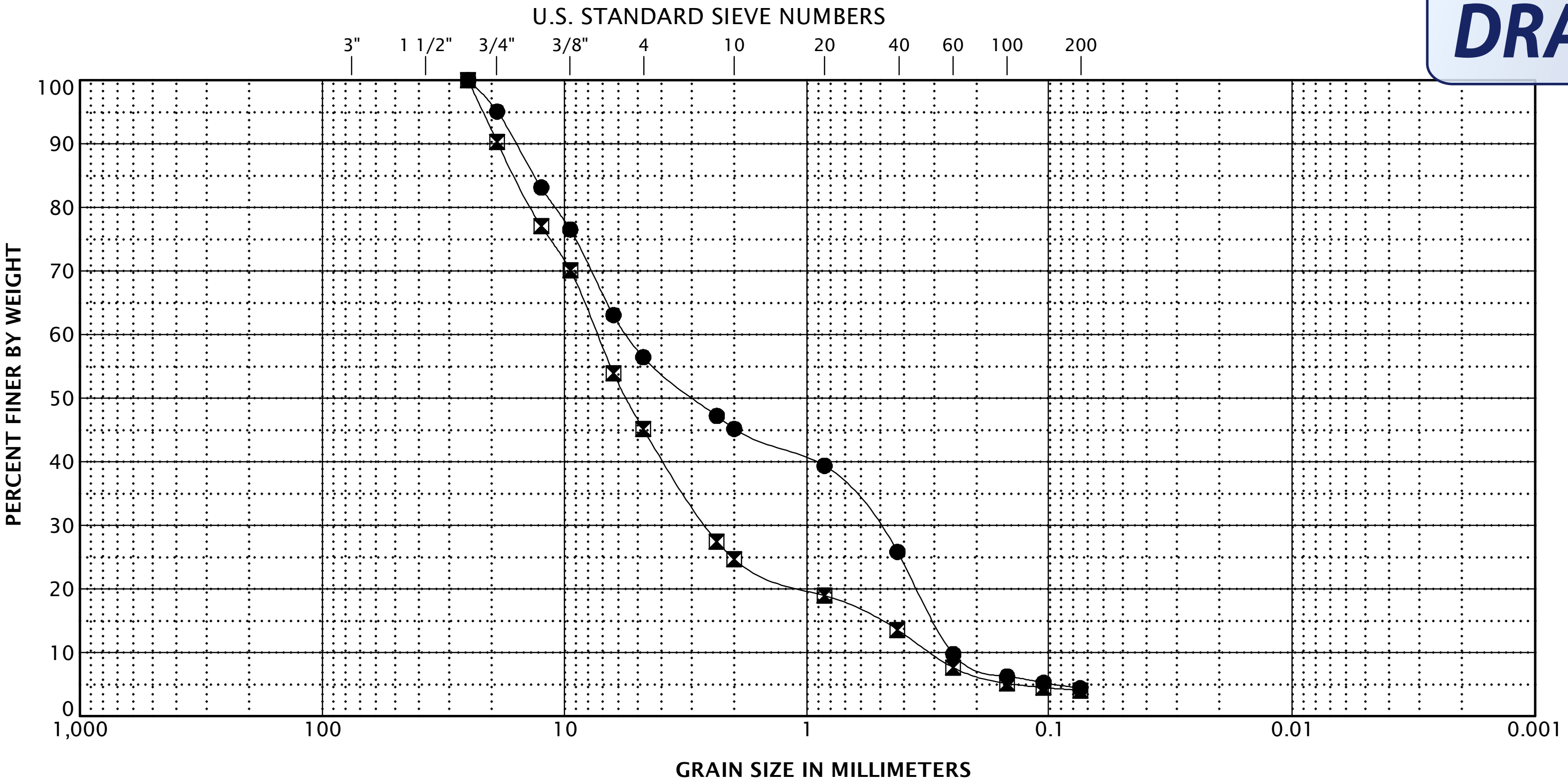
BORING B-6

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-6



BOULDERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	D60	D50	D30	D10	D5	GRAVEL (PERCENT)	SAND (PERCENT)	SILT (PERCENT)	CLAY (PERCENT)
●	B-3	2.5	9	5.53	2.92	0.53	0.25	0.10	44	52	4	
☒	B-6	2.5	6	7.35	5.55	2.61	0.31	0.14	55	41	4	

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GRAIN-SIZE TEST RESULTS

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-7

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.5	24.5	3				8			
B-1	5.0	22.0	7							
B-1	7.5	19.5	28							
B-1	10.0	17.0	11							
B-1	12.5	14.5	5							
B-1	15.0	12.0	11							
B-1	20.0	7.0	17							
B-1	25.0	2.0	9							
B-1	30.0	-3.0	15							
B-1	35.0	-8.0	10							
B-1	40.0	-13.0	18							
B-2	10.0	17.0	85							
B-2	12.5	14.5	8							
B-2	15.0	12.0	9							
B-3	2.5	20.5	9		44	52	4			
B-4	2.5	21.5	9							
B-4	5.0	19.0	4							
B-4	7.5	16.5	5							
B-4	10.0	14.0	29				44			
B-4	12.5	11.5	8							
B-4	15.0	9.0	9							
B-4	20.0	4.0	9							
B-4	25.0	-1.0	9							
B-5	2.5	22.5	37							
B-6	2.5	20.5	6		55	41	4			

NV5

SEATTLEPS-15-01

MARCH 2022

SUMMARY OF LABORATORY DATA

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE A-8

Summary of SPT Test Results

Project: CME 85 RIG, Test Date: 8/16/2019

FMX: Maximum Force
VMX: Maximum Velocity
BPM: Blows/Minute

EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Blows Applied /6"	Start Depth ft	Final Depth ft	**N Value**	**N60 Value**	Average FMX kips	Average VMX ft/s	Average BPM bpm	Average EFV ft-lb	Average ETR %
21.00	**6-8-4**	15.00	16.50	**12**	**17**	44	14.6	55.6	311.6	89.0
31.00	**7-5-6**	25.00	26.50	**11**	**16**	43	15.2	55.0	320.2	91.5
66.00	**9-5-6**	60.00	61.50	**11**	**16**	41	15.5	53.3	312.1	89.2
71.00	**14-10-9**	65.00	66.50	**19**	**27**	43	14.7	50.9	296.7	84.8
					Overall Average Values:	43	14.9	53.3	308.1	88.0
					Standard Deviation:	2	0.5	2.0	12.0	3.4
					Overall Maximum Value:	47	16.2	56.2	330.0	94.3
					Overall Minimum Value:	35	14.0	50.7	282.0	80.6

APPENDIX B

APPENDIX B

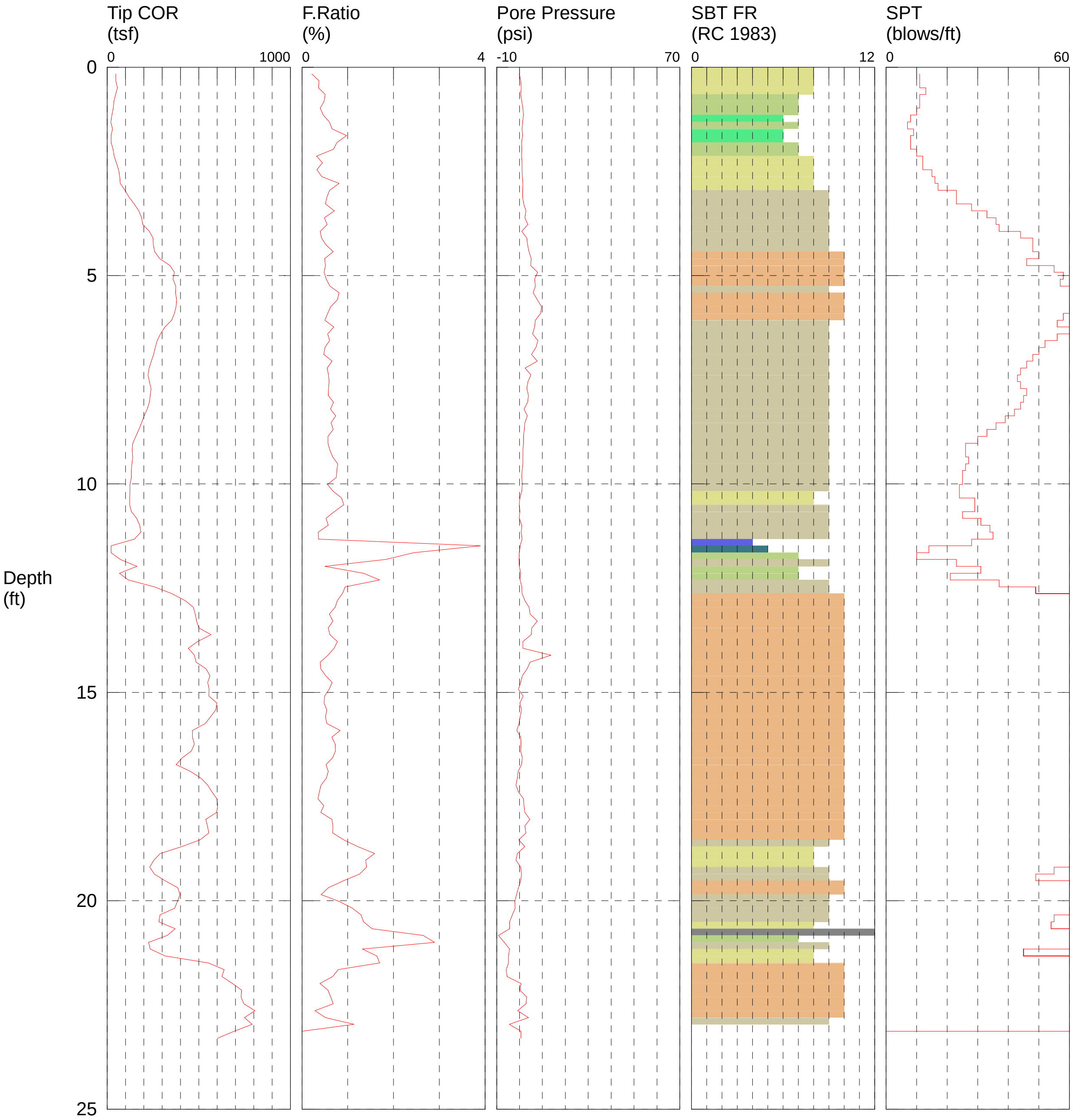
CONE PENETRATION TEST RESULTS

Subsurface conditions at the site were explored by conducting two CPTs (CPT-1 and CPT-2) to depths between 17.6 and 23.3 feet BGS. The CPTs were conducted by In Situ Engineering on December 20, 2021, using a truck-mounted CPT. The CPT logs are presented in this appendix.

CPT-01

CPT CONTRACTOR: In Situ Engineering
CUSTOMER: NV5
LOCATION: West Seattle
JOB NUMBER: SeattlePS-15-01

OPERATOR: Mayfield
CONE ID: DDG1351
TEST DATE: 12/20/2021 9:29:40 AM
PREDRILL: 0 ft
BACKFILL: Bentonite Slurry 20% + Bentonie Chips
SURFACE PATCH: None



TOTAL DEPTH: 23.294 ft

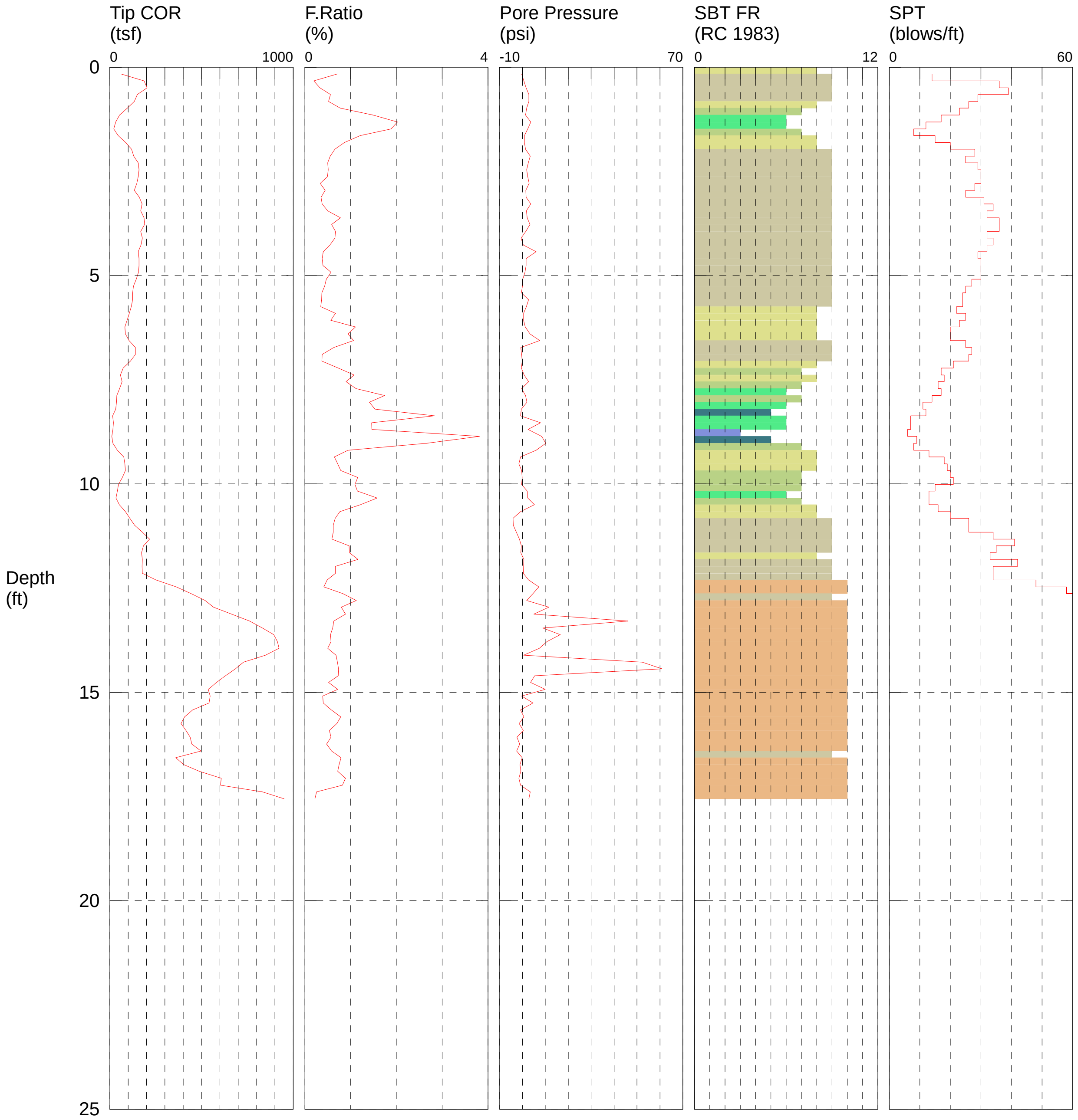
🟥 1 sensitive fine grained
🟥 2 organic material
🟦 3 clay
🟦 4 silty clay to clay
🟦 5 clayey silt to silty clay
🟩 6 sandy silt to clayey silt
🟩 7 silty sand to sandy silt
🟨 8 sand to silty sand
🟫 9 sand
🟧 10 gravelly sand to sand
⬜ 11 very stiff fine grained (*)
⬛ 12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

CPT-02

CPT CONTRACTOR: In Situ Engineering
CUSTOMER: NV5
LOCATION: West Seattle
JOB NUMBER: SeattlePS-15-01

OPERATOR: Mayfield
CONE ID: DDG1351
TEST DATE: 12/20/2021 11:35:03 AM
PREDRILL: 0 ft
BACKFILL: Bentonite Slurry 20% + Bentonie Chips
SURFACE PATCH: None



TOTAL DEPTH: 17.552 ft

■ 1 sensitive fine grained
■ 2 organic material
■ 3 clay
■ 4 silty clay to clay
■ 5 clayey silt to silty clay
■ 6 sandy silt to clayey silt
■ 7 silty sand to sandy silt
■ 8 sand to silty sand
■ 9 sand
■ 10 gravelly sand to sand
■ 11 very stiff fine grained (*)
■ 12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

APPENDIX C

APPENDIX C

ReMi SURVEY

Atlas Technical Consultants performed a ReMi survey of the site. Their report is presented in this appendix.

15115 SW Sequoia Parkway, Suite 130
Portland, Oregon 97224
(503) 836-7022 | oneatlas.com

September 1, 2021

Atlas No. 421024BSWG
Report No. 1

MR. KEVIN LAMB, P.E., L.E.G.
NV5
19201 120TH AVENUE SE, SUITE 201
BOTHELL, WA 98011

Subject: **Geophysical Evaluation**
PS 15-01
Seattle, Washington

Dear Mr. Lamb:

In accordance with your authorization, Atlas Technical Consultants has performed a geophysical evaluation pertaining to the PS 15-01 project located at 3010 59th Ave SW, Seattle, Washington (Figure 1). The purpose of our evaluation was to develop two orthogonal one-dimensional (1-D) shear-wave velocity profiles to be used for design and construction at the project site. This report presents the survey methodology, equipment used, analysis, and findings from our study. Our services were conducted on August 24, 2021.

Our scope of services for the project included the performance of two refraction microtremor (ReMi) profiles (RL-1 and RL-2) along orthogonal alignments at the subject property (Figure 2). The ReMi technique uses recorded surface waves (specifically Rayleigh waves) that are contained in background noise to develop a 1-D shear-wave velocity sounding of the study area down to a depth, in this case, of approximately 100 feet below ground surface (bgs). The depth of exploration is dependent on the length of the line and the frequency content of the background noise. The results of the ReMi method are displayed as a 1-D profile which represents the average condition across the length of the line. The ReMi method does not require an increase of material velocity with depth; therefore, low velocity zones (velocity inversions) are detectable with the ReMi method.

Our ReMi evaluation included the use of a 24-channel Geometrics Geode seismograph and 24, 4.5-Hz vertical component geophones. The geophones were spaced 10 feet apart for a total line length of 230 feet for both profiles. A total of 20 passive and 5 active records, 32 seconds in duration each at each line, were recorded and then downloaded to a field computer. The data were later processed using Surface Plus 9.1 - Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001), and other surface wave analysis methods. The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool where the users determine the best fitting model. The result is a 1-D shear-wave velocity model of the site with roughly 85 to 95 percent accuracy. Figure 3 depicts the general site conditions in the study area.

Table 1, Figure 4a (RL-1) and Table 2, Figure 4b (RL-2) present the results from our evaluation. Based on our analysis of the collected data, the average characteristic site shear-wave velocity down to a depth of 100 feet bgs is 1027 feet per second for RL-1 (Table 1) and 1055 feet per second for RL-2 (Table 2). These values correspond to IBC seismic site class ‘D’ (IBC, 2018). It should be noted the ReMi results represent the average condition across the length of the line.

Table 1 – ReMi Results

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)
RL-1 (N-S)	0-6	578
	6-17	792
	17-23	959
	23-31	1076
	31-53	1100
	53-68	1133
	68-89	1164
	89-100	1299

Table 2 – ReMi Results

Line No.	Depth (feet)	Shear Wave Velocity (feet/second)
RL-2 (W-E)	0-5	670
	5-17	869
	17-23	924
	23-32	978
	32-54	1136
	54-69	1158
	69-88	1192
	88-100	1260

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, express or implied, is made regarding the conclusions and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluating will be performed upon request.

This document is intended to be used only in its entirety. No portions of the document, by itself, is designed to completely represent any aspect of the project described herein. Atlas should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use of or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service on this project. Should you have questions related to this report, please contact the undersigned at your convenience.

Respectfully submitted,
Atlas Technical Consultants, LLC

Andrew Baird

Patrick Lehrmann

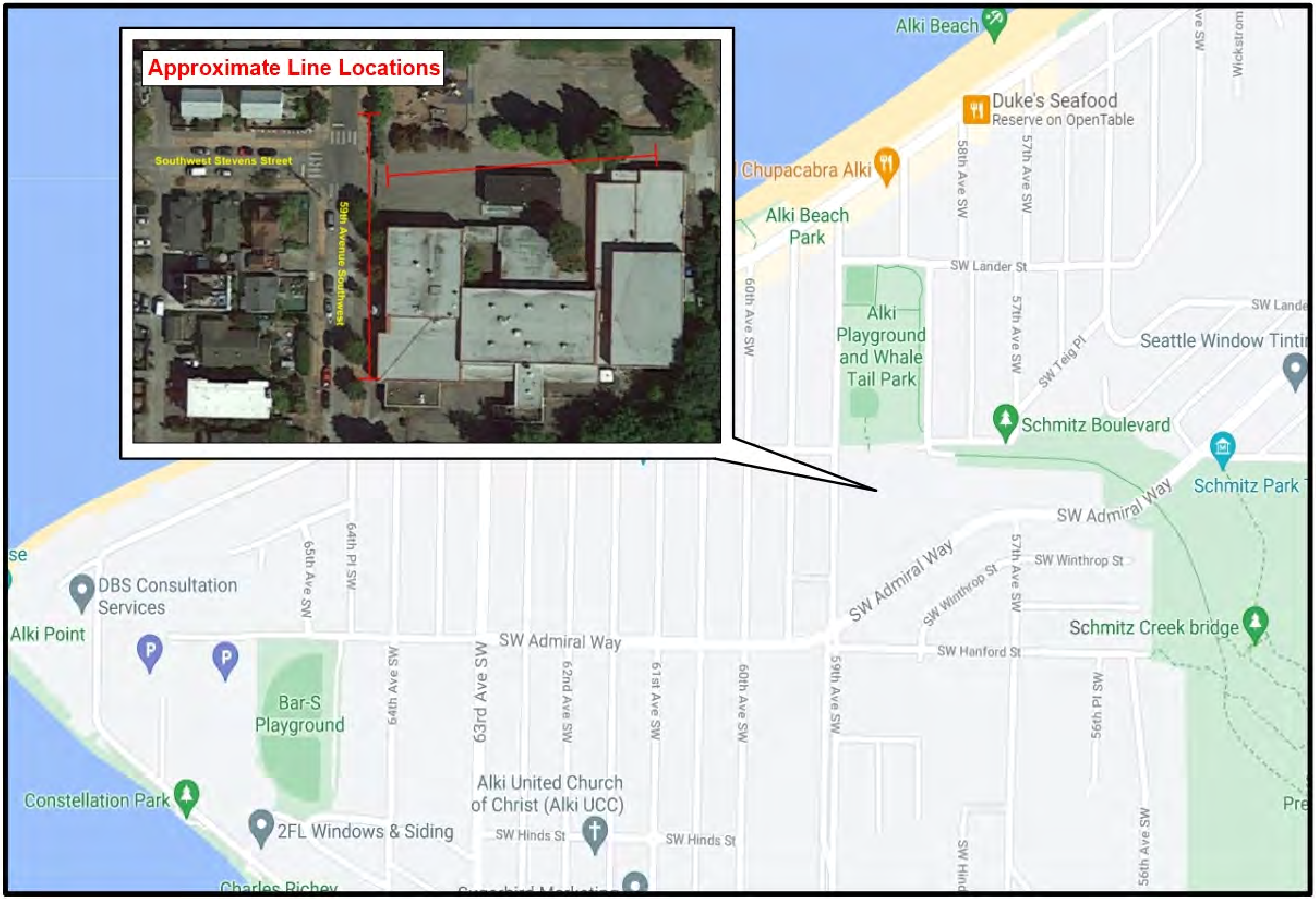
Andrew S. Baird
Project Geophysicist

Patrick F. Lehrmann, P.G. (CA, OR), P.Gp. (CA)
Principal Geologist/Geophysicist

TSW:ASB:PFL:ds

Attachments: Figure 1 – Site Location Map
Figure 2 – Seismic Line Location Map
Figure 3 – Site Photographs
Figure 4a – ReMi Results (RL-1)
Figure 4b – ReMi Results (RL-2)

Distribution: Kevin Lamb at Kevin.Lamb@NV5.com



SITE LOCATION MAP

N

PS 15-01
Seattle, Washington

Project No.: 421024BSWG

Date: 09/21

ATLAS

Figure 1

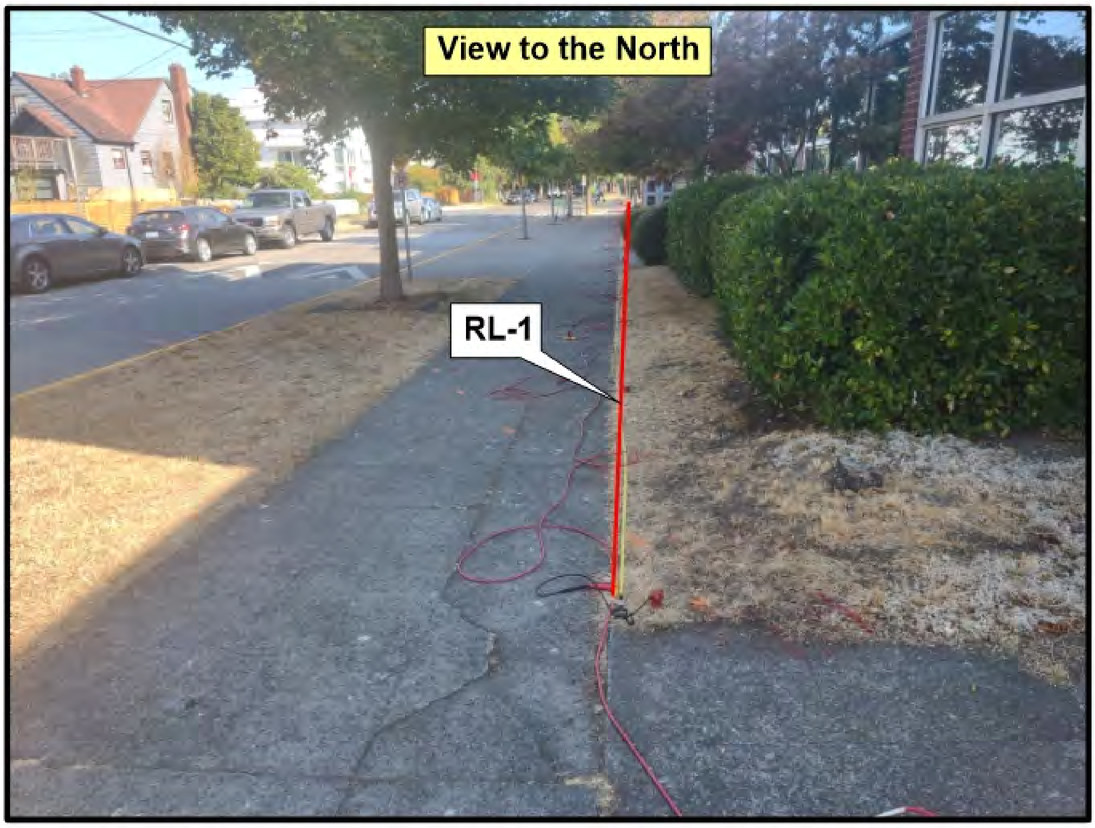
SEISMIC LINE LOCATION MAP

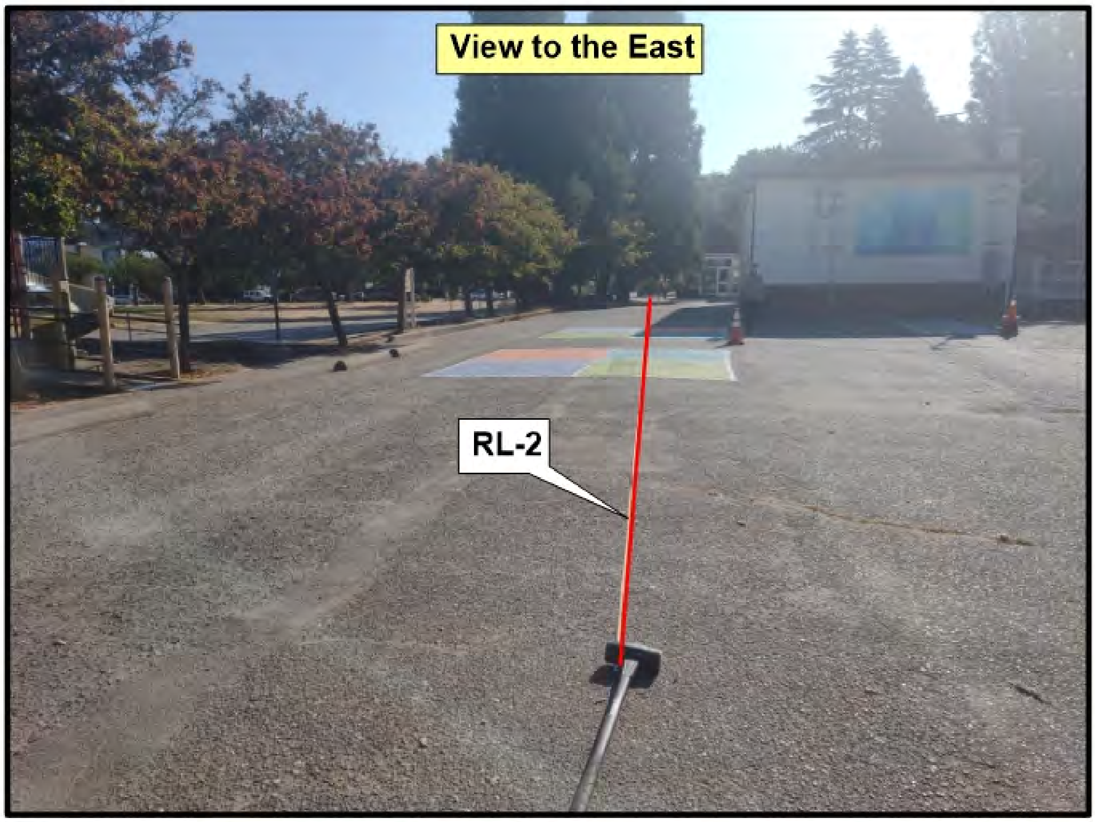
PS 15-01
Seattle, Washington

Project No.: 421024BSWG | Date: 09/21

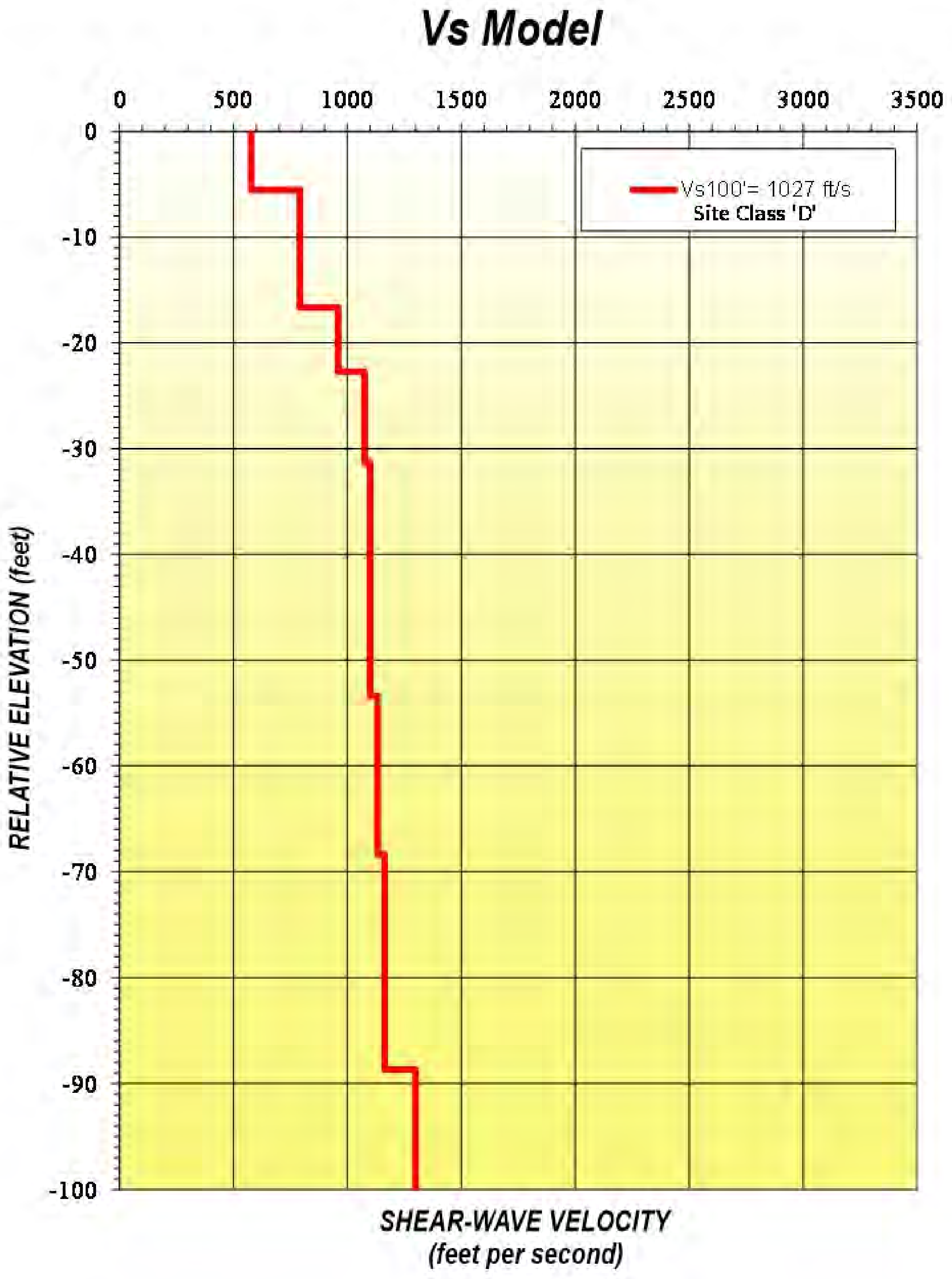
ATLAS

Figure 2





SITE PHOTOGRAPHS	PS 15-01 Seattle, Washington	ATLAS Figure 3
	Project No.: 421024BSWG Date: 09/21	



ReMi RESULTS
RL-1

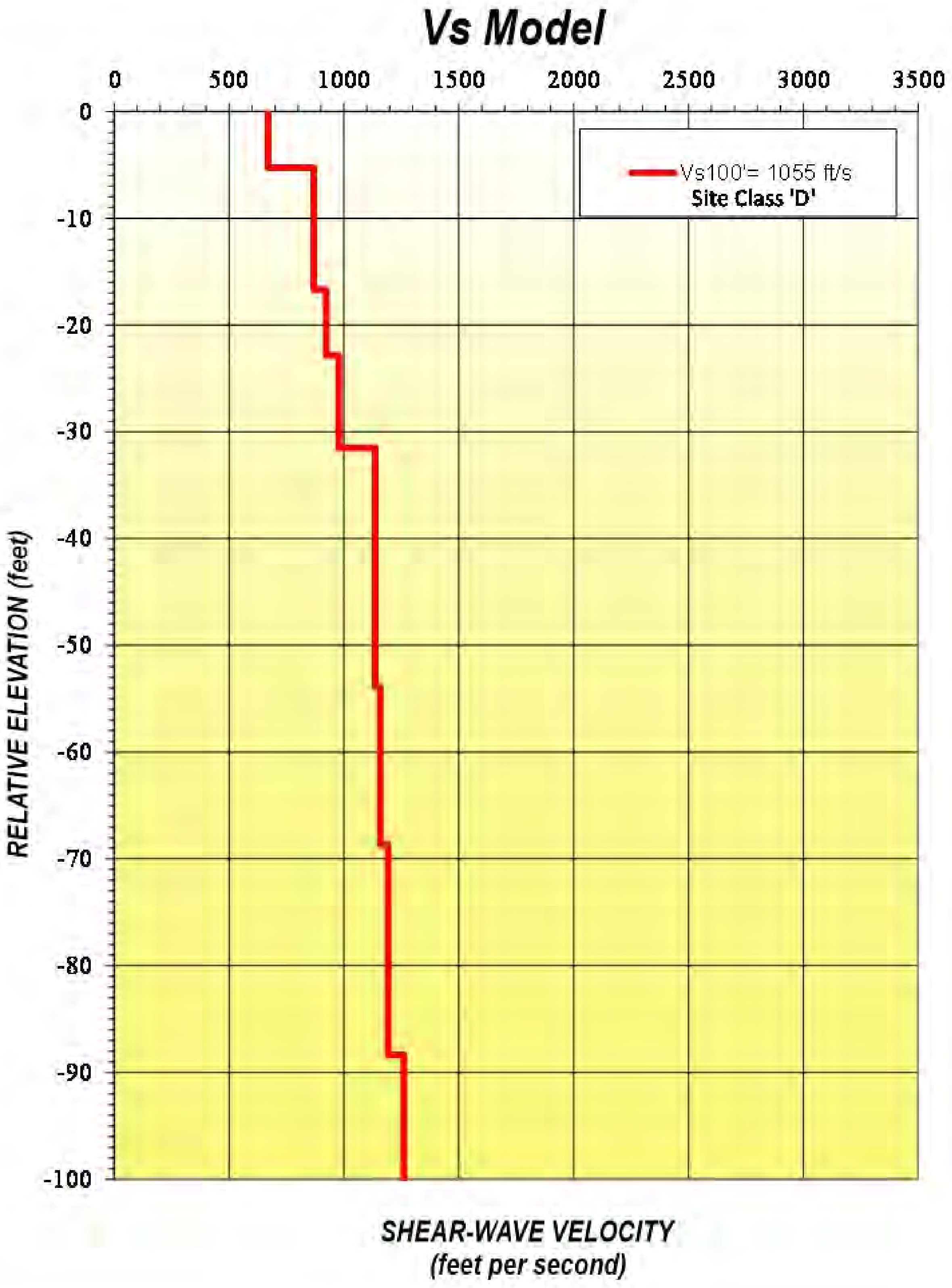
PS 15-01
Seattle, Washington

Project No.: 421024BSWG

Date: 09/21

ATLAS

Figure 4a



ReMi RESULTS
RL-2

PS 15-01
Seattle, Washington

Project No.: 421024BSWG

Date: 09/21

ATLAS

Figure 4b

APPENDIX D

APPENDIX D

SITE-SPECIFIC SEISMIC HAZARD EVALUATION

INTRODUCTION

This appendix summarizes the results of a site-specific seismic hazard evaluation for the new Alki Elementary Modernization Project in Seattle, Washington. This seismic hazard evaluation was performed in accordance with the requirements of ASCE 7-16 and the 2018 IBC. The new school will be up to four stories in height with a footprint of approximately 75,000 square feet. Based on experience with similar structures, we anticipate the maximum fundamental period of the structure will be up to 0.6 second.

SITE CONDITIONS

REGIONAL GEOLOGY AND SUBSURFACE CONDITIONS

The regional geology and subsurface conditions in the area are presented in the main report.

SHEAR WAVE VELOCITY TESTING

Shear wave velocity of the subsurface soil at the site was determined by completing ReMi soundings north and west of the existing school (two total soundings). Vs_{30} values of 1,207 fps (RL-1) and 1,055 fps (RL-2) were computed from the results of testing. Due to the similarity of the Vs_{30} values, an average Vs_{30} of 1,041 fps, which corresponds to a seismic site class of D, was used for project. The results of the shear wave velocity survey are presented in Appendix C.

SEISMIC SETTING

Earthquake Source Zones

Three scenario earthquakes were considered for this study consistent with the local seismic setting. Two of the possible earthquake sources are associated with the CSZ, and the third event is a shallow, local crustal earthquake that could occur in the North American Plate. The three earthquake scenarios are discussed below.

Regional Events

The CSZ is the region where the Juan de Fuca Plate is being subducted beneath the North American Plate. This subduction is occurring in the coastal region between Vancouver Island and northern California. Accumulated evidence suggests that this subduction zone has generated eight great earthquakes in the last 4,000 years, with the most recent event occurring approximately 300 years ago. The fault trace is mapped approximately 100 km west of the site.

Two types of subduction zone earthquakes are possible and considered in this study:

1. An interface event earthquake on the seismogenic part of the interface between the Juan de Fuca Plate and the North American Plate on the CSZ. This source can generate earthquakes with a moment magnitude of 9.0.

2. A deep intraplate earthquake on the seismogenic part of the subducting Juan de Fuca Plate. These events typically occur at depths of between 30 and 60 km. This source can generate an event with a moment magnitude of up to 8.0. An example of a deep intraplate earthquake is the 2001 Nisqually event.

Local Events

A significant earthquake could occur on a local fault near the site within the design life of the school. Such an event would cause ground shaking at the site that could be more intense than the CSZ events, although the duration would be shorter. Figure D-1 shows the locations of faults with potential Quaternary movement within a 40-km radius of the site. Figure D-2 shows the interpreted locations of seismic events that occurred between 1904 and 2020 (USGS, 2022). The most significant faults in site vicinity are the SFZ, Whidbey Island fault zone, and Tacoma fault zone. Table D-1 provides information regarding the faults.

Table D-1. Nearest Mapped Crustal Faults

Source	Closest Mapped Distance[1] (km)	Mapped Length[1] (km)	Age	Description
Seattle fault – north	0.67	69	<15,000 years before present	A 4- to 7-km-wide, east-trending fault zone extending from the Cascade Range to the Kitsap Peninsula. Forms boundary between uplifted Tertiary rock and the Quaternary Strata of the Seattle Basin.
Seattle fault – middle	2.6			
Seattle fault – south	4.3			
Whidbey Island fault zone	21.8	64	<15,000 years before present	A northwest-trending fault zone along the boundary between Eocene marine basalts and pre-Tertiary metamorphic rocks.
Tacoma fault zone	23.4	24	<15,000 years before present	An east-striking fault that forms the northwest boundary of the Tacoma Basin and western boundary of the Seattle uplift.

1. Reported by USGS (2022)

LIQUEFACTION

As described in the main report, liquefaction at the site is expected to be negligible.

DISCUSSION

Based on soil conditions, it is our opinion that the site-specific probabilistic and deterministic procedures in ASCE 7-16 Section 21.2 are appropriate for this site. These procedures use empirical GMPEs with a Vs_{30} value determined from the average foundation level to a depth of

100 feet BGS. Because liquefaction at the site is negligible and strong site effects are not present (based on shear wave velocity testing), it is our opinion that a one-dimensional site response per ASCE 7-16 Section 21.1 of ASCE 7-16 is not necessary.

SITE-SPECIFIC GROUND RESPONSE

SOURCE, SITE, AND ATTENUATION RELATIONSHIPS

Seismic Sources

Seismic sources for analysis were determined using Next Generation Attenuation West 2 (NGA-West2) embedded in the EZ-FRISK 8.07 computer program. As described above, the closest faults to the site are the SFZ and Whidbey Island fault zone. Figure D-2 shows the locations of faults with respect to the site.

Site Parameters

As described in "Shear Wave Velocity Testing" section, the Vs_{30} at the site was taken as the average of the two ReMi measurements at the site (1,041 fps = 317 meters per second). The site parameters of $Z_{1.0}$ and $Z_{2.5}$, which represent the depth at shear wave velocities of 1.0 km/s and 2.5 km/s, Vs were estimated from the Stephenson et al. (2017) velocity model. The $Z_{1.0}$ and $Z_{2.5}$ were 0.5 km and 5.8 km, respectively.

Attenuation Relationships

The attenuation relationships and weighting used in analysis are generally based on the USGS 2018 update (USGS, 2018a). The Atkinson and Macias (2009) model in USGS 2018 is not appropriate for Seismic Site Class D and was not used in analysis. We distributed weighting of Atkinson and Macias (2009) between BC Hydro and Zhao et al. (2006). A higher weighting was placed on BC Hydro because it includes more recent subduction events. Table D-2 shows the weighting used in analysis. In our opinion, the use of the attenuation relationships addresses epistemic uncertainty at the site.

Table D-2. Attenuation Relationships Weights for Seismic Sources

Faulting Type	Ground Motion Prediction Equation	2018 USGS Weight	NV5 Weighting
Shallow Faults and Shallow Crustal Background Seismicity	Abrahamson et al. (2014)	0.25	0.25
	Boore et al. (2014)	0.25	0.25
	Campbell and Bozorgnia (2014)	0.25	0.25
	Chiou and Youngs (2014)	0.25	0.25
Subduction Interface	Zhao et al. (2006)	0.33	0.4
	BC Hydro (Abrahamson et al., 2016)	0.34	0.6
	Atkinson and Macias (2009)	0.33	0
Subduction Interslab	Zhao et al. (2006)	0.5	0.5
	BC Hydro (Abrahamson et al., 2016)	0.5	0.5

PROBABILITY SEISMIC HAZARD ANALYSIS

General

A PSHA was computed to produce a uniform hazard spectrum for the Vs_{30} described above. Analysis was completed using EZ-FRISK 8.07 and the inputs described in the "Source, Site, and Attenuation Relationships" section. The coordinates for the analysis were 47.577330, -122.407543.

The site is classified as a near-fault site per ASCE 7-16. In our opinion, the GMPEs described above include forward rupture directivity, and supplemental forward rupture directivity modeling was not included in our analyses.

Results

Deaggregation Results

Table D-3 shows the contribution to the hazard from the major faults based on deaggregation at 0.6 second (approximate fundamental period of the building).

Table D-3. Contributions to Hazard

Source	Contribution to Hazard at 0.6 Second	Nearest Distance to Site (km)
SFZ	43	0.67
Crustal Gridded Sources	27	Varies
CSZ Interface	18	82
CSZ Intraplate – Deep Gridded Sources	9	Varies
Tacoma Fault	2	24
Whidbey Island Fault Zone	<1	21.8

The hazard is generally controlled by the faults that are closest to the site. Epsilons are generally median to 95th percentile with epsilons between 0 and 2 with an average of 0.95.

Maximum Rotated Component

Because the ground motion models used in the hazard calculation compute the average horizontal component of ground motions, scale factors were applied to adjust results to the MRC as described in ASCE 7-16 (C21.2). According to ASCE 7-16, a scale factor of 1.1 should be used for periods of 0.2 second and shorter, a scale factor of 1.3 should be used for periods of 1.0 second, and a scale factor of 1.5 was used for periods greater than 5.0 seconds (with averaging in between 0.2 and 1.0 second and between 1.0 second and 1.5 seconds).

Risk Coefficient

A second set of scale factors used to adjust the ordinate from a hazard representing 2 percent probability of exceedance to 1 percent probability of collapse in 50 years was also included in the MCE_R. The MCE_R risk coefficients were calculated using method 1 as described in ASCE 7-16 Section 22.2.1.2. A risk coefficient of C_{RS} = 0.900 was applied to the spectrum at periods of

0.2 second or less and a risk coefficient of C_{R1} = 0.891 was applied to the spectrum at periods greater than 1.0 second. Linear interpolation was used to compute risk coefficients between periods of 0.2 and 1.0 second.

Basin Effects

Seismological research has shown that sedimentary basins, including the Seattle Basin, can affect the amplitude and duration of earthquake ground motions. Based on Stephenson et al. (2017) and Figure 7 of USGS (2018b), the site is located within Seattle Basin and a $Z_{2.5}$ of 5.8 km was used for the project.

Basin factors are considered in the four NGA-West 2 GMPEs used in the PSHA. The subduction zone GMPEs do not explicitly include basin factors; however, because they are based on motions that were recorded at some sites with basins, there is inherently some basin effects included in the models. Basin effects are largest at higher periods and are more significant in tall buildings (more than ten stories in height). Recent research shows that basin factors of 1 to 1.3 are appropriate between a periods of 0 and the anticipated fundamental period of the building of 0.6. Based on the anticipated fundamental period of the structure, it is our opinion that the GMPEs described above include appropriate basin factors, and supplemental modeling was not included in our analyses.

PSHA Results

The results of the PSHA MCE_R with appropriate MRC, risk coefficient, and basin effects is shown on Figure D-3.

DETERMINISTIC SEISMIC HAZARD ANALYSIS

General

Per ASCE 7-16 Section 21.2.2, the deterministic MCE_R is the envelope of the 84th percentile spectral ordinates of the DSHA faults considered. A DSHA was completed using the same ground motion models and site parameters described in the PSHA.

Based on the results of analysis, the SFZ controls the deterministic spectrum at all periods. The deterministic MCE_R is shown on Figure D-3. The deterministic MCE_R was modified to represent the MRC using the methodology described previously. The risk coefficient is not included in the deterministic MCE_R.

SITE-SPECIFIC MCE_R AND DESIGN RESPONSE SPECTRA

As outlined in ASCE 7-16 Section 21.2.3, the site-specific MCE_R shall be taken as the lesser of the probabilistic MCE_R and the deterministic MCE_R. As shown on Figure D-3, the probabilistic MCE_R is lower than the deterministic MCE_R at all periods and is the site-specific MCE_R.

In accordance with ASCE 7-16 Section 21.3, the design response spectrum is two-thirds of the MCE_R at all periods; however, the design response spectrum at any period shall not be taken and less than 80 percent of S_a determined in accordance with Section 11.4.6, where F_a and F_v are determined as follows:

1. For Site Classes A, B, and C: F_a and F_v are determined using Tables 11.4-1 and 11.4-2, respectively.
2. For Site Class D: F_a is determined using Table 11.4-1 and F_v is taken as 2.4 for $S_1 < 0.2$ or 2.5 for $S_1 \geq 0.2$
3. For Site Class E: F_a is determined using Table 11.4-1 for $S_S < 1.0$ or taken as 1.0 for $S_S \geq 1.0$ and F_v is taken as 4.2 for $S_1 \leq 0.1$ or 4.0 for $S_1 > 0.1$

The parameter S_{DS} is taken as 90 percent of the maximum spectral acceleration from the site-specific design response spectrum at any period within the range from 0.2 second to 5.0 seconds. The parameter S_{D1} shall be taken as the maximum value of the product, TS_a, for periods from 1.0 second to 2.0 seconds for sites with $Vs_{30} > 1{,}200$ fps and for periods from 1.0 second to 5.0 seconds for sites with $Vs_{30} \leq 1{,}200$ fps. Figure D-4 shows the development of the design response spectrum.

The values of S_{MS} and S_{M1} shall be taken as 1.5 times S_{DS} and S_{D1} but shall not be less than 80 percent of the values determined in accordance with Section 11.4.3 for S_{MS} and S_{M1} and Section 11.4.5 for S_{DS} and S_{D1}. Based on this discussion, the site-specific design parameters are as follows:

- $S_{DS} = 1.065$ g
- $S_{D1} = 0.663$ g
- $S_{MS} = 1.598$ g
- $S_{M1} = 0.995$ g

FAULT SURFACE RUPTURE

No active faults are mapped directly beneath the site. Therefore, it is our opinion that the risk of fault rupture at the site is low.

LIQUEFACTION AND LATERAL SPREADING

Liquefaction and lateral spreading are discussed in the main report.

GROUND MOTION AMPLIFICATION

Soil capable of significantly amplifying ground motions beyond the levels determined by our site-specific seismic response analysis was not encountered during the subsurface explorations. The main report provides a detailed description of the subsurface conditions encountered. We conclude the level of amplification determined by our response analysis is appropriate for the project.

