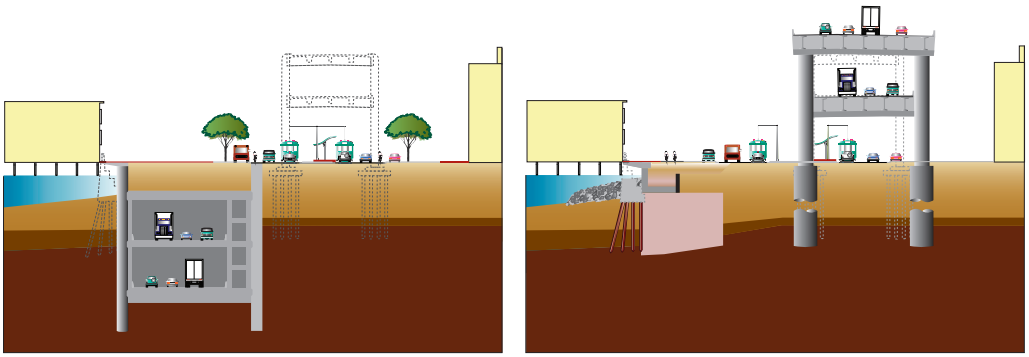
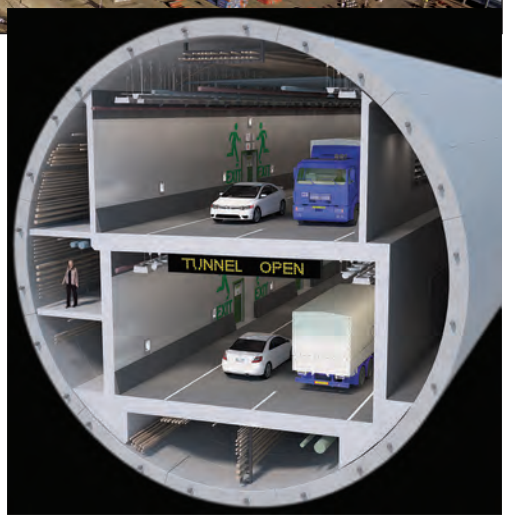
ALASKAN WAY VIADUCT REPLACEMENT PROJECT
Final Environmental Impact Statement

APPENDIX I Historic, Cultural, and Archaeological Resources





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U.S. Department of Transportation
Federal Highway Administration

Washington State
Department of Transportation

City of Seattle

JULY 2011

Alaskan Way Viaduct Replacement Project
Final EIS
Historic, Cultural, and Archaeological Resources Discipline Report

The Alaskan Way Viaduct Replacement Project is a joint effort between the Federal Highway Administration (FHWA), the Washington State Department of Transportation (WSDOT), and the City of Seattle. To conduct this project, WSDOT contracted with:

Parsons Brinckerhoff
999 Third Avenue, Suite 3200
Seattle, WA 98104

In association with:
Coughlin Porter Lundeen, Inc.
EnviroIssues, Inc.
GHD, Inc.
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Power Engineers, Inc.
Shannon & Wilson, Inc.
William P. Ott Construction Consultants

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LIST OF ATTACHMENTS

LIST OF EXHIBITS

ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effects
BMP	best management practice
B.P.	before present
bpsl	below present sea level
CFR	Code of Federal Regulations
City	City of Seattle
DAHP	Washington State Department of Archaeology and Historic Preservation
DPD	Department of Planning and Development
EIS	Environmental Impact Statement
fbs	feet below the surface
FHWA	Federal Highway Administration
HAER	Historic American Engineering Record
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NWAA	Northwest Archaeological Associates
Program	Alaskan Way Viaduct and Seawall Replacement Program
project	Alaskan Way Viaduct Replacement Project
RCW	Revised Code of Washington
SDOT	Seattle Department of Transportation
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SLS&E	Seattle Lake Shore and Eastern Railroad
SMC	Seattle Municipal Code
SODO	South of Downtown
SR	State Route
TBM	tunnel boring machine
USC	United States Code
WSDOT	Washington State Department of Transportation

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Chapter 1 INTRODUCTION AND SUMMARY

1.1 Introduction

This discipline report was prepared in support of the Final Environmental Impact Statement (EIS) for the Alaskan Way Viaduct Replacement Project. The Final EIS and all of the supporting discipline reports evaluate the Viaduct Closed (No Build Alternative) in addition to the three build alternatives: the Bored Tunnel Alternative (preferred), the Cut-and-Cover Tunnel Alternative, and the Elevated Structure Alternative, which are described in greater detail in Appendix B, Alternatives Description and Construction Methods Discipline Report. The designs for both the Cut-and-Cover Tunnel Alternative and the Elevated Structure Alternative have been updated since the 2006 Supplemental Draft EIS (WSDOT et al. 2006) to reflect that the section of the viaduct between S. Holgate Street and S. King Street is being replaced by a separate project and the alignment at S. Washington Street no longer intrudes into Elliott Bay. The effects of tolling on all three build alternatives are described in Chapter 7.

The Federal Highway Administration (FHWA) is the lead federal agency for this project, primarily responsible for compliance with the National Environmental Policy Act (NEPA) and other federal regulations, as well as distributing federal funding. Per the NEPA process, FHWA was responsible for selecting the preferred alternative. FHWA has based its decision on the information evaluated during the environmental review process, including information contained in the 2010 Supplemental Draft EIS (WSDOT et al. 2010) and previous evaluations in 2004 and 2006. After issuance of the Final EIS, FHWA will issue its NEPA decision, called the Record of Decision (ROD).

The 2004 Draft EIS (WSDOT et al. 2004) evaluated five Build Alternatives and a No Build Alternative. In December 2004, the project proponents identified the Cut-and-Cover Tunnel Alternative as the preferred alternative and carried the Rebuild Alternative forward for analysis as well. The 2006 Supplemental Draft EIS (WSDOT et al. 2006) analyzed two alternatives—a refined Cut-and-Cover Tunnel Alternative and a modified rebuild alternative called the Elevated Structure Alternative. After continued public and agency debate, Governor Gregoire called for an advisory vote to be held in Seattle. The March 2007 ballot included an elevated structure alternative (differing in design from the current Elevated Structure Alternative) and a surface tunnel hybrid alternative. The citizens voted down both alternatives.

After the 2007 election, the lead agencies committed to a collaborative process (referred to as the Partnership Process) to find a solution to replace the viaduct along Seattle's central waterfront. In January 2009, Governor Gregoire, King County

Executive Sims, and Seattle Mayor Nickels announced that the agencies had reached consensus and recommended replacing the aging viaduct with a bored tunnel, which is being evaluated in this Final EIS as the preferred alternative.

1.2 Summary of Alternatives

The Alaskan Way Viaduct Replacement Project (project) is one of several independent projects developed to improve safety and mobility along State Route (SR) 99 and the Seattle waterfront from the South of Downtown (SODO) area to Seattle Center. Collectively, these individual projects are referred to as the Alaskan Way Viaduct and Seawall Replacement Program (the Program). See Exhibit 1-1.

Exhibit 1-1. Other Projects Included in the Alaskan Way Viaduct and Seawall Replacement Program

Project	Bored Tunnel Alternative	Cut-and-Cover Tunnel Alternative	Elevated Structure Alternative
Independent Projects That Complement the Bored Tunnel Alternative			
Elliott Bay Seawall Project	X	Included in alternative	Included in alternative
Alaskan Way Surface Street Improvements	X	Included in alternative	Included in alternative
Alaskan Way Promenade/Public Space	X	Included in alternative	Included in alternative
First Avenue Streetcar Evaluation	X	Included in alternative	Included in alternative
Elliott/Western Connector	X	Function provided[1]	Function provided[1]
Transit enhancements	X	Not proposed[2]	Not proposed[2]
Projects That Complement All Build Alternatives			
S. Holgate Street to S. King Street Viaduct Replacement Project	X	X	X
Mercer West Project	X	X	X
Transportation Improvements to Minimize Traffic Effects During Construction	X	X	X
SR 99 Yesler Way Vicinity Foundation Stabilization	X	X	X
S. Massachusetts Street to Railroad Way S. Electrical Line Relocation Project	X	X	X

1. These specific improvements are not proposed with the Cut-and-Cover Tunnel and Elevated Structure Alternatives; however, these alternatives provide a functionally similar connection with ramps to and from SR 99 at Elliott and Western Avenues.
2. Similar improvements included with the Bored Tunnel Alternative could be proposed with this alternative.

This Final EIS evaluates the cumulative effects of all the build alternatives; however, direct and indirect environmental effects of these independent projects within the Program will be considered separately in independent environmental documents.

The S. Holgate Street to S. King Street Viaduct Replacement Project, currently under construction as a separate project, was designed to be compatible with any of the three viaduct replacement alternatives analyzed in this Final EIS.

This discipline report evaluates three build alternatives for replacing the Alaskan Way Viaduct in Seattle, King County, Washington (see Exhibit 1-2) and the Viaduct Closed (No Build Alternative). This report and the Final EIS incorporate the information and analyses that were included in the March 2004 Draft EIS, the July 2006 Supplemental Draft EIS, and the October 2010 Supplemental Draft EIS.

1.3 Bored Tunnel Alternative

The Bored Tunnel Alternative (preferred alternative) would replace the Alaskan Way Viaduct (SR 99) with a bored tunnel, remove the viaduct, decommission the Battery Street Tunnel, and improve the surface streets in the south and north portal areas of the tunnel (see Exhibit 1-3).

Improvements in the south portal area would include northbound and southbound access to and from SR 99 between S. Royal Brougham Way and S. King Street. Alaskan Way S. would be reconfigured with three lanes in each direction. Alaskan Way S. would have one new intersection, with a new east-west cross street at S. Dearborn Street.

Improvements in the north portal area would include restoring Aurora Avenue and providing northbound and southbound access to and from SR 99 between Harrison and Republican Streets. Aurora Avenue would be restored to grade level between Denny Way and John Street. John, Thomas, and Harrison Streets would be connected as cross streets. Mercer Street would be widened for two-way operation from Fifth Avenue N. to Dexter Avenue N. Broad Street would be filled and closed between Ninth Avenue N. and Taylor Avenue N. A new roadway would extend Sixth Avenue N. in a curved formation between Harrison and Mercer Streets, with a signalized intersection at Mercer Street.

1.4 Cut-and-Cover Tunnel Alternative

The Cut-and-Cover Tunnel Alternative would replace SR 99 with a six-lane cut-and-cover tunnel (three lanes in each direction) from approximately Railroad Way S. to Pine Street (see Exhibit 1-4). The western outer wall of the tunnel would serve as the new seawall. Between Pine Street and Virginia Street, a new aerial structure would be built, and SR 99 would connect to the Battery Street Tunnel by traveling under Elliott and Western Avenues. North of the Battery

6/20/11

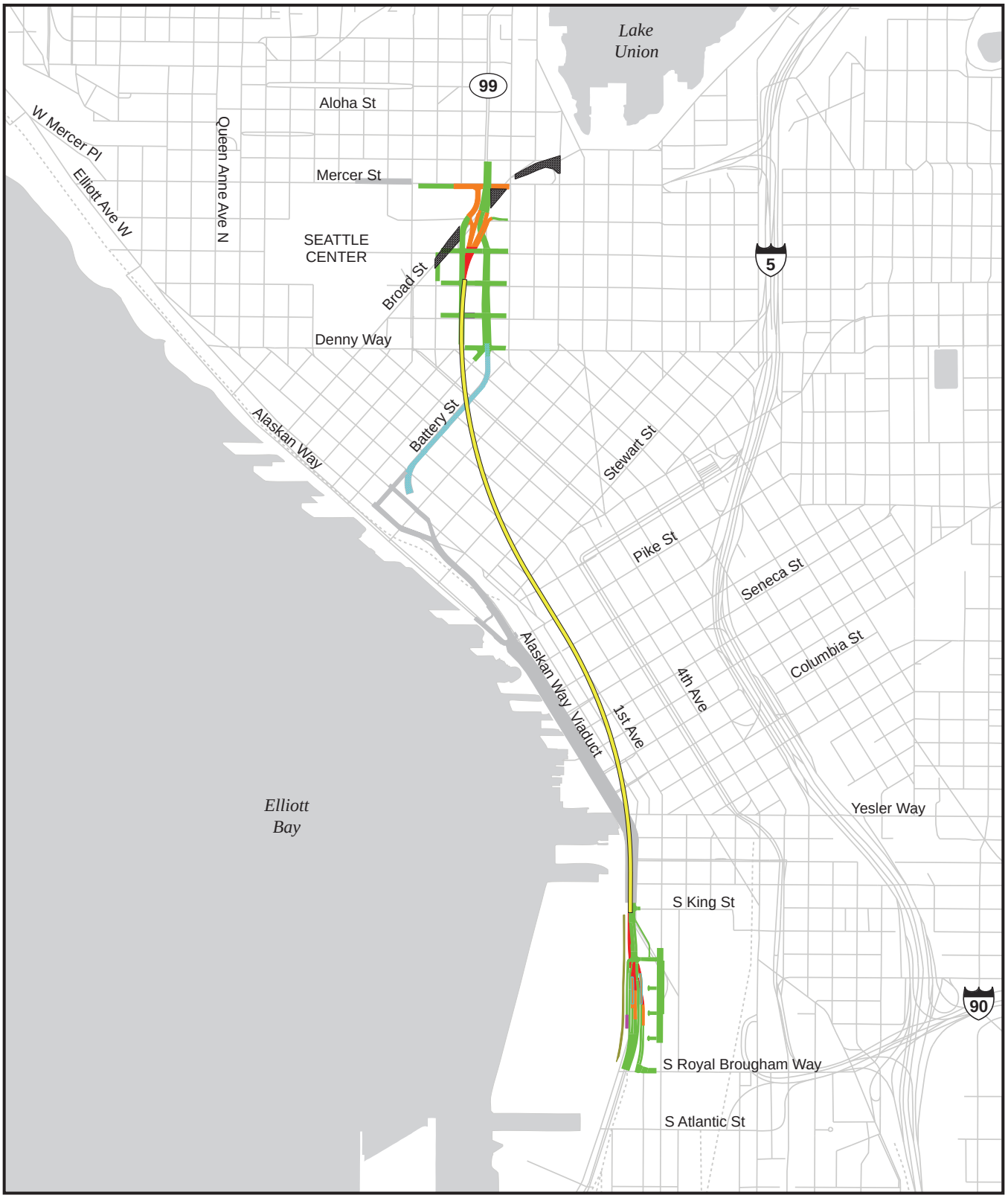
N

0 2,000

SCALE IN FEET

Note: The Cut-and-Cover Tunnel Alternative does not include the four ramps (Elliott, Western, Seneca, and Columbia) shown in gold.

Exhibit 1-2
Build Alternatives



4/28/10

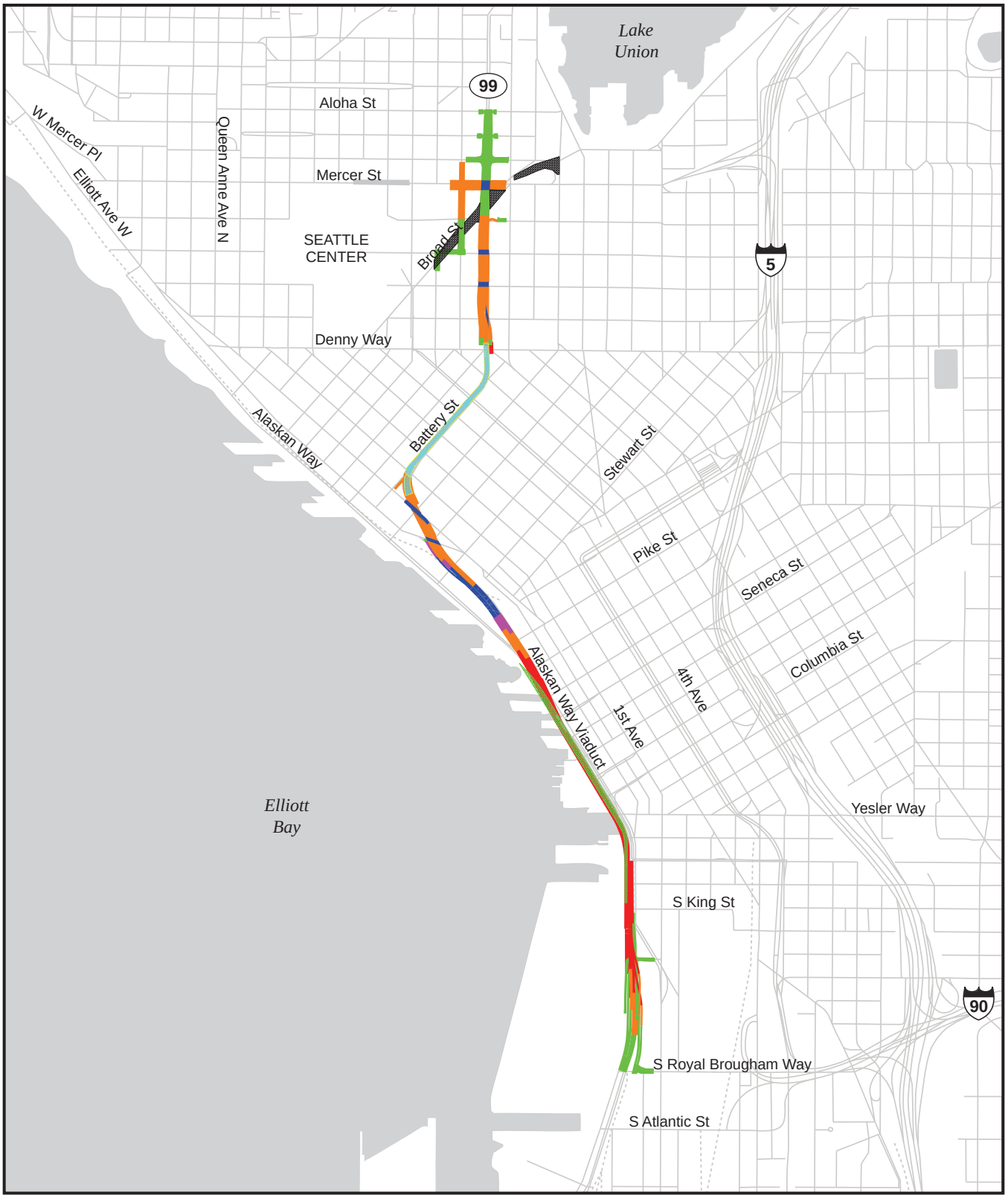
- At-Grade
- Cut-and-Cover
- Bored Tunnel
- Cut
- Fill
- Aerial Structure
- Decommission BST
- Broad Street Closed

N

0 1,800

SCALE IN FEET

Exhibit 1-3
Bored Tunnel Alternative



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N

0 1,800

SCALE IN FEET

- At-Grade
- Cut-and-Cover
- Cut
- Fill
- Aerial Structure
- Below Grade
- Broad Street Closed

Exhibit 1-4
Cut-and-Cover Tunnel Alternative

Street Tunnel, SR 99/Aurora Avenue would be improved and widened up to Aloha Street. Access to SR 99 would be provided at Denny Way, Republican Street, and Roy Street. Two new bridges would be built at Thomas and Harrison Streets. Broad Street would be closed between Fifth and Ninth Avenues N., allowing the street grid to be connected. Mercer Street would continue to cross under SR 99 as it does today, but it would be widened and converted to a two-way street with three lanes in each direction and a center turn lane.

1.5 Elevated Structure Alternative

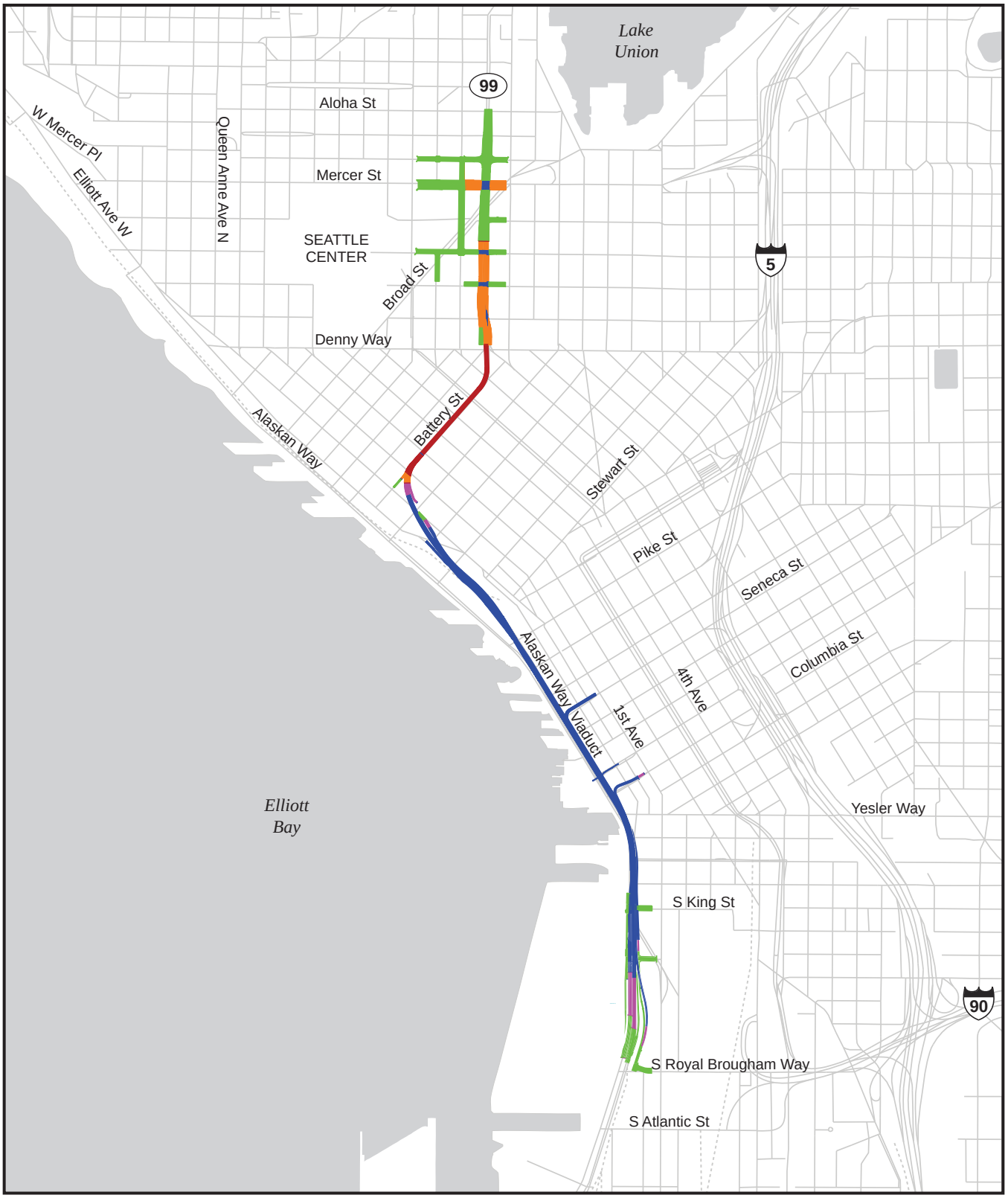
The Elevated Structure Alternative would transition from at-grade at S. Royal Brougham Way to a stacked aerial structure at approximately S. Main Street (see Exhibit 1-5). For the most part, the new elevated structure would have three lanes in each direction, and it would have wider lanes and shoulders than the existing viaduct. Between S. King Street and the ramps at Columbia and Seneca Streets, SR 99 would have four lanes in each direction. The existing ramps at Columbia and Seneca Streets would be rebuilt. The SR 99 structure would pass over Elliott and Western Avenues between Pine Street and the Battery Street Tunnel. The existing Elliott and Western ramps would be rebuilt similar to the existing facility. Improvements from the Battery Street Tunnel north would be the same as those for the Cut-and-Cover Tunnel Alternative. Alaskan Way would be replaced; the new roadway would convey at least two lanes of traffic in each direction. The northbound lanes would travel under the new elevated viaduct structure, and the southbound lanes would travel west of the new elevated viaduct structure. The waterfront streetcar would be replaced with two streetcar tracks that would share a travel lane with vehicles. Between Railroad Way S. and Yesler Way, Alaskan Way would have three lanes in each direction. The Elliott Bay Seawall would be replaced from about S. Jackson Street to Broad Street.

1.6 Viaduct Closed (No Build Alternative)

The Viaduct Closed (No Build Alternative) assumes that by the year 2030, the viaduct would be closed and would not be replaced.

1.7 Applicable Regulations and Guidelines

The environmental process for this project is governed by NEPA, which established the responsibility of the federal government to use all practicable means to preserve important historic, cultural, and natural aspects of the national heritage. As the lead federal agency for this project, FHWA has the primary responsibility for conformance with NEPA. The Washington State Department of Transportation (WSDOT) and the City of Seattle (City) are responsible for evaluating the proposed alternatives under the State Environmental Policy Act (SEPA).



4/28/11

N

0 1,800

SCALE IN FEET

- At-Grade
- Below Grade
- Cut
- Pedestrian Facilities
- Aerial Structure
- Retained Fill

Exhibit 1-5
Elevated Structure Alternative

FHWA and WSDOT must also comply with Section 106 of the National Historic Preservation Act. The Section 106 report was published in October 2010, as Appendix I, Section 106: Historic, Cultural, and Archaeological Resources Discipline Report, of the 2010 Supplemental Draft EIS. The Section 106 process is described here to explain how the evaluations were performed and the determinations made.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effect of their undertakings on historic properties. The agency must identify properties that are eligible or potentially eligible for listing in the National Register of Historic Places (NRHP) and then take steps to avoid and minimize the potential effects on the properties. If an undertaking will adversely affect an NRHP-eligible historic property, the effects must be mitigated. The lead agency seeks the input of consulting parties regarding potential mitigation. The mitigation is then detailed in a signed agreement document, referred to as a Memorandum of Agreement (MOA).

A *historic property* is any district, site, building, structure, or object that is included in or eligible for listing in the NRHP.

NRHP-eligible historic properties generally must be at least 50 years old; possess integrity of location, design, setting, materials, workmanship, feeling, and association; and meet at least one of the four criteria of significance:

a. Be associated with events that have made a significant contribution to the broad patterns of our history

b. Be associated with the lives of persons significant in our past

c. Embody the distinctive characteristics of a type, period, or method of construction or characteristics that represent the work of a master, that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction

d. Have yielded or may be likely to yield information important in history or prehistory

In addition, the following laws, ordinances, agreements, and guidelines are applicable to historic, cultural, and archaeological resources near the project area:

- Section 4(f) of the Department of Transportation Act of 1966, as amended (United States Code, Title 49, Section 303 [49 USC 303])
- The First Amended Programmatic Agreement among WSDOT, FHWA, the Washington State Department of Archaeology and Historic Preservation (DAHP), and the Advisory Council on Historic Preservation

- City of Seattle Landmarks Preservation Ordinance (Seattle Municipal Code, Chapter 25.12 [SMC 25.12]) and guidelines
- Pioneer Square Preservation District Ordinance (SMC 23.66) and guidelines
- Pike Place Market Historic District Ordinance (SMC 25.24) and guidelines
- Waterfront Historic Character Regulations (SMC 23.60.704)
- Interdepartmental Agreement on Review of Historic Buildings during SEPA Review, between the Seattle Department of Planning and Development (DPD) and the Department of Neighborhoods
- Clarification of SEPA Historic Preservation Policy for Potential Archaeologically Significant Sites and Requirements for Archaeological Assessments (DPD Director's Rule 2-98)

The evaluation process for effects on cultural resources also followed guidance provided by WSDOT's *Environmental Procedures Manual* (WSDOT 2010) and DAHP's *Washington State Standards for Cultural Resources Reporting* (DAHP 2010).

Several Washington state laws specifically address archaeological sites and Native American burials and could apply under special circumstances. The Archaeological Sites and Resources Act prohibits knowingly excavating or disturbing prehistoric and historical archaeological sites on public or private land without a permit from DAHP (Revised Code of Washington, Chapter 27.53 [RCW 27/53]). The Indian Graves and Records Act prohibits knowingly destroying American Indian graves and requires their inadvertent disturbance by construction or other activity to be followed by reinterment under the supervision of the appropriate Indian tribe (RCW 27.44).

1.8 Summary of Effects

This discipline report evaluates the historic, cultural, and archaeological resources near the project area for each of the three build alternatives and discusses the potential effects of the construction and operation of the alternatives and the efforts to avoid and minimize the effects. It also discusses measures for mitigating unavoidable adverse effects.

Section 106 regulations require that the agency define an Area of Potential Effects (APE). The study area established for the evaluation of project effects includes the APEs for all three build alternatives. The study area encompasses portions of two historic districts that are listed in the NRHP: the Pioneer Square–Skid Road Historic District and the Pike Place Market Historic District. Numerous other NRHP-listed properties are located along Western, First, and Second Avenues. In downtown, Belltown, and along the waterfront, there are a considerable number

of additional properties that are listed in, or eligible for listing in, the NRHP. Many of them are designated as Seattle landmarks; others appear to meet the criteria for this designation. The study area also encompasses seven recorded archaeological sites, as well as potential undiscovered sites.

1.8.1 Effects

Operational Effects

Operational effects are permanent effects that occur or continue after the facility is in operation. An effect is considered adverse when an action may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish any of the seven aspects of the property's integrity: location, design, setting, materials, workmanship, feeling, or association (Code of Federal Regulation, Title 36, Section 800.5[a][1] [36 CFR 800.5{a}{1}]). As described later in Section 6.1.1of this report, extensive efforts have been made to avoid and minimize effects on historic properties. For all three build alternatives, the primary adverse operational effect on historic properties would be the demolition of the Alaskan Way Viaduct. The Bored Tunnel Alternative would also decommission the Battery Street Tunnel. The viaduct and the Battery Street Tunnel have been determined eligible for listing in the NRHP as a single historic property. In addition to removing the Alaskan Way Viaduct, the Cut-and-Cover Tunnel Alternative and the Elevated Structure Alternative would replace the Elliott Bay Seawall, which is eligible for listing in the NRHP. The Cut-and-Cover Tunnel and Elevated Structure Alternatives would also have an adverse effect on the Washington Street Boat Landing, an NRHP-listed structure in the local Pioneer Square Preservation District. All three alternatives would include alterations to a manhole shaft of the Lake Union Sewer Tunnel, which is NRHP eligible. The operational effects of the three build alternatives are described in Chapter 5, Operational Effects and Mitigation.

In summary, historic properties that would potentially be adversely affected by the operation of each of the build alternative are the following:

- Bored Tunnel Alternative (preferred)
  - Alaskan Way Viaduct/Battery Street Tunnel
  - Lake Union Sewer Tunnel
- Cut-and-Cover Tunnel Alternative
  - Alaskan Way Viaduct
  - Lake Union Sewer Tunnel
  - Elliott Bay Seawall
  - Washington Street Boat Landing

- Elevated Structure Alternative

  - Alaskan Way Viaduct
  - Lake Union Sewer Tunnel
  - Elliott Bay Seawall
  - Washington Street Boat Landing

Construction Effects

The construction effects of the three build alternatives are described in Chapter 6, Construction Effects and Mitigation. The Bored Tunnel Alternative would result in settlement effects on two buildings in the Pioneer Square Historic District (the Western Building and the Polson Building), constituting an adverse effect on the historic district.

Construction of the Cut-and-Cover Tunnel and Elevated Structure Alternatives would have an adverse effect on the Pike Place Market Historic District and the central waterfront piers (Piers 54-57 and 59) because of the lengthy period of intensive construction along the waterfront. The Cut-and-Cover Tunnel Alternative would have an adverse effect on the Buckley's (MGM-Loew's) building, as it would have to be vacated for 6 months for tunnel construction directly beneath it. The Elevated Structure Alternative would have an adverse effect on the Old Spaghetti Factory, which would be adjacent to the Broad Street detour structure.

Each of the three build alternatives would result in typical temporary construction effects on the western edge of downtown Seattle. These indirect effects would include noise, traffic congestion, and reduced parking. Several buildings (shown in Exhibit 6.1) would have temporary utility easements during construction. Under the Cut-and-Cover Tunnel and Elevated Structure Alternatives, the central waterfront piers would be connected by temporary pedestrian bridges to improve access during construction. However, none of these effects would be severe enough to constitute an adverse effect on a historic building or a historic district. As required by Section 106 of the National Historic Preservation Act, these effects have been evaluated in terms of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, or association. None of these construction effects would significantly diminish any of the characteristics that qualify the historic property for inclusion in the NRHP. The potential construction effects that are not severe enough to be considered adverse would be addressed through the NEPA process.

More detailed information about construction effects is provided in other appendices to the Final EIS:

- Appendix C, Transportation Discipline Report

- Appendix D, Visual Quality Discipline Report
- Appendix F, Noise Discipline Report
- Appendix L, Economics Discipline Report
- Appendix M, Air Discipline Report
- Appendix P, Earth Discipline Report

One historic-period archaeological site that has been determined NRHP eligible would be affected by all three build alternatives: 45KI924.

Recorded historic-period archaeological sites for which NRHP eligibility has not yet been determined that would be adversely affected by one or more of the three build alternatives are the following:

- Site 45KI958, a historic-period archaeological site that would be adversely affected by all three build alternatives
- Site 45KI456, a Pre-Contact and historic-period archaeological site that might be adversely affected by the Cut-and-Cover Tunnel Alternative and the Elevated Structure Alternative
- Site 45KI482, a historic-period archaeological site that might be adversely affected by the Cut-and-Cover Tunnel Alternative and the Elevated Structure Alternative

Additional investigations would be undertaken at these sites in conjunction with construction. The results of the investigations would determine the NRHP eligibility of the sites. If WSDOT, on behalf of FHWA, determines the sites eligible for listing in the NRHP and DAHP concurs, data recovery would be undertaken to recover the information that qualifies the site for the NRHP.

All three build alternatives would result in ground disturbance in archaeologically sensitive areas. Archaeological coring can help evaluate stratigraphy in the vicinity and identify areas with a high probability of archaeological resources but it generally does not provide sufficient resolution to identify archaeological sites. Ground disturbance in sensitive areas would be archaeologically monitored.

1.8.2 Avoidance and Minimization

Extensive efforts have been made to avoid and minimize effects on historic properties. The alignment of the preferred alternative (Bored Tunnel Alternative) was moved west of First Avenue S. to avoid potential damage to the approximately 50 historic buildings along that street. Other measures include incentives in the design/build contract to minimize settlement, contractual penalties for exceeding settlement thresholds, an extensive monitoring program

that would provide early warning when settlement thresholds may be exceeded, contractual requirements for design and operation of the tunnel boring machine (TBM), and use of various soil improvement and grouting techniques to improve soil strength or compensate for ground loss as the excavation advances. To minimize the risk of settlement at the south end of the bored tunnel, a "protection box" constructed of secant piles would extend from approximately S. Dearborn Street to S. Main Street.

All the historic buildings along the tunnel alignment have been evaluated, and the potential damage due to settlement was determined to be negligible for most of them. The design/build contractor would develop a deformation analysis report that would include a comprehensive construction monitoring program to manage the risks of settlement and minimize the effects.

Two buildings in the Pioneer Square Historic District would benefit from proactive actions to avoid damage due to settlement:

- The One Yesler Building would be protected during tunnel boring by a below-grade micropile wall west of the building, which would protect the building but would have no effect on the building itself.
- The Polson Building would be protected by means of compensation grouting to stabilize the underlying soil, which would also have no effect on the building itself.

The building analysis also indicated that 11 historic buildings may potentially experience minor effects such as utility disruptions, minor cosmetic cracks, or slightly sticking doors and windows. Buildings will be monitored continuously during the tunnel boring, and compensation grouting would be performed if needed. Any damage would be repaired in kind, as needed, in keeping with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

Other activities for minimizing effects during construction would include the following:

- Develop a communications plan to keep property owners, residents, businesses, and employees in historic districts and in other historic buildings informed about construction issues.
- Establish and staff an information center in Pioneer Square to provide project and construction information and displays on the area's history and archaeology.
- Develop a traffic management and construction coordination plan to proactively provide information on lane and road closures, detours, parking changes, etc.

- Develop and implement a marketing plan to promote Pioneer Square as an attractive destination that is open for business for the duration of the project construction.
- Use best management practices (BMPs) to control noise, air pollution, and mud.
- Minimize construction traffic in historic areas when possible.
- Ensure continued access to stores, offices, and residences when possible.
- Minimize disruptions of utility service in historic areas and for historic buildings during construction.
- Schedule construction activities, when possible, to minimize effects on tourism and peak and seasonal shopping periods.
- Provide information on alternative transportation modes or provide alternative parking areas where parking is eliminated due to construction.

1.8.3 Mitigation

For adverse operational and construction effects that cannot be avoided, mitigation measures would be implemented. These measures are discussed in Chapters 5 and 6 and are included in an MOA that was developed for the Bored Tunnel Alternative (preferred alternative) by the State Historic Preservation Officer (SHPO), WSDOT, FHWA, affected tribes, and other consulting parties (see Attachment C).

Settlement damage to the Western Building would be mitigated through a building protection plan that involves replacing deteriorated piles beneath the building; reinforcing the basement walls; tying the building together where floors connect and where beams connect to columns; stabilizing cracked columns, walls, and beams; installing a temporary exterior steel frame; installing temporary interior shoring and guy wire bracing; injecting compensation grouting below grade. To help avoid settlement damage to the adjacent Polson Building, compensation grouting would be used to stabilize the surrounding soils. These stabilization activities would leave the exterior appearance of both buildings approximately the same as they are currently. The process of construction, tunneling and removal of the bracing would take approximately 12 months. The work would be reviewed by the Pioneer Square Preservation Board and would comply with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

Mitigation measures for other construction effects would include, but are not limited to, the following:

- A claims and repair process would be established to repair any damage to buildings.
- Project-related damage to historic buildings would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings. If exterior alterations are necessary, approval would be sought, as required, from the Pioneer Square Preservation Board, the Seattle Landmarks Preservation Board, the Pike Place Market Historical Commission (interior and exterior alterations), or DAHP.
- For archaeological resources, an Archaeological Treatment Plan will be developed for archaeological investigations, data recovery, and monitoring. An Unanticipated Discovery Plan, which has been prepared, provides for notification and consultation among concerned agencies and tribes related to discoveries of unanticipated archaeological materials or human remains.

The other major effect would be to the Alaskan Way Viaduct/Battery Street Tunnel. The viaduct structure would be demolished with all of the three build alternatives, and the Battery Street Tunnel would be decommissioned under the Bored Tunnel Alternative. Mitigation has been addressed in an MOA previously developed for the S. Holgate Street to S. King Street Viaduct Replacement Project. Under this MOA, interpretive programs have been developed and a Historic American Engineering Record (HAER) report (including photography) for the Alaskan Way Viaduct and the Battery Street Tunnel has been completed and submitted to the National Park Service (Sheridan 2009).

Mitigation measures for adverse construction effects on archaeological sites would include, but are not limited to, data recovery excavation and interpretation of results in various public venues. Construction would proceed in compliance with the MOA for the project. All of the mitigation measures would meet the requirements of Section 106 of the National Historic Preservation Act and other applicable laws, regulations, and policies.

1.8.4 Benefits

Two of the build alternatives, the Bored Tunnel Alternative and the Cut-and-Cover Tunnel Alternative, would provide benefits to historic properties along the east side of Alaskan Way by opening up views to and from the buildings and enhancing connections with the waterfront. The reduction in noise and air pollution would make the area more attractive for customers, residents, visitors, and employees and may increase the economic viability of the historic properties and the financial ability of property owners to maintain their historic properties properly. Pioneer Square's connection to the waterfront would be more like it was during its period of significance (1889–1931).

The central waterfront piers (Piers 54 through 59) would benefit in a similar manner from enhanced views and connections between downtown and the waterfront and the reduced vehicle noise.

These two alternatives also include demolition of the ramps at Seneca and Columbia Streets, which would open up the views to and from the adjoining historic buildings. The reduced vehicle noise would potentially enhance the economic viability of these buildings.

With the Bored Tunnel Alternative, the redirection of traffic to new ramps farther south would result in improved transit service in Pioneer Square. The Cut-and-Cover Tunnel and Elevated Structure Alternatives include replacing the waterfront streetcar, which would benefit transit on the waterfront and increase access to Pioneer Square.

The Cut-and-Cover Tunnel Alternative includes widening the pedestrian promenade on Alaskan Way and improving connections from the waterfront to the Pike Place Market, potentially enhancing the economic viability of the historic market and the central waterfront piers. The Bored Tunnel Alternative would provide opportunities for waterfront improvements by removing the viaduct, but the additional improvements would be designed and provided by a separate City of Seattle project.

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Chapter 2 METHODOLOGY

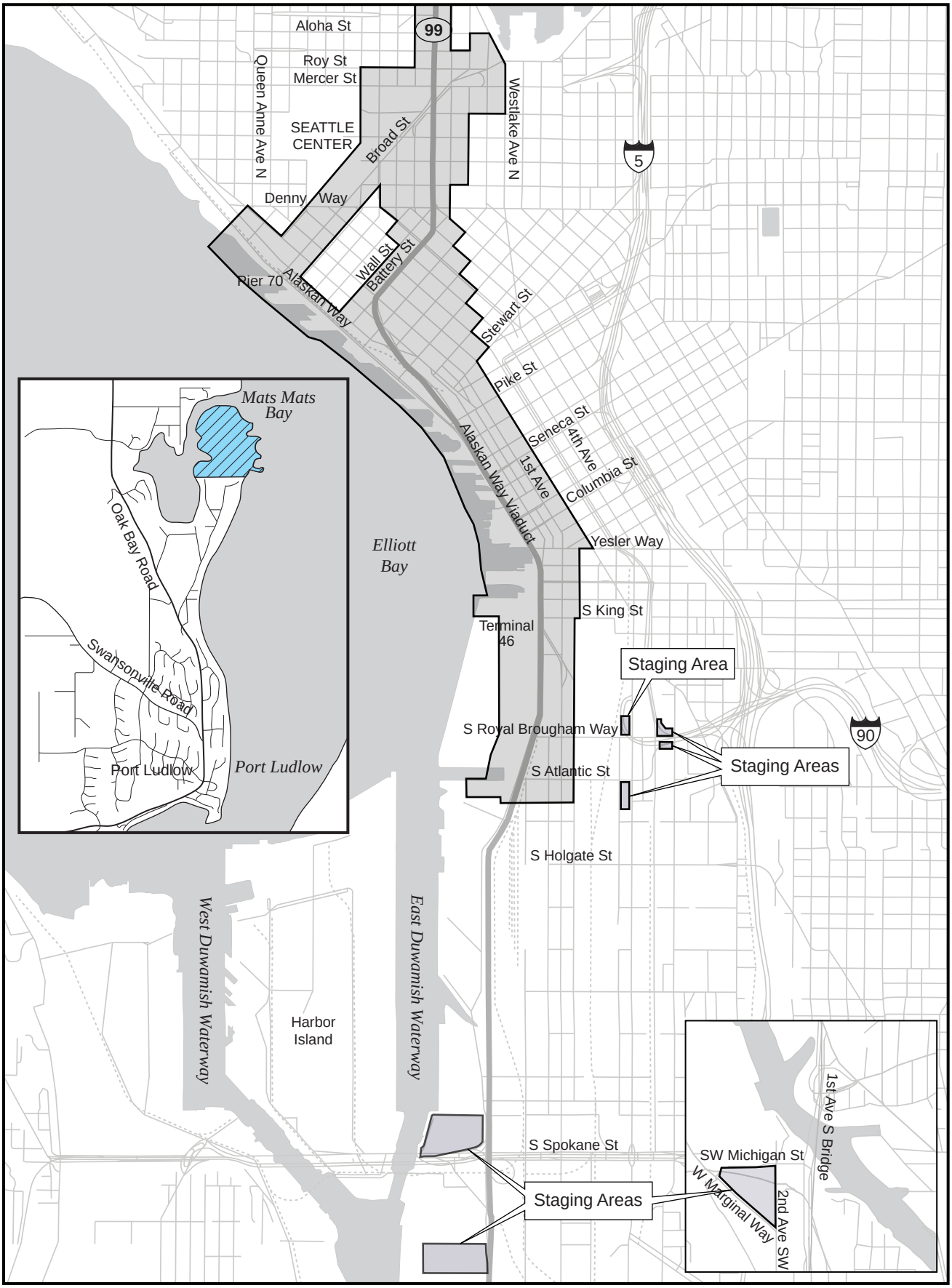
2.1 Study Area

The study area includes the APEs for all three build alternatives; these are the areas where the alternatives could result in direct or indirect effects on historic, cultural, or archaeological resources. The study area, shown in Exhibit 2-1, extends approximately one to two blocks on each side of the alignment of each of the build alternatives. Under the Bored Tunnel Alternative, the project area generally follows First Avenue and the existing SR 99 alignment, extending west to the waterfront to include the demolition of the Alaskan Way Viaduct. The project area widens in the north to include additional roadway improvements. The project area for the Cut-and-Cover Tunnel Alternative is similar, but it extends north along the waterfront past Broad Street to include the entire Elliott Bay Seawall. The project area for the Elevated Structure Alternative also includes Broad Street because of the detour required for that alternative. DAHP concurred with the APEs as they were developed for each alternative. Initial concurrence on the APE for the Bored Tunnel Alternative was received in March 2010. The APE was subsequently revised slightly, and DAHP concurred in December 2010.

In summary, the study area extends, from south to north, from just south of S. Royal Brougham Way to Ward Street near Lake Union. It extends west to east from the waterfront to Second Avenue, widening between Stewart Street and Wall Street to include much of Belltown. It also includes one block on each side of Broad Street along its entire length, widening at the east end to Westlake Avenue N. The study area also includes the staging areas described in Appendix B, Alternatives Description and Construction Methods Discipline Report, and the spoils disposal site at Mats Mats Quarry near Port Ludlow, in Jefferson County, Washington.