LANDSLIDE

Earthquake-induced landsliding generally occurs in steeper slopes comprised of relatively weak soil deposits. The site is primarily flat with a steep vegetated slope supported with rockeries in the southeast corner, and landslides are unlikely during postulated seismic scenarios.

SETTLEMENT

Settlement due to earthquakes is most prevalent in relatively deep deposits of dry, clean sand. We do not anticipate that significant settlement in addition to liquefaction-induced settlement will occur during design levels of ground shaking.

SUBSIDENCE/UPLIFT

Subduction zone earthquakes can cause vertical tectonic movements. The movements reflect coseismic strain release accumulation associated with interplate coupling in the subduction zone. Based on our review of the literature, the locked zone of the CSZ is in excess of 60 miles from the site. Consequently, we do not anticipate that subsidence or uplift is a significant design concern.

LURCHING

Lurching is a phenomenon generally associated with very high levels of ground shaking, which cause localized failures and distortion of the soil. The anticipated ground accelerations shown are below the threshold required to induce lurching of the site soil.

SEICHE AND TSUNAMI

The site is approximately 950 feet inland from Alki Beach. The susceptibility to seiches and tsunamis is considered low.

REFERENCES

Abrahamson et al., 2013. *Update of the AS08 Ground-Motion Prediction Equations Based on the NGA–West2 Data Set*: PEER 2013/ 2014 – May 2013.

Abrahamson, Norman, Nicholas Gregor, and Kofi Addo, 2016. BC Hydro Ground Motion Prediction Equations for Subduction Earthquakes. Earthquake Spectra: February 2016, Vol. 32, No. 1, pp. 23-44.

ASCE, 2016. Minimum Design Loads for Buildings and Other Structures. ASCE Standard ASCE/SEI 7-016. American Society of Civil Engineers.

Atkinson, G. M. and Macias, M., 2009. Implements the Subduction Interface GMM of Atkinson & Macias (2009) for large interface earthquakes in the Cascadia subduction zone. "Predicted Ground Motions for Great Interface Earthquakes in the Cascadia Subduction Zone," Bulletin of the Seismological Society of America, 99(3), 1552 – 1578.

Boore, D.M., Jonathan P. Stewart, Emel Seyhan, and Gail M. Atkinson, 2013. *NGA-West2 Equations for Predicting Response Spectral Accelerations for Shallow Crustal Earthquakes*: PEER 2013/2014 – May 2013.

Campbell, K. W., and Bozorgnia, Y., 2013. *NGA-West2 Campbell-Bozorgnia Ground Motion Model for the Horizontal Components of PGA, PGV, and 5%-Damped Elastic Pseudo-Acceleration Response Spectra for Periods Ranging from 0.01 to 10 sec*: PEER 2013/ 2014 – May 2013.

Chiou, B. S. J. and Youngs, R. R., 2013. *Update of the Chiou and Youngs NGA Ground Motion Model for Average Horizontal Component of Peak Ground Motion and Response Spectra:* PEER 2013/ 2014 – May 2013.

USGS 2018a. Additional Period and Site Class Maps for the 2014 National Seismic Hazard Model for the Conterminous United Stated States. Allison M. Shumway, Mark D. Petersen, Peter M. Powers, and Sanaz Rezaeian. Open File Report 2017-1111.

USGS, 2018b. Erin A. Wirth, Susan W. Chang, and Arthur D. Frankel. Report on Incorporating Sedimentary Basin Response into the Design of Tall Buildings in Seattle, Washington. Open-File Report 2018-1149.

USGS, 2022, Earthquake Hazards Program, *Unified Hazard Tool*, U.S. Geological Survey.

Zhao J X, Zhang J, Asano A, Ohno Y, Oouchi T, Takahashi T, Ogawa H, Irikura K, Thio H K, Somerville P G, Fukushima Y, Fukushima Y, 2006. Attenuation relations of strong ground motion in Japan using site classification based on predominant period. Bull Seism Soc Am 96: 898-913.

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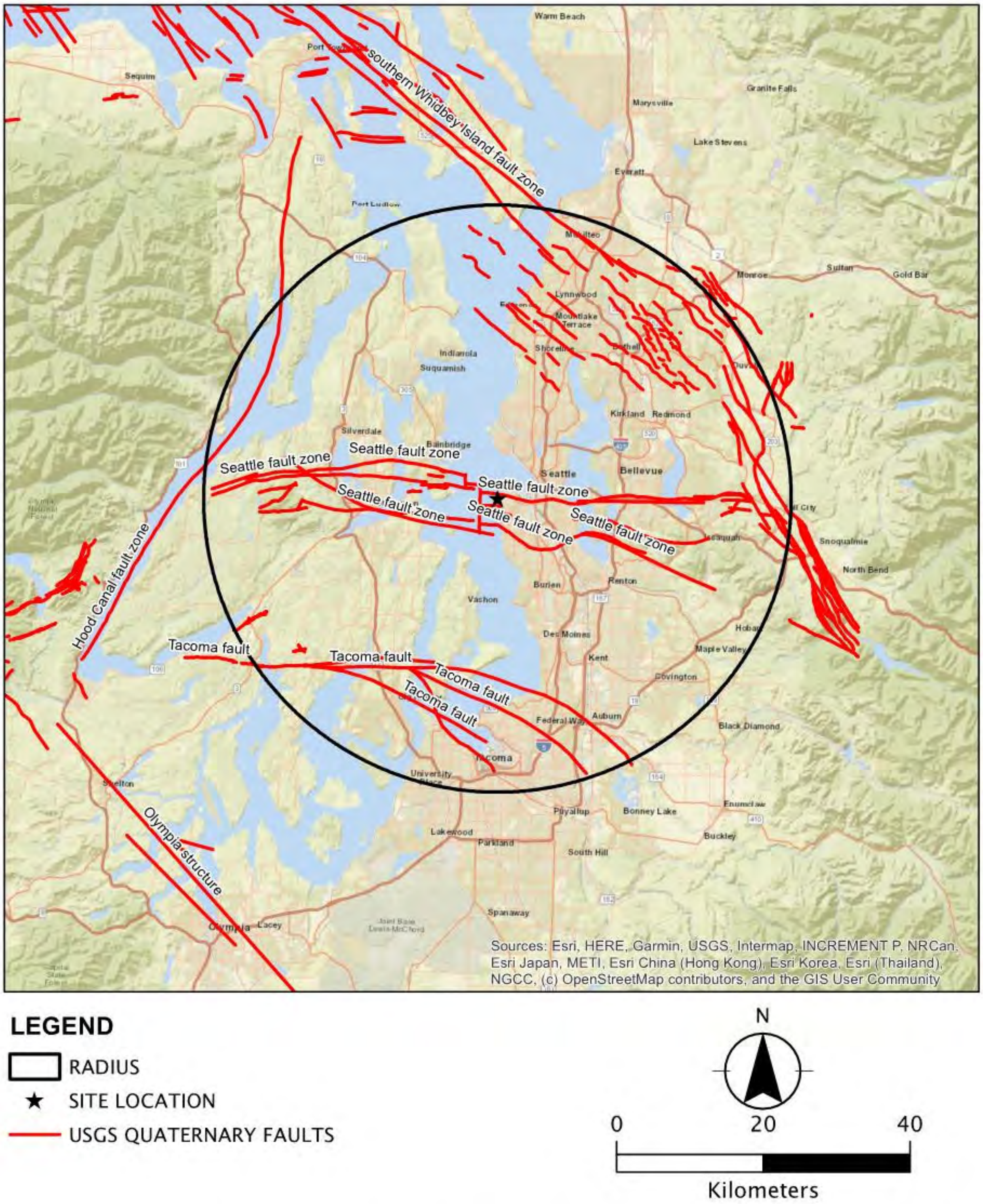
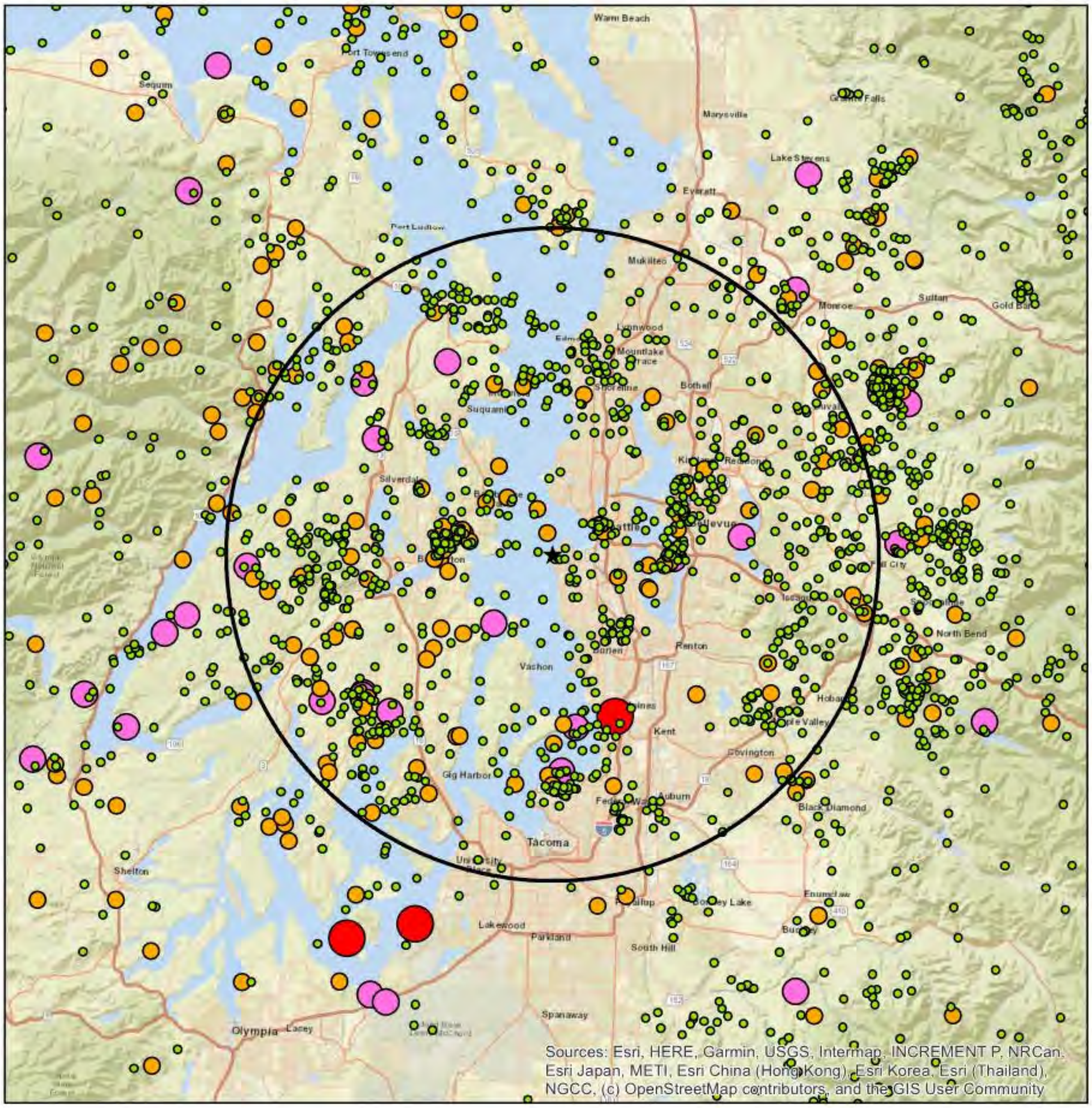


Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

USGS, accessed December 1, 2021, Quaternary Fault and Fold Database of the United States, U.S. Geological Survey, Available: https://www.usgs.gov/natural-hazards/earthquake-hazards/faults

NV5	SEATTLEPS-15-01	**QUATERNARY FAULT MAP**	
	MARCH 2022	ALKI ELEMENTARY MODERNIZATION PROJECT SEATTLE, WA	**FIGURE D-1**

DRAFT



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

LEGEND

▭ RADIUS

★ SITE LOCATION

INSTRUMENTAL EARTHQUAKE MAGNITUDE

- ● 2.0 - 3.0
- ● 3.0 - 4.0
- ● 4.0 - 6.0
- ● > 6.0

N

0 20 40

Kilometers

USGS, accessed March 14, 2022, Earthquake Hazards Program, US Earthquake Information by State, U.S. Geological Survey, Available: https://www.usgs.gov/natural-hazards/earthquake-hazards/earthquakes

Earthquakes in figure are from 1904-2022.

NV5	SEATTLEPS-15-01	**HISTORICAL SEISMICITY MAP**	
	MARCH 2022	ALKI ELEMENTARY MODERNIZATION PROJECT SEATTLE, WA	**FIGURE D-2**

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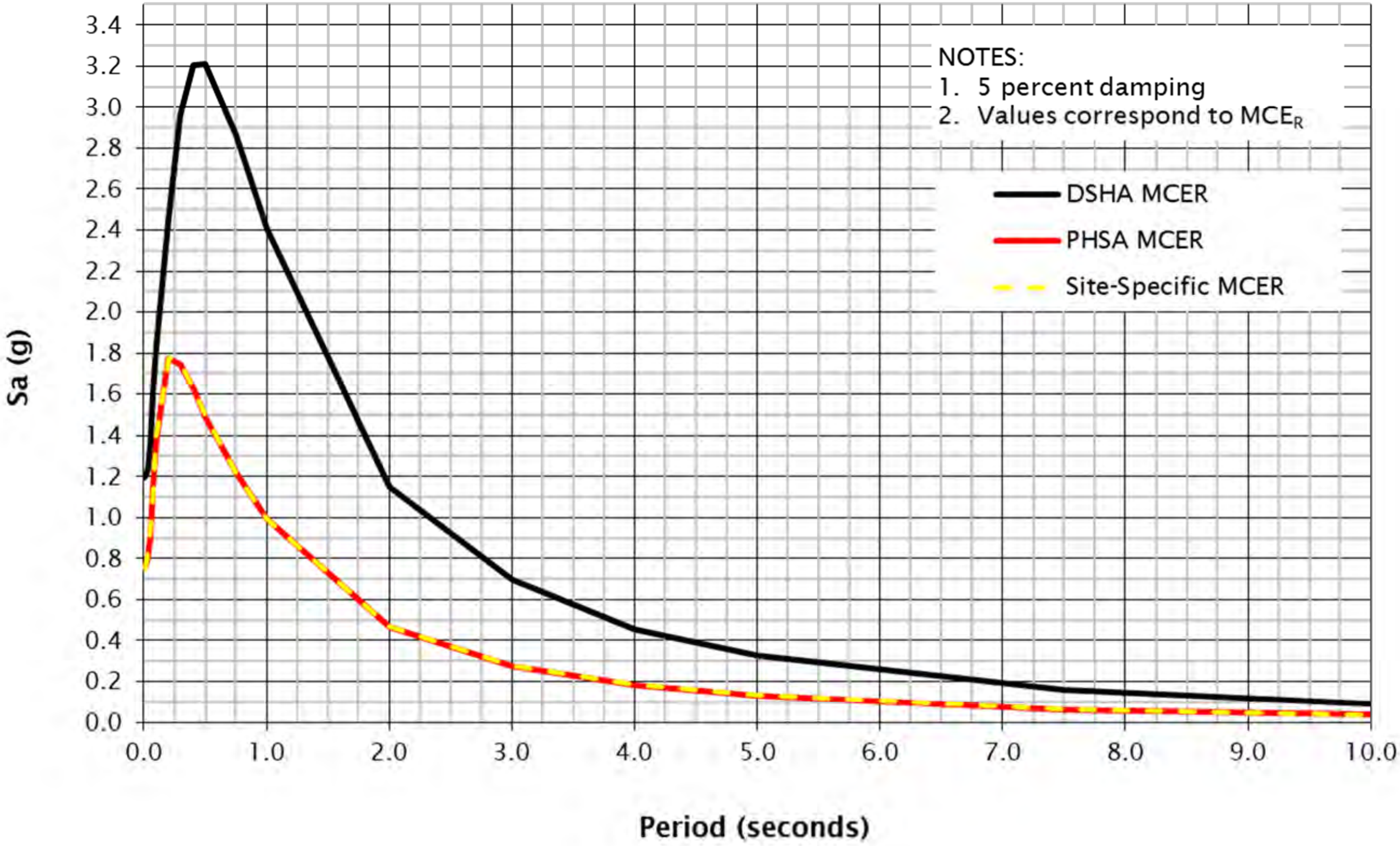
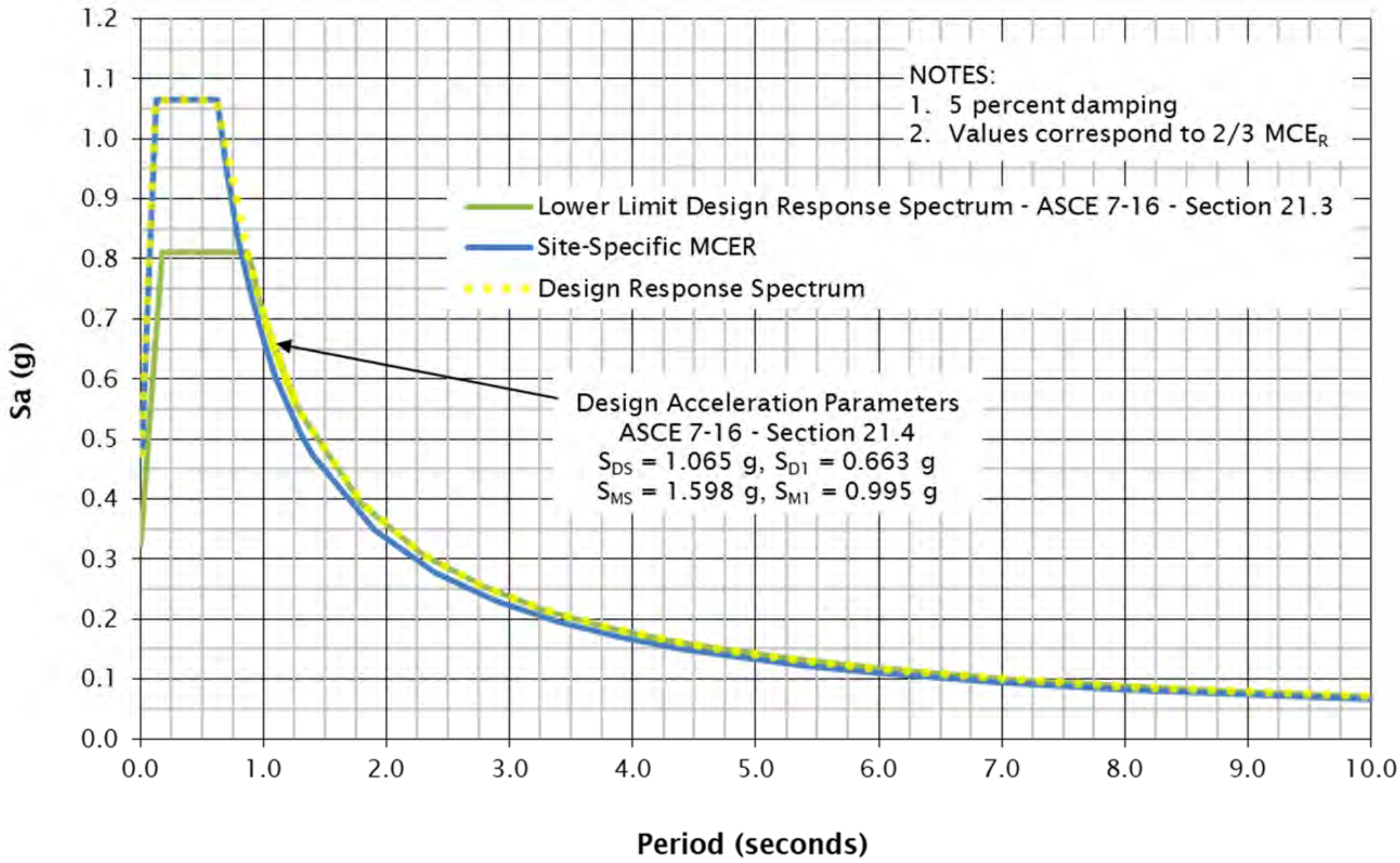


NV5	SEATTLEPS-15-01	**SITE-SPECIFIC MCE$_R$**	
	MARCH 2022	ALKI ELEMENTARY MODERNIZATION PROJECT SEATTLE, WA	**FIGURE D-3**

DRAFT



N|V|5

SEATTLEPS-15-01

MARCH 2022

DESIGN RESPONSE SPECTRUM

ALKI ELEMENTARY MODERNIZATION PROJECT
SEATTLE, WA

FIGURE D-4

Appendix B

CONSTRUCTION BEST MANAGEMENT PRACTICES

APPENDIX B

CONSTRUCTION BEST MANAGEMENT PRACTICES

The contractor will be required to implement measures to ensure the minimal environmental impacts throughout the construction process, which could include the following:

- The contractor will submit a written earthwork plan to the Project Engineer for approval prior to the commencing with any mass excavation or filling. The earthwork plan will also include:
    - Sequencing of the earthwork and grading activities;
    - Proposed equipment to be utilized;
    - Surface water diversion and control (description of how existing catch basins at the project site would remain intact and measures used to protect them from sediment during construction);
    - Proposed protection methods for excavated stockpiled fill materials and trenches;
    - Soil drying procedures; and,
    - Any other information pertinent to the manner in which the earthwork and grading will be performed.
- The contractor will obtain the City of Seattle's Department of Construction and Inspection approval that erosion control measures are in place and functioning, and will maintain erosion control measures as earthwork and utility construction commences in accordance with City of Seattle Standards.
- Surface water controls (i.e., temporary interceptor swales, check dams, silt fences, etc.) will be constructed simultaneously with clearing and grading for project development.
- Surface water and erosion control measures will be relocated or new measures will be installed so as site conditions change, erosion control measures remain in accordance with City of Seattle Best Management Practice (BMP) requirements during the construction period.
- All construction areas inactive for more than seven days during the dry season (April 1st to October 31st) or two days during the wet season (November 1st to March 31st) will be covered.
- Mitigation measures to reduce and/or control impacts to air will include:
    - Watering surfaces to control dust, the use of temporary ground covers, sprinkling the project site with approved dust palliatives, or use of temporary stabilizations practices upon the completion of grading.
    - Wheel-cleaning stations will be provided to ensure construction vehicle wheels and undercarriages do not carry excess dirt from the site onto adjacent roadways.

  - Streets will be regularly cleaned to ensure excess dust and debris is not transported from the construction site onto adjacent roads.
  - Construction activities will be planned to minimize exposing areas of earth for extended periods.
  - The contractor will be required to comply with the Puget Sound Clean Air Agency's (PSCAA) Regulation I, Section 9.15, requiring reasonable precautions to avoid dust emissions and Regulation I, Section 9.11, requiring the best available measures to control emissions of odor-bearing contaminants. The contractor will be required to comply with recommendations in the Washington Associated General Contractor brochure "Guide to Handling Fugitive Dust from Construction Projects."

- During construction, BMPs would be implemented to ensure that sediment originating from disturbed soils would be retained within the limits of disturbance. BMP measures may include installation of filter fabric between grate and rings of all catch basin inlets, fabric fencing, barriers, check dams, etc.

- Construction activities will be restricted to hours designated by the City of Seattle Noise Control Ordinance (SMC 25.08.425). If construction activities exceed permitted noise levels, the District would instruct the contractor to implement measures to reduce noise impacts to comply with the Noise Ordinance, which may include additional muffling of equipment.

- Construction vehicle traffic to and from the site will be minimized during peak traffic hours.

- Construction vehicles will not be parked in traffic lanes.

- Flaggers will be provided as required.

- Barriers, flashing lights, walkways, guardrails, and night lighting will be provided as required for safety and control.

- Fire lanes and roadways to existing buildings will be retained, as required by the fire department.

- Walkways leading past the site will remain clear of construction vehicles and debris and will remain safe at all times.

Appendix C

GREENHOUSE GAS EMISSIONS WORKSHEET

City of Seattle Department of Planning and Development
SEPA GHG Emissions Worksheet
Version 1.7 12/26/07

Introduction

The Washington State Environmental Policy Act (SEPA) requires environmental review of development proposals that may have a significant adverse impact on the environment. If a proposed development is subject to SEPA, the project proponent is required to complete the SEPA Checklist. The Checklist includes questions relating to the development's air emissions. The emissions that have traditionally been considered cover smoke, dust, and industrial and automobile emissions. With our understanding of the climate change impacts of GHG emissions, the City of Seattle requires the applicant to also estimate these emissions.

Emissions created by Development

GHG emissions associated with development come from multiple sources:

- The extraction, processing, transportation, construction and disposal of materials and landscape disturbance (Embodied Emissions)
- Energy demands created by the development after it is completed (Energy Emissions)
- Transportation demands created by the development after it is completed (Transportation Emissions)

GHG Emissions Worksheet

This GHG Emissions Worksheet has been developed to assist applicants in answering the SEPA Checklist question relating to GHG emissions. The worksheet was originally developed by King County, but the City of Seattle and King County are working together on future updates to maintain consistency of methodologies across jurisdictions.

The SEPA GHG Emissions worksheet estimates all GHG emissions that will be created over the life span of a project. This includes emissions associated with obtaining construction materials, fuel used during construction, energy consumed during a buildings operation, and transportation by building occupants.

Using the Worksheet

1. Descriptions of the different residential and commercial building types can be found on the second tabbed worksheet ("Definition of Building Types"). If a development proposal consists of multiple projects, e.g. both single family and multi-family residential structures or a commercial development that consists of more than on type of commercial activity, the appropriate information should be estimated for each type of building or activity.

2. For paving, estimate the total amount of paving (in thousands of square feet) of the project.

3. The Worksheet will calculate the amount of GHG emissions associated with the project and display the amount in the "Total Emissions" column on the worksheet. The applicant should use this information when completing the SEPA checklist.

4. The last three worksheets in the Excel file provide the background information that is used to calculate the total GHG emissions.

5. The methodology of creating the estimates is transparent; if there is reason to believe that a better estimate can be obtained by changing specific values, this can and should be done. Changes to the values should be documented with an explanation of why and the sources relied upon.

6. Print out the “Total Emissions” worksheet and attach it to the SEPA checklist. If the applicant has made changes to the calculations or the values, the documentation supporting those changes should also be attached to the SEPA checklist.

Alki Elementary School Addition and Renovation Project

Section I: Buildings

			Emissions Per Unit or Per Thousand Square Feet (MTCO2e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	**Lifespan Emissions (MTCO2e)**
Single-Family Home.............................	0		98	672	792	**0**
Multi-Family Unit in Large Building	0		33	357	766	**0**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home.......................................	0		41	475	709	**0**
Education		75.0	39	646	361	**78411**
Food Sales		0.0	39	1,541	282	**0**
Food Service		0.0	39	1,994	561	**0**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall).......................		0.0	39	577	247	**0**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement..........................

Pavement..		0.00				**0**

Total Project Emissions: **78411**

Version 1.7 12/26/07

Definition of Building Types

Type (Residential) or Principal Activity (Commercial)	**Description**
Single-Family Home....................................	Unless otherwise specified, this includes both attached and detached buildings
Multi-Family Unit in Large Building	Apartments in buildings with more than 5 units
Multi-Family Unit in Small Building	Apartments in building with 2-4 units
Mobile Home...	
Education	Buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."
Food Sales	Buildings used for retail or wholesale of food.
Food Service	Buildings used for preparation and sale of food and beverages for consumption.
Health Care Inpatient	Buildings used as diagnostic and treatment facilities for inpatient care.
Health Care Outpatient	Buildings used as diagnostic and treatment facilities for outpatient care. Doctor's or dentist's office are included here if they use any type of diagnostic medical equipment (if they do not, they are categorized as an office building).
Lodging	Buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.
Retail (Other Than Mall).............................	Buildings used for the sale and display of goods other than food.
Office	Buildings used for general office space, professional office, or administrative offices. Doctor's or dentist's office are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).
Public Assembly	Buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.
Public Order and Safety	Buildings used for the preservation of law and order or public safety.
Religious Worship	Buildings in which people gather for religious activities, (such as chapels, churches, mosques, synagogues, and temples).
Service	Buildings in which some type of service is provided, other than food service or retail sales of goods
Warehouse and Storage	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).
Other	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.
Vacant	Buildings in which more floorspace was vacant than was used for any single commercial activity at the time of interview. Therefore, a vacant building may have some occupied floorspace.

Sources: ....

Residential	2001 Residential Energy Consumption Survey Square footage measurements and comparisons http://www.eia.doe.gov/emeu/recs/sqft-measure.html
Commercial	Commercial Buildings Energy Consumption Survey (CBECS), Description of CBECS Building Types http://www.eia.doe.gov/emeu/cbecs/pba99/bldgtypes.html

Embodied Emissions Worksheet

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# thousand sq feet/ unit or building	Life span related embodied GHG missions (MTCO2e/ unit)	Life span related embodied GHG missions (MTCO2e/ thousand square feet) - See calculations in table below
Single-Family Home................................	2.53	98	39
Multi-Family Unit in Large Building	0.85	33	39
Multi-Family Unit in Small Building	1.39	54	39
Mobile Home...	1.06	41	39
Education	25.6	991	39
Food Sales	5.6	217	39
Food Service	5.6	217	39
Health Care Inpatient	241.4	9,346	39
Health Care Outpatient	10.4	403	39
Lodging	35.8	1,386	39
Retail (Other Than Mall)..........................	9.7	376	39
Office	14.8	573	39
Public Assembly	14.2	550	39
Public Order and Safety	15.5	600	39
Religious Worship	10.1	391	39
Service	6.5	252	39
Warehouse and Storage	16.9	654	39
Other	21.9	848	39
Vacant	14.1	546	39

Section II: Pavement.............................

All Types of Pavement............................			50

	Columns and Beams	Intermediate Floors	Exterior Walls	Windows	Interior Walls	Roofs	Total Embodied Emissions (MTCO2e)	Total Embodied Emissions (MTCO2e/ thousand sq feet)
Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building	5.3	7.8	19.1	51.2	5.7	21.3		
Average Materials in a 2,272-square foot single family home	0.0	2269.0	3206.0	285.0	6050.0	3103.0		
MTCO2e	0.0	8.0	27.8	6.6	15.6	30.0	88.0	38.7

Sources

All data in black text	King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov
Residential floorspace per unit	2001 Residential Energy Consumption Survey (National Average, 2001) Square footage measurements and comparisons http://www.eia.doe.gov/emeu/recs/sqft-measure.html
Floorspace per building	EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003) Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003 http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls
Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building	Athena EcoCalculator Athena Assembly Evaluation Tool v2.3- Vancouver Low Rise Building Assembly Average GWP (kg) per square meter http://www.athenasmi.ca/tools/ecoCalculator/index.html Lbs per kg 2.20 Square feet per square meter 10.76
Average Materials in a 2,272-square foot single family home	Buildings Energy Data Book: 7.3 Typical/Average Household Materials Used in the Construction of a 2,272-Square-Foot Single-Family Home, 2000 http://buildingsdatabook.eren.doe.gov/?id=view_book_table&TableID=2036&t=xls See also: NAHB, 2004 Housing Facts, Figures and Trends, Feb. 2004, p. 7.
Average window size	Energy Information Administration/Housing Characteristics 1993 Appendix B, Quality of the Data. Pg. 5. ftp://ftp.eia.doe.gov/pub/consumption/residential/rx93hcf.pdf

Pavement Emissions Factors MTCO2e/thousand square feet of asphalt or concrete pavement	**50 (see below)**

Embodied GHG Emissions……………………Worksheet Background Information

Buildings
Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass).

Estimating embodied GHG emissions is new field of analysis; the estimates are rapidly improving and becoming more inclusive of all elements of construction and development.

The estimate included in this worksheet is calculated using average values for the main construction materials that are used to create a typical family home. In 2004, the National Association of Home Builders calculated the average materials that are used in a typical 2,272 square foot single-family household. The quantity of materials used is then multiplied by the average GHG emissions associated with the life-cycle GHG emissions for each material.

This estimate is a rough and conservative estimate; the actual embodied emissions for a project are likely to be higher. For example, at this stage, due to a lack of comprehensive data, the estimate does not include important factors such as landscape disturbance or the emissions associated with the interior components of a building (such as furniture).

King County realizes that the calculations for embodied emissions in this worksheet are rough. For example, the emissions associated with building 1,000 square feet of a residential building will not be the same as 1,000 square feet of a commercial building. However, discussions with the construction community indicate that while there are significant differences between the different types of structures, this method of estimation is reasonable; it will be improved as more data become available.

Additionally, if more specific information about the project is known, King County recommends two online embodied emissions calculators that can be used to obtain a more tailored estimate for embodied emissions: www.buildcarbonneutral.org and www.athenasmi.ca/tools/ecoCalculator/.

Pavement
Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle. For specifics, see the worksheet.

Special Section: Estimating the Embodied Emissions for Pavement

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

The results of the studies are presented in different units and measures; considerable effort was undertaken to be able to compare the results of the studies in a reasonable way. For more details about the below methodology, contact matt.kuharic@kingcounty.gov.

The four studies, Meil (2001), Park (2003), Stripple (2001) and Treolar (2001) produced total GHG emissions of 4-34 MTCO2e per thousand square feet of finished paving (for similar asphalt and concrete based pavements). This estimate does not including downstream maintenance and repair of the highway. The average (for all concrete and asphalt pavements in the studies, assuming each study gets one data point) is ~17 MTCO2e/thousand square feet.

Three of the studies attempted to thoroughly account for the emissions associated with long term maintenance (40 years) of the roads. Stripple (2001), Park et al. (2003) and Treolar (2001) report 17, 81, and 68 MTCO2e/thousand square feet, respectively, after accounting for maintenance of the roads.

Based on the above discussion, King County makes the conservative estimate that 50 MTCO2e/thousand square feet of pavement (over the development's life cycle) will be used as the embodied emission factor for pavement until better estimates can be obtained. This is roughly equivalent to 3,500 MTCO2e per lane mile of road (assuming the lane is 13 feet wide).

It is important to note that these studies estimate the embodied emissions for roads. Paving that does not need to stand up to the rigors of heavy use (such as parking lots or driveways) would likely use less materials and hence have lower embodied emissions.

Sources:

Meil, J. A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential. 2006. Available: http://www.cement.ca/cement.nsf/eee9ec7bbd630126852566c40052107b/6ec79dc8ae03a782852572b90061b914/$FILE/ATTK0WE3/athena%20report%20Feb.%202%202007.pdf

Park, K, Hwang, Y., Seo, S., M.ASCE, and Seo, H. , "Quantitative Assessment of Environmental Impacts on Life Cycle of Highways," Journal of Construction Engineering and Management , Vol 129, January/February 2003, pp 25-31, (DOI: 10.1061/(ASCE)0733-9364(2003)129:1(25)).

Stripple, H. Life Cycle Assessment of Road. A Pilot Study for Inventory Analysis. Second Revised Edition. IVL Swedish Environmental Research Institute Ltd. 2001. Available: http://www.ivl.se/rapporter/pdf/B1210E.pdf

Treloar, G., Love, P.E.D., and Crawford, R.H. Hybrid Life-Cycle Inventory for Road Construction and Use. Journal of Construction Engineering and Management. P. 43-49. January/February 2004.

Energy Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	Energy consumption per building per year (million Btu)	Carbon Coefficient for Buildings	MTCO2e per building per year	Floorspace per Building (thousand square feet)	MTCE per thousand square feet per year	MTCO2e per thousand square feet per year	Average Building Life Span	Lifespan Energy Related MTCO2e emissions per unit	Lifespan Energy Related MTCO2e emissions per thousand square feet
Single-Family Home............................	107.3	0.108	11.61	2.53	4.6	16.8	57.9	672	266
Multi-Family Unit in Large Building	41.0	0.108	4.44	0.85	5.2	19.2	80.5	357	422
Multi-Family Unit in Small Building	78.1	0.108	8.45	1.39	6.1	22.2	80.5	681	489
Mobile Home..	75.9	0.108	8.21	1.06	7.7	28.4	57.9	475	448
Education	2,125.0	0.124	264.2	25.6	10.3	37.8	62.5	16,526	646
Food Sales	1,110.0	0.124	138.0	5.6	24.6	90.4	62.5	8,632	1,541
Food Service	1,436.0	0.124	178.5	5.6	31.9	116.9	62.5	11,168	1,994
Health Care Inpatient	60,152.0	0.124	7,479.1	241.4	31.0	113.6	62.5	467,794	1,938
Health Care Outpatient	985.0	0.124	122.5	10.4	11.8	43.2	62.5	7,660	737
Lodging	3,578.0	0.124	444.9	35.8	12.4	45.6	62.5	27,826	777
Retail (Other Than Mall)........................	720.0	0.124	89.5	9.7	9.2	33.8	62.5	5,599	577
Office	1,376.0	0.124	171.1	14.8	11.6	42.4	62.5	10,701	723
Public Assembly	1,338.0	0.124	166.4	14.2	11.7	43.0	62.5	10,405	733
Public Order and Safety	1,791.0	0.124	222.7	15.5	14.4	52.7	62.5	13,928	899
Religious Worship	440.0	0.124	54.7	10.1	5.4	19.9	62.5	3,422	339
Service	501.0	0.124	62.3	6.5	9.6	35.1	62.5	3,896	599
Warehouse and Storage	764.0	0.124	95.0	16.9	5.6	20.6	62.5	5,942	352
Other	3,600.0	0.124	447.6	21.9	20.4	74.9	62.5	27,997	1,278
Vacant	294.0	0.124	36.6	14.1	2.6	9.5	62.5	2,286	162

Sources

All data in black text	King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov
Energy consumption for residential buildings	2007 Buildings Energy Data Book: 6.1 Quad Definitions and Comparisons (National Average, 2001) Table 6.1.4: Average Annual Carbon Dioxide Emissions for Various Functions http://buildingsdatabook.eren.doe.gov/ Data also at: http://www.eia.doe.gov/emeu/recs/recs2001_ce/ce1-4c_housingunits2001.html
Energy consumption for commercial buildings and Floorspace per building	EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003) Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003 http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls
	Note: Data in plum color is found in both of the above sources (buildings energy data book and commercial buildings energy consumption survey).
Carbon Coefficient for Buildings	Buildings Energy Data Book (National average, 2005) Table 3.1.7. 2005 Carbon Dioxide Emission Coefficients for Buildings (MMTCE per Quadrillion Btu) http://buildingsdatabook.eere.energy.gov/?id=view_book_table&TableID=2057 Note: Carbon coefficient in the Energy Data book is in MTCE per Quadrillion Btu. To convert to MTCO2e per million Btu, this factor was divided by 1000 and multiplied by 44/12.
Residential floorspace per unit	2001 Residential Energy Consumption Survey (National Average, 2001) Square footage measurements and comparisons http://www.eia.doe.gov/emeu/recs/sqft-measure.html

average lief span of buildings,
estimated by replacement time method

	Single Family Homes	Multi-Family Units in Large and Small Buildings	All Residential Buildings
New Housing Construction, 2001	1,273,000	329,000	1,602,000
Existing Housing Stock, 2001	73,700,000	26,500,000	100,200,000
Replacement time:	57.9	80.5	62.5

(national average, 2001)

Note: Single family homes calculation is used for mobile homes as a best estimate life span.
Note: At this time, KC staff could find no reliable data for the average life span of commercial buildings.
Therefore, the average life span of residential buildings is being used until a better approximation can be ascertained.

Sources:

New Housing Construction, 2001
Quarterly Starts and Completions by Purpose and Design - US and Regions (Excel)
http://www.census.gov/const/quarterly_starts_completions_cust.xls
See also: http://www.census.gov/const/www/newresconstindex.html

Existing Housing Stock, 2001
Residential Energy Consumption Survey (RECS) 2001
Tables HC1:Housing Unit Characteristics, Million U.S. Households 2001
Table HC1-4a. Housing Unit Characteristics by Type of Housing Unit, Million U.S. Households, 2001
Million U.S. Households, 2001
http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf

Transportation Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	# people/ unit or building	# thousand sq feet/ unit or building	# people or employees/ thousand square feet	vehicle related GHG emissions (metric tonnes CO2e per person per year)	MTCO2e/ year/ unit	MTCO2e/ year/ thousand square feet	Average Building Life Span	Life span transportation related GHG emissions (MTCO2e/ per unit)	Life span transportation related GHG emissions (MTCO2e/ thousand sq feet)
Single-Family Home	2.8	2.53	1.1	4.9	13.7	5.4	57.9	792	313
Multi-Family Unit in Large Building	1.9	0.85	2.3	4.9	9.5	11.2	80.5	766	904
Multi-Family Unit in Small Building	1.9	1.39	1.4	4.9	9.5	6.8	80.5	766	550
Mobile Home	2.5	1.06	2.3	4.9	12.2	11.5	57.9	709	668
Education	30.0	25.6	1.2	4.9	147.8	5.8	62.5	9247	361
Food Sales	5.1	5.6	0.9	4.9	25.2	4.5	62.5	1579	282
Food Service	10.2	5.6	1.8	4.9	50.2	9.0	62.5	3141	561
Health Care Inpatient	455.5	241.4	1.9	4.9	2246.4	9.3	62.5	140506	582
Health Care Outpatient	19.3	10.4	1.9	4.9	95.0	9.1	62.5	5941	571
Lodging	13.6	35.8	0.4	4.9	67.1	1.9	62.5	4194	117
Retail (Other Than Mall)	7.8	9.7	0.8	4.9	38.3	3.9	62.5	2394	247
Office	28.2	14.8	1.9	4.9	139.0	9.4	62.5	8696	588
Public Assembly	6.9	14.2	0.5	4.9	34.2	2.4	62.5	2137	150
Public Order and Safety	18.8	15.5	1.2	4.9	92.7	6.0	62.5	5796	374
Religious Worship	4.2	10.1	0.4	4.9	20.8	2.1	62.5	1298	129
Service	5.6	6.5	0.9	4.9	27.6	4.3	62.5	1729	266
Warehouse and Storage	9.9	16.9	0.6	4.9	49.0	2.9	62.5	3067	181
Other	18.3	21.9	0.8	4.9	90.0	4.1	62.5	5630	257
Vacant	2.1	14.1	0.2	4.9	10.5	0.7	62.5	657	47

Sources

All data in black text	King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov
# people/ unit	Estimating Household Size for Use in Population Estimates (WA state, 2000 average) Washington State Office of Financial Management Kimpel, T. and Lowe, T. Research Brief No. 47. August 2007 http://www.ofm.wa.gov/researchbriefs/brief047.pdf Note: This analysis combines Multi Unit Structures in both large and small units into one category; the average is used in this case although there is likely a difference
Residential floorspace per unit	2001 Residential Energy Consumption Survey (National Average, 2001) Square footage measurements and comparisons http://www.eia.doe.gov/emeu/recs/sqft-measure.html
# employees/thousand square feet	Commercial Buildings Energy Consumption Survey commercial energy uses and costs (National Median, 2003) Table B2 Totals and Medians of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003 http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set1/2003excel/b2.xls Note: Data for # employees/thousand square feet is presented by CBECS as square feet/employee. In this analysis employees/thousand square feet is calculated by taking the inverse of the CBECS number and multiplying by 1000.

vehicle related GHG emissions			
Estimate calculated as follows (Washington state, 2006)_			
	56,531,930,000	2006 Annual WA State Vehicle Miles Traveled	
			Data was daily VMT. Annual VMT was 365*daily VMT.
			http://www.wsdot.wa.gov/mapsdata/tdo/annualmileage.htm
	6,395,798	2006 WA state population	
			http://quickfacts.census.gov/qfd/states/53000.html
	8839	vehicle miles per person per year	
	0.0506	gallon gasoline/mile	
			This is the weighted national average fuel efficiency for all cars and 2 axle, 4 wheel light trucks in 2005. This includes pickup trucks, vans and SUVs. The 0.051 gallons/mile used here is the inverse of the more commonly known term “miles/per gallon” (which is 19.75 for these cars and light trucks).
			Transportation Energy Data Book. 26th Edition. 2006. Chapter 4: Light Vehicles and Characteristics. Calculations based on weighted average MPG efficiency of cars and light trucks.
			http://cta.ornl.gov/data/tedb26/Edition26_Chapter04.pdf
			Note: This report states that in 2005, 92.3% of all highway VMT were driven by the above described vehicles.
			http://cta.ornl.gov/data/tedb26/Spreadsheets/Table3_04.xls
	24.3	lbs CO2e/gallon gasoline	
			The CO2 emissions estimates for gasoline and diesel include the extraction, transport, and refinement of petroleum as well as their combustion.
			Life-Cycle CO2 Emissions for Various New Vehicles. RENew Northfield.
			Available: http://renewnorthfield.org/wpcontent/uploads/2006/04/CO2%20emissions.pdf
			Note: This is a conservative estimate of emissions by fuel consumption because diesel fuel,
	2205		with a emissions factor of 26.55 lbs CO2e/gallon was not estimated.
	4.93	lbs/metric tonne	
		vehicle related GHG emissions (metric tonnes CO2e per person per year)	
average lief span of buildings, estimated by replacement time method		See Energy Emissions Worksheet for Calculations	
Commercial floorspace per unit		EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)	
		Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003	
		http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls	

Appendix D

TREE INVENTORY AND ARBORIST REPORT

Tree Solutions Inc
Consulting Arborists

Project No. TS - 8204

Arborist Inventory Report
DRAFT

To:	Brian Fabella; Project Manager Seattle Public Schools
Site:	Alki Elementary School, 3010 59th Ave SW, Seattle, WA 98116 Parcel ID: 0148000064
Re:	Tree Inventory and Assessment for the Gymnasium Modernization and Replacement Project, Contract Number P1948
Date:	February 15, 2022
Project Arborist:	Sean Dugan, Registered Consulting Arborist # 457 ISA Board Certified Master Arborist #PN-5459B ISA Qualified Tree Risk Assessor
Reviewed By:	Andrea Starbird, ISA Certified Arborist #PN-9084A ISA Qualified Tree Risk Assessor
Referenced Documents:	Boundary and Topographic Survey developed by Bush, Roed, and Hitchings Inc. dated December 13, 2021
Attached:	Draft Inventory Table of Trees Annotated Survey with Aerial Overlay SE Corner Annotated Boundary and Topographic Survey

Summary

We inventoried and assessed 32 trees on Seattle Public Schools property. Based on the city of Seattle Municipal Code (SMC 25.11), trees measuring 6 inches or greater in diameter at standard height (DSH) are required to be assessed for development projects. Unless indicated otherwise, we tagged each tree with an aluminum tree tag. Tree identifier corresponds to the number on each tag and used throughout this report.

Of the trees assessed, Tree 428, a vine maple (*Acer circinatum*) tree, meets the exceptional tree criteria outlined in the Seattle Director's Rule 16-2008.[1] We found no exceptional tree groves on site.

There were 31 trees located on adjacent properties trees that we inventoried. Trees on neighboring properties were documented if they were in the scoped area, appeared to be greater than 6 inches diameter, and their driplines extended over the property line. We used an alphabetical tree identifier for private property trees.

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[1] Sugimura, D.W. "DPD Director's Rule 16-2008". Seattle, WA, 2009

Tree D is a western hemlock (*Tsuga heterophylla*) tree that might be an exceptional co-owned tree. This tree will need to have the ivy removed and access provided to attain an accurate measurement of the trunk diameter.

Proposed development plans should be created and evaluated for potential negative impacts to trees. Tree protection specifications should be included in the plan sets and accounted for in the proposed development scheme. Tree protection specifications should be in line with those found in Section 015639 Tree and Plant Protection and Salvage project requirements.

Recommendations

- Site planning around exceptional trees must follow the guidelines outlined in SMC 25.11.050. [2]
- Site planning around trees in critical areas must follow the guidelines outlined in SMC 25.09.070.[3]
- Provide development plans to the project arborist for an evaluation of tree retention to update and finalize the arborist report.
- Utilize a common tree layer across the plan set that shows tree numbers, identifiers, accurate driplines, exceptional status, and limits of disturbance. This is critical on civil drawings and any drawings that show excavation near trees.
    - Coordinate with Tree Solutions to plan excavation methods to be used within the driplines of retained trees.
- Obtain permission to evaluate Tree D.
- Produce an assessment of impacts within the dripline of all exceptional trees.
- Include tree protection specification language provided in Appendix F in all plan sets. Incorporate all provisions in the provided specifications into the formal tree protection specifications.
- Tree protection specifications should be in line with those found in Section 015639 Tree and Plant Protection and Salvage project requirements.
- Plan for arborist monitoring of demolition, excavation activities, and any other soil disturbance within the tree protection area of any protected tree.

Assignment and Scope of Work

This report documents the site visit by Sean Dugan and Andrea Starbird, of Tree Solutions Inc. on January 11, 2022. Included are observations and data collected at Alki Elementary School, 3010 59th Ave SW, Seattle, WA. Brian Fabella, Project Manager with Seattle Public Schools, requested these services to acquire information for project planning purposes.

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[2] Seattle Municipal Code 25.11.050. General Provisions for Exceptional Trees

[3] Seattle Municipal Code 25.09.070 Standards for Trees and Vegetation in Critical Areas

We were asked to evaluate all regulated trees on the site and identify any exceptional trees, as defined by Seattle Director's Rule 16-2008, with reference to the Boundary and Topographic Survey developed by Bush, Roed, and Hitchings Inc. dated December 13, 2021. We were asked to produce an Arborist Report outlining our findings and recommendations.

Limits of Assignment
We were not provided access to the trees beyond a fence in the southeast corner of the site (Figure 1). For this area, we performed a level 1 assessment and estimated tree size. We did not physically tag each tree. The tree identifier is shown on the attached annotated survey with aerial overlay and on the SE Corner Annotated Boundary and Topographic Survey.

We have provided the report in draft form as no development plans have been fully assessed to provide recommended actions for each tree. Upon review of the proposed development plans the report can be finalized.

Observations and Discussion

Site

The approximately 63,000 square foot site fronts 59th Ave. SW to the west, Alki Playground and Seattle Parks property to the north, and residential properties to the east and south. The primary structure is a 39,567 square foot two-story masonry building.

The city of Seattle's Department of Construction and Inspection's GIS map shows the presence of two environmental critical areas (ECAs) on the site. A steep slope is located on the southeast portion of the site with the remaining property located within a liquefaction zone (see Figure 1).

We were provided with a survey of the property, which we annotated with an identifier for each tree (Annotated Survey with Aerial Overlay). We provided an additional markup of the southeast corner survey (SE Corner Annotated Boundary and Topographic Survey), which includes additional trees not shown on the survey. The difference is due to our assessment of individual trees and separate tree clusters within a grouping of multiple clusters.

Proposed Plans

This report is preliminary as we have not reviewed design or construction plans for this area.

Trees

We inventoried and assessed 32 trees on the subject property. Information specific to each tree can be found in the attached tree inventory - table of trees.

Tree 399 is located along the east perimeter of the site between a fence and retaining wall (Photo1). The tree likely has a significant root mass below the pavement on the east side of the building. Development of this area may require that this tree be removed.

Trees 400 through 425 are located in an area behind a chain-link fence, which we did not have access through the gate (Photo 2). We performed a level 1 assessment on these trees. The majority of the trees are located along the ECA slope. Several trees are growing out of a rockery retaining wall (Photo 3).

The overall quality of the tree stand is poor. Trees that are growing from the rockery and that have previously failed are poor candidates for retention. Ivy and clematis vines should be removed from the base and trunk of trees, so they can be reassessed for potential structural defects (Photos 2, 3, and 4).

Tree 426 is a large Camellia (*Camellia sinensis*) shrub, or small tree, located within a courtyard. The plant is approximately 8-inches away from the building facade and is a poor candidate for retention.

Trees 427 and 428 are located within the site's interior, between the school and the community center. Tree 428 is an exceptional size vine maple (*Acer circinatum*) tree, which is showing symptoms of stress. The tree appears to have dieback throughout the canopy and short shoot growth. It may be challenging to develop around the tree and ensure long-term viability based on the health. The tree is a poor candidate for transplanting.

Tree 429 is a Persian ironwood (*Parrotia persica*) tree identified as being in the Seattle Public School's Stanford Tree collection program (Photo 5). This tree, and tree 430 and English oak (*Quercus robur*), are in good health and structural condition. Both are good candidates for retention if the building envelope is not extended to the west.

Adjacent Site Trees

We inventoried 31 trees located in adjacent sites including 8 trees on private properties, 5 trees within the city right-of-way (ROW), and 18 trees on Seattle Parks property. All trees on private properties were estimated from the subject site or public property. None of the adjacent site trees were tagged.

Private property

Private property trees are identified as A through H. *Tree A* is located on the south perimeter and is potentially an exceptional willow (*Salix spp*) tree (Photo 4). The tree should be further assessed when in leaf if any development is proposed that could potentially have a negative impact on its health.

Trees B, C, and D are located on or near the south property line (Photo 6). Based on the survey, these trees straddle the property line and are co-owned with the neighbors to the south. There is a retaining wall north of the trees that has likely limited the extent of roots on the subject site; however, any development below the canopy of these trees should be evaluated for potential negative impacts to roots below the pavement.

Tree D, a western hemlock (*Tsuga heterophylla*) tree, was estimated to be approximately 24 inches in DSH. The species meets the definition of an exceptional tree at 24 inches DSH. To confirm if the tree is actually exceptional, the ivy obscuring the base would need to be removed and access to the base of the tree would be necessary to produce and accurate measurement.

Trees E, F, and G are located at the southwest corner of the property. There is a significant drainage issue in this area, next to the trees that should be corrected as part of the development. Roots are likely to be limited but might extend below the pavement and into the school property. Once the standing water and pavement is removed in this area the roots of the trees should be evaluated for potential negative impacts.

Tree G, a Sawara cypress (*Chamaecyparis pisifera*) tree, looks to be on private property. This would make the tree an exceptional tree; however, the tree is shown on the survey to be in the ROW. The ROW appears to increase in width at the point where the tree stands. If Tree G is located within the

ROW, then it will no longer meet the definition of an exceptional tree. The tree is not shown on the Seattle Department of Transportation's Tree Map.

Rights of Ways

Rights of ways trees are identified as R1 through R5. The trees located west of the school property within a planting strip between the sidewalk and road. All five trees are red maple (*Acer rubrum*) trees (Phots 7 & 8).

Each of the trees has an engraved paver indicating a company, person, or family that has dedicated the tree to the site. The base of Tree 5 has started to envelop the tree grate over the root zone (Photo 9). The grate will need to be cut away or removed to ensure the long-term viability of the tree.

Tree G, from above, is likely a ROW tree but should be confirmed.

Seattle Parks Trees

Parks trees are identified as P1 through P18 (Photos 10 through 13). Trees P1, P3, P4, and P5 are Incense cedar (*Calocedrus decurrens*) trees that meet the city's definition of an exceptional tree. The soils below all of the park's trees is highly compacted. This has reduced the drainage capacity of the soil (Photo 12). All of the trees are located sufficiently away from the Seattle Public Schools property where redevelopment is unlikely to have a negative impact on tree health or structure.

Discussion—Construction Impacts

This report is preliminary as we have not been provided design or construction plans for review. Upon the completion of development plan review, this report can be finalized.

Recommendations

- Site planning around exceptional trees must follow the guidelines outlined in SMC 25.11.050. [4]
- Site planning around trees in critical areas must follow the guidelines outlined in SMC 25.09.070.[5]
- Provide development plans to the project arborist for an evaluation of tree retention to update and finalize the arborist report.
- Utilize a common tree layer across the plan set that shows tree numbers, identifiers, accurate driplines, exceptional status, and limits of disturbance. This is critical on civil drawings and any drawings that show excavation near trees.
    - Coordinate with Tree Solutions to plan excavation methods to be used within the driplines of retained trees.
- Obtain permission to evaluate Tree D.
- Produce an assessment of impacts within the dripline of all exceptional trees.

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[4] Seattle Municipal Code 25.11.050. General Provisions for Exceptional Trees

[5] Seattle Municipal Code 25.09.070 Standards for Trees and Vegetation in Critical Areas

- Include tree protection specification language provided in Appendix F in all plan sets. Incorporate all provisions in the provided specifications into the formal tree protection specifications.
- Tree protection specifications should be in line with those found in Section 015639 Tree and Plant Protection and Salvage project requirements.
- Plan for arborist monitoring of demolition, excavation activities, and any other soil disturbance within the tree protection area of any protected tree.

Respectfully submitted,

Sean Dugan, Principal Consulting Arborist
Tree Solutions Inc.

Appendix A **Site Map**

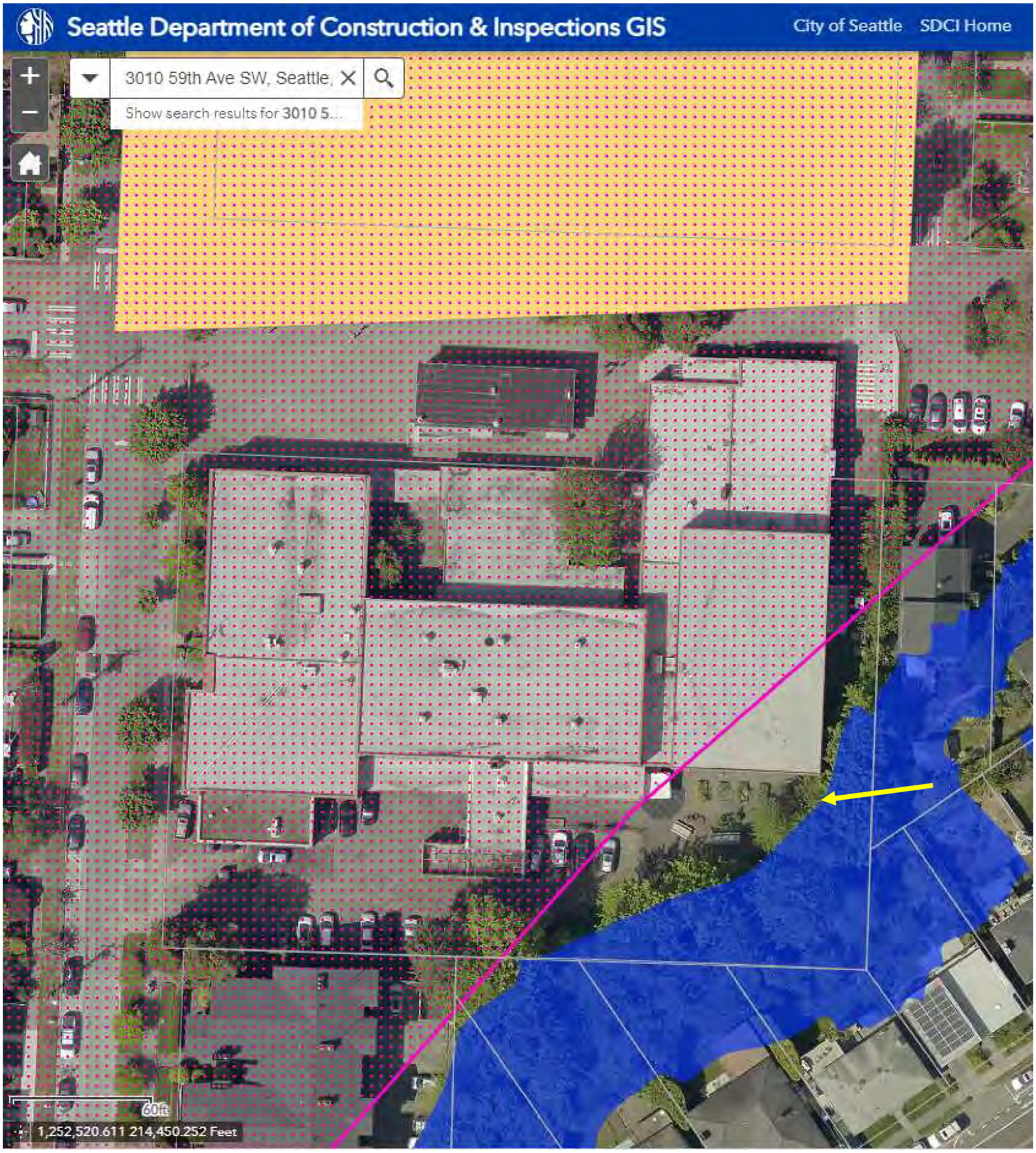


Figure 1. Aerial photograph with environmental critical areas overlay. The blue area represents steep slopes, and the pink dotted area is a liquefaction zone. The yellow area north of the property is a peat settlement area. The yellow arrow points to a fence that we did not have the ability to open and access the trees on the rear slope. (Source: https://seattlecitygis.maps.arcgis.com/ (accessed February 3, 2022).

Appendix B **Photographs**

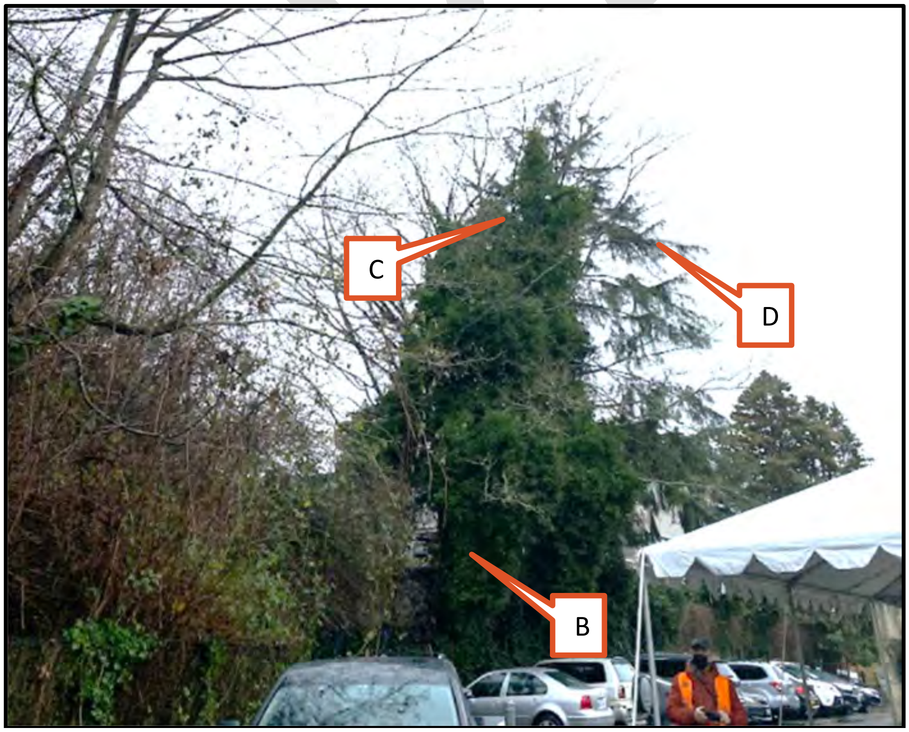
Photograph 1. Tree 399, located on the east perimeter of the property. The tree is growing between a retaining wall and a fence, limiting access to the base for an accurate diameter measurement.

Photograph 2. View looking at the southeast corner of the property. In this section tree numbers range from 400 through 425.

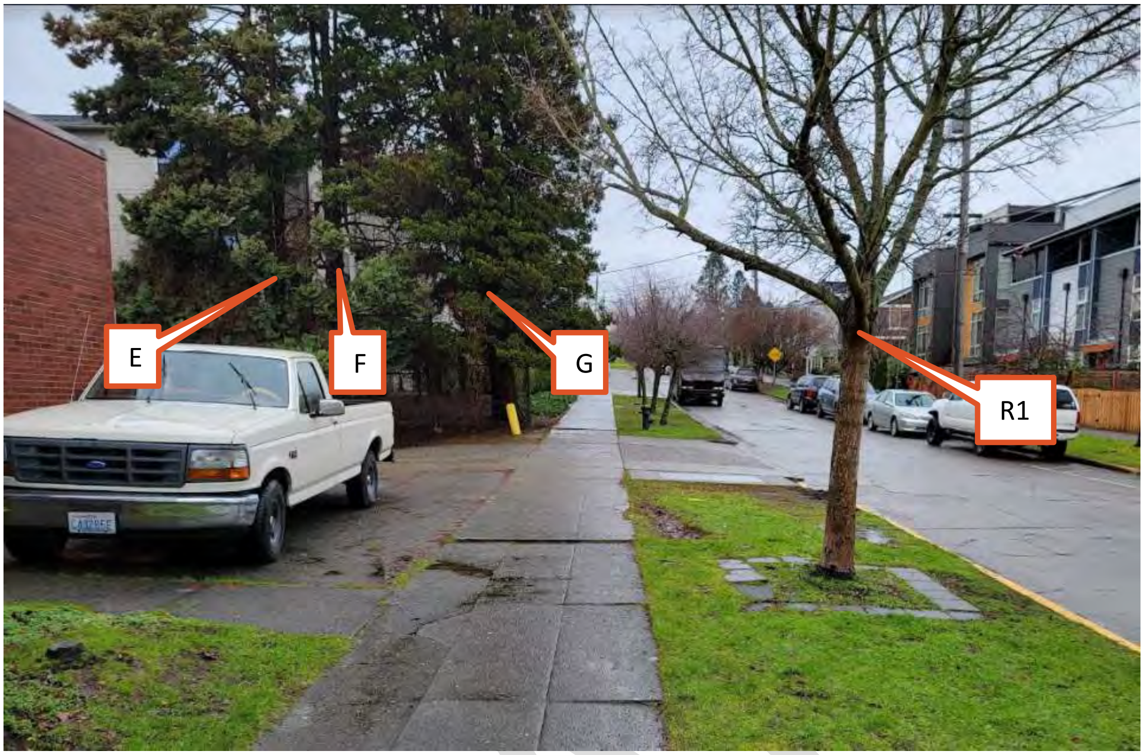
Photograph 3. View looking towards the rockeries in the southeast section of the site.

Photograph 4. View looking south at Trees 419 through 425. The trees are covered in invasive vines. The red arrow points to Tree A, an off-site tree that may qualify as exceptional once positively identified.

Photograph 5. View looking east at Tree 429, a Persian ironwood identified as a tree in the Seattle Public School's Stanford Tree collection program.



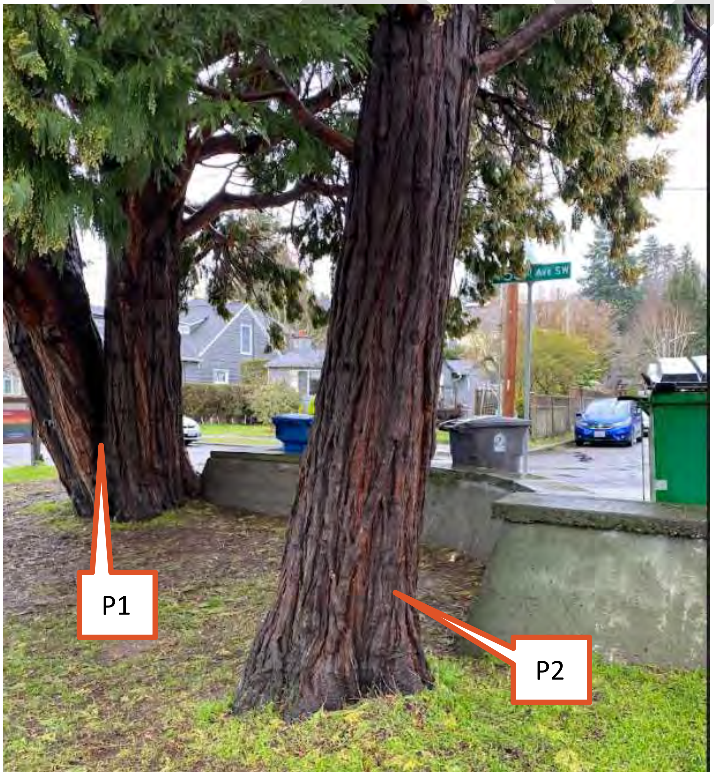
Photograph 6. View looing to the southwest at off-site trees B, C, and D.



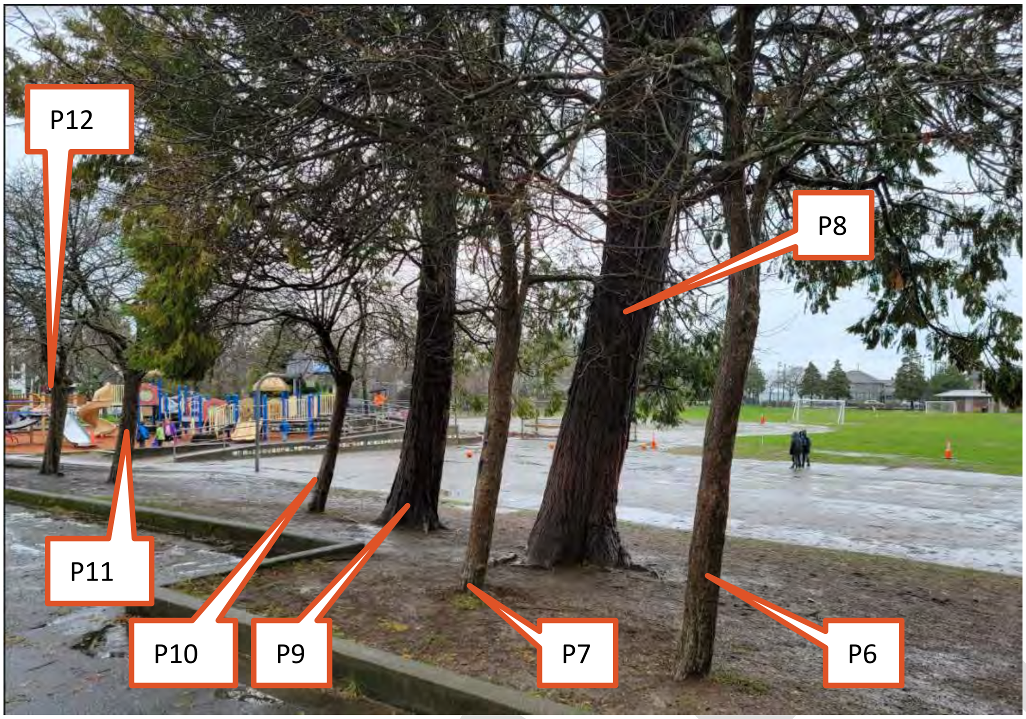
Photograph 7. View looing south at off-site trees. It is unclear as to which property Tree G stands. Tree R1 is located in the right-of-way

Photograph 8. View looking north at the trees in the right-of-way. The trees have signs that indicate they were donated by a local business and family.

Photograph 9. Right-of-way trees to the north of the row are beginning to envelop the tree grates.



Photograph 10. View looking to the east at Seattle Parks trees.



Photograph 11. View looking at the adjacent site Parks trees.

Photograph 12. View looking at the saturated soils at the base of trees near the play area.

Photograph 13. Juniper trees along the west side of the Parks property.

Appendix C References

Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Council of Tree and Landscape Appraisers, Guide for Plant Appraisal, 10th Edition, Second Printing. Atlanta, GA: The International Society of Arboriculture (ISA), 2019.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 1994.

Seattle Municipal Code 25.09.070. Standards for Trees and Vegetation in Critical Areas.

Seattle Municipal Code 25.11.050. General Provisions for Exceptional Trees.

Sugimura, D.W. "DPD Director's Rule 16-2008". Seattle, WA, 2009

Appendix D Glossary

ANSI A300: American National Standards Institute (ANSI) standards for tree care

DBH or DSH: diameter at breast or standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Council of Tree and Landscape Appraisers 2019)

ISA: International Society of Arboriculture

Regulated Tree: A tree required by municipal code to be identified in an arborist report.

Visual Tree Assessment (VTA): method of evaluating structural defects and stability in trees by noting the pattern of growth. Developed by Claus Mattheck (Harris, *et al* 1999)

Appendix E **Methods**

Measuring

I measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH). If a tree had multiple stems, I measured each stem individually at standard height and determined a single-stem equivalent diameter by using the method outlined in the city of Seattle Director's Rule 16-2008. A tree is regulated based on this single-stem equivalent diameter value. Because this value is calculated in the office following field work, some trees in our data set may have diameters smaller than 6 inches. These trees are included in the tree table for informational purposes only and not factored into tree totals discussed in this report.

Tagging

I tagged each tree with a circular aluminum tag at eye level. I assigned each tree a numerical identifier on our map and in our tree table, corresponding to this tree tag. I used alphabetical identifiers for trees off-site. Trees on public property receive a letter identifier followed by a numerical identifier.

Evaluating

I evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. An understanding of the uniform stress allows the arborist to make informed judgments about the condition of a tree.

Rating

When rating tree health, I took into consideration crown indicators such as foliar density, size, color, stem, and shoot extensions. When rating tree structure, I evaluated the tree for form and structural defects, including past damage and decay. Tree Solutions has adapted our ratings based on the Purdue University Extension formula values for health condition (*Purdue University Extension bulletin FNR-473-W - Tree Appraisal*). These values are a general representation used to assist arborists in assigning ratings.

Health

Excellent - Perfect specimen with excellent form and vigor, well-balanced crown. Normal to exceeding shoot length on new growth. Leaf size and color normal. Trunk is sound and solid. Root zone undisturbed. No apparent pest problems. Long safe useful life expectancy for the species.

Good - Imperfect canopy density in few parts of the tree, up to 10% of the canopy. Normal to less than ¾ typical growth rate of shoots and minor deficiency in typical leaf development. Few pest issues or damage, and if they exist, they are controllable, or tree is reacting appropriately. Normal branch and stem development with healthy growth. Safe useful life expectancy typical for the species.

Fair - Crown decline and dieback up to 30% of the canopy. Leaf color is somewhat chlorotic/necrotic with smaller leaves and "off" coloration. Shoot extensions indicate some stunting and stressed growing conditions. Stress cone crop clearly visible. Obvious signs of pest problems contributing to lesser condition, control might be possible. Some decay areas found in main stem and branches. Below average safe useful life expectancy

Poor - Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting of shoots is obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe and uncontrollable. Extensive decay or hollows in branches and trunk. Short safe useful life expectancy.

Structure

Excellent - Root plate undisturbed and clear of any obstructions. Trunk flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.

Good - Root plate appears normal, with only minor damage. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure and less than 25% of bark section missing. Good branch habit; minor dieback with some signs of previous pruning. Codominant stem formation may be present, requiring minor corrections.

Fair - Root plate reveals previous damage or disturbance. Dysfunctional roots may be visible around the main stem. Evidence of trunk damage or cavities, with decay or defects present and less than 30% of bark sections missing on trunk. Co-dominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.

Poor - Root plate disturbance and defects indicate major damage, with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important branches dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective action required.

Appendix F Tree Protection Specifications

The following is a list of general protection measures that should be employed before, during and after construction to ensure the long-term viability of retained trees. Site specific protection measures will be proposed when development details are provided for review.

1. **Project Arborist:** The project arborists shall at minimum have an International Society of Arboriculture (ISA) Certification and ISA Tree Risk Assessment Qualification.
2. **Tree Protection Area (TPA):** TPA is the area within the dripline of all retained trees. The TPA for non-exceptional trees may be reduced to within the dripline based on the recommendation of the project arborist. The TPA for exceptional trees may be reduced to within the dripline based on the recommendation of the project arborist and approval by the City of Seattle.
3. **Tree Protection Fencing:** Tree protection fencing shall consist of 6-foot-tall chain-link fencing installed at the edge of the TPA as approved by the project arborist. Fence posts shall be anchored into the ground or bolted to existing hardscape surfaces.
    a. Where trees are being retained as a group the fencing shall encompass the entire area including all landscape beds or lawn areas associated with the group.
    b. Per arborist approval, TPA fencing may be placed at the edge of existing hardscape within the TPA to allow for staging and traffic.
    c. Where work is planned within the TPA, install fencing at edge of TPA and move to limits of disturbance at the time that the work within the TPA is planned to occur. This ensures that work within the TPA is completed to specification.
    d. Where trees are protected at the edge of the project boundary, construction limits fencing shall be incorporated as the boundary of tree protection fencing.
4. **Access Beyond Tree Protection Fencing:** In areas where work such as installation of utilities is required within the TPA, a locking gate will be installed in the fencing to facilitate access. The project manager or project arborist shall be present when tree protection areas are accessed.
5. **Tree Protection Signage:** Tree protection signage shall be affixed to fencing every 20 feet. Signage shall be fluorescent, at least 2' x 2' in size. Signage must include all information in the PDF located here: http://www.seattle.gov/Documents/Departments/SDCI/Codes/TreeProtectionAreaSign.pdf in addition to the contact information for the project manager and instructions for gaining access to the area.
6. **Filter / Silt Fencing:** Filter / silt fencing within, or at the edge of the TPA of retained trees shall be installed in a manner that does not sever roots. Install so that filter / silt fencing sits on the ground and is weighed in place by sandbags or gravel. Do not trench to insert filter / silt fencing into the ground.
7. **Monitoring:** The project arborist shall monitor all ground disturbance at the edge of or within the TPA.
8. **Soil Protection:** Retain existing paved surfaces within or at the edge of the TPA for as long as possible. No parking, foot traffic, materials storage, or dumping (including excavated soils) are allowed within the TPA. Heavy machinery shall remain outside of the TPA. Access to the tree protection area will be granted under the supervision of the project arborist. If project arborist allows, heavy machinery can enter the area if soils are protected from the load. Acceptable methods of soil protection include placing 3/4-inch plywood over 4 to 6 inches of wood chip mulch, or use of AlturnaMats® (or equivalent product approved by the project arborist). Compaction of soils within the TPA must not occur.
9. **Soil Remediation:** Soil compacted within the TPA of retained trees shall be remediated using pneumatic air excavation according to a specification produced by the project arborist.

10. **Canopy Protection**: Where fencing is installed at the limits of disturbance within the TPA, canopy management (pruning or tying back) shall be conducted to ensure that vehicular traffic does not damage canopy parts. Exhaust from machinery shall be located 5 feet outside the dripline of retained trees. No exhaust shall come in contact with foliage for prolonged periods of time.
11. **Duff/Mulch:** Apply 6 inches of arborist wood chip mulch or hog fuel over bare soil within the TPA to prevent compaction and evaporation. TPA shall be free of invasive weeds to facilitate mulch application. Keep mulch 1 foot away from the base of trees and 6 inches from retained understory vegetation. Retain and protect as much of the existing duff and understory vegetation as possible.
12. **Excavation:** Excavation done within the TPA shall use alternative methods such as pneumatic air excavation or hand digging. If heavy machinery is used, use flat front buckets with the project arborist spotting for roots. When roots are encountered, stop excavation and cleanly sever roots. The project arborist shall monitor all excavation done within the TPA.
13. **Fill:** Limit fill to 1 foot of uncompacted well-draining soil, within the TPA of retained trees. In areas where additional fill is required, consult with the project arborist. Fill must be kept at least 1 foot from the trunks of trees.
14. **Root Pruning:** Limit root pruning to the extent possible. All roots shall be pruned with a sharp saw making clean cuts. Do not fracture or break roots with excavation equipment.
15. **Root Moisture:** Root cuts and exposed roots shall be immediately covered with soil, mulch, or clear polyethylene sheeting and kept moist. Water to maintain moist condition until the area is back filled. Do not allow exposed roots to dry out before replacing permanent back fill.
16. **Hardscape Removal:** Retain hardscape surfaces for as long as practical. Remove hardscape in a manner that does not require machinery to traverse newly exposed soil within the TPA. Where equipment must traverse the newly exposed soil, apply soil protection as described in section 8. Replace fencing at edge of TPA if soil exposed by hardscape removal will remain for any period of time.
17. **Tree Removal:** All trees to be removed that are located within the TPA of retained trees shall not be ripped, pulled, or pushed over. The tree should be cut to the base and the stump either left or ground out. A flat front bucket can also be used to sever roots around all sides of the stump, or the roots can be exposed using hydro or air excavation and then cut before removing the stump.
18. **Irrigation:** Retained trees with soil disturbance within the TPA will require supplemental water from June through September. Acceptable methods of irrigation include drip, sprinkler, or watering truck. Trees shall be watered three times per month during this time.
19. **Pruning:** Pruning required for construction and safety clearance shall be done with a pruning specification provided by the project arborist in accordance with American National Standards Institute ANSI-A300 2017 Standard Practices for Pruning. Pruning shall be conducted or monitored by an arborist with an ISA Certification.
20. **Plan Updates:** All plan updates or field modification that result in impacts within the TPA or change the retained status of trees shall be reviewed by the senior project manager and project arborist prior to conducting the work.
21. **Materials:** Contractor shall have the following materials on-site and available for use during work in the TPA:
    - **Sharp and clean bypass hand pruners**
    - **Sharp and clean bypass loppers**
    - **Sharp hand-held root saw**
    - **Reciprocating saw with new blades**
    - **Shovels**
    - **Trowels**
    - **Clear polyethylene sheeting**
    - **Burlap**
    - **Water**

Appendix G **Assumptions & Limiting Conditions**

1 Consultant assumes that the site and its use do not violate, and is in compliance with, all applicable codes, ordinances, statutes or regulations.

2 The consultant may provide a report or recommendation based on published municipal regulations. The consultant assumes that the municipal regulations published on the date of the report are current municipal regulations and assumes no obligation related to unpublished city regulation information.

3 Any report by the consultant and any values expressed therein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event, or upon any finding to be reported.

4 All photographs included in this report were taken by Tree Solutions, Inc. during the documented site visit, unless otherwise noted. Sketches, drawings and photographs (included in, and attached to, this report) are intended as visual aids and are not necessarily to scale. They should not be construed as engineering drawings, architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.

5 Unless otherwise agreed, (1) information contained in any report by consultant covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring.

6 These findings are based on the observations and opinions of the authoring arborist, and do not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described and assessed.

7 Measurements are subject to typical margins of error, considering the oval or asymmetrical cross-section of most trunks and canopies.

8 Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the site's soil should be obtained by a qualified professional if an additional understanding of the site's characteristics is needed to make an informed decision.

9 Our assessments are made in conformity with acceptable evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.

Preliminary Table of Trees

3010 59th Ave SW, Seattle, WA 98116

Arborist: SD, AS
Date of Inventory: Jan 11, 2022
Table Prepared: Jan 24, 2022

DSH (Diameter at Standard Height) is measured 4.5 feet above grade, or as specified in the Guide for Plant Appraisal, 10th Edition, published by the Council of Tree and Landscape Appraisers.

DSH for multi-stem trees are noted as a single stem equivalent, which is calculated using the method defined in the Director's Rule 16-2008.

Letters are used to identify trees on neighboring properties with overhanging canopies.

Dripline is measured from the center of the tree to the outermost extent of the canopy.

R# = Right of way tree, P# = parks tree

Tree's identified with green are located within a steep slope eca, and were not included on the site survey. TS performed a limited visual assessment (level 1) all diameters and driplines

						Dripline Radius (feet)							
Tree ID	**Scientific Name**	**Common Name**	**DSH** (inches)	**Health Condition**	**Structural Condition**	**N**	**E**	**S**	**W**	**Exceptional Threshold**	**Exceptional by Size**	**Proposed Action DRAFT**	**Notes**
399	*Acer macrophyllum*	Bigleaf maple	0.0	Good	Poor	7.0	7.0	7.0	7.0	*30.0*	-	Retain	over 6 inches diameter, but not exceptional size; no standard for diameter measurement; trunk is growing between wood wall and chainlink fence, would not support itself if fencing or wall was removed
400	*Acer macrophyllum*	Bigleaf maple	17.3	Good	Good	15.7	15.7	15.7	15.7	*30.0*	-	Retain	heavy ivy, base obscured, previously topped
401	*Acer macrophyllum*	Bigleaf maple	13.5	Good	Fair	12.6	12.6	12.6	12.6	*30.0*	-	Retain	heavy ivy, previously topped
402	*Acer macrophyllum*	Bigleaf maple	17.4	Good	Fair	14.7	14.7	14.7	14.7	*30.0*	-	Remove	heavy ivy, previously topped
403	*Acer macrophyllum*	Bigleaf maple	17.1	Good	Fair	16.7	16.7	16.7	16.7	*30.0*	-	Retain	further upslope, previously topped, heavy ivy
404	*Acer macrophyllum*	Bigleaf maple	12.0	Good	Fair	12.5	12.5	12.5	12.5	*30.0*	-	Retain	heavy ivy, previously topped
405	*Acer macrophyllum*	Bigleaf maple	8.0	Fair	Poor	12.3	12.3	12.3	12.3	*30.0*	-	Retain	heavy ivy
406	*Acer macrophyllum*	Bigleaf maple	10.8	Poor	Poor	6.4	6.4	6.4	6.4	*30.0*	-	Retain	
407	*Acer platanoides*	Norway maple	8.4	Good	Fair	12.3	12.3	12.3	12.3	*30.0*	-	Remove	

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional by Size	Proposed Action DRAFT	Notes
408	*Acer platanoides*	Norway maple	11.9	Good	Good	16.5	16.5	16.5	16.5	*30.0*	-	Remove	ivy growing into canopy
409	*Alnus rubra*	Red alder	9.0	Good	Good	15.4	15.4	15.4	15.4	*Not Exceptional unless in grove*	-	Remove	corrected phototropic lean, growing through fence
410	*Acer macrophyllum*	Bigleaf maple	5.8	Poor	Poor	13.2	13.2	13.2	13.2	*30.0*	-	Retain	growing out of rockery
411	*Prunus avium*	Wild cherry	9.0	Poor	Poor	6.4	6.4	6.4	6.4	*29.4*	-	Retain	multiple upright reiterated leaders
412	*Prunus avium*	Wild cherry	8.0	Poor	Poor	4.3	4.3	4.3	4.3	*29.4*	-	Retain	previously failed codominant stem, little live canopy left
413	*Prunus avium*	Wild cherry	6.0	Fair	Fair	8.3	8.3	8.3	8.3	*29.4*	-	Retain	top of rockery
414	*Prunus avium*	Wild cherry	11.0	Fair	Fair	9.5	9.5	9.5	9.5	*29.4*	-	Retain	previously topped, decay present, growing out side of rockery
415	*Prunus avium*	Wild cherry	7.0	Fair	Fair	9.3	9.3	9.3	9.3	*29.4*	-	Retain	growing out slope
416	*Acer macrophyllum*	Bigleaf maple	11.0	Good	Fair	13.5	13.5	13.5	13.5	*30.0*	-	Retain	
417	*Acer macrophyllum*	Bigleaf maple	10.0	Fair	Fair	15.4	15.4	15.4	15.4	*30.0*	-	Remove	ivy obscures defects
418	*Unknown*	Unknown	8.0	Poor	Poor	1.3	1.3	1.3	1.3	*30.0*	-	Retain	living snag, growing at top of steep slope, cannot determine species due to location, previously failed, in decline
419	*Acer macrophyllum*	Bigleaf maple	12.0	Fair	Fair	18.5	18.5	18.5	18.5	*30.0*	-	Retain	heavy ivy, previously failed and corrected, multiple breaks in canopy

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional by Size	Proposed Action DRAFT	Notes
420	*Acer macrophyllum*	Bigleaf maple	6.3	Fair	Fair	12.3	12.3	12.3	12.3	*30.0*	-	Retain	
421	*Acer macrophyllum*	Bigleaf maple	15.6	Fair	Fair	16.6	16.6	16.6	16.6	*30.0*	-	Remove	ivy, multistemmed at base
422	*Acer macrophyllum*	Bigleaf maple	6.0	Fair	Fair	9.3	9.3	9.3	9.3	*30.0*	-	Retain	heavy ivy obscures base, potentially multistemmed at base
423	*Acer macrophyllum*	Bigleaf maple	9.5	Good	Fair	12.4	12.4	12.4	12.4	*30.0*	-	Remove	multistemmed at base, invasive holly at base
424	*Acer macrophyllum*	Bigleaf maple	16.2	Fair	Fair	16.7	16.7	16.7	16.7	*30.0*	-	Retain	heavy ivy, base obscured
425	*Acer platanoides*	Norway maple	9.9	Good	Fair	11.4	11.4	11.4	11.4	*30.0*	-	Remove	ivy on base
426	*Camellia sinensis*	Camellia	9.2	Good	Good	11.4	11.4	13.4	1.4	*30.0*	-	Remove	phototropic away from school, canopy is primarily to the east, base of trunk is approximately 8” from school wall
427	*Acer rubrum*	Red maple	22.5	Good	Good	16.9	15.9	13.9	14.9	*25.0*	-	Remove	
428	*Acer circinatum*	Vine maple	8.3	Fair	Good	12.3	11.3	13.3	13.3	*8.0*	Exceptional	Remove	stressed, short shoot elongations, some canopy dieback, phototropic lean to the east
429	*Parrotia persica*	Persian ironwood	6.6	Good	Good	9.3	9.3	12.3	13.3	*14.3*	-	Retain	compacted soil around base near free library, SPS Stanford Tree collection/program
430	*Quercus robur*	English oak	9.8	Good	Good	11.4	7.9	10.4	13.4	*30.0*	-	Retain	

Tree Solutions Inc
Consulting Arborists

Preliminary Table of Trees

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Date of Inventory: Jan 11, 2022
Table Prepared: Jan 24, 2022

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional by Size	Proposed Action DRAFT	Notes
Adjacent Site Trees													
A	*Willow* spp.	Willow	6.0	Fair	Fair	8.3	8.3	8.3	8.3	*30.0*	-	Retain	ID to be confirmed when in leaf
B	*Acer platanoides*	Norway maple	6.0	Fair	Fair	17.3	17.3	17.3	17.3	*30.0*	-	Retain	17’ overhang over school property
C	*Acer platanoides*	Norway maple	22.8	Good	Good	29.0	29.0	29.0	29.0	*30.0*	-	Retain	28’ overhang over school property, base is obscured by ivy, ivy needs to be managed, few sprouts at base coming through fence
D	*Tsuga heterophylla*	Western hemlock	24.0	Good	Fair	20.0	20.0	20.0	20.0	*24.0*	Exceptional	Retain	heavy ivy, base is obscured
E	*Chamaecyparis pisifera*	Sawara cypress	16.0	Good	Good	14.7	14.7	14.7	14.7	*26.9*	-	Retain	filifera, canopy over driveway will likely require pruning for adequate clearance
F	*Chamaecyparis pisifera*	Sawara cypress	16.0	Good	Good	14.7	14.7	14.7	14.7	*26.9*	-	Retain	canopy over driveway will likely require pruning for adequate clearance
G	*Chamaecyparis pisifera*	Sawara cypress	28.0	Good	Good	15.2	15.2	15.2	15.2	*26.9*	Exceptional	Retain	Not identified on SDOT map, but if it is an SDOT tree will not be considered exceptional. If the tree is on private property, it will meet the exceptional tree criteria
H	*Acer macrophyllum*	Bigleaf maple	6.0	Fair	Poor	5.3	5.3	5.3	5.3	*30.0*	-	Retain	growing adjacent to fence
R1	*Acer rubrum*	Red maple	8.0	Good	Good	12.3	12.3	12.3	12.3	*25.0*	-	Retain	rubra sp, check sdot map, dedication plaque at base
R2	*Acer rubrum*	Red maple	10.0	Good	Good	12.4	12.4	12.4	12.4	*25.0*	-	Retain	dedication plaque at base, surface roots, root infrastructure conflict, growing out of root well
R3	*Acer rubrum*	Red maple	4.9	Good	Good	6.2	6.2	6.2	6.2	*25.0*	-	Retain	dedication plaque at base, seems to be donated tree

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R4	*Acer rubrum*	Red maple	4.2	Good	Good	6.2	6.2	6.2	6.2	*25.0*	-	Retain	
R5	*Acer rubrum*	Red maple	11.0	Good	Fair	13.5	13.5	13.5	13.5	*25.0*	-	Retain	tree grate being enveloped
P1	*Calocedrus decurrens*	Incense cedar	51.5	Good	Good	18.1	18.1	18.1	18.1	*30.0*	Exceptional	Retain	measured at narrowest point below union
P2	*Calocedrus decurrens*	Incense cedar	21.7	Good	Good	12.9	12.9	12.9	12.9	*30.0*	-	Retain	
P3	*Calocedrus decurrens*	Incense cedar	32.3	Good	Good	15.3	15.3	6.3	15.3	*30.0*	Exceptional	Retain	measured at narrowest point below union, shares canopy with adjacent trees
P4	*Calocedrus decurrens*	Incense cedar	32.5	Good	Good	22.4	22.4	22.4	22.4	*30.0*	Exceptional	Retain	
P5	*Calocedrus decurrens*	Incense cedar	34.7	Good	Good	14.4	21.4	1.4	16.4	*30.0*	Exceptional	Retain	shares canopy with adjacent trees
P6	*Crataegus monogyna*	Common hawthorn	6.6	Good	Good	7.3	7.3	7.3	7.3	*16.2*	-	Retain	
P7	*Crataegus monogyna*	Common hawthorn	7.3	Good	Good	9.3	9.3	9.3	9.3	*16.2*	-	Retain	very saturated soils
P8	*Calocedrus decurrens*	Incense cedar	29.0	Good	Good	18.2	18.2	18.2	18.2	*30.0*	-	Retain	
P9	*Calocedrus decurrens*	Incense cedar	20.5	Good	Good	12.9	12.9	12.9	12.9	*30.0*	-	Retain	
P10	*Crataegus monogyna*	Common hawthorn	7.4	Good	Good	9.3	9.3	9.3	9.3	*16.2*	-	Retain	

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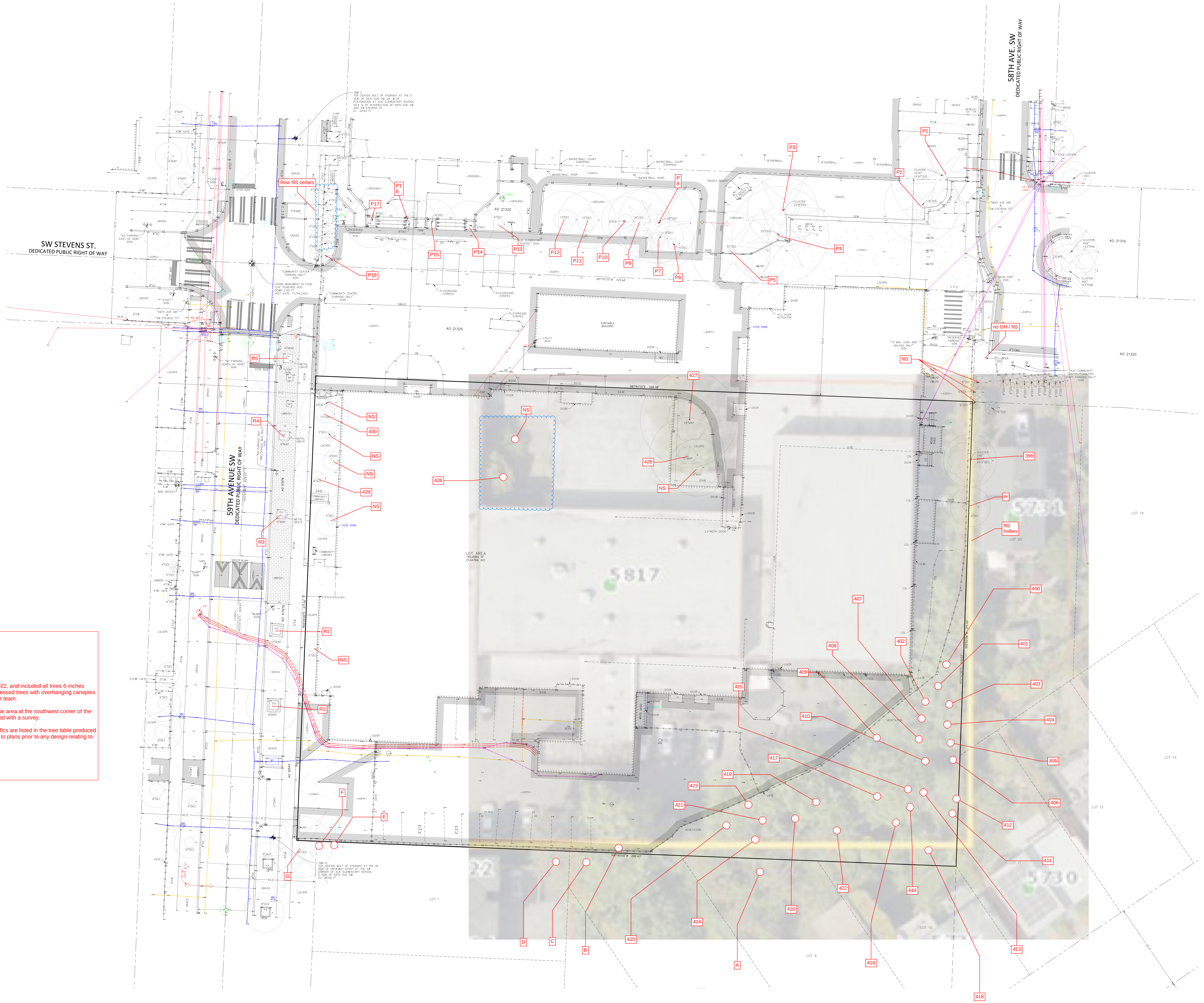
P11	*Crataegus monogyna*	Common hawthorn	10.1	Good	Good	10.4	10.4	10.4	10.4	*16.2*	-	Retain	
P12	*Crataegus monogyna*	Common hawthorn	11.0	Good	Good	11.5	11.5	11.5	11.5	*16.2*	-	Retain	compacted and wet soils
P13	*Crataegus monogyna*	Common hawthorn	5.8	Good	Good	9.2	9.2	9.2	9.2	*16.2*	-	Retain	
P14	*Crataegus monogyna*	Common hawthorn	7.3	Good	Good	7.3	7.3	7.3	7.3	*16.2*	-	Retain	compacted soils with pooling water in tree well
P15	*Crataegus monogyna*	Common hawthorn	5.5	Good	Good	6.2	6.2	6.2	6.2	*16.2*	-	Retain	
P16	*Crataegus monogyna*	Common hawthorn	7.9	Good	Good	9.3	9.3	9.3	9.3	*16.2*	-	Retain	
P17	*Crataegus monogyna*	Common hawthorn	8.1	Good	Good	10.3	10.3	10.3	10.3	*16.2*	-	Retain	
P18	*Juniperus* spp.	Ornamental juniper	5.9	Good	Good	7.2	7.2	7.2	7.2	*30.0*	-	Retain	upright bluish species, young planting



Annotated Survey with Aerial Overlay

Tree Solutions Inc.
Arborist: S. Dugan, A. Starbird
206-528-4670

Tree Inventory

Tree inventory took place on January 11, 2022, and included all trees 6-inches diameter or greater on the site. We also assessed trees with overhanging canopies or trees identified as important by the project team.

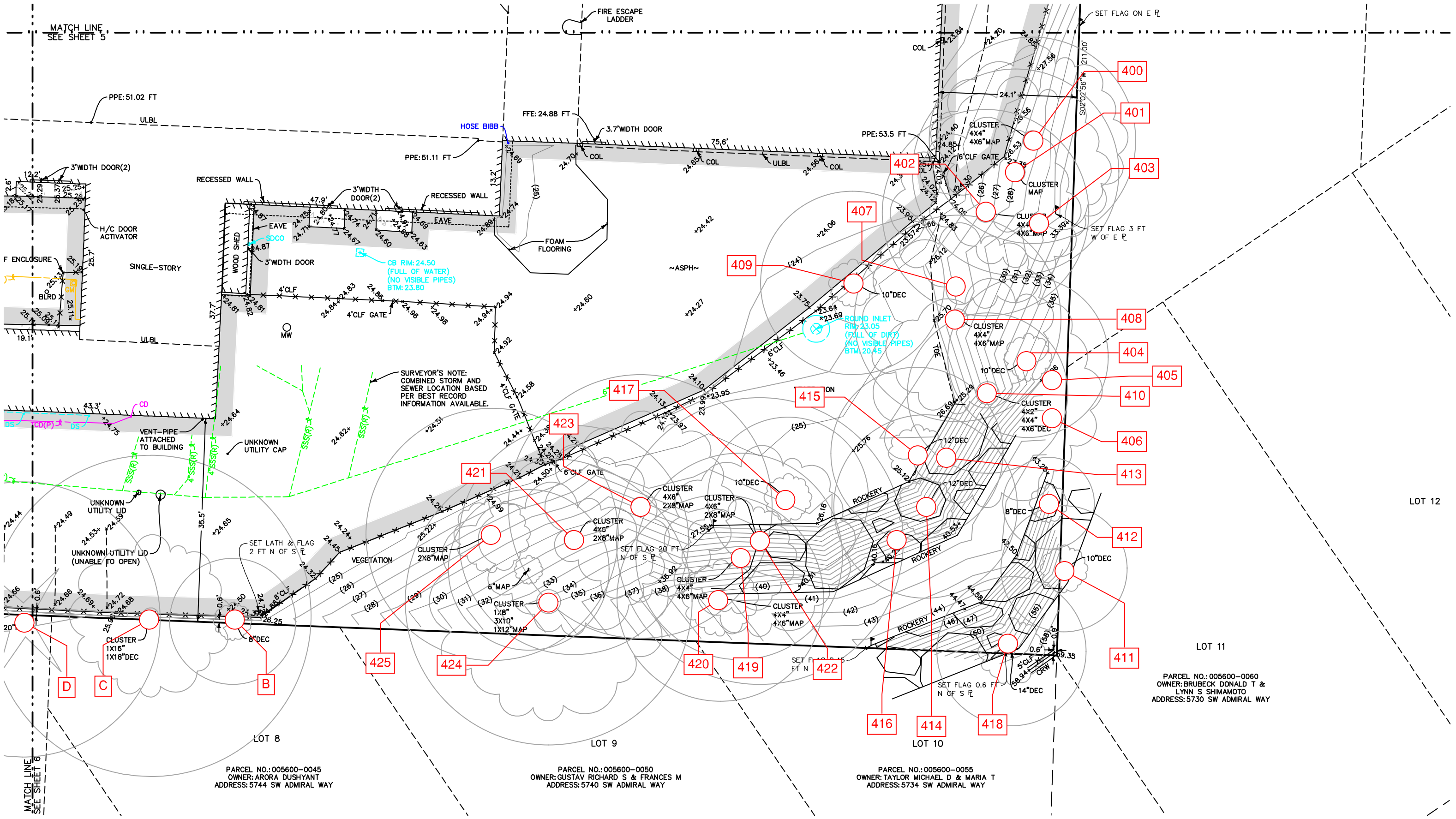
Tree locations in the steep critical steep slope area at the southwest corner of the site are approximate and should be confirmed with a survey.