The staging areas would be located in industrial areas on prepared gravel or paved surfaces, with no additional ground disturbance. Mats Mats Quarry is an existing, permitted, operational facility, and no expansion would be needed to accommodate the disposal of uncontaminated spoils from the bored tunnel. At these locations, there would be no effects on historic properties, and they are not discussed further.

To evaluate the potential effects of each of the build alternatives on subsurface archaeological resources, the area of potential ground disturbance was delineated within the APE for each alternative. Within the area of potential ground disturbance, the depth of potential ground disturbance depends on the project elements (see Exhibits 2-2 through 2-10).



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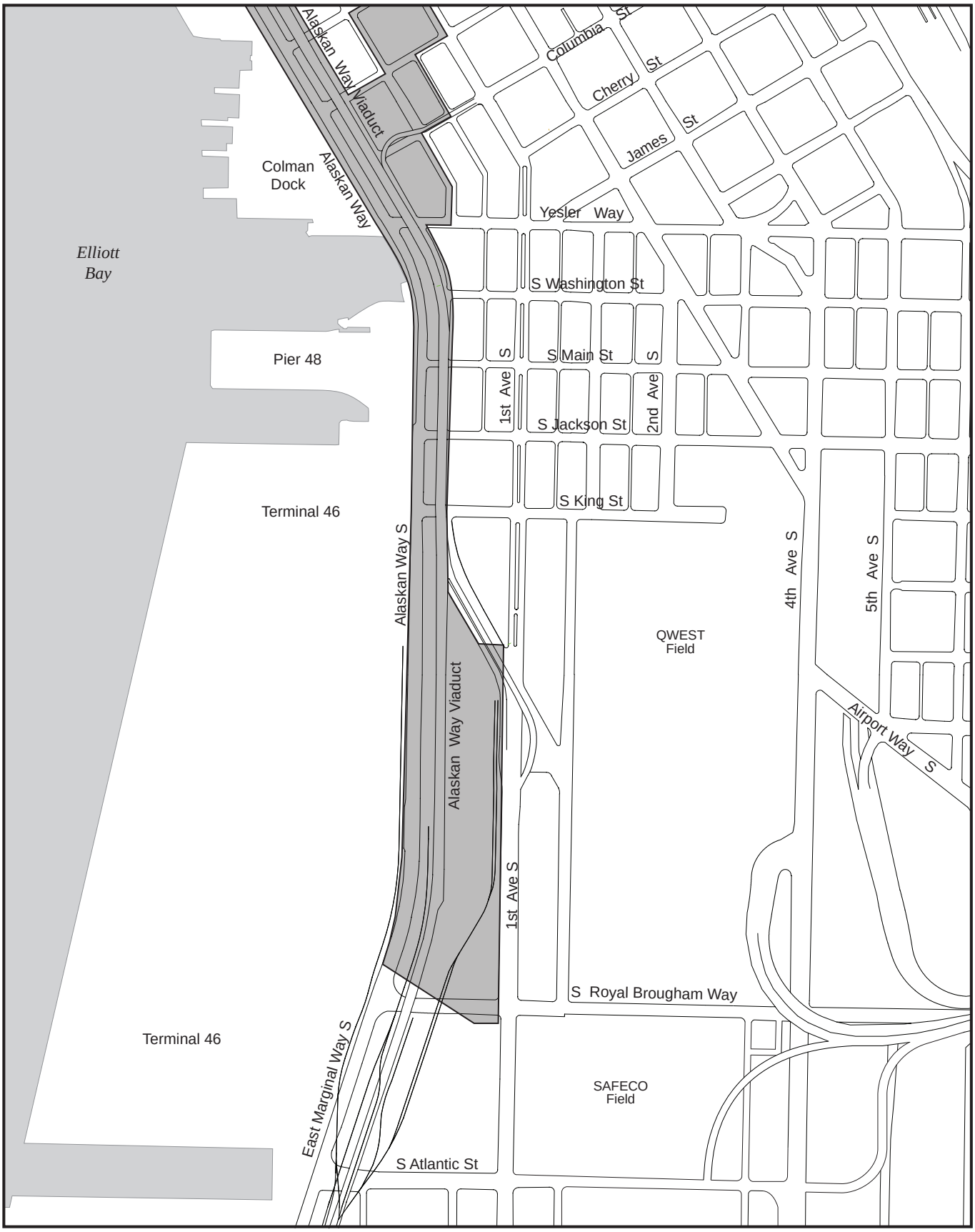
SCALE IN FEET

Build Alternatives Study Area

Existing Mats Mats Quarry

Exhibit 2-1
Study Area



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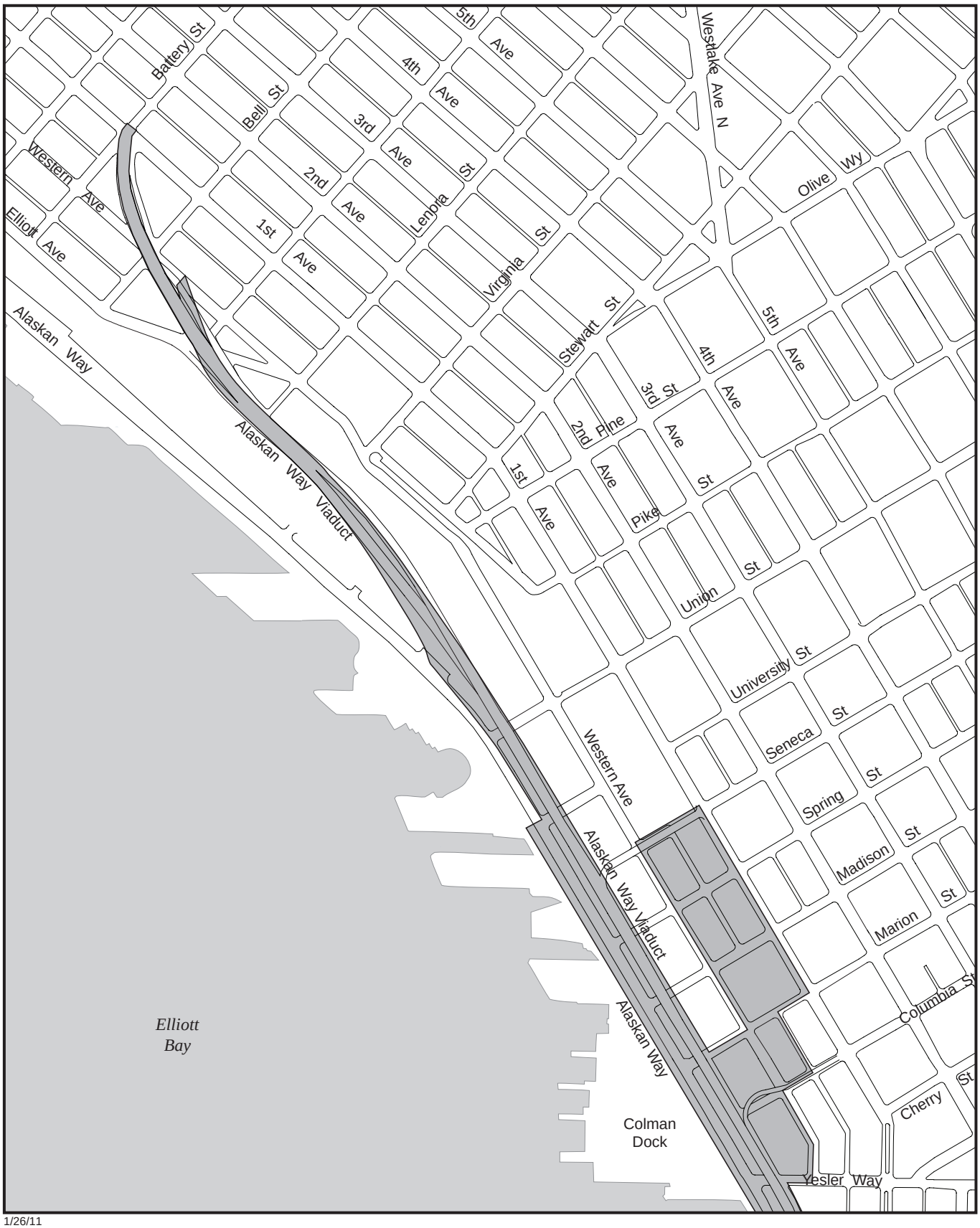
SCALE IN FEET

Areas of Ground Disturbance

Exhibit 2-2
Potential Ground Disturbance for the Bored Tunnel Alternative - South



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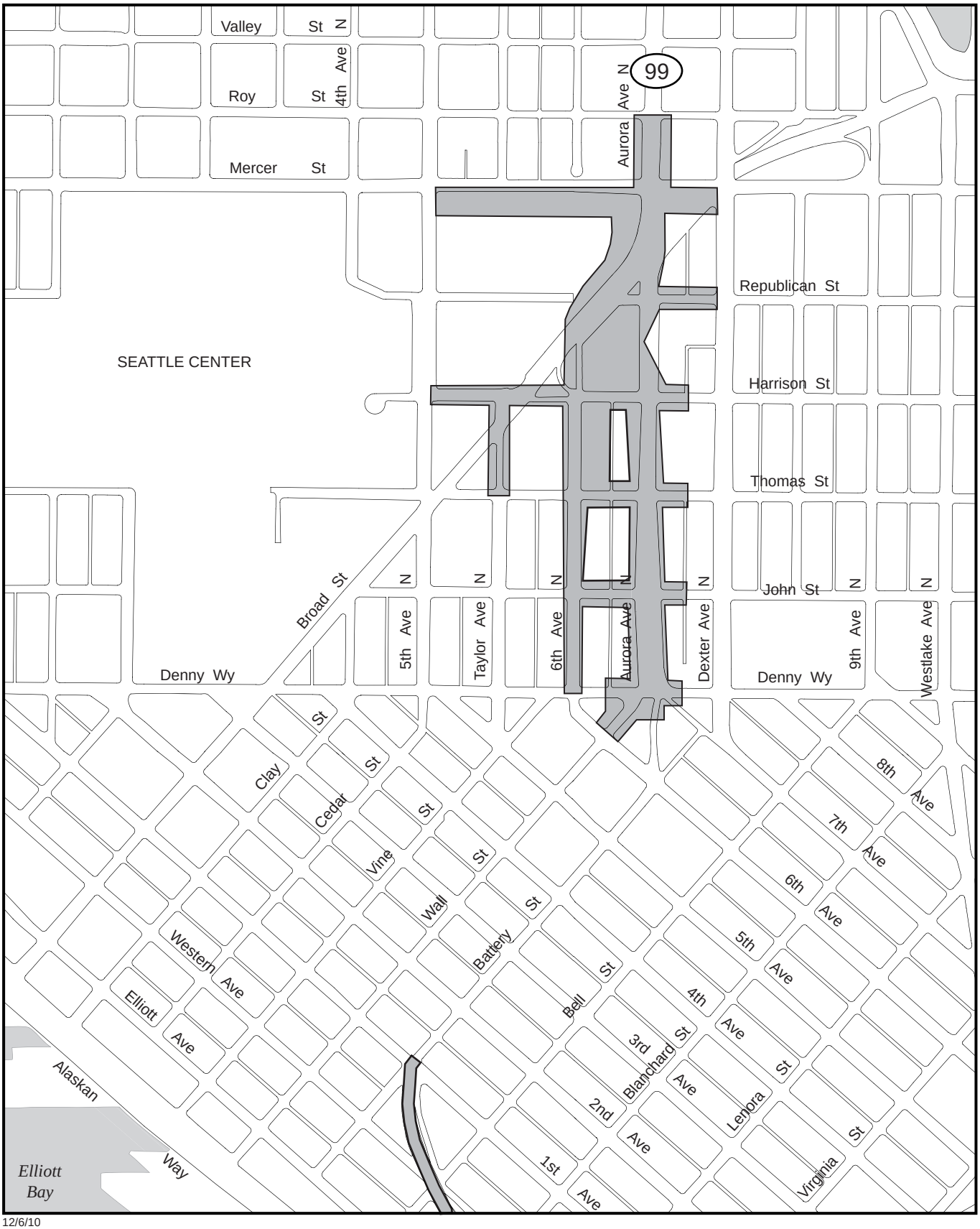
Areas of Ground Disturbance

Exhibit 2-3
Potential Ground Disturbance for the Bored Tunnel Alternative - Central



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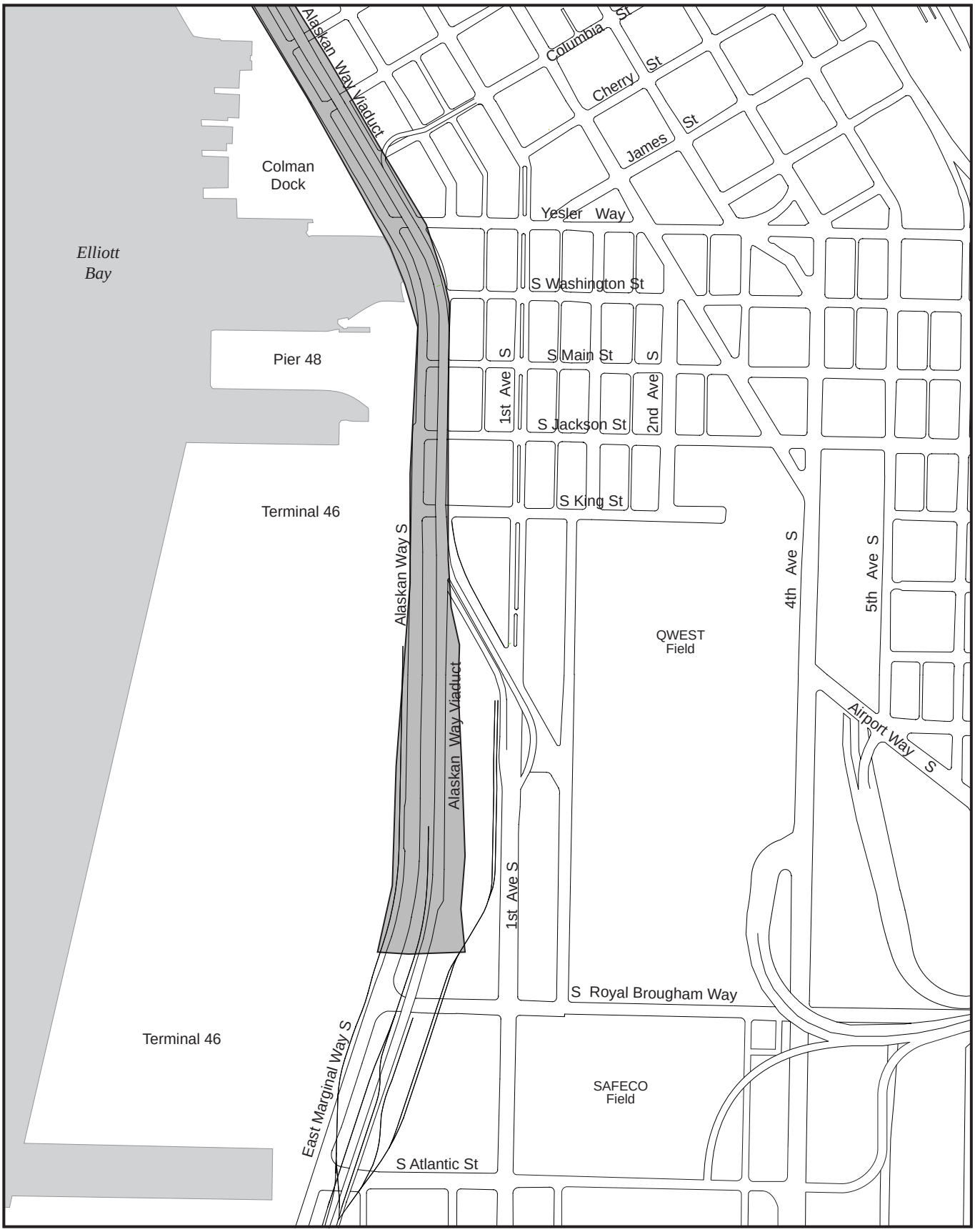
Areas of Ground Disturbance

Exhibit 2-4
Potential Ground Disturbance for the Bored Tunnel Alternative - North



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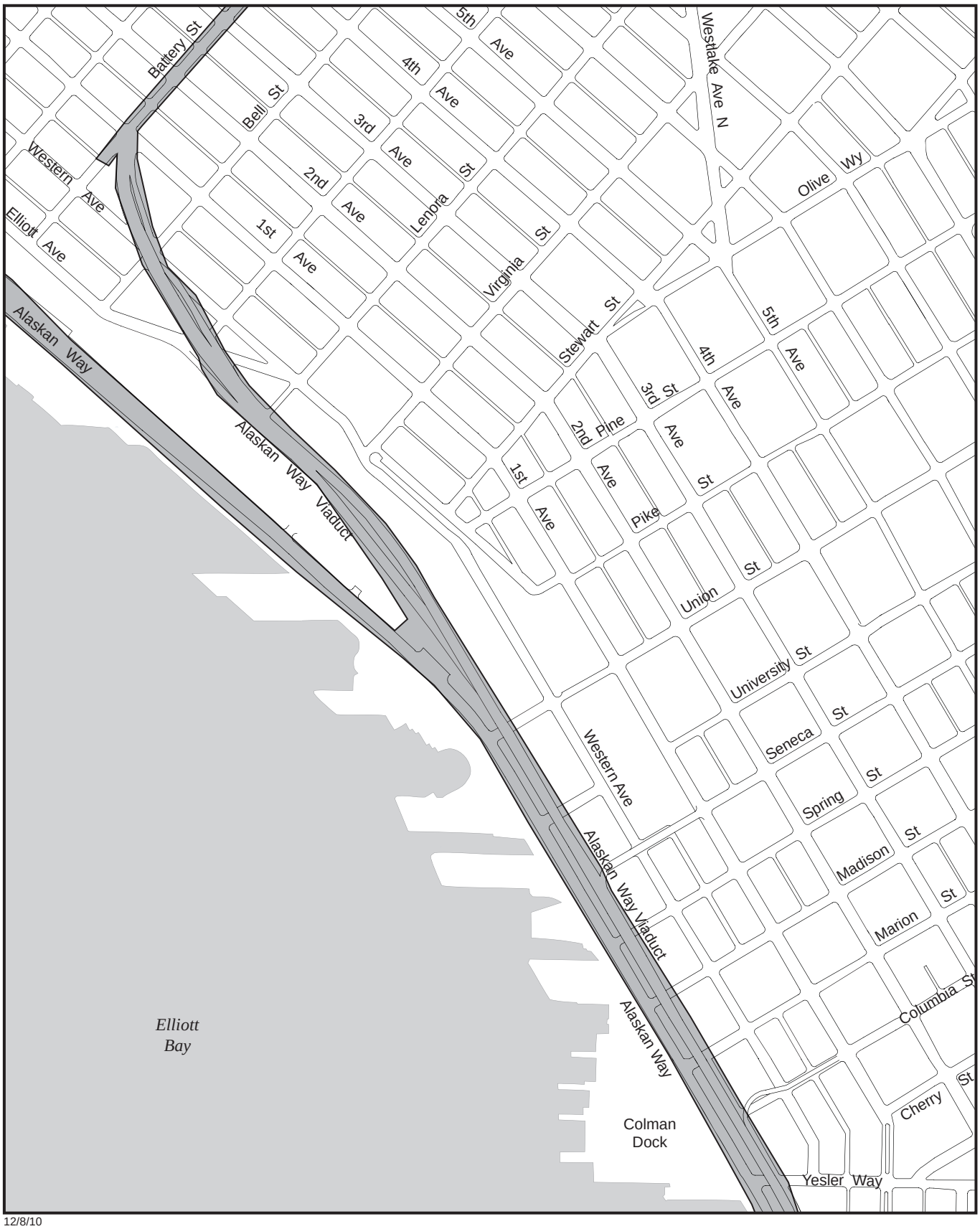
Areas of Ground Disturbance

Exhibit 2-5
Potential Ground Disturbance for the Cut-and-Cover Tunnel Alternative - South



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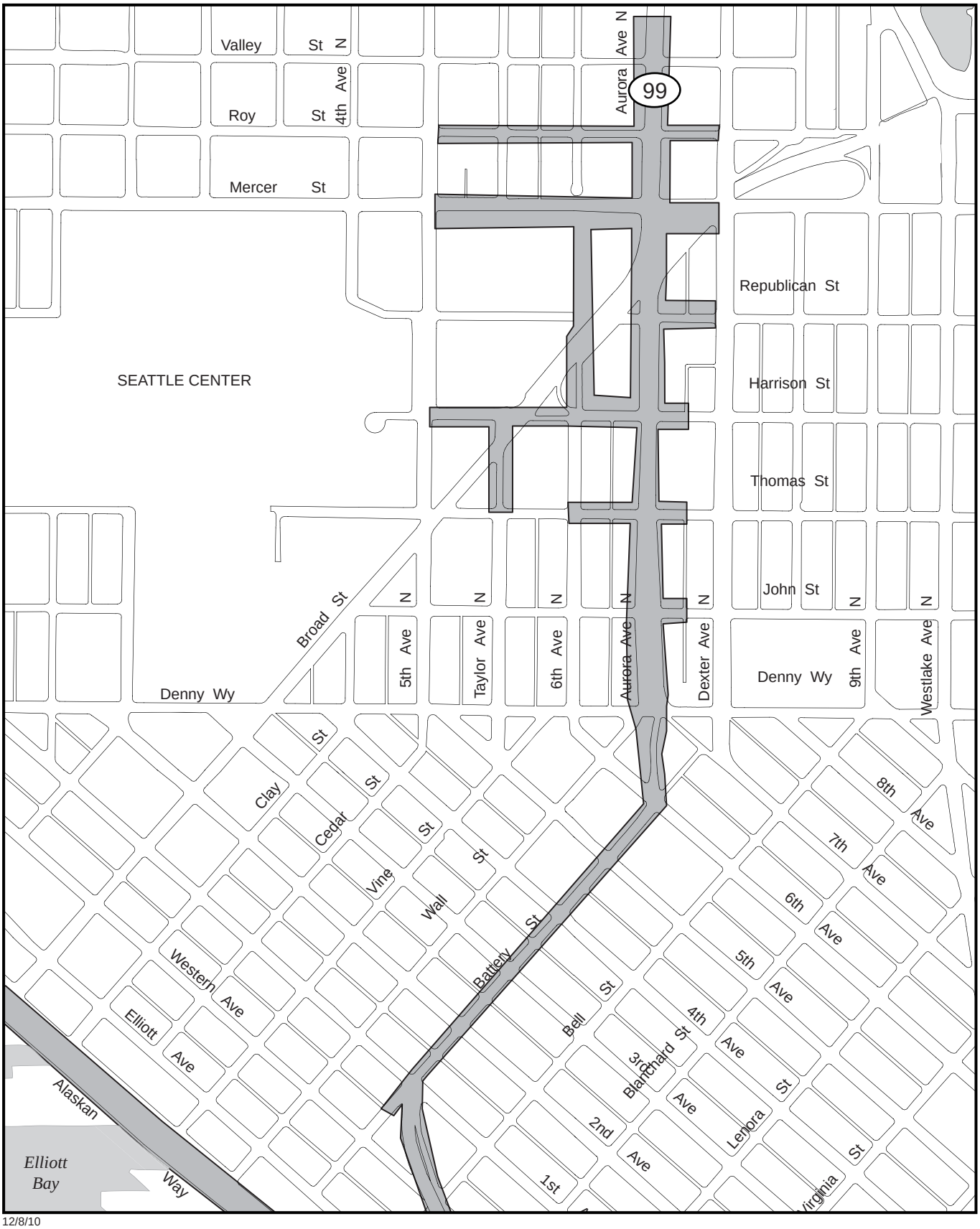
Areas of Ground Disturbance

Exhibit 2-6
Potential Ground Disturbance for the Cut-and-Cover Tunnel Alternative - Central



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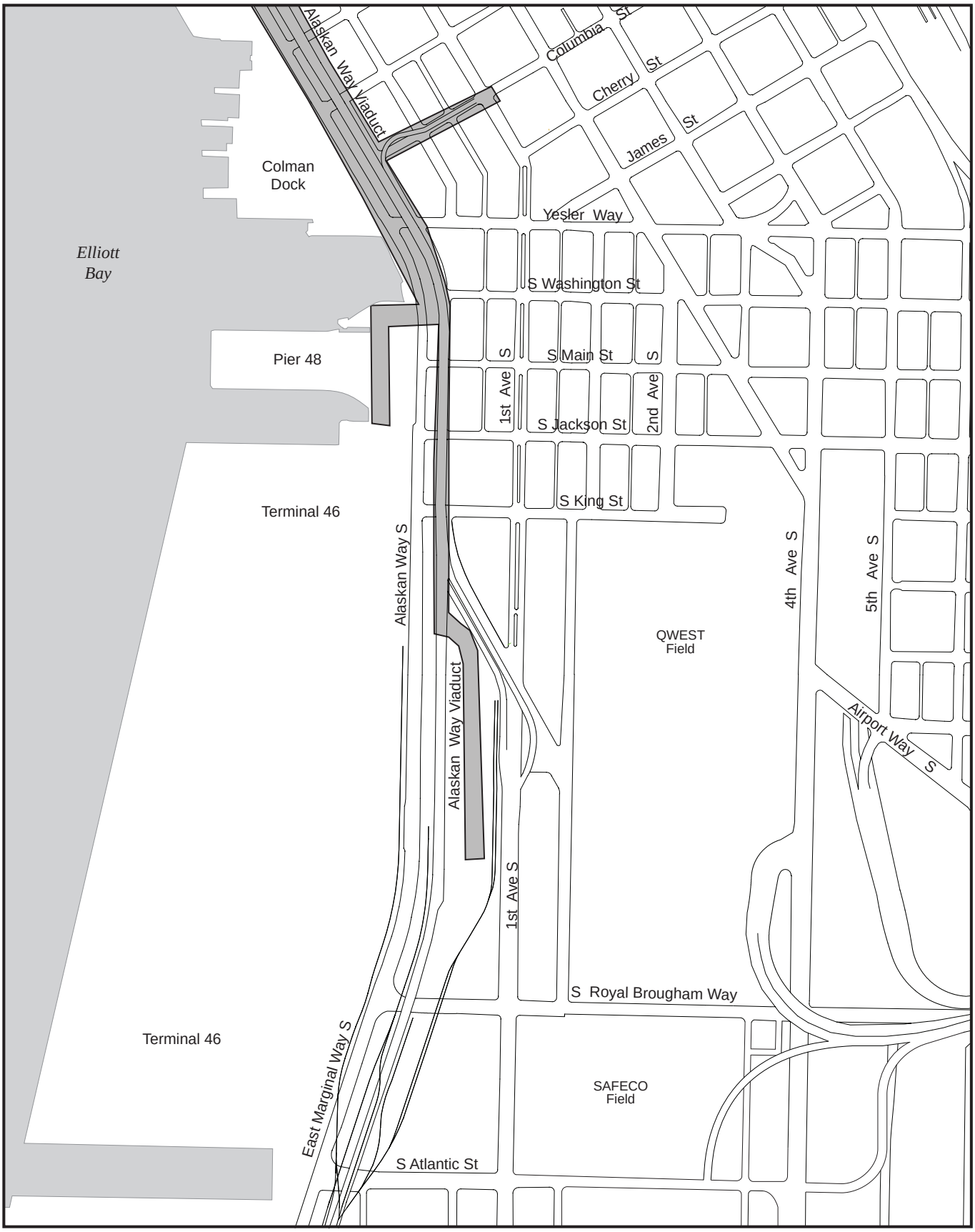
Areas of Ground Disturbance

Exhibit 2-7
Potential Ground Disturbance for the Cut-and-Cover Tunnel Alternative - North



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Areas of Ground Disturbance

Exhibit 2-8
Potential Ground Disturbance for the Elevated Structure Alternative - South

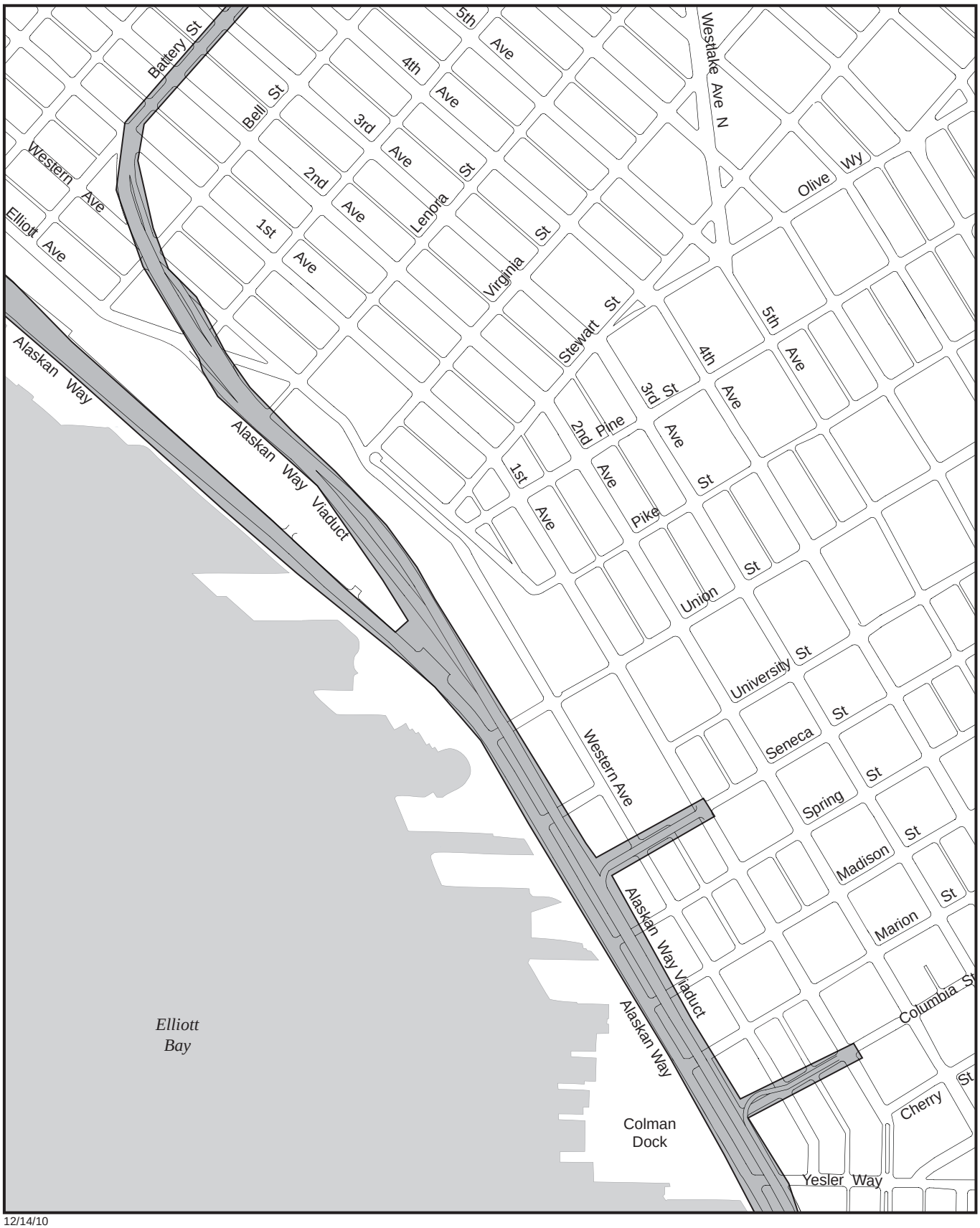
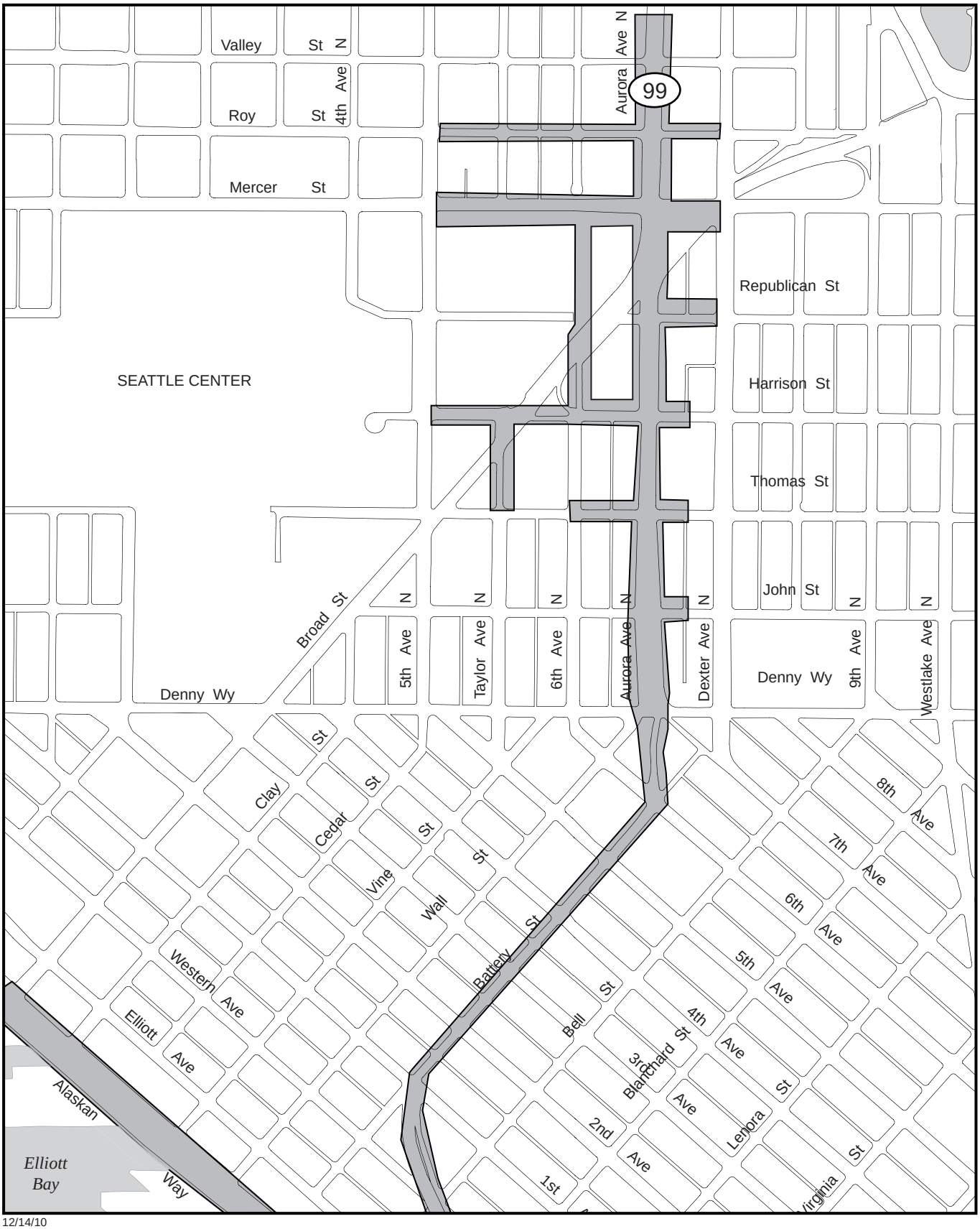


Exhibit 2-9
Potential Ground Disturbance for the Elevated Structure Alternative - Central



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Areas of Ground Disturbance

Exhibit 2-10
Potential Ground Disturbance for the Elevated Structure Alternative - North

2.1.1 Bored Tunnel Alternative

The project elements with a potential to adversely affect archaeological resources in the area of potential ground disturbance for the Bored Tunnel Alternative include the following:

- From S. Royal Brougham Way to just north of S. Dearborn Street between Alaskan Way S. and First Avenue S., the south portal for the Bored Tunnel Alternative would include the excavation of a cut-and-cover trench to a maximum depth of approximately 90 feet below the surface (fbs), excavation of a tunnel operations building to a maximum depth of approximately 60 fbs, excavation of utility trenches and vaults to a maximum depth of approximately 13 fbs, excavation of stormwater facilities to a maximum depth of 20 fbs, and surface improvements to an estimated depth of 5 fbs. An aerial ramp would be constructed at S. Royal Brougham Way, with pilings and associated ground improvements disturbing the ground to a depth of up to 100 fbs.
- From S. Royal Brougham Way to S. Washington Street, pile walls would be installed west and east of the cut-and-cover trench and bored tunnel. The pile walls would extend to the base of the tunnel, a maximum of 90 fbs. Intersecting walls, also a maximum of 90 fbs, would be installed in the area between Yesler Way and Seneca Street, between First Avenue and Alaskan Way.
- From one-half block north of S. Washington Street to one-half block north of Yesler Way, ground improvements would be needed below the pile foundations of the Alaskan Way Viaduct to a maximum depth of approximately 110 fbs.
- From Yesler Way to Seneca Street between the Alaskan Way Viaduct and First Avenue, shafts 15 feet in diameter would be excavated in one location to a maximum depth of approximately 55 fbs.
- From Columbia Street to Madison Street along Western Avenue and from Western Avenue to First Avenue within Madison Street, trenches for water line relocation would be excavated to a maximum depth of approximately 8 fbs.
- From S. King Street to University Street between Alaskan Way and the Alaskan Way Viaduct, trenches and vaults for transmission line relocation would be excavated to a maximum depth of approximately 9 fbs.

- From S. King Street to Pike Street within Alaskan Way and continuing from Pike Street to Bell Street along the alignment of the Alaskan Way Viaduct, trenches and vaults for communications line relocation would be excavated to an estimated depth of 5 fbs.
- From the Alaskan Way Viaduct to Western Avenue within University Street, trenches and vaults for transmission line relocation would be excavated to a maximum depth of approximately 15 fbs.
- From Denny Way to Mercer Street between Fifth Avenue N. and Dexter Avenue N., the north portal for the Bored Tunnel Alternative would require the excavation of a cut-and-cover trench to a maximum depth of approximately 90 fbs, the excavation of utility trenches and vaults to a maximum depth of approximately 14 fbs, the excavation of stormwater and combined sewer facilities to a maximum depth of 25 fbs, and surface improvements to an estimated depth of 5 fbs.
- At all existing viaduct columns, removal of the Alaskan Way Viaduct would include excavation within the footprint of each bent to a depth no greater than the pile caps, approximately 5 fbs.

2.1.2 Cut-and-Cover Tunnel Alternative

The project elements with a potential to adversely affect archaeological resources in the area of potential ground disturbance for the Cut-and-Cover Tunnel Alternative include the following:

- The cut-and-cover tunnel would initially follow the current alignment of Alaskan Way S. It would begin at S. Royal Brougham Way and reach approximately 60 fbs at S. Dearborn Street. It would be approximately 90 feet wide.
- From S. Dearborn Street, the cut-and-cover tunnel would continue to follow the alignment of Alaskan Way S., sloping slightly downward. By S. Main Street, the maximum extent of ground disturbance would be 86 fbs.
- At Pier 48, at the foot of S. Washington Street, the Elliott Bay Seawall would be replaced. The area of the ground disturbance would be approximately 40 feet wide and 45 fbs.
- North of S. Washington Street, the cut-and-cover tunnel would continue in the alignment of Alaskan Way S., sloping slightly upward, with its western wall also incorporating the seawall. By Seneca Street, the maximum depth of disturbance would be approximately 72 fbs.

- At Seneca Street, the cut-and-cover tunnel would turn slightly eastward and follow the alignment of the current Alaskan Way Viaduct. The area of ground disturbance would be wider, approximately 120 feet, to accommodate both the tunnel and the replacement of the seawall. The tunnel would begin sloping upward.
- At Union Street, excavation for the cut-and-cover tunnel would diverge from the excavation for the seawall replacement. Ground disturbance for the seawall would follow the alignment of Alaskan Way and would be approximately 40 feet wide and a maximum of 60 fbs. Ground disturbance for the tunnel would be approximately 90 feet wide and a maximum of 45 feet deep.
- Excavation for the cut-and-cover tunnel would continue along the Alaskan Way Viaduct alignment, still sloping upward, approximately 90 feet wide. By midblock between Pike Street and Pine Street, the roadway would emerge at the surface. Excavation for the seawall would continue along the Alaskan Way alignment, approximately 40 feet wide and a maximum of 60 fbs.
- The roadway would continue at the surface to Lenora Street. Ground disturbance for utilities trenches and vaults would be 8 to 10 fbs.
- At Lenora Street, the ground disturbance would be approximately 90 feet wide and reach 25 fbs just before the Battery Street Tunnel, as the tunnel curves to the northeast. The seawall excavation would continue north along Alaskan Way to Broad Street, approximately 40 feet wide and a maximum of 60 fbs.
- By Second Avenue and Battery Street, the roadway would reach the Battery Street Tunnel. The alignment would continue through the Battery Street Tunnel to the intersection of Denny Way and Aurora Avenue.
- Between Denny Way and Republican Street, the cut-and-cover tunnel would be excavated to a maximum depth of approximately 50 fbs.
- At all existing bents of the Alaskan Way Viaduct where the cut-and-cover tunnel deviates from the viaduct footprint, removal of the viaduct would include excavation within the footprint of each bent to a depth no greater than the pile caps, which are approximately 5 fbs.
- Utility trenches and vaults would be excavated to a maximum depth of approximately 14 fbs, stormwater facilities to a maximum depth of 25 fbs, and surface improvements to an estimated depth of 5 fbs.

2.1.3 Elevated Structure Alternative

The project elements with a potential to adversely affect archaeological resources in the area of potential ground disturbance for the Elevated Structure Alternative include the following:

- From just south of S. Dearborn Street to S. Washington Street, the new elevated structure would be built in the location of the existing Alaskan Way Viaduct. The structure would be supported on 12-foot-wide piles in groups of three, at 100-foot intervals. The piles would be excavated through Holocene sediments to competent (glacial) sediments, a maximum of 100 fbs. From S. Washington Street to Virginia Street, the piles would be in groups of two. The exact pile locations are currently unknown; therefore, ground disturbance to the maximum depth could occur anywhere within the alignment between the southern extent of the project area and Virginia Street.
- Excavation for the Elliott Bay Seawall replacement would extend along Alaskan Way S. from Pier 48 at the foot of S. Washington Street to Broad Street. At Pier 48, the excavation would be approximately 40 feet wide and 45 feet deep. From Pier 48, the excavation would follow the existing seawall as it continues north along Alaskan Way to Broad Street at 40 feet wide and 60 fbs.
- At Virginia Street, the new elevated structure would connect to the existing viaduct structure, which would be retrofitted (from Virginia and the Battery Street Tunnel). Ground improvements such as jet grouting or placement of stone columns would likely occur, and ground disturbance could reach a maximum depth of 100 fbs.
- The alignment of the new elevated structure would continue through the Battery Street Tunnel to the intersection of Denny Way and Aurora Avenue. Ground disturbance for utilities trenches and vaults at this surface segment would be approximately 8 to 10 fbs.
- Between Denny Way and Republican Street, a cut-and-cover tunnel would be excavated to a maximum depth of approximately 50 fbs. Utility trenches and vaults would be excavated to a maximum depth of approximately 14 fbs, stormwater facilities to a maximum depth of 25 fbs, and surface improvements to an estimated depth of 5 fbs.
- Between S. King Street and Pike Street, utilities trenches and vaults would be excavated in the alignments of both Alaskan Way and the Alaskan Way Viaduct to a maximum depth of 15 fbs.

2.2 Analysis of Affected Environment

After the study area was delineated, information was gathered to better understand the historical context of the project and its environs and to identify historic and archaeological resources. This involved both archival research and field work.

2.2.1 Archival Research

The primary sources of archival data fall into two categories:

- Information concerning previously identified resources
- Information needed to identify and evaluate the significance of newly identified resources

To locate buildings or structures that previously had been identified as historically significant, information about the history of the area, the historic districts, and the individual buildings was collected. The major sources were the following:

- Nomination forms for properties listed in the NRHP and for Seattle landmarks
- Information concerning the historic districts
- Information from previous surveys of the area, including the recent City survey of downtown and Belltown (City of Seattle 2008)
- DAHP Historic Property Inventory forms
- Information in previous environmental reports regarding potential historic resources in the study area
- Developmental history found in standard works of history, university theses, and similar sources
- Historical building data from city directories, building permit files, and King County Tax Assessor property record cards. Historical photographs of key buildings and their surroundings.

To evaluate the significance of potential historic resources, the researchers used National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation* (Andrus 2002).

To identify previously recorded archaeological sites, information was collected from DAHP in Olympia, as well as from published sources at the University of Washington, Seattle Public Libraries, Washington State Library, and other locations. Historical maps and photographs were also reviewed.

To identify and evaluate the significance of newly identified archaeological resources, the researchers referred to the National Register Bulletin 36, *Guidelines for Evaluating and Registering Archaeological Properties* (Little et al. 2000). Other guidance from the National Park Service, the Advisory Council on Historic Preservation, and DAHP was consulted as needed. Archival records of similar sites and nearby sites, at DAHP and elsewhere, were also consulted for comparative purposes.

2.2.2 Built Environment Investigations

All properties within the study area that were constructed in or before 1963 were evaluated (see Attachment A), except those that had been recorded previously. Evaluated properties have been recorded in the DAHP Historic Property Inventory Database. Copies of these inventory forms are part of the project record and are accessible on the DAHP website (http://www.dahp.wa.gov/pages/wisaardintro.htm).

Information from the City's comprehensive survey of downtown properties (City of Seattle 2008) was a major source of information for assessing the significance of buildings in the study area, as well as survey work and additional research conducted for the project. For properties that have not been surveyed, information from City construction records, the King County Tax Assessor, city directories, and other archival information was used to assess the significance of the properties.

Areaways (spaces beneath the sidewalks adjacent to some buildings) in the study area have also been identified and evaluated. Information on their historic and structural characteristics that was collected by consultants for the Seattle Department of Transportation (SDOT) from 2000 to 2002 (City of Seattle 2003) has been expanded and updated through physical inspections by the project's structural engineers and consultants (Coughlin Porter Lundeen et al. 2010).

2.2.3 Archaeological Investigations

After the delineation of areas of potential ground disturbance, the probability that archaeological materials would be present in those areas was assessed (Huber et al. 2010).

Within the area of potential ground disturbance, probability of encountering archaeological materials varies based on several factors, which can be divided into three categories:

- Presence of Holocene sediments or intact historic surfaces
- Presence of archaeological materials associated with those sediments or surfaces

- Intersection of project construction with those sediments or surfaces

Investigation for the presence of Holocene sediments or landforms and intact historic surfaces required deep archaeological testing that consisted of geoarchaeological techniques, such as core sampling, as well as limited open excavation using heavy equipment, such as backhoes and excavators. This deep testing was necessary because of the constraints of the urban environment within the project area, specifically pavement, utilities, and historic and modern fill.

Existing geoarchaeological data were examined. The GeoMapNW database, formerly maintained online by the University of Washington Department of Earth and Space Sciences, provided the results of geotechnical investigations conducted for a variety of purposes and projects throughout Seattle. A second set of data was provided by previous geoarchaeological and geotechnical investigations conducted as part of the project.

Additional geoarchaeological work was also performed specifically for the Bored Tunnel Alternative. The additional work included continuous cores (rotasonic cores, split-spoon, or hollow-stem auger geoprobes), which allowed precision in delineating stratigraphy and reached depths in excess of the limits of open excavation. However, cores offer only a narrow view. Although stable surfaces and even artifact-bearing layers can be identified, it is difficult to assess the horizontal extent of these deposits, as well as their significance and integrity.

In areas where the constraints of the urban environment allowed, open excavations, primarily backhoe trenches and augers, allowed correlations to be traced among depositional units and cultural layers with a greater degree of confidence. Larger cross-sections also exposed a greater range of surfaces and contacts. However, trench exposures were limited to only the upper 25 feet of soil and were often terminated at much shallower depths because of obstructions, contamination, or water infiltration.

Archaeologists have monitored 31 rotasonic cores, 178 probes, and 3 open excavation projects for the Program within the study area. All of the rotasonic cores and open excavations were conducted for the purposes of archaeological investigation. Most of the probes were conducted for geotechnical purposes but were monitored by archaeologists. The archaeological coring project reports are indicated in Exhibit 2-11, and the excavation reports are indicated in Exhibit 2-12.

Exhibit 2-11. Alaskan Way Viaduct and Seawall Replacement Program Archaeological Coring Reports

Author and Date	Description	Results
Huber et al. 2010	Synthesis of the Alaskan Way Viaduct and Seawall Replacement	The synthesis reviewed all prior coring, as well as a new series of cores. Probability models

Exhibit 2-11. Alaskan Way Viaduct and Seawall Replacement Program Archaeological Coring Reports (continued)

Author and Date	Description	Results
	Program Archaeological Coring Projects	were developed for the area of ground disturbance for the Bored Tunnel Alternative. Analysis of the new archaeological cores strongly suggested that a portion of Ballast Island has been identified.
Rinck and Valentino 2009	Summary of TB- and GP-Borehole Series Archaeological Core Monitoring	The cores identified natural and cultural stratigraphic units as well as industrial, domestic, and architectural cultural materials. Archaeological resources associated with the Dearborn South Tideland Site (45KI924), which dates between 1895 and 1910, were identified.
Miss et al. 2010	S. Holgate Street to S. King Street Viaduct Replacement Project Archaeological Treatment Plan	The cores identified natural and cultural stratigraphic units as well as industrial, domestic, and architectural cultural materials. Archaeological resources associated with the Dearborn South Tideland Site (45KI924), which dates between 1895 and 1910, were identified.
Miss, Matson, Valentino, et al. 2008 (NADB# 1351445)	Archaeological Core Collection Program, Phase I	Rotasonic coring identified well-defined natural and cultural stratigraphic units throughout the construction corridor, as well as archaeological evidence of industrial and transportation features. Historic-period artifacts deposited during the early twentieth century were recovered.
Miss, Valentino, Rinck, et al. 2008 (NADB# 1351449)	Archaeological Assessment S. Holgate to S. King Streets	Rotasonic coring identified well-defined natural and cultural stratigraphic units, as well as industrial, domestic, and architectural cultural materials.
Valentino et al. 2008 (NADB# 1351879)	Yesler Way Stabilization Project Archaeological Assessment	Rotasonic coring identified well-defined natural and cultural stratigraphic units, as well as industrial, domestic, and architectural cultural materials.
NWAA 2006 (NADB# 1347441)	TOD-BF Geoarchaeological Examination of Geoprobes	Geoprobes identified well-defined natural and cultural stratigraphic units, as well as industrial, domestic, and architectural cultural materials.
Gillis et al. 2005a (NADB# 1346580)	Archaeological Resources Monitoring of Geotechnical Borings From Harrison to Valley Streets	No archaeological resources were identified.
Gillis et al. 2005b (NADB# 1348804)	Archaeological Resources Monitoring of Geotechnical Borings From S. Spokane Street to the Battery Street Tunnel	No archaeological resources were identified.

Note: NADB = National Archaeological Database

Exhibit 2-12. Alaskan Way Viaduct and Seawall Replacement Program Archaeological Excavation Reports

Author and Date	Description	Results
Valentino et al. 2008 (NADB# 1349691)	Yesler Way Stabilization Project Archaeological Assessment Technical Memorandum	No significant archaeological sites or properties were identified. There was less vertical variability and fewer discrete facies deposits than expected.
Valentino et al. 2010 (NADB# 1353931)	Results of Monitoring for the Alaskan Way Viaduct Electrical Line Relocation Project	Investigation of NRHP-eligible property 45KI924 identified backlot sheet middens, industrial locations, structural foundations associated with specific businesses, and remains associated with the creation of the landform itself.
Wegener et al. 2010	Archaeological Exploration Within the SDOT Harrison Street Maintenance Yard in Support of the Alaskan Way Viaduct Replacement Project, King County, Washington	Potentially eligible NRHP cultural deposits in the form of deeply buried historic-period structural remains appear to be located within the parcel.

Notes: NADB = National Archaeological Database
NRHP = National Register of Historic Places
SDOT = Seattle Department of Transportation

The probability of the presence of archaeological materials in the identified Holocene sediments was assessed through extensive background research and analysis of the testing data.

Background research included a review of cultural, historical, and geoarchaeological sources. Cultural and historical information was compiled in two detailed research designs for the identification and evaluation of archaeological properties previously developed for the project (Miss and Hodges 2007; Miss et al. 2007). These studies reviewed the existing viaduct alignment and vicinity, developed historical contexts, identified sensitive areas and methods for investigating subsurface archaeological materials, and established the framework for assessing the significance of discoveries. Additional cultural and historical information was gathered for individual projects in the Program.

Previous geoarchaeological results were used to identify artifact-bearing strata in Holocene sediments and plan future test locations. Archaeologists directly observed several new geotechnical bores completed for the project between 2005 and 2009 and were able to log information important for the identification of

cultural resources (Gillis et al. 2005a; Gillis et al. 2005b; Miss and Hodges 2007; Hodges et al. 2007; Roedel et al. 2003).

In 2007, a program of continuous rotasonic cores was proposed for identifying archaeological historic properties at sensitive locations determined from existing geotechnical data and archival research (Miss and Hodges 2007; Miss et al. 2007). Northwest Archaeological Associates (NWAA) completed Phase 1 of the program, collecting and analyzing sonicores from along Alaskan Way in 2008 (Miss et al. 2008). Based on these results, additional cores were collected within the APE of the S. Holgate Street to S. King Street Viaduct Replacement Project (FHWA et al. 2008).

NWAA conducted additional coring during work to stabilize support columns (bents) in the one-block section of the viaduct between Columbia Street and Yesler Way (Valentino et al. 2008). The coring indicated the presence of complex stratigraphy at the location. However, in larger excavations, there was less vertical variability and fewer discrete deposits than expected, providing valuable correlation data between coring and open excavation. Additional open excavations undertaken as part of the S. Holgate Street to S. King Street Viaduct Replacement Project (FHWA et al. 2008) and results of archaeological monitoring for the Electrical Line Relocation Project (Miss and Valentino 2007; Valentino et al. 2010) provided important information that allowed the correlation of cores and historic fill sequences south of S. Dearborn Street.

For all coring and excavation, artifacts were collected and analyzed. Artifacts were initially sorted by material class. Subsequent analysis focused on their characteristics organized by material class and function according to Sprague (1981). A wide range of published sources was used to identify and describe artifact manufacture, function, and history. Artifact deposits were compared to historical maps and archival sources to assess historical associations. These associations were used to assign date ranges to deposits and estimate the extent and content of the unexcavated portions of deposits encountered in cores or open excavations.

The extensive background research, geoarchaeological and geotechnical investigations, and archaeological testing allowed archaeologists to identify site deposits and determine areas sensitive for potential archaeological resources within the area of potential ground disturbance.

2.3 Analysis of Environmental Effects

Once the historic and archaeological resources were identified through archival research and field work, the potential effects of the project on these resources were identified.

An alternative would affect historic resources if it alters the characteristics that qualify a historic property for inclusion in the NRHP. The effect is adverse if it diminishes the integrity of such characteristics. If the project alternative adversely affects a historic property, then it may significantly affect the quality of the human environment under NEPA.

2.3.1 Built Environment Resources

To determine the direct and indirect effects of the project on built environment resources, the following information was used:

- For operational effects, the type and extent of permanent effects (such as significant alteration to or the loss of a historic property) caused by the project were identified.
- For construction effects on historic resources, the following information was used:
  - Construction methods
  - Location and duration of construction and demolition
  - Street use changes such as loss of parking
  - Location and duration of excavation
  - Need for construction easements near historic buildings
  - Amount of building settlement potentially caused by tunnel construction
  - Locations of tunnel operations and tunnel maintenance buildings, emergency egresses, and staging and spoils disposal areas.

The extent to which these effects would alter the integrity of the historic properties was analyzed based on engineering analysis and consideration of the relevant NRHP criteria. For example, if building alterations are necessary, the degree to which the alterations would affect the resource's physical integrity and historic significance was analyzed using the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

Indirect effects, such as noise, dust and mud, traffic congestion, construction traffic, loss of parking, and limited access to buildings and structures, were identified and analyzed based on technical data and the effects of previous projects.

2.3.2 Archaeological Resources

For most projects, the contents and boundaries of archaeological sites are explored before construction. The responsible federal agency then determines whether the sites are eligible for listing in the NRHP, how they will be affected by the project, and how adverse effects should be avoided, minimized, or mitigated. For this project, however, the standard approach was not possible.

The project includes areas where access to cultural resources is restricted by depth, groundwater, existing infrastructure, transportation requirements, the need to maintain utility services, and construction methods; therefore, the identification and evaluation efforts (36 CFR 800.4[b][2]) would be performed according to a phased process, which would be coordinated with construction. These efforts may include data recovery using controlled archaeological excavation, as well as planning for discovery, testing, evaluation, and data recovery investigations integrated with the construction processes. These measures have been developed in consultation with SHPO, affected tribes, and other consulting parties, as described in the project MOA.

2.4 Determination of Mitigation Measures

2.4.1 Built Environment Resources

Mitigation measures for adverse effects on historic properties were determined in consultation with SHPO, affected tribes, and other consulting parties and are discussed in the MOA for this project.

Mitigation measures for operational effects have been identified based on past projects and state and federal guidance. Mitigation measures for construction effects have been focused on repairing any potential damage in the most effective manner and in accordance with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

2.4.2 Archaeological Resources

Mitigation of adverse effects on significant archaeological sites discovered before or during construction includes scientific data recovery or other suitable measures. Mitigation measures have been determined in consultation with SHPO, affected tribes, and other consulting parties and are described in an MOA and an associated Archaeological Treatment Plan. To minimize adverse effects on inadvertently discovered archaeological deposits that are potentially significant, all construction would be conducted under an Unanticipated Discovery Plan that would include provisions for initiating consultation upon the discovery of cultural materials or human remains.

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Chapter 3 STUDIES AND COORDINATION

3.1 Studies

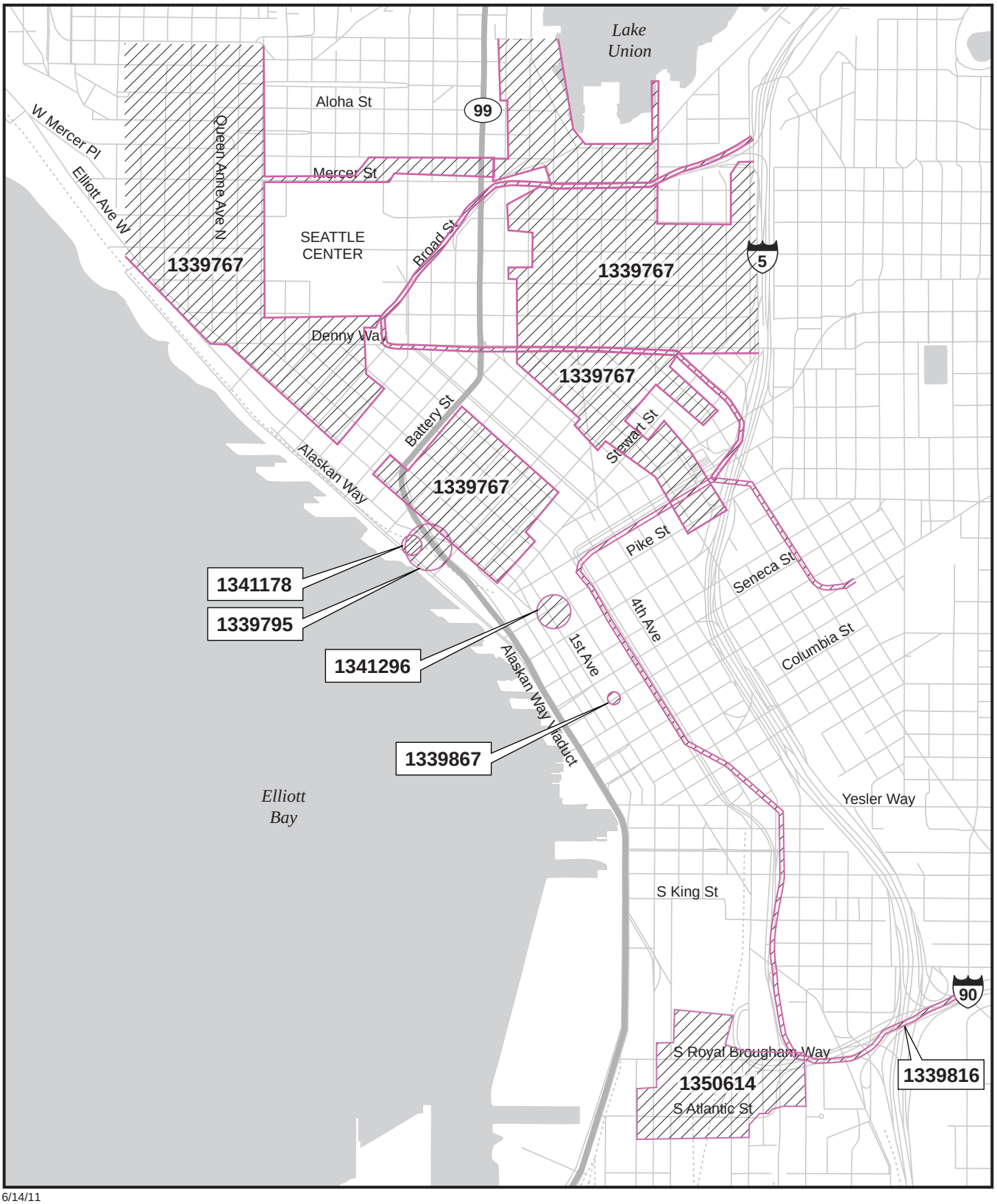
3.1.1 Archival Research

A variety of studies were used to collect and refine information for the overview of the affected environment provided in Chapter 4 and the analysis of individual resources. Of particular importance was previous work, including the discipline reports and technical memoranda for the 2004 Draft EIS, the 2006 Supplemental Draft EIS, and the 2010 Supplemental Draft EIS.

For built environment resources, other useful documents were the City's context statements for the downtown area (City of Seattle 2008) and the updated NRHP nomination for the Pioneer Square–Skid Road Historic District (Link 2007). Among the most important resources were environmental documents completed for other projects in the area, including those for the Seattle Commons (Tobin and Hart-Crowser 1994), the Major League Baseball Stadium (Washington State Major League Baseball Stadium Public Facilities District 1996), the Port of Seattle's Central Waterfront Project (Port of Seattle 1994), and the Waterfront South Master Plan proposed by the Port of Seattle and WSDOT in 1999 (Hart-Crowser 1999). Additional information was obtained from the NRHP form for the Alaskan Way Viaduct and Battery Street Tunnel (George 2001). Other studies include an NRHP multiple-property nomination form for Seattle apartment buildings (Sheridan 2008) and a study performed in 1988 by the Seattle Department of Community Development on the renovation of apartment buildings in the Denny Regrade (City of Seattle 1988).

For archaeological resources, sources included the archaeological research design for the project (Miss and Hodges 2007; Miss et al. 2007), as well as the other cultural resources survey reports for projects in the Program (see Exhibits 2-11 and 2-12). In addition to the investigations for the project, seven cultural resources studies unrelated to the project have been conducted in the study area, as shown in Exhibits 3-1 and 3-2. These studies identified several areas with increased probability for archaeological resources and one archaeological site that is eligible for listing in the NRHP.

Primary documents, ethnographies, and historical accounts were located in local libraries and archives, including those of the University of Washington, the Seattle Public Library, the Museum of History and Industry, and the Seattle Municipal Archives.



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CR Surveys

Note:
The number in the call-out is a NADB number (National Archaeological Database)

Exhibit 3-1
Locations of Previous Cultural Resources Surveys in Study Area

Exhibit 3-2. Descriptions of Previous Cultural Resources Surveys in the Study Area

Author and Date	Description	Results
NWAA/EHC 2007 (NADB# 1350614)	SR 519 Intermodal Access Project, Phase 2: South Atlantic Corridor. Addendum to Cultural Resources Discipline Report: Results of Supplemental Archaeological Investigations	No NRHP-eligible sites were identified. Further archaeological treatment and monitoring are recommended in limited areas due to the potential for historic-period archaeological sites.
Lewarch et al. 2002 (NADB# 1341178)	Archaeological Evaluation and Construction Excavation Monitoring at the World Trade Center, Baba'kwob Site (45KI456)	Historic–period archaeological deposits were identified, including Native American human remains (45KI456).
Rooke 2002 (NADB# 1341296)	Letter Report: Procedures and Results of a Cultural Resources Survey of Cingular Wireless Project Site WA-795	No archaeological resources were identified.
Forsman et al. 2000 (NADB# 1339867)	Proposed Aspen Murray Hotel/Condominium Project Archaeological and Traditional Cultural Places Overview, Seattle, King County, Washington	No NRHP-eligible sites were identified. Archaeological monitoring was recommended due to the potential for historic-period archaeological sites.
Forsman et al. 1998 (NADB# 1339795)	Wall Street Project Cultural Resources Overview	Review of geotechnical borings indicated moderate to high probability for Pre-Contact and historic-period archaeological resources. Archaeological monitoring was recommended.
Forsman et al. 1997 (NADB# 1339767)	Denny Way/Lake Union Combined Sewer Overflow Control Project, Seattle, King County. Cultural Resources Assessment.	Literature review only. Further archaeological work was recommended.
Courtois et al. 1998 (NADB# 1339816)	Link Central Light Rail Transit Project Seattle, Tukwila, and SeaTac, Washington. Final Technical Report, Historic and Archaeological Resources.	Limited archaeological testing. Areas around south Lake Union were determined to have a high potential for archaeological resources.

Note: NADB = National Archaeological Database
NRHP = National Register of Historic Places

Collections of early photographs and maps were critical in reconstructing the early land use and historical changes in land use near the APE. Among the most important of these were the University of Washington and Museum of History and Industry maps and photographic collections and the Sanborn Fire Insurance maps (Sanborn 1884, 1888, 1905, and 1917).

3.1.2 Built Environment Investigations

Existing buildings that had already been listed in the NRHP, included in a historic district, or designated as Seattle landmarks were identified. A survey of

all other buildings in the study area constructed in or before 1963 was conducted and data on the history and degree of historical integrity of each property were collected. This information was used to determine whether each building potentially met the NRHP or Seattle landmark criteria. Recommendations on NRHP-eligibility were made for DAHP concurrence.

3.1.3 Archaeological Investigations

Archaeological testing assessed the presence of deeply buried cultural deposits that may be eligible for listing in the NRHP within the area of potential ground disturbance. Two forms of testing were conducted: geoarchaeological testing and deep archaeological testing.

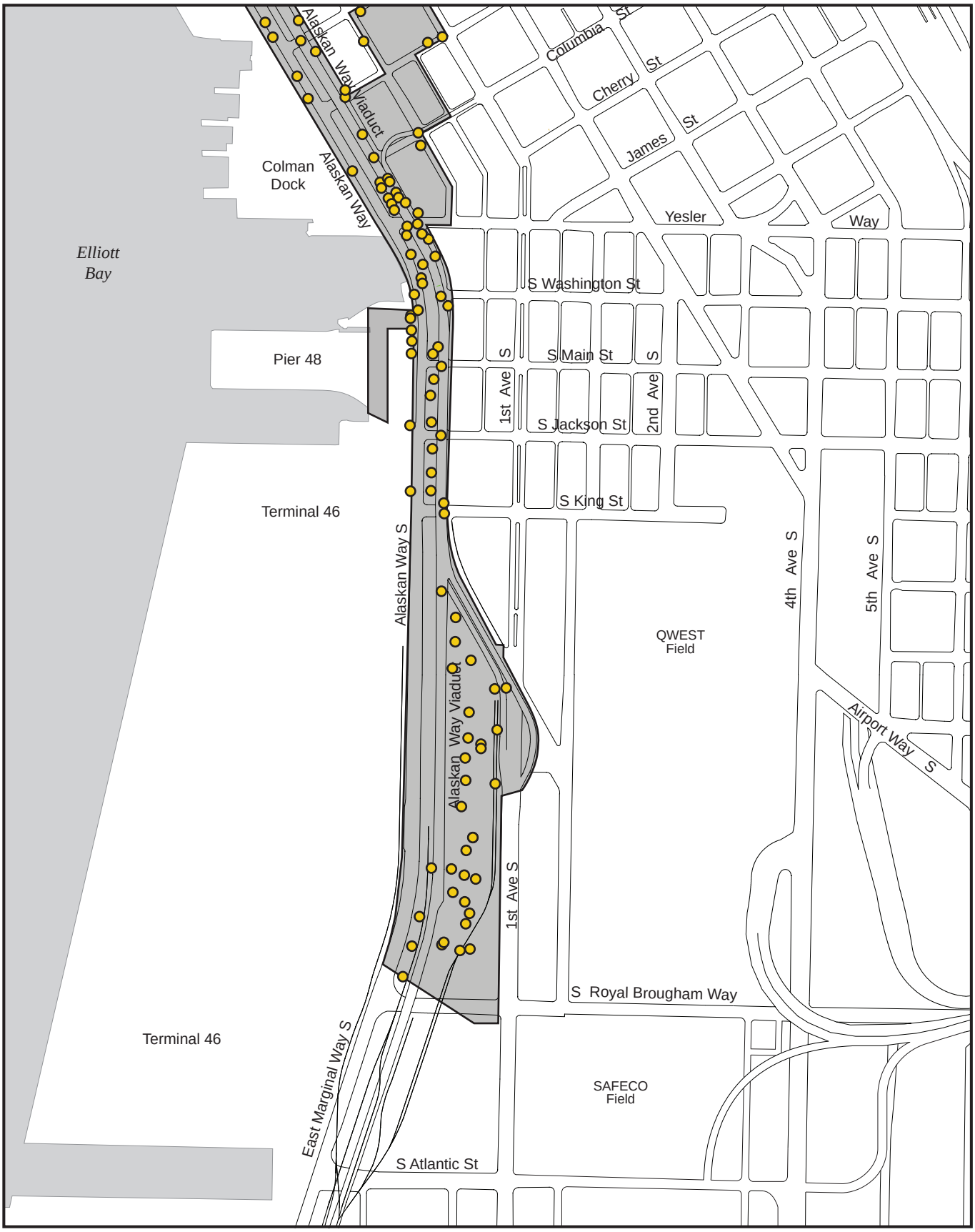
Geoarchaeological Testing

Geoarchaeological testing was performed in areas in which the constraints of the urban environment within the area of potential ground disturbance prevented open excavation. The testing focused on three primary goals:

- Defining areas within the area of potential ground disturbance that are sensitive for potential archaeological resources
- Defining the presence of Ballast Island in relation to the area of potential ground disturbance
- Defining the western shoreline of Denny Island

The geoarchaeological investigations included review and compilation of coring data and documents from the coring program, focusing on the identification of potential adverse effects on cultural resources that are eligible for listing in the NRHP within the area of potential ground disturbance for each alternative. The locations of all coring monitored by archaeologists for the project are shown in Exhibits 3-3 through 3-5.

The information about sediments and artifacts obtained for the set of cores collected within the boundaries of the area of potential ground disturbance were examined to define stratigraphic relationships between natural and anthropogenic strata. Coring results were compared to the locations of structures shown on overlays of relevant sections of the 1884, 1888, 1905, and 1917 Sanborn Fire Insurance maps. The interpretation of the origin of stratigraphic units in the cores was facilitated by the analysis of the timing and nature of filling events along Seattle's waterfront in the late-nineteenth and early-twentieth centuries. These data were then compiled and incorporated into a project database that was used to construct three-dimensional images showing relationships between stratigraphic units and classes of artifacts found in the cores, which could then be compared and contrasted with the Sanborn structural overlays.



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Project Borehole

Areas of Ground Disturbance

Exhibit 3-3
Subsurface Coring Locations - South

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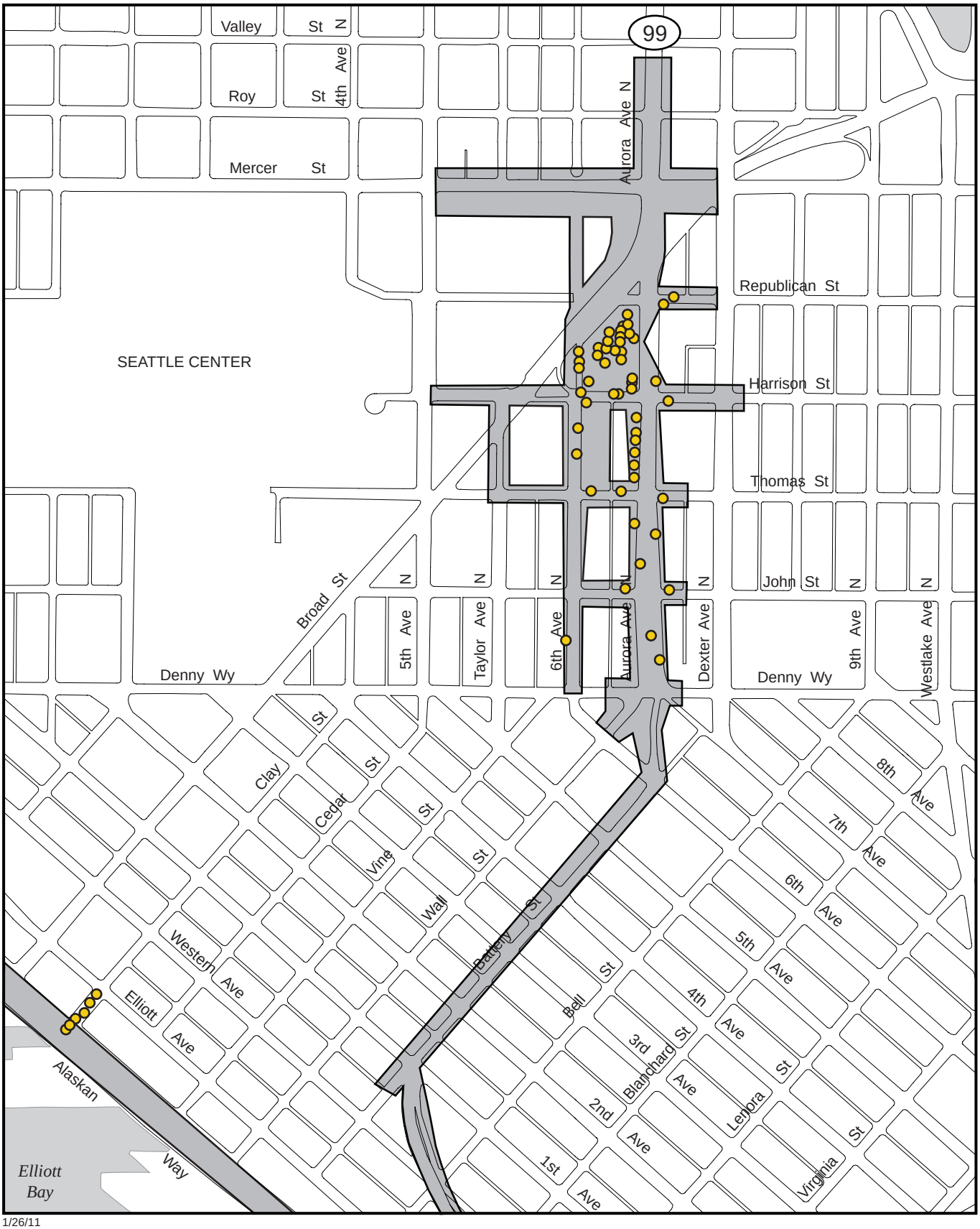
Project Borehole

Areas of Ground Disturbance

Exhibit 3-4
Subsurface Coring Locations - Central



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Project Borehole

Areas of Ground Disturbance

Exhibit 3-5
Subsurface Coring Locations - North

The analysis of core data identified three general stratigraphic units that characterize the deposits within the area of potential ground disturbance. Cultural resources that are eligible for listing in the NRHP could potentially be associated with two of the three units: prehistoric Holocene sediments and historic-period fill. The oldest unit consists of Pleistocene till and outwash sediments, which predate the human occupation of the Pacific Northwest. Marine and terrestrial Holocene sediments rest on top of this Pleistocene surface, and the Holocene sediments have the potential to contain cultural resources from the prehistoric and historic period. The upper surface of the Holocene stratum is the surface on which the Seattle waterfront development first occurred. The youngest stratum consists of historic-period fill.

This geoarchaeological testing identified several areas with a high likelihood of containing cultural resources with sufficient integrity to be considered eligible for listing in the NRHP. These locations, detailed in Section 4.3.3, include potential Native American archaeological resources and historic-period archaeological resources.

Additional cores were drilled and analyzed to define the presence of two specific geographical features: Ballast Island and Denny Island, two historically described locations within the area of ground disturbance for the Cut-and-Cover Tunnel Alternative and the Elevated Structure Alternative that are now covered by historic and modern fill.

Ballast Island was created, as its name implies, by ships dumping ballast into the nearshore waters of Elliott Bay. Ships' ballasts in the mid- to late-1800s generally consisted of materials that could be had for little or no cost. They might have consisted of sand, gravels, cobbles, demolition debris, or whatever might have been available after cargo was offloaded. There are historical references and photographs indicating that Native Americans regularly camped on Ballast Island either while working in Seattle or while they rested during their travels up or down Puget Sound (Miss and Hodges 2007). The historical location of Ballast Island, as described in documents and photographs, appears to have been between S. Washington Street and S. Main Street.

Denny Island was a promontory along Seattle's original shoreline that curved around a shallow saltwater lagoon. The Denny party settled there after leaving their original settlement in West Seattle. It is recorded by Waterman (1922) as the location of two Native American villages, one on each side of the promontory. Denny Island has a high probability for archaeological resources dating to the Pre-Contact and early historic periods. Historic maps show Denny Island between S. King Street on the south and S. Washington Street on the north. From west to east, Denny Island is shown to extend from east of Alaskan Way to approximately Second Avenue S.

Deep Archaeological Testing

Deep archaeological testing was conducted at one location within the area of potential ground disturbance that allowed open excavation: a section of the north portion of the study area that is located within an SDOT) maintenance yard. This location, which would be affected primarily by the Bored Tunnel Alternative, provided one of the only areas where open excavation was possible. This lot is bounded by Broad Street to the northwest, Republican Street to the north, Aurora Avenue to the east, Harrison Street to the south, and Sixth Avenue N. to the west (see Exhibit 3-6). The location had been identified previously by geoarchaeological and geotechnical testing to contain potential intact Holocene sediments with a high likelihood of containing Native American resources. The archaeological testing was undertaken to assess whether deeply buried cultural deposits that may be eligible for listing in the NRHP exist within the SDOT parcel (Wegener et al. 2010).

The SDOT parcel had as much as 15 feet of fill on top of native sediments. Therefore, the identification of potential archaeological deposits required the removal of overburden with the use of heavy equipment. A trackhoe was used to excavate trenches between 15 and 26 feet deep, and drilling equipment was used to excavate auger holes as deep as 40 feet. Sediments removed during mechanical excavations were inspected for cultural material, and a sample of mechanically excavated sediment was screened.

A total of 600 linear feet of trench was excavated, equaling 2,147 square feet, or approximately 3 percent of the parcel. The soil excavated from the trenches was stockpiled adjacent to each trench for inspection, screening, and backfilling. A total of 17 auger holes were excavated, which equals 91.5 square feet. The soil excavated from the holes was stockpiled beside each hole for inspection, screening, and backfilling.

These auger holes were placed strategically within the intervening spaces between trenches, as well as in the parking area along the south end of the parcel where trenching was impossible.

Summary of Geoarchaeological Investigations and Deep Archaeological Testing

Geoarchaeological testing was able to define several areas that are sensitive for potential archaeological resources within the area of potential ground disturbance. These sensitive areas are described in Section 4.3.3.

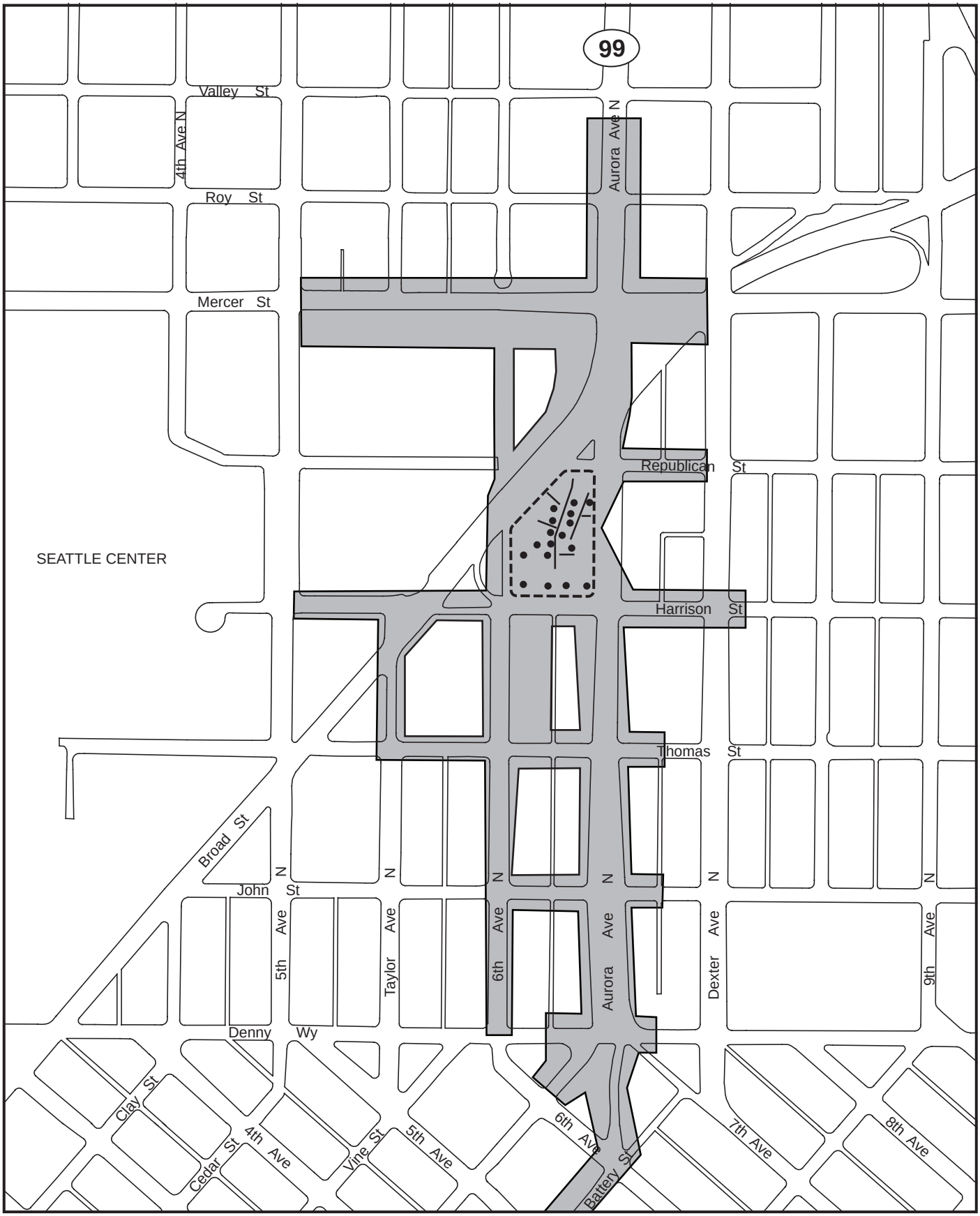

Exhibit 3-6
Location of Archaeological Testing in Project Area - North

Geoarchaeological testing also further refined the understanding of the location of Ballast Island and Denny Island. Deep archaeological testing conducted at the SDOT maintenance yard provided a correlation with previous coring data for the area and helped to define one new site, 45KI958, as well as Holocene deposits that should be considered sensitive for potential Native American resources. These results are presented in Chapter 4.

3.2 Coordination

3.2.1 Agency Coordination and Consultation

Coordination with relevant agencies is an important part of compliance with regulations and successful identification of historic resources and potential effects on them. As described in 36 CFR 800.16[f], consultation related to Section 106 of the National Historic Preservation Act is "the process of seeking, discussing and considering the views of other participants and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process."

Coordination meetings have been held with SHPO, the City Historic Preservation Officer, and the WSDOT Cultural Resources Specialist. Through these meetings, an agreement was reached on the APEs and the overall approach to the survey and inventory process. Information on potential effects was shared with these agencies as project engineering progressed. WSDOT has also met with the Pioneer Square Preservation Board and the Pike Place Market Historical Commission to discuss the project and its potential effects.

In addition, WSDOT identified other interested groups and consulted with them about the project and its potential effects on historic resources. These groups included King County, the Washington Trust for Historic Preservation, Historic Seattle, 4Culture, the Alliance for Pioneer Square, the National Trust for Historic Preservation, and property owners Benjamin and Lois Mayers. WSDOT contacted these organization and solicited comments throughout the Section 106 process: upon determination of the APEs, upon identification of historic properties and Seattle landmarks within the APEs, and upon determination of adverse effects on historic properties. Consulting parties also participated in the development of mitigation measures, which are described in an MOA. Related correspondence is included in Appendix U, Correspondence.

3.2.2 Tribal Coordination and Consultation

A Tribal Consultation Plan was developed for the project to guide government-to-government tribal consultation from project initiation through the NEPA determination. This plan was prepared by WSDOT and delivered to interested and affected tribes at the beginning of the project for review and comment. In following the guidelines of the Tribal Consultation Plan, WSDOT and FHWA are

working together with tribes to ensure early and continued feedback from and involvement of tribes potentially affected by the project and to ensure that tribal input is incorporated into the decision-making process (see Appendix U, Final EIS Correspondence).

In August 2001, the project team initiated formal Section 106 consultation with the following tribes:

- Muckleshoot Indian Tribe
- Snoqualmie Indian Tribe
- Suquamish Tribe
- The Tulalip Tribes
- Confederated Tribes and Bands of the Yakama Nation
- Duwamish Tribe (a non-federally recognized tribe)
- Kikiallus Tribe (a non-federally recognized tribe, no longer active as of September 2004)

In January 2011, the project team initiated formal Section 106 consultation with three additional tribes:

- Jamestown S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Port Gamble S'Klallam Tribe

Since the initiation of consultation, WSDOT and FHWA have continued tribal consultation, which has included presentations of the following project documents to the tribes:

- Report on Archaeological Monitoring of Geotechnical Explorations, March 2004
- Draft Environmental Impact Statement and Section 106: Historic, Cultural and Archaeological Resources Discipline Report, March 2004 (WSDOT et al. 2004)
- Unanticipated Discovery Plan, November 2004
- Report on Archaeological Monitoring of Geotechnical Explorations, October 2005
- Report on Archaeological Monitoring of Geotechnical Explorations, June 2006

- Supplemental Draft Environmental Impact Statement and Section 106: Historic, Cultural and Archaeological Resources Discipline Report, July 2006 (WSDOT et al. 2006)
- Research Design for Identification of Archaeological Properties, January 2007
- Cultural Resources Methodology for the Supplemental Draft Environmental Impact Statement, June 2009
- Draft Area of Potential Effects (APE), August 2009
- Phase 2 Archaeological Coring Locations, August 2009
- Revised Purpose and Need Statement, September 2009
- Supplemental Draft Environmental Impact Statement and Section 106: Historic, Cultural and Archaeological Resources Discipline Report, October 2010 (WSDOT et al. 2010)

In addition to providing project information to the tribes for review and comment, WSDOT and FHWA met regularly with tribal council members and staff. This ongoing communication included a series of project meetings with the tribes from 2004 to 2011, during which WSDOT staff provided program updates, reviewed project alternatives, and gathered information from the tribes on the potential for the alternatives to affect their resources.

WSDOT and FHWA also met with the tribes to develop an MOA and to obtain tribal input related to specific measures for addressing their concerns about cultural resources during construction.

Once project construction begins, WSDOT and FHWA will ensure continued coordination with the tribes as necessary and will ensure compliance with the MOA and the Unanticipated Discovery Plan for the project, which addresses both cultural resources and the discovery of human remains.

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Chapter 4 AFFECTED ENVIRONMENT

This chapter describes the evolution of the natural setting for Pre-Contact Native American settlement and the earliest American immigrants. This evolution influenced the location and preservation of the evidence of human occupation. This chapter also describes the ethnohistory and history of the study area, including the processes and events that influenced the location of Native American activities in the nineteenth century and the kind of evidence of that remains. Events that influenced Seattle's early settlement and its development into a metropolis are also discussed.

4.1 Natural Setting

The east shoreline of the central Puget Sound is relatively straight and featureless, consisting almost entirely of high bluffs, broken only by Elliott Bay and Commencement Bay and by a number of streams in steep, narrow ravines (Collins and Sheikh 2005b). In the mid-1870s when it was first mapped, the shoreline of Elliott Bay, south from Smith Cove to the area of what is now Pioneer Square, was characterized by bluffs or low banks backed by steep slopes. The shore below was relatively broad, with a berm and a narrow back shore. Elliott Bay, exclusive of the mouth of the Duwamish River, was the location of three tidal marsh complexes: West Point, Smith Cove (the largest of the three), and the area now covered by the Occidental Square area in downtown Seattle (Collins and Sheikh 2005a). The lagoon-marsh complex in the Occidental Square area had already been filled and streets platted by 1875. The only map records are the 1853 plat map and a sketch map annotated 20 years after the Battle of Seattle, one skirmish in the Indian uprising that followed the signing of treaties in the region (Phelps 1855–1856). The complex was separated from Elliott Bay by a sand barrier with a central opening for tidal flow. Most of the complex was labeled "tide marsh," and early maps depicted several isolated lagoons within the complex (Collins and Sheikh 2005a). Muddy tidal flats extended south from the complex to the Duwamish River delta and Alki Point.

At the north end of the study area, a small prairie formerly occupied a relatively level upland between Lake Union and the waterfront, north of Denny Hill. The original topography is now dominated by modified land that was either filled or leveled.

4.1.1 Landscape Development

The Puget Sound basin is part of a much larger elongated structural trough traversing British Columbia, Washington, and Oregon, east of the Coast Mountain ranges. The modern topography and surficial geology is the result of multiple widespread continental glaciations that extended southward from British Columbia. The latest glacial maximum began about 17,000 to 18,000 years ago and

ended abruptly with the onset of climate warming about 14,000 years ago (Easterbrook 1993, 2003).

Deglaciation occurred rapidly during a period that probably lasted less than 1,000 years. The outwash deposited during the advance of the Vashon ice sheet filled Puget Sound. The surface of this fill is rarely higher than 500 feet in elevation and is interrupted by north-south oriented troughs that were created by water flowing beneath the ice and streaming across the landscape as the ice retreated (Booth and Goldstein 1994). As a result, the topography of the Seattle area is dominated by well-defined north-trending ridges and deep ice-gouged troughs occupied by the waters of Puget Sound, Lake Washington, and Lake Sammamish (Galster and Laprade 1991; Liesch et al. 1963; Yount et al. 1993).

During and immediately after the deglaciation, between 13,000 and 7,000 years ago, the global sea level rose rapidly from a maximum low of about 390 feet below present sea level (bpsl) to about 30 feet bpsl. The rate of sea-level rise then declined appreciably from about 6,000 to 3,000 years ago; about 5,700 years ago, the sea level was about 16 feet bpsl.

As the glaciers retreated, the land area that was formerly depressed under the weight of the ice experienced an isostatic rebound that lifted land levels between 197 and 262 feet within the Puget Lowland. The rebound appears to have stopped by 9,000 years ago, at which time ongoing global sea-level rise began to drown the early Holocene shorelines (Dragovich et al. 1994). As the sea level rose, marine incursion resulted in the formation of deltas at the head of the Duwamish Valley near present-day Auburn (Crandell 1963; Dragovich et al. 1994).