Dripline measurements and other tree specifics are listed in the tree table produced by Tree Solutions Inc. and should be added to plans prior to any design relating to tree protection.

Below regulated size: NS

Not on survey: ○

IN THE SW 1/4 OF THE SE 1/4 OF SECTION 10, TOWNSHIP 24 NORTH, RANGE 3 EAST, W.M.



LEGEND

	ASPHALT (ASPH)
BE	BUILDING ENTRANCE
o	BOLLARD (BLRD)
▨	BRICK SURFACE
	BUILDING LINE
BC	BUILDING CORNER
BR	BIKE RACK
	BUILDING LIGHT
	CANOPY
	CATCH BASIN (CB)
	CONCRETE SURFACE
CC/XC/&G	CONCRETE/EXTRUDED CURB/& GUTTER
CD	CONDUIT DROP

CW/BW	CONCRETE/BRICK WALK
CRW	CONCRETE RETAINING WALL
—x—x—	CHAIN LINK FENCE (CLF)
COL	COLUMN
℄/M	CENTERLINE/MONUMENT LINE
CS/MS/WS	CONCRETE/METAL/WOOD STAIRS
♿	H/C PARKING SPACE
CON	CONIFEROUS TREE
DEC	DECIDUOUS TREE
COC	CENTER OF CHANNEL
DS	DOWN SPOUT
DWY	DRIVEWAY
ECD	ELECTRICAL CONDUIT
ED	ELECTRICAL DUCT
EM	ELECTRICAL METER
EV/ET	ELECTRICAL VAULT/TRANSFORMER

	FOUND SURVEY MONUMENT (AS NOTED)
	FIRE HYDRANT
FFE	FINISH FLOOR ELEVATION
G	GAS MAIN
GM	GAS METER
	GAS VALVE
GV	GAS VAULT
GB	GRADE BREAK
	GUY ANCHOR
○ GP/UP/PP	GUY/POWER/UTILITY POLE
	HANDRAIL
IV	IRRIGATION VALVE
IE	INVERT ELEVATION
	LIGHT POLE (WOOD)
☼	LIGHT POLE (DECORATIVE)

LSCAPE/PA	LANDSCAPE/PLANTER
◎	MANHOLE
US	MAILBOX (FEDERAL/PRIVATE)
○ MW	MONITOR WELL
OHP/OHC//OHF OHT	OVERHEAD POWER/FIBER/CABLE/TELEPHONE
OHG	OVERHEAD GUYWIRE
PPE	PARAPET ELEVATION
P.S.	PARKING SPACE(S)
ℙ	PROPERTY LINE (PL)
(P)	PAINTED UTILITY LOCATION
⟹	PIPE FLOW DIRECTION
CP/DI/CMP/VC	CONCRETE/IRON/METAL/CLAY (PIPE TYPES)
PE/PVC	POLYETHYLENE PIPE (POLYMER PIPE TYPES)
PS/PSS	COMBINED/SANITARY SEWER
PSD	STORM DRAIN
⊞	PRIVATE CATCH BASIN

(R)	RECORD DATA
	ROCKERY
SD	SERVICE DRAIN (STORM)
SDCO/SSCO	STORM DRAIN/SANITARY SEWER
SSS	SANITARY SIDE SEWER
	SIGN/STREET NAME SIGN
	TEMPORARY BENCHMARK (TBM)
TCD	TELEPHONE CONDUIT (BURIED)
→	TRAFFIC FLOW DIRECTION
TOE	TOE OF SLOPE
TOP	TOP OF BANK
ULBL	UPPER LEVEL BUILDING LINE
WV	WATER VAULT
W	WATER MAIN
WM	WATER METER

⋈	WATER VALVE
	WATER GATE VALVE/CHAMBER
VO/CO	VACATION/CONDEMNATION ORDINANCE
	WOOD FENCE (WF)
	FLAG
	IRON FENCE (WIF)
ALD	ALDER TREE
CED	CEDAR TREE
HEM	HEMLOCK TREE
MAP	MAPLE TREE
OAK	OAK TREE
PINE	PINE TREE
RHO	RHODODENDRON TREE

N

10 0 5 10
(IN FEET)
1 inch = 10 ft.

1969
DAKIN A. BEL

NO	REVISION	DATE

BUSH, ROED & HITCHINGS, INC.
LAND SURVEYORS & CIVIL ENGINEERS
2009 MINOR AVE. EAST
SEATTLE, Washington
98102-3513
(206) 323-4144
1-800-935-0508
WWW.BRHINC.COM

BOUNDARY AND TOPOGRAPHIC SURVEY
5817 SW STEVENS ST
SEATTLE PUBLIC SCHOOLS
SEATTLE KING COUNTY WASHINGTON

drawn by JRP
checked by DAB
scale 1"=10'
date 12/13/21
job no. 2021231.00
sheet 7 of 7

Appendix E

HAZARDOUS MATERIALS SURVEY REPORT

Limited Hazardous Building Material Survey Seattle School District No. 1 Alki Elementary School

3010 59th Avenue South
Seattle, Washington

EHSI Project No. 11541

Prepared for:
Brian Fabella
Project Manager
Seattle School District No.1
2445 Third Avenue South
Seattle, Washington 98134

Prepared by:
EHS-International, Inc.
1011 Southwest Klickitat Way, Suite 104
Seattle, Washington 98134
206-381-1128

Sunny Joshi
Project Manager

Mikes Harris
Senior Technical Reviewer

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- Environmental Consulting
- Hazardous Materials Management
- Industrial Hygiene Services
- Construction Management
- Indoor Air Quality

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EXECUTIVE SUMMARY

Seattle School District No. 1 has contracted EHS-International, Inc. (EHSI), a hazardous materials and industrial hygiene consulting firm, to conduct a Limited Hazardous Materials Survey of Alki Elementary School located at 3010 59th Avenue Southwest Seattle, Washington (Site). EHSI understands that the survey will be used in project planning for upcoming Alki Elementary School Replacement project which includes a complete demolition of the Site.

The limited hazardous materials survey included asbestos-containing materials (ACM); lead-containing paint (LCP); polychlorinated biphenyl (PCB)-containing light ballasts; mercury-containing fluorescent light tubes, switches, and thermostats; and other regulated materials. This survey was performed in accordance with federal, state, and local regulatory requirements. Each regulated material included in the survey is summarized below.

Previous Reports

As part of our asbestos survey methodology, EHSI reviewed previous reports and the AHERA Management plan available for the Site. EHSI was provided with two good faith inspection (GFI) surveys and the AHERA Management plan for the site. Two documents, *2008 Good Faith Inspection Letter - Alki Elementary School and 2009 Good Faith Inspection Letter - Alki Elementary School* were prepared by Novo Laboratory and Consulting Services, dated March 20th, 2008, and January 26th, 2009, and were both written as comprehensive hazardous material building surveys. EHSI incorporated results of both GFI's while creating our sampling plan.

Thirty-eight (3) bulk asbestos samples were collected during the survey, and seven (7) homogenous areas of ACMs were found. Samples were collected from various types of vinyl floor tile and mastic and window frame sealant or glazing compounds. Additionally, two (2) lead samples were taken, and painted building components were found to contain some lead in paint. EHSI has incorporated these homogenous materials into this report.

Asbestos-Containing Building Materials

EHSI collected one hundred and fifty (150) bulk samples of suspect ACM at the Site. Additionally, eight (8) split bulk samples were sent to a second laboratory for quality assurance purposes. Of the one hundred and fifty (150) bulk samples, laboratory analyses revealed thirty-seven (37) bulk samples from fifteen (15) homogenous materials contained greater than one percent asbestos. Several of the materials that do not contain asbestos are adhered to ACM and must also be assumed to be contaminated with asbestos in the event those materials are removed or disturbed during demolition. Specific sample locations of the suspect materials can be referenced in sample location figures SL-1 through SL-3.

The following ACMs or assumed ACMs were identified at the Site described below by area.

- **3,000 SF -** Asbestos-Containing Material (ACM) Red 9'x9' vinyl flooring tile with black mastic (on concrete). Rooms 102 and 103, the Nurses office and Reception Area
- **792 SF** – ACM gray caulking (on fogged glass windowpanes). The varioussizes and

configurations of windows are described below. Reception Area, Kitchen, and classroom 102

  - 4’x11’
  - 1’x1’x 6”

- **7 Each (EA)** – Black rubber sink gasket with yellow mastic and yellow paper (on metal pipe 2’ outside diameter).

  Nurses’ office and classroom 202
- **24,000 SF–** ACM Tan 9’x9’ vinyl composite tile and 12’x12’ various colored vinyl composite tile with **black mastic** (on concrete). Throughout 1st floor.
- **147 SF/3 EA –** ACM Black window caulking (on metal frame window 7’x7’). North central Corridor
- **550 Linear Feet (LF) –** ACM Gray Caulking (on brick/marblecrete). Building Exterior
- **400 SF –** ACM White TSI (on bricks and paint in original boiler). Boiler Room
- **2,100 SF –** ACM White skim coat with blue paint (on concrete walls). Boiler Room
- **< 2 SF –** ACM Beige firestop (on GWB). Stock Room
- **4,000 SF** – ACM White joint compound (JC) (on Gypsum Wall Board (GWB). Throughout
- **540 SF/30 EA** – ACM Gray caulking (on metal frame window). Building Exterior
- **260 SF** – ACM Dark brown 9’x9’ vinyl flooring tile with black mastic (on wood). North Book Room and Psychology Office
- **5,600 SF** – ACM White JC (on GWB). Main distribution frame, Dumbwaiter access panel
- **5 SF**– ACM Residual TSI (on pipe). Attic
- **300 SF** – ACM Gray glazing (on wood frame window). Portable 1 and Portable 2
- **25 EA** – Speaker box (1’x1’) with assumed ACM internal components. Throughout
- **2 EA** – Speaker box (2’x4’) with assumed ACM internal components. Cafeteria East wall
- **31 EA** – Assumed ACM fire doors
  - **2 EA –** Metal fire door with 3-hour rating (double door type). Northeast Hallway
  - **16 EA** – Metal fire door with 90-minute rating (single door type). Throughout
  - **5 EA –** Wooden fire door with 1-hour rating (single door type). Throughout
  - **7 EA –** Metal fire door with 45-minute rating (single door type). Throughout
  - **1 EA** – Metal fire door with 20-minute rating (single door type). Gym Office
- **32 EA –** Large Wall heater (6’x3’) with assumed ACM internal components. Throughout
- **4 EA –** Small wall heater (2’x3’) with assumed ACM internal components. Throughout Bathrooms
- **75 EA –** Assumed ACM mudded elbows and pipe fittings. Throughout
- **1,033 SF –** Assumed ACM boiler insulation. Boiler Room
- **1,340 LF –** Assumed ACM pipe insulation. Throughout
- **6 EA –** Electrical panels with assumed ACM internal components. Throughout

Lead‑Containing Paint

EHSI completed a limited Lead assessment of the building using an X-Ray Fluorescence (XRF) Spectrum Analyzer. Lead was detected in XRF analyzed sample as a part of the limited hazardous building material survey. Because EHSI's survey was limited and did not include a comprehensive paint color and substrate survey, EHSI recommends assuming painted coatings within the building contain at least detectable levels of lead.

The OSHA Lead in Construction Standard applies to construction-related tasks that impact any detectable level of lead. During demolition activities, we recommend that the contractor use precautions and follow health and safety guidelines, since all painted surfaces within the project area are considered to contain detectable levels of lead. EHSI recommends that the provided XRF analyzed results be used in conjunction with other applicable (e.g., air monitoring) data to evaluate the potential for elevated occupation lead exposures during demolition activities.

Arsenic-Containing Materials

EHSI completed a limited Arsenic assessment of the building by collecting and analyzing three (3) paint chip samples. Arsenic was detected in three (3) of the collected samples as part of the limited hazardous building material survey.

The OSHA Arsenic in Construction Standard applies to construction-related tasks that impact any detectable level of Arsenic. During demolition activities, we recommend that the contractor use precautions and follow health and safety guidelines, since all painted surfaces within the project area are considered to contain detectable levels of Arsenic.

Polychlorinated Biphenyl Light Ballasts, Mercury, and Other Regulated Materials

As part of our survey for regulated materials, EHSI quantified the number of light ballasts and prepared an inventory of other installed regulated materials that may classify as universal hazardous wastes or other regulated wastes. These materials included mercury-containing items such as fluorescent light tubes, high-intensity discharge lighting, thermostats, and switches. All identified magnetic ballasts are assumed to contain PCBs. A similar assumption applies to mercury potentially present within fluorescent lamps and fluorescent light fixtures. Generally, it is not necessary to sample these materials because their presence within the building represents a future cost for disposal of the facility's installed contents.

The following regulated materials were identified at the Site described below.

- **3 EA –** Mercury containing thermostats
- **1 EA –** Fire alarm control panel w/ lead acid batteries
- **1,286 –** Mercury-containing light tubes
- **1 EA –** PCB-containing magnetic ballast
- **4 EA –** CFC containing refrigerators

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1.0 INTRODUCTION

Seattle School District No.1 has contracted EHS-International, Inc. (EHSI), a hazardous materials and industrial hygiene consulting firm, to conduct a Limited Hazardous Materials Survey of the Alki Elementary School building located at 3010 59th Avenue Southwest, Seattle, Washington (Site). EHSI understands that the survey will be used in project planning for upcoming Alki Elementary School Replacement project which includes a complete demolition of the Site.

The limited hazardous materials survey included asbestos-containing materials (ACM); lead-containing paint (LCP); polychlorinated biphenyl (PCB)-containing light ballasts; mercury-containing fluorescent light tubes, switches, and thermostats; and other regulated materials. This survey was performed in accordance with federal, state, and local regulatory requirements. Each regulated material included in the survey is summarized below.

1.1 Scope of Work

The scope of services for the limited hazardous materials survey included the following tasks:

- Review and incorporate past asbestos survey information into this survey.
- Collect bulk suspect asbestos-containing materials ACM samples as necessary to identify ACM within the Site building. Where bulk sampling or access is not possible, review available historical drawings and make inventory assumptions to the likely quantities of ACM that can be assumed.
- Collect limited lead-containing paint (LCP) chip samples of common color paints on representative building components and have them analyzed for lead. Inventory universal wastes such as potential polychlorinated biphenyl (PCB)-containing lighting ballasts; mercury-containing fluorescent light tubes; high pressure sodium lamps; mercury-containing fluorescent light tubes, switches, and thermostats.
- Prepare a summary report documenting the findings of the survey and provide tables summarizing hazardous materials, analytical data, comments and recommendations for handling and control.

1.2 Building Description

Alki Elementary School is located at 3010 59th Avenue Southwest in Seattle, Washington. The school was originally constructed is 1913 and was composed of five classrooms. Between 1953 and 1954, an auditorium/lunchroom, a gymnasium and six new classrooms were added, expanding the school and its capacity for students. An earthquake in April 1965 caused damages and it was determined the original 1913 structure would be demolished. The demolition occurred in 1965 and a replacement addition was completed in September 1967. Another renovation followed in 1968, during which eight classrooms, a, multipurpose room, and a learning resource center were added. The Alki Elementary School interior is composed of brick, concrete masonry unit and gypsum wallboard on wood framing. The exterior is composed of brick and marble Crete with several window panels and a flat membraned roofing system.

1.3 Limitations

The conclusions of the report are professional opinions based solely upon visual site observations, and interpretations of sample analyses as described in this report. The opinions presented herein apply to conditions existing at the time of the investigation, and interpretation of current regulations pertaining to ACMs. Therefore, opinions and recommendations provided herein might not apply to future conditions that may exist at the Site. Current applicable regulations should always be verified prior to any work involving asbestos or other regulated materials. This survey is not intended to be used as an abatement design document. All existing conditions, quantities, and locations should be verified prior to abatement. ACM may be located within areas that were not accessible during this survey. The survey did not include an investigation of potentially buried piping within or in the vicinity of the structures.

The purpose of the limited hazardous material survey is to reasonably test for evidence of asbestos and other hazardous materials in suspect or randomly selected materials at a facility. It should be noted that no survey can be comprehensive or exhaustive enough to eliminate the possibility that ACM present at the Site may not be detected during the survey. Therefore, the completion of this or any survey for ACM or other hazardous materials should not be considered a warranty or guarantee that these materials do not exist, even if they are not detected through a survey.

The survey did not include comprehensive sampling of the following materials or locations at the Site due to limited access:

- Materials associated with energized electrical equipment (e.g. wiring and panel boards) and transformers
- Materials located below grade in pipe chases
- Buried piping
- Gaskets or packing materials in closed equipment

Due to the age of the building on the Site, it is possible that materials associated with the above-noted structures/systems may be asbestos-containing. If suspect materials are determined to be present within the above-noted systems, the materials should be considered as presumed ACMs until proven otherwise by sampling and laboratory analysis.

2.0 METHODOLOGY

Information concerning the Site was obtained from site inspections conducted by EHSI employees including Mr. Matt Macfarlane, Ms. Haley Mills, and Mr. Reese Myers. Copies of their AHERA building inspector certifications are included in Appendix A. This section describes the sampling methodology and applicable asbestos regulations.

2.1 Asbestos Survey Methodology

A visual inspection of accessible areas was conducted to identify suspect ACM and assumed ACM. The asbestos survey was performed by AHERA-certified building inspectors in accordance with a sampling protocol appropriate for the demolition of the Site building. The sampling protocol was developed in accordance with the following:

- U. S. Environmental Protection Agency (EPA) Asbestos Regulation within the Toxic Substances Control Act (40 Code of Federal Regulation [CFR] 763)
- Puget Sound Clean Air Agency (PSCAA) Asbestos Control Standards (Regulation III, Article 4), and
- Washington State Department of Labor and Industries Asbestos, Tremolite, Anthophyllite, and Actinolite Regulation (WAC 296-62-077).

The sampling plan included, at a minimum, the collection and analysis of samples as follows:

- Thermal system insulation (TSI): EHSI collected a minimum of three samples in a distributive manner from each homogeneous sampling area not presumed to contain asbestos. At least one bulk sample of patched TSI was collected from each homogenous area, if the patch was less than 6 square feet in area.
- Surfacing material: EHSI collected a minimum of three samples in a distributive manner from each homogenous area that was 1,000 square feet or less in area. A minimum of five samples were collected from each homogenous area that was more than 1,000 square feet but less than or equal to 5,000 square feet in area. A minimum of seven samples were collected from each homogenous area that was more than 5,000 square feet in area.
- Miscellaneous material: EHSI collected bulk samples of suspect ACM in a distributive manner as deemed sufficient by the AHERA-certified building inspector. At least one sample was collected of each suspect miscellaneous material not presumed to contain asbestos.
- Non-suspect materials: According to 40 CFR 763-86(4), where the accredited inspector has deemed the material to be fiberglass, foam glass, rubber, or other recognized non-ACM, sampling is not required.

EHSI collected four hundred thirty-seven (437) bulk samples of suspect ACM. Samples were collected by carefully removing small portions of the suspect material with a sharp knife or other hand tool suitable for the material being sampled. The sampling instrument was wiped with a clean moist cloth to decontaminate the tool and minimize the potential release of asbestos fibers or cross-contamination of subsequent samples. Once collected, each bulk sample was sealed in a new clean plastic bag to eliminate the possibility of cross-contamination, labeled with the sample name, and shipped to the analytical laboratory under standard chain-of-custody protocols. Bulk ACM sample locations are illustrated in Figures SL-1 through SL-5.

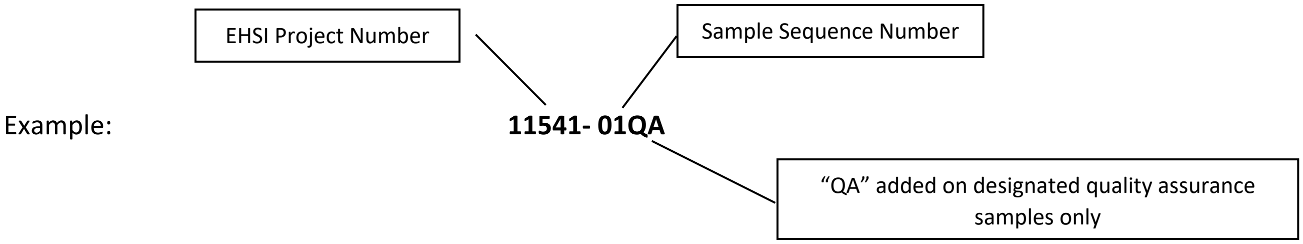
2.1.1 Previous Reports

As part of our asbestos survey methodology, EHSI reviewed previous reports and the AHERA Management plan available for the Site. EHSI was provided with two good faith inspection (GFI) surveys and the AHERA Management plan for the site. Two documents, *2008 Good Faith Inspection Letter - Alki Elementary School and 2009 Good Faith Inspection Letter - Alki Elementary School* were prepared by Novo Laboratory and Consulting Services, dated March 20th, 2008, and January 26th, 2009, and were both written as comprehensive hazardous material building surveys. EHSI incorporated results of both GFI's while creating our sampling plan.

Thirty-eight (38) bulk asbestos samples were collected during the survey, and seven (7) homogenous areas of ACMs were found. Samples were collected from various types of vinyl floor tile and mastic and window frame sealant or glazing compounds. Additionally, two (2) lead samples were taken, and painted building components were found to contain some lead in paint. EHSI has incorporated these homogenous materials into this report.

2.1.2 Sample Documentation

A unique sample identification system was employed for bulk samples of suspect ACMs collected during the survey that includes the project number, and sample sequence number.



Data pertinent to each sample (e.g., date, sample name, material description, and material category) was recorded on a field data sheet. The material determination of friability was made by the AHERA-certified building inspector in the field. Details regarding the bulk samples of suspect ACMs and their friability are summarized in Table 1.

2.1.3 Laboratory Analysis

As specified in 40 CFR 763.87, each sample was analyzed using polarized light microscopy (PLM) with dispersion staining in accordance with EPA Method 600/R-93/116. Samples were analyzed for asbestos content by NVL Laboratories, Inc. (NVL) in Seattle, Washington. NVL participates in the National Institute for Standards and Technology National Voluntary Laboratory Accreditation Plan (NVLAP). Only materials containing greater than 1% total asbestos were classified as "asbestos-containing" based on EPA, state, and local regulations.

Split samples were collected from some same locations for the purposes of quality assurance (QA) and sent to a separate laboratory for analysis. QA samples were submitted to Seattle Asbestos Test, LLC (SAT) in Seattle, Washington. SAT is also a NVLAP-accredited laboratory.

Laboratory analytical reports and chain-of-custody forms are provided in Appendix B. Laboratory certifications are provided in Appendix C.

2.2 Lead Survey

EHSI's lead survey consisted of x-ray fluorescence (XRF) samples of suspect paints and building materials. EHSI used an Olympus Delta x-ray fluorescence (XRF) Spectrum Analyzer to measure lead content of paint coatings and suspect lead containing materials During the survey EHSI followed the manufacturer's instructions for pre- and post – calibration checks on the XRF using National Institute of Standards and Technology (NIST) calibration cards. XRF readings of paint are considered representative of all layers of paint at each sample location. Results of XRF samples are included in Table 2.

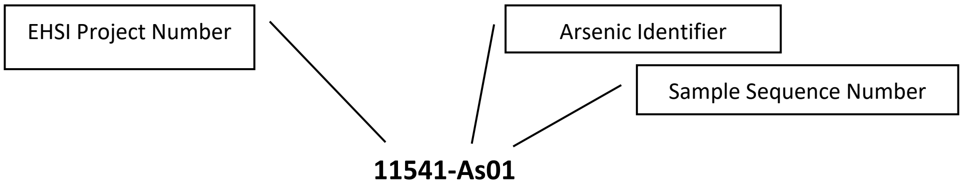
2.3 Arsenic Survey

The Arsenic survey consisted of EHSI collecting a minimal number of representative suspect paint chip samples. EHSI collected three (3) samples during the limited hazardous building material survey. Paint chip samples were obtained by carefully scraping the paint layers away from the substrate with a stainless-steel knife blade. Approximately 1 square inch of paint coating was removed for each sample. Samples were then placed into 2-ounce, puncture-proof, polyethylene bags, labeled with sample name, and placed in a box for shipping to the analytical laboratory under standard chain-of-custody protocols. The sampling blade was cleaned to reduce the possibility of cross-contamination between sample locations

2.3.1 Sample Documentation

A unique sample identification system was employed for mortar samples that included the project number, chemical abbreviation for lead, and sample sequence number.

Example:



2.3.2 Laboratory Analysis

The mortar samples were analyzed in accordance with EPA Method 3051/6010D by NVL. NVL participates in the National Environmental Laboratory Accreditation Program and employs American Industrial Hygiene Association quality control procedures.

Laboratory analytical reports and chain-of-custody forms are provided in Appendix B. Laboratory certifications are provided in Appendix C.

2.4 Visual Survey of PCBs, Mercury, and Other Regulated Materials

Verifying the presence or absence of PCBs, mercury, or other regulated materials by laboratory analysis, was beyond the scope of this survey. The survey did include visual identification and determination of quantities of potentially PCB-containing fluorescent light ballasts or transformers. All the magnetic ballasts were assumed to contain PCBs. A similar assumption applies to mercury potentially present within fluorescent lamps in fluorescent light fixtures, High Intensity Discharge (HID) lamps, thermometers, thermostats, mercury switches.

3.0 RESULTS

This section summarizes the results of the limited hazardous building material survey conducted at the Site.

3.1 Asbestos

The following ACMs or assumed ACMs were identified at the Site, described below. All quantities are approximate.

- **3,000 SF -** Asbestos-Containing Material (ACM) Red 9’x9’ vinyl flooring tile with black mastic (on concrete). Rooms 102 and 103, the Nurses office and Reception Area
- **792 SF** – ACM gray caulking (on fogged glass windowpanes). The varioussizes and configurations of windows are described below. Reception Area, Kitchen, and classroom 102
    - 4’x11’
    - 1’x1’x 6”
- **7 Each (EA)** – Black rubber sink gasket with yellow mastic and yellow paper (on metal pipe 2’ outside diameter).

  Nurses’ office and classroom 202
- **24,000 SF–** ACM Tan 9’x9’ vinyl composite tile and 12’x12’ various colored vinyl composite tile with **black mastic** (on concrete). Throughout 1st floor.
- **147 SF/3 EA –** ACM Black window caulking (on metal frame window 7’x7’). North central Corridor
- **550 Linear Feet (LF) –** ACM Gray Caulking (on brick/marblecrete). Building Exterior
- **400 SF –** ACM White TSI (on bricks and paint in original boiler). Boiler Room
- **2,100 SF –** ACM White skim coat with blue paint (on concrete walls). Boiler Room
- **< 2 SF –** ACM Beige firestop (on GWB). Stock Room
- **4,000 SF** – ACM White joint compound (JC) (on Gypsum Wall Board (GWB). Throughout
- **540 SF/30 EA** – ACM Gray caulking (on metal frame window). Building Exterior
- **260 SF** – ACM Dark brown 9’x9’ vinyl flooring tile with black mastic (on wood). North Book Room and Psychology Office
- **5,600 SF** – ACM White JC (on GWB). MDF, Dumbwaiter access panel
- **5 SF** – ACM Residual TSI (on pipe). Attic
- **300 SF** – ACM Gray glazing (on wood frame window). Portable 1 and Portable 2
- **25 EA** – Speaker box (1’x1’) with assumed ACM internal components. Throughout
- **2 EA** – Speaker box (2’x4’) with assumed ACM internal components. Cafeteria East wall
- **31 EA** – Assumed ACM fire doors
    - **2 EA –** Metal fire door with 3-hour rating (double door type). Northeast Hallway
    - **16 EA** – Metal fire door with 90-minute rating (single door type). Throughout
    - **5 EA –** Wooden fire door with 1-hour rating (single door type). Throughout
    - **7 EA –** Metal fire door with 45-minute rating (single door type). Throughout
    - **1 EA** – Metal fire door with 20-minute rating (single door type). Gym Office
- **32 EA –** Large Wall heater (6’x3’) with assumed ACM internal components. Throughout
- **4 EA –** Small Wall heater (2’x3’) with assumed ACM internal components. Throughout Bathrooms
- **75 EA –** Assumed ACM mudded elbows and pipe fittings. Throughout
- **1,033 SF –** Assumed ACM boiler insulation. Boiler Room

- **1,340 LF –** Assumed ACM pipe insulation. Throughout
- **6 EA –** Electrical panels with assumed ACM internal components. Throughout

A detailed summary of ACMs including the sample number, homogenous material description, material classification, analytical results, and quantity (for ACMs only) is provided in Table 1. Copies of the analytical laboratory reports and chain-of-custody forms for bulk samples of suspect ACM are included in Appendix B. Select photographs of ACMs are provided in Appendix D. Bulk suspect ACM sample locations are illustrated on Figures SL-1 through SL-5.

3.2 Lead

The Washington State Department of Commerce defines LCP as coatings with a concentration of lead greater than or equal to 0.5 percent by weight. However, the U.S. Department of Labor and the Washington State Department of Labor and Industries require that the Washington State Construction Standards for Lead (WAC 296-155-176) be followed during “new construction, alteration, repair, or renovation of structures, substrates, or portions thereof that contain lead, or materials containing lead.” These standards consider *any detectable* concentration of lead to be a potential hazard during construction activities.

EHSI used an XRF spectrum analyzer as part of the lead inspection. Thirty-four (34) samples were analyzed for Lead. XRF sample results ranged from 5.0 mg/kg to less than the detectable limit. Table 2 summarizes XRF lead samples, including sample number, material description, substrate, color, and analytical results. EHSI recommends treating all painted surfaces as having paint with detectable concentrations of lead. A comprehensive analysis of all potential painted surfaced and substrates color combinations was beyond the scope of work for this survey.

3.4 Arsenic

EHSI completed a limited Arsenic assessment of the building by collecting and analyzing three (3) paint samples. Arsenic was detected in three (3) of the collected samples as part of the limited hazardous building material survey.

A copy of the laboratory analytical report and chain-of-custody form for Arsenic samples are included in Appendix B.

4.0

3.5 PCBs, Mercury, and Other Regulated Materials

A tabulated summary of fluorescent light ballasts, mercury-containing light tubes, HID lamps, compact fluorescent light bulbs, switches, and thermostats, are provided in Table 5.

CONCLUSIONS AND RECOMMENDATIONS

A copy of this report must be provided to any contractor bidding and/or conducting work at the Site. The contractor must also have a copy of this report during renovation or demolition activities at the Site. Conclusions and recommendations for each regulated material category are summarized below.

4.1 Asbestos-Containing Materials

ACMs were identified at the Alki Elementary School building. An asbestos abatement contractor licensed in accordance with WAC 296-62-077 and PSCAA Regulation III, Article 4 must remove all asbestos-containing and asbestos contaminated building materials prior to disturbance.

The contractor should also use caution when performing renovation or demolition activities within the project areas even after asbestos abatement activities have been conducted. Concealed materials may be encountered during a renovation or demolition project. ACM may be located between walls, in pipe chases, between pipe flanges or other inaccessible areas.

If additional suspect building materials not identified specifically in this report as either ACM or non-ACM are identified during demolition activities, they should be treated as ACM until sampled by an AHERA-certified building inspector and proven to not contain asbestos through laboratory analysis.

4.2 Lead Paint

The Washington State Department of Labor and Industries considers any detectable concentration of lead to be a potential hazard during construction activities. Based on the limited testing of painted surfaces completed by EHSI, EHSI recommends assuming all painted surfaces in the project area contain at least detectable levels of lead. Most of the paint coatings were found to be in good condition. EHSI recommends that the contractor use precautions and follow applicable health and safety guidelines when removing materials during asbestos abatement activities, building renovation, or demolition.

For work on building components containing lead or other heavy metals, which may result in personnel exposures, the contractor must assess the hazard. Based on the assessment, and previous similar work and exposure monitoring results, the contractor may have to provide any or all the following for employees per WAC 296-155-176:

- Respiratory protection.
- Protective clothing.
- Clean change areas.
- Clean handwashing facilities.
- Biological monitoring to consist of blood sampling and analysis for lead and zinc protoporphyrin levels; and
- Hazard communication training.

Initial employee exposure monitoring must be conducted for each separate task involving the handling of LCP-coated building materials. If 8-hour time-weighted average exposures exceed the action level of 30 micrograms per cubic meter, the contractor must continue to conduct periodic air monitoring at specified intervals, and institute medical surveillance and comprehensive training programs. If the OSHA 8-hour time-weighted average permissible exposure limit of 50 micrograms per cubic meter of lead is exceeded, more stringent and additional requirements become effective, such as engineering controls, respiratory protection, regulated work areas and warning signs in lead work areas.

The general contractor performing renovation or demolition work should be informed of the presence of lead in the project area. All personnel impacting LCP (or other lead-containing materials) should be provided additional training concerning the health effects of lead, proper work methods, appropriate use of personal protective equipment, and regulations governing lead exposures. Air monitoring to assess lead exposures should be performed for all personnel involved in the demolition process where LCP may be removed.

4.3 PCBs, Mercury, and Other Regulated Materials

4.3.1 Polychlorinated Biphenyl Light Ballasts

The Washington State Dangerous Waste Regulation, WAC 173-303, designates that discarded transformers, capacitors, or bushings containing PCBs at concentrations of 2 parts per million or greater be treated as a PCB-containing material. Light ballasts fall under this regulation. Previous regulations dictated that any material with less than 50 parts per million of PCBs could be labeled as a non-PCB-containing material. Because of this regulatory change, EHSI recommends that all light ballasts be tracked, removed, handled, and disposed of in an appropriate manner. Ballasts with a label stating, "NO PCB" (or something similar) shall be packaged for recycling by an approved recycling facility.

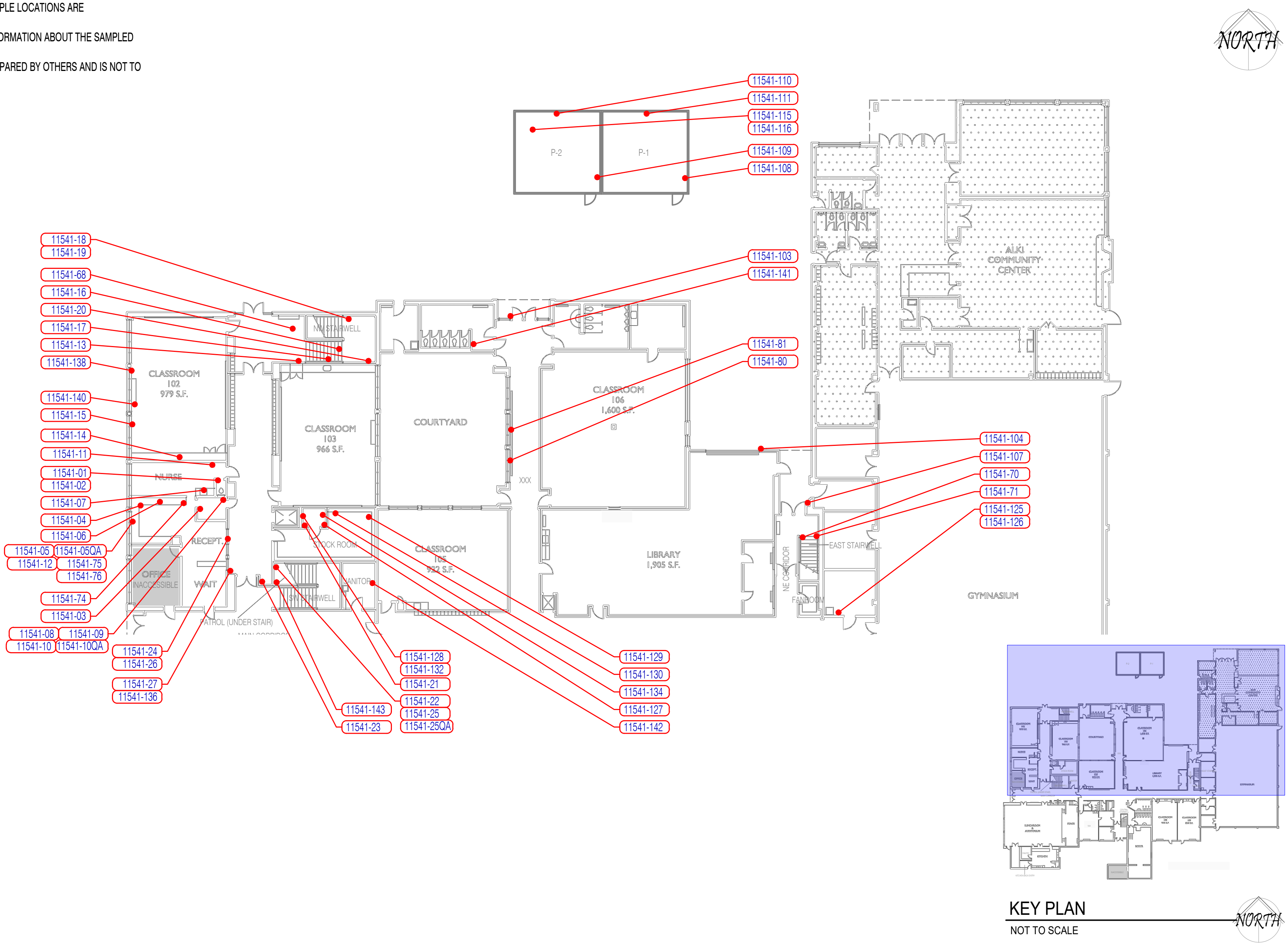
4.3.2 Mercury

Many fluorescent light tubes, HID lamps, thermostats, and switches contain mercury that is harmful to the environment and human health. The EPA and Washington State Department of Ecology have placed these materials in a special category of dangerous waste known as universal waste. Some of the requirements included within the Standards for Universal Waste Management (WAC 173-303-573) include:

- Immediately place lamps showing evidence of leakage, damage, etc. into a container following removal.
- Containerize in closed, structurally sound, compatible containers. Cardboard containers may be used for inside storage only.
- Labeling container as follows: "Waste Lamps," or "Universal Waste Lamps".
- Track the length of time since waste lamp generation. Acceptable methods of proof include date on label, inventory system, etc.
- Respond immediately to potential releases. If determined to be a release, contain, and determine if it designates as a dangerous waste.
- Disposal of universal waste as general or construction debris is not permitted.
- The crushing of fluorescent light tubes on-site is not allowed. In addition, measures should be taken to prevent breakage of fluorescent light tubes while the light tubes are in transit to their destination.
- Provide training to employees on the proper handling and emergency procedures for universal waste lamps.
- Track shipments of universal waste lamps with records (invoice, manifest, etc.) kept for a minimum of 3 years.

Figures

1. DRAWING IS SCHEMATIC AND SAMPLE LOCATIONS ARE APPROXIMATE.
2. REFER TO REPORT FOR MORE INFORMATION ABOUT THE SAMPLED MATERIALS.
3. BACKGROUND DRAWING WAS PREPARED BY OTHERS AND IS NOT TO SCALE.

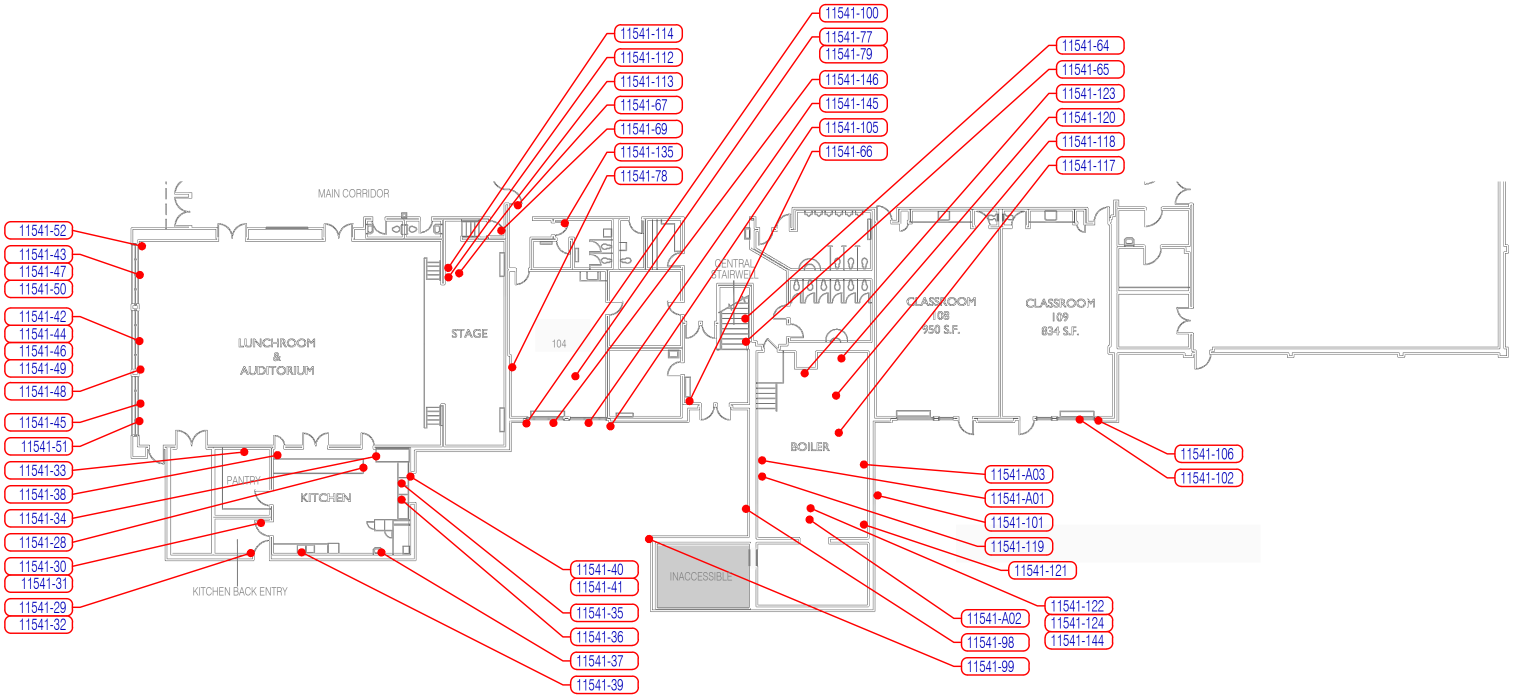


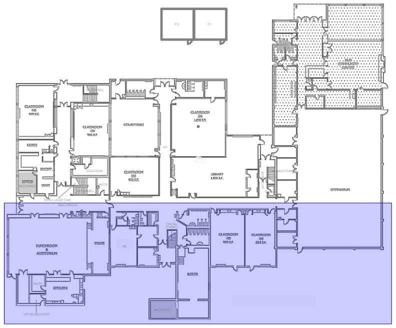
ehsi A Subsidiary of SoundEarth Strategies
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT INFO:	SURVEY DATES:	PROJECT MANAGER:	INSPECTORS:	LEGEND:	DRAWING TITLE:	ISSUE DATE:	EHSI PROJECT #
HAZARDOUS MATERIALS SURVEY ALKI ELEMENTARY SCHOOL 3010 59TH AVENUE SW SEATTLE, WA SEATTLE PUBLIC SCHOOLS SEATTLE, WA	02/23/22, 02/24/22 02/25/22	S. JOSHI DRAWN BY: F. DIMALANTA	M. MACFARLANE R. MYERS H. MILLS	11541-XX BULK ASBESTOS SAMPLE LOCATIONS	FIRST FLOOR PLAN NORTH	03/17/2022 SCALE: NTS	11541-01 SHEET SL-1

1. DRAWING IS SCHEMATIC AND SAMPLE LOCATIONS ARE APPROXIMATE.
2. REFER TO REPORT FOR MORE INFORMATION ABOUT THE SAMPLED MATERIALS.
3. BACKGROUND DRAWING WAS PREPARED BY OTHERS AND IS NOT TO SCALE.