4.1.2 Late Holocene Delta Growth in the Duwamish Valley

The delta of the Duwamish Valley formed about 5,700 years before present (B.P.), when a large-scale collapse of the summit and flank of Mount Rainier resulted in the Osceola Mudflow. The flow passed down the White River and spilled into the Green and Puyallup River drainages (Dragovich et al. 1994; Mullineaux 1970). After emplacement of the Osceola Mudflow, river aggradation (buildup) and delta progradation (build out) brought the Duwamish delta from Auburn to its present position emptying into Elliott Bay. Current research indicates that the Duwamish delta arrived near Terminal 107 on the Duwamish River (at S.W. Hudson Street) between 1520 and 2120 B.P. The 1,400-acre Elliott Bay tidal flats filled over the next 1,500 years.

4.1.3 Earthquakes

The project area is located in the northern portion of the Seattle Fault zone. The fault and its associated fault strands extend from the foothills of the Cascade Range to Hood Canal, and the fault zone is one of several in the Puget Lowland

(Nelson et al. 2003; Sherrod 2001). Coastal tectonic research has documented a large earthquake on the fault dating 1050–1020 B.P. (Bucknam et al. 1992; Atwater and Moore 1992). During this event, Alki Point at the southern entrance to Elliott Bay was raised more than 13 feet, creating the broad beach that hosted Native American encampments and, later, the Denny party. At the same time, the West Point spit just north of Elliott Bay subsided approximately 3 feet (Atwater and Moore 1992). The shoreline of what was once Denny Island subsided as well, inundating and subsequently burying any archaeological deposits that may have been present on the beaches. At the time of the earthquake, the Duwamish delta would have been about 5 miles south of the fault (Sherrod 2001).

4.1.4 Resources

Elliott Bay and the Duwamish delta provided important and diverse resources that influenced the locations and times of occupation for Pre-Contact period people. The tidal flats, the shoreline below the bluffs, and the heavily wooded slopes above the shoreline supported a wide range of habitats. The open water harbored squid, shrimp, various sea mammals, and runs of anadromous fish, including sockeye and Chinook salmon and steelhead trout. Bottom dwellers included ling cod, flounder, sole, rockfish, and invertebrates such as sea cucumbers, crabs, and octopuses. The intertidal zone, which extended along the waterfront, included many invertebrates, among them crabs, shrimp, clams, oysters, mussels, chitons, barnacles, and sea urchins. Portions of the relatively young tidal flats were saturated with water but above the mean high tide level. These tidal flats were covered with salt-tolerant sedges, grasses, and rushes and hosted migratory and resident birds. The forest above the shoreline was inhabited by various large and small mammals and provided important cedar and other trees and plants useful for wood, fiber, food, tools, and medicines.

4.2 Cultural Setting

Before the arrival of Euro-Americans, Indian settlements were scattered along the shoreline of Elliott Bay and around the Duwamish River delta. After the arrival of the Denny party and the establishment of Yesler's mill, Native Americans provided important labor for domestic and industrial activities, as well as supplying food for the growing community. Separate Indian encampments or enclaves continued through the 1870s. Temporary encampments of families headed to work in the agricultural fields were established seasonally in the tidal flats south of Jackson Street and included Alaska Natives and members of distant tribes.

The first non-Native settlements within the current city limits of Seattle were established along the Duwamish River and on the forested Alki peninsula in 1851. Donation land claims were established around eastern Elliott Bay by early 1852;

early the next year, Henry Yesler's first mill began producing lumber on the thin strip of land that connected Denny Island to the mainland. The city's development continued from this early start, interrupted briefly by the Indian Wars in 1856 and spurred on by events of the nineteenth and twentieth centuries, including the Yukon Gold Rush, the Spanish-American War, World War I and World War II, the development of railroad transportation, and ever-changing national fortunes.

4.2.1 Pre-Contact Period

The earliest settlement of the region occurred in the early postglacial period, at least 11,000 years ago, based on finds of extinct mammals such as the Manis Mastodon near Sequim and scattered finds of artifacts, such as tools, thought to be of similar antiquity. Discoveries of these sorts of artifacts that were closest to the study area are associated with an ancient peat bog near Maple Valley and near Redmond beneath a peat layer dated to 10,500 B.P. (Kopperl et al. 2010; Meltzer and Dunnell 1987). Pre-Contact period sites from around the Pacific Northwest suggest continuous habitation throughout the ensuing 11,000 years (Ames and Maschner 1999; Matson and Coupland 1995). In the Puget Sound region, assemblages of stone tools called "Olcott" are attributed to early occupations. Olcott tools are found on the edges of terraces, often away from the saltwater shoreline, a position that suggests a site with expansive views as might benefit hunters. Such locations may also have been chosen to avoid the unstable river bottoms and shorelines. By about 5,000 years ago, shorelines that might have hosted early inhabitants were inundated by rising sea levels that have accompanied continued postglacial warming, making evidence of marine-oriented settlement before this time difficult to find.

Sites dating after about 5,000 years ago are more common. During this period, groups began to organize themselves in more complex ways. The subsistence base included a broad spectrum of locally available resources. The period between 3,000 and 1,000 B.P. saw the emergence of a semi-sedentary settlement pattern based on central villages with highly specialized seasonal camps. There is evidence of an increasingly sophisticated use of storage technology, increased population, and the emergence of ranked societies. The final 1,000 years of regional prehistory were characterized by permanent houses in central villages, a salmon-based economy, and ascribed social status (Matson and Coupland 1995; Morgan 1999).

Recorded Pre-Contact archaeological sites on the Elliott Bay shoreline, near the early historic-period mouth of the Duwamish River, and at West Point in Magnolia provide information on the kinds of archaeological sites that might occur in shoreline and bluff environments of Elliott Bay. Data from the West Point Site Complex (45KI428 and 45KI429) [redacted]

demonstrate long-term Pre-Contact occupation of the marine littoral zone in the greater Seattle area, dating back 4,500 years. The archaeological record shows a change in site function, due to a combination of rising sea level, changes in the configuration of the West Point landform, regional changes in Pre-Contact subsistence-settlement pattern organization, and effects of the earthquake on the Seattle Fault approximately 1,100 years ago (Larson and Lewarch 1995).

The physical setting of the West Point Site Complex shares many elements of the geomorphology of the shoreline and bluff landforms in the central and northern portions of the Alaskan Way Viaduct corridor (the project study area). West Point included bluffs of Lawton Clay that backed a marine beach. An intermittent stream carved a ravine in the bluffs, with springs that provided fresh water. As a result of the Seattle Fault earthquake, West Point dropped 3 feet relative to the surface elevation of Puget Sound. After the earthquake, Indian people reoccupied the West Point landform and the area for short-term seasonal camps.

Data from the Duwamish No. 1 Site (45KI23) document occupation on a stream terrace at the margin of Elliott Bay over the past 2,000 years (Campbell 1981; URS Corporation and BOAS, Inc. 1987). The terrace was uplifted approximately 20 feet by the same Seattle Fault earthquake 1,100 years ago. The prograding delta of the Duwamish River reached the vicinity of the Duwamish No. 1 Site (45KI23) between 500 and 1,000 years ago, and the local habitat changed from a marine littoral setting to a river delta and riverbank riparian environment.

4.2.2 Ethnography and Ethnohistory

The study area is in traditional territory of the Duwamish, a Lushootseed-speaking group that lived in villages on the shores of Elliott Bay, Lake Washington, Lake Union, Salmon Bay, and on the banks of the Duwamish, Black, and Cedar Rivers. Today, many Duwamish descendants have chosen to become members of federally recognized tribes, including the Muckleshoot Indian Tribe, the Snoqualmie Indian Tribe, the Suquamish Tribe, and the Tulalip Tribes, while others continue to seek independent Duwamish tribal status.

Like many other Puget Sound groups, the Duwamish traditionally followed a seasonal round that was tied to available resources. The region is one of mild climate and abundant resources, and usually enough salmon could be harvested in a few weeks to last the winter. In spring and summer, people dispersed from winter villages of cedar plank houses to live in temporary camps to fish, hunt land and sea mammals, and collect roots, berries, and other plants. In winter, preserved forms of these foods supported the village while important ceremonial work was completed. Winter was also important for establishing and maintaining social relationships. Heads of households hosted public events marking changes in status, such as naming, puberty, marriage, or death. The

more important the family, the more guests were welcomed, representing ties of marriage, adoption, trade, and social obligation (Miller 1999).

The Lushootseed names of places remembered by former inhabitants dot the margin of Elliott Bay, the Duwamish delta, and adjacent lakes and waterways (see Exhibit 4-1 and Attachment B). They represent the memory of a people intimately familiar with the local landscape; they refer to resource locations, encampments, events, and places of myth or are simply descriptive.

At the south end of the study area were villages near Djidjilä'l^{3}lltc (see Exhibit 4-1, #23), "the crossing over place." This place name refers to the promontory of Denny Island, roughly between S. Washington Street and S. King Street and First Avenue S. to Second Avenue S. A village was located on each side of the promontory and a trail led from the beach on Elliott Bay to the lagoon on the east side of the island, hence the crossing over. At the north end of the study area was Baba'kwob (see Exhibit 4-1, #22), or prairie, a series of open spaces. These open spaces were crossed by Ctca'q^{w}cĭd (see Exhibit 4-1, #143), a trail between Elliott Bay and Lake Union that originated on the waterfront between Bell and Broad Streets (Waterman 2001).

A second set of locations, including encampments, cemeteries, and work areas, has been gleaned from historical accounts, records, and photographs (see Exhibit 4-2). These are specific locations, sometimes overlapping with the named ethnographic locations shown in Exhibit 4-1. Accounts from the 1850s confirm encampments and possibly a longhouse on the promontory near Djidjilä'l^{3}lltc (see Exhibit 4-2, #20/#21) and south of future Yesler Way. Confusion exists about the meaning of Baba'kwob (see Exhibit 4-1, #22) in these accounts. Most sources apply the name to prairies and open spaces at the north end of the study area, but the same name or a similar name is applied to an encampment that may have included a longhouse on the bluff [redacted] or may have been an encampment on the beach at the foot of Bell Street (see Exhibit 4-2, #7). David Denny's house [redacted] (and within the prairie-meadow-marsh identified as Baba'kwob) was reportedly the site of a gathering place for potlatches (see Exhibit 4-2, #2).

Other encampments included a longhouse at the south end of Lake Union (see Exhibit 4-2, #3) and temporary camps [redacted] (see Exhibit 4-2, #6); [redacted] in the pasture of early settler Arthur Denny (see Exhibit 4-2, #10); on the beach [redacted] (see Exhibit 4-2, #13); "Curley's Camp" [redacted] (see Exhibit 4-2, #15); Ballast Island [redacted] (see Exhibit 4-2, #18); on the beach [redacted] (see Exhibit 4-2, #19); on the tidelands south of Yesler Way S. (see Exhibit 4-2, #22); and east of Denny Island (see Exhibit 4-2, #23).

Exhibit 4-1 Locations of Ethnographic Sites contains sensitive cultural resources information that is exempt from public disclosure pursuant to provisions of the Public Records Act (RCW 42.56.300).

Exhibit 4-2 Probable Locations of Historically Described Native American Sites contains sensitive cultural resources information that is exempt from public disclosure pursuant to provisions of the Public Records Act (RCW 42.56.300).

These residential locations represent three periods of historical Native American presence: existing villages and longhouses observed by the earliest American settlers; areas occupied by Indians displaced from traditional sites, but still living in the city and providing important labor and subsistence to the new residents; and temporary camps occupied by transient traders and hop pickers later in the nineteenth century after exclusionary laws were passed by the City. In the late nineteenth century and early twentieth century, sailors, fishermen, and many of the unemployed lived near the waterfront west of First Avenue. Those who were slightly better off lived on First, Second, or Third Avenues in boarding houses or rooms on the upper floors of business buildings. Rooming houses and small dwellings clustered around sawmills, packing plants, and the railroad housed much of the work force. Among these was the small house of Princess Angeline, Chief Seattle's daughter (see Exhibit 4-2, #8), at the foot of Pike Street. An area known as Shacktown developed on partially filled tidal flats along First Avenue S. south of Denny Island. The community was made up of loggers, miners, seasonal employees, and Indian fisherman who lived in small dwellings, many on pilings, and in floating houses (Miss and Hodges 2007; Miss et al. 2007). The use of Elliott Bay by Indians continued, with canoes drawn up and tents pitched for temporary camps on the newly filled tidelands (see Exhibit 4-2, #24).

The early historical record also includes descriptions of burial sites and cemeteries. Accounts include discoveries of burial sites during construction in Belltown in the 1870s (see Exhibit 4-2, #5), [redacted] (see Exhibit 4-2, #11) and [redacted] (see Exhibit 4-2, #14). A cemetery was reported on bluffs later lowered by grading [redacted] beside a ravine (see Exhibit 4-2, #12).

4.2.3 Euro-American Historical Context

In 1792, Captain George Vancouver led the first European expedition to enter Puget Sound, mapping and renaming features of the landscape. British fur traders were the next to enter the region in the 1820s and built trading posts, most notably Fort Nisqually, strategically located between Fort Vancouver and Fort Langley. The United States Exploring Expedition led by Lieutenant Charles Wilkes marked American entry into the region in 1841. Like the earlier Vancouver exploration, the Wilkes party assigned their own names to the landscape and its features, including Puget Sound, Elliott Bay, and Piner's Point. Piner's Point, which was later renamed Denny Island, hosted the initial American settlement of Seattle.

After 1846, when the United States and Great Britain finally agreed on the boundary between their holdings in the Northwest, American settlers were drawn to the region, traveling north from the Willamette country. In 1851, the first American settlers in the region settled as far north as the Duwamish River, where they planned to farm. In 1852, the more entrepreneurial members of the Denny

party filed claims extending from Denny Island to Lake Union (see Exhibits 4-3 and 4-4). The plat for the new town of Seattle was filed in 1852 as soon as the act creating Washington Territory was signed. The same year, Henry Yesler established his sawmill at the foot of Mill Street (later Yesler Way). Yesler's mill was soon expanded with a wharf that served as the early business center of the town and eventually stretched 900 feet into the bay by the 1880s. By the early 1870s, several more wharves extended from the shoreline between Mill and Main Streets, and the Atkins and Commercial wharves extended south over the tidelands from Commercial Street.

Coal, the first major exportable commodity of the region, was shipped from bunkers at the foot of Pike Street, where it was delivered in 1872 by a narrow-gauge track extending from south Lake Union down Westlake Avenue to Pike Street and then down Pike Street to Elliott Bay. After 1876, shipments left from bunkers on the King Street Wharf, the terminus of the Seattle and Walla Walla Railroad. Coal was shipped primarily to California, where the Central Pacific Railroad was one of the major consumers.

By 1889, the small settlement at Yesler's wharf had grown into a regional center with a thriving commercial district extending along what are now First and Occidental Avenues. Although some buildings were brick, the majority were wood. When a cabinetmaker's glue pot ignited at First Avenue and Madison Street on June 6, 1889, the resulting fire destroyed 58 blocks, virtually all of the commercial district at that time, prompting a transformation in the city (see Exhibit 4-5).

The entrepreneurial community saw the fire as a chance to build a new, modern city, and work proceeded immediately. New city ordinances required that all construction within the downtown area be of masonry or other fireproof construction. More than 130 brick or stone buildings were built within the next year. The result was a homogeneous commercial sector of red brick buildings in the latest Richardsonian Romanesque style, suited to become the center of trade for the new state of Washington. This became today's Pioneer Square Historic District.

At about the same time as the city was being rebuilt, growth also occurred on the waterfront to the north. William Bell's claim near Bell Street developed into a mixed industrial and residential community, with sawmills, fish processing plants, modest homes, boarding houses, small apartment buildings, and larger residential hotels for workers. In 1889, the same year as the fire, Bell built the Austin A. Bell Building, a red brick Victorian Gothic structure designed by Elmer Fisher, the same architect who designed many of the new Pioneer Square buildings (Ochsner 1994).

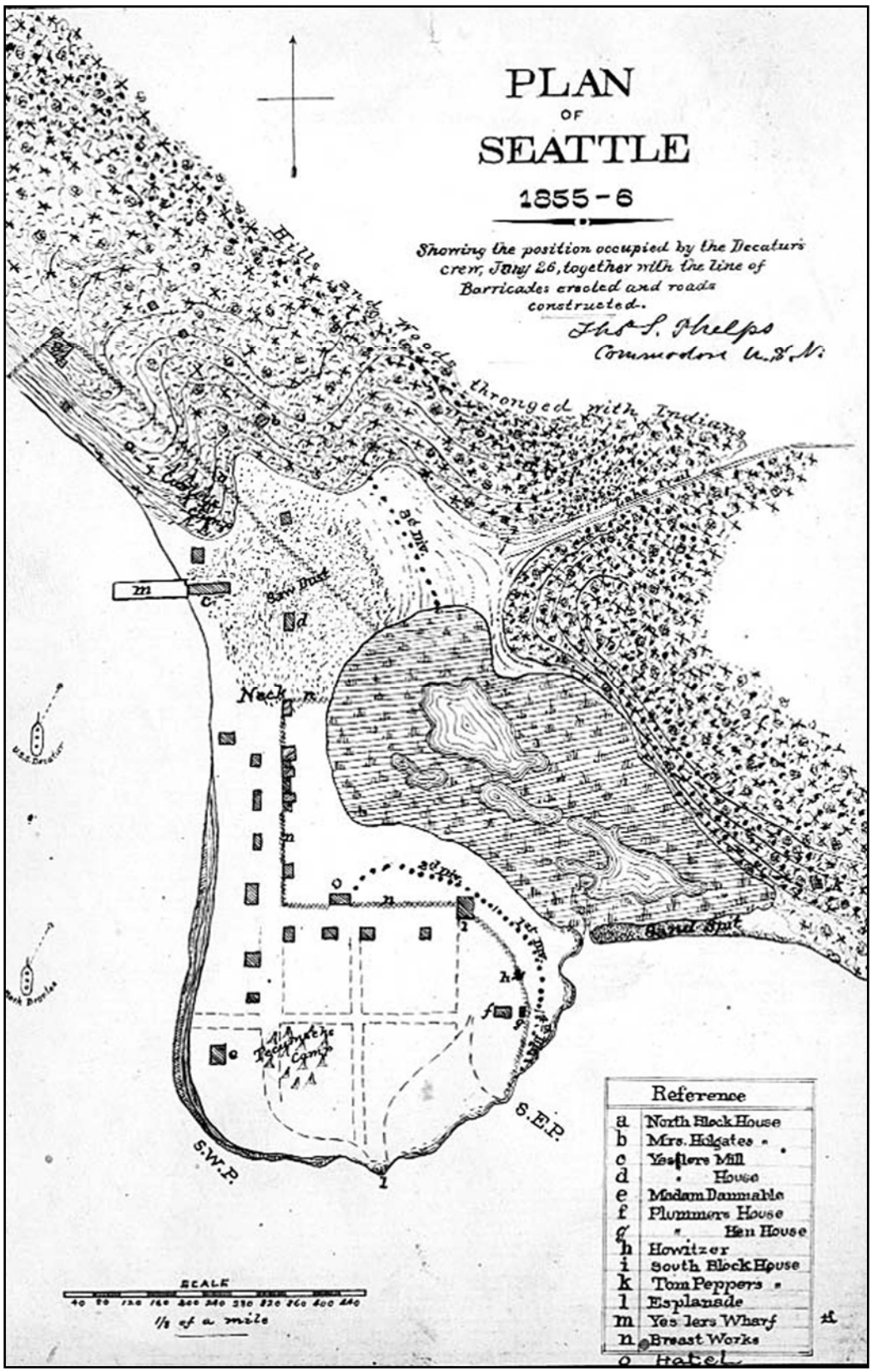
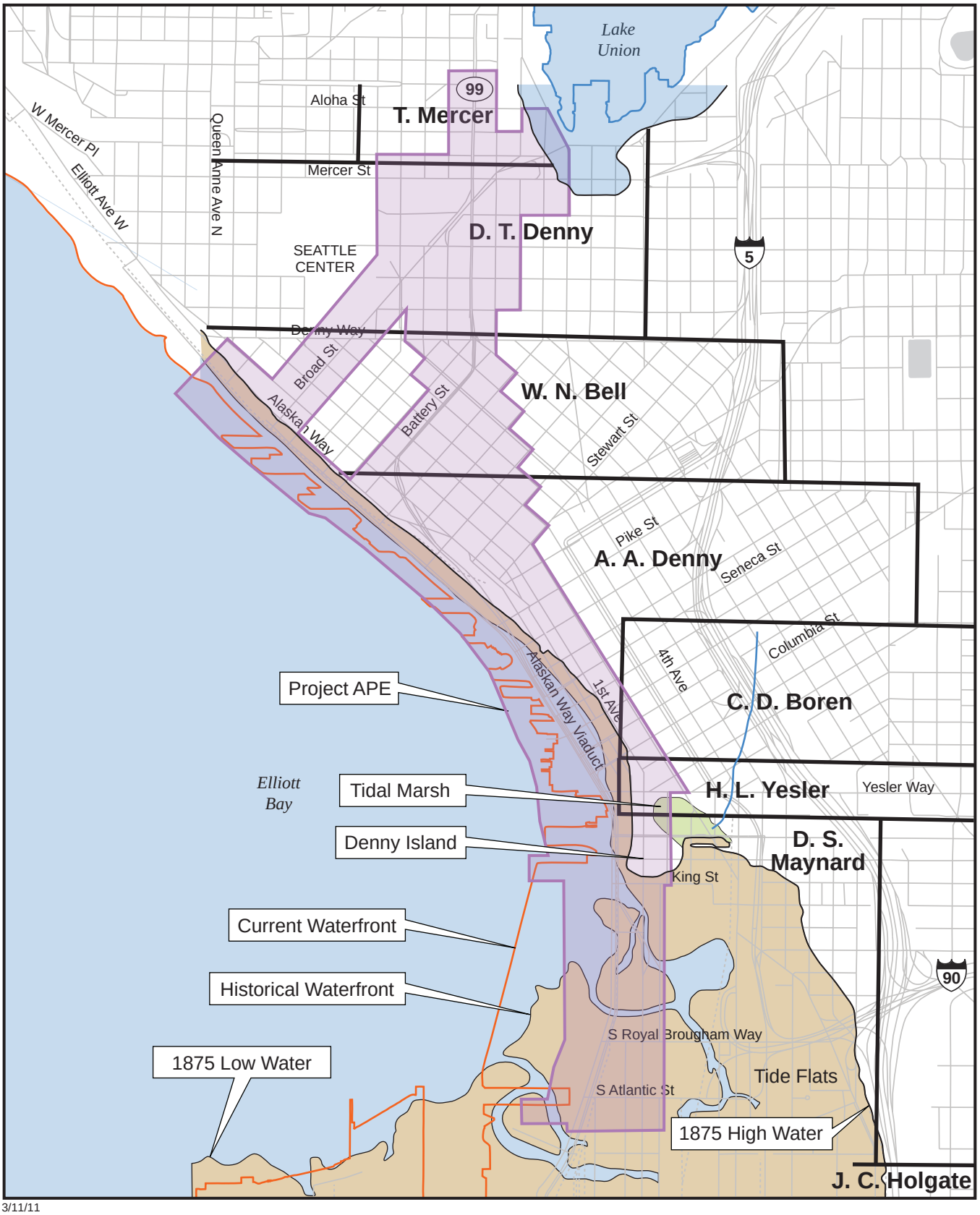


Exhibit 4-3. Map of Seattle in 1855-1856, drawn by Phelps and published in the late 1880s as part of his reminiscences (UW Special Collections, Seattle Photographic Collection, Image SEA1382).



3/11/11

N

0 1,800

SCALE IN FEET

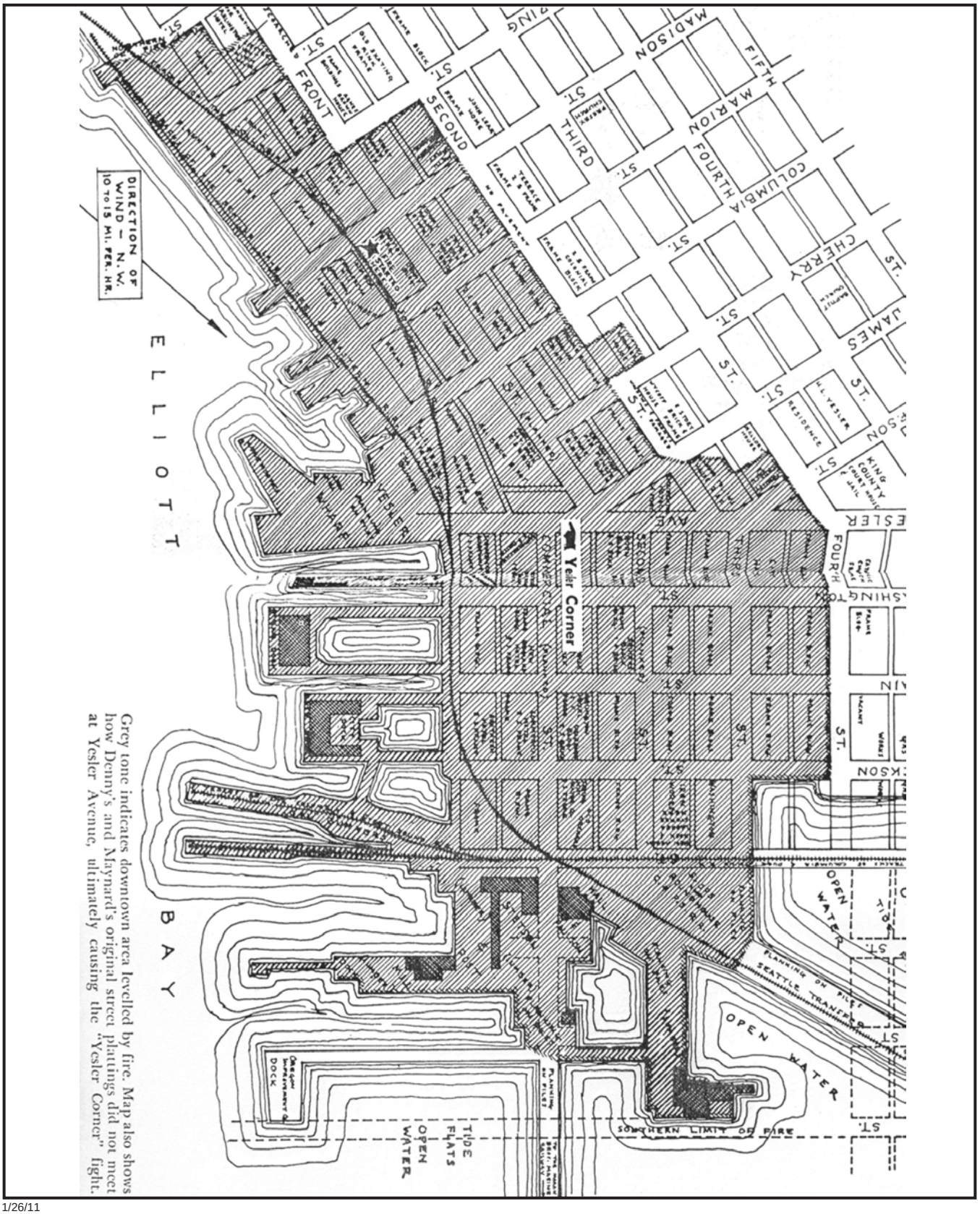
Build Alternatives Study Area

Tideflats

Marsh

Creek

Exhibit 4-4
Land Claims in the Project Vicinity



Grey tone indicates downtown area levelled by fire. Map also shows how Denny's and Maynard's original street plattings did not meet at Yesler Avenue, ultimately causing the "Yesler Corner" fight.

1/26/11

N

0 1,800

SCALE IN FEET

Exhibit 4-5
Map Showing the Extent of the Great Seattle Fire in 1889

Shortly after the fire, President Cleveland proclaimed Washington's statehood, on November 11, 1889. Over the next 30 years, an economic depression, a speculative frenzy over Klondike gold, and America's involvement in the Spanish-American War and World War I also had significant effects on the local economy (Hines 1893).

Before the turn of the twentieth century, Seattle was not primarily a manufacturing city but the commercial center for a broad hinterland that included Puget Sound, western Canada, and Alaska. After the fire, the city developed a stronger manufacturing base that initially relied on the raw materials available in the region and provided goods for local use. Lumber and other timber products dominated the market, and significant industries included shipbuilding, fish processing, and brick making. Additional manufacturing concerns including foundries, boiler makers, and machinery; machine tool makers provided ancillary products for the railroads and industrial plants. Other significant industries, based on the number of workers employed, included furniture making, bread and baking, flour milling, printing and publishing, and meat processing (Berner 1991; Sale 1976).

Seattle was profoundly affected by the Panic of 1893, a 4-year national depression. Because the city depended on East Coast investors to finance its new construction and infrastructure, development slowed substantially. However, the economy revived dramatically in June 1897, with the arrival of the steamer *Portland* carrying "more than a ton of gold" mined along the Klondike River. Seattle quickly became "The Gateway to Alaska," the commercial center and supply point for the subsequent gold rush. Adventurers from throughout the world sought fortunes in the Klondike, passing through Seattle to buy supplies. Although few made fortunes in mining, the city's merchants, hoteliers, theaters, restaurants, and shipping companies thrived. First Avenue was given over to small hotels, stores, cafés, and saloons serving sailors and other travelers. It retained this character for decades. The population grew by more than 25,000 people in only 3 years, reaching more than 80,000 in 1900 (Crowley and History Link 2001).

In 1909, Seattle hosted a belated celebration of the gold rush, the Alaska-Yukon-Pacific Exposition. Although the fair was held at the University of Washington campus, its effects spread through the city with the development of hotels, apartment buildings, and other amenities, including many in the downtown Belltown area. More than 3 million visitors attended the fair, enhancing the city's national and international status and setting the stage for future growth.

After construction of the Lake Washington Ship Canal in 1916, Lake Union began to play a much more important role in the local economy. The area grew into a mixed neighborhood of residences, industry, and retail and service businesses. Dry docks, marinas, machine shops, mills, factories, and worker housing were built around the south end of the lake. Streetcars connected the area to

downtown and Fremont, but it was not until 1907 that Westlake Avenue and Valley Street were graded and filled to improve north-south road connections.

During World War I, Seattle became the principal port on the West Coast. When the war ended, the city lost much of its military business, but with the help of the Panama Canal, new markets around the world were opened to Seattle shipping (Berner 1991; Dorpat 2006; Berner 1992). This post-war prosperity was not sustained. By the time of the Great Depression, the hope that Seattle's position as a major port could prop up the local economy faded. Seattle continued its role as an important regional distribution and service center, and the value of its trade with Alaska, in particular, was fairly steady, but throughout the decade, shipping remained fairly stagnant (Berner 1992).

When the nationwide economic downturn of the Great Depression reached Seattle, the city was hard hit, losing population and experiencing a sharp decline in the value of its manufactures. When World War II began, Seattle, which had been an important shipbuilding center during World War I, quickly geared up again to produce military vessels and soon expanded its output of other war-related products, including trucks and lumber.

Besides its advantages as a port city, Seattle was well located to profit from the growing importance of the aircraft industry. The presence of the Boeing airplane plant in the city led to millions of dollars in contracts and thousands of new jobs. Thousands of newcomers flocked to Seattle to join the city's industrial labor force, which doubled between 1939 and 1941 (Sale 1976; Berner 1999).

By the early 1950s, there were 31 piers on the waterfront between Smith Cove and the East Waterway. New development was directed to the south of this area as larger contiguous sites were needed for the greater volumes of cargo and improved connections to railroad and highway transportation networks. The tidelands became the preferred sites to accommodate these needs.

4.2.4 Historic Development Context

From the earliest days of settlement, Seattle residents altered the landscape along Puget Sound to provide better transportation access and encourage the development of commerce and industry. Steep hillsides and surrounding tidelands were challenges to expansion, but by filling, dredging, and leveling, the city created more usable land for urban growth. Ambitious projects to dredge canals for oceangoing vessels and to regrade the city's main thoroughfares for easier access provided millions of cubic yards of earth and sand, which, in turn, was used to fill the tidal areas. For a short period at the end of the nineteenth century, industrial, commercial, and residential development took place side by side with the improvement of wharf and railroad facilities on these newly created lands. Soon after the twentieth century began, however, the major

transcontinental railroads took control of most of the former tidal flats south of the city, influencing the direction of future growth and establishing patterns that would be in place until after World War II.

Railroads

The key to Seattle's position as both a regional and worldwide supply and distribution center was a diversified transportation system. Seattle's waterfront, which was also the center of its rail network, was destroyed by the Great Fire of 1889, but in rebuilding, the city was eventually able to organize its transportation network both on land and along the waterfront. The city's strong desire to have a connection to transcontinental rail lines and the power of the major railroad companies had a significant effect on Seattle's development during this period, particularly in the reclaimed tidal flats.

In 1873, Tacoma was selected as the terminus for the Northern Pacific. Although Seattle was surprised by the selection, within 3 days Seattle residents pledged funds to build their own railroad. By February 1877, the Seattle and Walla Walla line was completed from the King Street Wharf to Renton and early in 1878 was extended to Newcastle, increasing the ease with which these coal-mining areas could transport products to the Seattle waterfront. New industries also got their start in the city, supplying mining and transportation companies with everything from boilers to railcars (Armbruster 1999; Andrews 2005; Hanford 1923).

In 1881, Henry Villard, owner of the Oregon Transportation Company, purchased the Seattle and Walla Walla line, which was renamed the Columbia and Puget Sound Railroad. By 1884, Villard had connected Seattle to the mainline via the Puget Sound Shore Railroad, which crossed the tidelands before reaching S. King Street (Armbruster 1999). Seattleites were dissatisfied with the unreliable service provided by the Northern Pacific connection from Tacoma. In 1885, local business leaders incorporated the Seattle Lake Shore and Eastern Railroad (SLS&E) with a route planned to extend north from the central waterfront around the north sides of Lake Union and Lake Washington, and through the Squak Valley (Issaquah) to Snoqualmie Pass and eastward. A City ordinance created Railroad Avenue, designated for use by all transcontinental lines entering Seattle, with the SLS&E situated on the prime eastern portion. Railroad Avenue, a 2-mile trestle extending along the waterfront, was completed in the fall of 1887 (Armbruster 1999; Hanford 1923; Bagley 1916; Beaton 1914).

By the 1890s, several railroads were actively competing for a space on Seattle's waterfront. Seattle became a prize in the fierce competition among the late nineteenth century's two great railroad giants—Henry Villard and James J. Hill. A third, Edward Harriman, also entered the fray soon after the turn of the century. The Northern Pacific purchased the SLS&E in 1891. Part of the reason for the

acquisition was the pending arrival in the Northwest of the "Empire Builder," James J. Hill.

Hill pushed west with his privately financed Great Northern Railway, from the Great Lakes to the Pacific. He secured favorable concessions to make Seattle the terminus of his line, obtaining valuable property along Smith Cove and in the unfilled tidelands south of downtown and negotiating for some of the unused right-of-way of the SLS&E along Railroad Avenue, as well as additional land on S. Jackson Street for feeder lines and railroad outbuildings (Andrews 2005; Armbruster 1999). By October 1896, a new freight depot, which stretched for a full block east to west on Jackson Street, was completed. Three spur tracks abutted the facility on the south, while several loading bays were located on the north side (Armbruster 1999).

Hill's plans for the use of Railroad Avenue ran into opposition from R. H. Thomson, who had been hired as Seattle's city engineer in 1892. Thomson filed a report opposing the project because it impeded access to the wharves and waterfront manufacturers. He encouraged the railroad baron to consider a tunnel through the city as an alternative to the congested Railroad Avenue. From 1903 to 1904, the Great Northern and the Northern Pacific joined forces in building the mile-long Great Northern Tunnel under the city that Thomson had suggested. In 1906, Hill also built a grand passenger depot, King Street Station, at the south end of the tunnel (Andrews 2005; Phelps 1978; Crowley and MacIntosh 1999; Schwantes 1993).

While the Great Northern Railway and the Northern Pacific Railroad began to consolidate their side tracks, freight warehouses, and other facilities in the tidelands south of S. King Street and east of Second Avenue, Edward H. Harriman entered the Seattle market with the Oregon-Washington Railroad, a Union Pacific subsidiary. Harriman had reached an agreement with the Northern Pacific Railroad to share that line's tracks from Vancouver, Washington, to Seattle. When its first trains entered Seattle in January 1910, the Union Pacific used a temporary depot at Railroad Avenue and S. Dearborn Street. Harriman purchased property in the tidelands to develop freight and warehouse facilities and to establish his own depot, which was built almost adjacent to rival Hill's King Street Station. When completed in May 1911, it was first known as Oregon and Washington Station but later became simply Union Station (Armbruster 1999; Beaton 1914; Andrews 2005).

Harriman's entry into Seattle caused what some have called the greatest frenzy in early Seattle real estate history. In 1907, the railroad's agents began paying large sums for the tideland lots south of S. King Street along Railroad Avenue and First Avenue S. Many of the lots had already been developed with a variety of industrial and commercial businesses. These buildings were torn down to make way for additional railroad tracks, as well as for a large new freight warehouse

built south of S. Dearborn Street on First Avenue S. By 1912 when the freight warehouse was nearing completion, the railroad had developed additional sidetracks and other facilities along First Avenue S. almost as far south as S. Hanford Street, dominating the developed tidal flats east of the wharves along the recently completed East Waterway (Bagley 1929; Asay 1991).

In 1905, the Chicago, Milwaukee, and St. Paul announced the extension of its line from South Dakota to Puget Sound. In September 1908, the line reached the top of Snoqualmie Pass, and freight traffic began in the summer of 1909. The Milwaukee Railroad initially used King Street Station, but soon switched to the new depot built by the Union Pacific (Armbruster 1999; Schwantes 1993).

Because of its proximity to wharves, railroads, and city streets, Western Avenue developed into a warehousing and distribution center for produce and other food products. One of the largest brokers, John Agen, founder of the Northwest dairy industry, established his headquarters here in 1910. He built his own dock (now Pier 56) nearby to receive and ship eggs, butter, and cheese. In 1907, the Pike Place Market opened nearby at First and Pike Streets to provide a means for consumers to buy directly from farmers without dealing with the middlemen on Western Avenue. Over the next 10 years, permanent buildings with market stalls were constructed to replace the wagons used originally. By 1927, more than 400 farmers were selling at the expanded complex (Woodbridge and Montgomery 1980).

Over the years, a maze of freight yards and tracks were created with overlapping and sometimes conflicting services. Wartime increases in freight and troop movements for both world wars were offset in later years by increased transport of freight by truck and travel by automobile and later by airplane. At one time, Seattle welcomed five transcontinental lines and had two major passenger terminals. By the 1970s, passenger service was subsidized by Amtrak at King Street Station. Mergers and consolidations in the railroad industry left only two railroads operating in the city.

Tidelands

In 1893, the state legislature passed an act that allowed private individuals or companies to dig waterways through the public tidelands and to use excavated materials to reclaim the tidelands, while receiving a percentage of the proceeds from the land sales to finance the effort (Bagley 1916; Berner 1991; Dorpat and McCoy 1998; Finger 1968; Hynding 1973; Warren 1981). To take advantage of this law, the Seattle and Lake Washington Waterways Company was founded in 1894 by former territorial governors John Ferry and Eugene Semple, with backing from St. Louis investors. The company planned to dig a canal from Puget Sound to Lake Washington on the south side of the city, using the removed earth to fill in the tidelands and sluicing huge sections of Beacon Hill onto the tidal areas. The South Canal, as the project was known, would allow large vessels to enter the

lake from Puget Sound. A second project begun in 1895 involved the creation of a peninsula extending south from Denny Island with dredge spoils from Elliott Bay. The company also planned to dredge two canals, the East and West Waterways, around a man-made land mass (later known as Harbor Island) and to dredge and straighten the Duwamish River so that it could accommodate ocean-going vessels (Dorpat and McCoy 1998; Berner 1991).

The company received a contract from the state to initiate these plans, which were partially financed by liens on the filled lots. The Seattle and Lake Washington Waterways Company could charge the cost of the fill for each parcel along with 15 percent interest, which was to be paid by buyers through the state in 10 annual installments. Semple and his investors also had the option to purchase any filled lands that were not sold after a year. Along with his St. Louis backers, Semple was also able to secure bank loans after he had raised another half million dollars from local subscriptions. More than 2,500 Seattle businessmen and other residents enthusiastically supported the company's goal of digging the canal and filling the tidelands (Hynding 1973). The company hired the Bowers Dredging Company of San Francisco to undertake the work, which began in late July 1895.

The first lots of the newly constructed peninsula south of S. King Street were sold in early January 1896, and the rest of the reclaimed land north of Connecticut Street (now S. Royal Brougham Way) was sold within 6 months. Buyers included the Stetson and Post Mill Company, the Moran brothers, and a few others who already had businesses operating on wharves extending out into this portion of the tidal flats. Two lots were purchased by the Columbia and Puget Sound Railway Company, but most of the rest were sold to well-known local residents, many of whom were investors in the canal company. A number of these lots were sold again within a few years or leased to companies as the area experienced rapid industrial and commercial growth (Commissioner of Tidelands n.d.).

The Seattle and Lake Washington Waterways Company faced fierce opposition from a group of influential Seattleites who supported a northern canal rather than Semple's plan. These supporters of the northern route to Lake Washington from Shilshole Bay through Salmon Bay and Lake Union sought government financing for construction. The group filed expensive legal suits and secured an injunction to stop work on the South Canal, eventually forcing the dredging company into bankruptcy (Hynding 1973).

After nearly 2 years of litigation during which no filling was performed, the South Canal project was revived in 1900 and reclamation efforts resumed. A local company, Puget Sound Bridge and Dredging, was hired to continue work on the East Waterway. This waterway was completed by the fall of 1902, and dredging of the West Waterway began in the summer of 1903 (Hynding 1973).

In the meantime, the company also started excavation for the South Canal through Beacon Hill and the Rainier Valley, using surplus water from the city's Cedar River system to sluice the west side of the steep slope and then carry the earth by flume into the nearby tidelands. This phase of the project, which was initiated in the fall of 1901, continued to be mired in controversy as people began to question whether Seattle's water had been sold too cheaply to the canal company. The City began to change its policies toward the company, reducing the amount of water it agreed to supply and then refusing to vacate streets for construction. Finally in 1905, the South Canal project quietly died. The completed portion of the South Canal was abandoned and later filled and replatted for development (Bagley 1916; Warren 1981; Dorpat and McCoy 1998; Berner 1991).

During the next decade, more than 1,400 acres of tidelands were reclaimed, and by 1917, more than 90 percent of the tidal areas that Semple had planned to fill were completed (Bagley 1916; Warren 1981; Dorpat and McCoy 1998; Berner 1991; Hynding 1973). The City condemned portions of the new land for roads and services, and blocks in the tidelands were platted and frequently replatted. This process continued in a piecemeal fashion for several more decades (Phelps 1978; Dorpat and McCoy 1998).

Grades and Regrades

The early attempts to make it easier for wagons and other traffic to travel up and down Seattle's steep hillsides began in 1876 as the City passed ordinances establishing street grades and authorizing work on First Avenue from Mill Street (Yesler Way) to Pike Street, and then on Mill Street from First to Eighth Avenues. The work was difficult, and landslides on Mill Street caused the contractor to halt the grading efforts midway through the project. First Avenue was completed, but not without additional cribwork in places to shore up the road and the large amounts of fill. Photographs taken by the Peterson Brothers studio in 1878 show an extensive log wall or bulkhead extending from at least Columbia Street northward toward Union Street. Seneca Street also had to be extended above First Avenue by an overhead bridge (see Exhibit 4-6) (Bagley 1929; Dorpat 2006; Finger 1968). Grading of Pike and Union Streets took place in 1882, and Jackson Street was first graded from the downtown area to Lake Washington in 1883 (Buerge 1986; Andrews 2005).

The Seattle Engineering Department began nearly 60 projects to change the topography of Seattle between 1898 and 1931. Collectively called the regrades, these projects altered the elevation of more than 20 city streets and also removed more than 250 feet from the height of Denny Hill (Klingle 2001). The First Avenue regrade, which extended from Pike Street to Denny Way, was completed in 1898. Attempts to grade small areas of First Avenue along the west side of

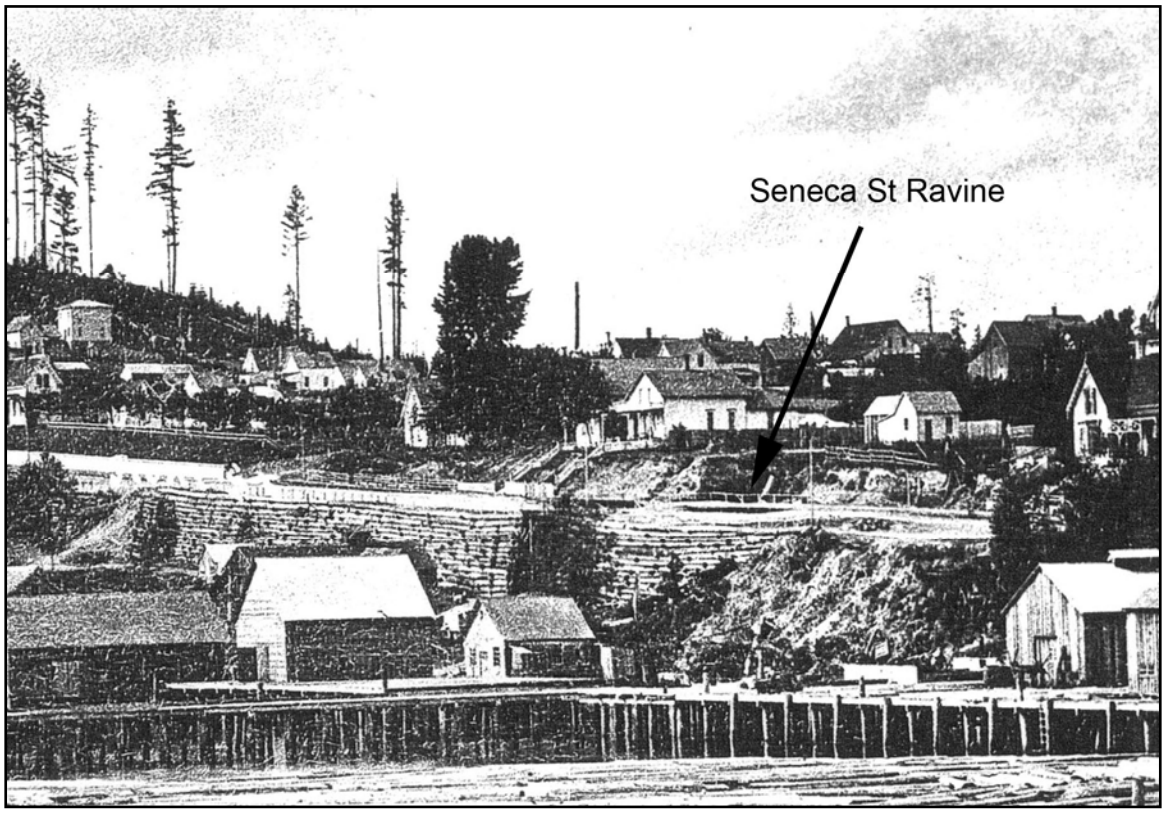


Exhibit 4-6. Cribbing along Front Street (First Avenue) and the Bridge of the Seneca Street Ravine, 1878 (UW Special Collections, Peterson Brothers Collection, PH Coll 284; photograph by the Peterson Brothers)

Denny Hill had taken place periodically to provide better access to areas to the north. As a result of the regrade, property values along First Avenue increased dramatically and prompted business owners and landowners to ask for the regrading of Second Avenue.

Steam shovels and cars were used for most of the excavation in this area rather than the sluicing techniques common to other regrading efforts. Streetcar lines were supported by wooden trestles as the digging proceeded and then lowered down to the new elevation during the night so as not to interrupt transportation flows. After the Second Avenue regrade was completed in June 1906, property values increased. Regrades along Third Street, Westlake Avenue, and Fairview Avenue followed in subsequent years (Klingle 2001; Thomson 1950; Dimock 1928).

Contracts for the Jackson Street regrade were awarded in April 1907, and the work was completed by February 1910, with 1,810,656 cubic yards of earth excavated. The City used hydraulic sluicing techniques borrowed from the mining industry to flush dirt from hills into the tidal flats. The regrade washed away as much as 85 feet of the hill and leveled most of the buildings. The Jackson Street regrade provided spoils to fill the adjacent tidelands, which were raised as much as 40 feet in some areas. In 1910, regrading extended along Dearborn Street and, north of downtown, along Dexter Avenue and a number of nearby north-south streets (Thomson 1950; Dimock 1928; Hershman et al. 1981).

Denny Hill separated developments along south Lake Union and Queen Anne Hill from the rapidly growing downtown business district. The steep grades were difficult to negotiate with horse-drawn wagons and effectively blocked the northward expansion of the city. The first Denny regrade included several regrade projects that spanned the years 1903 to 1911. By far, the largest of these involved the removal of the west half of Denny Hill east of Fifth Avenue.

In 1908, Westlake Avenue was regraded, and Ninth Avenue N. was regraded to funnel development toward Lake Union (Morse 1989). Substantial growth followed these regrades, with construction of the Moore and New Washington (now Josephinum) hotels on Second Avenue in 1908 and the Securities Building on Third Avenue in 1913. The Western Avenue vicinity, from First Avenue west to Alaskan Way, was not leveled; its steep slopes gave it a character that was different from the eastern section. It retained its light industrial plants and modest workers' housing until the 1980s.

Beginning in 1928, the second Denny regrade project removed the remaining east half of Denny Hill and all potential for archaeological deposits from Fifth Avenue east to Ninth Avenue and north to about Harrison Street. The depth of the cut was as much as 89 feet, and the spoils were removed by power shovels and then placed on conveyor belts (Phelps 1978). The conveyors extended more than half a mile, from Sixth Avenue and Battery Street to a dock on Railroad Avenue, where the earth

was loaded onto scows. Much of this material was deposited in the deep-water areas of Elliott Bay, off-shore between Pike and Battery Streets. Another portion of the fill was used in the valley immediately east of Denny Hill to raise the grade as much as 25 feet in some places (Dimock 1928).

This final regrade was completed in 1930, creating a flat expanse east of Fifth Avenue. Westlake Avenue, which had been graded and filled near Lake Union in 1907, was connected to downtown. This massive effort was undertaken to encourage businesses to move into the area, but by the time it was completed, the Great Depression had reduced business activity. However, one business sector took advantage of the newly opened land—auto dealers. Westlake Avenue became Seattle's new Auto Row, as dealers were being crowded out of their original quarters on Capitol Hill's Pike and Pine Streets.

Aside from the regrades, the late 1920s was a very intense period of physical development for Seattle, during which the face of its downtown changed completely. The financial section along Second and Third Avenues grew with the Exchange Building and the Northern Life (Seattle) Tower. Many other buildings were added on Fourth and Fifth Avenues. The Bon Marché department store moved east from Second Avenue to Fourth and Pine Streets, establishing a new retail center close to the 1918 Frederick and Nelson store at Fifth Avenue and Pine Street.

Another impetus to northward expansion of the business district was the development of a new commercial center at the former site of the University of Washington. The university had moved to the shores of Portage Bay in 1895, but it was not until 1907 that development began on its original site on Fourth and Fifth Avenues between Seneca and Union Streets. By 1910, this complex provided a new focus for up-and-coming businesses. Although only the Cobb Building (1910) remains from these original structures, numerous other buildings from this period remain in the area north of Pioneer Square: the National Bank of Commerce (1908), the Joshua Green Building (1913), the Bank of California (1916), the Arctic Building (1916), and the Times Square Building (1916).

Belltown also evolved considerably in the 1920s, although on a small scale. Because it was close to downtown but less congested and costly, it proved the ideal location for apartment buildings for downtown and waterfront workers and for support services such as printing. A large number of these apartment buildings remain. Buildings from one of Seattle's little-known industries, film distribution, can also be found. Hollywood movie studios originally shipped film reels by train to regional centers for distribution to local theaters. Belltown was the regional film distribution center for the Northwest.

Railroad Avenue and the Seawalls

Railroad Avenue continued to be, in the minds of many, an impediment to the city's growth. It was a key location, particularly during the heyday of rail and water travel in the first two decades of the century. All of Puget Sound was tied together by the Mosquito Fleet, steamboats that served communities large and small all around the sound, including those on the Kitsap and Olympic Peninsulas and on Bainbridge, Vashon, and Whidbey Islands. The frequent arrival of Mosquito Fleet steamers full of shoppers and goods made the waterfront a place that bustled not only with rail lines and cargo, but also with people for whom Railroad Avenue was the gateway to the city. Colman Dock at the foot of Madison Street was the Seattle terminus for most of these boats.

But growing train and freight traffic conflicted with passenger traffic. After the railroad tunnel was completed in 1905, some train traffic eased, but the advent of motorized vehicles soon made the waterfront thoroughfare even more congested and dangerous. One historian called it a "hole-ridden hell to cross, inspiring progressive muckrakers to see in the decaying timber quays a sign of the scabby morals on the waterfront" (Dorpat and McCoy 1998). To solve some of the problems, the City went ahead with construction of a new concrete seawall between S. Washington and Madison Streets on the southern edge of the waterfront between 1911 and 1916. Earth from the Jackson Street regrade and other areas was likely used to fill around Railroad Avenue, and much of the road surface was then covered with brick pavers (Makers 1979).

The planked road that covered the rest of Railroad Avenue to the north needed constant repairs, and the City had plans to extend the seawall and fill in additional parts of the road for more paving. Money was evidently set aside for the Madison to Pike Street section as early as 1920; however, possibly for political reasons, the improvements were not made at that time. Continuing arguments with the railroads over the high cost of the project and proposed limitations on trackage in the area stalled progress on the work (Phelps 1978).

By the 1920s, many railroad facilities had moved south of the city, where much of the industrial base was located. In 1929, the railroads signed a new franchise agreement that limited through tracks along the central waterfront to the east side of Railroad Avenue. Only spur lines to the piers would actually cross the main portion of the avenue. This agreement allowed the City to proceed with its plans to extend the seawall from Madison to Broad Streets, and funding was secured by late 1933 (Phelps 1978).

The seawall, touted in local newspapers and even national engineering publications as a "novel design," used precast-concrete slabs set into steel sheet piling to form the face of the wall on the water side and was held in place by a timber relieving platform supported by vertical timber pilings (Phelps 1978). The project was

completed in 1936, but required continuing inspection for decaying timbers and corrosion of the sheet piling. As the seawall was constructed, Railroad Avenue was filled with sediments from the mouth of the Cedar River and then paved to Broad Street (Phelps 1978). With a growing number of automobiles in the city, Railroad Avenue became an increasingly important north-south route used by motorists to avoid busy downtown streets (Dorpat and McCoy 1998).

The Motor Vehicle and Post-War Transformation

By the late 1920s, the automobile was making major inroads into the local transportation system. Streetcars and steamboats suffered a long period of decline, and local streetcars ceased their runs in 1941. Passenger-only steamers continued to run into the 1930s but were soon replaced with new, more expensive ferries that could carry automobiles as well as passengers.

In Pioneer Square, both the amount of traffic and its nature changed with the growing population and changing transportation modes. First Avenue and Yesler Way had historically been a crossroads for Seattle. In 1904, the City counted 2,745 horse-drawn vehicles at First Avenue and Cherry Street. In 1937, the number of motor vehicles counted at First Avenue S. and Yesler Way was 13,000, with another 33,000 on Alaskan Way (City of Seattle 1904, 1938).

Another major Depression-era infrastructure improvement was the completion, in 1932, of the Aurora Avenue Speedway, which included the George Washington Memorial Bridge (the Aurora Bridge) and a stretch of roadway with no intersections or traffic signals from the east side of Queen Anne Hill to north Green Lake. This highway offered, for the first time, a quick, direct automobile route from north Seattle to downtown, terminating at Denny Way. Aurora Avenue was part of a national phenomenon of highway building to accommodate the growing popularity of the automobile. Years before, a prominent Shoreline resident, Judge James Ronald, an avid promoter of good roads, had proclaimed his vision of Aurora Avenue as part of a grand highway from Canada to Mexico. A 1921 article (Chambers 1921) described "the Pacific Highway, the broad stretch of pavement, 700 miles in length at present and 1,600 when completed…the forerunner of great highways beyond the conception of the present generation that will mark the nation like a great checkerboard with its mass of highway arteries running in every direction and over which will flow the traffic of the continent."

Seattle was transformed economically and socially by World War II. Its northern Pacific location made it a strategic military base for the war against Japan. More importantly, its airplane factories and shipyards made it a crucial part of the war effort. Waterfront industries south of downtown and in the Spokane Street vicinity prospered. South Lake Union also flourished with the expansion of the shipyards and related industries, along with the establishment of a major naval reserve training center at the south end. However, civilian construction virtually came to a

halt, and there is little legacy of the war in the downtown area or on the waterfront. The war's most lasting effect was the vast increase in population, as many of the thousands who came for military service or to work in industry remained here.

Development was very slow during the 1950s, as the region and the country struggled with the transition to a post-war economy. The Norton Building, the city's first major International-style structure, was built in 1960, 15 years after the end of the war. Ironically, it was adjacent to downtown's last major building project, the 1930 Exchange Building, built three decades earlier.

The opening of the Alaskan Way Viaduct on April 4, 1953, symbolized the final transition of the post-war world from water and rail transportation to automobiles and trucks. The viaduct structure connected to Aurora Avenue, completing the Pacific Highway (now designated SR 99) through downtown Seattle. It also dramatically altered the character of the waterfront and the western edge of downtown, turning the city's back on what had once been its gateway. Near its previous terminus at Denny Way, Aurora Avenue entered a new tunnel beneath Battery Street, emerging just west of First Avenue. From that point, the roadway continued on a double-level structure just east of Alaskan Way, past Pioneer Square and through the railroad yards south of downtown.

Planning for the Alaskan Way Viaduct had begun in 1934, shortly after completion of the Aurora Avenue Speedway. Detailed design work started in 1949, with construction of the first segment (Battery Street to Pike Street) from December 1949 to July 1951. The Pike Street to King Street segment was constructed between January 1951 and the summer of 1952. At that time, construction of the Battery Street Tunnel to connect the new viaduct to Aurora Avenue began, with the completion in June 1954. Over the next few years, additional construction took place at the south end, to S. Holgate Street, and the entire project was completed in August 1958 (George 2001).

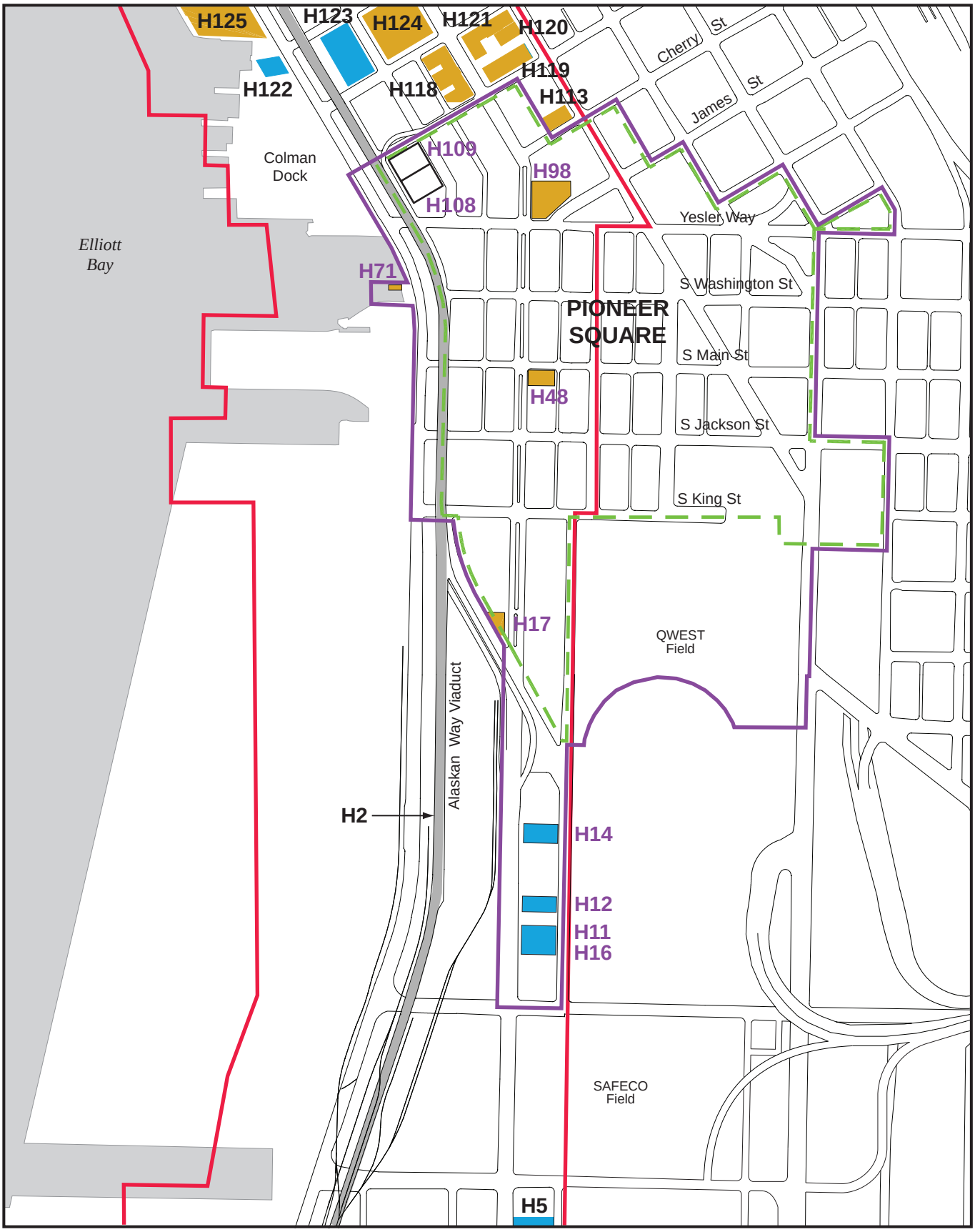
In 1962, the Century 21 Exposition, Seattle's second World's Fair, was held to raise Seattle's visibility, attract industry, and revitalize downtown and the languishing Denny Regrade (Findlay 1992). The project revitalized much of the area between Lake Union and Elliott Bay, at the foot of Queen Anne Hill. An entertainment center, with a civic arena, auditorium, and football stadium, had been built on Mercer Street in the 1920s, near the site where pioneers David and Louisa Denny had settled. However, the surrounding Warren Avenue neighborhood, containing some of the oldest houses near downtown, had deteriorated to slum-like conditions. The older civic structures were rebuilt for the fair, and the surrounding 74-acre site was cleared to build new facilities. Despite the fair's popularity and financial success, it was not until 1969 that substantial downtown development occurred, with the Seattle First National Bank Building, followed by the Bank of California, the Rainier Tower, and a new federal office building.

In the early 1960s, the automobile's influence was further emphasized by the proposals of local business leaders to demolish the old buildings of the Pike Place Market and Pioneer Square to make room for modern ring roads and parking garages. Momentum against these plans grew over the following decade. As a result of local activism and leadership, both neighborhoods were designated as NRHP historic districts. These were among the first districts in the nation to be designated after the establishment of the NRHP by the 1966 passage of the National Historic Preservation Act. The City also established its own historic preservation program in 1973, designating numerous individual buildings as landmarks (City of Seattle 2007-2008).

In November 1971, a citizen's initiative overwhelmingly defeated a plan to demolish and replace the Pike Place Market. Between 1972 and 1978, original buildings were renovated and new housing was added, using federal and private funds (Kreisman 1999). The community of farmers and produce dealers was joined by crafts people and numerous shops to form a thriving and internationally known market district. The boundaries of the local historic district (but not the NRHP historic district) were expanded westward in 1984 and 1991 to include the area beyond Western Avenue.

Pioneer Square was undergoing a similar renaissance during this time. Architects and property owners, with City and federal assistance, worked to renovate buildings, one by one, and to attract new restaurants, shops, and residents. The boundaries of the NRHP historic district were expanded twice, in 1978 and 1988, to incorporate subsequent warehouse buildings to the east and on First Avenue S. The Pioneer Building, Pioneer Place, and the Pergola, at First Avenue and Yesler Way, were designated as a National Historic Landmark. Fewer than 2,500 historic places in the nation have this designation, which is given to properties that are exceptionally valuable in illustrating or interpreting the history of the United States. The City's local historic district (the Pioneer Square Preservation District), which has boundaries slightly different from those of the NRHP historic district, extends south to S. Royal Brougham Way (see Exhibits 4-7 and 4-8). The local historic district also extends west to include the Washington Street Boat Landing, which is listed separately in the NRHP. With the protection of its historic district designation, Pioneer Square retains its historic character as a late nineteenth century commercial center, despite the construction of two sports stadiums nearby.

Belltown also changed during the 1970s, although the circumstances differed. The growth expected after the regrades had never reached this area north of downtown. Its character remained primarily one- to three-story buildings, providing housing and services for downtown. The numerous apartment buildings from the 1920s and earlier remained. By the late 1960s, economic and technological developments led to the decline of Belltown industries, with substantial changes in land use. The American Can Company plant, the largest facility in the area when it opened in



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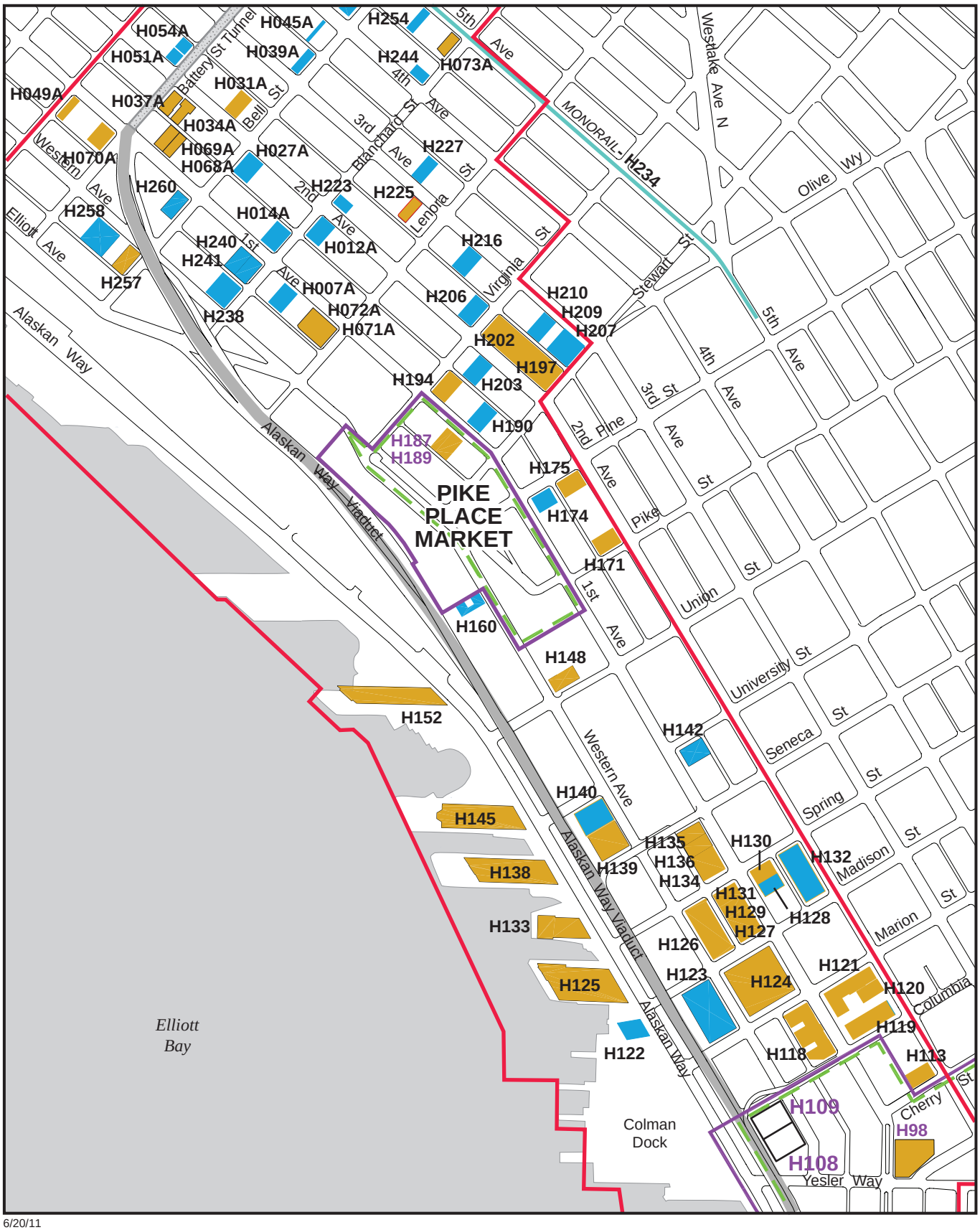
SCALE IN FEET

National Register and/or City Landmark
NRHP Eligible
Local Historic District
National Historic District
Area of Potential Effects

Note: See Attachment A for building name and address.

Exhibit 4-7
Historic Buildings in the Study Area - South



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SCALE IN FEET

National Register and/or City Landmark

NRHP Eligible

Local Historic District

National Historic District

Area of Potential Effects

Note: See Attachment A for building name and address.

Exhibit 4-8
Historic Buildings in the Study Area - Central

1924, closed in 1970. It reopened in 1980 as the Seattle Trade Center. The company's pier (Pier 69) was later renovated into the Port of Seattle's headquarters. The Booth Fisheries pier was replaced by the Edgewater Inn in the early 1960s. In the 1970s and 1980s, nonprofit housing agencies, with federal housing funds, acquired and restored more than 20 buildings for use as low-income housing. Several new low-income apartment buildings were added as well. In 2001, the last three remaining worker's cottages at Vine and Elliott Streets were designated as Seattle landmarks.

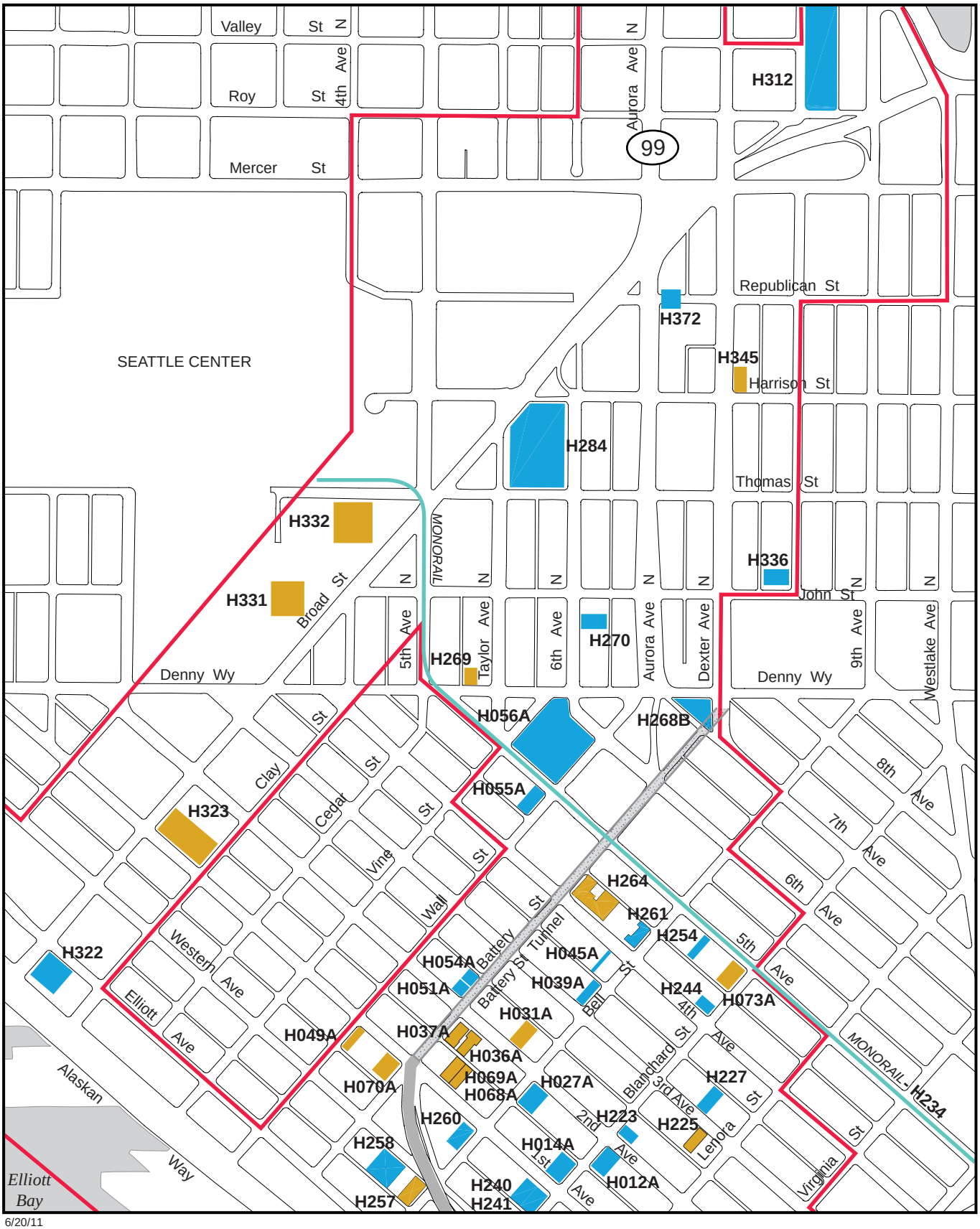
Since 1975, the downtown/waterfront vicinity has generally continued to thrive. In the 1990s, Belltown saw a housing boom with the construction of numerous high rises. Pioneer Square experienced substantial renovation. By 2000, most buildings in the district had received at least some renovation, with many offices and housing units added. The Kingdome, a sports stadium completed in 1976, was demolished in 2000 and replaced by two stadiums. The baseball park (Safeco Field) was built south of the Kingdome (outside the local historic district) in 1999. After the Kingdome demolition, a football stadium (Qwest Field) was built on its site, partially within the local historic district. The addition of Qwest Field and Safeco Field brought increased attention to this warehouse/industrial neighborhood and expectations of future growth and land use changes adjacent to the railyards and the Alaskan Way Viaduct.

Land uses were also changing on the waterfront. The old Colman Dock and the Grand Trunk Pacific Dock to the north were demolished in 1964 and 1965 for the construction of a new Washington State Ferries terminal, oriented primarily to transporting automobiles rather than walk-on passengers. The Port of Seattle's freight traffic increased, requiring the construction of large container terminals with rail access. By the 1990s, these new facilities filled much of the traditional mixed industrial area from Pioneer Square south to the Spokane Street Bridge. As traditional maritime uses declined along the central waterfront, the historic pier sheds were converted to tourist-oriented restaurants and shops. Today, condominiums, a new hotel, and varied office uses are also part of the mix of uses along the waterfront.

4.3 Cultural Resources Within the Study Area

4.3.1 Built Environment Resources

The study area encompasses Seattle's richest area for historic resources. Properties listed in the NRHP and those identified as eligible for listing are indicated in Attachment A. The designated historic resources and the boundaries of the historic districts (NRHP and local) in the study area are shown in Exhibits 4-7, 4-8, and 4-9.



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SCALE IN FEET

National Register and/or City Landmark
NRHP Eligible
Local Historic District
National Historic District
Area of Potential Effects

Note: See Attachment A for building name and address.

Exhibit 4-9
Historic Buildings in the Study Area - North

The unique ID numbers shown on the exhibits correspond to the historic resources listed in Attachment A. Surveyed properties that were determined not eligible for listing in the NRHP are also listed in Attachment A.

Historic Districts and Buildings

Two NRHP historic districts are located within the study area: the Pioneer Square–Skid Road Historic District and the Pike Place Market Historic District, each of which has a locally designated historic district with slightly larger boundaries, as shown in Exhibits 4-7 and 4-8. There is one National Historic Landmark (the Pioneer Building, Pioneer Place, and Pergola [H-98]), which is located at First Avenue and Yesler Way. In addition, there are 27 properties listed in the NRHP (including several buildings that are within historic district boundaries). Many of these properties are clustered along First Avenue just north of the Pioneer Square Historic District. Twenty-two of these properties have been designated as Seattle landmarks (see Exhibit 4-10), including the piers along the central waterfront. Approximately 69 additional properties are eligible for NRHP listings; these are listed in Attachment A.

Exhibit 4-10. NRHP-Listed Properties in the Study Area

ID Number	Location	Popular Name (Historic Name)	Date	Designation
	Alaskan Way Viaduct to Fifth and Sixth Avenues, James and Columbia Streets, First Avenue S. (500 block)	Pioneer Square–Skid Road Historic District	1889–1931	NRHP, local district
	First Avenue to Western Avenue between Virginia and Union Streets	Pike Place Market Historic District	NA	NRHP, local district
H-17	553 First Avenue S.	Triangle Hotel	1910	NRHP, SL, PSHD
H-48	310 First Avenue S.	Globe Building	1890	NRHP, PSHD
H-71	Foot of S. Washington Street	Washington Street Boat Landing	1920	NRHP, PSHD
H-98	606 First Avenue at Yesler Way	Pioneer Building, Pioneer Place, and Pergola	1889, 1909	NHL, PSHD
H-113	705 Second Avenue	Hoge Buildings	1911	NRHP, SL
H-118	801–821 First Avenue	Colman Building	1980, 1906, 1929	NRHP, SL
H-124	901 First Avenue	Federal Office Building	1932	NRHP
H-126	1000 Western Avenue	National Building	1904	NRHP, SL

Exhibit 4-10. NRHP-Listed Properties in the Study Area (continued)

ID Number	Location	Popular Name (Historic Name)	Date	Designation
H-127	1001–1011 First Avenue	Alexis Hotel (Globe Building)	1901	NRHP, SL
H-129	1013 First Avenue	Arlington South (Beebe Building)	1901	NRHP, SL
H-130	1018 First Avenue	Holyoke Building	1890	NRHP, SL
H-131	1019–1023 First Avenue	Arlington North (Hotel Cecil)	1901	NRHP, SL
H-135	1115–1117 First Avenue	Grand Pacific (Grand Pacific Hotel)	1901	NRHP, SL
H-136	1123 First Avenue	Grand Pacific (Colonial Hotel)	1901	NRHP, SL
H-139	1203–1207 Western Avenue	(Olympic Warehouse)	1910	NRHP, SL
H-148	84 Union Street (1400 Western)	Marketside Flats (U.S. Immigration Building)	1915	NRHP, SL
H-175	119 Pine Street	Doyle Building (J.S. Graham Store)	1920	NRHP, SL
H-187	1915 First Avenue	Alaska Trade Building	1910	NRHP, PPMHD
H-189	1921 First Avenue	Butterworth Building	1915	NRHP, PPMHD
H-194	1932 First Avenue	Terminal Sales Building	1923	NRHP, SL
H-197	1902 Second Avenue	Josephinum (New Washington Hotel)	1908	NRHP, SL
H-202	1926 Second Avenue	Moore Hotel/Theater	1907	NRHP, SL
H-068A	2320 First Avenue	Barnes Building	1889	NRHP, SL
H-069A	2326 First Avenue	Austin Bell Building	1890	NRHP, SL
H-070A	2401 First Avenue	Hull Building	1889	NRHP, SL
H-071A	2101–2015 First Avenue	Guiry Hotel	1904	NRHP, SL
H-072A	2111 First Avenue	Schillestad Building	1907	NRHP, SL
H-073A	420 Blanchard Street	Windham Apartments	1925	NRHP, SL

Notes: NHL = National Historic Landmark
NRHP = National Register of Historic Places
PPMHD = Pike Place Market Historic District
PSHD = Pioneer Square Historic District
SL = Seattle landmark

Areaways

Areaways are spaces beneath the sidewalks, located between the building walls and the walls supporting the streets. These are particularly common in Pioneer Square and are found in some other older buildings. Areaways are typically an integral part of a building, either open to the basement or accessible through doorways. Areaways that are located in an NRHP historic district or are attached to an NRHP-listed building are part of the historic resource and are protected. Areaways adjoining a building that is eligible for listing in the NRHP are also eligible. The required protective measures vary based on the conditions and historic features in each areaway.

Areaways typically have four structural components:

- **Deck.** The deck, or ceiling, of an areaway rests on steel I-beams and supports the sidewalk above. In early post-fire (1889–1890s) construction, the deck sometimes consists of vaulted red brick arches. Later construction typically has concrete decks, either arches or flat slabs.
- **Street wall.** The walls supporting the streets are typically made of brick, rubble (irregular stone), or concrete. Some of the original brick or rubble walls have been covered with concrete, particularly where a major building rehabilitation has been completed.
- **Building wall.** In earlier construction (circa 1889–1905), the basement wall of buildings was constructed of brick or stone. Often, arched doorways and windows connect the basement and the areaway. Some openings have been filled with wood or concrete; others remain much as they were. In many cases, there is no building wall, leaving the existing basement open to the areaway with the building edge defined only by large brick or concrete columns.
- **End or partition walls.** The walls at the ends of each areaway may be constructed of brick, concrete, or stone rubble. They are not necessarily the same material as the building wall or the street wall; many buildings combine two or three materials. The partition walls, which divide larger areaways into sections, are also usually constructed of brick or rubble, with many buildings having a combination of materials in different sections.

Some areaways, primarily in Pioneer Square, have prismatic skylights to provide natural light to the underground spaces. However, skylights are very vulnerable to damage from moisture, foot traffic, vibration, and other factors, and the majority of them have been covered with concrete. Some have been replaced with newer versions, yielding a more modern appearance but still maintaining

the original function. Only a small number of these original skylights remain, generally in poor condition.

The Pioneer Square areaways are important resources in the NRHP historic district. In the oldest parts of the district, the areaways were created after the 1889 fire when the city raised the street grade to alleviate the effects of the swampy conditions in the area. In buildings constructed in later years, the areaways appear to have been constructed primarily to acquire more basement area. Many areaways were used for storage, while others functioned as part of the adjacent uses such as restaurants or saloons. Today, most of the areaways are vacant or used for storage, but some are integrated into basements and used as part of the commercial use or for parking.

Some areaways (primarily those in Pioneer Square dating from circa 1889 to 1905) contain historic features such as brick or stone walls, brick arches, doorways, windows, or brick columns or artifacts such as a window sash, hardware, or machinery. These are important historic resources associated with the early development of Seattle and should be protected or restored as much as possible. The concrete areaways found in more recent buildings (after about 1905) seldom contain specific historic features or artifacts. However, they may be significant as part of the adjacent building (usually a section of the basement); any protection or minimization measures should take into account the areaway and its relationship to the building. Some areaways, even on historically significant buildings, have been so altered and modernized that they no longer retain integrity of materials or feeling.

The study area contains approximately 86 areaways, many of which retain much of their historic character. The presence of areaways is noted in Attachment A, which lists all buildings in the study area built before 1963. In Pioneer Square, almost every building on First Avenue/First Avenue S. from south of S. King Street to north of Cherry Street has an areaway; these are among the oldest and most intact areaways in the city. Of the 43 buildings on this stretch of First Avenue, 30 have one or more historically significant areaways. Elsewhere in Pioneer Square, within the study area, an additional 20 buildings have areaways; most of these are on Occidental Avenue S., and 15 are historically significant. The western edge of Pioneer Square has very few areaways. There are none on Alaskan Way/Alaskan Way S., and only three buildings west of Post Alley have areaways. The remaining areaways are located in older buildings north of Pioneer Square. The majority of these areaways are within the Pike Place Market Historic District or in buildings that are listed in the NRHP (see Attachment A).

4.3.2 Recorded Archaeological Resources

One Native American archaeological site (45KI456, the Baba'kwob site), and seven historic-period archaeological sites are recorded within the study area (see Exhibit 4-11). The Baba'kwob site and four of the historic-period archaeological sites are or may be within the area of potential ground disturbance for one or more of the build alternatives. Only one site has been determined eligible for listing in the NRHP: 45KI924, the Dearborn South Tideland Site.

Site 45KI958, SDOT Maintenance Yard Site

This historic-period archaeological site was discovered during archaeological testing for the Bored Tunnel Alternative. It consists of 11 buried features and 252 historic-period artifacts at the base of a layer of historic fill. The observed features included red brick foundations and clay sewer pipes that likely date to the early twentieth century and a concrete piling, pillar, and foundation that were likely built in the 1940s. Recovered artifacts included food and beverage bottles, toiletry bottles, ceramic sherds from porcelain architectural and electrical objects, sherds of ceramic tableware, and a Lincoln "Wheat Ears" penny stamped 1940. WSDOT and FHWA have not yet determined the NRHP eligibility of this site; the determination is pending the collection of further information.

Site 45KI456, Baba'kwob

The Native American archaeological site recorded within the study area, 45KI456, was named Baba'kwob by the recorders (Lewarch et al. 2002). This is a different location from the grassy clearing also named Baba'kwob that is described by Waterman (2001). Native American human remains and glass trade beads were found in excavation spoils during the construction of the World Trade Center [redacted] A review of historical maps suggests that this material may have accumulated along the lower slope and within a ravine that approximates the Bell Street alignment. The ethnographically and ethnohistorically recorded trail from the waterfront to the prairies above Lake Union followed this ravine, and settlement ranging from a beach encampment to a longhouse has been described at or near this location. The site was recommended not eligible for listing in the NRHP, but no formal determination has been made.

Site 45KI482, World Trade Center North Historic Site

This historic-period archeological site was discovered during archaeological construction monitoring one block north of 45KI456. The area is shown on Sanborn Fire insurance maps as warehouses from the early 1890s to the 1940s, although a cabin is shown on the eastern portion of the site near the intersection of Battery Street and Water Street (now Elliott Avenue) on the 1893 Sanborn Fire Insurance map. The 1893 map shows that the western portion of the site was

Exhibit 4-11 Archaeological Sites in and Adjacent to the Study Area contains sensitive cultural resources information that is exempt from public disclosure pursuant to provisions of the Public Records Act (RCW 42.56.300).

probably over water on piers and wharfs. Recovered artifacts included domestic bottles, ceramic housewares, items related to the care of horses, and faunal remains. The 1905 Sanborn Fire Insurance map shows no domestic structures, only the Galbraith and Bacon company warehouse, which may have still been partially on pilings. By 1950, the Sanborn Fire Insurance map shows the parcel in use for cement and lime storage. Features located at the site included a fragment of a brick wall, pilings, and a pile of concrete likely dating from the post-1904 use of this site. The artifact deposit and pilings appear to date from the 1890s to 1904; the concrete and brick wall appear to date from 1904 to the 1940s. NRHP eligibility has not been determined.

Site 45KI924, Dearborn South Tideland Site

The Dearborn South Tideland Site occupies most of the Washington-Oregon Shippers Cooperative Association (WOSCA) site [redacted] The site is located on dredge spoils deposited on the former tidal flats in this area. Dredging began in 1895, and the area was above tide level by 1898, when rapid development, including construction of substantial brick buildings, began.

The Union Pacific purchased the property in 1908. By 1910, the area had been cleared, the grade raised, and an extensive railroad freight yard established. The site contains building remains, refuse accumulations, and other cultural features associated with the period from circa 1895 to circa 1910 and represents historic development of the tidal flats south of Denny Island. The site was determined eligible for listing in the NRHP, and DAHP concurred on July 8, 2010 (see Appendix U, Final EIS Correspondence).

Site 45KI930

This site is the remains of a railroad, including ties and ballast, found on First Avenue S. south of S. King Street. The railroad was found less than a foot below the current road surface during monitoring of utility trench excavations (Gilpin and Butler 2009). The site was recommended not eligible for listing in the NRHP, but no formal determination has been made.

Site 45KI942, W.L. McCabe's Machine Shop

This site is a historic-period deposit 3 to 7 fbs resting on reclaimed tidelands created using spoils dredged from Elliott Bay. Cultural material consists of demolition debris and other material associated with a machine shop, tool shed, forge, and paint storage building. The lack of other structural remains and debris suggests thorough demolition and cleanup with only the lowest structural elements remaining. The machine shop appears to have been in business for only a year, based on its single listing in Seattle city directories in 1904. McCabe's may have supplied parts for larger companies like the nearby Variety Iron Works or

possibly for the flour and lumber mills or railcar manufacturers nearby (Meyer and Shong 2010). The site was determined not eligible for listing in the NRHP, and DAHP concurred on February 16, 2010.

Site 45KI943, Dearborn North Tideland Site

This site is a historic-period deposit associated with a triangular configuration of four commercial lots on reclaimed tidelands. Cultural material was found 3 to 10 fbs during monitoring of excavation for the Electrical Line Replacement Project. The cultural material is primarily structural demolition debris from a series of buildings and structures present from 1893 to 1950, intermixed with some domestic and personal artifacts. Historical maps show that the property hosted an elevated trestle of the Seattle Terminal Railroad in 1893 followed by scattered facilities of the Post Stetson Lumber Company in 1904. By 1950, a two-story auto freight depot, freight shed, and office occupied the lots. These buildings were demolished during construction of the Alaskan Way Viaduct and the ramp that replaced Railroad Way. The site failed to meet requirements for integrity because of the mixing of deposits. The site was determined not eligible for listing in the NRHP, and DAHP concurred on February 16, 2010.

Site 45KI947

This site was discovered during investigations for the S. Holgate Street to S. King Street Viaduct Replacement Project. It contains stratified remains of residential and commercial structures dating to the first half of the twentieth century. The residential and commercial structures, including outbuildings associated with the Variety Iron Works and two wood-framed dwellings, were identified on the 1904 Sanborn Fire Insurance map. Archaeological investigation revealed a discontinuous layer of industrial debris below sparse domestic debris. The site has the potential to yield information on residential life, commerce, and trade that is not available from written sources. The site was determined not eligible for listing in the NRHP, and DAHP concurred on February 16, 2010.

4.3.3 Areas Sensitive for Additional Archaeological Resources

Access to potential cultural resources is restricted by their depth, the presence of groundwater, existing infrastructure, transportation requirements, the need to maintain utility services, and construction methods. Therefore, the identification of cultural resources within the area of ground disturbance was addressed primarily be means of the geoarchaeological and geotechnical coring program that is described in Section 3.1.3, as well as historical maps and descriptions. Geoarchaeological and geotechnical coring efforts are well-suited to the discovery of landforms and sediments, ancient and modern, rather than cultural resources associated with those landforms and sediments. Although the coring effort has some limited potential to identify archaeological sites, particularly if those sites

manifest as dense accumulations of cultural materials, geoarchaeological and geotechnical testing primarily contributes information about landforms and sediments. Each identified landform or sediment may not have associated cultural materials, but without a given landform or sediment in place, the presence of cultural materials is less likely. In this case, geotechnical methods can establish a baseline related to potential locations open to human activity, even though these methods may be inadequate in identifying the activity itself.