NORTH





KEY PLAN

NOT TO SCALE

NORTH

ehsi
A Subsidiary of SoundEarth Strategies
1011 SW Klickitat Way, Suite 104
Seattle, Washington 98134
Ph: 206.381.1128
Fax: 206.254.4279

PROJECT INFO:
HAZARDOUS MATERIALS SURVEY
ALKI ELEMENTARY SCHOOL
3010 59TH AVENUE SW
SEATTLE, WA
SEATTLE PUBLIC SCHOOLS
SEATTLE, WA

SURVEY DATES:
02/23/22, 02/24/22
02/25/22

PROJECT MANAGER:
S. JOSHI

DRAWN BY:
F. DIMALANTA

INSPECTORS:
M. MACFARLANE
R. MYERS
H. MILLS

LEGEND:

11541-XX	BULK ASBESTOS SAMPLE LOCATIONS
11541-AXX	BULK ARSENIC SAMPLE LOCATIONS

DRAWING TITLE:
FIRST FLOOR PLAN
SOUTH

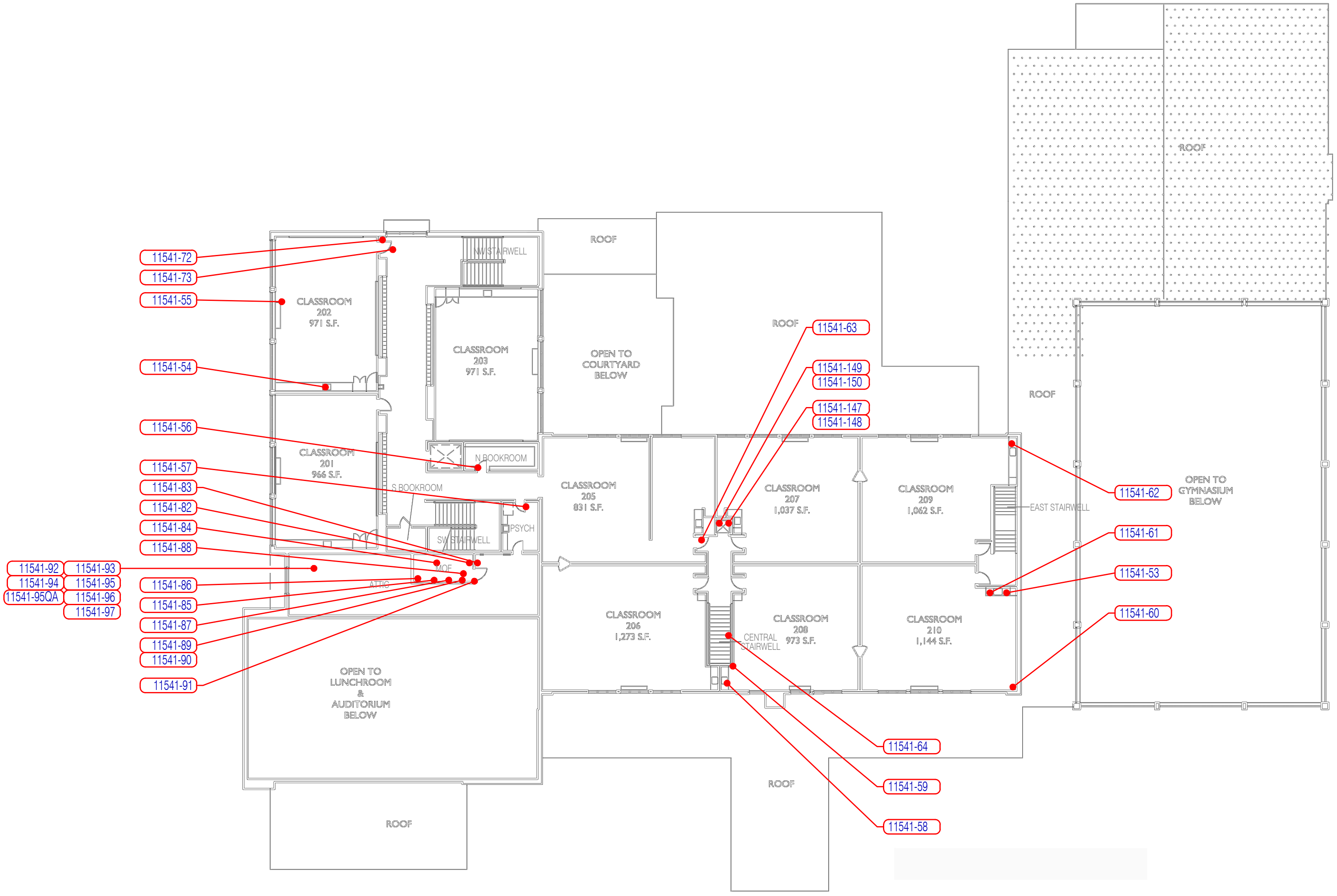
ISSUE DATE:
03/17/2022

SCALE:
NTS

EHSI PROJECT #
11541-01

SHEET
SL-2

1. DRAWING IS SCHEMATIC AND SAMPLE LOCATIONS ARE APPROXIMATE.
2. REFER TO REPORT FOR MORE INFORMATION ABOUT THE SAMPLED MATERIALS.
3. BACKGROUND DRAWING WAS PREPARED BY OTHERS AND IS NOT TO SCALE.



ehsi A Subsidiary of SoundEarth Strategies 1011 SW Klickitat Way, Suite 104 Seattle, Washington 98134 Ph: 206.381.1128 Fax: 206.254.4279	PROJECT INFO: HAZARDOUS MATERIALS SURVEY ALKI ELEMENTARY SCHOOL 3010 59TH AVENUE SW SEATTLE, WA SEATTLE PUBLIC SCHOOLS SEATTLE, WA	SURVEY DATES: 02/23/22, 02/24/22 02/25/22	PROJECT MANAGER: S. JOSHI DRAWN BY: F. DIMALANTA	INSPECTORS: M. MACFARLANE R. MYERS H. MILLS	LEGEND: 11541-XX BULK ASBESTOS SAMPLE LOCATIONS	DRAWING TITLE: SECOND FLOOR PLAN	ISSUE DATE: 03/17/2022 SCALE: NTS	EHSI PROJECT # 11541-01 SHEET SL-3

Tables

Table 1
Summary of Asbestos Bulk Sampling and Analytical Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW
Seattle, WA 98116
EHSI Project Number: 11541

Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
First Floor								
11541-01	**1**	**102 / 103 / Nurse / Reception**	**Red 9'x9' vinyl tile** on black mastic (on concrete)	**6% Chrysotile (vinyl tile)**	**3,000**	**SF**	**Misc.**	**NF**
11541-02 11541-03 11541-21	1	Throughout	4" brown cove base on tan & brown mastic (on GWB)	ND (all layers)	475	LF	Misc.	NF
11541-04 11541-74	1	Throughout	Yellow Formica countertop on yellow mastic (on wood)	ND (all layers)	136	SF	Misc.	NF
11541-05 **11541-138**	**1 / 2**	**Throughout**	**Gray caulking** (on fogged glass window 4'x11' on 1'x1'x6" glass panes)	**3% Chrysotile**	**792**	**LF**	**Misc.**	**F**
11541-06 11541-37	1	Reception Kitchen / Main Kitchen	Black rubber sink gasket on red paper (on pipe 2" OD)	ND (all layers)	2	EA	Misc.	NF
11541-07 **11541-54**	**1 / 2**	**Throughout**	Black rubber sink gasket on **yellow mastic** on yellow paper (on metal pipe 2" OD)	**4% Chrysotile (yellow mastic)**	**7**	**EA**	**Misc.**	**NF**
11541-08 11541-76	1	Throughout	2'x2' SACT worm track pattern	ND	980	SF	Misc.	NF
11541-09 11541-09QA 11541-75	1	Reception Office	1'x1' dot-patterned ACT on brown glue dot (on wood)	ND (all layers)	980	SF	Misc.	NF
11541-10 11541-20 11541-33 11541-136 11541-137 11541-140 11541-142	1/2	Throughout	White plaster on paint (on concrete)	ND	25,000	SF	Surfacing	F
11541-11	1	Nurse's Office	Clear mastic w/ debris (holding white casework to red vinyl tile)	ND	<24	SF	Misc.	NF
11541-12 11541-15	1	Throughout	Gray window caulking (on MFW 2'x3')	ND	576	SF	Misc.	NF
11541-13 11541-23	1	Throughout	6" blue cove base on yellow & brown mastic (on plaster and on GWB)	ND (all layers)	730	LF	Misc.	NF
11541-14 11541-16	1	Throughout	Green/black vinyl on brown mastic (on wood)*applied as flooring in stairwells and as countertop in classrooms	ND (all layers)	700	SF	Misc.	NF
11541-65 11541-71	1	Central Stairwell	Brown vinyl tile on brown mastic (on GWB) *applied as cove base	ND (all layers)	50	SF	Misc.	NF

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Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
11541-17	1	NW Stairwell	Black vinyl tile on brown mastic (on plaster on paint) *applied as cove base	ND (all layers)	50	SF	Misc.	NF
11541-18 11541-48 11541-48QA	1.5	Throughout	4" black cove base on yellow mastic (on wood / plaster)	ND (all layers)	162	LF	Misc.	NF
11541-19	1.5	NW Stairwell	Green 12'x12' vinyl tile on tan mastic (on wood)	ND (all layers)	12	SF	Misc.	NF
11541-22 **11541-25** **11541-25QA** **11541-66** **11541-67** **11541-135**	**1**	**Throughout 1st Floor**	Tan 9'x9' vinyl composite tile & various colored 12'x12' vinyl composite tile on **black mastic** (on concrete)	**3% Chrysotile (black mastic)**	**24,000**	**SF**	**Misc.**	**NF**
11541-24 11541-26	1	NW Corridor	Black foam window sealant (on metal frame window 2'x3')	ND	30 / 3	LF / EA	Misc.	NF
11541-27	1	NW Corridor	Green Formica on yellow mastic (on wood)	ND (all layers)	30	SF	Misc.	NF
11541-28	1	Kitchen	Brown/black vinyl on yellow mastic (on metal)	ND (all layers)	80	SF	Misc.	NF
11541-29 11541-30 11541-30QA	1	Kitchen	White plastic wainscoting on tan mastic (on wood)	ND (all layers)	720	SF	Misc.	NF
11541-31 11541-32	1	Kitchen	White caulking (behind wainscoting on CMU)	ND	110	LF	Misc.	NF
11541-34	1	Kitchen	White caulking (on plaster)	ND	<2	LF	Misc.	NF
11541-35	1	Kitchen	Yellow pipe dope under metal sink (on pipe 2" OD)	ND	<2	LF	Misc.	NF
11541-36	1	Kitchen	White pipe dope under metal sink (on pipe 2" OD)	ND	<6	LF	Misc.	NF
11541-38 11541-40	1	Kitchen	Gray mortar (between 5"x11" pink bricks and windows)	ND	180	SF	Misc.	NF
11541-41	1	Kitchen	Black window sealant (on metal frame window 1.5'x3')	ND	< 5/ 1	SF / EA	Misc.	NF
11541-42 11541-43	1	Cafeteria	Black window caulking (on metal frame window 4'x1')	ND	6	EA	Misc.	NF
11541-44 11541-45	1	Cafeteria	Black window caulking (on metal frame window 4'x2')	ND	36	EA	Misc.	NF
11541-46 11541-47	1	Cafeteria	Light gray window caulking (on metal frame window 4'x1')	ND	6	EA	Misc.	NF
11541-49 11541-50	1	Cafeteria	Dark gray caulking on red paint (on painted brick)	ND	<6	SF	Misc.	NF

Table 1
Summary of Asbestos Bulk Sampling and Analytical Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW
Seattle, WA 98116
EHSI Project Number: 11541

Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
11541-51 11541-52	1	Cafeteria	White & gray streaked 12'x12' vinyl tile on brown mastic (on concrete)	ND	2,400	SF	Misc.	NF
11541-68 11541-72	1	Throughout	1'x1' ACT deep wormhole pattern on brown mastic (on wood)	ND (all layers)	1,920	SF	Misc.	NF
11541-69	1	Main Corridor	1'x1' ACT worm track pattern on brown mastic (on wood)	ND (all layers)	2,460	SF	Misc.	NF
11541-77 11541-79	1	Classroom 104	White 1'x1' circle pattern ACT on brown mastic (on wood)	ND (all layers)	825	SF	Misc.	NF
11541-80 **11541-81**	**1**	**North Central Corridor**	**Black window caulking** (on metal frame window 7'x7')	**2-3% Chrysotile**	**147 / 3**	**SF / EA**	**Misc.**	**NF**
11541-98 11541-99 11541-100 11541-101 11541-102 11541-103 11541-104	1	Exterior	Brown marble Crete (on concrete)	ND	5,500	SF	Surfacing	F
11541-105 **11541-106** **11541-107**	**1**	**Exterior**	**Gray caulking** (on brick/marble Crete) *this material is present every place the marble Crete joins up against brick	**2% Chrysotile**	**550**	**LF**	**Misc.**	**NF**
11541-112	1	Stage	Blue curtain	ND	800	SF	Misc.	NF
11541-113	1	Stage	Tan curtain	ND	800	SF	Misc.	NF
11541-114	1	Stage	White curtain rope 1/4" OD	ND	160	LF	Misc.	NF
11541-117 **11541-118**	**1**	**Boiler Room**	**White TSI** (on bricks/paint in original boiler)	**23% Chrysotile**	**400**	**SF**	**TSI**	**F**
11541-119 **11541-120** **11541-121**	**1**	**Boiler Room**	**White skim coat w/ blue paint** (on concrete walls)	**2% Chrysotile**	**2,100**	**SF**	**Surfacing**	**F**
11541-122	1	Boiler Room	Green gasket (found on floor)	ND	1	EA	Misc.	NF
11541-123	1	Boiler Room	Gray gasket (found on floor)	ND	1	EA	Misc.	NF
11541-124 11541-144	1	Boiler Room	Chimney brick & mortar on blue paint	ND	128	SF	Misc.	NF
11541-125 11541-126	1	Throughout	Yellow fiberglass on white mud & white wrap 4" OD (on pipe 2" OD)	ND	3	EA	TSI	F
11541-127 11541-128	1	Elevator Mech Room	Red firestop (on GWB)	ND	<4	SF	Misc.	NF

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Alki Elementary School
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Seattle, WA 98116
EHSI Project Number: 11541

Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
11541-129 11541-130	1	Throughout	Gray caulking (on metal ducting 1' OD)	ND	1,600	LF	Misc.	NF
11541-131	**1**	**Stock Room**	**Beige firestop** (on GWB)	**2% Chrysotile**	**<2**	**SF**	**Misc.**	**NF**
11541-132 **11541-133** **11541-134** **11541-143**	**1**	**Throughout**	**White JC** (on GWB)	**2-3% Chrysotile *<1% when composited as part of a wallboard system)**	**4,000**	**SF**	**Misc.**	**F**
11541-139	1/2	Elevator	Tan vinyl on white mastic (on particle board flooring)	ND	24	SF	Misc.	NF
11541-141	1	Girls Bathroom North	Blue 2"x2" ceramic floor tile on gray grout, clear caulking, and debris (on concrete)	ND	480	SF	Misc.	NF
11541-145 **11541-146**	**1**	**Exterior**	**Gray caulking** (on metal frame window 6'x4')	**4% Chrysotile**	**540 / 30**	**SF / EA**	**Misc.**	**NF**

Table 1
Summary of Asbestos Bulk Sampling and Analytical Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW
Seattle, WA 98116
EHSI Project Number: 11541

Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
Assumed	**1/2**	**Throughout**	**Speaker box on assumed ACM internal components (1'x1')**	**Assumed**	**25**	**EA**	**Misc.**	**NF**
Assumed	**1**	**Cafeteria (East Wall)**	**Speaker box on assume ACM internal components (2'x4')**	**Assumed**	**2**	**EA**	**Misc.**	**NF**
Assumed	**1**	**NE Hallway**	**Metal 3-hour fire door on assumed ACM internal components**	**Assumed**	**2**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout**	**Metal 90-minute fire door on assumed ACM internal components**	**Assumed**	**16**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout**	**Wooden 1 hour fire door on assumed ACM internal components**	**Assumed**	**5**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout**	**Metal 45-minute fire door on assumed ACM internal components**	**Assumed**	**7**	**EA**	**Misc.**	**NF**
Assumed	**1**	**Gym Office**	**Metal 20-minute fire door on assumed ACM internal components**	**Assumed**	**1**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout**	**Wall heater on assumed ACM internal components (6'x3')**	**Assumed**	**24**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout Bathrooms**	**Wall heater on assumed ACM internal components (2'x3')**	**Assumed**	**4**	**EA**	**Misc.**	**NF**
Assumed	**1/2**	**Throughout**	**Assumed ACM mudded elbows/fittings**	**Assumed**	**75**	**EA**	**TSI**	**F**
Assumed	**1/2**	**Throughout**	**Assumed ACM pipe insulation**	**Assumed**	**1,340**	**LF**	**TSI**	**F**
Assumed	**1/2**	**Throughout Bathrooms**	**Electrical panels on assumed ACM internal components**	**Assumed**	**6**	**EA**	**Misc.**	**NF**
Assumed	**1**	**Boiler Room**	**Assumed ACM boiler insulation**	**Assumed**	**1,033**	**SF**	**TSI**	**F**
Assumed	**1**	**Boiler Room**	**Assumed ACM pipe insulation (on pipe 4" OD)**	**Assumed**	**220**	**LF**	**TSI**	**F**
Assumed	**1**	**Boiler Room**	**Assumed ACM pipe insulation (on pipe 6" OD)**	**Assumed**	**165**	**LF**	**TSI**	**F**
Assumed	**1**	**Boiler Room**	**Assumed ACM pipe insulation (on pipe 1' OD)**	**Assumed**	**120**	**LF**	**TSI**	**F**
Second Floor								
11541-53 11541-58	2	Throughout	Black rubber sink gasket (on pipe 2" OD)	ND	13	EA	Misc.	NF
11541-55	2	Classroom 202	Gray rolled carpet on tan mastic on green/black vinyl tile on black mastic (on wood)	ND (all layers)	800	SF	Misc.	NF
11541-56 **11541-57**	**2**	**N Book Room / Psych Office**	**Dark brown 9'x9' vinyl tile** on black mastic (on wood)	**3-4% Chrysotile**	**260**	**SF**	**Misc.**	**NF**
11541-59 11541-60	2	Throughout	Blue rolled carpet on yellow mastic (on wood)	ND (all layers)	2,200	SF	Misc.	NF
11541-61 11541-62	2	Throughout	Yellow Formica on clear mastic (on wood)	ND (all layers)	55	SF	Misc.	NF
11541-64 11541-70	1.5	Throughout	Brown vinyl on yellow mastic (on wood)	ND (all layers)	240	SF	Misc.	NF
11541-63 11541-73	2	Throughout	Various colored 12'x12' vinyl tile on yellow mastic on gray leveling compound on black mastic (on wood)	ND (all layers)	1,140	SF	Misc.	NF
11541-82 11541-83	2	MDF	Gray sealant (on white PVC pipe 4" OD)	ND	<5	LF	Misc.	NF

Table 1
Summary of Asbestos Bulk Sampling and Analytical Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW
Seattle, WA 98116
EHSI Project Number: 11541

Sample Number	Floor	HSA Location	Sample Description	Result	Quantity	Units	Material Type	Friable/ Non-Friable
11541-84 11541-85	2	MDF	Yellow translucent caulking (on GWB and wood)	ND	<50	LF	Misc.	NF
11541-86 11541-89	2	MDF	White 12'x12' vinyl tile on yellow mastic (on wood)	ND (all layers)	112	SF	Misc.	NF
11541-87 11541-88	2	MDF	3" white cove base on yellow mastic (on GWB)	ND (all layers)	40	LF	Misc.	NF
11541-90 **11541-91** **11541-149** **11541-150**	**2**	**Throughout**	**White jc** (on GWB)	**2% Chrysotile** ***<1% when composited as part of a wallboard system**	**5,600**	**SF**	**Misc.**	**NF**
11541-92 **11541-97**	**2**	**Attic**	**Residual TSI** (on pipe)	**<1-20% Chrysotile, 15% Amosite**	**5**	**LF**	**Surfacing**	**F**
11541-93 11541-96	2	Throughout	Yellow pipe dope (on pipe 2" OD)	ND	<10	SF	Misc.	NF
11541-147 11541-148	2	Dumbwaiter Access Panel	Red material (between metal beam and dumbwaiter winch assembly)	ND	<2	SF	Misc.	NF
			Portable					
11541-108	1	P-1	Chalkboard (black)	ND	40	SF	Misc.	NF
11541-109	1	P-2	Chalkboard (green)	ND	40	SF	Misc.	NF
11541-110 **11541-111**	**1**	**P-1 / P-2**	**Gray glazing** (on wood frame window)	**3% Chrysotile**	**300**	**SF**	**Misc.**	**NF**
11541-115 11541-116	Subfloor	P-2	Black vapor barrier paper on black mastic (under wood floor)	ND (all layers)	1,820	SF	Misc.	NF

Table 2
Summary of Arsenic Bulk Sampling and Analytical Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW

Sample Number	Floor	Location	Component / Substrate	Color	Results (percent Pb by weight)
First Floor					
11541-A1	1	Boiler Room	Paint / Skim / Concrete	Blue	<20.0
11541-A2	1	Boiler Room	Paint / Metal Pipe	Black	<40.0
11541-A3	1	Boiler Room	Paint / Skim / Concrete	Blue	<17.0

NOTES:

Bold text indicates sample contains detectable levels of Lead.

< = less than

As = Arsenic

Table 3
Summary of PCB Light Ballasts, Mercury, and other Regulated Materials
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW

Material Description	Quantity	Fixtures	Light Tubes/Bulbs	Magnetic Ballasts
1 foot by 4 foot fluorescent light fixture with three tubes and two electronic ballasts	--	635	1,270	1
2 foot by 4 foot fluorescent light fixture with three tubes and two electronic ballasts	--	8	16	--
Mercury containing thermostat	2	--	--	--
CFC-containing refrigerator	1	--	--	--
TOTAL	**--**	**643**	**1286**	**1**

NOTES:

Magnetic ballasts are assumed to contain polychlorinated biphenyls (PCBs)

CFC = chlorofluorocarbon

CFL = compact fluorescent lamp

HID = high intensity discharge

Table 9
Summary of XRF Results
Seattle Public Schools
Alki Elementary School
3010 59th Ave SW
Seattle, WA 98116
EHSI Project Number: 11541

Read Number	Floor	Location	Component	Substrate	Color	Results mg/cm^2
1	**2**	**205**	**Paint**	**GWB**	**White**	**0.30**
2	**2**	**205**	**Paint**	**GWB**	**Gray**	**0.32**
3	**2**	**208**	**Paint**	**GWB**	**Blue**	**0.76**
4	**2**	**210**	**Paint**	**GWB**	**White**	**0.31**
5	**2**	**Stairwell**	**Paint**	**GWB**	**White**	**0.01**
6	**1**	**Stairwell**	**Paint**	**GWB**	**White**	**0.01**
7	**1**	**Library**	**Paint**	**GWB**	**White**	**0.19**
8	1	Boys RR South	Paint	GWB	White	<LOD
9	1	Boys RR South	Paint	GWB	White	<LOD
10	1	Central N/S Corridor	Paint	GWB	White	<LOD
12	**1**	**105**	**Paint**	**GWB**	**White**	**0.18**
13	**1**	**Janitors Closet**	**Paint**	**Plaster**	**Off-White**	**0.18**
14	1	Cafeteria	Paint	GWB	White	<LOD
15	1	Cafeteria	Paint	GWB	Blue	<LOD
16	**1**	**Kitchen**	**Paint**	**Plaster**	**White**	**0.14**
17	1	Pantry	Paint	GWB	White	<LOD
18	**1**	**Pantry**	**Paint**	**CMU**	**White**	**0.87**
19	**1**	**Kitchen (Back Entry)**	**Paint**	**CMU**	**White**	**0.52**
20	**1**	**Kitchen**	**Paint**	**Brick**	**Pink**	**5.00**
21	1	Office	Paint	Plaster	White	<LOD
22	1	Office	Paint	Plaster	White	<LOD
23	**1**	**Office**	**Paint**	**GWB**	**Yellow**	**0.49**
24	**1**	**Nurse**	**Paint**	**GWB**	**Green**	**0.17**
25	**1**	**Hallway (Lockers)**	**Paint**	**Metal**	**Blue**	**0.07**
26	1	NW Stairwell (Storage Door)	Paint	Metal	Tan	<LOD
27	1	NW Stairwell	Paint	Plaster	White	<LOD
28	**2**	**Hallway (Lockers)**	**Paint**	**Metal**	**Blue**	**0.08**
29	2	203	Paint	GWB	Green	<LOD
30	2	Elevator	Paint	Metal	Brown	<LOD
31	**2**	**Elevator**	**Paint**	**Metal**	**Brown**	**0.02**
32	**2**	**N Bookroom**	**Paint**	**Plaster**	**Yellow**	**0.01**
33	**2**	**Psych Office**	**Paint**	**Plaster**	**Yellow**	**0.24**
34	**2**	**Attic Exhaust**	**Paint**	**Metal**	**Gray**	**0.33**
35	**1**	**Exterior (Portable)**	**Paint**	**Wood**	**Off-White**	**1.27**
36	1	Exterior (Portable)	Paint	Wood	Brown	<LOD

Table 9
Summary of XRF Results
Seattle Public Schools
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3010 59th Ave SW
Seattle, WA 98116
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Read Number	Floor	Location	Component	Substrate	Color	Results mg/cm^2
37	**1**	**Windows (Exterior Portable)**	**Paint**	**Wood**	**White**	**5.00**
38	**1**	**Door (Exterior Portable)**	**Paint**	**Wood**	**Brown**	**1.08**
39	**1**	**Portable (P1)**	**Paint**	**CAB**	**White**	**0.05**
40	**1**	**Portable (P2)**	**Paint**	**CAB**	**White**	**0.12**
41	**1**	**Door (Exterior)**	**Paint**	**Wood**	**Blue**	**0.15**
42	**1**	**Door (Exterior)**	**Paint**	**Metal**	**Blue**	**0.11**
43	**1**	**Door (Exterior)**	**Paint**	**Wood**	**Off-White**	**0.05**
44	**1**	**Exterior (Boiler Room)**	**Paint**	**Concrete**	**Off-White**	**0.19**
45	**1**	**Boiler Room**	**Paint**	**Plaster**	**Blue**	**5.00**
46	**1**	**Boiler Room**	**Paint**	**Plaster**	**Blue**	**5.00**
47	**1**	**Dumbwaiter**	**Paint**	**Metal**	**Blue**	**0.02**

NOTES:

LOD: Limit of Detection 0.01 mg/cm^2

Bold text indicates sample contains detectable levels of Lead.

< = less than

CAB = cement asbestos board

CMU = concrete masonry unit

GWB = gypsum wall board

Pb = lead

Appendix A

Inspector Certifications

Certificate of Completion

This is to certify that

Reese M. Myers

has satisfactorily completed
24 hours of training as an

AHERA Building Inspector

to comply with the training requirements of
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

182809
Certificate Number

ARGUS PACIFIC
TRAINING • CONSULTING
A Terracon COMPANY

Oct 27 - 29, 2021 Expires in 1 year.
Date(s) of Training

Exam Score: 92
(if applicable)

Instructor: David Welch

ARGUS PACIFIC, INC / 21905 64th AVE W, SUITE 100 / MOUNTLAKE TERRACE, WASHINGTON 98043 / 206.285.3373 / ARGUSPACIFIC.COM

Certificate of Completion

This is to certify that

Matthew A. Macfarlane

has satisfactorily completed
24 hours of training as an

AHERA Building Inspector

to comply with the training requirements of
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

182026
Certificate Number

ARGUS PACIFIC
TRAINING • CONSULTING
A Terracon COMPANY

Jul 21 - 23, 2021 Expires in 1 year.
Date(s) of Training

Exam Score: 96%
(if applicable)

Instructor: Alison Robinson

ARGUS PACIFIC, INC / 21905 64th AVE W, SUITE 100 / MOUNTLAKE TERRACE, WASHINGTON 98043 / 206.285.3373 / ARGUSPACIFIC.COM

Appendix B

Laboratory Analytical Reports and Chain-of-Custody Forms

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

March 1, 2022

David Braungardt
EHS International
1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 2203668.00

Client Project: 11541-01
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Dear Mr. Braungardt,

Enclosed please find test results for the 45 sample(s) submitted to our laboratory for analysis on 2/23/2022.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with **U. S. EPA 40 CFR Appendix E to Subpart E of Part 763**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116**, Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

NVLAP
Lab Code: 102063-0

Enc.: Sample Results

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321922 **Client Sample #: 11541-01**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Red vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**Chrysotile 6%**

Layer 2 of 3 **Description:** Thin black asphaltic mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles, Debris	Cellulose	<1%	**None Detected ND**

Layer 3 of 3 **Description:** Thin gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321923 **Client Sample #: 11541-02**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Tan brittle mastic with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 22321924 **Client Sample #: 11541-03**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles, Debris	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Tan brittle mastic with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris Paint	Cellulose <1%	**None Detected ND**

Lab ID: 22321925 **Client Sample #: 11541-04**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray/yellow vinyl material with yellow vinyl coating

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow brittle mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	None Detected ND	**None Detected ND**

Lab ID: 22321926 **Client Sample #: 11541-05**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** White crumbly sandy material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Sand, Fine particles Debris	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Fine grains Debris	Cellulose <1%	**Chrysotile 3%**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321927 **Client Sample #: 11541-06**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Pale red fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 79%	**None Detected ND**

Lab ID: 22321928 **Client Sample #: 11541-07**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Black rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles, Debris	None Detected ND	**None Detected ND**

Layer 2 of 3 **Description:** Beige crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected ND	**Chrysotile 4%**

Layer 3 of 3 **Description:** Tan fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 83%	**None Detected ND**

Lab ID: 22321929 **Client Sample #: 11541-08**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Glass debris	Cellulose 49%	**None Detected ND**
Paint	Glass fibers 34%	

Lab ID: 22321930 **Client Sample #: 11541-09**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Cellulose 84%	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles	Cellulose <1%	**None Detected ND**

Lab ID: 22321931 **Client Sample #: 11541-10**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Mineral grains, Fine particles	None Detected ND	**None Detected ND**
Paint		

Layer 2 of 2 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	Cellulose 2%	**None Detected ND**
Fine grains		

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321932 **Client Sample #: 11541-11**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small sample size.

Layer 1 of 1 **Description:** Clear brittle material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Wood flakes	Cellulose <1%	**None Detected ND**

Lab ID: 22321933 **Client Sample #: 11541-12**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose <1%	**None Detected ND**

Layer 2 of 3 **Description:** Black foamy material with thin clear adhesive and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Adhesive/Binder Debris	Cellulose <1%	**None Detected ND**

Layer 3 of 3 **Description:** Thin white fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 67%	**None Detected ND**

Lab ID: 22321934 **Client Sample #: 11541-13**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unable to separate mastics for analysis.

Layer 1 of 2 **Description:** Pale blue rubbery material with dark blue surface

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Off-white soft mastic with thin brown soft mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Lab ID: 22321935 **Client Sample #: 11541-14**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Black and green vinyl material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine particles	Synthetic fibers 2%	**None Detected ND**
	Cellulose <1%	

Layer 2 of 2 **Description:** Brown brittle mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Lab ID: 22321936 **Client Sample #: 11541-15**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black foamy material with clear adhesive and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Adhesive/Binder Debris	Cellulose <1%	**None Detected ND**

Lab ID: 22321937 **Client Sample #: 11541-16**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Green vinyl material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Thin black asphaltic mastic with wood debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Debris Wood flakes	Cellulose	2%	**None Detected ND**

Lab ID: 22321938 **Client Sample #: 11541-17**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Black brittle vinyl material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles, Debris	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles, Debris	Cellulose	<1%	**None Detected ND**

Lab ID: 22321939 **Client Sample #: 11541-18**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Black rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles, Fine grains Debris	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Off-white soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** White compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous binder, Calcareous particles, Paint	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321940 **Client Sample #: 11541-19**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Green vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Thin beige crumbly material with wood debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Debris	Cellulose	1%	**None Detected ND**
Wood flakes			

Lab ID: 22321941 **Client Sample #: 11541-20**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small sample size.

Layer 1 of 2 **Description:** White crumbly material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains, Fine particles	None Detected	ND	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Thin off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**
Fine grains			

Lab ID: 22321942 **Client Sample #: 11541-21**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Layer 1 of 2 **Description:** Brown rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321943 **Client Sample #: 11541-22**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Trace amount of layer 2 remaining.

Layer 1 of 2 **Description:** Tan vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	Mineral fibers	4%	**None Detected ND**

Layer 2 of 2 **Description:** Trace black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles	None Detected	ND	**Chrysotile 3%**

Lab ID: 22321944 **Client Sample #: 11541-23**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Pale blue rubbery material with dark blue surface

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Off-white soft mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 3 of 3 **Description:** Thin white compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous binder, Calcareous particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 22321945 **Client Sample #: 11541-24**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black foamy material with clear adhesive and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam, Adhesive/Binder Debris	Cellulose	1%	**None Detected ND**

Lab ID: 22321946 **Client Sample #: 11541-25**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unable to separate materials in layer 2 for analysis, asbestos concentrated in black mastic.

Layer 1 of 2 **Description:** Pale pink vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow soft adhesive with black asphaltic mastic and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Adhesive/Binder, Asphalt/Binder, Fine particles Debris	Cellulose	<1%	**Chrysotile 2%**

Lab ID: 22321947 **Client Sample #: 11541-26**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black foamy material with clear adhesive and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam, Debris	Cellulose	1%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321948 **Client Sample #: 11541-27**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray/white vinyl with green patterned vinyl coating

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow brittle adhesive with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Adhesive/Binder, Fine particles, Debris	Cellulose	<1%	**None Detected ND**

Lab ID: 22321949 **Client Sample #: 11541-28**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Black and brown vinyl material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles, Debris	Synthetic fibers	1%	**None Detected ND**
	Cellulose	<1%	

Layer 2 of 2 **Description:** Thin yellow mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	None Detected	ND	**None Detected ND**

Lab ID: 22321950 **Client Sample #: 11541-29**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Glass fibers	10%	**None Detected ND**

Layer 2 of 2 **Description:** Tan brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321951 **Client Sample #: 11541-30**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White vinyl material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Tan brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321952 **Client Sample #: 11541-31**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White rubbery material with trace paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Debris Paint	None Detected	ND	**None Detected ND**

Lab ID: 22321953 **Client Sample #: 11541-32**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White rubbery material with trace paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Debris Paint	Cellulose	<1%	**None Detected ND**

Lab ID: 22321954 **Client Sample #: 11541-33**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small amount of layer 2 for thorough analysis.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 2 **Description:** White crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Trace off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321955 **Client Sample #: 11541-34**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	<1%	**None Detected ND**

Lab ID: 22321956 **Client Sample #: 11541-35**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Tan soft crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Fine grains	Synthetic fibers	2%	**None Detected ND**
Debris	Cellulose	<1%	

Lab ID: 22321957 **Client Sample #: 11541-36**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321958 **Client Sample #: 11541-37**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Layer 1 of 2 **Description:** Black rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Layer 2 of 2 **Description:** Pale red fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 83%	**None Detected ND**

Lab ID: 22321959 **Client Sample #: 11541-38**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Loose beige crumbly sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Sand, Fine particles Mineral grains	None Detected ND	**None Detected ND**

Lab ID: 22321960 **Client Sample #: 11541-39**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white soft material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Lab ID: 22321961 **Client Sample #: 11541-40**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Beige brittle material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Mineral grains, Fine particles Debris	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203668.00
Client Project #: 11541-01
Date Received: 2/23/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22321962 **Client Sample #: 11541-41**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black foamy material with clear adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam, Adhesive/Binder	None Detected	ND	**None Detected ND**

Lab ID: 22321963 **Client Sample #: 11541-42**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Rubber/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22321964 **Client Sample #: 11541-43**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Rubber/Binder, Fine particles	Cellulose	<1%	**None Detected ND**

Lab ID: 22321965 **Client Sample #: 11541-44**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material with red embedded fibrous mesh

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Rubber/Binder, Fine particles	Synthetic fibers	5%	**None Detected ND**

Lab ID: 22321966 **Client Sample #: 11541-45**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Rubber/Binder, Fine particles	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/01/2022
Reviewed by: Nick Ly **Date:** 03/01/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203668.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/2/2022 **Time** 3:55 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	22321922	11541-01		A
2	22321923	11541-02		A
3	22321924	11541-03		A
4	22321925	11541-04		A
5	22321926	11541-05		A
6	22321927	11541-06		A
7	22321928	11541-07		A
8	22321929	11541-08		A
9	22321930	11541-09		A
10	22321931	11541-10		A
11	22321932	11541-11		A
12	22321933	11541-12		A
13	22321934	11541-13		A
14	22321935	11541-14		A
15	22321936	11541-15		A
16	22321937	11541-16		A
17	22321938	11541-17		A
18	22321939	11541-18		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	2/23/22	1555
Analyzed by	Hilary Crumley		NVL	3/1/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/23/2022
Time: 3:53 PM
Entered By: Fatima Khan

ASBESTOS LABORATORY SERVICES

NVL

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203668.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/2/2022 **Time** 3:55 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
19	22321940	11541-19		A
20	22321941	11541-20		A
21	22321942	11541-21		A
22	22321943	11541-22		A
23	22321944	11541-23		A
24	22321945	11541-24		A
25	22321946	11541-25		A
26	22321947	11541-26		A
27	22321948	11541-27		A
28	22321949	11541-28		A
29	22321950	11541-29		A
30	22321951	11541-30		A
31	22321952	11541-31		A
32	22321953	11541-32		A
33	22321954	11541-33		A
34	22321955	11541-34		A
35	22321956	11541-35		A
36	22321957	11541-36		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	2/23/22	1555
Analyzed by	Hilary Crumley		NVL	3/1/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/23/2022
Time: 3:53 PM
Entered By: Fatima Khan

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203668.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/2/2022 **Time** 3:55 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45

Rush Samples

	Lab ID	Sample ID	Description	A/R
37	22321958	11541-37		A
38	22321959	11541-38		A
39	22321960	11541-39		A
40	22321961	11541-40		A
41	22321962	11541-41		A
42	22321963	11541-42		A
43	22321964	11541-43		A
44	22321965	11541-44		A
45	22321966	11541-45		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	2/23/22	1555
Analyzed by	Hilary Crumley		NVL	3/1/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/23/2022
Time: 3:53 PM
Entered By: Fatima Khan

2203668

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Pager: 206.344.1878
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

NVL LABS

Client EHS International, Inc.
Street 1011 SW Klickitat Way
Suite 104
Seattle, WA 98134
Project Manager David Braungardt
Project Location SSD Alki Elementary Regulated Materials/HazMat Consulting

Phone: (206) 381-1128 **Fax:** (206) 254-4279

NVL Batch Number
Client Job Number 11541-01
Total Samples
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address davidb@ehsintl.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other
☑ **Asbestos Bulk** ☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk
☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS	**Inst./Det Limit**	**Matrix**		**RCRA Metals**	☐ All 8	**Other Metals** ☐ All 3
☐ Total Metals ☐ TCLP	☐ FAA (ppm) ☐ ICP (ppm) ☐ GFAA (ppb)	☐ Air Filter ☐ Drinking water ☐ Dust/wipe (Area) ☐ Soil ☐ Paint Chips in %	☐ Paint Chips in cm ☐ Waste Water ☐ Other	☐ Arsenic (As) ☐ Barium (Ba) ☐ Cadmium (Cd) ☐ Chromium (Cr) ☐ Lead (Pb)	☐ Mercury (Hg) ☐ Selenium (Se) ☐ Silver (Ag)	☐ Copper (Cu) ☐ Nickel (Ni) ☐ Zinc (Zn)

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify)

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		11541- 01		
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13		✓		
14				
15		11541-45		

	Print Below	Sign Below	Company	Date	Time
Sampled by	Matt Macfarlane		EHSI	2.23.22	1240
Relinquished by	~~Matt Macfarlane~~ Reese Myers		EHSI	2.23.22	~~3:05~~ 1551
Received by			nvl labs	2/23/22	3:55pm
Analyzed by					
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Please e-mail results. cc: mattm@ehsintl.com, reesem@ehsintl.com

INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

March 3, 2022

David Braungardt
EHS International
1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 2203890.00

Client Project: 11541-01
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Dear Mr. Braungardt,

Enclosed please find test results for the 45 sample(s) submitted to our laboratory for analysis on 2/25/2022.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with **U. S. EPA 40 CFR Appendix E to Subpart E of Part 763**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116**, Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

NVLAP
Lab Code: 102063-0

Enc.: Sample Results

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323200 **Client Sample #: 11541-46**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray soft elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Black foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam	None Detected	ND	**None Detected ND**

Lab ID: 22323201 **Client Sample #: 11541-47**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray soft elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Black foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam	None Detected	ND	**None Detected ND**

Lab ID: 22323202 **Client Sample #: 11541-48**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 4 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 4 **Description:** Off-white soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 3 of 4 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 4 of 4 **Description:** White crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323203 **Client Sample #: 11541-49**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black soft elastic material with trace amount of paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 22323204 **Client Sample #: 11541-50**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black soft elastic material with trace amount of paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 22323205 **Client Sample #: 11541-51**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Trace amount of black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Fine particles	Cellulose	3%	**None Detected ND**

Layer 2 of 3 **Description:** Gray vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 3 of 3 **Description:** Beige soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323206 **Client Sample #: 11541-52**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Off-white vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Beige soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Cellulose	4%	**None Detected ND**
Insect parts, Debris			

Lab ID: 22323207 **Client Sample #: 11541-53**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323208 **Client Sample #: 11541-54**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Beige fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	26%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323209 **Client Sample #: 11541-55**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Multicolored fibrous material with white fibrous mesh and yellow brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Synthetic fibers 46%	**None Detected ND**

Layer 2 of 3 **Description:** Black vinyl with green coating material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected ND	**None Detected ND**

Layer 3 of 3 **Description:** Black asphaltic mastic (on wood)

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Fine particles, Wood flakes	Cellulose 4%	**None Detected ND**

Lab ID: 22323210 **Client Sample #: 11541-56**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown brittle tile

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected ND	**Chrysotile 3%**

Layer 2 of 2 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 22323211 **Client Sample #: 11541-57**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown brittle tile

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected ND	**Chrysotile 4%**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
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Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Fine particles	Cellulose	3%	**None Detected ND**

Lab ID: 22323212 **Client Sample #: 11541-58**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323213 **Client Sample #: 11541-59**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Multicolored fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Synthetic fibers	49%	**None Detected ND**

Layer 2 of 2 **Description:** Yellow/gray soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Cellulose	3%	**None Detected ND**

Lab ID: 22323214 **Client Sample #: 11541-60**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Multicolored fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Synthetic fibers	49%	**None Detected ND**

Layer 2 of 2 **Description:** Yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Cellulose	4%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323215 **Client Sample #: 11541-61**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Cellulose 34%	**None Detected ND**

Layer 2 of 2 **Description:** Beige soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles	Cellulose 2%	**None Detected ND**

Lab ID: 22323216 **Client Sample #: 11541-62**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Cellulose 36%	**None Detected ND**

Layer 2 of 2 **Description:** Beige soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 22323217 **Client Sample #: 11541-63**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Blue vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Beige soft mastic (on wood)

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Wood flakes	Cellulose 6%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

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Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323218 **Client Sample #: 11541-64**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Beige rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White crumbly mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323219 **Client Sample #: 11541-65**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown rubbery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic with paper and paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine grains, Fine particles	Cellulose	13%	**None Detected ND**
Paint	Wollastonite	2%	

Lab ID: 22323220 **Client Sample #: 11541-66**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** White vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Gray crumbly material with yellow adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Cellulose	4%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Adhesive/Binder

Layer 3 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Fine particles	None Detected	ND	**Chrysotile 3%**

Lab ID: 22323221 **Client Sample #: 11541-67**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Green vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Yellow brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Cellulose	2%	**None Detected ND**

Layer 3 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Fine particles	None Detected	ND	**Chrysotile 4%**

Lab ID: 22323222 **Client Sample #: 11541-68**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Off-white fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Glass fibers	49%	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323223 **Client Sample #: 11541-69**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Layer 1 of 2 **Description:** Off-white fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Perlite, Fine grains	Cellulose	37%	**None Detected ND**
Fine particles, Paint	Glass fibers	28%	

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323224 **Client Sample #: 11541-70**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Beige rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Beige brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Tan fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Wood flakes	Cellulose	98%	**None Detected ND**

Lab ID: 22323225 **Client Sample #: 11541-71**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Brown rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Brown brittle mastic with paper and paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine grains, Fine particles	Cellulose	11%	**None Detected ND**
Paint	Wollastonite	3%	

Lab ID: 22323226 **Client Sample #: 11541-72**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Insufficient sample amount for further analysis (Layer 3).

Layer 1 of 3 **Description:** Gray fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Glass beads, Perlite	Glass fibers	47%	**None Detected ND**
Fine particles, Paint	Cellulose	13%	

Layer 2 of 3 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** White compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Cellulose	3%	**Chrysotile 2%**

Lab ID: 22323227 **Client Sample #: 11541-73**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Blue vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Gray crumbly material with yellow mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine grains, Fine particles	Cellulose	14%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
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Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 3 of 3 **Description:** Black asphaltic mastic (on wood)

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Fine particles, Wood flakes	Cellulose	16%	**None Detected ND**

Lab ID: 22323228 **Client Sample #: 11541-74**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray vinyl with yellow coating material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Trace amount of beige mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	Cellulose	4%	**None Detected ND**

Lab ID: 22323229 **Client Sample #: 11541-75**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Tan fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Wood flakes, Paint	Cellulose	98%	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles	Cellulose	2%	**None Detected ND**

Lab ID: 22323230 **Client Sample #: 11541-76**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Beige fibrous material with paint and trace amount of beige mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine grains, Fine particles	Glass fibers	41%	**None Detected ND**
Glass beads, Paint	Cellulose	23%	

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
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Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323231 **Client Sample #: 11541-77**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Glass beads, Fine particles	Glass fibers	49%	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Brown brittle mastic with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose	26%	**None Detected ND**
	Talc fibers	2%	

Lab ID: 22323232 **Client Sample #: 11541-78**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Multicolored interwoven fibrous material with gray rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Synthetic fibers	38%	**None Detected ND**
	Glass fibers	14%	

Layer 2 of 3 **Description:** Beige vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**Chrysotile 3%**

Layer 3 of 3 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Fine particles	None Detected	ND	**Chrysotile 4%**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323233 **Client Sample #: 11541-79**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Glass beads, Fine particles	Glass fibers 44%	**None Detected ND**
Paint		

Layer 2 of 2 **Description:** Brown brittle mastic with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose 11%	**None Detected ND**
	Talc fibers 2%	

Lab ID: 22323234 **Client Sample #: 11541-80**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Cellulose 2%	**Chrysotile 3%**

Layer 2 of 2 **Description:** Black foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Synthetic foam	Cellulose 2%	**None Detected ND**

Lab ID: 22323235 **Client Sample #: 11541-81**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Gray crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	None Detected ND	**Chrysotile 2%**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Black foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Synthetic foam	Cellulose	3%	**None Detected ND**

Lab ID: 22323236 **Client Sample #: 11541-82**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Fine particles	Cellulose	3%	**None Detected ND**

Lab ID: 22323237 **Client Sample #: 11541-83**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Fine particles	Cellulose	11%	**None Detected ND**

Lab ID: 22323238 **Client Sample #: 11541-84**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Clear soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323239 **Client Sample #: 11541-85**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Layer 1 of 2 **Description:** Clear soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323240 **Client Sample #: 11541-86**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323241 **Client Sample #: 11541-87**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow soft mastic with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose	14%	**None Detected ND**

Lab ID: 22323242 **Client Sample #: 11541-88**
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022
Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 3 **Description:** White rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Vinyl/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 3 **Description:** Yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 3 of 3 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Cellulose 11%	**None Detected ND**

Lab ID: 22323243 **Client Sample #: 11541-89**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** White vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 3 **Description:** Yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 3 of 3 **Description:** Yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose 3%	**None Detected ND**

Lab ID: 22323244 **Client Sample #: 11541-90**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains, Fine particles	Cellulose 2%	**None Detected ND**

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203890.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Gypsum/Binder, Fine grains, Calcareous particles	Cellulose	15%	**None Detected ND**
	Glass fibers	9%	

Sampled by: Client
Analyzed by: Akane Yoshikawa **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203890.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45

Rush Samples

	Lab ID	Sample ID	Description	A/R
1	22323200	11541-46		A
2	22323201	11541-47		A
3	22323202	11541-48		A
4	22323203	11541-49		A
5	22323204	11541-50		A
6	22323205	11541-51		A
7	22323206	11541-52		A
8	22323207	11541-53		A
9	22323208	11541-54		A
10	22323209	11541-55		A
11	22323210	11541-56		A
12	22323211	11541-57		A
13	22323212	11541-58		A
14	22323213	11541-59		A
15	22323214	11541-60		A
16	22323215	11541-61		A
17	22323216	11541-62		A
18	22323217	11541-63		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Akane Yoshikawa		NVL	3/3/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:12 PM
Entered By: Kelly AuVu

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203890.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
19	22323218	11541-64		A
20	22323219	11541-65		A
21	22323220	11541-66		A
22	22323221	11541-67		A
23	22323222	11541-68		A
24	22323223	11541-69		A
25	22323224	11541-70		A
26	22323225	11541-71		A
27	22323226	11541-72		A
28	22323227	11541-73		A
29	22323228	11541-74		A
30	22323229	11541-75		A
31	22323230	11541-76		A
32	22323231	11541-77		A
33	22323232	11541-78		A
34	22323233	11541-79		A
35	22323234	11541-80		A
36	22323235	11541-81		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Akane Yoshikawa		NVL	3/3/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:12 PM
Entered By: Kelly AuVu

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203890.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
37	22323236	11541-82		A
38	22323237	11541-83		A
39	22323238	11541-84		A
40	22323239	11541-85		A
41	22323240	11541-86		A
42	22323241	11541-87		A
43	22323242	11541-88		A
44	22323243	11541-89		A
45	22323244	11541-90	Composite	A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Akane Yoshikawa		NVL	3/3/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:12 PM
Entered By: Kelly AuVu

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Pager: 206.344.1878
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

2203890

L A B S

Client EHS International, Inc.
Street 1011 SW Klickitat Way
Suite 104
Seattle, WA 98134
Project Manager David Braungardt
Project Location SSD Alki Elementary Regulated Materials/HazMat Consulting
Phone: (206) 381-1128 **Fax:** (206) 254-4279

NVL Batch Number
Client Job Number 11541-01
Total Samples
Turn Around Time ☐ 1-Hr ☐ 2-Hrs ☐ 4-Hrs ☐ 24-Hrs ☐ 2 Days ☐ 3 Days ☐ 4 Days ☑ 5 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address davidb@ehsintl.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other
☑ **Asbestos Bulk** ☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk
☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS
☐ Total Metals
☐ TCLP

Inst./Det Limit
☐ FAA (ppm)
☐ ICP (ppm)
☐ GFAA (ppb)

Matrix
☐ Air Filter
☐ Drinking water
☐ Dust/wipe (Area)
☐ Soil
☐ Paint Chips in %
☐ Paint Chips in cm
☐ Waste Water
☐ Other

RCRA Metals ☐ All 8
☐ Arsenic (As)
☐ Barium (Ba)
☐ Cadmium (Cd)
☐ Chromium (Cr)
☐ Lead (Pb)
☐ Mercury (Hg)
☐ Selenium (Se)
☐ Silver (Ag)

Other Metals
☐ All 3
☐ Copper (Cu)
☐ Nickel (Ni)
☐ Zinc (Zn)

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify)

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		11541- 46		
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		11541- 90		

	Print Below	Sign Below	Company	Date	Time
Sampled by	Reese M., Haley M., Matt M.		EHSI	2/26/22	
Relinquished by	Matt M.		EHSI	2/26/22	
Received by	Kelly Fuller			2/25/22	1605
Analyzed by					
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Please e-mail results. cc: mattm@ehsintl.com, reesem@ehsintl.com

INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

March 2, 2022

David Braungardt
EHS International
1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 2203891.00

Client Project: 11541-01
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Dear Mr. Braungardt,

Enclosed please find test results for the 45 sample(s) submitted to our laboratory for analysis on 2/25/2022.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with **U. S. EPA 40 CFR Appendix E to Subpart E of Part 763**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116**, Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

NVLAP
Lab Code: 102063-0

Enc.: Sample Results

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323245 **Client Sample #: 11541-91**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous binder, Calcareous particles, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Gypsum/Binder, Fine grains, Fine particles	Cellulose	25%	**None Detected ND**
	Glass fibers	4%	

Lab ID: 22323246 **Client Sample #: 11541-92**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Fine grains	None Detected	ND	**Chrysotile 20%**
			Amosite 15%

Lab ID: 22323247 **Client Sample #: 11541-93**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Tan crumbly/soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers	2%	**None Detected ND**

Lab ID: 22323248 **Client Sample #: 11541-94**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 3 **Description:** Thin white soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** White fibrous mesh with paper and foil with thin off-white mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Metal foil	Cellulose	50%	**None Detected ND**
Mastic/Binder	Glass fibers	15%	

Layer 3 of 3 **Description:** Yellow fluffy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Glass debris	Glass fibers	97%	**None Detected ND**

Lab ID: 22323249 **Client Sample #: 11541-95**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected	ND	**Chrysotile 70%**

Lab ID: 22323250 **Client Sample #: 11541-96**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Tan crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris	Synthetic fibers	2%	**None Detected ND**
	Cellulose	<1%	

Lab ID: 22323251 **Client Sample #: 11541-97**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of layer sequence. Analysis of layer 2 is inconclusive due to contamination from layer 3. Trace

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 3 **Description:** White soft material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles, Debris	Cellulose 15%	**None Detected ND**

Layer 2 of 3 **Description:** Thin tan soft crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles	None Detected ND	**Chrysotile <1%**

Layer 3 of 3 **Description:** Trace white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles	None Detected ND	**Chrysotile 7%**

Lab ID: 22323252 **Client Sample #: 11541-98**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence. Small amount of layer 2.

Layer 1 of 2 **Description:** Beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose thin off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Sand, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 22323253 **Client Sample #: 11541-99**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Thin beige brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Layer 2 of 3 **Description:** Loose thin off-white sandy material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles Paint	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Thin gray brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Fine particles Paint	None Detected	ND	**None Detected ND**

Lab ID: 22323254 **Client Sample #: 11541-100**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** Beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323255 **Client Sample #: 11541-101**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** Beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Loose off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323256 **Client Sample #: 11541-102**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence. Small sample size.

Layer 1 of 2 **Description:** Thin beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose thin off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323257 **Client Sample #: 11541-103**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** Beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323258 **Client Sample #: 11541-104**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 2 **Description:** Beige brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323259 **Client Sample #: 11541-105**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris	Cellulose	<1%	**Chrysotile 2%**

Lab ID: 22323260 **Client Sample #: 11541-106**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris	None Detected	ND	**Chrysotile 2%**

Lab ID: 22323261 **Client Sample #: 11541-107**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris Miscellaneous particles	Cellulose	<1%	**Chrysotile 2%**

Lab ID: 22323262 **Client Sample #: 11541-108**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Brown compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Cellulose 85%	**None Detected ND**

Lab ID: 22323263 **Client Sample #: 11541-109**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Thin green crumbly vinyl

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	Cellulose 1%	**None Detected ND**

Layer 2 of 2 **Description:** Tan fibrous backing with white mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Mastic/Binder	Cellulose 82%	**None Detected ND**

Lab ID: 22323264 **Client Sample #: 11541-110**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** White crumbly material with thin paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint Debris	Cellulose <1%	**Chrysotile 3%**

Lab ID: 22323265 **Client Sample #: 11541-111**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white crumbly material with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint Debris	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
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Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323266 **Client Sample #: 11541-112**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Dark purple woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 88%	**None Detected ND**

Lab ID: 22323267 **Client Sample #: 11541-113**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Beige woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 86%	**None Detected ND**

Lab ID: 22323268 **Client Sample #: 11541-114**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Loose off-white fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 87%	**None Detected ND**

Lab ID: 22323269 **Client Sample #: 11541-115**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 4 **Description:** Tan fibrous material black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Asphalt/Binder, Asphaltic Particles	Cellulose 59%	**None Detected ND**

Layer 2 of 4 **Description:** Black asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles	Cellulose 53%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 3 of 4 **Description:** Black asphaltic fibrous material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles, Debris Insect parts	Cellulose 54%	**None Detected ND**

Layer 4 of 4 **Description:** Tan fluffy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 73%	**None Detected ND**

Lab ID: 22323270 **Client Sample #: 11541-116**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 4 **Description:** Black asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles	Cellulose 53%	**None Detected ND**

Layer 2 of 4 **Description:** Tan fibrous material with black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Asphalt/Binder, Asphaltic Particles	Cellulose 63%	**None Detected ND**

Layer 3 of 4 **Description:** Black asphaltic fibrous material with black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Asphaltic Particles	Cellulose 55%	**None Detected ND**

Layer 4 of 4 **Description:** Tan fluffy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose 76%	**None Detected ND**

Lab ID: 22323271 **Client Sample #: 11541-117**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Beige crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Glass debris	None Detected	ND	**Chrysotile 23%**

Lab ID: 22323272 **Client Sample #: 11541-118**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Black asphaltic crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Paint	None Detected	ND	**Chrysotile 15%**

Layer 2 of 2 **Description:** Beige crumbly sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 22323273 **Client Sample #: 11541-119**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Fine particles	Cellulose	1%	**Chrysotile 2%**
Fine grains			

Lab ID: 22323274 **Client Sample #: 11541-120**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand, Fine particles	Cellulose	3%	**Chrysotile 2%**
Fine grains			

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

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Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 22323275 **Client Sample #: 11541-121**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Loose off-white sandy material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	Cellulose	4%	**Chrysotile 2%**
Fine grains, Paint			

Lab ID: 22323276 **Client Sample #: 11541-122**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Green soft material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	Cellulose	10%	**None Detected ND**

Lab ID: 22323277 **Client Sample #: 11541-123**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 2 **Description:** Black fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	50%	**None Detected ND**

Layer 2 of 2 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	52%	**None Detected ND**
	Glass fibers	4%	

Lab ID: 22323278 **Client Sample #: 11541-124**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence. Small amount of layer 2.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

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Client: EHS International
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Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 2 **Description:** Loose beige crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Glass debris Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Loose thin beige sandy material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles Paint	None Detected	ND	**None Detected ND**

Lab ID: 22323279 **Client Sample #: 11541-125**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Off-white soft crumbly coating

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Glass debris	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Yellow fluffy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Glass debris	Glass fibers	96%	**None Detected ND**

Lab ID: 22323280 **Client Sample #: 11541-126**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Layer 1 of 3 **Description:** Off-white soft crumbly coating

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Glass debris	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** White fibrous mesh with paper and foil with off-white mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mastic/Binder, Metal foil	Cellulose	50%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

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Client: EHS International
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Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

	Glass fibers 15%	

Layer 3 of 3 **Description:** Yellow fluffy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Glass debris	Glass fibers 96%	**None Detected ND**

Lab ID: 22323281 **Client Sample #: 11541-127**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small amount of layer 2 for analysis, trace amount remaining.

Layer 1 of 2 **Description:** Red soft material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Mineral grains	Glass fibers 6%	**None Detected ND**

Layer 2 of 2 **Description:** Trace white compacted powdery material with paint and paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Calcareous particles, Paint	Cellulose 20%	**None Detected ND**

Lab ID: 22323282 **Client Sample #: 11541-128**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small amount of layer 2 for analysis, trace amount remaining.

Layer 1 of 2 **Description:** Red soft material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Mineral grains	Glass fibers 5%	**None Detected ND**

Layer 2 of 2 **Description:** Trace white compacted powdery material with paint and paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Calcareous particles, Paint	Cellulose 25%	**None Detected ND**

Lab ID: 22323283 **Client Sample #: 11541-129**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

---

Layer 1 of 1 **Description:** Gray soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	<1%	**None Detected ND**

Lab ID: 22323284 **Client Sample #: 11541-130**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Gray soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Cellulose	1%	**None Detected ND**

Lab ID: 22323285 **Client Sample #: 11541-131**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**Chrysotile 2%**

Lab ID: 22323286 **Client Sample #: 11541-132**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Trace amount of layer 1 remaining.

Layer 1 of 2 **Description:** Trace white compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous binder, Calcareous particles, Paint	Cellulose	<1%	**None Detected ND**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Gypsum/Binder, Fine grains, Fine particles	Cellulose	26%	**None Detected ND**
	Glass fibers	4%	

Lab ID: 22323287 **Client Sample #: 11541-133**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203891.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles	Cellulose <1%	**None Detected ND**

Lab ID: 22323288 **Client Sample #: 11541-134**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Thin white compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Calcareous binder, Calcareous particles	Cellulose 45%	**None Detected ND**

Lab ID: 22323289 **Client Sample #: 11541-135**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Confirmation by TEM is recommended for vinyl tile due to limitation of PLM to detect fibers below 0.25

Layer 1 of 2 **Description:** Tan vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Vinyl/Binder, Fine grains, Fine particles	Mineral fibers 4%	**None Detected ND**

Layer 2 of 2 **Description:** Black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Asphalt/Binder, Asphaltic Particles	Cellulose <1%	**Chrysotile 4%**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/02/2022
Reviewed by: Nick Ly **Date:** 03/02/2022

Nick Ly, Technical Director

ASBESTOS LABORATORY SERVICES

Company	EHS International	**NVL Batch Number**	**2203891.00**
Address	1011 SW Klickitat Way. Suite 104 Seattle, WA 98134	**TAT**	5 Days **AH** No
		Rush TAT	
Project Manager	Mr. David Braungardt	**Due Date**	3/4/2022 **Time** 4:15 PM
Phone	(206) 381-1128	**Email**	davidb@ehsintl.com
Cell	(206) 510-8305	**Fax**	(206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk

Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	22323245	11541-91	Composite	A
2	22323246	11541-92		A
3	22323247	11541-93		A
4	22323248	11541-94		A
5	22323249	11541-95		A
6	22323250	11541-96		A
7	22323251	11541-97		A
8	22323252	11541-98		A
9	22323253	11541-99		A
10	22323254	11541-100		A
11	22323255	11541-101		A
12	22323256	11541-102		A
13	22323257	11541-103		A
14	22323258	11541-104		A
15	22323259	11541-105		A
16	22323260	11541-106		A
17	22323261	11541-107		A
18	22323262	11541-108		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Hilary Crumley		NVL	3/2/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:16 PM
Entered By: Kelly AuVu

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number **2203891.00**
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
19	22323263	11541-109		A
20	22323264	11541-110		A
21	22323265	11541-111		A
22	22323266	11541-112		A
23	22323267	11541-113		A
24	22323268	11541-114		A
25	22323269	11541-115		A
26	22323270	11541-116		A
27	22323271	11541-117		A
28	22323272	11541-118		A
29	22323273	11541-119		A
30	22323274	11541-120		A
31	22323275	11541-121		A
32	22323276	11541-122		A
33	22323277	11541-123		A
34	22323278	11541-124		A
35	22323279	11541-125		A
36	22323280	11541-126		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Hilary Crumley		NVL	3/2/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:16 PM
Entered By: Kelly AuVu

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number **2203891.00**
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45

Rush Samples

	Lab ID	Sample ID	Description	A/R
37	22323281	11541-127		A
38	22323282	11541-128		A
39	22323283	11541-129		A
40	22323284	11541-130		A
41	22323285	11541-131		A
42	22323286	11541-132	Composite	A
43	22323287	11541-133		A
44	22323288	11541-134	Composite	A
45	22323289	11541-135		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Hilary Crumley		NVL	3/2/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:16 PM
Entered By: Kelly AuVu

2203891

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Pager: 206.344.1878
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

L A & B S

Client EHS International, Inc.
Street 1011 SW Klickitat Way
Suite 104
Seattle, WA 98134
Project Manager David Braungardt
Project Location SSD Alki Elementary Regulated Materials/HazMat Consulting
Phone: (206) 381-1128 **Fax:** (206) 254-4279

NVL Batch Number
Client Job Number 11541-01
Total Samples
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address davidb@ehsintl.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other
☑ **Asbestos Bulk** ☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk
☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS
☐ Total Metals
☐ TCLP

Inst./Det Limit
☐ FAA (ppm)
☐ ICP (ppm)
☐ GFAA (ppb)

Matrix
☐ Air Filter
☐ Drinking water
☐ Dust/wipe (Area)
☐ Soil
☐ Paint Chips in %
☐ Paint Chips in cm
☐ Waste Water
☐ Other

RCRA Metals ☐ All 8
☐ Arsenic (As)
☐ Barium (Ba)
☐ Cadmium (Cd)
☐ Chromium (Cr)
☐ Lead (Pb)
☐ Mercury (Hg)
☐ Selenium (Se)
☐ Silver (Ag)

Other Metals
All 3
☐ Copper (Cu)
☐ Nickel (Ni)
☐ Zinc (Zn)

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify)

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		11541-91		
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		11541-135		

	Print Below	Sign Below	Company	Date	Time
Sampled by	Haley M., Matt M.		EHSI	2-25-22	
Relinquished by	Matt M.		EHSI	2-25-22	
Received by	Kelly Aller		NVL	2/25/22	1615
Analyzed by					
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Please e-mail results. cc: mattm@ehsintl.com, reesem@ehsintl.com

INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

March 3, 2022

David Braungardt
EHS International
1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 2203892.00

Client Project: 11541-01
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Dear Mr. Braungardt,

Enclosed please find test results for the 15 sample(s) submitted to our laboratory for analysis on 2/25/2022.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with **U. S. EPA 40 CFR Appendix E to Subpart E of Part 763**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116**, Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

NVLAP
Lab Code: 102063-0

Enc.: Sample Results

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Lab ID: 22323290 **Client Sample #: 11541-136**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White crumbly material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Fine grains Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White sandy crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Sand Foamed glass, Fine grains	Cellulose	<1%	**None Detected ND**

Lab ID: 22323291 **Client Sample #: 11541-137**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** White crumbly material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains, Fine particles Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Sand	Cellulose	2%	**None Detected ND**

Lab ID: 22323292 **Client Sample #: 11541-138**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Pale gray brittle material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine grains, Mineral grains	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Fine particles, Debris	Spider silk <1%	

Lab ID: 22323293 **Client Sample #: 11541-139**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 2 **Description:** Tan vinyl material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Vinyl/Binder, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Layer 2 of 2 **Description:** Thin off-white crumbly mastic with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Lab ID: 22323294 **Client Sample #: 11541-140**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 3 **Description:** Thin white powdery material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	None Detected ND	**None Detected ND**

Layer 2 of 3 **Description:** White crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Mineral grains, Fine particles Paint	None Detected ND	**None Detected ND**

Layer 3 of 3 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	Cellulose 1%	**None Detected ND**

Lab ID: 22323295 **Client Sample #: 11541-141**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Unsure of correct layer sequence.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Layer 1 of 4 **Description:** Green ceramic material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Ceramic/Binder, Fine particles	None Detected ND	**None Detected ND**

Layer 2 of 4 **Description:** Pale yellow soft rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Layer 3 of 4 **Description:** Peach brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Mineral grains, Fine particles	None Detected ND	**None Detected ND**

Layer 4 of 4 **Description:** Gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles, Mineral grains	None Detected ND	**None Detected ND**

Lab ID: 22323296 **Client Sample #: 11541-142**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Small amount of layer 2 for thorough analysis.

Layer 1 of 2 **Description:** White crumbly material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Mineral grains, Fine particles Paint	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white loose sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Sand, Fine particles	Cellulose 1%	**None Detected ND**

Lab ID: 22323297 **Client Sample #: 11541-143**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Composite result (per client request) for whole sample is less than 1% asbestos.

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Layer 1 of 3 **Description:** Beige compacted powdery material with layered paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous binder, Calcareous particles, Paint	None Detected	ND	**Chrysotile 3%**

Layer 2 of 3 **Description:** Trace off-white compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous binder, Calcareous particles	Cellulose	46%	**Chrysotile 2%**

Layer 3 of 3 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Gypsum/Binder, Fine grains, Fine particles	Cellulose	26%	**None Detected ND**
	Glass fibers	3%	

Lab ID: 22323298 **Client Sample #: 11541-144**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Off-white crumbly sandy material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand, Fine particles	None Detected	ND	**None Detected ND**
Paint			

Lab ID: 22323299 **Client Sample #: 11541-145**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Beige crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Debris	Cellulose	<1%	**Chrysotile 4%**

Lab ID: 22323300 **Client Sample #: 11541-146**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Loose black crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Fine grains	Cellulose	<1%	**None Detected ND**
Debris, Miscellaneous particles, Glass debris	Glass fibers	<1%	

Lab ID: 22323301 **Client Sample #: 11541-147**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Orange soft rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris	Glass fibers	23%	**None Detected ND**

Lab ID: 22323302 **Client Sample #: 11541-148**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Layer 1 of 1 **Description:** Orange soft rubbery material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Debris	Glass fibers	24%	**None Detected ND**

Lab ID: 22323303 **Client Sample #: 11541-149**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Composite result (per client request) for whole sample is less than 1% asbestos.

Layer 1 of 2 **Description:** Beige compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous binder, Calcareous particles	None Detected	ND	**Chrysotile 2%**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Gypsum/Binder, Fine grains, Fine particles	Cellulose	25%	**None Detected ND**
	Glass fibers	3%	

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: Mr. David Braungardt
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203892.00
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116

Lab ID: 22323304 **Client Sample #: 11541-150**

Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Comments: Composite result (per client request) for whole sample is less than 1% asbestos.

Layer 1 of 2 **Description:** Beige compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Calcareous binder, Calcareous particles	Cellulose 43%	**Chrysotile 2%**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Gypsum/Binder, Fine grains, Fine particles	Cellulose 26%	**None Detected ND**
	Glass fibers 3%	

Sampled by: Client
Analyzed by: Hilary Crumley **Date:** 03/03/2022
Reviewed by: Nick Ly **Date:** 03/03/2022

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASBESTOS LABORATORY SERVICES

Company EHS International
Address 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134
Project Manager Mr. David Braungardt
Phone (206) 381-1128
Cell (206) 510-8305

NVL Batch Number 2203892.00
TAT 5 Days **AH** No
Rush TAT
Due Date 3/4/2022 **Time** 4:15 PM
Email davidb@ehsintl.com
Fax (206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 15 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	22323290	11541-136		A
2	22323291	11541-137		A
3	22323292	11541-138		A
4	22323293	11541-139		A
5	22323294	11541-140		A
6	22323295	11541-141		A
7	22323296	11541-142		A
8	22323297	11541-143	Composite	A
9	22323298	11541-144		A
10	22323299	11541-145		A
11	22323300	11541-146		A
12	22323301	11541-147		A
13	22323302	11541-148		A
14	22323303	11541-149	Composite	A
15	22323304	11541-150	Composite	A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Hilary Crumley		NVL	3/3/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:25 PM
Entered By: Kelly AuVu

2203892

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Pager: 206.344.1878
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

Client EHS International, Inc.
Street 1011 SW Klickitat Way
Suite 104
Seattle, WA 98134
Project Manager David Braungardt
Project Location SSD Alki Elementary Regulated Materials/HazMat Consulting
Phone: (206) 381-1128 **Fax:** (206) 254-4279

NVL Batch Number
Client Job Number 11541-01
Total Samples
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address davidb@ehsintl.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other

☑ **Asbestos Bulk** ☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk

☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS
☐ Total Metals
☐ TCLP

Inst./Det Limit
☐ FAA (ppm)
☐ ICP (ppm)
☐ GFAA (ppb)

Matrix
☐ Air Filter
☐ Drinking water
☐ Dust/wipe (Area)
☐ Soil
☐ Paint Chips in %
☐ Paint Chips in cm
☐ Waste Water
☐ Other

RCRA Metals ☐ All 8
☐ Arsenic (As)
☐ Barium (Ba)
☐ Cadmium (Cd)
☐ Chromium (Cr)
☐ Lead (Pb)
☐ Mercury (Hg)
☐ Selenium (Se)
☐ Silver (Ag)

Other Metals
☐ All 3
☐ Copper (Cu)
☐ Nickel (Ni)
☐ Zinc (Zn)

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify)

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		11541- 136		
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		11541 - 150		

	Print Below	Sign Below	Company	Date	Time
Sampled by	Haley M. Matt M.		EHSI	2.25.22	1500
Relinquished by	Matt M.		EHSI	2.25.22	
Received by	[illegible]		NVL	2/25/22	1615
Analyzed by					
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Please e-mail results. cc: mattm@ehsintl.com, reesem@ehsintl.com

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

March 2, 2022

David Braungardt
EHS International
1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

NVL Batch # 2203893.00

RE: **Total Metal Analysis**
Method: EPA 6010 (price per analyte) <paint>
Item Code: ICP-M2

Client Project: 11541-01
Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Dear Mr. Braungardt,

NVL Labs received 3 sample(s) for the said project on 2/25/2022. Preparation of these samples was conducted following protocol outlined in EPA 3051/6010D, unless stated otherwise. Analysis of these samples was performed using analytical instruments in accordance with EPA 6010 (price per analyte) <paint> . The results are usually expressed in mg/kg and ppm. Test results are not blank corrected.

For recent regulation updates pertaining to current regulatory levels or permissible exposure levels, please call your local regulatory agencies for more detail.

At NVL Labs all analyses are performed under strict guidelines of the Quality Assurance Program. This report is considered highly confidential and will not be released without your approval. Samples are archived after two weeks from the analysis date. Please feel free to contact us at 206-547-0100, in case you have any questions or concerns.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample results

Analysis Report

Total Metals

Client: EHS International
Address: 1011 SW Klickitat Way. Suite 104
Seattle, WA 98134

Attention: **Mr. David Braungardt**
Project Location: SSD Alki Elementary Regulated Materials/HazMat Consulting

Batch #: 2203893.00
Matrix: Paint
Method: EPA 3051/6010D
Client Project #: 11541-01
Date Received: 2/25/2022
Samples Received: 3
Samples Analyzed: 3

Lab ID	Client Sample #	Elements	Sample wt (g)	RL mg / kg	Results in mg / kg	Results in ppm
22323305	11541-A1	Arsenic (As)	0.2039	20.0	< 20.0	< 20.0
22323306	11541-A2	Arsenic (As)	0.0994	40.0	< 40.0	< 40.0
22323307	11541-A3	Arsenic (As)	0.2321	17.0	< 17.0	< 17.0

Sampled by: Client
Analyzed by: Shalini Patel
Reviewed by: Nick Ly
Date Analyzed: 03/01/2022
Date Issued: 03/02/2022

Nick Ly, Technical Director

mg/ kg = Milligrams per kilogram
ppm = Parts per million
RL = Reporting Limit
'<' = Below the reporting Limit

Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

METAL LABORATORY SERVICES

Company	EHS International	**NVL Batch Number**	**2203893.00**
Address	1011 SW Klickitat Way. Suite 104 Seattle, WA 98134	**TAT**	5 Days **AH** No
		Rush TAT	
Project Manager	Mr. David Braungardt	**Due Date**	3/4/2022 **Time** 4:15 PM
Phone	(206) 381-1128	**Email**	davidb@ehsintl.com
Cell	(206) 510-8305	**Fax**	(206) 254-4279

Project Name/Number: 11541-01 **Project Location:** SSD Alki Elementary Regulated Materials/HazMat Consulting

Subcategory Inductively Coupled Plasma (ICP) - Group Tests

Item Code ICP-M2 EPA 6010 (price per analyte) <paint>

Metals Arsenic (As)

Total Number of Samples 3

Rush Samples

	Lab ID	Sample ID	Description	A/R
1	22323305	11541-A1		A
2	22323306	11541-A2		A
3	22323307	11541-A3		A

	Print Name	Signature	Company	Date	Time
Sampled by					
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Kelly AuVu		NVL	2/25/22	1615
Analyzed by	Shalini Patel		NVL	3/1/22	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 2/25/2022
Time: 4:28 PM
Entered By: Kelly AuVu

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Pager: 206.344.1878
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

2203893

Client EHS International, Inc.
Street 1011 SW Klickitat Way
Suite 104
Seattle, WA 98134
Project Manager David Braungardt
Project Location SSD Alki Elementary Regulated Materials/HazMat Consulting
Phone: (206) 381-1128 **Fax:** (206) 254-4279

NVL Batch Number
Client Job Number 11541-01
Total Samples
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address davidb@ehsintl.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other

☐ **Asbestos Bulk** ☐ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk

☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS
☑ Total Metals
☐ TCLP

Inst./Det Limit
☐ FAA (ppm)
☑ ICP (ppm)
☐ GFAA (ppb)

Matrix
☐ Air Filter
☐ Drinking water
☐ Dust/wipe (Area)
☐ Soil
☑ Paint Chips in %
☐ Paint Chips in cm
☐ Waste Water
☐ Other

RCRA Metals ☐ All 8
☑ Arsenic (As)
☐ Barium (Ba)
☐ Cadmium (Cd)
☐ Chromium (Cr)
☐ Lead (Pb)
☐ Mercury (Hg)
☐ Selenium (Se)
☐ Silver (Ag)

Other Metals
☐ All 3
☐ Copper (Cu)
☐ Nickel (Ni)
☐ Zinc (Zn)

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify)

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		11541-A1		
2		-A2		
3		-A3		
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Matt M.		EHSI	2.25.22	1500
Relinquished by	Matt M.		EHSI	2.25.22	
Received by	Kelly Adler		NVL	2/25/22	1615
Analyzed by					
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Please e-mail results. cc: mattm@ehsintl.com, reesem@ehsintl.com

SEATTLE ASBESTOS TEST, LLC

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

www.seattleasbestostest.com, admin@seattleasbestostest.com

Project Manager:	David Braungardt, Matt MacFarlane, Reese Myers	Date Analyzed:	3/4/2022
Client:	EHS International, Inc.	Client Job#:	11541-01
Address:	1011 SW Klickitat Way, Suite 104, Seattle, WA 98134	Project Location:	SSD Alki Elementary
Tel:	425.455.2959	Laboratory batch#:	202209385
Date Report Issued:	3/4/2022	Samples Received:	8

Enclosed please find the test results for the bulk samples submitted to our laboratory for asbestos analysis. Analysis was performed using polarized light microscopy (PLM) in accordance with Test Method US EPA - 40 CFR Appendix E of Part 763, Interim Method of Determination of Asbestos in Bulk Insulation Samples and Test Method US EPA/600/R-93/116.

Percentages for this report are done by visual estimate and relate to the suggested acceptable error ranges by the method. Since variation in data increases as the quantity of asbestos decreases toward the limit of detection, the EPA recommends point counting for samples containing between <1% and 10% asbestos (NESHAP, 40 CFR Part 61). Statistically, point counting is a more accurate method. If you feel a point count might be beneficial, please feel free to call and request one.

The test results refer only to the samples or items submitted and tested. The accuracy with which these samples represent the actual materials is totally dependent on the acuity of the person who took the samples. This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government. The test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory. If the sample is inhomogeneous the sub-samples of the components are analyzed separately as layers.This report in its entirety consists of this cover leter, the customer sampling COC or data sheet, and the analytical report which is page numbered.

This report is highly confidential and will not be released without your consent. Samples are archived for 30 days after the analysis, and disposed of as hazardous waste thereafter.

Thank you for using our service and let us know if we can further assist you.

Sincerely

SZhang

Steve (Fanyao) Zhang
Approved Signatory

202209385

SEATTLE ASBESTOS TEST, LLC

LYNNWOOD LAB: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel:425.673.9850, Fax:425.673.9810, NVLAP Accreditation Lab Code: 200768.
BELLEVUE LAB: 12727 Northup Way, Suite 1, Bellevue, WA 98005, Tel:425.861.1111, Fax:425.861.1118, NVLAP Accreditation Lab Code: 200876,
SEATTLE LAB: 4500 9th Ave. NE, Suite 300, Seattle, WA 98105, Tel:206.633.1111, Fax:206.633.4747, NVLAP Accreditation Lab Code: 201057, Email: admin@seattleasbestostest.com, Website: www.seattleasbestostest.com

CHAIN OF CUSTODY

☑ Bulk Asbestos ☐ Point Count 400 ☐ Point Count 1000 ☐ Point Count Gravimetric ☐ Other (Specify)

☐ 1 Hour ☐ 2 Hours ☐ Same day (4 to 6 Hrs.) ☐ 1 Day ☐ ______ Days

EHS International, Inc.
1011 SW Klickitat Way, Suite 104, Seattle, WA 98134 Tel: 206.381.1128 Fax: 206.254.4279

Job#: 11541-01 Proj. Location: SSD Alki Elementary # of Samples: 4

	Project Manager / Tech.	Cell	Email		Proj. Manager / Tech.	Cell	Email
☑	David Braungardt	206.510.8305	DavidB@ehsintl.com	☑	Matt Macfarlane	503.349.4165	MattM@ehsintl.com
☐	Fred Luck	425.691.0978	FredL@ehsintl.com	☐	Mike Harris	360.442.6790	Mikeh@ehsintl.com
☐	Shonnessy Gilmore	425.471.2166	ShonnessyG@ehsintl.com	☐	Haley Mills	425.281.1422	Hmills@soundearthinc.com
☐	Sunny Joshi	858.357.3428	SunnyJ@ehsintl.com	☐	Travis Zandi	206.446.5551	TZandi@ehsintl.com
☐	Soumeya Benzina	206.307.2515	SoumeyaB@ehsintl.com	☑	Reese Myers	714.466-0359	ReeseM@ehsintl.com
☐	Marcus Gladden	206.819.4213	MarcusG@ehsintl.com				

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LOCATION	NOTES
1	11541 -05QA			
2	11541 - 09QA			
3	11541 - 25QA			
4	11541 - 30QA			
5	11541 - 48QA			
6	11541 - 95QA			
7	11541 - 108QA			
8	11541 - 143QA			
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

	Print Name	Signature	Company	Date	Time
Sampled:	Reese Myers/Matt M		EHS International, Inc.	2-23-22	0700
Relinquished:	Reese Myers		EHS International, Inc.	2-23-22	
Delivered:	Matt M.		EHS International, Inc.	2-25-22	
Received:	Carolyn Yeo		Seattle Asbestos Test	2/25/22	16:25
Analyzed:	Xiaoping Lin		Seattle Asbestos Test	3/4/2022	13:00
Reported:			Seattle Asbestos Test		

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form, the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results. It is the client's responsibility to make sure the samples are appropriately taken according to federal and local regulations. Invoices paid late may be charged of interest, and invoices go to collection may be charged 17% to 25% of collection fee. NSF checks will be charged of $50.

SAMPLE DELIVERED TO: ☐ Lynnwood Lab ☐ Bellevue Lab ☐ Seattle Lab Page 1 of ( )

RESULTS REPORTING METHOD: ☐ Phone ☐ Fax ☐ E-mail

OTHER: ☐ Composite all Wallboard Samples ☐ Point Count ...... % or less asbestos

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM]
EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: David Braungardt, Matt MacFarlane, Reese Myers
Client: EHS International, Inc.
Address: 1011 SW Klickitat Way, Suite 104, Seattle, WA 98134
Job#: 11541-01
Batch#: 202209385
Date Received: 2/25/2022
Samples Rec'd: 8
Date Analyzed: 3/4/2022
Samples Analyzed: 8
Project Loc.: SSD Alki Elementary

Analyzed by: Carolyn Yeo/Xingping Lin

SZhang
Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
1	11541-05QA	1	Gray sandy/brittle material		**None detected**	Sand, Filler, Binder	3	Cellulose
2	11541-09QA	1	Brown fibrous material with paint		**None detected**	Filler, Paint	87	Cellulose
		2	Brown mastic		**None detected**	Mastic/binder	2	Cellulose
3	11541-25QA	1	Pink tile		**None detected**	Vinyl/binder, Mineral grains	3	Cellulose
		2	Black mastic	3	**Chrysotile**	Mastic/binder	3	Cellulose
4	11541-30QA	1	White hard material		**None detected**	Binder, Filler		None detected
		2	Yellow mastic		**None detected**	Mastic/binder	2	Cellulose
5	11541-48QA	1	Black rubbery material		**None detected**	Rubber/binder	2	Cellulose
		2	Brown/yellow mastic		**None detected**	Mastic/binder	3	Cellulose
		3	Gray sandy/brittle material		**None detected**	Sand, Filler, Binder	2	Cellulose
6	11541-95QA	1	Gray fibrous material with paint	68	**Chrysotile**	Binder, Filler, Paint	25	Cellulose
7	11541-108QA	1	Brown fibrous material with paint		**None detected**	Filler, Paint	90	Cellulose
8	11541-148QA	1	Pink fibrous material		**None detected**	Binder, Filler	71	Cellulose, Glass fibers

Appendix C

Laboratory Certifications

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

NVL Laboratories, Inc.

4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: June 01, 2023
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: June 01, 2023
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: June 01, 2023
☐	**FOOD**	Accreditation Expires:
☑	**UNIQUE SCOPES**	Accreditation Expires: June 01, 2023

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision19: 09/01/2020

Date Issued: 04/30/2021

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861
Issue Date: 04/30/2021

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 02/07/1997

IHLAP Scope Category	Field of Testing (FOT)	Technology sub-type/Detector	Published Reference Method/Title of In-house Method	Component, parameter or characteristic tested
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)	-	NIOSH 7400	Asbestos/Fibers
Miscellaneous Core	Gravimetric	-	NIOSH 0500	Total Dust
Miscellaneous Core	Gravimetric	-	NIOSH 0600	Respirable Dust
Spectrometry Core	Atomic Absorption	FAA	NIOSH 7082	Lead
Spectrometry Core	Inductively-Coupled Plasma	ICP/AES	NIOSH 7300	RCRA Metals
Spectrometry Core	X-ray Diffraction (XRD)	-	NIOSH 7500	Silica

A complete listing of currently accredited IHLAP laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861
Issue Date: 04/30/2021

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 04/01/1997

Component, parameter or characteristic tested	Technology sub-type/Detector	Method	Method Description *(for internal methods only)*
Airborne Dust	AA	EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A
Paint	AA	EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A
Settled Dust by Wipe	AA	EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A
Soil	AA	EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A

A complete listing of currently accredited ELLAP laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861
Issue Date: 04/30/2021

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Environmental Microbiology Laboratory Accreditation Program (EMLAP)

Initial Accreditation Date: 02/07/1997

EMLAP Scope Category	Field of Testing (FOT)	Component, parameter or characteristic tested	Method	Method Description *(for internal methods only)*
Fungal	Air - Direct Examination	Spore Trap	SOP 12.133	In House: Analysis of Spore Trap
Fungal	Bulk - Direct Examination	Bulk	SOP 12.133	In House: Analysis of Spore Trap
Fungal	Surface - Direct Examination	Surface Wipe	SOP 12.133	In House: Analysis of Spore Trap

A complete listing of currently accredited EMLAP laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861
Issue Date: 04/30/2021

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Unique Scopes Laboratory Accreditation Programs (Unique Scopes)

Initial Accreditation Date: 04/01/2013

Unique Scopes Scope Category	Field of Testing (FOT)	Component, parameter or characteristic tested	Method	Method Description *(for internal methods only)*
Consumer Product Testing	Lead in Paint and Other Similar Surface Coatings	Surface paint	CPSC-CH-E1003-09	-
	Total Lead in Metal Children's Products	Metallic jewelry	CPSC-CH-E1001-08	-
	Total Lead in Non-Metal Children's Products	Non-metallic	CPSC-CH-E1002-08	-

A complete listing of currently accredited Unique Scopes laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 102063-0

NVL Laboratories, Inc.
Seattle, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30
Effective Dates

Dana S. Leaman
For the National Voluntary Laboratory Accreditation Program

NVLAP® **National Voluntary Laboratory Accreditation Program**

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

NVL Laboratories, Inc.

4708 Aurora Avenue N.
Seattle, WA 98103
Mr. Nghiep Vi Ly
Phone: 206-547-0100   Fax: 206-634-1936
Email: nick.l@nvllabs.com
http://www.nvllabs.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 102063-0

Bulk Asbestos Analysis

Code	***Description***
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Dana S Leaman

For the National Voluntary Laboratory Accreditation Program

Effective 2021-10-01 through 2022-09-30

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200768-0

Seattle Asbestos Test, LLC
Lynnwood, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2021-10-01 through 2022-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

Appendix D

Selected Photographs of Asbestos Containing Materials

Photo #1: Sample 11541-01: **ACM Red 9'x9' vinyl tile (6& Chrysotile)** on black mastic (on concrete)
Location: Throughout Office
Quantity: 3,000 SF

Photo #2: Sample 11541-05: **ACM Gray caulking (3% Chrysotile)** on fogged glass window 4'x11' w/ 1'x1'x6" glass panes
Location: Throughout west-facing side of school
Quantity: 792 LF

Photo #3: Sample 11541-07: Black rubber sink gasket on **ACM yellow mastic (4% Chrysotile)** on yellow paper (on metal pipe 2" OD)
Location: Throughout
Quantity: 7 EA

Photo #4: Sample 11541-22: Various colored 9'x9' vinyl composite tile & various colored 12'x12' vinyl composite tile on **ACM black mastic (3% Chrysotile)** on concrete
Location: Throughout 1st Floor
Quantity: 24,000 SF

Photo #5: Sample 11541-81: **ACM Black window caulking (2-3% Chrysotile)** on metal frame windows 7'x7'
Location: North Central Corridor
Quantity: 150 SF

Photo #6: Sample 11541-105: **ACM Gray caulking (2% Chrysotile)** joining brick/marblecrete

Location: Throughout exterior
Quantity: 550 LF

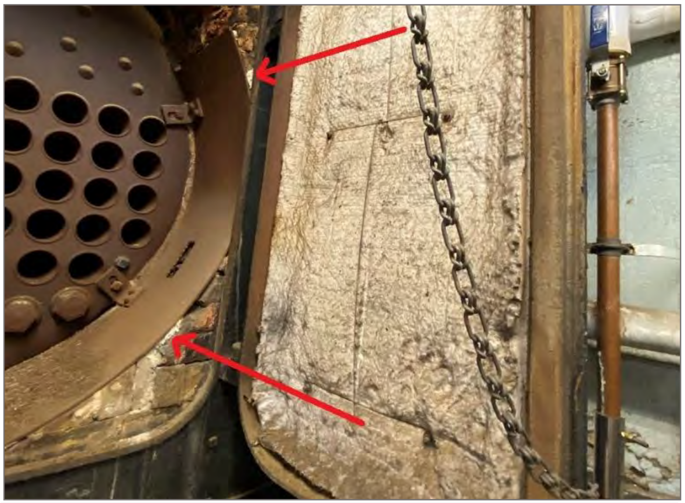

Photo #7: Sample 11541-117: **ACM White TSI (23% Chrysotile)** throughout original boiler
Location: Boiler Room
Quantity: 400 SF

Photo #8: Sample 11541-121: **White skim coat (2% Chrysotile)** on concrete walls
Location: Boiler Room
Quantity: 2,100 SF

Photo #9: Sample 11541-131: **ACM Beige firestop (2% Chrysotile)** on GWB
Location: Stock Room
Quantity: <2 SF

Photo #10: Sample 11541-132: **ACM White jc (2-3% Chrysotile)** on GWB
*<1% when composited as part of GWB system
Location: Throughout First Floor
Quantity: 4,000 SF

Photo #11: Sample 11541-146: **ACM Gray caulking (4% Chrysotile)** on metal frame window 5'x7'
Location: Throughout Exterior
Quantity: 540 SF / 30 EA

Photo #12: Sample 11541-56: **ACM dark brown 9'x9' vinyl tile (3-4% Chrysotile)** on black mastic (on wood)

Location: Throughout Second Floor
Quantity: 260 SF

Photo #13: Sample 11541-149: **ACM White jc (2% Chrysotile)** on GWB
*<1% when composited as part of GWB system
Location: Throughout Second Floor
Quantity: 5,600 SF

Photo #14: Sample 11541-97: **ACM Residual TSI (<1-20% Chrysotile, 15% Amosite)** on pipe

Location: Throughout

Quantity: 5 SF

Photo #15: Sample 11541-146: **ACM Gray glazing (3% Chrysotile)** on wood frame window

Location: P-1 / P-2
Quantity: 300 SF

Photo #16: Assumed ACM painted TSI on boilers/equipment

Location: Boiler Room

Quantity: 1,033 SF

Appendix F

LANDMARK NOMINATION DETERMINATION, DAHP GOVERNOR'S EXECUTIVE ORDER 21-02 LETTER, AND CULTURAL RESOURCES ASSESSMENT

(On-File with SPS)

The City of Seattle
Landmarks Preservation Board
Mailing Address: PO Box 94649, Seattle WA 98124-4649
Street Address: 600 4th Avenue, 4th Floor

LPB 138/22

Ms. Rebecca Acensio
Seattle Public Schools
Mail Stop: 22-336
P.O. Box 34165
Seattle, WA 98124-1165

Re: <u>Denial of Nomination of Alki Elementary School - 3010 59th Avenue SW / 5817 SW Stevens Street</u>

Dear Ms. Acensio:

At the April 20, 2022, meeting of the City's Landmarks Preservation Board, a motion was made to approve the nomination of Alki Elementary School at 3010 59th Avenue SW / 5817 SW Stevens Street. The vote to approve was 2 in favor, 7 opposed. Therefore, the motion failed and the nomination was denied.

<u>Termination of Proceedings</u>

SMC 25.12.850A states:
"In any case where a site, improvement or object is nominated for designation as a landmark site or landmark and thereafter the Board fails to approve such nomination or to adopt a report approving designation of such site, improvement or object, such proceeding shall terminate and no new proceeding under this ordinance may be commenced with respect to such site, improvement or object within five (5) years from the date of such termination without the written agreement of the owner, except that when the site or improvement nominated is Seattle School District property and is in use as a public school facility, no new proceeding may be commenced within ten (10) years from the date of such termination."

This provision is applicable to these nomination proceedings.

<u>Issued</u>: April 22, 2022

Erin Doherty

Erin Doherty
Landmarks Preservation Board Coordinator

Administered by The Historic Preservation Program
The Seattle Department of Neighborhoods
"Printed on Recycled Paper"

cc: Tingyu Wang, Seattle Public Schools
Susan Boyle, BOLA Architecture + Planning
David Peterson, Historic Resource Consulting
Jessica Clawson, McCullough Hill Leary PS
Nathan Torgelson, SDCI
Katrina Nygaard, SDCI
Kristen Johnson, Acting Chair, LPB

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 13, 2022

Brian Fabella
Seattle Public Schools
Project Manager

In future correspondence please refer to:
Project Tracking Code: 2022-05-03131
Property: Alki Elementary School Replacement Project
Re: No Historic Properties Impacted

Dear Brian Fabella:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced proposal. Your communication on this action has been reviewed on behalf of the SHPO under provisions of Governor's Executive Order 21-02. Our review is based upon documentation provided in your submittal.

It is our opinion that that no historic properties will be impacted by the current project as proposed. As a result of our concurrence, further contact with DAHP on this proposal is not necessary. However, if new information about affected resources becomes available and/or the project scope of work changes significantly, please resume consultation as our assessment may be revised. Also, if any archaeological resources are uncovered during construction, please halt work immediately in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. If you have any questions, please feel free to contact me.

Sincerely,

Holly Borth
Preservation Design Reviewer
(360) 890-0174
Holly.Borth@dahp.wa.gov

State of Washington • Department of Archaeology & Historic Preservation
P.O. Box 48343 • Olympia, Washington 98504-8343 • (360) 586-3065
www.dahp.wa.gov

Appendix G

TRANSPORTATION TECHNICAL REPORT

TRANSPORTATION TECHNICAL REPORT

for the

Alki Elementary School Addition and Renovation

PREPARED FOR:

Seattle Public Schools

PREPARED BY:

heffron transportation inc

6544 NE 61st Street, Seattle, WA 98115
ph: (206) 523-3939 ◆ www.hefftrans.com

June 27, 2022

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1. INTRODUCTION

This report presents the transportation impact analyses for the Seattle Public Schools' (SPS) proposed addition and renovation of Alki Elementary School. The scope of analysis and approach were based on extensive past experience performing transportation impact analyses for projects throughout the City of Seattle, including numerous analyses prepared for Seattle Public Schools projects. This report documents the existing conditions in the site vicinity, presents estimates of project-related traffic, and evaluates the anticipated impacts to the surrounding transportation system including transit, parking, safety, and non-motorized facilities. These analyses were prepared to support the SEPA Checklist for this project.

At the time of data collection for this analysis in November 2021, Seattle Schools had returned to five-day, in-person learning after the disruption and school closures caused by the COVID-19 pandemic in 2020-21, which affected traffic volumes and travel patterns throughout Seattle and near the site. Some transportation patterns in the City overall, at the school, and within the local site vicinity have not returned to pre-pandemic conditions. In addition, the West Seattle High-Rise Bridge remained closed for repair after March 2020 inspections indicated accelerated growth of new and existing cracks in the structure. The Seattle Department of Transportation (SDOT) is currently completing repairs to the bridge with re-opening anticipated by mid-2022. This temporary closure has also affected commuting patterns for West Seattle residents. Therefore, the analyses were prepared using a combination of traffic data collected for this project in February 2022 and other data collected in the area in 2017 and 2019. The volumes were adjusted to reflect representative normalized (non-pandemic) conditions according to standards and practices recommended by the Institute of Transportation Engineers (ITE)[1] and other industry professionals.[2]

1.1. Project Description

Seattle Public Schools is proposing a multi-story addition and renovation project for Alki Elementary School on the same site, which is located at 3010 – 59th Avenue SW in West Seattle. The following sections describe the existing school site and the proposed project.

1.1.1. Existing School Site

The 1.4-acre school site is bounded by 59th Avenue SW on the west, Seattle Parks and Recreation property to the north, and private residential properties to the east and south. The existing main school building on the western portion of the site has two stories with about 46,330 square feet (sf) of floor area. The attached one-story fieldhouse on the east side of main school building sits on both SPS and Parks' property and has about 13,330 sf of floor area. It functions as the school gymnasium and support spaces, while the northern portion of the fieldhouse building is operated by Parks as the Alki Community Center, which utilizes the gymnasium and some support spaces for its after-school and summer programs.[3] A portable building and a paved play surface are located on Parks' property north of the school building.

A paved surface with room to park about 20 vehicles is located on the south side of the school buildings and is accessed from a driveway at the south edge of the site on 59th Avenue SW. Much of the parking lot striping has faded, but historical aerial images indicate the area has been used for parking 20 or more vehicles. This area is also used for trash and recycling container storage and pick up.

The hard-surface area north of the building (referred to as a Parks Boulevard) has a gated access drive on 59th Avenue SW opposite SW Stevens Street. It is signed for "Community Center Parking Only," but is also used for school-event parking. Historical aerials indicate the surface can accommodate about 27

---

[1] ITE, *What a Transportation Professional Needs to Know About Counts and Studies during a Pandemic*, July 2020.

[2] Kittelson & Associates, *Estimating Traffic Volumes Under COVID-19 Pandemic Conditions*, April 2, 2020.

[3] Mahlum Architects, *Alki Elementary School Condition Assessment Report*, February 2022.

parked vehicles. The Parks property on the north side has a curb cut extending from the south end of 58th Avenue SW. It provides access to two parking stalls—one 15-minute load space and one disabled permit space. To the east of these stalls are six spaces signed for "Alki Community Center Permitted Staff Parking Only." East of these spaces, the Parks property extends east and becomes Schmitz Preserve Park. It contains the Schmitz-Park-to-Alki Trail with trail connections to SW Hinds Street to the southeast near the Schmitz Park School site and the SW Manning Street / 53rd Avenue SW intersection near the south end of the park.

The curb-side frontage on the east of 59th Avenue SW in front of the school building (between the site access driveway and SW Stevens Street) is signed for "School Bus Only (7-10 A.M. and 1-4 P.M.)." North of SW Stevens Street and adjacent to a portion of the Alki Playground, the east side of 59th Avenue SW (about 135 feet) is signed for "15-minute School Load Only (7-10 A.M. and 1-4 P.M.)" and "No Parking" during all other times. The project site location and vicinity are shown in Figure 1.

According to information published in *Building for Learning, Seattle Public Schools Histories, 1862-2000*,[4] the existing school is located a short distance from where David Denny, Lee Terry, Captain Robert Fay, and John Low camped on September 27, 1851—a site known to the Duwamish Indians as Swaquamox. Children on Alki first attended the West Seattle School (located on a site to the east at what is now the California Avenue SW / SW Lander Street intersection) and with younger children attending the first Alki School in a double portable located at what is now the SW Carroll Street / Chilberg Avenue SW intersection. The current site for the permanent school was purchased by the Seattle School District and the new school opened in 1913 with approximately 175 students in grades 1 through 8. In 1953–54, an auditorium / lunchroom, a gymnasium, and six classrooms were added at the site; the gym and adjacent playfield were shared with the Seattle Parks Department. The school reached its peak enrollment in 1958 with 620 students in grades K through 6. In April 1965, an earthquake seriously damaged the three-story 1913 section of the building. The 1954 additions were repaired while a replacement addition, containing eight classrooms, a multipurpose room, and a learning resource center was dedicated in April 1968.

In November 2021, at the time traffic data were collected for this analysis, enrollment was 308 students,[5] which is below the school's reported capacity of 369 students[6] and below its recent peak enrollment of 413 students in 2015. At the time of analysis, the school had 38 employees.[7]

---

[4] Nile Thompson and Carolyn J. Marr; *Building for Learning, Seattle Public Schools Histories, 1862-2000;* 2002.

[5] Seattle Public Schools, *Alki Elementary – School-at-a Glance Report*, November 10, 2021.

[6] Seattle Public Schools, School Capacity Summary, Updated October 16, 2019. Reflects number of students that will fit into the school based on the number of teaching spaces and class sizes in the Weighted Staffing Standards (WSS) model.

[7] M. Skeffington, Alki Elementary Principal, via email from Mahlum, Nov. 16, 2022.

SEATTLE PUBLIC SCHOOLS
Alki Elementary School
Addition and Renovation

Figure 1

Site Location and Vicinity

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1.1.2. Proposed Site Changes

The proposed project would replace the existing school buildings with a new multi-story building on the western portion of the school site. The Alki Community Center Building and Gymnasium would also be renovated. The school would be designed to accommodate 502 students plus up to 40 children in early learning (pre-school) programs, which would represent a net increase of about 173 students compared to current school capacity and an increase of 234 students compared to the enrollment at the time of data collection for this analysis. SPS estimates that total staffing at the school would be 65 to 75 employees[8]—an increase of 27 to 37 compared to current conditions.

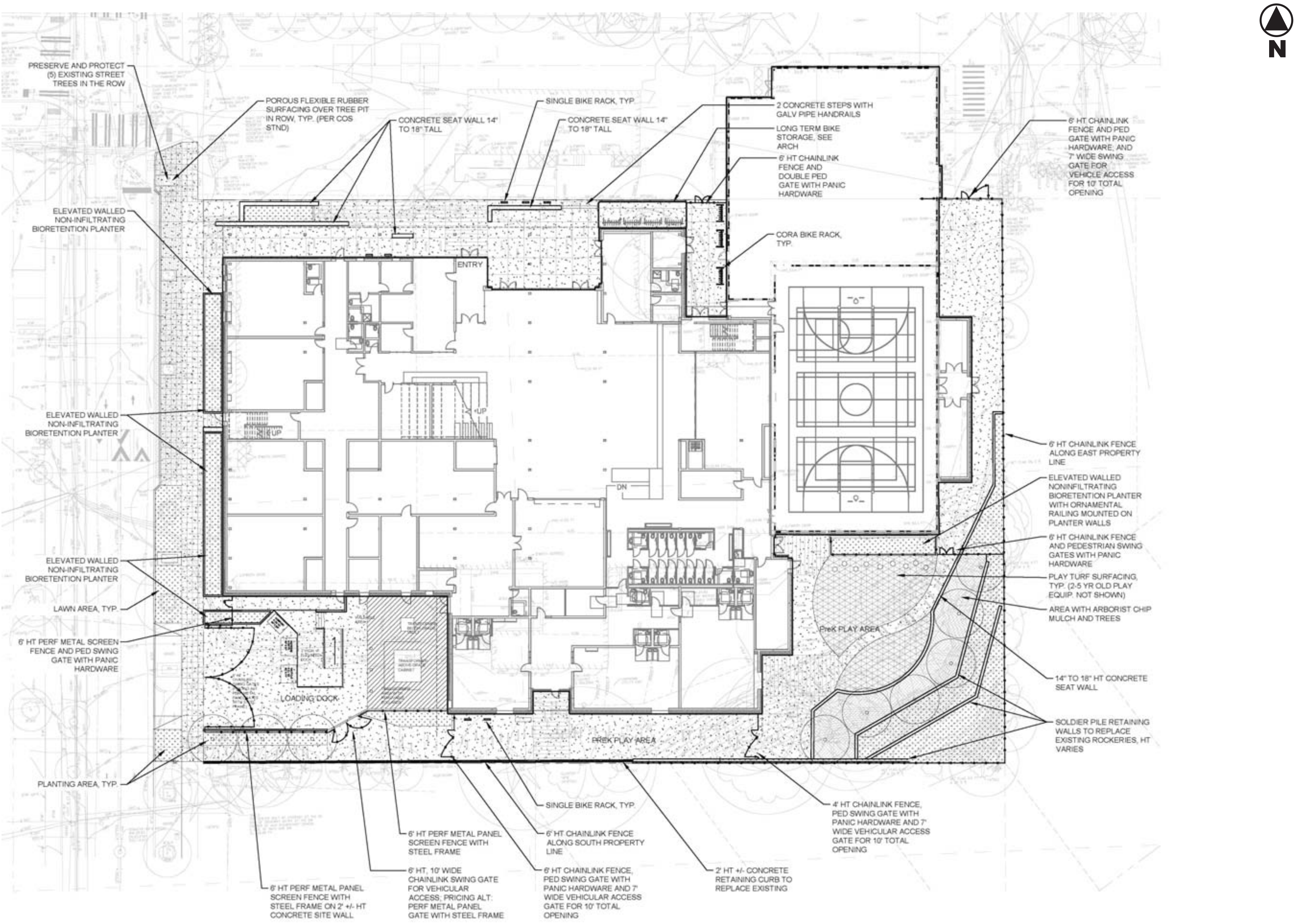
The existing on-site parking lot would be eliminated and no on-site parking is proposed with the addition and renovation project. The existing curb cut on 59th Avenue SW that provides access to the parking lot would be modified and reconstructed to provide access to the new on-site service / loading area.

The on-street school-bus load/unload zone would be retained along the east side of 59th Avenue SW adjacent to the school building with a two-foot widened pull-out area to better accommodate school buses. The project would also retain the existing curb-side passenger-vehicle load/unload area along the east side of 59th Avenue SW north of the school and adjacent to Alki Playground. The project would improve the frontage along 59th Avenue SW with new curb, sidewalk, and street trees. The proposed site plan is shown in Figure 2.

Construction is planned to begin in July 2023 with the new school opening in fall 2025. During construction; the students and staff would be temporarily housed at the Schmitz Park School site. Future analyses (without and with the project) presented in this report reflect year 2025 conditions.