Sensitive areas in the study area for one or more of the build alternatives include the following:

- The Holocene shoreline before historic and modern land-making activities, as identified by historical maps (see Exhibit 4-2) and confirmed by the coring results
- Surfaces and landforms with archaeological potential located by means of coring
- Locations of early historic structures, especially those that may yield important information about early Seattle, as shown on Sanborn Fire Insurance maps and other early maps

Holocene Shoreline and Tidelands

Holocene sediments are present between Pleistocene tills and overlying historic-period anthropogenic fill within the study area. These sediments have the potential for containing Native American artifacts and cultural deposits ranging in age from the earliest peopling of the New World circa 11,000 years ago to the early historic period in the 1850s. In much of the combined area of potential ground disturbance, however, the Holocene sediments were tidal flats and tidal zones (see Exhibit 4-2), not dry land. It is possible that these tidal areas were once used for resource procurement by Native Americans. Isolated archaeological materials may exist in these areas that result from these activities, including wooden stakes, lattice, or basket traps. These tidal Holocene sediments occur in four locations within the areas of potential ground disturbance:

- The southern project extent, south of S. King Street between East Marginal Way S./Alaskan Way S. and First Avenue S.
- The area from just south of S. Jackson Street to just south of Columbia Street within Alaskan Way S.
- The area from Yesler Way to Seneca Street between the Alaskan Way Viaduct and First Avenue
- The area from Union Street to Pike Street within Alaskan Way

These locations should be considered sensitive for potential archaeological deposits.

The area of ground disturbance also includes an area of Holocene sediments that were upland shoreline before historical and modern filling. The former beach shoreline between Union Street and Broad Street, where sites 45KI482 and 45KI456 were discovered, is sensitive for historic-period and Pre-Contact archaeological resources.

Other Holocene Surfaces and Landforms

During coring and deep archaeological testing, Holocene strata were encountered in two locations inland of the shoreline. No archaeological materials were found during the coring or testing, but these strata should be considered sensitive for Pre-Contact archaeological resources:

- From Pike to Bell Streets along the alignment of the Alaskan Way Viaduct, Holocene sediments appear near the surface in one location and are overlain in other locations by a relatively thin layer of historic-period fill deposits. These Holocene deposits should be considered sensitive for Pre-Contact (and possibly early historic-period) archaeological resources.
- In the northern portion of the project area, between John Street and Mercer Street, a deeply buried Holocene peat deposit has been identified. The peat deposit has been radiocarbon dated at around 11,000 B.P. and would potentially have been available for use by Native Americans from that time to the historic period. The presence of the peat deposit indicates that a relatively resource-rich environment existed prehistorically. Although no Native American cultural deposits were discovered in this area during deep archaeological testing, known Native American cultural deposits are associated with peat deposits elsewhere in Washington. These locations should also be considered sensitive for historic-period and Pre-Contact archaeological deposits.

Documented Historic Locations

Coring in conjunction with the analysis of historical maps, photographs, and descriptions has allowed a delineation of areas sensitive for potential archaeological deposits dating to the historic period as well. Much of the area of potential ground disturbance was historically part of the transportation corridor and has a low likelihood for the presence of significant archaeological resources. However, several locations have been identified that should be considered sensitive for potential archaeological deposits:

- The southern portion of the study area, south of S. King Street, which has intact historical surfaces dating to circa 1895 with associated

archaeological deposits, as evidenced by the presence of site 45KI924 in this location.

- The locations of Denny and Ballast Islands, where coring has confirmed terrestrial Holocene sediments, and historic and ethnographic literature documents intensive Pre-Contact and historic-period use.
- The area from Pike to Bell Streets along the alignment of the Alaskan Way Viaduct, which traverses several historic blocks that were not part of the former transportation corridor.
- The northern portion of the study area, between John Street and Roy Street, which has intact historical surfaces that have been sealed by fill and have associated archaeological deposits as evidenced by the presence of site 45KI958.
- The waterfront north of Blanchard Street between Alaskan Way and Elliott Avenue, where historic-period sites 45KI456 and 45KI482 have been discovered. Historical photographs and the 1888 Sanborn Fire Insurance map show cabins on the beach at the Bell Street ravine, and Lewarch et al. (2002) concluded that the cabins may have been moved between 25 and 100 feet after the construction of the Great Northern Railway Tunnel in 1903–1904. The beaches in the northern part of Elliott Bay were home to marginalized populations, and any intact archaeological remains are likely to be significant.

Chapter 5 OPERATIONAL EFFECTS AND MITIGATION

5.1 Viaduct Closed (No Build Alternative)

No effects on archaeological properties would result from the operation of the Viaduct Closed (No Build Alternative). However, as described in the following subsections, there would be effects on the built environment under either an unplanned loss of use of the viaduct or a catastrophic failure and collapse.

5.1.1 Unplanned Loss of Facilities

Under this scenario, the viaduct would be closed by the year 2030. The sudden unplanned closure could occur due to structural deficiencies, other types of deterioration, or a smaller earthquake event. SR 99 would be closed for an unknown period of time until a viaduct replacement could be built. There would likely be a period of time during which the region would have to function without a replacement. Some transportation solution would be found and implemented as quickly as possible. In the meantime, an unusable viaduct would result in significantly increased traffic and congestion throughout the downtown area. An unusable viaduct could also result in loss of access and altered traffic patterns that could result in adverse effects due to degraded economic viability of the Pioneer Square Historic District and the Pike Place Market Historic District and interference with the continued use and maintenance of the historic buildings in these districts. Some areaways (spaces beneath the sidewalks of older buildings) on First Avenue S., among the oldest in Seattle, may be adversely affected by vibrations due to increased use of the street by heavy vehicles that would be diverted from the viaduct.

5.1.2 Catastrophic Failure and Collapse

This scenario considers the effects of a catastrophic failure and collapse of SR 99. Under this scenario, a seismic event of similar or greater magnitude than the February 2001 Nisqually earthquake could trigger failure of portions of the viaduct. Such an event would result in severe effects, demolishing or severely damaging the viaduct, the seawall, buildings, utilities, and other facilities. The historic buildings at greatest risk due to the collapse of the viaduct are the buildings in the Pioneer Square Historic District that are closest to the viaduct, generally between S. King and Columbia Streets, and Piers 54 through 59. In addition, this scenario would lead to the same effects as those of unplanned loss of the viaduct, as described in Section 5.1.1.

5.2 Bored Tunnel Alternative

Effects on Historic Properties

The Bored Tunnel Alternative would have two adverse operational (permanent) effects. One adverse operational effect would be the demolition of the Alaskan Way Viaduct and the decommissioning of the Battery Street Tunnel (considered a single resource); the other adverse operational effect on historic properties would be the alteration of a manhole shaft on the Lake Union Sewer Tunnel.

One non-adverse operational (permanent) effect would be increased traffic in Pioneer Square, since the Bored Tunnel Alternative would not provide midtown ramps; some vehicles going to and from downtown destinations would use ramps south of the historic district (not adverse). The other non-adverse operational effect would be the presence of a tunnel operations building adjacent to the historic district and across from the Triangle Building.

The permanent operational effects of the Bored Tunnel Alternative on historic properties are described in the following subsections (see also Exhibit 5-1).

Alaskan Way Viaduct and Battery Street Tunnel

The primary adverse operational effects of the Bored Tunnel Alternative on historic properties would be the demolition of the Alaskan Way Viaduct and the decommissioning of the Battery Street Tunnel. Both structures are eligible for listing in the NRHP, but as a single resource. The decommissioning of the Battery Street Tunnel is considered an adverse operational effect under Section 106. However, the work involved in decommissioning would result in only short-term, non-adverse effects. The current proposal is to use crushed concrete rubble recycled from the demolition of the existing viaduct to fill the Battery Street Tunnel approximately two-thirds full and then to pump in low-strength concrete slurry to fill the remaining space and solidify the rubble. The slurry mix would be poured from approximately seven openings adjacent to Battery Street. Several NRHP buildings are clustered near First Avenue and Battery Street at the south end of the tunnel: the Hull Building (H-070A), the Austin Bell Building (H-069A), and the Barnes Building (H-068A).

Lake Union Sewer Tunnel

Another adverse operational effect on historic properties would be the alteration of a manhole shaft on the Lake Union Sewer Tunnel. The brick-lined Lake Union Sewer Tunnel, built in 1891–1894, is largely intact. It extends along Republican Street from Westlake Avenue N. to Sixth Avenue N., then west on Denny Way to Elliott Bay. Construction of the off-ramp at Republican Street would require that the removal of the upper section (approximately 6.5 feet) of a manhole shaft. The shaft is lined with brick, except for the upper 1.8 feet, on which the brick was

replaced with concrete in a previous grading operation. Approximately 4.7 feet of the original brick lining material would be removed. The opening would be covered with a reinforced-concrete top slab with an integral manhole ring, and it would continue to function as an access point to the sewer tunnel.

Traffic in Pioneer Square Historic District

Increased traffic in the Pioneer Square Historic District would not be an adverse effect. Traffic would increase because the Bored Tunnel Alternative would not provide ramps downtown; some vehicles going to and from downtown destinations would use ramps south of the historic district. Analysis of traffic patterns for vehicles accessing ramps to and from SR 99 in the stadium area indicates that vehicles would disperse to several streets, such as S. Royal Brougham Way, Alaskan Way, First Avenue, and Fourth Avenue. Please see Appendix C, Transportation Discipline Report, for the transportation analysis and measures for managing traffic and parking. The increased traffic would not result in an adverse effect under Section 106 of the National Historic Preservation Act. Increased traffic would have an adverse effect on a historic district if it led to the diminishment of its integrity and the qualities that made it eligible to be listed as an NRHP historic district. This could occur, for example, if there was so much traffic congestion that people stopped patronizing businesses or renting apartments or offices, and property owners were no longer able to properly maintain their buildings. Inadequate maintenance could lead to a loss of historic features that are important to the district's design and character. Because traffic in Pioneer Square is controlled by signals, the increased traffic volume is not expected to affect the pedestrian character of the area or make it more difficult to walk to shops or restaurants. Pioneer Square was historically an active place with considerable traffic, and the increased traffic volume would not affect its historic character or its integrity as an NRHP historic district.

Although the increased traffic would not result in an adverse effect on the historic district, it may pose an inconvenience to some businesses, employees, residents, and customers. Appendix C, Transportation Discipline Report, discusses measures that would be implemented to mitigate the effects of increased traffic.

Tunnel Operations Building

The presence of a 65-foot-high tunnel operations building at the south portal of the bored tunnel would represent a permanent but non-adverse effect. The facility, which would contain ventilation fans and exhaust stacks as well as emergency generators and electrical and fire support systems, would be constructed on the southwest corner of First Avenue S. and Railroad Way S., across the street from the Triangle Building (NRHP listed and a Seattle landmark) and adjacent to the boundary of the Pioneer Square Historic District. The building would be a noticeable new feature, larger than the building that was previously on the site but

less obtrusive than the adjacent ramp, which was recently demolished. Because the building would be outside the historic district and would be of compatible design and materials, its introduction would not be considered to have an adverse effect on historic properties. The visual effect of the tunnel operations building on the adjacent historic district would be minimized by careful design to ensure that it would be compatible with the surrounding buildings and historic context of the area. The structure would be reviewed by the Seattle Design Commission and the City Historic Preservation Officer, under the City's SEPA policies (SMC 25.05.675), as appropriate.

Effects on Archaeological Properties

No operational effects on archaeological properties would result from the Bored Tunnel Alternative, because no additional ground disturbance is expected after the construction is completed.

5.3 Cut-and-Cover Tunnel Alternative

Effects on Historic Properties

The Cut-and-Cover Tunnel Alternative would result in the following permanent effects on historic properties (see Exhibit 5-1):

- The Alaskan Way Viaduct would be demolished (adverse effect).
    - The Elliott Bay Seawall would be demolished (adverse effect).
    - As described in Section 5.2, construction of the Republican Street off-ramp would involve altering a manhole shaft on the Lake Union Sewer Tunnel (adverse effect).
    - The Washington Street Boat Landing pergola would be removed and relocated back to the water's edge after construction (adverse effect).
    - A permanent easement would be acquired beneath the Buckley's (MGM-Loew's) building, which is a Seattle landmark. A permanent easement for tiebacks would also be needed at the Oregon Hotel. Neither of these easements would affect the building enough to be an adverse effect.
    - The Battery Street Tunnel would be altered with fire and life safety improvements, including increased clearance. This would not affect the utility of the tunnel and is not an adverse effect.
- The north portal of the Burlington Northern Railroad Tunnel may be altered. This portal is not readily visible to the public, and the alterations would not adversely affect either its usefulness as a railroad tunnel or its historic significance.

- As with the Bored Tunnel Alternative, a tunnel maintenance building, compatible in design and materials, would be constructed on the southwest corner of First Avenue S. and Railroad Way S., across the street from the boundary of the Pioneer Square Historic District and the NRHP-listed Triangle Building.
- Another tunnel maintenance building would be constructed at the foot of Battery Street, adjacent to the Hull Building. Because of careful siting at the tunnel portal, this would not be an adverse effect.
- Access to the loading docks at two buildings on the east side of Alaskan Way (the Pacific Net and Twine Building and the Olympic Warehouse) would be altered. The alterations would not affect the function or appearance of the buildings and would not be adverse.
- An emergency tunnel egress would be constructed in the basement of Fire Station No. 2 (non-adverse effect).
- Emergency egress structures for the cut-and-cover tunnel would be built on Alaskan Way near S. King Street and Yesler Way, in the Pioneer Square Historic District. Two additional egress structures associated with the tunnel may be constructed near historic properties: one on the west side of Alaskan Way between Piers 57 and 59 (central waterfront) and the other adjacent to the Pike Street Hillclimb (Pike Place Market Historic District). If the final locations of these small structures are within a historic district, they would be reviewed by the appropriate historic district board for compatibility with the historic character. The visual effect of the emergency egress structures on the historic districts would be minimized by careful design to ensure that they would be compatible with the surrounding buildings and historic context of the area. The structures would be reviewed by the Seattle Design Commission, the Pike Place Market Historical Commission, the Pioneer Square Preservation Board, or the City Historic Preservation Officer, under the City's SEPA policies (SMC 25.05.675), as appropriate. (These small egress structures represent a non-adverse effect.)

Effects on Archaeological Properties

No operational effects on archaeological properties would result from the Cut-and-Cover Tunnel Alternative because no additional ground disturbance is expected after the construction is completed.

5.4 Elevated Structure Alternative

Effects on Historic Properties

The Elevated Structure Alternative would result in the following permanent effects on historic properties (see Exhibit 5-1):

- The Alaskan Way Viaduct would be demolished (adverse effect).
- The Battery Street Tunnel would be altered (non-adverse effect).
- The Elliott Bay Seawall would be demolished (adverse effect).
- The Washington Street Boat Landing pergola would be removed and put back after construction (adverse effect).
- Construction of the Republican Street off-ramp would involve altering a manhole shaft on the Lake Union Sewer Tunnel (adverse effect).
- An emergency tunnel egress would be constructed in the basement of Fire Station No. 2 (non-adverse effect).
- The primary additional effects of this alternative would be the result of the visual intrusion of the new elevated structure. These visual effects would be approximately the same as those of the existing structure. The new elevated structure would be a highly visible element of the streetscape of Pioneer Square, particularly on Alaskan Way S. and looking west from First Avenue. The structure would continue to block views from the waterfront to the historic buildings in the Pioneer Square Historic District, and outward views would continue to be restricted. The rebuilt ramps at Columbia and Seneca Streets would continue to affect the Polson (H-109), Journal (H-110), Colman (H-118), Grand Pacific (Colonial Hotel) (H-136), and Olympic Warehouse (H-139) buildings. The presence of the new elevated structure would noticeably affect the historic context of the western portion of the Pioneer Square Historic District, as the existing viaduct does. Please see Appendix D, Visual Quality Discipline Report, for further detail on potential visual effects.
- Permanent easements for utilities may be needed for two buildings at the end of Yesler Way in Pioneer Square: the One Yesler Building (H-87) and the Pioneer Square Hotel (H-88) (non-adverse effect).

Effects on Archaeological Properties

No operational effects on archaeological properties would result from the Elevated Structure Alternative, because additional ground disturbance is not expected after the construction is completed.

Exhibit 5-1. Operational Effects on Historic Properties

Property (Building No.)[1]	National Register Status	Bored Tunnel Alternative*	Cut-and-Cover Tunnel Alternative*	Elevated Structure Alternative*
Pioneer Square Historic District	NRHP historic district	Adjacent tunnel operations building Increased traffic	Emergency egress structure Adjacent tunnel maintenance building	Visual effects on buildings toward the western edge of the district
Alaskan Way Viaduct[2]	NRHP eligible	Demolition (adverse effect)	Demolition (adverse effect)	Demolition (adverse effect)
Battery Street Tunnel[2]	NRHP eligible	Decommissioning (adverse effect)	Alteration	Alteration
Elliott Bay Seawall	NRHP eligible	No operational effect	Demolition (adverse effect)	Demolition (adverse effect)
One Yesler Building (H-87) 1 Yesler Way	PSHD	No operational effect	No operational effect	Utility easement
Pioneer Square Hotel (H-88) 77 Yesler Way	PSHD	No operational effect	No operational effect	Utility easement
Washington Street Boat Landing (H-71) Foot of Washington Street	NRHP; PSPD	No operational effect	Removal and relocation (adverse effect)	Removal and relocation (adverse effect)
Olympic Warehouse (H-139) 1203 Western Avenue	NRHP, SL	No operational effect	Altered access	No operational effect
Pacific Net and Twine Building (H-140) 51 University Street	NRHP eligible; SL eligible	No operational effect	Altered access	No operational effect
Burlington Northern Railroad Tunnel (H-3) S. Main Street to Bell Street	NRHP eligible	No operational effect	Altered portal	No operational effect
Buckley's/MGM-Loew's (H-037A) 2331 Second Avenue	NRHP eligible; SL	No operational effect	Easement beneath building	No operational effect
Oregon Hotel (H-260) 2301 First Avenue	NRHP eligible; SL eligible	No operational effect	Easement for tiebacks	No operational effect

Exhibit 5-1. Operational Effects on Historic Properties (continued)

Property (Building No.)[1]	National Register Status	Bored Tunnel Alternative*	Cut-and-Cover Tunnel Alternative*	Elevated Structure Alternative*
Fire Station No. 2 (H-264) 2334 Fourth Avenue	NRHP eligible; SL	No operational effect	Emergency egress in basement	Emergency egress in basement
Lake Union Sewer Tunnel (H-372) Republican Street east of Aurora Avenue	NRHP eligible	Alter manhole shaft (adverse effect)	Alteration of manhole shaft (adverse effect)	Alteration of manhole shaft (adverse effect)

Notes: NRHP = National Register of Historic Places
PSHD = Pioneer Square Historic District
SL = Seattle Landmark
1. Building number corresponds with the number in Attachment A.
2. The Alaskan Way Viaduct and the Battery Street Tunnel are recorded as a single historic property, but each part would be affected differently by the various alternatives.
* All effects are considered non-adverse except where adverse effects are noted for individual entries.

More detailed information about mitigating the operational effects related to visual quality, noise, and air quality is provided in the following discipline reports:

- Appendix D, Visual Quality Discipline Report
- Appendix F, Noise Discipline Report
- Appendix M, Air Discipline Report

5.5 Operational Mitigation

Mitigation measures for unavoidable operational effects on historic properties are included in an MOA that was developed for the preferred alternative (Bored Tunnel Alternative) by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties (Attachment C). If one of the other build alternatives is selected, the MOA would be changed to reflect the mitigation needed for that the particular alternative.

Mitigation for the primary unavoidable operational effects, the demolition of the Alaskan Way Viaduct and decommissioning of the Battery Street Tunnel (Bored Tunnel Alternative only), is addressed in an MOA for the S. Holgate Street to S. King Street Viaduct Replacement Project. Under this MOA, an HAER report (including photographs) for the viaduct and the Battery Street Tunnel has been completed and submitted to the National Park Service (Sheridan 2009). Interpretive and public outreach programs have also been developed, including a podcast and an interactive website about the history of Seattle and the viaduct.

No mitigation would be necessary for operational effects on archaeological properties, because no additional ground disturbance is expected after the construction of the build alternatives is completed; therefore, there would be no effects on these properties.

5.5.1 Bored Tunnel Alternative

Mitigation for the demolition of the Alaskan Way Viaduct and the decommissioning of the Battery Street Tunnel has already been mitigated through the MOA for the S. Holgate Street to S. King Street Viaduct Replacement Project, described above in Section 5.5.

Alteration of the Lake Union Sewer Tunnel manhole shaft would be mitigated by documentation of the history and condition of the tunnel.

5.5.2 Cut-and-Cover Tunnel Alternative

If the Cut-and-Cover Tunnel Alternative becomes the preferred alternative, mitigation measures for unavoidable operational effects would be included in an MOA developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties. The mitigation measures may include but are not limited to the following:

- The removal of Washington Street Boat Landing pergola would be mitigated by restoration of the pergola and replacement at the water's edge. Restoration and placement of the pergola would be reviewed by the Pioneer Square Preservation Board.
- The demolition of the Elliott Bay Seawall would be mitigated by (1) HAER documentation of the seawall, and (2) preservation and appropriate replacement of the historical plaques and markers along the seawall.
- As noted above in Section 5.5.1, documentation to mitigate the alteration of the Lake Union Sewer Tunnel manhole shaft would be included in the MOA for the Cut-and-Cover Tunnel Alternative. Mitigation for the demolition of the Alaskan Way Viaduct is already included in the MOA for the S. Holgate Street to S. King Street Viaduct Replacement Project.

5.5.3 Elevated Structure Alternative

Because the Elevated Structure Alternative would result in essentially the same operational effects as the Cut-and-Cover Tunnel Alternative, the mitigation measures would be the same as those described in Section 5.5.2.

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Chapter 6 CONSTRUCTION EFFECTS AND MITIGATION

This chapter discusses potential effects on historic, cultural, and archaeological resources during the construction of each of the three build alternatives. It begins with a discussion of construction effects on built environment resources, followed by a discussion of construction effects on archaeological and cultural resources. It describes the potential effects, the measures that have been or would be implemented to avoid or minimize the effects, and the mitigation measures to be implemented for unavoidable adverse effects.

This chapter discusses both adverse and non-adverse effects. Under Section 106 of the National Historic Preservation Act [36 CFR 800.5(a)(1)], an effect is considered adverse when an action may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish any of the seven aspects of the property's integrity: location, design, setting, materials, workmanship, feeling, or association.

Effects that are not considered adverse are those that have some potential effect on an historic district or building but are less severe. These include most effects related to a building's use or economic viability. Under Section 106, there is a high standard for an effect to be considered adverse if it is related to economic conditions. An effect would be considered adverse only if it was so severe or prolonged that it would threaten the ability of the property owner to properly maintain the property and would, therefore, potentially lead to a loss of the property's historic integrity (such as a loss of historic materials or features).

6.1 Construction Effects on Built Environment Resources

Two types of effects on historic properties may occur during construction: (1) direct physical effects, caused primarily by settlement or vibration; and (2) more widespread indirect effects due to noise, dust and mud, traffic congestion, construction traffic, loss of parking, and limited access to buildings and structures. These indirect effects would be greatest within approximately one block of the project area (shown in Exhibit 2-1), but they would also occur to a lesser extent over a broader area. The potential direct construction effects on historic properties for each of the build alternatives are summarized in Exhibit 6-1.

Exhibit 6-1. Construction Effects on Historic Properties

Property (Building No.) [1]	National Register Status	Bored Tunnel Alternative*	Cut-and-Cover Tunnel Alternative*	Elevated Structure Alternative*
Pioneer Square Historic District	NRHP historic district	Settlement damage to two buildings (adverse effect) Increased traffic congestion	Increased traffic and potential damage to areaways	Increased traffic and potential damage to areaways
Western Building (H-108) 619 Western Avenue	PSHD	Damage due to settlement (adverse effect on PSHD)	Temporary utility easement	Temporary utility easement
Polson Building (H-109) 83 Columbia Street	PSHD	Damage due to settlement (adverse effect on PSHD)	Temporary utility easement	Temporary utility easement
Pike Place Market Historic District	NRHP historic district	No construction effect	Long-term reduction in parking and waterfront connections (adverse effect)	Long-term reduction in parking and waterfront connections (adverse effect)
Maritime Building (H-123) 911 Western Avenue	NRHP eligible	No construction effect	Temporary utility easement	Temporary utility easement
Olympic Warehouse (H-139) 1203 Western Avenue	NRHP, SL	No construction effect	Temporary utility easement	Temporary utility easement
Pacific Net and Twine Building (H-140) 51 University Street	NRHP eligible	No construction effect	Temporary utility easement	Temporary utility easement
Fix Building (H-160) 1507 Western Avenue	NRHP eligible	No construction effect	No construction effect	Temporary utility easement

Exhibit 6-1. Construction Effects on Historic Properties (continued)

Property (Building No.) [1]	National Register Status	Bored Tunnel Alternative*	Cut-and-Cover Tunnel Alternative*	Elevated Structure Alternative*
Piers 54, 55, 56, 57, and 59 (H-125, H-133, H-138, H-145, and H-152)	NRHP eligible, SL	No construction effect	Long-term severe traffic disruption, reduced access, and reduced parking (adverse effect) Temporary pedestrian bridges	Long-term severe traffic disruption, reduced access, and reduced parking (adverse effect) Temporary pedestrian bridges
Austin Bell Building (H-069A) 2326 First Avenue	NRHP, SL	No construction effect	Temporary tieback easement	Temporary tieback easement
Belltown Lofts (H-257) 66 Bell Street	SL	No construction effect	Temporary tieback easement	No construction effect
Buckley's (MGM-Loew's) (H-037A) 2331 Second Avenue	NRHP eligible, SL	No construction effect	6-month vacation for underpinning (adverse effect)	Temporary tieback easement
Lexington-Concord Apartments (H-051A) 2402 Second Avenue	NRHP eligible	No construction effect	Temporary tieback easement	Temporary tieback easement
Old Spaghetti Factory (H-322) 2800 Elliott Avenue	NRHP eligible	No construction effect	No construction effect	Economic, visual, and vibration effects due to Broad Street detour structure (adverse effect)

Note: This table does not include more generalized indirect effects such as noise and traffic congestion that would be experienced over a wider area during construction.
NRHP = National Register of Historic Places
PSHD = Pioneer Square Historic District
PSPD = Pioneer Square Preservation District (local)
SL = Seattle Landmark
[1] Building number corresponds to the number in Attachment A.
* All effects are considered non-adverse except where adverse effects are noted for individual entries.

6.1.1 All Build Alternatives

Common Construction Effects

One project action that would affect historic resources is included in all three build alternatives: demolition of the Alaskan Way Viaduct. All three build alternatives would also require traffic alterations during construction that may potentially affect some historic resources.

Viaduct Demolition

All three build alternatives would demolish the existing viaduct and adjoining ramps from approximately S. King Street to the Battery Street Tunnel. Although the viaduct and the tunnel are a single historic resource, they are discussed separately because the two components would be treated differently under the various build alternatives.

The demolition and removal of the viaduct structure is considered an adverse operational effect under Section 106, and is discussed in Chapter 5. The viaduct would be taken apart by sections. With this approach, vibration associated with demolition and removal is not expected to be substantial, and it would not result in an adverse effect on the adjacent historic properties.

The viaduct demolition would be performed by two demolition crews working in two-block segments for a total of approximately 9 months. However, each individual area would be affected for a much shorter period of time. The economic effects due to demolition would not be considered adverse because the demolition would not continue for a long enough period to interfere with the financial ability of owners to maintain the buildings in good condition. Employees, customers, and residents would be able to continually occupy the buildings but may be affected by noise, dust, and limited access and parking for a period of time. The potentially affected buildings would be those adjacent to the viaduct between S. Jackson and Columbia Streets and near the ramps on Columbia and Seneca Streets. The adjacent buildings within the Pioneer Square Historic District are the following (shown on Exhibits 4-7 and 4-8):

- Otto Sturham & Sons Building (H-43)
- Our Home Hotel (H-53)
- Boston Hotel (H-54)
- OK Hotel (H-58)
- Seattle Image Setting (H-59)
- Lutheran Compass Center (H-74)
- Prudential Building (H-81)

- Pioneer Square Hotel (H-82)
- One Yesler Building (H-87)
- Western Building (H-108)
- Polson Building (H-109)
- Daily Journal of Commerce building (H-110)

Also potentially affected would be three properties listed in the NRHP: Grand Pacific Building (H-135), Olympic Warehouse (H-139), and Colman Building (H-118). Users of the central waterfront piers (Piers 54 through 59) may also be affected by noise, dust, and limited access and parking but to a lesser extent because the piers are farther away. The economic effects would not be severe enough to be considered an adverse effect on historic properties.

Traffic

Under all three build alternatives, traffic patterns downtown would change during construction, with closures of Alaskan Way and SR 99 and detours for varying durations depending on the alternative. The Bored Tunnel Alternative would result in the least traffic effects during construction and the Cut-and-Cover Tunnel Alternative would have the greatest traffic effects. Most of the traffic during construction would disperse to various routes throughout downtown and would not significantly affect the Pioneer Square Historic District or the Pike Place Market Historic District. Please see Appendix C, Transportation Discipline Report, for the transportation analysis and measures to address traffic management and parking.

The historic neighborhoods (Pioneer Square, the Pike Place Market, and the central waterfront historic pier area) depend on tourist and entertainment traffic, so even the perception of reduced access could have noticeable economic effects. Experience with the Nisqually earthquake (which occurred in February 2001) showed that a prolonged period of traffic disruption and construction could potentially result in the loss of the distinctive character and economic base of historic neighborhoods. If these effects are severe enough, they could reduce revenue for businesses, thereby affecting the economic viability of businesses and the ability of the owners to maintain the buildings in good condition. Measures would be implemented to help business owners and neighborhoods maintain business viability during construction.

Avoidance and Minimization of Construction Effects

Throughout the project planning and design process, efforts have been made to avoid or minimize adverse effects on historic resources. One of the first steps in the design process was to identify and map both designated and potential historic

properties (both NRHP-listed and locally designated properties). The design team used this information to influence specific construction decisions in order to avoid effects on historic resources whenever possible.

Efforts to minimize effects during construction would include the following:

- Develop a communications plan to keep property owners, residents, businesses, and employees in historic districts and in other historic buildings informed about construction issues. Elements of this program could include e-mail updates, a website with frequent updates, a newsletter, a telephone information line, and/or regular meetings with historic district organizations and building owners.
- Provide information on alternative transportation modes or parking.
- Use BMPs to control noise, including the quietest possible equipment and techniques and construction of noise walls or other barriers to block noise before it reaches historic buildings as needed.
- Use BMPs to control air pollution and mud.
- Minimize construction traffic in historic areas when possible.
- Ensure continued access to stores, offices, and residence when possible.
- Minimize disruptions of utility service in historic areas and for historic buildings during construction.
- Schedule construction activities, when possible, to minimize effects on tourism and peak and seasonal shopping periods.

Mitigation of Construction Effects

Adverse effects due to traffic, noise levels, vibration, and air quality would apply to historic resources located adjacent to the project construction. Therefore, the mitigation measures implemented to address those effects would also minimize the effects on historic resources.

In addition, WSDOT will minimize effects on historic resources by implementing the following measures:

- Traffic mitigation measures, as described in Appendix C, Transportation Discipline Report
- Compliance with construction management plans, such as the Fugitive Dust Control Plan and the Spill Prevention, Control, and Countermeasures Plan
- Access to stores, offices, and residences in historic areas

- Minimization of disruptions to utility services in historic areas and for historic buildings
- Use of newsletter, websites, posters, community e-mail updates, community events, and other methods of communication to keep property owners, residents, and business owners and employees in historic districts informed about construction issues

Mitigation for unavoidable construction effects on the built environment is included in an MOA (see Attachment C) for the preferred alternative (Bored Tunnel Alternative), which is discussed in Section 6.1.2, under the heading "Construction Effects." If one of the other build alternatives is selected, the MOA would be changed to reflect the mitigation needed for that alternative.

6.1.2 Bored Tunnel Alternative

Construction Effects

Construction of the Bored Tunnel Alternative (preferred) would take approximately 5.4 years, with construction activity taking place primarily near the two tunnel portals. SR 99 would be closed for 3 weeks, plus occasional weekend closures. Also, between S. Atlantic and S. King Streets, Alaskan Way S. would be closed for the entire 5.4-year construction period.

More detailed information relating to construction is provided in the following discipline reports:

- Appendix B, Alternatives Description and Construction Methods Discipline Report
- Appendix C, Transportation Discipline Report
- Appendix F, Noise Discipline Report
- Appendix M, Air Discipline Report
- Appendix P, Earth Discipline Report

Building Settlement

The primary adverse effects on historic properties related to construction would be a result of settlement due to soil subsidence as the TBM moves from Alaskan Way to First Avenue. In order to determine the risk of building damage due to settlement, a preconstruction assessment of buildings in the study area was conducted (Coughlin Porter Lundeen et al. 2010). The extent of potential damage depends primarily on the building's existing structural condition and the depth of the tunnel beneath the building. To avoid and minimize these effects, structural engineers have inspected every building within the anticipated settlement zone (approximately one block on each side of the proposed alignment). Each

inspection consisted of a review of available building plans and a physical inspection of both the exterior and interior to identify the structural system, existing cracks or flaws, and other relevant conditions. This information was then analyzed to evaluate the potential effect of predicted settlement on each building. The strategy for minimizing and/or mitigating effects is based on this analysis.

To identify buildings that are potentially vulnerable to damage due to settlement during tunneling, the data from the building assessments were analyzed and each building was rated using the Boscardin and Cording analytical method (Exhibit 6-4), a standard widely used for this purpose (Coughlin Porter Lundeen et al. 2010). This initial rating was then refined using more detailed computer-aided analysis for at-risk structures and professional engineering judgment to better account for the existing structural condition of the building and other unique factors. This analysis classifies potential building damage due to settlement in terms of six categories, as described in Exhibit 6-2. A damage rating of "slight" or less was considered non-adverse, because any damage could be easily repaired without diminishing the integrity of a building. Potential damage of "moderate" or greater was considered an adverse effect.

Exhibit 6-2. Building Damage Classification

Class of Damage	Description of Damage	Approximate Width of Cracks
Negligible	Hairline cracks.	<0.1 millimeter
Very slight	Fine cracks; perhaps an isolated slight fracture in building. Cracks in exterior brickwork visible upon close inspection.	<1 millimeter
Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible; some repointing may be required for weather tightness. Doors and windows may stick slightly.	<5 millimeters
Moderate	Cracks may require cutting out and patching. Tuck-pointing and replacement of some exterior brickwork may be required. Doors and windows stick. Utility service may be interrupted. Weather-tightness may be impaired.	5 to 15 millimeters, or several cracks >3 millimeters
Severe	Extensive repair required, involving removal and replacement of section of walls, especially over doors and windows. Windows and door frames distorted, floor slopes noticeably; walls lean, doors bulge noticeably; some loss of bearing in beams. Utility service disrupted.	15 to 25 millimeters; also depends on number of cracks
Very severe	Major repair required, involving partial or complete reconstruction. Beams lose bearing. Walls lean badly and require shoring. Windows broken by distortion. Danger of instability.	Usually >25 millimeters; also depends on number of cracks

Source: Boscardin and Cording 1989.

As a result of the engineering analysis, two historic buildings were rated as having a risk of moderate or more severe damage from settlement: the Western Building and the Polson Building. Both buildings are contributing properties in the Pioneer Square Historic District, and these settlement effects would therefore result in an adverse effect on the district. Mitigation for the effect is discussed under the heading "Mitigation of Construction Effects."

The Western Building (H-108, 619 Western Avenue), located on Western Avenue near the end of Yesler Way, may experience a very severe effect due to settlement during the tunnel boring process. An inspection of the building indicates that it is currently in poor structural condition, primarily due to severe settlement that has occurred because the supporting timber piles have decayed (Coughlin Porter Lundeen 2010). Because of the poor condition of the building, the settlement that would occur during tunnel boring may cause severe cracking of the exterior and interior walls and loss of bearing in the beams, potentially leading to the building's collapse. Several options for stabilizing the building and reinforcing the failed foundation were studied, as well as building demolition (Coughlin Porter Lundeen 2011).

The adjoining Polson Building (H-109, 83 Columbia Street) is also at risk of moderate damage due to settlement.

It is possible that settlement would result in utility disruption or damage to streets or sidewalks, which could affect individual historic buildings along the alignment or in the Pioneer Square or Pike Place Market Historic Districts. If they occur, such effects would most likely be repaired quickly. The possible short-term economic effect would not be considered adverse under Section 106 because it would not be likely to affect the economic viability of the historic buildings and districts or the characteristics that make them eligible for listing in the NRHP.

No damage to areaways is expected. Areaways in Pioneer Square are located some distance from (one block or more) the tunnel alignment. Each Pioneer Square areaway has been inspected by structural engineers; these assessments indicate that the Pioneer Square areaways within the study area are typically in fair condition but are vulnerable because of their age and materials. Areaways outside of Pioneer Square (primarily near the Pike Place Market Historic District) are typically of newer concrete construction and are generally in fair to good structural condition. No damage is expected because the bored tunnel would be at great depth when it reaches the Pike Place Market area. Any damage would be minimized by careful monitoring to warn of potential settlement as the TBM advances and by the installation of temporary supports or cribbing if warranted by the results of the monitoring and assessment of the building.

Traffic and Parking Effects in Pioneer Square and Pike Place Market Historic Districts

Traffic patterns downtown would change during construction, because SR 99 and Alaskan Way near the southwestern edge of Pioneer Square would be closed for the entire 5.4-year construction period. SR 99 would be reduced to two lanes in each direction periodically over a 3.5-year period, with occasional short-term closures. Most of the traffic during construction would disperse to various routes throughout downtown and would not result in an adverse effect on the Pioneer Square or the Pike Place Market Historic Districts. Some parking would be removed in the Pioneer Square area during construction. However, adequate parking would still be available in nearby pay lots. See Appendix C, Transportation Discipline Report, for the transportation analysis and measures to address traffic management and parking.

Construction Staging Area Effects

At the south portal of the bored tunnel, the primary construction staging area would be located at First Avenue S. and Railroad Way S., across the street from the NRHP-listed Triangle Building and the Pioneer Square Historic District. Until the completion of the bored tunnel, this site would contain temporary ventilation fans, air compressors, electric generators, and other construction equipment. Tunnel spoils would be removed from the area by means of a conveyor system. The spoils (or muck) would be transported by barge to the Mats Mats Quarry near Port Ludlow in Jefferson County. This level of activity and noise could potentially affect some nearby residents, employees, and customers, but the effects are not expected to be severe enough to threaten the continued maintenance and preservation of the buildings. Therefore, they are not considered adverse effects.

In the north portal area, the bored tunnel would extend to Thomas Street, where a TBM retrieval shaft would be excavated between Thomas and Harrison Streets upon completion of the tunnel boring. A cut-and-cover tunnel segment would extend between John, Thomas, and Harrison Streets. Harrison Street and a portion of Sixth Avenue would be rebuilt just north of the existing Battery Street Tunnel. A tunnel operations building would be built between Thomas and Harrison Streets on the east side of the tunnel. There would be no effects on historic resources as a result of this construction in the north portal area.

Avoidance and Minimization of Construction Effects

Considerable effort has gone into avoiding and minimizing potential damage to historic properties due to settlement during construction of the Bored Tunnel Alternative. The major factors in tunneling-induced settlement are the alignment and size of the tunnel and the geotechnical conditions. Tunnel alignment and size are driven primarily by highway and tunnel design standards and by project

constraints at either end. During the design of the Bored Tunnel Alternative, the proposed alignment was shifted to the west away from First Avenue S. This change avoided potential construction effects on more than 50 buildings in the Pioneer Square Historic District.

A number of measures would be implemented to further minimize construction effects on historic properties. These measures include incentives in the design/build contract to minimize settlement, contractual penalties for exceeding the settlement threshold, an extensive monitoring program that would provide early warning when the settlement threshold may be exceeded, contractual requirements for design and operation of the TBM, and use of various soil improvement and grouting techniques to improve soil strength or compensate for ground loss as the excavation advances. Consolidation and compensation grouting techniques would involve injecting a low-viscosity grout to fill voids and compensate for soil settlement, thereby reducing effects.

One measure to minimize the risk of settlement at the south end of the bored tunnel would be the construction of a "protection box" made of secant piles that would extend from approximately S. Dearborn Street (south of the Pioneer Square Preservation District) to S. Main Street. Before the TBM moves north of S. King Street, slurry or secant piles would be installed along both sides of the tunnel alignment to just south of Yesler Way. Once the walls have been installed, the TBM excavation operation would begin.

A deformation analysis report is being developed that will include a comprehensive construction monitoring program to manage the risks of settlement and minimize effects. The monitoring plan is summarized in the project MOA (see Attachment C). Based on the allowable settlement threshold determined through analysis of the buildings and soil conditions, settlement at points on each building would be continuously measured, starting before the tunneling begins and continuing until up to a year after the tunneling operation has passed the building. In addition, the ground, groundwater levels, and other structures and utilities in the construction area would be monitored before construction begins to establish a baseline, during construction, and after construction. A variety of monitoring instrumentation would be used, including tiltmeters, crack gauges, liquid levels, inclinometers, and seismographs. The number and type of instruments would be tailored to the size and characteristics of each building.

As the TBM advances, measurement of ground loss directly over the tunnel would provide an indicator of potential effects on buildings and other facilities. To reduce settlement, any voids created by the tunneling process would be filled with grout as the TBM advances. If settlement exceeds the established thresholds (a moderate rating on the damage scale in Exhibit 6-2), the project would consult with DAHP regarding necessary actions.

Although the potential damage was determined to be negligible for most of the historic buildings along the tunnel alignment, the settlement analyses indicated that the One Yesler Building in the Pioneer Square Historic District would benefit from proactive measures to avoid damage due to settlement. The One Yesler Building would be protected during tunnel boring by constructing a below-grade micropile wall to the west of the building. This would protect the building but would have no effect on the building itself. The building would be monitored for the duration of project construction.

The settlement analyses also indicated that 11 historic buildings may potentially experience minor effects (very slight on the damage scale in Exhibit 6-2), such as utility disruptions, minor cracks that require interior painting or repainting of brick walls, or slightly sticking doors and windows. These effects are not considered adverse because they would not diminish the integrity of the buildings or their historic features. However, any damage would be repaired in kind, as needed, in keeping with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

Because settlement would be controlled through the operation of the TBM, the risk would be too slight to warrant proactive compensation grouting. However, the buildings would be monitored continuously during tunneling and the necessary preparation for grouting would be completed in advance so that it could be implemented as a contingency measure. If the monitoring during TBM operation indicates a need, grouting would be performed immediately to prevent damage. If settlement exceeds the established thresholds (a moderate rating on the damage scale in Exhibit 6-2), WSDOT would consult with DAHP regarding necessary actions.

The 11 buildings that may experience minor effects are the following:

- Federal Office Building (H-124)
- National Building (H-126)
- Alexis Hotel (Globe Building) (H-127)
- Arlington South (Beebe Building) (H-129)
- Arlington North (Hotel Cecil) (H-131)
- Watermark Tower (Colman Building) (H-134)
- Grand Pacific (Grand Pacific Hotel) (H-135)
- Grand Pacific (Colonial Hotel) (H-136)
- Fire Station No. 2 (H-264)
- Two Bells Bar and Grill (H-045A)
- Archstone Belltown (Grosvenor House) (H-056A)

Mitigation of Construction Effects

Mitigation for unavoidable construction effects on the built environment is described in an MOA (Attachment C) developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties.

Mitigation for potential damage to the 11 historic buildings identified in the previous section is addressed in the project MOA. Other activities to minimize effects during construction include those listed in Section 6.1 as common to all effects and the following:

- Establishment of a claims fund for repairing any damage to buildings. A stream-lined local procedure would be implemented to ensure that repairs are made as quickly as possible. An architectural historian would be involved in the evaluation and repair of damage to historic buildings.
- Repair of damage caused by the project in-kind and in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. If exterior alternations are necessary, approval would be sought as required from the Pioneer Square Preservation Board, the Seattle Landmarks Preservation Board, the Pike Place Market Historical Commission, or DAHP for buildings that are NRHP eligible but not for locally designated buildings.
- Development of a communications plan to keep property owners, residents, businesses, and employees in historic districts and in other historic buildings informed about construction issues. Elements of this plan could include e-mail updates, a website with frequent updates, newsletter articles, and regular public meetings. Elements of this plan are outlined in the project MOA (Attachment C).
- Establishment and staffing of an information center in Pioneer Square to provide project and construction information and displays on the area's history and archaeology.
- Development of a traffic management and construction coordination plan to proactively provide information on lane and road closures, detours, parking changes, etc. Elements of this plan are outlined in the project MOA (Attachment C).
- Development and implementation of marketing activities to promote Pioneer Square as an attractive destination that is open for business for the duration of project construction. Elements of this plan are outlined in the project MOA (Attachment C).

Western Building

Numerous options were evaluated to mitigate settlement damage to the Western Building.

The following building protection work was selected; the activities will include:

- Investigating the condition of the piles and supplementing deteriorated piles with new micropiles
- Installing new shotcrete walls in the basement
- Providing positive connections to tie the building together where floors connect and where beams connect to columns
- Stabilizing cracked columns, walls, and beams with steel channels, concrete jackets, and/or fiberwrap
- Installing a temporary exterior steel frame to provide secondary support and to brace the building against sway and differential movement during tunneling
- Installing temporary interior shoring and guy wire bracing to provide secondary fill support of vertical loads and to prevent sway of the building during tunneling
- Injecting compensation grouting below grade to offset any settlement due to tunneling activity
- Patching any exterior holes resulting from installation or removal of the temporary steel frame
- Monitoring the building for the duration of project construction

The steel framing and the interior shoring and bracing would be removed when the risk of settlement diminishes, leaving the exterior appearance of the building approximately the same as it is currently. The process of construction, tunneling, and removal of the bracing would take approximately 12 months. The work would be reviewed by the Pioneer Square Preservation Board and would be performed in compliance with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

Polson Building

Actions would be taken to protect the adjacent Polson Building during the construction activities on the Western Building. The Polson Building would also be protected by compensation grouting to stabilize the surrounding soil, which would have no effect on the building itself. The work would be reviewed by the Pioneer Square Preservation Board and would be performed in compliance with the

Secretary of the Interior's Standards for Rehabilitation of Historic Buildings (36 CFR 67.6).

6.1.3 Cut-and-Cover Tunnel Alternative

Construction Effects

Construction of the Cut-and-Cover Tunnel Alternative would take 8.75 years. Major construction activity would occur for 6.25 years and would take place along the entire corridor at various times. During this period, travel on SR 99 would be limited to one direction for 2.25 years, and the route would be completely closed for 2.25 years. Alaskan Way along the central waterfront would be limited to local traffic only for a period of 3.5 to 4.5 years, and it would be reduced to one lane for an additional 3.5 years. The construction effects would vary over that time, depending on the work being performed and its location. However, construction and traffic disruption would continue throughout the entire period, especially on the central waterfront.

More detailed information is provided in the following discipline reports:

- Appendix B, Alternatives Description and Construction Methods Discipline Report
- Appendix C, Transportation Discipline Report
- Appendix F, Noise Discipline Report
- Appendix M, Air Discipline Report
- Appendix P, Earth Discipline Report

Construction of the cut-and-cover tunnel would begin along the central waterfront, resulting in traffic disruption. While access to the piers would be provided, perceptions of access difficulties would potentially discourage casual visitors. Potential effects include exposure of building occupants and customers to noise and dust, and sporadic changes to access. These effects would, in turn, result in an economic effect on the businesses, both retail and office, currently located on the piers. This economic effect would potentially extend to the Pike Place Market and Pioneer Square areas, because parking would be more difficult to find and people would tend to stay away from the area.

Construction of the Cut-and-Cover Tunnel Alternative would result in adverse effects on the following historic properties:

- Piers 54 through 59 on the central waterfront would be severely affected because of the long period of construction and the very restricted use of Alaskan Way in front of the piers for 8.5 years. This period is long enough

to potentially threaten the ability of the property owners to maintain the structures adequately.

- The Pike Place Market Historic District would potentially be adversely affected because of the lengthy construction period. Much of the market's business relies on the availability of parking along the waterfront and on a strong connection with waterfront attractions such as the Seattle Aquarium and the historic piers.
- The Buckley's (MGM-Loew's) building (H-037A) at Second Avenue and Battery Street would be adversely affected because it would have to be vacated for safety reasons for approximately 6 months to complete the underpinning work inside the building for construction of the tunnel.

Non-adverse construction effects would include the following:

- Removal of parking on First Avenue S. would increase traffic (especially heavy trucks and buses) above the fragile areaways beneath the sidewalks, potentially leading to structural damage.
- Removal of parking beneath the viaduct and on First Avenue/First Avenue S. would potentially discourage customers from patronizing businesses along the central waterfront and, to a lesser extent, in the Pike Place Market and Pioneer Square Historic Districts.
- Temporary pedestrian bridges would be constructed between Piers 54 and 55 and Piers 56 and 57. The construction plans would be reviewed by the Seattle Landmarks Preservation Board to ensure that the new structures would not permanently harm their historic character or materials.
- Temporary easements for utility relocation may be required for five historic buildings: Western Building (H-108), Polson Building (H-109), Maritime Building (H-123), Olympic Warehouse (H-139), and the Pacific Net and Twine Building (H-140).
- Construction of a retaining wall between Stewart and Blanchard Streets, in the vicinity of the Pike Place Market and Victor Steinbrueck Park, would result in potential noise and other construction effects.
- In the north end, temporary bridges would be constructed at John and Thomas Streets, potentially disrupting traffic destined for Seattle Center.
- Construction of the tunnel maintenance building near First Avenue and Battery Street would result in potential effects on the adjacent Hull Building (H-070A); these effects would not be severe enough to threaten the physical integrity of the building.

- Broad Street north of Thomas Street would be demolished and backfilled to bring it to the same grade as the surrounding streets. This construction would potentially affect attendance at Seattle Center to some extent.
- Temporary easements for construction tiebacks may be needed for three historic buildings: Belltown Lofts (H-257), Austin Bell Building (H-069A), and Lexington-Concord Apartments (H-051A).

Avoidance and Minimization of Construction Effects

Throughout the project planning and design process, efforts have been made to avoid or minimize adverse effects on historic and archaeological resources. One of the first steps in the design process was to identify and map both designated and potential historic properties (both NRHP-listed and locally designated properties). The design team used this information to influence specific construction decisions in order to avoid effects on historic resources whenever possible.

Activities to minimize effects during construction would include those listed in Section 6.1.1 for all three build alternatives. In addition, the areaways that would potentially be adversely affected by increased traffic would be evaluated and monitored.

Mitigation of Construction Effects

If the Cut-and-Cover Tunnel Alternative becomes the preferred alternative, mitigation measures for unavoidable construction effects would be described in an MOA developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties. The mitigation measures may include the following:

- Compensation would be paid to the owner of the Buckley's/MGM-Loew's building for the 6 months of use, to prevent deterioration of the historic materials and features.
- Project-related damage to historic buildings would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings. If exterior alterations are necessary, approval would be sought, as required, from the Pioneer Square Preservation Board, the Seattle Landmarks Preservation Board, the Pike Place Market Historical Commission (interior and exterior alterations), or DAHP.
- A claims and repair process would be established to repair any damage to historic buildings. An architect who has experience with historic buildings would be involved in evaluating and repairing any damage to historic buildings.

6.1.4 Elevated Structure Alternative

Construction Effects

Construction of the Elevated Structure Alternative would take approximately 10 years, including utility relocation. Major construction activity would occur for 7.5 years. For 6 years during this period, SR 99 would be reduced to two lanes in each direction. The route would be completely closed in each direction for a total of 3 to 6 months. A detour structure would be on Broad Street for 4.25 years. Traffic on Alaskan Way would be restricted to one lane in each direction for approximately 10 years. The construction effects would vary over that time period, depending on the work being performed and its location. However, construction and traffic disruption would continue throughout the entire construction period, especially on the central waterfront.

More detailed information is provided in the following discipline reports:

- Appendix B, Alternatives Description and Construction Methods Discipline Report
- Appendix C, Transportation Discipline Report
- Appendix F, Noise Discipline Report
- Appendix M, Air Discipline Report
- Appendix P, Earth Discipline Report

Construction of the Elevated Structure Alternative would result in adverse effects on the following historic properties:

- The Pike Place Market Historic District would be potentially adversely affected because of the lengthy construction period. Much of the market's business relies on the availability of parking along the waterfront and on a strong connection with waterfront attractions such as the Seattle Aquarium and the historic piers.
- Piers 54 through 59 on the central waterfront would also potentially be adversely affected because of the long period of construction and the restricted use of Alaskan Way in front of the piers for 10 years. This period is long enough to potentially threaten the ability of the property owners to maintain the structures adequately.
- Construction of the Broad Street detour would potentially result in adverse effects on the Old Spaghetti Factory (H-322), a building that is eligible for listing in the NRHP and for Seattle landmark designation. The detour would carry southbound SR 99 traffic from Aurora Avenue near Republican Street down Broad Street to the Alaskan Way surface street. A bridge would be built over the railroad tracks and Elliott Avenue,

rounding the sharp curve at the end of Broad Street next to the Old Spaghetti Factory. Vibration associated with the construction of the detour would potentially result in effects on the 1902 brick building. The structure would be in place for more than 4 years, so that altered traffic patterns, visual effects and the noise, dust and congestion from construction would potentially disrupt the business so much that it could lead to closure of the restaurant and the abandonment and deterioration of the building.

Non-adverse construction effects would include the following:

- Removal of parking on First Avenue S. would increase traffic (especially heavy trucks and buses) above the fragile areaways beneath the sidewalks, potentially leading to structural damage. However, the period of time during which heavy traffic would be using First Avenue/First Avenue S. through the Pioneer Square Historic District, the most vulnerable area, may be less than that for the Cut-and-Cover Tunnel Alternative.
- Removal of parking beneath the viaduct and on First Avenue/First Avenue S. and disruption due to construction would potentially discourage customers from patronizing businesses along the central waterfront and, to a lesser extent, in the Pike Place Market and Pioneer Square Historic Districts.
- Temporary easements for utility relocation may be required for six historic buildings: Western Building (H-108), Polson Building (H-109), Maritime Building (H-123), Olympic Warehouse (H-139), Pacific Net and Twine Building (H-140), and Fix Building (H-160). An aerial easement may also be needed at the Polson Building for construction of the new ramp.
- Temporary easements for construction tiebacks for the Battery Street Tunnel may be needed for three historic buildings: Austin Bell Building (H-069A), Buckley's (MGM-Loew's) building (H-037A), and Lexington-Concord Apartments (H-051A).
- Temporary pedestrian bridges would be constructed between Piers 54 and 55 and Piers 56 and 57. The construction plans would be reviewed by the Seattle Landmarks Preservation Board to ensure that the new structures would not permanently harm their historic character or materials.
- Each of the three build alternatives would result in typical temporary construction effects on the western edge of downtown Seattle. These indirect effects would include noise, traffic congestion, and reduced parking. Several buildings (shown in Exhibit 6-1) would have temporary utility easements during construction.

- The diversion of southbound SR 99 traffic onto Broad Street could lead to increased congestion that would potentially limit access to Seattle Center, which includes several buildings that are eligible for listing in the NRHP (the Space Needle, the Pacific Science Center, and the Center House). Because these businesses depend on tourists, access limitations could reduce their economic viability.

None of these effects would be severe enough to constitute an adverse effect on a historic building or a historic district. As required by Section 106 of the National Historic Preservation Act, these effects have been evaluated in terms of the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, or association. None of these construction effects would significantly diminish any of the characteristics that qualify the historic property for inclusion in the NRHP. The potential construction effects that are not severe enough to be considered adverse would be addressed through the NEPA process.

Avoidance and Minimization of Construction Effects

Throughout the project planning and design process, efforts have been made to avoid or minimize adverse effects on historic and archaeological resources. One of the first steps in the design process was to identify and map the historic districts and designated and potential historic properties (both NRHP-listed and locally designated properties). The design team used this information to influence specific construction decisions in order to avoid effects on historic resources whenever possible.

Activities to minimize effects during construction would include those listed in Section 6.1.1 for all three build alternatives. Additional activities include the following:

- Evaluate and monitor the Old Spaghetti Factory and develop a plan to minimize effects during construction and use of the Broad Street detour structure.
- Evaluate and monitor the areaways that would potentially be adversely affected by increased traffic.

Mitigation of Construction Effects

If the Elevated Structure Alternative becomes the preferred alternative, mitigation measures for unavoidable construction effects would be described in an MOA developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties. The mitigation measures may include the following:

- Project-related damage to historic buildings would be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings. If exterior alterations are necessary, approval would

be sought, as required, from the Pioneer Square Preservation Board, the Seattle Landmarks Preservation Board, the Pike Place Market Historical Commission (interior and exterior alterations), or DAHP.

- A claims and repair process would be established to repair any damage to historic buildings. An architect who has experience with historic buildings would be involved in evaluating and repairing any damage to historic buildings.

6.2 Construction Effects on Archaeological Resources

6.2.1 Construction Effects Common to All Build Alternatives

Two recorded archaeological sites would be adversely affected by construction of all three of the build alternatives. The effects of each of the alternatives on these two sites are indicated in Exhibit 6-3. Several archaeologically sensitive areas would also be affected by all three build alternatives; these areas and the effects are discussed below.

Exhibit 6-3. Recorded Archaeological Sites Affected by All Three Build Alternatives

Site	National Register Status	Bored Tunnel Alternative	Cut-and-Cover Tunnel Alternative	Elevated Structure Alternative
45KI924, Dearborn South Tideland Site	NRHP eligible	South portal excavation and utilities work (adverse effect)	South portal excavation and utilities work (adverse effect)	Piling supports and utilities work (adverse effect)
45KI958	No eligibility determination or recommendation	North portal excavation, intersection improvements, and utilities work (adverse effect if eligible)	Tunnel excavation, intersection improvements, and utilities work (adverse effect if eligible)	Tunnel excavation, intersection improvements, and utilities work (adverse effect if eligible)

The Dearborn South Tideland Site (45KI924), which is eligible for listing in the NRHP, would be adversely affected under all three build alternatives. For the Bored Tunnel and Cut-and-Cover Tunnel Alternatives, excavation of the south portal and utilities work would disturb the site (please see Appendix K, Public Services and Utilities Discipline Report, for a discussion of project effects due to utility relocations). For the Elevated Structure Alternative, installation of piling supports and utilities work would disturb site deposits.

Site 45KI958, the historic-period site in the northern portion of the study area, has not been evaluated for NRHP eligibility. If the site is determined to be eligible for

listing in the NRHP, all three build alternatives would adversely affect it. Under all three build alternatives, SR 99 would cross under surface streets in a cut-and-cover trench. Excavation of the trench would disturb and remove site deposits. These effects would directly alter the characteristics that qualify the site for inclusion in the NRHP (if indeed the site is determined to be eligible for listing in the NRHP); therefore, they constitute adverse effects.

All three build alternatives would also result in effects on certain archaeologically sensitive areas. If one or more sites that are eligible for listing in the NRHP are discovered before or during construction in these areas, the sites would be adversely affected under all three build alternatives. The locations that have been identified as sensitive for potential archaeological deposits within each alternative's area of potential ground disturbance are indicated in Exhibit 6-4, with the locations listed from south to north within the study area.

Sensitive areas that would be affected by all three build alternatives are the following:

- Area between S. Royal Brougham Way and S. King Street, where historic resources are likely to be present beneath regrade fill. The Bored Tunnel and Cut-and-Cover Tunnel Alternatives would include a cut-and-cover trench in this location, and the Elevated Structure Alternative would include piling supports.
- Former tidal flat areas between S. Royal Brougham Way and S. King Street, and in the Alaskan Way alignment from just south of S. Jackson Street to just south of Columbia Street, where Native American resources may be present. These areas were probably used as a resource gathering locations and travel corridors, and some artifacts or features may be present. All three build alternatives would involve ground disturbance (trenching, piling supports, or ground improvements) through the entire depth of potential resources in these areas.
- Holocene sediments near the modern ground surface in the Alaskan Way Viaduct alignment between Pike and Bell Streets. Disturbance during the historic period has reduced the potential for the presence of Native American Pre-Contact archaeological resources, but such resources may still be present. The Cut-and-Cover Tunnel and Elevated Structure Alternatives would involve ground disturbance through the entire depth of potential deposits, whereas the Bored Tunnel Alternative would involve disturbance of the upper 5 feet of the deposits.
- The area from the north portal of the Battery Street Tunnel to Ward Street, where historic surfaces are known to exist beneath fill, as demonstrated by the presence of site 45KI958. All three build alternatives would involve

the excavation of a cut-and-cover trench in this area, as well as utilities upgrades.

- A peat deposit in the northern portion of the study area (between John Street and Valley Street, along Aurora Avenue N.) dating to the Pre-Contact period that may contain Native American deposits. No archaeological materials have been found in the peat layer, but such materials may be present and as yet undiscovered. All three build alternatives would result in disturbance of the peat layer by the excavation of a cut-and-cover trench and utilities work.

Exhibit 6-4. Effects of the Build Alternatives on Archaeologically Sensitive Areas

Archaeologically Sensitive Area (South to North)	Type of Potential Resources	Depth of Potential Resources	Bored Tunnel Alternative	Cut-and-Cover Tunnel Alternative	Elevated Structure Alternative
Area between S. Royal Brougham Way and S. King Street	Native American resources at tidal flat elevation	22.5 to 41 feet below surface	Cut-and-cover trench at south portal, depth varying between 10 and 90 feet	Cut-and-cover trench, depth varying between 10 and 60 feet	Piling supports, maximum depth 100 feet
Area between S. Royal Brougham Way S. King Street	Historic resources at dredge fill elevations	4 to 12 feet below surface	Cut-and-cover trench at south portal, depth varying between 10 and 90 feet	Cut-and-cover trench, depth varying between 10 and 60 feet	Piling supports, maximum depth 100 feet
Alaskan Way alignment from just south of S. Jackson Street to just south of Columbia Street	Native American resources at tidal flat elevation	23 to 30 feet below surface	Ground improvements for bent stabilization, maximum depth 110 feet	Cut-and-cover trench, maximum depth 86 feet Seawall improvements north of S. Jackson Street, maximum depth of 45 feet	Piling supports, maximum depth 100 feet Seawall improvements north of S. Jackson Street, maximum depth 45 feet
Alaskan Way Viaduct alignment from Pike to Bell Streets	Native American resources associated with terrestrial Holocene sediments	0 to 14 feet below surface	Utilities, maximum depth 5 feet	Cut-and-cover trench, maximum depth 25 feet	Piling supports, maximum depth 100 feet

Exhibit 6-4. Effects of the Build Alternatives on Archaeologically Sensitive Areas (continued)

Archaeologically Sensitive Area (South to North)	Type of Potential Resources	Depth of Potential Resources	Bored Tunnel Alternative	Cut-and-Cover Tunnel Alternative	Elevated Structure Alternative
Alaskan Way Viaduct alignment from Pike to Bell Streets	Historic-period resources associated with upper surface of terrestrial Holocene sediments	0 to 14 feet below surface	Utilities, maximum depth 5 feet	Cut-and-cover trench, maximum depth 25 feet	Piling supports, maximum depth 100 feet
Area from Battery Street Tunnel north portal to Ward Street	Native American resources associated with Holocene peat deposit	11.5 to 17.5 feet below surface	Cut-and-cover trench and utilities, maximum depth 90 feet	Cut-and-cover trench and utilities, maximum depth 50 feet	Cut-and-cover trench and utilities, maximum depth 50 feet
Area from Battery Street Tunnel north portal to Ward Street	Historic-period resources associated with upper surface of Holocene peat deposit	11.5 to 17.5 feet below surface	Cut-and-cover trench and utilities, maximum depth 90 feet	Cut-and-cover trench and utilities, maximum depth 50 feet	Cut-and-cover trench and utilities, maximum depth 50 feet

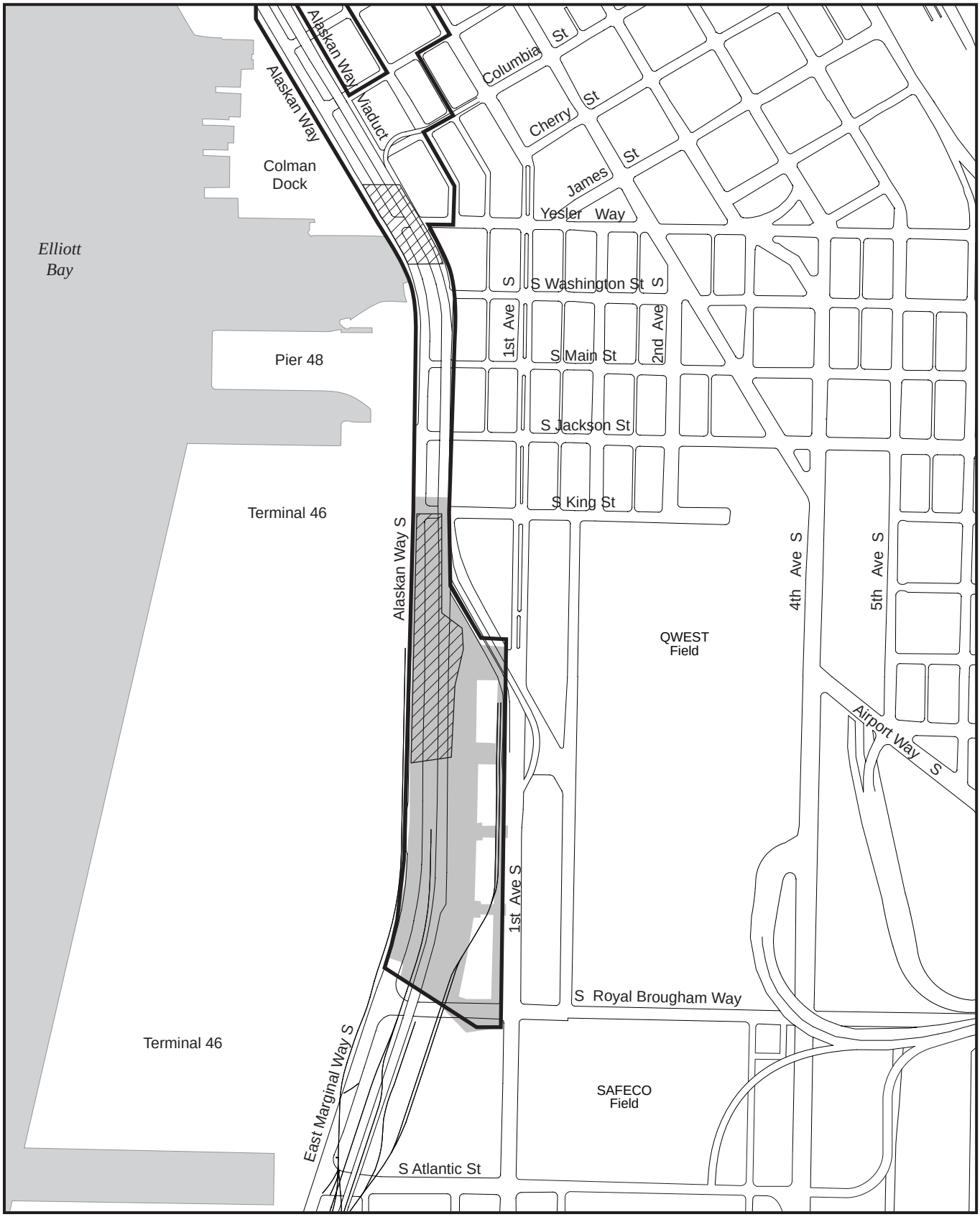
6.2.2 Bored Tunnel Alternative

Construction Effects

Other than the construction effects common to all three build alternatives (described in Section 6.2.1), potential adverse effects on one additional archaeologically sensitive area would result from the Bored Tunnel Alternative (see Exhibits 6-5 through 6-7). In the area between the Alaskan Way Viaduct and First Avenue between Yesler Way and Seneca Street, ground improvements would reach the depth of former tidal flats, where there may be isolated Native American artifacts.

Avoidance and Minimization of Construction Effects

Throughout the project planning and design process, efforts have been made to avoid or minimize adverse effects on archaeological resources. One of the first steps in the design process was to identify and map both recorded and potential archaeological sites. The design team used this information to influence specific decisions in order to avoid effects on archaeological resources whenever possible. When effects appeared to be unavoidable, efforts were made to minimize them.



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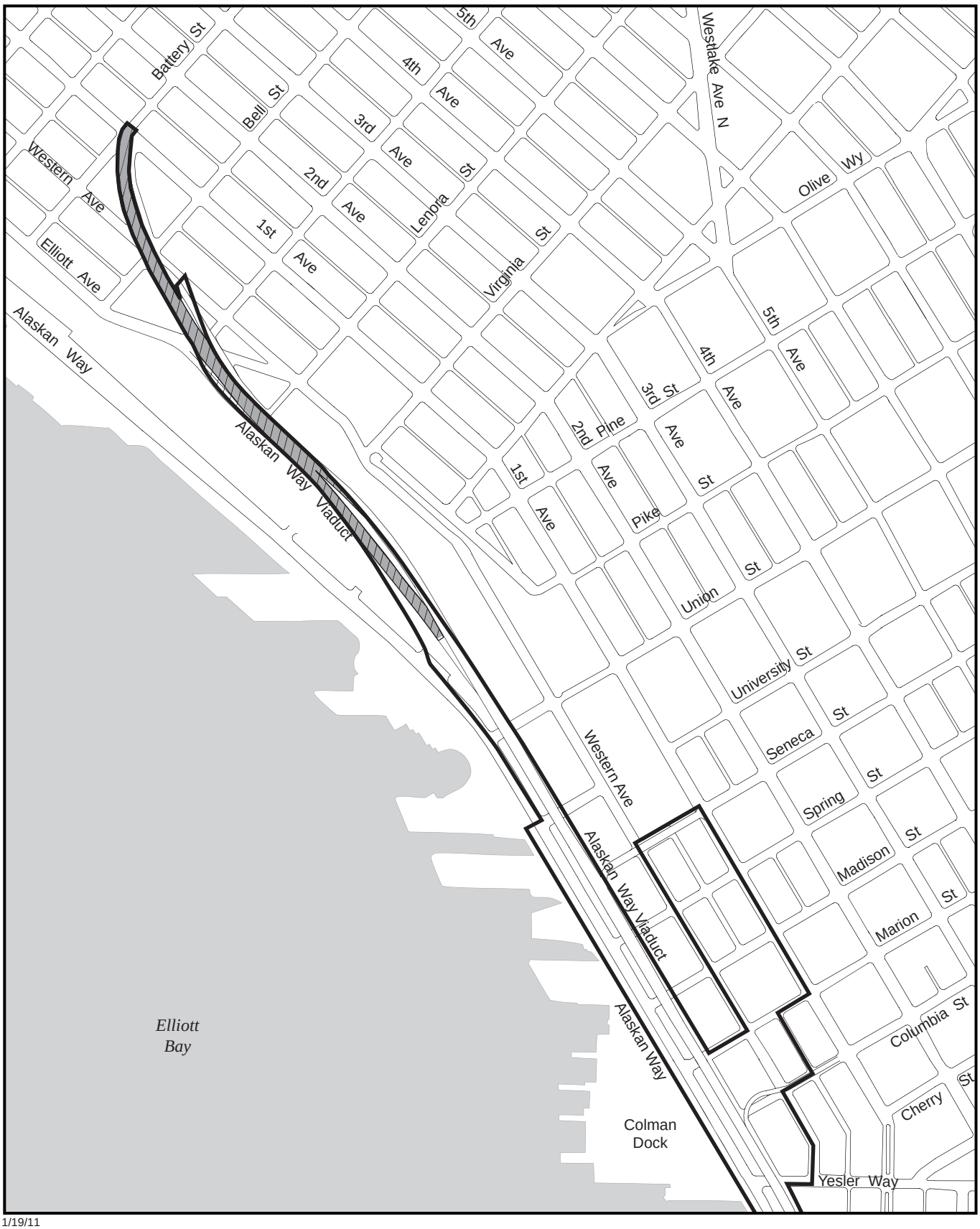
SCALE IN FEET

Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-5
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Bored Tunnel Alternative - South



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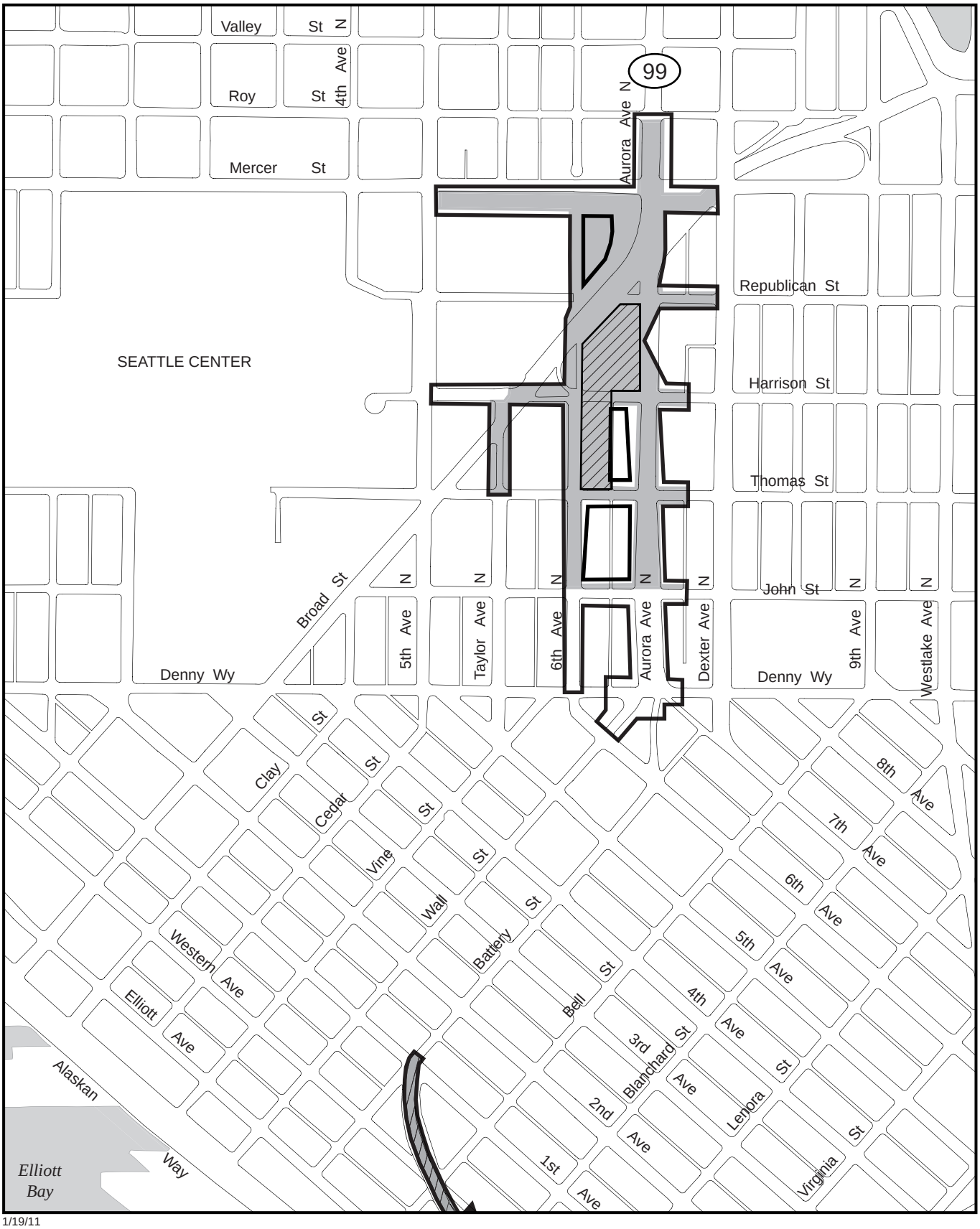
Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-6
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Bored Tunnel Alternative - Central



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SCALE IN FEET

Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-7
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Bored Tunnel Alternative - North

Mitigation of Construction Effects

Mitigation measures for adverse effects on archaeological resources are described in an MOA developed for the preferred alternative (Bored Tunnel Alternative) by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties. The requirements of the MOA include the development of an Archaeological Treatment Plan for investigations, data recovery, and monitoring (see Attachment C). An Unanticipated Discovery Plan has also been prepared; it provides for notification and consultation among concerned agencies and tribes related to discoveries of unanticipated archaeological materials or human remains.

6.2.3 Cut-and-Cover Tunnel Alternative

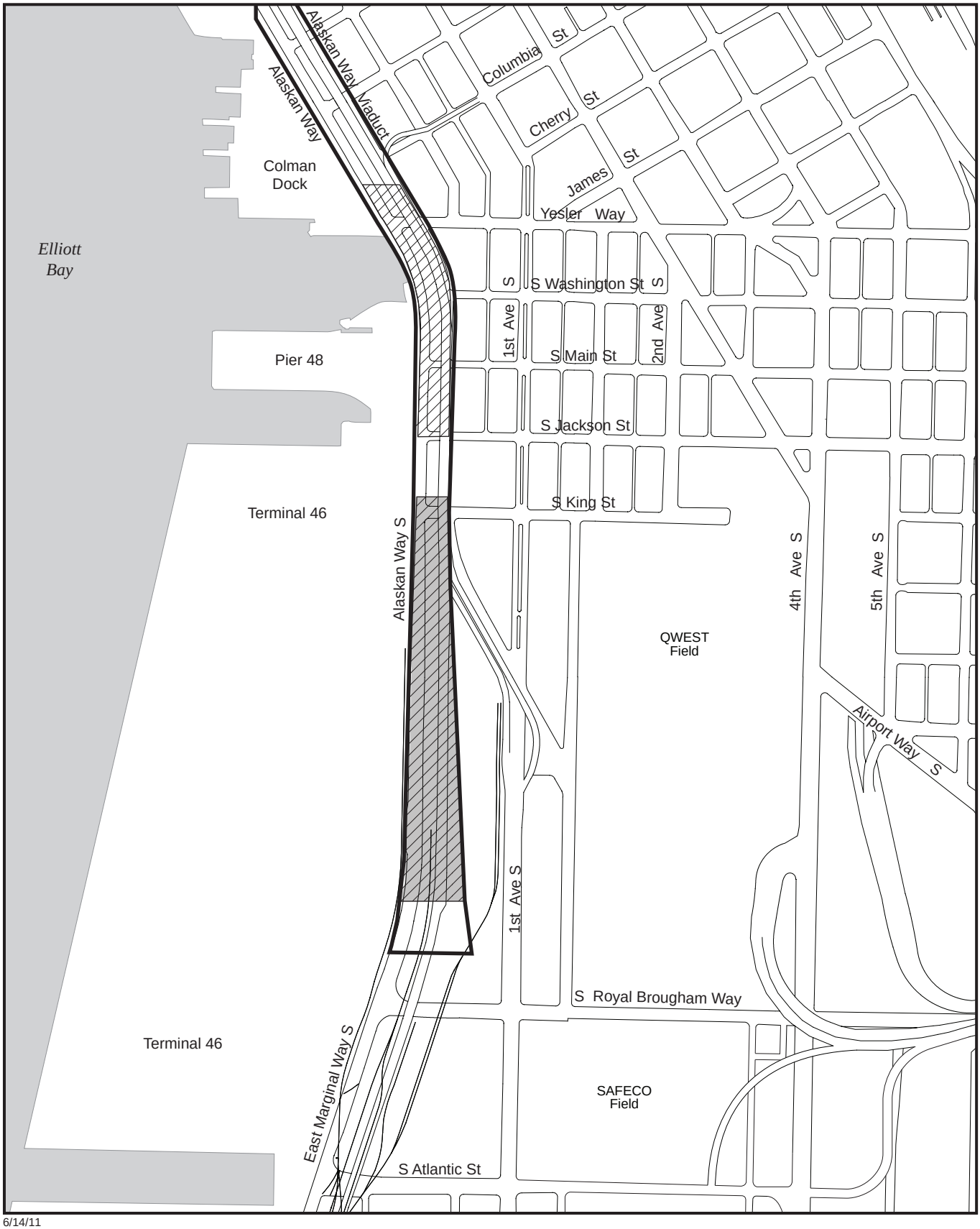
Construction Effects

Other than the construction effects common to all three build alternatives (described in Section 6.2.1), potential adverse effects on two additional archaeological sites and two additional archaeologically sensitive areas would result from the Cut-and-Cover Tunnel Alternative (see Exhibits 6-8 through 6-10).

The Baba'kwob site (45KI456) and the World Trade Center North Historic Site (45KI482) would likely be affected by the seawall replacement. The sites are located on the same landform, the edge of a low, wave-cut bank above the beach and below a steep bluff (Lewarch et al. 2002). The bluff was cut by the Bell Street ravine. The Baba'kwob site is just south of the ravine, and the World Trade Center North Historic Site is just north of it. Both sites were located during preconstruction monitoring, and the site boundaries were not clearly delineated. The Baba'kwob site in particular shows evidence of bluff slumping and movement of archaeological deposits (Lewarch et al. 2002). The area of ground disturbance associated with the Cut-and-Cover Tunnel Alternative is west of the known extent of both sites. However, the sites may well extend farther west than their mapped boundaries, especially given the known slumping of the bluffs toward the beach and the reported historical use of the beach in the vicinity of the Bell Street ravine for housing for marginalized people. Therefore, the Cut-and-Cover Tunnel Alternative may adversely affect one or both sites.

The Cut-and-Cover Tunnel Alternative would affect two archaeologically sensitive areas:

- The Ballast Island area, where Native Americans camped during the historic period. The Cut-and-Cover Tunnel Alternative would involve trenching in this area, through the entire depth of the deposit.



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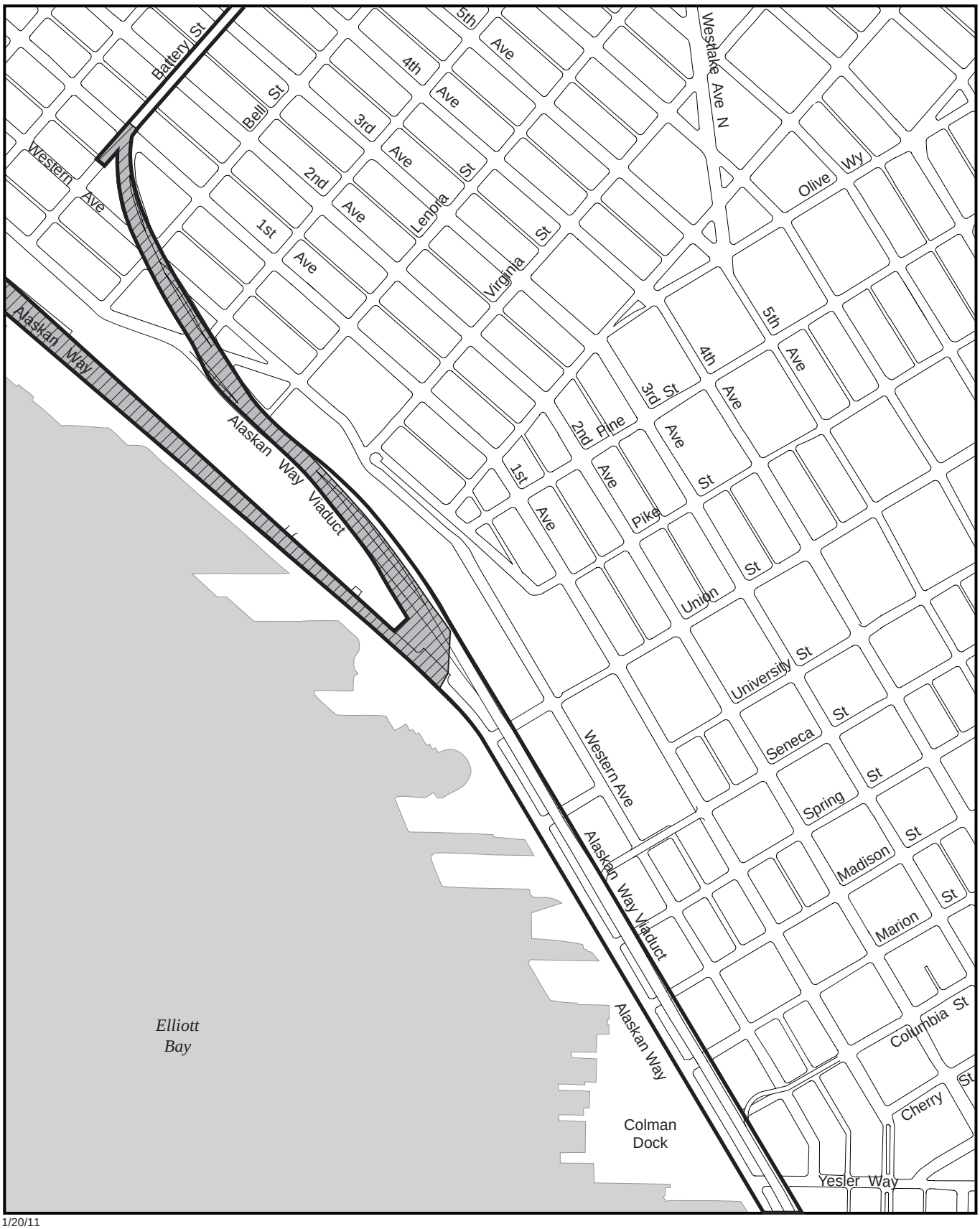
SCALE IN FEET

Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-8
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Cut-and-Cover Tunnel Alternative - South



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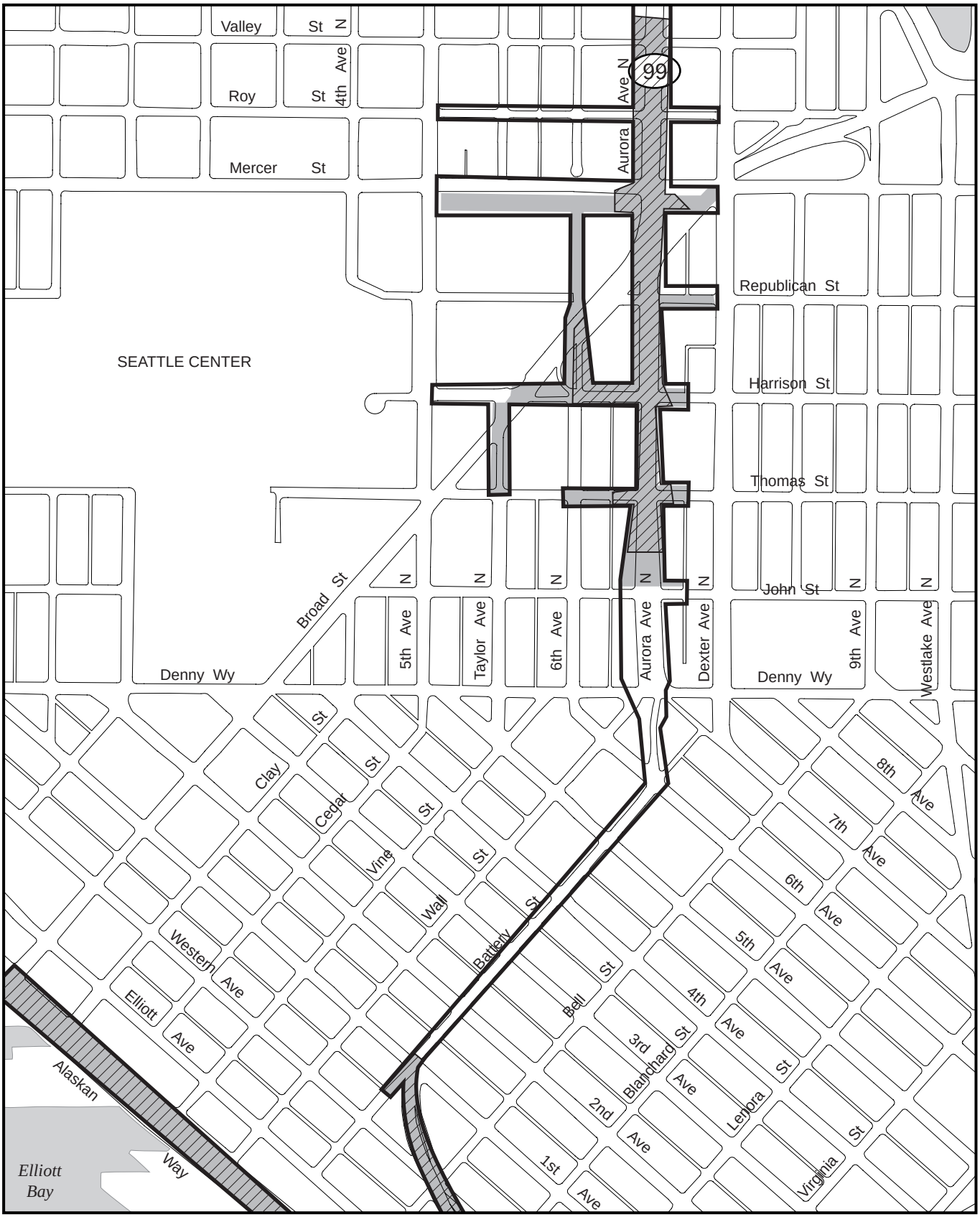
SCALE IN FEET

Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-9
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Cut-and-Cover Tunnel Alternative - Central



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Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-10
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Cut-and-Cover Tunnel Alternative - North

- The area between Alaskan Way and Elliott Avenue, from Blanchard Street to the northern extent of the project area. Historic-period archaeological resources are known to be present in the area, as demonstrated by the Baba'kwob site (45KI456) and the World Trade Center North Historic Site (45KI482). The Cut-and-Cover Tunnel Alternative would involve seawall replacement in this area, which would disturb the entire depth of the deposit.

Avoidance and Minimization of Construction Effects

Efforts during the planning process to avoid and minimize effects are the same as those described for the Bored Tunnel Alternative in Section 6.2.2.

Mitigation of Construction Effects

If the Cut-and-Cover Tunnel Alternative is selected as the preferred alternative, mitigation measures would be determined and described in an MOA developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties for the Cut-and-Cover Tunnel Alternative, as explained for the Bored Tunnel Alternative in Section 6.2.2.