---

[8] Mahlum, February 28, 2022.



Source: Mahlum Architects, May 6, 2022

SEATTLE PUBLIC SCHOOLS
Alki Elementary School
Addition and Renovation

Figure 2

Proposed Site Plan

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transportation inc

2. BACKGROUND CONDITIONS

This section presents the existing and future conditions without the proposed project. The impacts of the proposed project were evaluated against these base conditions. For comparison, and to provide an analysis of potential new traffic and parking impacts, year 2025-without-project conditions assume the existing Alki Elementary School would continue to operate at its existing enrollment capacity. The following sections describe the existing roadway network, traffic volumes, traffic operations (in terms of levels of service), traffic safety, transit facilities, non-motorized facilities, and parking (both on- and off-street).

Seven intersections were selected for study based on the site location, attendance area, and travel routes typically used by family drivers, buses, and staff to access and egress the site area. The following study area intersections were identified for analysis for both the morning and afternoon peak hours.

All-Way Stop Controlled Intersection

- SW Stevens Street / 59th Avenue SW

Uncontrolled Intersection

- SW Lander Street / 58th Avenue SW
- SW Stevens Street / 58th Avenue SW

One- or Two-Way Stop Controlled Intersections

- SW Lander Street / 59th Avenue SW
- Alki Avenue SW / 59th Avenue SW
- SW Admiral Way / 59th Avenue SW

Signalized

- Pedestrian signal at Admiral Wy SW at 59th Ave SW

2.1. Roadway Network

The following describes key roadways in the site vicinity. Roadway classifications are based on the City's Street Classification Map.[9] Speed limits are 25 miles per hour (mph) on arterials (unless otherwise signed) and 20 mph on local access streets.

59th Avenue SW is a north-south local access street extending from Alki Avenue SW to the school site and Chilberg Avenue SW. It is classified as Collector Arterial between SW Admiral Way and SW Spokane Street. The street has one travel lane in each direction. Sidewalks and curbs are provided along the school's frontage and along the east side of the street. Parallel parking is permitted intermittently on both sides of the roadway. Along the school frontage, the curb-side is reserved for school buses from 7 to 10 A.M. and 1 to 4 P.M. There is a school zone speed limit of 20 mph in the vicinity of the school that is in effect when children are present and advisory 15-mph signage indicating speed humps along the roadway.

58th Avenue SW is a north-south non-arterial local access street extending from Alki Avenue SW to the school site in two disconnected segments. Near the site, the street is about 21-feet wide and allows for two-way travel. Sidewalks and curbs are provided along both sides of the street, and parallel parking is permitted intermittently on the east side. There is a school zone speed limit of 20 mph in the vicinity of the school in effect when children are present.

Alki Avenue SW is an east-west Minor Arterial that connects from 63rd Avenue SW on the west to Harbor Avenue SW on the east. West of 63rd Avenue SW, it is a residential street. Near the site, it has curbs, gutters, sidewalks, and parking on both sides. The travel lanes are marked as sharrows[10] in both directions and the multi-use Alki Trail is located along the north side of the roadway

SW Lander St is an east-west non-arterial local access street that extends from 59th Avenue SW to 55th Avenue SW. Near the site, there are curbs, gutters, and sidewalks on both sides. Parallel parking occurs intermittently on both sides of the roadway.

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[9] Seattle Department of Transportation (SDOT), Interactive Street Classification Maps, accessed November 2021.

[10] A "sharrow" is a shared-lane pavement marking that is placed in the roadway lane to highlight the shared space; however, unlike a bicycle lane it does not delineate a particular part of the roadway that a bicyclist should use.

SW Stevens St is an east-west non-arterial local access street that extends from 59th Avenue SW at the project site corner to 62nd Avenue SW on the west and from the northeast site corner to 57th Avenue SW on the east. Near the site and west of 59th Avenue SW, the street has curbs, gutters, and sidewalks on both sides; east of 58th Avenue SW, there are curbs on both sides and parallel parking is allowed intermittently on the north side. There is a school zone speed limit of 20 mph in the vicinity of the school that is in effect when children are present.

SW Admiral Way is an east-west Minor Arterial that extends from SW Avalon Way to Alki Point. West of 63rd Avenue SW, it becomes a non-arterial local access street and ends west of 65th Avenue SW. Near the school site, the roadway has two travel lanes (one in each direction) and bike lanes (in-street with minor separation) in each direction. Sidewalks, curbs, gutters, and parallel parking are present along both sides of the street.

Several documents were reviewed to determine if any planned transportation improvements could affect the roadways and intersections near Alki Elementary School by 2025 when the new school would be completed and occupied. These documents are listed below.

> ***City of Seattle's Adopted 2021-2026 and Proposed 2022-2027 Capital Improvement Programs (CIP)*** [11] – No improvements to the transportation network were identified in the site vicinity.
>
> ***City of Seattle's Pedestrian Master Plan***[12] ***and Pedestrian Master Plan 5-Year Implementation Plan and Progress Report***[13] – The plans include the area around the school as part of the South Sector's Priority Investment Network and Seattle's Urban Village Network identifying missing sidewalks around the school on arterials and non-arterials. No improvements to the transportation network were identified in the site vicinity.
>
> ***Leavy to Move Seattle Work Plan Report***[14]– This document outlines SDOT's workplan to deliver citywide transportation projects and services funded in part or in full by the Levy to Move Seattle (approved by voters in 2015). The nine-year workplan (2016-2024) documents achievements and challenges and sets the agency's plan for future years. There are no projects defined in the site vicinity.
>
> ***Adopted Seattle Bicycle Master Plan (BMP)***[15] – The plan proposes future improvements along roadways within the site vicinity that have not been implemented yet. The plan recommends continuing a minor in-street bicycle lane (a bicycle facility with minor separation) along SW 59th Ave SW between SW Admiral Way and SW Spokane Street. The ***Seattle Bicycle Master Plan – 2021-2024 Implementation Plan***[16] which defines the BMP priorities does not define projects in the site vicinity. No improvements to the transportation network near the site were defined in the and in the ***Neighborhood Greenways***[17] website (updated February 25, 2021).

None of the planning documents included any transportation improvements that would affect the roadway network operations or intersection capacity within the study area by 2025. Therefore, the existing roadway and intersection configurations were assumed to remain unchanged for the 2025 analysis presented in this report.

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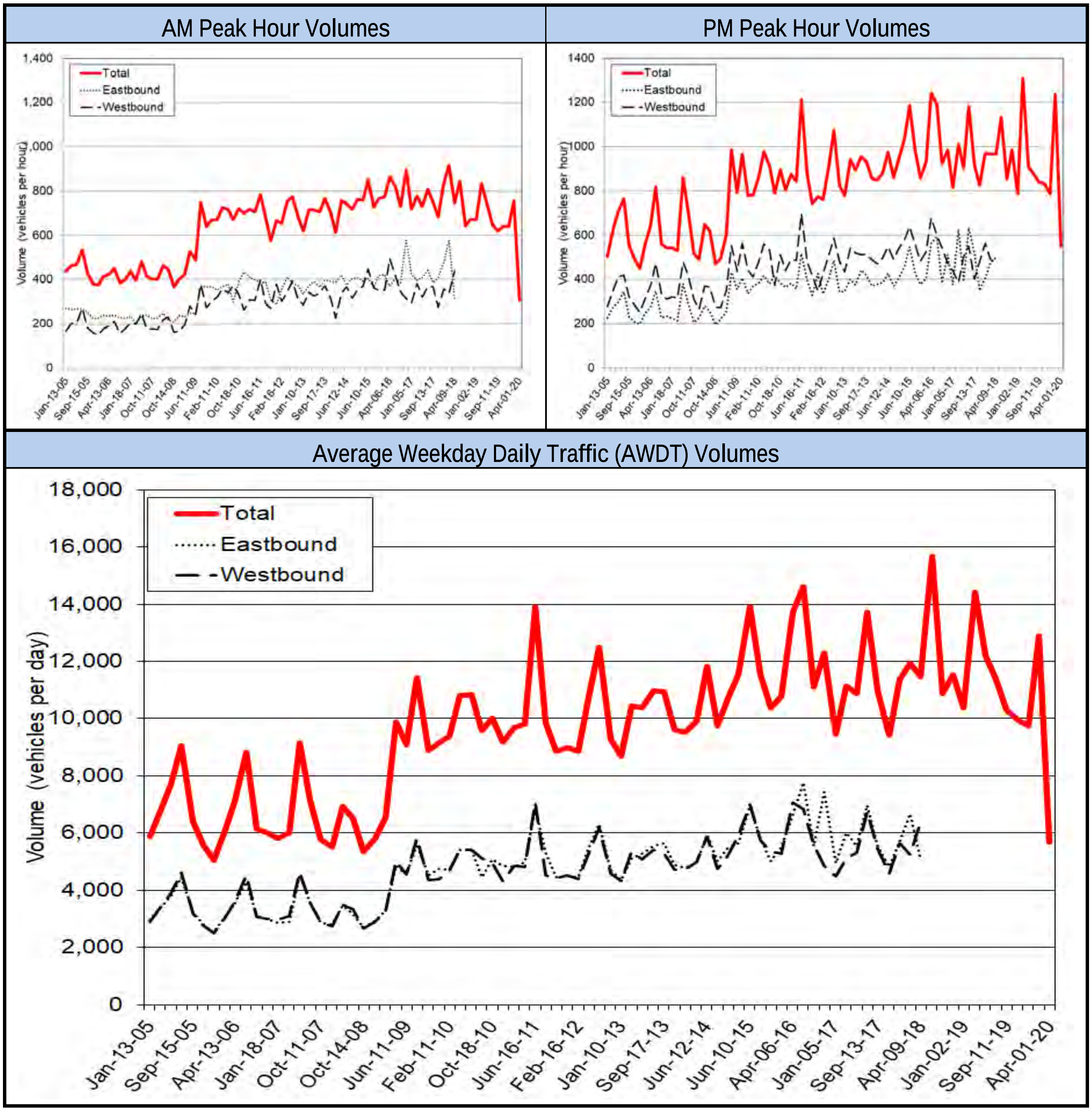
[11] City of Seattle, online access November 2021.
[12] City of Seattle, June 2017.
[13] City of Seattle, December 2019.
[14] Seattle Department of Transportation, November 2018.
[15] City of Seattle, April 2014.
[16] Seattle Department of Transportation, May 2021.
[17] City of Seattle, online access November 2021.

2.2. Traffic Volumes

2.2.1. Historical Traffic Volumes

Traffic volumes on the arterials around Alki Elementary, especially along Alki Avenue SW, fluctuate seasonally due to its proximity the beach-front park. SDOT has performed traffic counts on Alki Avenue SW west of Harbor Avenue SW (the nearest location for regular counts) about five times per year since 2005. These counts were compiled to show how AM peak hour, PM peak hour, and daily traffic volumes have fluctuated over the past 15 years. Figure 3 shows the traffic volume trends from 2005 through April 2020 when volumes declined steeply due to the COVID-19 pandemic.

Figure 3. Traffic Volumes on Alki Avenue SW – January 2005 thru April 2020

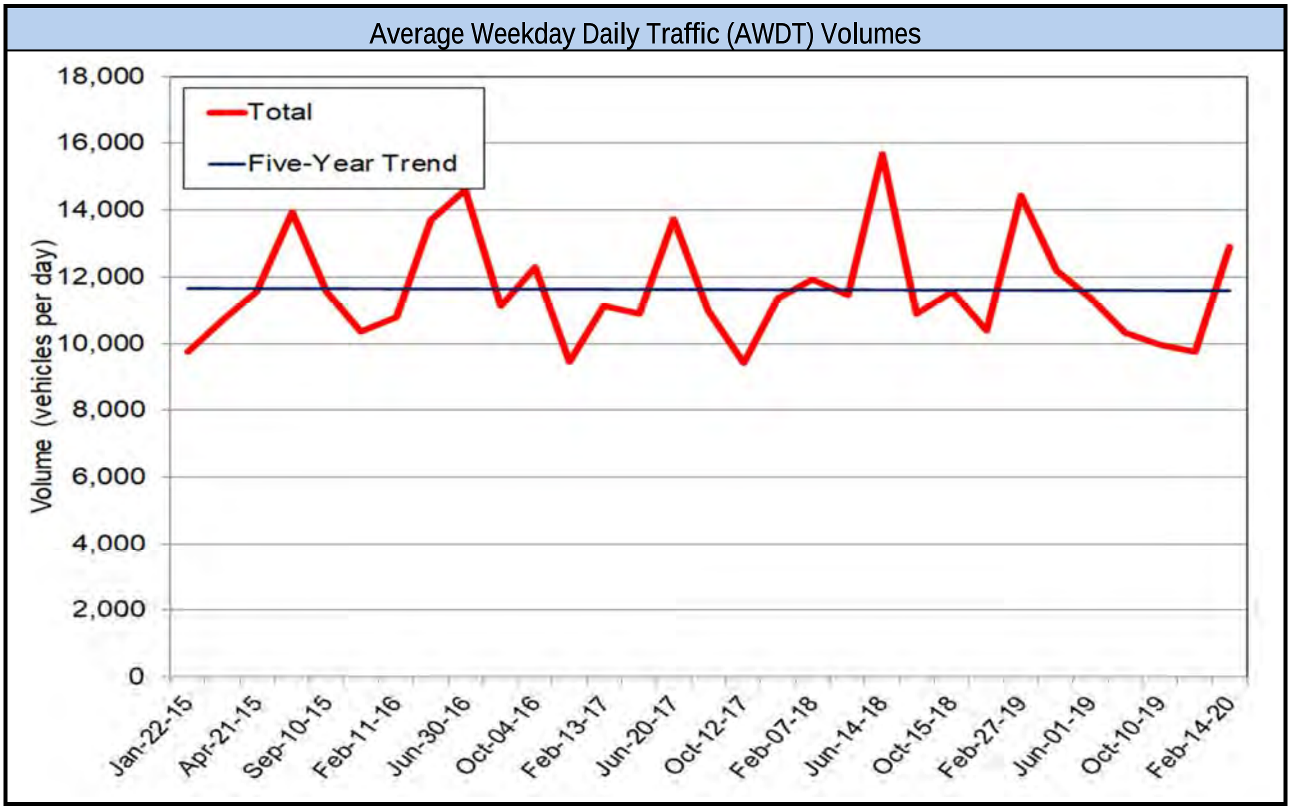


Source: Count data on Alki Avenue SW west of Harbor Avenue SW, SDOT, Traffic Count Database, 2021 (only totals are available after 2018).

The count data demonstrate the seasonal fluctuation of traffic with volumes during summer (most peaks are in June) typically higher than the late fall winter (the lowest volumes are typically in January). In addition, the data show that the seasonal fluctuation is more pronounced during the PM peak hour than during the AM peak hour. This is expected since recreational activity associated with Alki Beach tends to be higher in the late afternoon and early evenings during the longer days of warm-weather months.

To understand more recent traffic trends prior to the COVID-19 pandemic and prior to the emergency closure of the West Seattle High-Rise Bridge, the data for the five-year period between 2015 and February 2020 were examined. Figure 4 shows the average weekday volumes during that period along with the five-year trend. As shown, the seasonal fluctuation is still evident, but the volume trend remained virtually unchanged (or slightly declining) during the five years prior to the pandemic and bridge closure. Because Alki Elementary is not open in the summer, and because the school generates little to no traffic during the PM peak hour, no adjustments were made to account for the seasonal spikes in traffic due to Alki Beach activity.

Figure 4. Traffic Volumes on Alki Avenue SW – January 2015 thru February 2020



Source: Count data on Alki Avenue SW west of Harbor Avenue SW, SDOT, Traffic Count Database, 2021.

2.2.2. Existing Conditions

At the time of this analysis, the school day at Alki Elementary School started at 7:55 A.M. and ended at 2:25 P.M. To capture the existing traffic conditions during the current arrival and dismissal peak periods, traffic counts were performed from 7:00 to 9:00 A.M. and from 1:30 to 3:30 P.M. on Thursday, November 18, 2021 at each of the six study intersections. The counts indicated that the morning and afternoon peak hours for school traffic occurred from 7:15 to 8:15 A.M. and from 1:45 to 2:45 P.M., respectively.

The 2021 peak hour volumes on SW Admiral Way at 59th Avenue SW were compared to volumes compiled from turning movement counts performed at this intersection by SDOT in March 2017 and June 2018. This review found that eastbound volumes have declined by about 32% in the morning peak hour and by about 17% in the afternoon peak hour compared to the pre-pandemic/pre-bridge-closure 2018 and 2019 data; westbound declines were about 9% in the morning and 28% in the afternoon. Therefore, to reflect normalized existing conditions (non-pandemic with the West Seattle High-Rise Bridge re-opened), morning and afternoon peak hour volumes on the arterials—SW Admiral Way and Alki Avenue SW—were increased by 32% eastbound and 9% westbound in the morning; 17% eastbound and 28% westbound in the afternoon. Background volumes at the non-arterial local access street intersections were increased by 9% in the morning and 17% in the afternoon. These normalization adjustments result in a conservatively-high baseline of peak hour traffic volumes to represent existing conditions. Figure 5 shows the existing (2021) normalized morning and afternoon peak hour traffic volumes.

2.2.3. Future Without-Project Conditions

Future traffic volume forecasts for 2025 conditions without the project were developed using a compound annual growth rate. As described previously, SDOT's historical traffic count data on Alki Avenue SW indicate volumes have remained relatively flat over the five years prior to the pandemic and West Seattle Bridge closure. Although volumes have remained stable, to reflect the possibility of traffic growth in non-school traffic that could occur by 2025, a 1.0% compound annual growth rate was applied to the normalized 2021 traffic volumes described above. This rate is within the range of rates used for traffic analyses of other developments in the vicinity and throughout Seattle. Based on review of Seattle Department of Construction & Inspection's (SDCI's) Property and Building Activity permit map, one proposed development project (SCDI #3015843 – 2626 Alki Avenue SW) was identified that could contribute to increases in traffic at study intersections by year 2025. A current transportation report was not available for the proposal,[18] which proposed to develop a mixed-use building with 17 apartment units and about 2,700-sf of commercial space. Therefore, trip estimates were derived by Heffron Transportation and added to the background traffic volumes. Figure 6 shows the forecast 2025-without-project morning and afternoon peak hour traffic volumes.

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[18] SDCI issued a Correction Notice on September 17, 2019 requesting updated traffic and parking analysis.

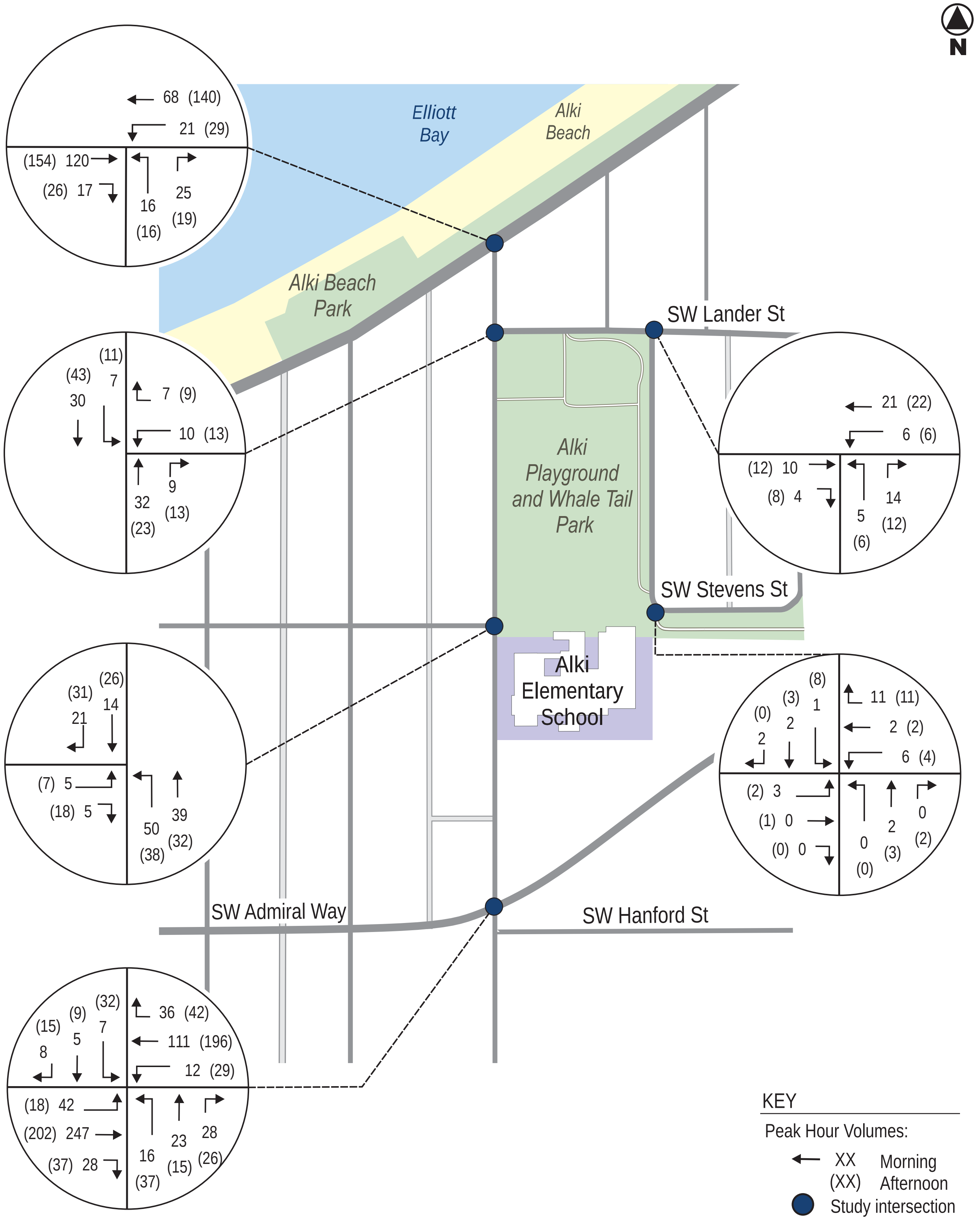

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Figure 5
Normalized Existing (2021) Traffic Volumes
Morning and Afternoon Peak Hours

heffron transportation inc

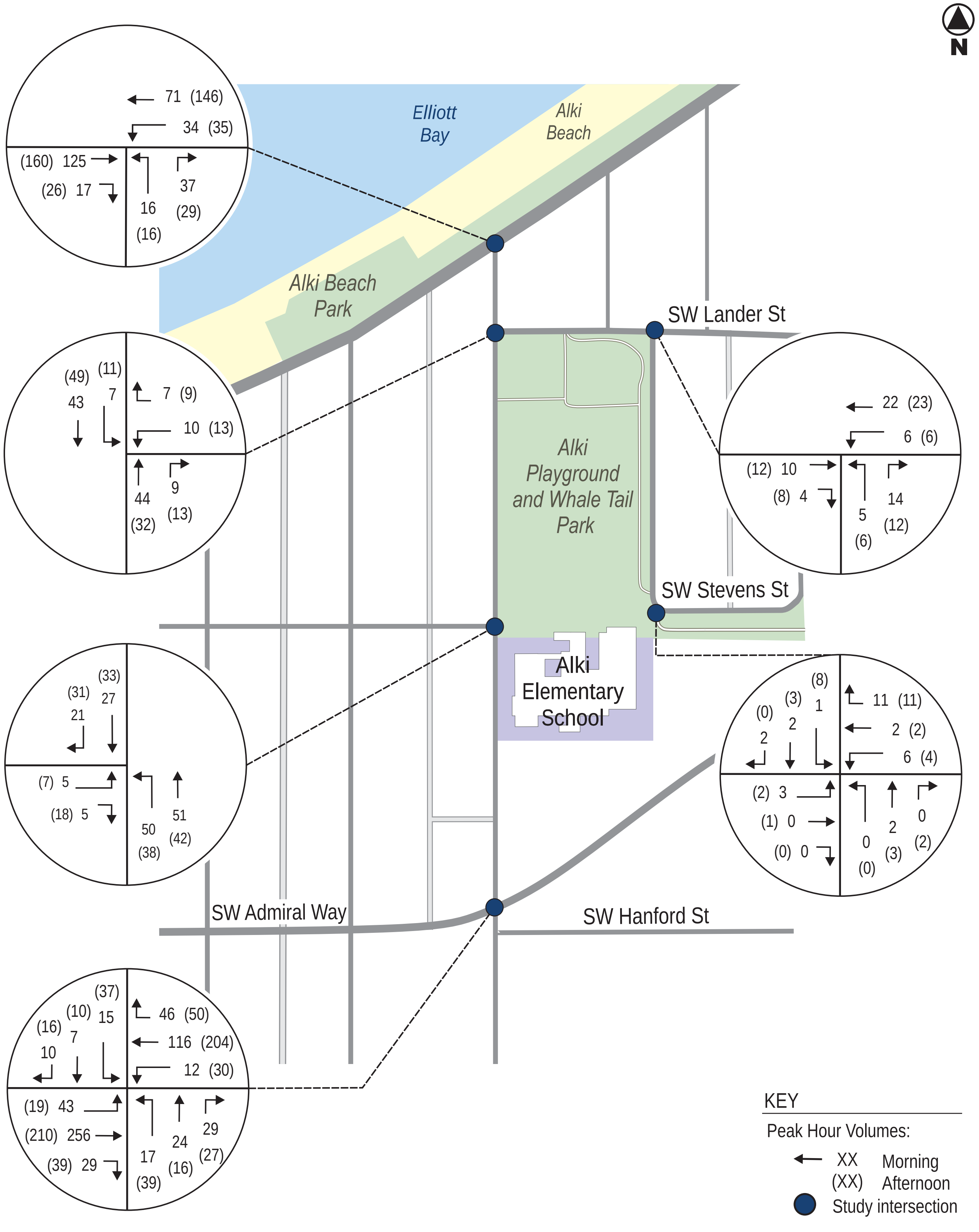

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Figure 6
Forecast 2025-Without-Project Traffic Volumes
Morning and Afternoon Peak Hours

2.4. Traffic Operations

2.4.1. Off-Site Study Area Intersections

Traffic operations are evaluated based on level-of-service (LOS), which is a qualitative measure used to characterize intersection operating conditions. Six letter designations, “A” through “F,” are used to define level of service. LOS A is the best and represents good traffic operations with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. The City of Seattle does not have adopted intersection level of service standards; however, project-related intersection delay that causes a signalized intersection to operate at LOS E or F, or increases delay at a signalized intersection that is projected to operate at LOS E or F without the project, may be considered a significant adverse impact, if increases are greater than 5 seconds. The City may tolerate LOS E/F conditions at unsignalized locations where traffic control measures (such as conversion to all-way-stop-control or signalization) are not warranted or desirable.

Levels of service for the study area intersections were determined using methodologies established in the *Highway Capacity Manual (HCM), 6th Edition.*[19] Appendix A summarizes HCM level of service thresholds and definitions for signalized and unsignalized intersections. The modeling assumptions for existing conditions, including signal timing and phase splits for the pedestrian signal on Admiral Way, were provided by SDOT.[20] Levels of service for the study area intersections were determined using the *Synchro 10.3* analysis software. The models reflect existing intersection geometries and channelization; these characteristics were assumed to remain unchanged for future 2025 conditions.

Table 1 summarizes existing and forecast 2025 levels of service without the proposed project for both the morning and afternoon peak hour conditions. As shown, all of the study area intersections currently operate at LOS A overall during both the morning and afternoon peak hours with all movements operating at LOS C or better. All intersections are expected to continue operating at LOS A overall in 2025 without the project with all movements remaining at LOS C or better. The assumed growth in background traffic is estimated to add small amounts of delay (less than four seconds per vehicle) to five of the seven study-area intersections by 2025. Because existing volumes are very low at the remaining two unsignalized intersection, the assumed growth rate did not result in noticeable changes to volume forecasts nor any increases in delay by 2025-without the project.

Based on observations at the existing school during morning arrival and afternoon dismissal, passenger vehicles arrive from all directions at the SW Stevens Street / 59th Avenue SW intersection. Due to the width of both streets (25-feet curb-to-curb with parking permitted on both sides), the travel ways are effectively restricted to one lane for both directions of travel. This results in peak-period congestion and some undesirable vehicle movements at this intersection during the 15 to 20 minutes before and after school. During the periods of peak load / unload activity, on-street parking and maneuvering into and out of the parking spaces slows travel around the school.

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[19] Transportation Research Board 2016.
[20] SDOT, December 2021.

Table 1. Level of Service Summary – Existing and 2025-Without-Project Conditions

	Morning Peak Hour				Afternoon Peak Hour			
Control Type / Intersections	Existing		Without-Project		Existing		Without-Project	
Signal	LOS[1]	Delay[2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Admiral Way / Pedestrian Xing at 59th	A	7.6	A	7.7	A	7.4	A	7.5
All-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Stevens Street / 59th Avenue SW	A	8.1	A	8.4	A	7.4	A	7.5
Two-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Admiral Wy / 59th Ave SW (overall)	A	3.7	A	4.5	A	4.1	A	4.4
Eastbound Left Turns	A	7.8	A	7.8	A	7.9	A	7.9
Westbound Left Turns	A	8.2	A	8.2	A	8.0	A	8.0
Northbound Movements	C	17.3	C	18.4	C	16.1	C	17.0
Southbound Movements	C	15.7	C	19.0	C	16.4	C	17.7
One-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Lander St / 59th Ave SW (overall)	A	2.1	A	1.7	A	2.3	A	2.1
Southbound Left Turns	A	7.5	A	7.6	A	7.4	A	7.4
Westbound Movements	A	9.8	B	10.1	A	9.4	A	9.5
Alki Ave SW / 59th Ave SW (overall)	A	2.8	A	3.4	A	1.9	A	2.2
Westbound Left Turns	A	7.8	A	7.9	A	7.8	A	7.8
Northbound Movements	B	11.0	B	11.4	B	10.9	B	11.0
Uncontrolled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Lander St / 58th Ave SW (overall)	A	4.4	A	4.4	A	2.7	A	2.7
Westbound Left Turns	A	7.3	A	7.3	A	7.4	A	7.4
Northbound Movements (assumed stop [3])	A	8.9	A	8.9	A	9.1	A	9.1
SW Stevens St / 58th Ave SW (AWS [4])	A	7.0	A	7.0	A	6.9	A	6.9

Source: Heffron Transportation, Inc., April 2022.

1. *LOS = Level of service.*
2. *Delay = Average seconds of delay per vehicle.*
3. *Intersection is uncontrolled; analysis reflects observed behavior of northbound drivers stopping.*
4. *Intersection is uncontrolled; assumes all-way-stop operations based on volumes and configuration.*

2.4.2. Site Access

The school has one vehicular access driveway on 59th Avenue SW that provides access to the existing on-site parking lot and service area.

2.5. Parking Supply and Occupancy

On-street parking at and around the Alki Elementary School site was surveyed to determine the existing parking supply and parking occupancy. The results of those surveys were used to estimate how parking occupancy could be affected by the school addition and renovation project (which is presented later in Section 3.4). The following sections describe the parking supply as well as the current parking occupancy and utilization rates.

2.5.1. Methodology and Study Area

Detailed on-street parking studies were performed and supply was documented according to the methodology outlined in the City's Tip #117. Although Tip #117 was created for another purpose, it outlines the City's preferred methodology to determine the number and type of on-street parking spaces that may exist within a defined study area, and how much of that supply is currently utilized at different times of the day.

The study area for the on-street parking analysis included all roadways within an 800-foot *walking* distance from the school site, as is typically required by the City of Seattle. The 800-foot walking distance results in a study area that extends just east of 61st Avenue SW to the west, Alki Avenue SW to the north, just west of the 56th Avenue SW to the east, and just north of SW Hinds Street to the south. The study area consists primarily of single- and multi-family residences, many of which have driveways, garages, and/or off-street parking accessed via alleys.

Existing On-Street Parking Supply

The study area was separated into individual block faces. A block face consists of one side of a street between two cross-streets. For example, the north side of SW Stevens Street, between 61st Avenue SW and 60th Avenue SW is one block face (identified as block face 'BA' for this study). The study area and block face designations are shown on Figure 7.

Each block face was measured and analyzed to determine the number of available on-street parking spaces. First, common street features—such as driveways, fire hydrants, and special parking zones—were noted and certain distances adjacent to the street features were noted. No on-street parking capacity is assumed within 30 feet of a signalized or marked intersection, within 20 feet of an uncontrolled intersection, within 15 feet on either side of a fire hydrant, or within 5 feet on either side of a driveway or alley. The remaining unobstructed lengths between street features were converted to legal on-street parking spaces using values in the City's Tip #117. Based on extensive past experience of Heffron Transportation preparing on-street parking utilization studies, a trend has been observed that the increased popularity of smaller cars and the tendency for drivers to park closer together in areas with higher utilization can result in more available supply than would be suggested by the Tip #117 guidance. Detailed parking supply by block face is provided in Appendix B.

The parking supply survey determined that there are 374 on-street parking spaces within the existing study area and 355 have no signed restrictions. After accounting for school-bus and school-load restrictions along 59th Avenue SW (totaling 9 spaces), and Alki Community Center Staff Parking along Schmitz Park Road Street (6 spaces). The study-area on-street parking supply totals 359 spaces across all three survey periods.

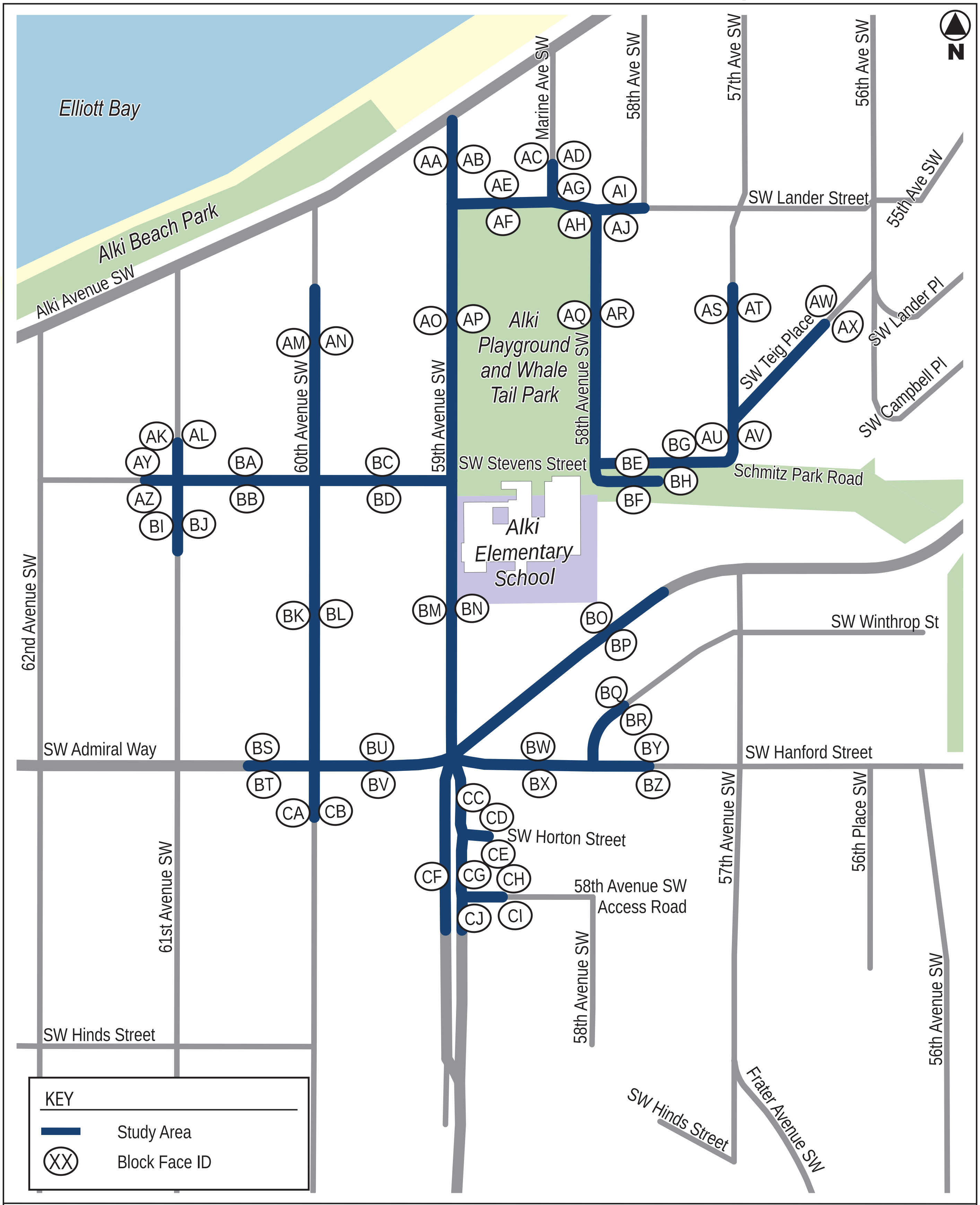

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Figure 7
Study Area for On-Street Parking Utilization Surveys

heffron transportation inc

Existing On-Street Parking Occupancy

At the time of this study, Seattle Public Schools had returned to in-person learning despite the lingering effects of the COVID-19 pandemic. While some employees were beginning to return to offices in the greater Seattle region, many were still working from home, especially in West Seattle due to the High-Rise Bridge closure, which likely resulted in higher levels of resident-generated parking demand at and near homes during weekdays.

Parking occupancy counts were performed in December 2021. Weekday occupancy counts were performed during early morning (between 7:00 and 7:45 A.M.), the time when staff would typically begin to arrive at the school, and mid-morning (between 10:30 and 11:15 A.M.), the time when school-day parking is typically highest. Evening counts were performed (between 7:30 and 8:15 P.M.) when school events would typically occur. The counts for each day were compiled and averaged. The results of the parking occupancy surveys are summarized in Table 2. Detailed summaries of the on-street parking occupancy by block face for all counts are provided in Appendix B.

On-street parking utilization was calculated using the methodology described in Tip #117 and is the number of vehicles parked on-street divided by the number of legal on-street parking spaces within the study area or on a specific block face. The study area utilization totals are summarized in Table 2. For the purpose of evaluating the potential on-street parking impacts associated with the new school, the City considers utilization rates of 85% or higher to be effectively full.

Table 2. Parking Occupancy Survey Results – December 2021

Time Period Surveyed	Parking Supply	Total Vehicles Parked	% Utilization
Weekday Early Morning (7:00 to 7:45 A.M.)			
Tuesday, December 7, 2021	359 [a]	191	53%
Thursday, December 9, 2021	359 [a]	202	56%
Average	359 [a]	*197*	*55%*
Weekdays Mid-Morning (10:30 to 11:15 A.M.)			
Tuesday, December 7, 2021	359 [a]	179	50%
Thursday, December 9, 2021	359 [a]	187	52%
Average	359 [a]	*183*	*51%*
Weekday Evenings (7:30 to 8:15 P.M.)			
Tuesday, December 7, 2021	359 [a]	203	57%
Thursday, December 9, 2021	359 [a]	207	58%
Average	359 [a]	*205*	*57%*

Source: Heffron Transportation, Inc., December 2021.

a. Parking supply values exclude, 9 spaces signed for School Load Only (7 – 10 am, 1 – 4 pm) no parking all other times, and 6 spaces signed for Alki Community Center – Staff Parking.

As shown, the surveys determined that parking utilization ranged between 50% and 58% during all time periods and unused parking averaged between 152 and 180 spaces across the six observations during three periods. It is acknowledged that parking demand in the vicinity is also influenced by the seasonal activities at the Alki Beach front, which are not reflected in the counts from December 2021. Increased recreational parking demand tends to increase in the later afternoon and early evening beginning in spring as the weather warms and continues through summer into early fall. The seasonal increases in parking demand likely have limited influence during weekday school hours (7:55 A.M. to 2:25 P.M.), but can heavily influence conditions in the late afternoon and early evening during late spring and early fall periods when occasional school events may also be scheduled.

2.5.2. Off-Street Parking

There is one on-site parking lot with an estimated parking supply of 20 spaces. The lot is located on the south side of the school and has some stalls for signed staff (3 spaces) and loading (1 space). The lot is accessed from a driveway on 59th Avenue SW about 230 feet south of SW Steven Way. On-site parking occupancy was observed on the same days and times as listed previously for the on-street parking observations. There were 6 and 12 vehicles parked on-site during the two early morning observations, 17 and 19 vehicles parked during the two mid-morning observations, and 1 and 3 vehicles parked during the two evening observations.

2.6. Traffic Safety

Collision data for the study area intersections and roadway segments were obtained from SDOT's Open Data Portal for the period between January 1, 2018 and the most recent records available as of December 1, 2021 (3.9 years). The data were examined to determine if there are any unusual traffic safety conditions that could impact or be impacted by the proposed project. Table 3 below summarizes the collision data.

Table 3. Collision Summary (January 1, 2018 through December 1, 2021)

Intersection	Rear-End	Side-Swipe	Left Turn	Right Angle	Ped / Cycle	Other [a]	Total for 4 Years	Average/ Year
SW Admiral Way / 59th Avenue SW	0	0	0	1	0	1	2	0.5
SW Stevens Street / 59th Avenue SW	0	0	0	0	0	1	1	0.3
SW Lander Street / 59th Avenue SW	0	0	0	0	0	0	0	0.0
Alki Avenue SW / 59th Avenue SW	0	0	0	0	0	0	0	0.0
SW Lander Street / 58th Avenue SW	0	0	0	0	0	0	0	0.0
SW Stevens Street / 58th Avenue SW	0	0	0	0	0	0	0	0.0
Roadway Segment	**Rear-End**	**Side-Swipe**	**Left Turn**	**Right Angle**	**Ped / Cycle**	**Other [a]**	**Total for 4 Years**	**Average/ Year**
59th Avenue SW between SW Admiral Way and Alki Avenue SW [b]	1	0	0	0	1	4	6	1.5
58th Avenue SW between SW Stevens Street and SW Lander St	0	0	0	0	0	1	1	0.3

Source: City of Seattle Department of Transportation, https://data-seattlecitygis.opendata.arcgis.com/datasets/collisions, December 1, 2021.

a. *'Other' collisions included two vehicles striking parked vehicles, one vehicle struck an object in the roadway, and four collisions with insufficient information to determine type that involved property damage only to a parked vehicle.*

Unsignalized intersections with five or more collisions per year and signalized intersections with 10 or more collisions per year are considered high collision locations by the City. As shown, all of the study area intersections averaged less than a collision per year. Of the 10 total collisions reported at the six intersections and along the two street segments, six involved parked vehicles. There was one reported collision that involved a pedestrian crossing mid-block along 59th Avenue SW. None of the studied location meet the criteria for a high-collision location, and none of the reported collisions resulted in fatalities. Overall, these data do not indicate any unusual traffic safety conditions.

2.7. Transit Facilities and Service

King County Metro Transit (Metro) provides bus service in the site vicinity. The closest bus stop is located about 450 feet to the south on SW Admiral Way at 59th Avenue SW and serves eastbound buses; a stop serving westbound buses is located about 1,000 feet away on SW Admiral Way at 61st Avenue SW. These stops are served by Metro Routes 50, 56, and 775, which are described below.

> **Route 56** provides daily, peak period service between the Alki and Downtown Seattle with stops in the Admiral District. On weekdays, the route operates with eight trips inbound to Downtown Seattle in the morning between 5:50 and 9:00 A.M.; it operates with seven trips outbound from Downtown in the afternoon between about 3:00 and 6:45 P.M.
>
> **Route 50** provides daily service between the Alki and Othello Station with stops in the Admiral District, Alaska Junction, SODO, VA Medical Center, Beacon Hill, Columbia City and Seward Park. On weekdays, the route operates with inbound trips to Othello Station with headways (time between consecutive buses) of 15 to 45 minutes between about 5:30 A.M. and 12:00 A.M.; it operates outbound trips to Alki with 30- to 45-minute headways between about 5:00 A.M. and 12:00 A.M.
>
> **Route 775** provides weekday, peak period service in one direction between Seacrest Park and Alki with a stop in the Admiral District. On weekdays, the route operates with six trips between about 6:30 and 9:00 A.M.; it operates outbound seven trips between about 3:15 and 7:00 P.M. There are also stops located about 0.2 mile to the north on Alki Avenue SW at 59th Avenue SW.

In January 2017, King County Metro adopted ‘Metro Connects,[21] the 25-year vision plan that will serve as the guiding policy framework for future improvements to the transit network. The plan identifies some changes to routes serving the study area, but none are expected to be in place by 2025 when the school re-opening occurs.

School bus transportation is typically made available to transportation-eligible students attending Alki Elementary. According to District staff, Alki Elementary was served by two full-size buses and one smaller SPED school bus prior to the COVID-19 pandemic.[22] Due to ongoing driver shortages and other factors resulting from the pandemic, no school buses were serving the site during the counts and analysis performed in November and December 2021.

2.8. Non-Motorized Transportation Facilities

As described in the Roadway Network section, most roadways in the study area have sidewalks on both sides; intersections in the site vicinity with marked crosswalks are listed below:

- SW Stevens Street / 59th Avenue SW: *crosswalk on south, west and north legs;*
- SW Stevens Street / 58th Avenue SW: *crosswalk on north leg;*
- Alki Avenue SW / 59th Avenue SW: *crosswalk on west and east legs; and*
- SW Admiral Way / 59th Avenue SW: *crosswalk on south, east and north legs.*

A pedestrian traffic signal is located on the east leg of the stop-sign-controlled SW Admiral Way / 59th Avenue SW intersection.

The count data indicated high levels of pedestrian activity at intersections near the school during the analysis hours. The SW Stevens Street / 59th Avenue SW intersection experienced the highest pedestrian volume with about 260 pedestrians crossing during the morning peak hour and about 375 crossing in the

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[21] King County Metro, adopted January 2017.

[22] Email communication, M. Barrett – Project Manager, Capital Projects and Planning, Seattle Public Schools, Nov. 2019.

afternoon. Pedestrian volumes were lower farther from the site. It is noted that the counts were conducted in November when weather during the school day was dry and temperatures were normal. The school Principal indicated that about five families bicycle to and from school on a regular basis.[23]

The City of Seattle's currently-adopted *CIP* and the *Safe Routes to School 5-Year Action Plan for Seattle 2021-2025*[24] were reviewed to determine if any pedestrian facility improvements are planned in the area. The proposed *2021-2026 CIP* includes funding over the next five years to advance the *Pedestrian Master Plan*[25] recommendations. *Seattle Pedestrian Master Plan 2022-2024 Implementation Plan Report*[26] does not list any planned improvements within the study area.

Some of the roadways in the vicinity of the site have bicycle facilities. 59th Avenue SW is designated as a neighborhood greenway between SW Admiral Way and Alki Avenue SW. Alki Avenue SW has sharrows and an adjacent multi-use trail. SW Admiral Way includes an in-street bike lane with minor separation between 63rd Avenue SW and California Avenue SW. The *BMP* identifies planned bicycle infrastructure improvements. The plan recommends continuing a minor in-street bicycle lane (a bicycle facility with minor separation) from SW Admiral Way and south along a segment of SW 59th Avenue SW between SW Admiral Way and SW Spokane Street. The *Seattle Bicycle Master Plan – 2021-2024 Implementation Plan*,[27] which defines the BMP priorities, does not define projects in the site vicinity. The *Neighborhood Greenways*[28] website (updated February 25, 2021) does not identify any new or upcoming greenway projects near the school site.

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[23] Mahlum Architects, May 7, 2022.
[24] SDOT, 2021.
[25] SDOT, June 2017.
[26] SDOT, 2021.
[27] Seattle Department of Transportation, May 2021.
[28] https://www.seattle.gov/transportation/projects-and-programs/programs/greenways-program, accessed April 2022.

3. PROJECT IMPACTS

This section describes the conditions that would exist with the Alki Elementary School addition and renovation complete and the school operating with up to 542 students. Vehicle trip estimates associated with the project were added to the 2025-without-project traffic volume forecasts. Level of service analyses were performed to determine the proposed project's impact on traffic operations in the study area. Parking demand and the potential change to on-street parking utilization was also estimated.

3.1. Roadway Network

The new Alki Elementary project would eliminate the existing staff parking lot on the south side of the existing building. The existing access driveway serving that lot would be modified to serve a new gated delivery / service area proposed on the southwest corner of the site. The project would improve its site's frontage along 59th Avenue SW with new curb, sidewalk, street trees, and with a two-foot widened pull-out area to better accommodate school buses. It is anticipated that SPS will renew its code departure for the on-street school-bus load/unload zone along 59th Avenue SW. All frontage improvements will be coordinated with SDOT.

Curb-side passenger-vehicle drop-off/pick-up is planned to be retained, and possibly extended northward, along the east side of 59th Avenue SW adjacent to the Alki Playground. Family-vehicle load/unload would also continue to occur with the use of on-street parking in the surrounding residential neighborhood. However, it is acknowledged that as part of the City's *Seattle Transportation Plan* process (launched in March 2022), SDOT is reviewing, and may in the longer-term expand, its school-streets program that closes neighborhood streets around some schools to pass-through traffic, including parents. This program has a goal of reducing traffic congestion in front of schools, encouraging families to walk or bike to school, and/or park a few blocks away and walk, dispersing the vehicular traffic impacts of the school. To reflect worst-case conditions for evaluating potential impacts, this analysis reflects the current patterns with vehicular activity more concentrated adjacent to and near the school site.

3.2. Traffic Volumes

The proposed project could generate new vehicular, pedestrian, and bicycle activity on the surrounding transportation network. The school is expected to have an enrollment capacity of up to 542 students, and is expected to generate an increase in daily and peak hour traffic compared to existing conditions. The following describes the method used to estimate project-generated traffic.

3.2.1. School Trip Generation

Trip generation estimates for school projects are generally developed using one of two methods. For new schools, rates published in the ITE's *Trip Generation Manual*[29] can be applied. For modernizations, replacement, and/or expansions of existing schools, actual counts of the existing school can be used. Trip generation estimates were derived from the video traffic counts performed at surrounding intersections and along the roadways adjacent to the school. The resulting estimates were compared to published trip generation rates.

Based on the data collected, the school currently generates an estimated 0.68 trips per student in the morning peak hour and 0.78 trips per student in the afternoon peak hour. The rates are similar to rates derived from counts at other Seattle elementary schools. However, it is acknowledged that the derived rates may be higher than normal conditions due to the lack of school bus service and more adult family members working from home (due to COVID and the bridge closure) with availability to drive students to and from school. Since these rates were derived specifically for the existing school, they are most

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[29] ITE, 11th Edition, September 2021.

appropriate for use in evaluating future conditions with the added enrollment capacity that would occur with the Alki Elementary School addition and renovation project.

The derived rates were applied to estimate trip generation by the Alki Elementary School addition and renovation at its proposed new enrollment capacity (542 students including the proposed new pre-school component). Table 4 presents the resulting trip generation estimates. The number of school buses serving the site is expected to return to prior levels with two full-size and one SPED bus.[30] These estimates account for trips associated with the pre-school and before- and after-school care components, although many of those trips may occur outside of the peak hours for the school. The net change in trips was derived by comparing the trips with the proposed expansion to those that existed with the enrollment level in November 2021. This is a worst-case condition since the current enrollment is lower than the school's capacity as well as historic enrollment.

Table 4. Alki Elementary School Addition and Renovation Project – Trip Generation Estimates

		Morning Peak Hour			Afternoon Peak Hour		
Site Condition	Enrollment	In	Out	Total	In	Out	Total
Proposed Alki Elementary School	542 students [a]	192	174	366	222	200	422
Existing Alki Elementary School	308 students [b]	109	99	208	126	114	240
Net Change	234 students	83	75	158	96	86	182

Source: Heffron Transportation, Inc., April 2022.

a. *Potential future capacity of school with addition, renovation, and new Pre-K element.*

b. *Enrollment of the existing school at the time of site traffic counts; SPS P223 Enrollment Report, Nov. 2021.*

3.2.2. Trip Distribution & Assignment

The expanded Alki Elementary School is expected to accommodate growth largely within the existing enrollment area for the school. Trip distribution patterns for the added elementary school trips within the project study area were developed based on a combination of resources including: 1) the school's attendance area; 2) population density data in census tracks within the subsectors of school's attendance area; 3) employment location of residents living within the school's attendance area from *OnTheMap,*[31] 4) Google Maps predictive travel-route and travel-time mapping resource; and 5) traffic counts and directional patterns at intersections adjacent to the site. The resulting trip patterns reflect typical habits of some family drivers linking student drop-off and pick-up trips with trips to and from work or other destinations. For existing, without-, and with-project conditions, most of the morning and afternoon peak hour trips consist of passenger vehicles (for student drop off and pick up) and school buses with some trips generated by teachers and staff.

School buses would use northbound 59th Avenue SW to access the bus loading area adjacent to the school. Family-vehicle drivers are expected to use curb-side areas adjacent to the Alki Playground along 59th Avenue SW and on-street parking within the surrounding neighborhood. The proposed school layout would not provide on-site staff and visitor parking. Staff and visitors would be required to use on-street parking in the site vicinity. Figure 8 shows the estimated net changes in traffic at the study intersections along with the project trip distribution percentages for both the morning and afternoon peak hours. The net changes in peak hour trips were combined with the forecast 2025-without-project traffic volumes to reflect future conditions with the school addition and renovation. Figure 9 shows the forecast 2025-with-project morning and afternoon peak hour traffic volumes.

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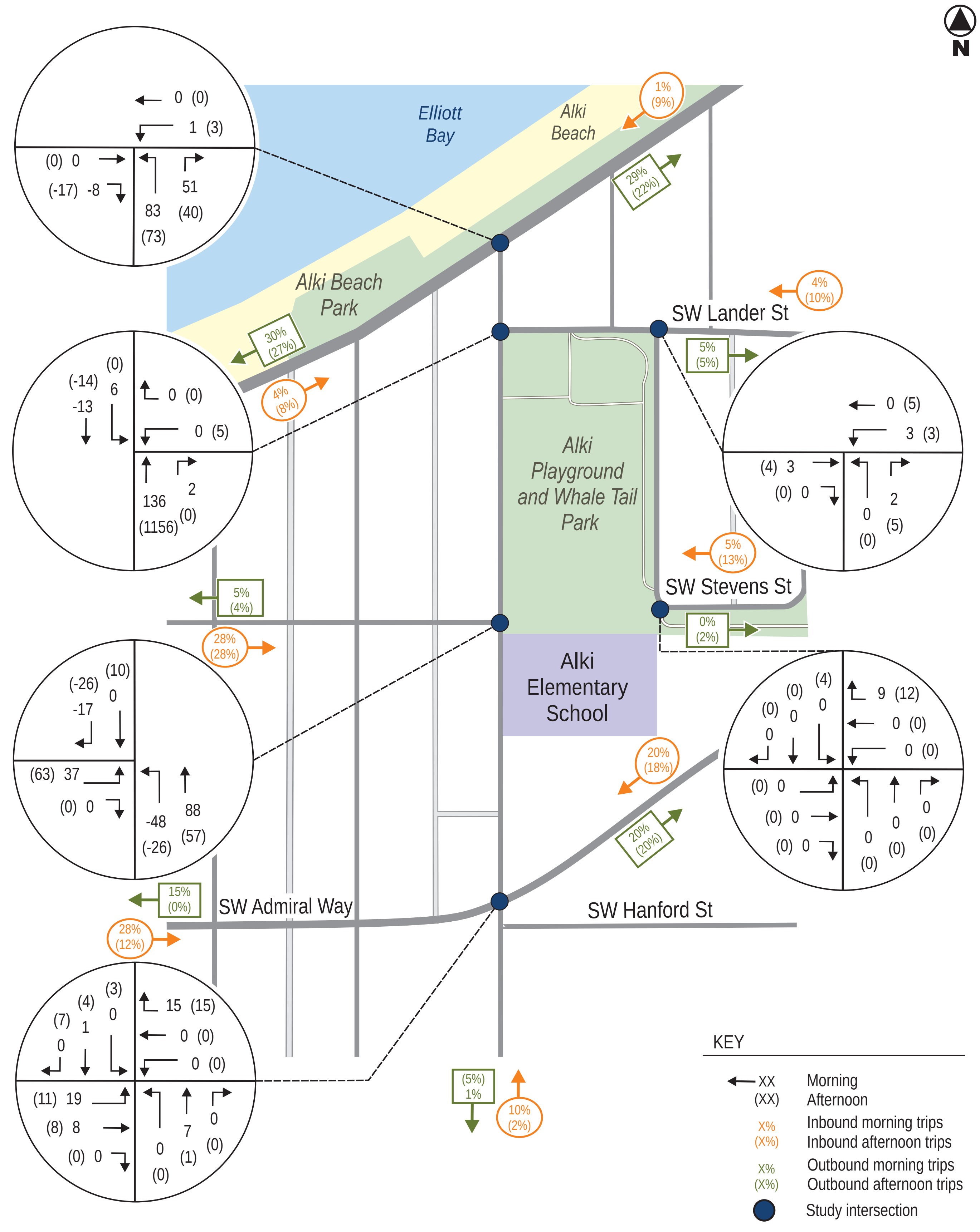
[30] Email communication, T. Yang, February 23, 2022.

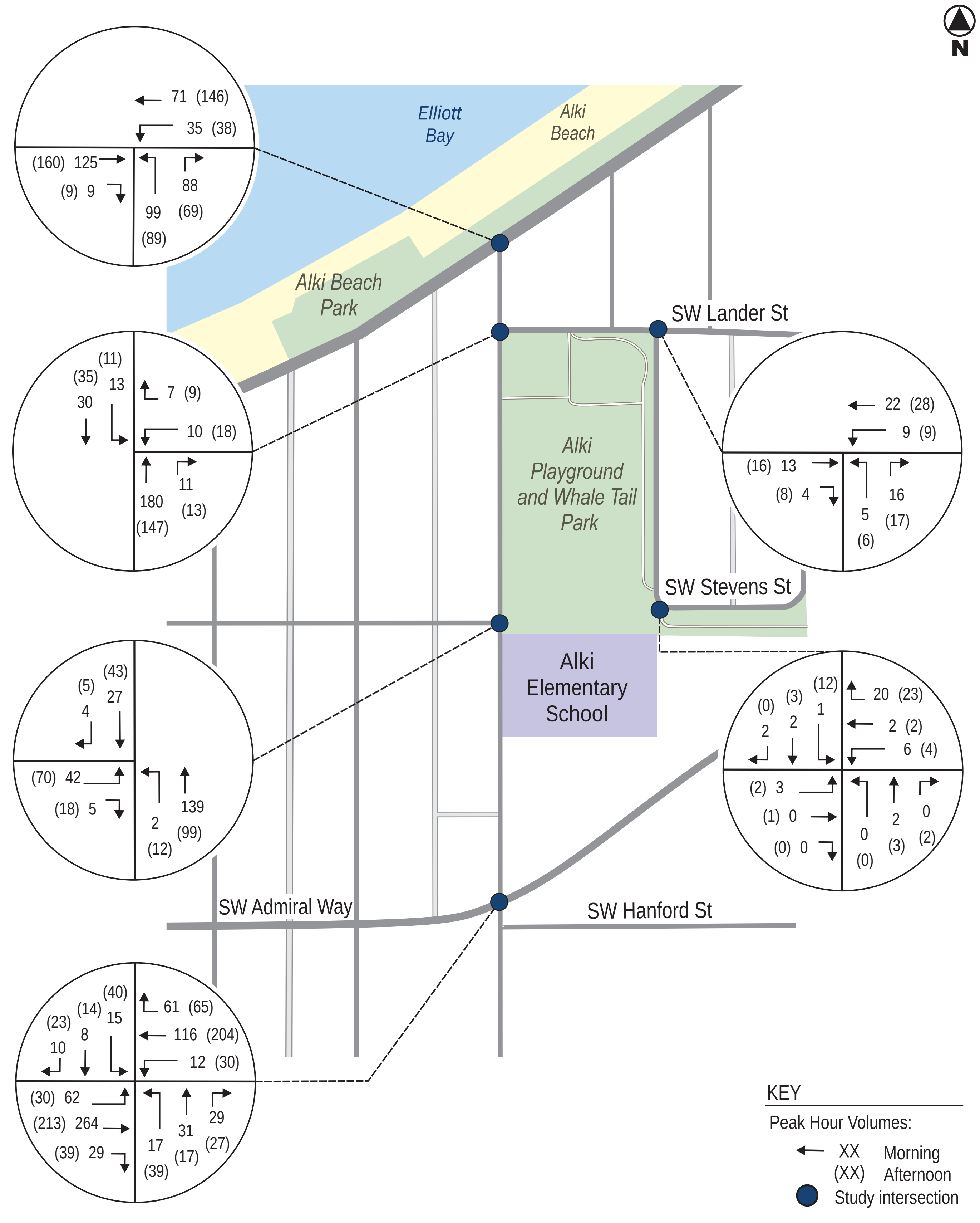
[31] Version 6, United States Census Bureau, web-based mapping and reporting application, https://onthemap.ces.census.gov/, accessed March 2021.



SEATTLE PUBLIC SCHOOLS
Alki Elementary School
Addition and Renovation

Figure 8
Net Project Trips and Distribution
Morning and Afternoon Peak Hours

heffron transportation inc



SEATTLE PUBLIC SCHOOLS
Alki Elementary School
Addition and Renovation

Figure 9
Forecast 2025-With-Project Traffic Volumes
Morning and Afternoon Peak Hours

heffron transportation inc

3.3. Traffic Operations

Intersection levels of service for forecast 2025-with-project conditions were evaluated using the same methodology described previously. The additional enrollment capacity could result in increased pedestrian trips, crossings, and bicycle activity at the nearby study intersections. The operational analyses accounted for these potential increases. Table 5 shows the results of the analysis; levels of service for the 2025-without-project conditions are provided for comparison.

Table 5. Level of Service Summary – Forecast 2025-Without- and With-Project Conditions

	Morning Peak Hour				Afternoon Peak Hour			
Control Type / Intersections	Without-Project		With-Project		Without-Project		With-Project	
Signal	LOS [1]	Delay [2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Admiral Way / Pedestrian Xing at 59th	A	7.7	A	9.3	A	7.5	A	9.0
All-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Stevens Street / 59th Avenue SW	A	8.4	A	9.5	A	7.5	A	8.4
Two-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Admiral Wy / 59th Ave SW (overall)	A	4.5	A	5.6	A	4.4	A	5.2
Eastbound Left Turns	A	7.8	A	8.0	A	7.9	A	8.1
Westbound Left Turns	A	8.2	A	8.4	A	8.0	A	8.1
Northbound Movements	C	18.4	C	23.4	C	17.0	C	19.5
Southbound Movements	C	19.0	C	23.6	C	17.7	C	20.0
One-Way Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Lander St / 59th Ave SW (overall)	A	1.7	A	1.2	A	2.1	A	1.4
Southbound Left Turns	A	7.6	A	8.7	A	7.4	A	8.0
Westbound Movements	B	10.1	B	13.7	A	9.5	B	11.4
Alki Ave SW / 59th Ave SW (overall)	A	3.4	B	10.8	A	2.2	A	6.2
Westbound Left Turns	A	7.9	A	7.8	A	7.8	A	7.8
Northbound Movements	B	11.4	C	19.4	B	11.0	B	14.9
Uncontrolled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Lander St / 58th Ave SW (overall)	A	4.4	A	4.5	A	2.7	A	2.9
Westbound Left Turns	A	7.3	A	7.3	A	7.4	A	7.5
Northbound Movements (assumed stop [3])	A	8.9	A	9.0	A	9.1	A	9.2
SW Stevens St / 58th Ave SW (AWS [4])	A	7.0	A	7.0	A	6.9	A	7.0

Source: Heffron Transportation, Inc., April 2022.

1. *LOS = Level of service.*
2. *Delay = Average seconds of delay per vehicle.*
3. *Intersection is uncontrolled; analysis reflects observed behavior of northbound drivers stopping*
4. *Intersection is uncontrolled; assumes all-way-stop operations based on volumes and configuration.*

As shown, all of the study-area intersections are forecast to continue operating at LOS A overall with all movements remaining at LOS C or better during both peak hours in 2025 with the Alki Elementary School addition and renovation project. The added vehicular traffic as well as increases in pedestrian activity around the school during peak hours due to the larger enrollment capacity is expected to add vehicular delay to study-area intersections. However, the project-related increases are forecast at eight seconds or less per vehicle. As is typical in school areas during peak conditions—some congestion around the school would continue to occur during the 20 minutes before and after school. The project would not result in significant adverse impacts to study area traffic operating conditions.

3.4. Parking Supply and Demand

The project would eliminate the on-site parking and the vehicles that currently park there (observations found 17 to 19 vehicles in school days) would be displaced to on-street parking in the site vicinity. The school would continue to have less off-street parking than would be required by Seattle land use code. As part of the building permit approval process for the project, SDCI is anticipated to initiate a Development Standard Departure process with the Seattle Department of Neighborhoods to review this and any other code departures requested.

The school's frontage along 59th Avenue SW that prohibits parking, but allows school load/unload activities during peak periods on school days, would not substantially change with project.

3.4.1. School Day Parking

School-day parking at elementary schools is primarily influenced by staffing levels and family-volunteer activity. With the school at its proposed increased enrollment capacity (542 students), the school could have up 65 to 75 total employees (an increase of 27 to 37 compared to current conditions). Future parking demand estimates were developed based on studies at similar elementary schools in the area and rates published by ITE. Observations performed by Heffron Transportation at numerous Seattle elementary schools indicate school-day parking demand rates ranging from 1.06 to 1.23 vehicles parked per employee. ITE's *Parking Generation*[32] includes rates of 0.13-vehicles-per-student and 0.95-vehicles-per-employee. Based on the range of rates available, the proposed project with the enrollment capacity and staffing increase, the expanded school could generate an additional parking demand of 26 to 45 vehicles; demand would vary somewhat depending on the number of part-time staff and volunteers on site at any one time. With the elimination of the on-site parking lot, the project could increase demand for on-street parking on school days by 45 to 64 vehicles.

As detailed previously, on-street parking within the site vicinity averages between 50% and 56% occupied on school days with between 157 and 180 unused spaces across four day-time observation periods. Therefore, the increase in school-generated demand could be accommodated by unused supply and typical utilization is estimated to remain between 64% and 73%.

3.4.2. Evening Event Parking

The school is expected to continue hosting evening events periodically throughout the school year. In general, evening events are held between about 5:30 or 6:00 P.M. and 8:00 P.M. Evening events typically occur about once per month or once every other month with attendance that can range from 50 to over 300 people. The types of events typically held at elementary schools are listed below.

- **Large School Events** – Curriculum Night (Open House) is held once per year in the fall and can have the highest attendance. Other occasional events could consist of concerts or performances, Literacy Night, Math Night, Art Walk, and Movie Nights that each may draw about 100 attendees. Some of the larger events have staggered arrivals and not all attendees are on site at once, while others have fixed start and end times and all attendees are on site simultaneously.
- **PTA Meetings** – PTA meetings may occur once per quarter with about 50 attendees.

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[32] ITE, 5th Edition, January 2019.

- **Community Use** – The site may be scheduled for use by community groups (e.g., Cub Scouts, Boy Scouts, Brownies, etc.) or recreational sports that may occur in classrooms, the lunchroom, gymnasium, or other areas of the school. These typically have relatively small attendance of 10 to 50, but may occur more frequently.

For larger events, there are usually between 3.0 and 3.5 persons attending for each parked vehicle (the higher rate is more common for larger events). This rate accounts for higher levels of carpooling (parents and children in a single vehicle) as well as drop-off activity that does not generate parked vehicles. At these rates, the larger events (those other than Curriculum Night) could generate parking demand between 45 and 120 vehicles. With continued use of the Park Boulevard for evening school event parking (about 27 vehicles may be accommodated) combined unused on-street spaces (found to be more than 150 spaces as presented previously), the on-street parking in the study area is expected to remain below 85% during these events. Due to the relative infrequency of those events (one per month or every other month), the increase in demand associated with the project would not represent a significant adverse impact.

With the expanded school at its planned capacity, the largest event—Curriculum Night—is likely to cause on-street parking within the study area to be full or to have demand that extends beyond the 800-foot study area. In addition, Curriculum Night typically occurs in late September or early October when seasonal use of the Alki Beach front is higher and background on-street parking occupancy can be much higher. Therefore, to mitigate this potential impact, it is recommended that the school modify the event to reduce total peak demand by separating it into two sessions or into two nights based on grade levels (as occurs at some other Seattle elementary schools). The school should also develop a neighborhood communication plan to inform nearby neighbors of large events each year—those expected to draw attendance of about 400 or more—the level estimated to cause on-street parking to exceed 85%.

3.5. Traffic Safety

The collision data provided for the study area did not indicate any unusual collision patterns that would impact or be impacted by the proposed project. The larger school is expected to increase traffic and pedestrian traffic activity around the school site. However, the existing measures implemented around the school, including school-zone speed limits and crossing guards, are expected to continue. The project is not expected to result in significant adverse safety impacts.

3.6. Transit

School bus service is expected to resume with the proposed project, and as noted previously, no change to the number of school buses that have historically served the site is anticipated with the proposed project. On-street school-bus load/unload would be retained along the east side of 59th Avenue SW.

Some transit trips may be generated by the teachers or staff at the site; however, the traffic estimates do not rely on reductions in auto trips to account for any staff transit usage. The closest bus stops are located on SW Admiral Way at 59th Avenue SW (for eastbound buses) and 61st Avenue SW (for westbound buses). The project is not expected to result in adverse impacts to transit facilities or service.

3.7. Non-Motorized Transportation Facilities

Alki Elementary School, with increased enrollment capacity, is expected to generate some additional pedestrian trips within the site vicinity. It is anticipated that the largest increases in pedestrian activity would occur along 59th Avenue SW and SW Stevens Street adjacent to the school. There may also be increases in bicycle trips within the site vicinity due to the proposed project. The project proposes to accommodate long-term protected and secured parking for up to 20 bicycles and short-term parking for up to 20 bicycles. The project design team anticipates that a code departure for less-than-required bicycle parking may be pursued.

3.8. Short-term Impacts from Construction

The school would be closed during construction, which is planned to start in February 2024, and end in August 2025 when the school is planned to be ready for occupancy and reopen in fall 2025. During construction, students would be temporarily accommodated in the Schmitz Park School located at 5000 SW Spokane Street southeast of Alki Elementary.

The construction effort would include demolition and earthwork that would generate truck traffic to and from the site. It is estimated that the proposed project would require excavation and export of about 3,000 cubic yards (cy) of material and imported structural fill material of about 500 cy.[33] This earthwork effort is anticipated to occur over about four month beginning in July 2023. Assuming 15% swell/fluff and average of 20-cubic yards per truck (truck/trailer combination), the earthwork transport (import and export) could generate about 200 truckloads over the duration of the effort. If assumed to be completed over about 4 weeks (20 days) during that period, it would generate about 10 truckloads per day and an average of about 1 or 2 truckloads per hour (up to 2 trucks in and 2 trucks out) on a typical eight-hour construction work day. This volume of truck traffic would be noticeable to the residents living adjacent to the site, but would not adversely impact traffic operations in the area. Construction access for workers is expected to occur from 59th Avenue SW. Overall site-generated traffic during construction is expected to be lower than conditions with the school operating normally when students are on campus.

The construction of the project would also generate employee, equipment, and material delivery trips to and from the site. It is anticipated that construction workers would arrive at the construction site before the AM peak traffic period on local area streets and depart the site prior to the PM peak period; construction work shifts for schools are usually from 7:00 A.M. to 3:30 P.M., with workers arriving between 6:30 and 6:45 A.M., but not starting work until 7:00 A.M. The number of workers at the project site at any one time would vary depending upon the construction element being implemented, but is expected to peak at 70 to 80 workers. Construction worker parking is expected to occur in the on-site parking lot, on the basketball court and Parks Boulevard (pending coordination with Seattle Parks and Recreation), and legal on-street parking in the vicinity. Some construction workers may also utilize mass-transit to access the site.

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[33] Mahlum Architects, May, 7, 2022.

4. FINDINGS AND RECOMMENDATIONS

The following sections summarize the findings and recommendations of the analysis.

4.1. Short-Term Conditions – Construction

- The project is proposed to begin construction in July 2023 with occupancy of the expanded school in fall 2025. During the construction effort, Alki Elementary School students and staff would be temporarily relocated to the Schmitz Park School site.
- Earthwork export is estimated to generate about 10 truckloads per day and an average of about 1 or 2 truckloads per hour (up to 2 trucks in and 2 trucks out) on a typical eight-hour construction work day. This volume of truck traffic would be noticeable to the residents living adjacent to the site, but would not adversely impact traffic operations in the area. Construction access for trucks is expected to occur from 59th Avenue SW. Since students would be located off-site for the duration of the construction effort, overall site-generated traffic is expected to be lower than conditions with the school operating normally.
- Construction worker parking is expected to occur in the on-site parking lot, on the basketball court and Parks Boulevard (pending coordination with Seattle Parks and Recreation), and legal on-street parking in the vicinity.

It is recommended that the contractor and SPS develop a Construction Transportation Management Plan. Details to be included in this plan are described in Section 4.3.

4.2. Long-Term Conditions – Operations

- The proposed project is expected to increase the student capacity to 542 students (up from its current enrollment of 308 students) and could have up to 65 to 75 employees (up from the current 38 employees).
- At the proposed capacity and compared to the site's current enrollment, the proposed school is projected to generate a net increase of 158 trips (83 in, 75 out) during the morning peak hour (from 7:15 to 8:15 A.M.) and 182 trips (96 in, 86 out) during the afternoon peak hour (from 1:45 to 2:45 P.M.).
- The existing access driveway serving that lot would be modified to serve a new gated delivery / service area proposed on the southwest corner of the site. The project would improve its site's frontage along 59th Avenue SW with new curb, sidewalk, street trees, and with a two-foot widened pull-out area to better accommodate school buses. It is anticipated that SPS will renew its code departure for the on-street school-bus load/unload zone along 59th Avenue SW. All frontage improvements will be coordinated with SDOT.
- Curb-side passenger-vehicle drop-off/pick-up is planned to be retained, and possibly extended northward, along the east side of 59th Avenue SW adjacent to the Alki Playground. Family-vehicle load/unload would also continue to occur with the use of on-street parking in the surrounding residential neighborhood.
- The added vehicular traffic as well as increases in pedestrian activity around the school during peak hours due to the larger enrollment capacity is expected to add vehicular delay to study-area intersections. However, the project-related increases are forecast at eight seconds or less per vehicle and all of the study-area intersections are forecast to continue operating at LOS A overall with all movements remaining at LOS C or better during both peak hours in 2025 with the

project. As is typical in school areas during peak conditions—some congestion around the school would continue to occur during the 20 minutes before and after school.

- At the proposed enrollment capacity of 542 students, on-street school-day parking demand may increase by about 45 to 64 vehicles. Demand is likely to vary somewhat depending on the number of part-time staff and volunteers on site at any one time. The increase in school-generated on-street parking demand could be accommodated by unused supply and typical utilization is estimated to remain between 64% and 73%.
- With continued use of the Park Boulevard for evening school event parking (about 27 vehicles may be accommodated) combined unused on-street spaces, the on-street parking in the study area is expected to remain below 85% during most events. The largest event—Curriculum Night—is likely to cause on-street parking within the study area to be full or to have demand that extends beyond the 800-foot study area.

Based the above findings, the school addition and renovation project would not result in significant adverse impacts to traffic operations or parking. However, because the site would be reconfigured to accommodate a larger enrollment capacity, several measures are recommended (see Section 4.3) to minimize traffic and parking-effects on the surrounding neighborhood.

4.3. Recommendations

Based on the findings presented above, the following measures are recommended to reduce the traffic and parking impacts associated with construction and operations of the Alki Elementary school with the proposed addition and renovation.

A. **Construction Transportation Management Plan (CTMP):** The District should require the selected contractor to develop a Construction Transportation Management Plan (CTMP) that addresses traffic and pedestrian control during construction of the new facility. It would define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP would direct trucks along the shortest route to arterials and away from residential streets to avoid unnecessary conflicts with resident and pedestrian activity. The CTMP may also include measures to keep adjacent streets clean on a daily basis at the truck exit points (such as street sweeping or on-site truck wheel cleaning) to reduce tracking dirt offsite.

B. **Develop Plan for Large-Events:** For the one or two largest events each year expected to attract 400 or more attendees (such as Curriculum Night), the school should develop a large-event plan that modifies the event to reduce total peak demand by separating it into two sessions or into two nights based on grade levels (as occurs at some other Seattle elementary schools).

C. **Develop Neighborhood Communication Plan for School Events:** The District and school administration should develop a neighborhood communication plan to inform nearby neighbors of large events (those expected to draw 400 people or more) each year. The plan should be updated annually (or as events are scheduled) and should provide information about the dates, times, and rough magnitude of attendance. The communication would be intended to allow neighbors to plan for the occasional increase in on-street parking demand that would occur with large events.

D. **Update right-of-way and curb-side signage:** The District should work with SDOT to confirm the locations, extents, and signage (such as times of restrictions) of the school-bus and/or school load zones along adjacent streets.

APPENDIX A
Level of Service Definitions

Levels of service (LOS) are qualitative descriptions of traffic operating conditions. These levels of service are designated with letters ranging from LOS A, which is indicative of good operating conditions with little or no delay, to LOS F, which is indicative of stop-and-go conditions with frequent and lengthy delays. Levels of service for this analysis were developed using procedures presented in the *Highway Capacity Manual, Sixth Edition* (Transportation Research Board, 2016).

Signalized Intersections

Level of service for signalized intersections is defined in terms of average delay for all vehicles that travel through the intersection. Delay can be a cause of driver discomfort, frustration, inefficient fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average delay per vehicle in seconds. Delay is a complex measure and is dependent on a number of variables including: number and type of vehicles by movement, intersection lane geometry, signal phasing, the amount of green time allocated to each phase, transit stops and parking maneuvers. Table A-1 shows the level of service criteria for signalized intersections from the *Highway Capacity Manual, Sixth Edition.*

Table A-1. Level of Service for Signalized Intersections

Level of Service	Average Control Delay Per Vehicle
A	≤ 10 seconds
B	> 10 – 20 seconds
C	> 20 – 35 seconds
D	> 35 – 55 seconds
E	> 55 – 80 seconds
F	> 80 seconds

Source: Transportation Research Board, Highway Capacity Manual, Exhibit 19.8, 2016.

Unsignalized Intersections

For unsignalized intersections, level of service is based on the average delay per vehicle for each turning movement. The level of service for all-way stop or roundabout-controlled intersections is based upon the average delay for all vehicles that travel through the intersection. The level of service for a one- or two-way, stop-controlled intersection, delay is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. Table A-2 shows the level of service criteria for unsignalized intersections from the *Highway Capacity Manual, Sixth Edition*.

Table A-2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle
A	0 – 10 seconds
B	> 10 – 15 seconds
C	> 15 – 25 seconds
D	> 25 – 35 seconds
E	> 35 – 50 seconds
F	> 50 seconds

Source: Transportation Research Board, Highway Capacity Manual, Exhibit 20.2, 2016.

APPENDIX B
Parking Utilization Study Data

				Parking Supply								
										Total Parking		
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted	3 Min PLZ 7a-6p Exc Sun/Hol	School Load Only 7-10a, 1-4p Exc Sat/Sun/Hol, No Parking All Other Times	Alki Community Center - Staff Parking Only	Disabled	**Total Parking**	**Morning**	**Mid Morning**	**Evening**
AA	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	W	4	0	0	0	1	**5**	**5**	**5**	**5**
AB	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	E	0	0	0	0	0	**0**	**0**	**0**	**0**
AC	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	W	1	0	0	0	0	**1**	**1**	**1**	**1**
AD	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	E	0	0	0	0	0	**0**	**0**	**0**	**0**
AE	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	N	0	0	0	0	0	**0**	**0**	**0**	**0**
AF	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	S	6	2	0	0	0	**8**	**8**	**8**	**8**
AG	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	N	0	0	0	0	0	**0**	**0**	**0**	**0**
AH	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	S	0	0	0	0	0	**0**	**0**	**0**	**0**
AI	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	N	0	0	0	0	0	**0**	**0**	**0**	**0**
AJ	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	S	2	0	0	0	0	**2**	**2**	**2**	**2**
AK	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	W	1	0	0	0	0	**1**	**1**	**1**	**1**
AL	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	E	1	0	0	0	0	**1**	**1**	**1**	**1**
AM	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	W	16	0	0	0	0	**16**	**16**	**16**	**16**
AN	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	E	11	0	0	0	0	**11**	**11**	**11**	**11**
AO	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	W	27	0	0	0	0	**27**	**27**	**27**	**27**
AP	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	E	0	0	9	0	0	**9**	**0**	**0**	**0**
AQ	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	W	0	0	0	0	0	**0**	**0**	**0**	**0**
AR	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	E	21	0	0	0	0	**21**	**21**	**21**	**21**
AS	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	W	12	0	0	0	0	**12**	**12**	**12**	**12**
AT	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	E	10	0	0	0	0	**10**	**10**	**10**	**10**
AU	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	W	2	0	0	0	0	**2**	**2**	**2**	**2**
AV	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	E	1	0	0	0	0	**1**	**1**	**1**	**1**
AW	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	NW	4	0	0	0	0	**4**	**4**	**4**	**4**
AX	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	SE	0	0	0	0	0	**0**	**0**	**0**	**0**

				Parking Supply								
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted	3 Min PLZ 7a-6p Exc Sun/Hol	School Load Only 7-10a, 1-4p Exc Sat/Sun/Hol, No Parking All Other Times	Alki Community Center - Staff Parking Only	Disabled	**Total Parking**	**Total Parking**		
										Morning	**Mid Morning**	**Evening**
AY	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	N	2	0	0	0	0	**2**	**2**	**2**	**2**
AZ	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	S	1	0	0	0	0	**1**	**1**	**1**	**1**
BA	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	N	8	0	0	0	0	**8**	**8**	**8**	**8**
BB	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	S	7	0	0	0	0	**7**	**7**	**7**	**7**
BC	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	N	9	0	0	0	0	**9**	**9**	**9**	**9**
BD	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	S	7	0	0	0	0	**7**	**7**	**7**	**7**
BE	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	N	0	0	0	0	0	**0**	**0**	**0**	**0**
BF	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	S	0	0	0	6	0	**6**	**0**	**0**	**0**
BG	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	N	4	0	0	0	0	**4**	**4**	**4**	**4**
BH	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	S	0	0	0	0	0	**0**	**0**	**0**	**0**
BI	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	W	4	0	0	0	0	**4**	**4**	**4**	**4**
BJ	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	E	6	0	0	0	0	**6**	**6**	**6**	**6**
BK	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	27	0	0	0	0	**27**	**27**	**27**	**27**
BL	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	27	0	0	0	0	**27**	**27**	**27**	**27**
BM	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	23	0	0	0	0	**23**	**23**	**23**	**23**
BN	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	0	0	0	0	0	**0**	**0**	**0**	**0**
BO	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	NW	10	0	0	0	0	**10**	**10**	**10**	**10**
BP	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	SE	18	0	0	0	0	**18**	**18**	**18**	**18**
BQ	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	NW	7	0	0	0	0	**7**	**7**	**7**	**7**
BR	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	SE	3	0	0	0	0	**3**	**3**	**3**	**3**
BS	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	N	5	0	0	0	0	**5**	**5**	**5**	**5**
BT	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	S	1	0	0	0	1	**2**	**2**	**2**	**2**
BU	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	N	10	0	0	0	0	**10**	**10**	**10**	**10**
BV	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	S	6	0	0	0	0	**6**	**6**	**6**	**6**

				Parking Supply								
										Total Parking		
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted	3 Min PLZ 7a-6p Exc Sun/Hol	School Load Only 7-10a, 1-4p Exc Sat/Sun/Hol, No Parking All Other Times	Alki Community Center - Staff Parking Only	Disabled	**Total Parking**	**Morning**	**Mid Morning**	**Evening**
BW	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	N	7	0	0	0	0	**7**	**7**	**7**	**7**
BX	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	S	8	0	0	0	0	**8**	**8**	**8**	**8**
BY	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	N	4	0	0	0	0	**4**	**4**	**4**	**4**
BZ	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	S	5	0	0	0	0	**5**	**5**	**5**	**5**
CA	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	3	0	0	0	0	**3**	**3**	**3**	**3**
CB	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	E	2	0	0	0	0	**2**	**2**	**2**	**2**
CC	59TH AVE SW	SW ADMIRAL WAY AND SW HORTON ST	E	4	0	0	0	0	**4**	**4**	**4**	**4**
CD	SW HORTON ST	DEAD END AND 59TH AVE SW	N	0	0	0	0	0	**0**	**0**	**0**	**0**
CE	SW HORTON ST	DEAD END AND 59TH AVE SW	S	0	0	0	0	0	**0**	**0**	**0**	**0**
CF	59TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	11	0	0	0	0	**11**	**11**	**11**	**11**
CG	59TH AVE SW	SW HORTON ST AND 58TH AVE SW ACCESS RD	E	4	0	0	0	0	**4**	**4**	**4**	**4**
CH	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	N	0	0	0	0	0	**0**	**0**	**0**	**0**
CI	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	S	0	0	0	0	0	**0**	**0**	**0**	**0**
CJ	59TH AVE SW	58TH AVE SW ACCESS RD AND 800' BOUNDARY	E	3	0	0	0	0	**3**	**3**	**3**	**3**
			TOTAL	**355**	**2**	**9**	**6**	**2**	**374**	**359**	**359**	**359**

				Parking Supply			Parking Occupancy								
				Total Parking			Morning (7:00 A.M. to 7:45 A.M.)			Mid Morning (10:30 A.M. to 11:15 A.M.)			Evening (7:30 P.M. to 8:15 P.M.)		
Block Face ID	Street Name	Street Segment	Side of Street	Morning	Mid Morning	Evening	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
AA	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	W	**5**	**5**	**5**	2	5	**4**	3	3	**3**	5	5	**5**
AB	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	E	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AC	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	W	**1**	**1**	**1**	1	0	**1**	1	1	**1**	1	0	**1**
AD	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	E	**0**	**0**	**0**	0	1	**1**	0	1	**1**	0	1	**1**
AE	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	N	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AF	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	S	**8**	**8**	**8**	6	5	**6**	6	5	**6**	6	7	**7**
AG	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	N	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AH	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	S	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AI	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	N	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AJ	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	S	**2**	**2**	**2**	1	2	**2**	1	2	**2**	1	2	**2**
AK	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	W	**1**	**1**	**1**	1	2	**2**	0	1	**1**	2	2	**2**
AL	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	E	**1**	**1**	**1**	2	1	**2**	0	0	**0**	2	2	**2**
AM	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	W	**16**	**16**	**16**	10	12	**11**	10	9	**10**	14	13	**14**
AN	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	E	**11**	**11**	**11**	9	8	**9**	9	6	**8**	10	10	**10**
AO	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	W	**27**	**27**	**27**	13	13	**13**	14	15	**15**	9	13	**11**
AP	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	E	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AQ	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	W	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AR	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	E	**21**	**21**	**21**	10	10	**10**	8	11	**10**	14	14	**14**
AS	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	W	**12**	**12**	**12**	5	8	**7**	6	6	**6**	5	5	**5**
AT	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	E	**10**	**10**	**10**	2	3	**3**	2	3	**3**	3	3	**3**
AU	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	W	**2**	**2**	**2**	1	1	**1**	2	1	**2**	2	2	**2**
AV	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	E	**1**	**1**	**1**	0	0	**0**	0	0	**0**	0	0	**0**
AW	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	NW	**4**	**4**	**4**	0	0	**0**	0	0	**0**	0	0	**0**
AX	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	SE	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
AY	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	N	**2**	**2**	**2**	0	0	**0**	0	2	**1**	1	2	**2**
AZ	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	S	**1**	**1**	**1**	1	1	**1**	1	1	**1**	0	0	**0**

				Parking Supply			Parking Occupancy								
				Total Parking			Morning (7:00 A.M. to 7:45 A.M.)			Mid Morning (10:30 A.M. to 11:15 A.M.)			Evening (7:30 P.M. to 8:15 P.M.)		
Block Face ID	Street Name	Street Segment	Side of Street	Morning	Mid Morning	Evening	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
BA	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	N	8	8	8	6	6	6	5	5	5	6	4	5
BB	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	S	7	7	7	6	7	7	6	5	6	7	6	7
BC	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	N	9	9	9	5	5	5	4	4	4	5	5	5
BD	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	S	7	7	7	3	3	3	3	4	4	5	5	5
BE	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	N	0	0	0	0	0	0	0	0	0	0	0	0
BF	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	S	0	0	0	0	0	0	0	0	0	0	0	0
BG	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	N	4	4	4	1	1	1	2	2	2	1	2	2
BH	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	S	0	0	0	0	0	0	0	0	0	0	0	0
BI	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	W	4	4	4	0	0	0	1	1	1	1	2	2
BJ	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	E	6	6	6	3	2	3	2	1	2	6	3	5
BK	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	27	27	27	20	17	19	18	16	17	18	17	18
BL	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	27	27	27	16	17	17	12	17	15	20	19	20
BM	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	23	23	23	17	17	17	18	20	19	14	17	16
BN	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	0	0	0	0	0	0	0	0	0	0	0	0
BO	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	NW	10	10	10	9	10	10	11	10	11	14	11	13
BP	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	SE	18	18	18	8	11	10	8	7	8	5	8	7
BQ	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	NW	7	7	7	4	5	5	3	5	4	4	4	4
BR	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	SE	3	3	3	1	1	1	1	0	1	1	1	1
BS	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	N	5	5	5	5	4	5	4	3	4	5	3	4
BT	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	S	2	2	2	1	1	1	1	2	2	0	2	1
BU	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	N	10	10	10	8	10	9	8	8	8	6	8	7
BV	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	S	6	6	6	4	5	5	2	2	2	4	1	3
BW	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	N	7	7	7	1	0	1	1	0	1	0	0	0
BX	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	S	8	8	8	2	1	2	1	1	1	1	2	2
BY	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	N	4	4	4	0	0	0	0	1	1	0	0	0
BZ	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	S	5	5	5	1	1	1	1	1	1	1	1	1

				Parking Supply			**Parking Occupancy**								
				Total Parking			**Morning (7:00 A.M. to 7:45 A.M.)**			**Mid Morning (10:30 A.M. to 11:15 A.M.)**			**Evening (7:30 P.M. to 8:15 P.M.)**		
Block Face ID	Street Name	Street Segment	Side of Street	**Morning**	**Mid Morning**	**Evening**	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
CA	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	**3**	**3**	**3**	2	0	**1**	1	0	**1**	0	0	**0**
CB	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	E	**2**	**2**	**2**	1	2	**2**	0	1	**1**	1	2	**2**
CC	59TH AVE SW	SW ADMIRAL WAY AND SW HORTON ST	E	**4**	**4**	**4**	0	0	**0**	0	0	**0**	0	0	**0**
CD	SW HORTON ST	DEAD END AND 59TH AVE SW	N	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
CE	SW HORTON ST	DEAD END AND 59TH AVE SW	S	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
CF	59TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	**11**	**11**	**11**	2	2	**2**	2	3	**3**	2	2	**2**
CG	59TH AVE SW	SW HORTON ST AND 58TH AVE SW ACCESS RD	E	**4**	**4**	**4**	0	0	**0**	0	0	**0**	0	0	**0**
CH	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	N	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
CI	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	S	**0**	**0**	**0**	0	0	**0**	0	0	**0**	0	0	**0**
CJ	59TH AVE SW	58TH AVE SW ACCESS RD AND 800' BOUNDARY	E	**3**	**3**	**3**	1	2	**2**	1	1	**1**	1	1	**1**
			TOTAL	**359**	**359**	**359**	**191**	**202**	**197**	**179**	**187**	**183**	**203**	**207**	**205**

				Parking Supply			Parking Utilization								
				Total Parking			Morning (7:00 A.M. to 7:45 A.M.)			Mid Morning (10:30 A.M. to 11:15 A.M.)			Evening (7:30 P.M. to 8:15 P.M.)		
Block Face ID	Street Name	Street Segment	Side of Street	**Morning**	**Mid Morning**	**Evening**	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
AA	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	W	**5**	**5**	**5**	40%	100%	**70%**	60%	60%	**60%**	100%	100%	**100%**
AB	59TH AVE SW	800' BOUNDARY AND SW LANDER ST	E	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AC	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	W	**1**	**1**	**1**	100%	0%	**50%**	100%	100%	**100%**	100%	0%	**50%**
AD	MARINE AVE SW	800' BOUNDARY AND SW LANDER ST	E	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AE	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AF	SW LANDER ST	MARINE AVE SW AND 59TH AVE SW	S	**8**	**8**	**8**	75%	63%	**69%**	75%	63%	**69%**	75%	88%	**81%**
AG	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AH	SW LANDER ST	58TH W AVE SW AND MARINE AVE SW	S	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AI	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AJ	SW LANDER ST	58TH E AVE SW AND 58TH W AVE SW	S	**2**	**2**	**2**	50%	100%	**75%**	50%	100%	**75%**	50%	100%	**75%**
AK	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	W	**1**	**1**	**1**	100%	200%	**150%**	0%	100%	**50%**	200%	200%	**200%**
AL	61ST AVE SW	800' BOUNDARY AND SW STEVENS ST	E	**1**	**1**	**1**	200%	100%	**150%**	0%	0%	**0%**	200%	200%	**200%**
AM	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	W	**16**	**16**	**16**	63%	75%	**69%**	63%	56%	**59%**	88%	81%	**84%**
AN	60TH AVE SW	800' BOUNDARY AND SW STEVENS ST	E	**11**	**11**	**11**	82%	73%	**77%**	82%	55%	**68%**	91%	91%	**91%**
AO	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	W	**27**	**27**	**27**	48%	48%	**48%**	52%	56%	**54%**	33%	48%	**41%**
AP	59TH AVE SW	SW LANDER ST AND SW STEVENS ST	E	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AQ	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	W	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AR	58TH AVE SW	SW LANDER W ST AND SW STEVENS ST	E	**21**	**21**	**21**	48%	48%	**48%**	38%	52%	**45%**	67%	67%	**67%**
AS	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	W	**12**	**12**	**12**	42%	67%	**54%**	50%	50%	**50%**	42%	42%	**42%**
AT	57TH AVE SW	800' BOUNDARY AND SW TEIG PL	E	**10**	**10**	**10**	20%	30%	**25%**	20%	30%	**25%**	30%	30%	**30%**
AU	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	W	**2**	**2**	**2**	50%	50%	**50%**	100%	50%	**75%**	100%	100%	**100%**
AV	57TH AVE SW	SW TEIG PL AND SW STEVENS ST	E	**1**	**1**	**1**	0%	0%	**0%**	0%	0%	**0%**	0%	0%	**0%**
AW	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	NW	**4**	**4**	**4**	0%	0%	**0%**	0%	0%	**0%**	0%	0%	**0%**
AX	SW TEIG PL	800' BOUNDARY AND 57TH AVE SW	SE	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
AY	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	N	**2**	**2**	**2**	0%	0%	**0%**	0%	100%	**50%**	50%	100%	**75%**
AZ	SW STEVENS ST	61ST AVE SW AND 800' BOUNDARY	S	**1**	**1**	**1**	100%	100%	**100%**	100%	100%	**100%**	0%	0%	**0%**
BA	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	N	**8**	**8**	**8**	75%	75%	**75%**	63%	63%	**63%**	75%	50%	**63%**

				Parking Supply			**Parking Utilization**									
				Total Parking			**Morning (7:00 A.M. to 7:45 A.M.)**			**Mid Morning (10:30 A.M. to 11:15 A.M.)**			**Evening (7:30 P.M. to 8:15 P.M.)**		
Block Face ID	Street Name	Street Segment	Side of Street	**Morning**	**Mid Morning**	**Evening**	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
BB	SW STEVENS ST	60TH AVE SW AND 61ST AVE SW	S	**7**	**7**	**7**	86%	100%	**93%**	86%	71%	**79%**	100%	86%	**93%**
BC	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	N	**9**	**9**	**9**	56%	56%	**56%**	44%	44%	**44%**	56%	56%	**56%**
BD	SW STEVENS ST	59TH AVE SW AND 60TH AVE SW	S	**7**	**7**	**7**	43%	43%	**43%**	43%	57%	**50%**	71%	71%	**71%**
BE	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
BF	SW STEVENS ST	57TH AVE SW AND 58TH AVE SW	S	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
BG	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	N	**4**	**4**	**4**	25%	25%	**25%**	50%	50%	**50%**	25%	50%	**38%**
BH	SCHMITZ PARK RD	DEAD END AND SW STEVENS ST	S	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
BI	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	W	**4**	**4**	**4**	0%	0%	**0%**	25%	25%	**25%**	25%	50%	**38%**
BJ	61ST AVE SW	SW STEVENS ST AND 800' BOUNDARY	E	**6**	**6**	**6**	50%	33%	**42%**	33%	17%	**25%**	100%	50%	**75%**
BK	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	**27**	**27**	**27**	74%	63%	**69%**	67%	59%	**63%**	67%	63%	**65%**
BL	60TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	**27**	**27**	**27**	59%	63%	**61%**	44%	63%	**54%**	74%	70%	**72%**
BM	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	W	**23**	**23**	**23**	74%	74%	**74%**	78%	87%	**83%**	61%	74%	**67%**
BN	59TH AVE SW	SW STEVENS ST AND SW ADMIRAL WAY	E	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
BO	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	NW	**10**	**10**	**10**	90%	100%	**95%**	110%	100%	**105%**	140%	110%	**125%**
BP	SW ADMIRAL WAY	800' BOUNDARY AND 59TH AVE SW	SE	**18**	**18**	**18**	44%	61%	**53%**	44%	39%	**42%**	28%	44%	**36%**
BQ	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	NW	**7**	**7**	**7**	57%	71%	**64%**	43%	71%	**57%**	57%	57%	**57%**
BR	SW WINTHROP ST	800' BOUNDARY AND SW HANFORD ST	SE	**3**	**3**	**3**	33%	33%	**33%**	33%	0%	**17%**	33%	33%	**33%**
BS	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	N	**5**	**5**	**5**	100%	80%	**90%**	80%	60%	**70%**	100%	60%	**80%**
BT	SW ADMIRAL WAY	60TH AVE SW AND 800' BOUNDARY	S	**2**	**2**	**2**	50%	50%	**50%**	50%	100%	**75%**	0%	100%	**50%**
BU	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	N	**10**	**10**	**10**	80%	100%	**90%**	80%	80%	**80%**	60%	80%	**70%**
BV	SW ADMIRAL WAY	59TH AVE SW AND 60TH AVE SW	S	**6**	**6**	**6**	67%	83%	**75%**	33%	33%	**33%**	67%	17%	**42%**
BW	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	N	**7**	**7**	**7**	14%	0%	**7%**	14%	0%	**7%**	0%	0%	**0%**
BX	SW HANFORD ST	SW WINTHROP ST AND 59TH AVE SW	S	**8**	**8**	**8**	25%	13%	**19%**	13%	13%	**13%**	13%	25%	**19%**
BY	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	N	**4**	**4**	**4**	0%	0%	**0%**	0%	25%	**13%**	0%	0%	**0%**
BZ	SW HANFORD ST	800' BOUNDARY AND SW WINTHROP ST	S	**5**	**5**	**5**	20%	20%	**20%**	20%	20%	**20%**	20%	20%	**20%**
CA	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	**3**	**3**	**3**	67%	0%	**33%**	33%	0%	**17%**	0%	0%	**0%**
CB	60TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	E	**2**	**2**	**2**	50%	100%	**75%**	0%	50%	**25%**	50%	100%	**75%**

				Parking Supply			**Parking Utilization**								
				Total Parking			**Morning (7:00 A.M. to 7:45 A.M.)**			**Mid Morning (10:30 A.M. to 11:15 A.M.)**			**Evening (7:30 P.M. to 8:15 P.M.)**		
Block Face ID	Street Name	Street Segment	Side of Street	**Morning**	**Mid Morning**	**Evening**	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average	Tuesday 12.7.2021	Thursday 12.9.2021	School Day Average
CC	59TH AVE SW	SW ADMIRAL WAY AND SW HORTON ST	E	**4**	**4**	**4**	0%	0%	**0%**	0%	0%	**0%**	0%	0%	**0%**
CD	SW HORTON ST	DEAD END AND 59TH AVE SW	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
CE	SW HORTON ST	DEAD END AND 59TH AVE SW	S	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
CF	59TH AVE SW	SW ADMIRAL WAY AND 800' BOUNDARY	W	**11**	**11**	**11**	18%	18%	**18%**	18%	27%	**23%**	18%	18%	**18%**
CG	59TH AVE SW	SW HORTON ST AND 58TH AVE SW ACCESS RD	E	**4**	**4**	**4**	0%	0%	**0%**	0%	0%	**0%**	0%	0%	**0%**
CH	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	N	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
CI	58TH AVE SW ACCESS RD	58TH AVE SW AND 800' BOUNDARY	S	**0**	**0**	**0**	NS	NS	**NS**	NS	NS	**NS**	NS	NS	**NS**
CJ	59TH AVE SW	58TH AVE SW ACCESS RD AND 800' BOUNDARY	E	**3**	**3**	**3**	33%	67%	**50%**	33%	33%	**33%**	33%	33%	**33%**
			TOTAL	**359**	**359**	**359**	**53%**	**56%**	**55%**	**50%**	**52%**	**51%**	**57%**	**58%**	**57%**