6.2.4 Elevated Structure Alternative

Construction Effects

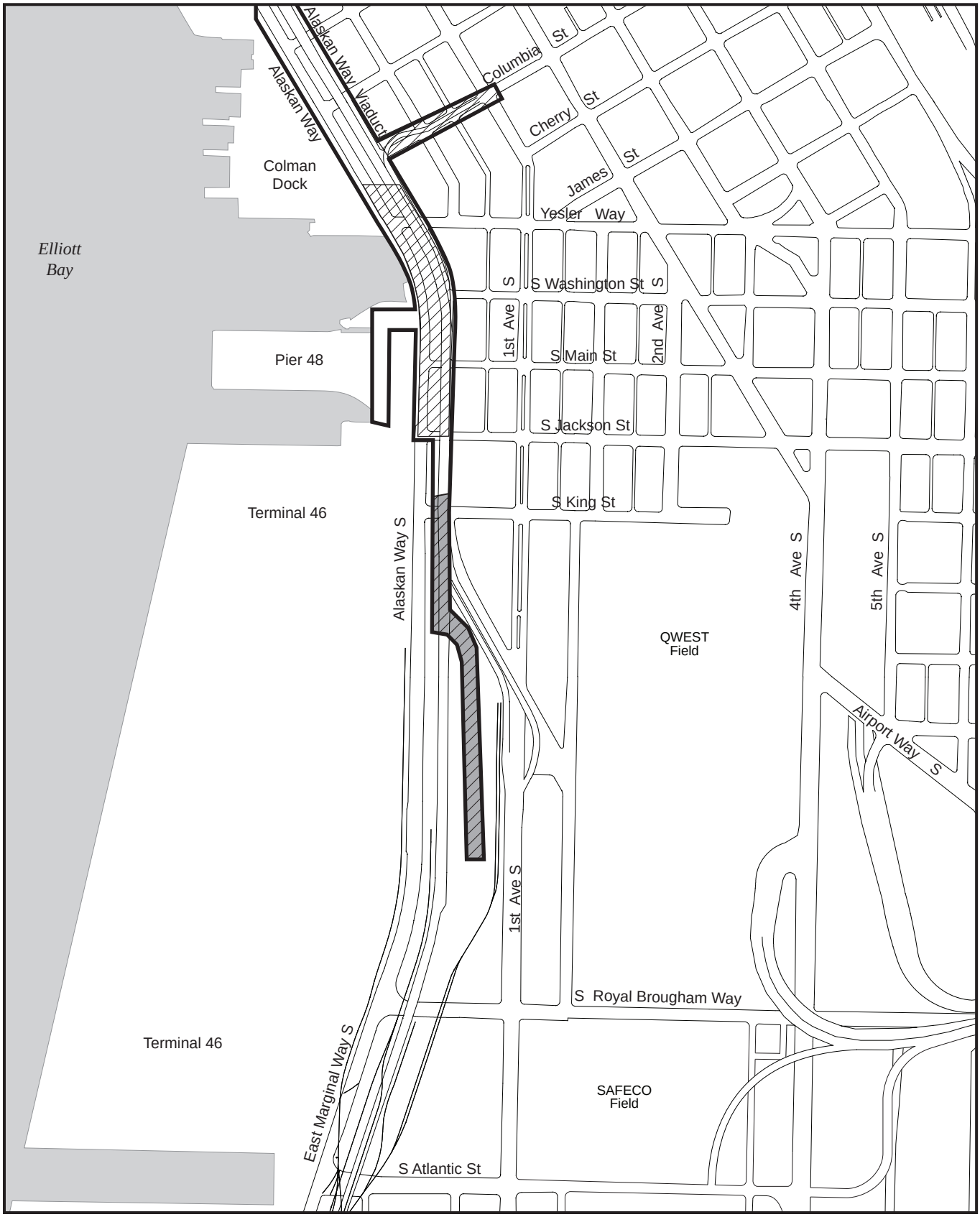
The potential construction effects of the Elevated Structure Alternative on archaeological resources would be very similar to those of the Cut-and-Cover Tunnel Alternative, with one exception. In the Alaskan Way alignment between S. Dearborn Street and Pike Street, the horizontal extent of disturbance resulting from the piling installation associated with the Elevated Structure Alternative would be smaller than the extent of the disturbance resulting from the trenching associated with the Cut-and-Cover Tunnel Alternative. Therefore, the effects of the Elevated Structure Alternative on the former tidal flats areas in the Alaskan Way alignment between S. Dearborn Street and S. King Street and between Union Street and Pike Street would be less than those resulting from the Cut-and-Cover Tunnel Alternative (see Exhibits 6-11 through 6-13).

Avoidance and Minimization of Construction Effects

Efforts during the planning process to avoid and minimize effects are the same as those described for the Bored Tunnel Alternative in Section 6.2.2.

Mitigation of Construction Effects

If the Elevated Structure Alternative is selected as the preferred alternative, mitigation measures would be determined and described in an MOA developed by WSDOT, FHWA, SHPO, affected tribes, and other consulting parties for the Elevated Structure Alternative, as explained for the Bored Tunnel Alternative in Section 6.2.2.



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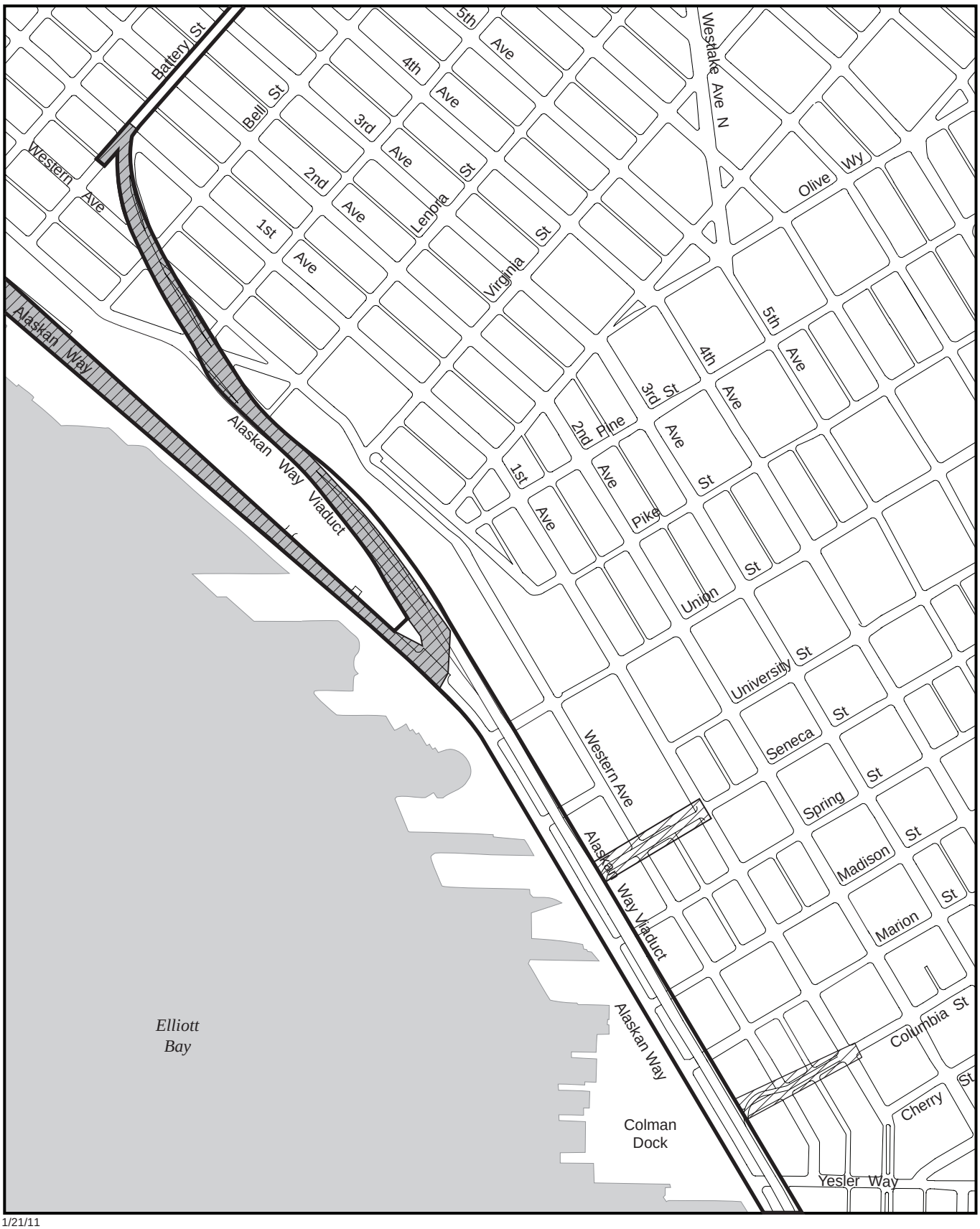
Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-11
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Elevated Structure Alternative - South



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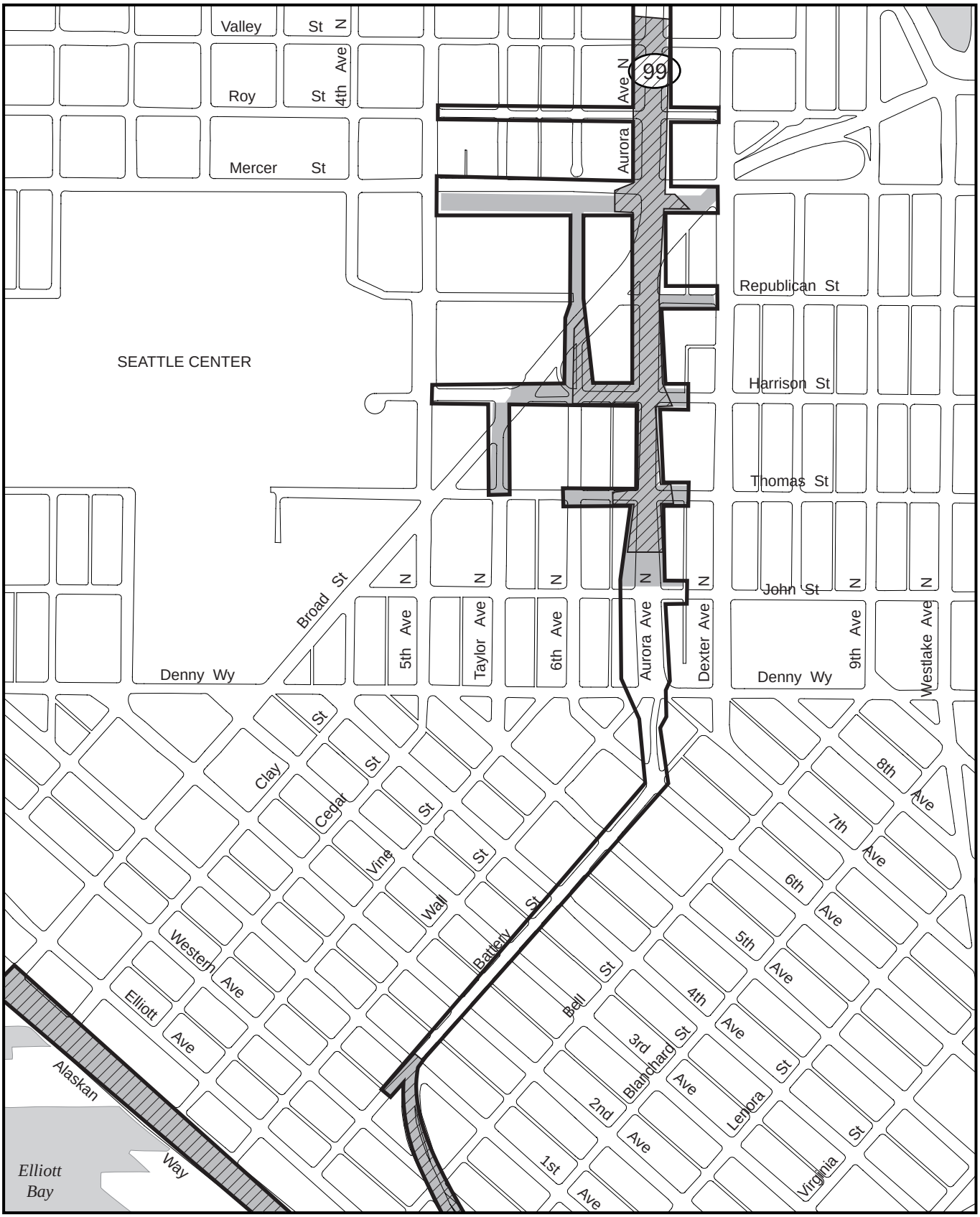
SCALE IN FEET

Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-12
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Elevated Structure Alternative - Central



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Potential Historic Archaeological Resources

Potential Native American Archaeological Resources

Areas of Potential Ground Disturbance

Exhibit 6-13
Intersection of Project Elements, Sensitive Areas, and Recorded Archaeological Resources for the Elevated Structure Alternative - North

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Chapter 7 TOLLING

7.1 Description of Tolling

A range of tolling proposals was considered and analyzed. The considerations included using low, medium, or high tolls; varying the toll by time of day; applying a peak-only toll; tolling the tunnel segment only; or tolling the tunnel and the SR 99 corridor by charging drivers who use the corridor to get to or through downtown Seattle from points north and south of the tunnel. The analysis did not assume that transit or carpools would pay a toll.

Further detail on tolling, the variables tested, and the analysis is provided in Appendix C, Transportation Discipline Report.

Although tolling would increase the volume of traffic in the downtown area, the effect on historic buildings and on the Pioneer Square and Pike Place Market Historic Districts would not be adverse. Tolling is not expected to have any differential effects on archaeological resources in the study area, because it would not affect cultural resources that may be buried beneath the transportation facilities.

A major potential effect of tolling at any rate level or location is the diversion of traffic to other routes. People who do not want to pay the toll would choose to travel on a more congested route to save money. The traffic modeling analysis estimated a percentage of drivers who would use alternate routes. Much of the diverted traffic would use the alternate routes closest to SR 99: Alaskan Way or First Avenue/First Avenue S. The increased traffic on these routes could potentially affect two historic districts (Pioneer Square and Pike Place Market) and two neighborhoods with numerous historic buildings (Belltown and the central waterfront). However, the effect would not be adverse. Under Section 106, there is a high standard for adverse effects related to economic conditions. Increased traffic could have an adverse effect on an historic district if it diminished its historic integrity and the qualities that made it eligible to be listed in the NRHP. For example, traffic congestion could have an adverse effect on historic buildings if traffic becomes severe enough or prolonged enough that it leads to a loss of businesses in the historic district. Property owners would then be unable to maintain the buildings properly and historic material or features could be lost. In other words, it would have an adverse effect if there is so much congestion that people stop patronizing businesses or renting apartments or leasing offices.

The increased traffic may pose an inconvenience to some businesses, employees, residents, and customers. Appendix C, Transportation Discipline Report, discusses measures that would be implemented to mitigate the traffic effects. However, tolling is not expected to increase traffic effects enough to threaten the viability of the historic districts or the historic buildings.

The traffic analysis indicates that the diverted traffic would spread over several parallel routes (Alaskan Way; First, Second and Fourth Avenues; and I-5). Because of this distribution and because traffic in downtown Seattle is controlled by signals, the increased traffic volume is not expected to affect the pedestrian character of the historic areas or make it more difficult for people to get to work or patronize shops or restaurants. The increased traffic may make it more difficult for trucks to make pickups and deliveries, especially during the busiest hours of the day.

In some cases, vibration from traffic can potentially damage vulnerable historic buildings. However, each intersection has a traffic signal and the vehicles would be moving relatively slowly. The amount of vibration is not expected to affect the buildings.

The traffic analysis indicates that tolling would affect traffic and intersections primarily in the southern and northern portions of the study area. In the central portion, the effects would be primarily on Fourth Avenue. Therefore, the traffic effects would be in the Pioneer Square area, with little effect on the Pike Place Market.

Under each of the build alternatives, the potential effects of tolling on intersections in Pioneer Square are described in the following subsections. The greatest amount of diversion to surface streets would occur with the Elevated Structure Alternative, for which it is estimated that nearly two-thirds of the vehicles would choose not to pay the toll. The Bored Tunnel Alternative would negatively affect four Pioneer Square intersections, whereas each of the other two alternatives would affect two intersections. Further detail is provided in Appendix C, Transportation Discipline Report.

7.2 Tolled Bored Tunnel Alternative

The traffic analysis indicates that the tolled Bored Tunnel Alternative would have the following effects on Pioneer Square traffic in the year 2030 (as compared to the non-tolled Bored Tunnel Alternative):

- Approximately 39 percent of SR 99 vehicle volumes through downtown would divert to parallel routes.
- Four intersections in the Pioneer Square area would be noticeably more congested, with delays of 1 to 3 minutes:
  - First Avenue S. and Yesler Way (AM and PM peak hour)
  - Second Avenue S. and S. Jackson Street (AM and PM peak hour)
  - Second Avenue S. and S. Main Street (AM peak hour)
  - Fourth Avenue S. and S. Jackson Street (AM and PM peak hour)

7.3 Tolled Cut-and-Cover Tunnel Alternative

The traffic analysis indicates that the tolled Cut-and-Cover Tunnel Alternative would have the following effects on Pioneer Square traffic in the year 2030 (as compared to the non-tolled Cut-and-Cover Tunnel):

- Approximately 52 percent of SR 99 vehicle volumes through downtown would divert to parallel routes.
- Two intersections in the Pioneer Square area would be noticeably more congested, with delays of 1 to 3 minutes:
  - First Avenue S. and Yesler Way (AM peak hour)
  - Fourth Avenue S. and S. Jackson Street (AM peak hour)

7.4 Tolled Elevated Structure Alternative

The traffic analysis indicates that the tolled Elevated Structure Alternative would have the following effects on Pioneer Square traffic in the year 2030 (as compared to the non-tolled Elevated Structure Alternative):

- Approximately 65 percent of SR 99 vehicle volumes through downtown would divert to parallel routes.
- Two intersections in the Pioneer Square area would be noticeably more congested, with delays of 1 to 3 minutes:
  - First Avenue S. and Yesler Way (AM and PM peak hour)
  - Fourth Avenue S. and S. Jackson Street (PM peak hour)

7.5 Viaduct Closed (No Build Alternative)

The Viaduct Closed (No Build Alternative) would displace all trips from SR 99 to alternate routes, leading to greater levels of traffic congestion throughout the day.

The traffic analysis indicates that this alternative would have a greater effect on congestion than would any of the tolled build alternatives.

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ATTACHMENT A

Inventory of Buildings and Structures 40 or More Years Old Within the Area of Potential Effects

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ATTACHMENT A

Exhibit A-1 shows the properties within the study area that were built in 1963 or earlier, with their historic designation. Properties are listed generally from south to north and west to east. Eligibility for Seattle landmark designation is only an opinion; it can be confirmed only by the Seattle Landmarks Preservation Board.

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-1	Alaskan Way	Elliott Bay Seawall (Alaskan Way Seawall)		Eligible NRHP
H-2	Alaskan Way/Battery Street	Alaskan Way Viaduct and Battery Street Tunnel		Eligible NRHP
H-3	S. Main Street to Bell Street	Burlington Northern Railroad Tunnel (Great Northern Railway Tunnel)		Eligible NRHP
H-4	1526 First Avenue S.	Emerald Market Supply (David Dow and Sons)		Not eligible
H-5	1518 First Avenue S.	McKinnon Furniture (Frederick & Nelson Warehouse)		Eligible NRHP and SL
H-6	1251 First Avenue S.	Great Floors (International Harvester)		Not eligible
H-7	1201 First Avenue S.	Pyramid Alehouse		Not eligible
H-8	1041 First Avenue S.	Gerry Sportswear		Not eligible
H-9	1026 First Avenue S.	Stadium Silver Cloud Inn		PSPD; not eligible NRHP
H-10	1028 First Avenue S.	Hawk's Nest (Maginnis Bottling Works)		PSPD; not eligible NRHP
H-11	1014 First Avenue S.	Olympic Reprographics (M.F. Backus Warehouse)		PSPD; eligible NRHP
H-12	1000 First Avenue S.	Palmer Court (A.L. Palmer Building)		PSPD; eligible NRHP
H-13	902 First Avenue S.	Artists' Gallery of Seattle/ Worldwide Marble & Granite		PSPD; not eligible NRHP
H-14	900 First Avenue S.	Roebling Building		PSPD; eligible NRHP
H-15	820 First Avenue S.	Coastal Environmental Systems		PSPD; not eligible NRHP

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-16	1020–1022 First Avenue S.	E.O. Graves Building		PSPD; eligible NRHP
H-17	553 First Avenue S.	Triangle Hotel	X	NRHP, SL, PSHD
H-18	505 First Avenue S.	Starbucks		PSHD
H-19	501 First Avenue S.	(Seattle Hardware Annex)	X	PSHD
H-20	83 S. King Street	83 King Street and Garage (Seattle Hardware Co.)		PSHD
H-21	590 First Avenue S.	(Seattle Plumbing Building)		PSHD
H-22	568 First Avenue S.	Provident Building		PSHD
H-23	562 First Avenue S.	The Copy Machine (Bornstein & Sons)		PSHD
H-24	558 First Avenue S.	Fobes Supply Co.		PSHD
H-25	548 First Avenue S.	Elysian Fields/Reedo Building (Carten Brothers/Nordic Cold Storage)		PSHD
H-26	542 First Avenue S.	Washington Shoe Building		PSHD
H-27	538 First Avenue S.	Sluggers (Kaufman Warehouse)		PSHD
H-28	508–534 First Avenue S.	Florentine Condominiums (Seattle Security Co. Warehouse)		PSHD
H-29	500 First Avenue S.	101 King Street (Norfin Building)	X	PSHD
H-30	410 Alaskan Way S.	Merrill Place Garage		PSHD
H-31	419 First Avenue S.	Merrill Place (Hambach Building)	X	PSHD
H-32	411 First Avenue S.	Merrill Place (Seller Building)	X	PSHD
H-33	401 First Avenue S.	Merrill Place (Schwabacher Hardware Co.)	X	PSHD
H-34	100 S. King Street	Westland Building		PSHD
H-35	419 Occidental Avenue S.	F.X. McRory's	X	PSHD
H-36	79 S. Jackson	Merrill Place		PSHD
H-37	80 S. Jackson	80 S. Jackson Condo (Steinberg Building)	X	PSHD
H-38	101 S. Jackson	Heritage Building (Wax & Raine)	X	PSHD

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-39	115 S. Jackson Street	Fisher Building		PSHD
H-40	122 S. Jackson Street	Herman Blumenthal Building	X	PSHD
H-41	123 S. Jackson Street	Jackson Square Building	X	PSHD
H-42	316 Alaskan Way S.	Old Seattle Parking Garage		PSHD
H-43	304 Alaskan Way S.	C&H Company (Otto Sturham & Sons)		PSHD
H-44	322 First Avenue S.	Jackson Building	X	PSHD
H-45	316 First Avenue S.	Seattle Quilt Building	X	PSHD
H-46	314 First Avenue S.	Nord Building	X	PSHD
H-47	313 First Avenue S.	Crown Hotel	X	PSHD
H-48	310 First Avenue S.	Globe Building	X	NRHP, PSHD
H-49	309 First Avenue S.	Maud Building	X	PSHD
H-50	301 First Avenue S.	Bread of Life Mission (Matilda Winehill Block)	X	PSHD
H-51	311½ Occidental Avenue S.	Waltham Block	X	PSHD
H-52	201 Alaskan Way S.	Pier 48		Not eligible
H-53	75 S. Main Street	Our Home Hotel		PSHD
H-54	76 S. Main Street	Boston Hotel		PSHD
H-55	80 S. Main Street	Argens Safe and Lock Co.		PSHD
H-56	117 S. Main Street	Union Trust Annex	X	PSHD
H-57	119 S. Main Street	Union Trust Building	X	PSHD
H-58	212 Alaskan Way S.	OK Hotel		PSHD
H-59	210 Alaskan Way S.	Seattle Image Setting (People's Supply Company)		PSHD
H-60	201–205 First Avenue S.	J&M Hotel & Café	X	PSHD
H-61	202 First Avenue S.	Buttnick Building	X	PSHD
H-62	217–19 First Avenue S.	New England Hotel	X	PSHD
H-63	216 First Avenue S.	Grand Central (Squire-Latimer Building)	X	PSHD
H-64	213 First Avenue S.	Artforte Gallery	X	PSHD
H-65	211 First Avenue S.	Lucky Hotel	X	PSHD
H-66	209 First Avenue S.	Marathon Building	X	PSHD
H-67	207 First Avenue S.	Skagit Hotel	X	PSHD
H-68	206 First Avenue S.	City Loan Building	X	PSHD

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-69	115 Occidental Avenue S.	Star Theater	X	PSHD
H-70	109 Occidental Avenue S.	Saveway Market	X	PSHD
H-71	Foot of S. Washington Street	Washington Street Boat Landing		NRHP, PSPD
H-72	68 S. Washington Street	Washington Park Building	X	PSHD
H-73	72 S. Washington Street	Seattle Publishing		PSHD
H-74	77 S. Washington Street	Lutheran Compass Center (Pacific Coast Co.)		PSHD
H-75	81 S. Washington Street	St. Charles Hotel		PSHD
H-76	108 S. Washington Street	Delmar Hotel		PSHD
H-77	116 and 118 S. Washington Street	Laguna Pottery (Scandinavian Hotel/Clancy Building		PSHD
H-78	124 S. Washington Street	Last Supper Club (Interurban Hotel)		PSHD
H-79	104 First Avenue S.	Lippy Building	X	PSHD
H-80	102 First Avenue S.	Olympic Block	X	PSHD
H-81	114 Alaskan Way S.	Prudential Building		PSHD
H-82	110 Alaskan Way S.	Pioneer Square Hotel (Heffernan Engine Works)		PSHD
H-83	117 First Avenue S.	Maynard Building	X	PSHD
H-84	112 First Avenue S.	City Club Building	X	PSHD
H-85	114 First Avenue S.	State Hotel		PSHD
H-86	109–115 First Avenue S.	Terry-Denny Lofts (Northern Hotel)	X	PSHD
H-87	1 Yesler Way	One Yesler Building (Bedford Hotel)		PSHD
H-88	77 Yesler Way	Pioneer Square Hotel (Yesler Hotel)		PSHD
H-89	76–84 Yesler Way/ 611 Post Avenue	(Travelers Hotel)		PSHD
H-90	90 Yesler Way	606 Post (Post Hotel)	X	PSHD
H-91	93 Yesler Way 103–107 First Avenue S.	Schwabacher Building	X	PSHD
H-92	95 Yesler Way	Yesler Building (Bank of Commerce)	X	PSHD

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-93	109 Yesler Way	Merchants' Café	X	PSHD
H-94	119 Yesler Way	Korn Building	X	PSHD
H-95	515 Second Avenue	2nd and James parking garage	X	PSHD
H-96	619 Post Avenue	Seattle Steam	X	PSHD
H-97	605 First Avenue	Mutual Life Building	X	PSHD
H-98	606 First Avenue at Yesler Way	Pioneer Building, Pioneer Place, and Pergola	X	NHL, PSHD
H-99	612 First Avenue	Howard Building	X	PSHD
H-100	616 First Avenue	Lowman & Hanford Building	X	PSHD
H-102	625 First Avenue	Emerald City Building (K&R/Pioneer Office Equipment)	X	PSHD
H-103	627 First Avenue	Yam Oriental Rugs (Silver Hotel)	X	PSHD
H-104	102–110 Cherry Street	Scheuerman Building	X	PSHD
H-105	107 Cherry Street	Lowman Building	X	PSHD
H-106	601 Second Avenue	Butler Garage	X	PSHD
H-107	619 Second Avenue	Broderick Building	X	PSHD
H-108	619 Western Avenue	Western Building		PSHD
H-109	61 Columbia Street	Polson Building		PSHD
H-110	83 Columbia Street	Journal Building		PSHD
H-111	701–723 First Avenue	All-Rite Parking Garage/US Bank		PSHD
H-112	706 First Avenue	Parking garage		PSHD
H-113	705 Second Avenue	Hoge Building	X	NRHP, SL
H-115	801 Alaskan Way	Piers 52/53 (Colman Dock)		Not eligible
H-116	809 Western Avenue	Commuter Building Garage (Mutual Creamery)		Not eligible
H-117	815 Western Avenue	Commuter Building (Carstens Building)		Not eligible
H-118	801–821 First Avenue	Colman Building	X	NRHP, SL
H-119	801 Second Avenue	Norton Building		SL; eligible NRHP
H-120	815 Second Avenue	Key Bank (Bank of California)	X	SL; eligible NRHP
H-121	821 Second Avenue	Exchange Building	X	SL; eligible NRHP

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-122	925 Alaskan Way	Fire Station No. 5		Eligible NRHP and SL
H-123	911 Western Avenue	Maritime Building		Eligible NRHP
H-124	901 First Avenue	Federal Office Building		NRHP
H-125	1001 Alaskan Way	Pier 54 (Northern Pacific Railroad 3/ Galbraith Dock)		SL; eligible NRHP
H-126	1000–1024 Western Avenue	National Building		NRHP, SL
H-127	1001–1011 First Avenue	Alexis Hotel (Globe Building)	X	NRHP, SL
H-128	1012 First Avenue	Schoenfeld Furniture Store Building		Eligible NRHP and SL
H-129	1013 First Avenue	Arlington South (Beebe Building)	X	NRHP, SL
H-130	1018 First Avenue	Holyoke Building	X	NRHP, SL
H-131	1019-1023 First Avenue	Arlington North (Hotel Cecil)	X	NRHP, SL
H-132	1015 Second Avenue	Federal Reserve Bank	X	Eligible NRHP
H-133	1101 Alaskan Way	Pier 55 (Northern Pacific Railroad 4/ Arlington Dock)		SL; eligible NRHP
H-134	1107 First Avenue (94–96 Spring Street)	Watermark Tower (Colman Building)		SL; not eligible NRHP
H-135	1115-1117 First Avenue	Grand Pacific (Grand Pacific Hotel)	X	NRHP, SL
H-136	1123 First Avenue	Grand Pacific (Colonial Hotel)	X	NRHP, SL
H-138	1201 Alaskan Way	Pier 56 (Frank Waterhouse House)		SL; eligible NRHP
H-139	1203-1207 Western Avenue	(Olympic Warehouse)		NRHP, SL
H-140	51 University Street	(Pacific Net and Twine Building)		Eligible NRHP and SL
H-141	1206–1212 First Avenue	Freedman's Loans/Money Mart		Not eligible
H-142	1216–1222 First Avenue	Diller Hotel	X	Eligible NRHP and SL
H-143	1201–1211 Second Avenue	Seneca Building (Brown Building)	X	Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-144	1215 Second Avenue	Galland Building (Stone, Fisher & Lane Department Store)	X	Not eligible
H-145	1301 Alaskan Way	Pier 57 (John P. Agen's/Milwaukee Dock)		SL; eligible NRHP
H-146	1319 Western Avenue	Seattle Steam (Mutual Light and Heating Company)		Not eligible
H-147	55 Union Street	Shurgard Storage (Diamond Ice & Storage Company)		Not eligible
H-148	84 Union Street (1400 Western)	Marketside Flats (U.S. Immigration Building)	X	NRHP, SL
H-149	1315 First Avenue	(Hotel Vendome/Post Edwards Building)		Not eligible
H-150	1414 Alaskan Way	Market Square (Schwabacher Warehouse No. 2)		Not eligible
H-151	1426 Alaskan Way	Bakun Building (A.C. Frye Company)		Not eligible
H-152	1483 Alaskan Way	Pier 59/Seattle Aquarium (Ainsworth & Dunn Pike St. Wharf)		SL, Not eligible
H-153	1401 Western Avenue	Antique Warehouse (G.J. Callahan Warehouse)		Not eligible
H-156	1430 Western Avenue	La Salle Apartments		PPMHD
H-157	1423 First Avenue	Economy Market		PPMHD
H-158	1426 First Avenue	Showbox		Not eligible
H-159	1501 Western Avenue	Madore Building		Not eligible
H-160	1507 Western Avenue	Fix Building		Eligible NRHP and SL
H-161	1527–1531 Western Avenue	Heritage House/garage		PPMHD (local)
H-162	1500 First Avenue	Broderick Building		Not eligible
H-163	1505 First Avenue	Corner Market	X	PPMHD
H-164	1510 First Avenue	Déjá Vu Showgirls (S.J. Holmes Building)		Not eligible
H-165	1513 First Avenue	Sanitary Market	X	PPMHD
H-166	1531 First Avenue	Market House		PPMHD

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-167	1501 Pike Place	Pike Place Market Main Arcade		PPMHD
H-168	1534 Pike Place	Triangle Building		PPMHD
H-169	110 Union Street	Harold Poll Building (Hancock Building)	X	Not eligible
H-170	1530 Post Alley	Seattle's Best		PPMHD
H-171	1501 Second Avenue	Eitel Building	X	SL; eligible NRHP
H-172	103 Pike Street	Hahn Building (Elliott Hotel)		Not eligible
H-173	114 Pike Street	Hard Rock Café (Liberty Building)		Not eligible
H-174	107 Pine Street	Gatewood Apartments	X	Eligible NRHP and SL
H-175	119 Pine Street	Doyle Building (J.S. Graham Store)	X	NRHP, SL
H-176	1600 Pike Place	Garden Center Building		PPMHD
H-177	1601 Second Avenue	Broadacres Building	X	Not eligible
H-178	1613 Second Avenue	MJA Building (Ames Building)		Not eligible
H-180	86 Pine Street	Inn at the Market		PPMHD
H-181	1900 Pike Place 80 Stewart Street	Stewart House	X	PPMHD
H-182	1912 Pike Place	Starbucks Coffee		PPMHD
H-183	1924 Pike Place	Soames Dunn Building	X	PPMHD
H-184	1928 Pike Place	Champion Building		PPMHD
H-185	1930 Pike Place	Pike & Virginia Building		PPMHD
H-186	1901 First Avenue	Fairmount Apartments		PPMHD
H-187	1915 First Avenue	Alaska Trade Building	X	NRHP, PPMHD
H-188	1923 First Avenue	Smith Block	X	PPMHD
H-189	1921 First Avenue	Butterworth Building	X	NRHP, PPMHD
H-190	1920 First Avenue	Oxford Apartments		Eligible NRHP and SL
H-193	1924 First Avenue	Cipra Building		Not eligible
H-194	1932 First Avenue	Terminal Sales Building		NRHP, SL
H-195	1931 First Avenue	Livingston Baker Apartments		PPMHD
H-196	1937 First Avenue	Virginia Inn (Landes Block)		PPMHD

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-197	1902 Second Avenue	Josephinum (New Washington Hotel)	X	NRHP, SL
H-198	1915 Second Avenue	Second Avenue Parking Garage (Northwest Building Co. Garage)		Not eligible
H-199	116 Stewart Street	St. Regis (Hotel Archibald)		Not eligible
H-200	1919 Second Avenue	(Hansen Brothers Building)		Not eligible
H-201	1921 Second Avenue	Great Jones Home (Barnett's Auction House)		Not eligible
H-202	1926 Second Avenue	Moore Hotel/Theater	X	NRHP, SL
H-203	1927 Second Avenue	Terminal Sales Annex (Puget Sound News)		SL; eligible NRHP
H-204	2016 First Avenue	Vogue Hotel		Not eligible
H-205	104 Pine Street	Atwood Apartments		Not eligible
H-206	2000 Second Avenue	Palladian Apartments (Calhoun Hotel)	X	Eligible NRHP and SL
H-207	1907 Third Avenue	Bergman's (Donohoe Garage)		Eligible NRHP and SL
H-208	1915 Third Avenue	Downtown Mini-Storage (White Garage)		Not eligible
H-209	1921 Third Avenue	Haddon Hall Apartments (Kelley-Gorham Building)		Eligible NRHP and SL
H-210	1925 Third Avenue	Trust Building (Heiden Building)		Eligible NRHP and SL
H-211	2006 Second Avenue	Bushell's Auction House		Not eligible
H-212	2014 Second Avenue	Trust Parking (President Garage)		Not eligible
H-213	2001 Third Avenue	Swifty Printing		Not eligible
H-214	2013–2015 Third Avenue	First Avenue Service Center Shelter		Not eligible
H-215	2019 Third Avenue	Denny Hill Building		Not eligible
H-216	2025 Third Avenue	Pathé Building		Eligible NRHP and SL
H-217	2031 Third Avenue	Jewish Federation of Seattle		Not eligible
H-218	2035 Fourth Avenue	Ralph's Grocery		Not eligible
H-219	2021 Fourth Avenue	Stratford Apartments (Nesika Apartments)		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-220	2033 Fourth Avenue	Jiffy Lube		Not eligible
H-221	2106 Second Avenue	Belltown Service Center		Not eligible
H-222	2122 Second Avenue	Velocity/Saito's (Henry's Garage)		Not eligible
H-223	2132 Second Avenue	Castle Apartments		Eligible NRHP and SL
H-224	2101 Third Avenue	Sig's Barber Shop		Not eligible
H-225	2107 Third Avenue	(Metropolitan Printing Company)		SL; eligible NRHP
H-226	2118 Third Avenue	National Assoc. of Credit Management (Sam Inch Gotham Garage)		Not eligible
H-227	2124 Third Avenue	Swenson Say Faget (Rex Land Company)		Eligible NRHP and SL
H-228	2132 Third Avenue	Mexican Consulate		Not eligible
H-229	2133 Third Avenue	Markham Building		Not eligible
H-231	2100 Fourth Avenue	Cinerama Theatre		Not eligible
H-232	2116 Fourth Avenue	Dean's Transmissions (Speed Roberts Auto Repair)		Not eligible
H-233	2124 Fourth Avenue	Downtown Seattle Public Health Center		Not eligible
H-234	Fifth Avenue from Pine Street to Seattle Center	Seattle Alweg Monorail		SL; eligible NRHP
H-235	2115 Fifth Avenue	Digital Reproductive Services (Northwest Auto Radio)		Not eligible
H-236	2121 Fifth Avenue	Vacant		Not eligible
H-237	2127 Fifth Avenue	Groundspeak (Kerry Foster Auto Repair)		Not eligible
H-238	2200 Western Avenue	Union Livery Stable		Eligible NRHP and SL
H-239	2218 Western Avenue	Venom (Greenbaum's United Furniture)		Not eligible
H-240	2205 First Avenue	Lewiston Hotel		Eligible NRHP and SL
H-241	2209 First Avenue	Scargo Apartments		Eligible NRHP and SL
H-242	2225 First Avenue	Apex Hotel		Not eligible
H-243	306 Blanchard Street	Cornelius Apartments		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-244	2200 Fourth Avenue	Fourth and Blanchard (Otis Elevator)		Eligible NRHP and SL
H-245	2208 Fourth Avenue	Kaye-Smith Productions (Northern Radio Company)		Not eligible
H-246	2212 Fourth Avenue	Kaye-Smith Productions (Shields Harper)		Not eligible
H-247	2218 Fourth Avenue	Garage (Automotive Service Company)		Not eligible
H-248	2219 Fourth Avenue	Spitfire		Not eligible
H-249	2230 Fourth Avenue	Charlesgate Apartments		Not eligible
H-251	2211 Fifth Avenue	Sprye Domain (Lewis Casing Company)		Not eligible
H-252	2217 Fifth Avenue	(Lyric Theater)		Not eligible
H-253	2218 Fifth Avenue	Wexley School for Girls (Western Type & Printing)		Not eligible
H-254	2221 Fifth Avenue	(Royal Typewriter)		Eligible NRHP and SL
H-255	2231 Fifth Avenue	Seattle Glassblowing		Not eligible
H-256	2235 Fifth Avenue	Vacant (Toledo Scales)		Not eligible
H-257	66 Bell Street	Belltown Lofts		SL; not eligible NRHP
H-258	2315 Western Avenue	Compton Building (Bon Marché Stable)		Eligible NRHP
H-259	2333 Western Avenue	Mars Hill Church (Marine Firemen's Union)		Not eligible
H-260	2301–2305 First Avenue	Oregon Hotel		Eligible NRHP and SL
H-261	2302 Fourth Avenue	Franklin Apartments		Eligible NRHP and SL
H-262	2306 Fourth Avenue	Seattle Micro		Not eligible
H-263	2316 Fourth Avenue	Close Instrument Company		Not eligible
H-264	2334 Fourth Avenue	Fire Station No. 2		SL; eligible NRHP
H-265	2326 Sixth Avenue	Antioch University (Farmers Insurance)		Not eligible
H-266	2331 Seventh Avenue	Midas		Not eligible
H-267	521 Wall Street	Sixth and Wall Building (Seattle Post-Intelligencer)		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-268A	616 Battery Street	Elephant Car Wash		Not eligible
H-268B	616 Battery Street	Elephant Car Wash Sign		Eligible NRHP and SL
H-269	566 Denny Way	Walgreen's (Seattle First National Bank)		SL; eligible NRHP
H-270	120 Sixth Avenue N.	Seattle Housing Authority		Eligible NRHP and SL
H-271	113 Dexter Avenue N.	KEXP		Not eligible
H-272	133 Dexter Avenue N.	Willamette Dental		Not eligible
H-273	203 Sixth Avenue N.	Space Needle Corporation		Not eligible
H-274	233 Sixth Avenue N.	ARC of King County		Not eligible
H-275	200 Sixth Avenue N.	Travelodge		Not eligible
H-276	605 Thomas Street	Bianchi Law Firm		Not eligible
H-277	609 Thomas Street	Casa del Rey (Matanela Apartments)		Not eligible
H-278	225 Aurora Avenue N.	Quality Inn (Tropics Motel)		Not eligible
H-279	232 Aurora Avenue N.	Publishers Mailing Services		Not eligible
H-280	203 Dexter Avenue N.	WW Art Gallery		Not eligible
H-281	231 Dexter Avenue N.	vacant		Not eligible
H-282	516 Broad Street	Ride the Duck		Not eligible
H-283	333 Taylor Avenue N.	Adler Giersch (Harrison Investment Company)		Not eligible
H-284	319 Sixth Avenue N.	Seattle City Light Broad Street Substation		Eligible NRHP and SL
H-286	332 Fifth Avenue N.	iMusic Lounge		Not eligible
H-287	330 Sixth Avenue N.	Launching Pad Building (AAA Washington)		Not eligible
H-288	325 Aurora Avenue N.	Seattle Pacific Hotel (Imperial 400 Motel)		Not eligible
H-289	333 Dexter Avenue N.	King Broadcasting		Not eligible
H-290	408 Aurora Avenue N.	Clark Construction Co.		Not eligible
H-291	434 Aurora Avenue N.	Hostess Bakery/Continental Baking Co.		Not eligible
H-292	401 Dexter Avenue N.	Thompson Printing		Not eligible
H-293	407 Dexter Avenue N.	Wright Exhibition Space		Not eligible
H-294	500 Aurora Avenue N.	School of Visual Concepts (J.T. Hardeman Hat Company)		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-295	500 Dexter Avenue N.	Barking Lounge		Not eligible
H-296	501 Dexter Avenue N.	Imigri		Not eligible
H-297	509 Dexter Avenue N.	United Business Supply		Not eligible
H-298	513 Dexter Avenue N.	Glazer's/Phototronics		Not eligible
H-299	522 Dexter Avenue N.	Vacant		Not eligible
H-300	525 Dexter Avenue N.	Goods for the Planet		Not eligible
H-301	530 Dexter Avenue N.	US Bank		Not eligible
H-302	601 Aurora Avenue N.	Church of Scientology		Not eligible
H-303	610 Aurora Avenue N.	Vacant		Not eligible
H-304	620 Aurora Avenue N.	Vacant		Not eligible
H-305	701 John Street	Denny Park Auto Clinic		Not eligible
H-306	721 Aurora Avenue N.	Pagliacci Pizza		Not eligible
H-307	800 Mercer Street	Vacant		Not eligible
H-308	601 Dexter Avenue N.	Copiers Northwest		Not eligible
H-309	700 Dexter Avenue N. 770 Roy Street	Huletz Electric/Auto Hound		Not eligible
H-310	717 Dexter Avenue N.	European Auto Service		Not eligible
H-311	708 Sixth Avenue N.	Midori Inc.		Not eligible
H-312	701 Dexter Avenue N. 800 Aloha Street	Seattle Parks Maintenance Facility (Puget Sound Power & Light)		Eligible NRHP and SL
H-313	701–711 Ninth Avenue N.	Bucca di Beppo/Ducati		Not eligible
H-314	739 Ninth Avenue N.	Maaco		Not eligible
H-315	753 Ninth Avenue N.	KPG Architects		Not eligible
H-316	731 Westlake Avenue N.	Jillian's		Not eligible
H-002A	2108 Western Avenue	Ewing & Clark (Medill Auto Repair)		Not eligible
H-003A	2116 Western Avenue	Elliott Bay Bicycles		Not eligible
H-004A	2100 First Avenue	Patagonia		Not eligible
H-005A	2112 First Avenue	Federal Army-Navy Surplus		Not eligible
H-006A	2119 First Avenue	Mud Bay		Not eligible
H-007A	2121 First Avenue	Cherry Street Coffee House (Colski Building)		Eligible NRHP and SL
H-008A	2132 First Avenue	Taco del Mar/Cellars		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-009A	2117 Second Avenue	D.W. Close (Seattle Radio Supply)		Not eligible
H-010A	2119 Second Avenue	El Rey Apartments		Not eligible
H-011A	2124 Second Avenue	(Hoover Company)		Not eligible
H-012A	2125 Second Avenue	Rivoli Apartments		Eligible NRHP and SL
H-013A	2137 Second Avenue	Zoe's Restaurant		Not eligible
H-014A	2200–2204 First Avenue	Jetway Apartments/E.E. Robbins (Donald/Alexandria Hotel)		Eligible NRHP and SL
H-015A	2212–2216 First Avenue	Kasota Building (Strand Hotel)		Not eligible
H-016A	2218 First Avenue	Tia Lou's (Mattson's Music House)		Not eligible
H-017A	2234 First Avenue	White's Hitchcock Building		Not eligible
H-018A	113 Bell Street	Cooper Cart (Ice Delivery Company)		Not eligible
H-019A	2200 Second Avenue	Crocodile		Not eligible
H-020A	2205 Second Avenue	Humphrey Apartments		Not eligible
H-021A	2207 Second Avenue	Mayflower Apartments		Not eligible
H-022A	2214 Second Avenue	Tula's		Not eligible
H-023A	2216–2222 Second Avenue	Shorty's		Not eligible
H-024A	2224 Second Avenue	Lava Lounge (Wayne Apartments)		Not eligible
H-025A	2230 Second Avenue	Mama's Mexican Kitchen		Not eligible
H-026A	2231 Second Avenue	Bedlam (Perry's Machine Shop)		Not eligible
H-027A	2235 Second Avenue	Bedlam (Bell Street Studios)		Eligible NRHP and SL
H-028A	2300 First Avenue	Endless Know/Dorothy Day House (Douglas Hotel)		Not eligible
H-029A	2330 First Avenue	Catholic Seamen's Club (Paramount Studios)		Not eligible
H-030A	2309 Second Avenue	Wasabi Bistro		Not eligible
H-031A	2312 Second Avenue	Roq la Rue (RKO)		Eligible NRHP and SL

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-032A	2319–2323 Second Avenue	Kushibar		Not eligible
H-033A	2221 Third Avenue	(Bethel Temple)		Not eligible
H-034A	2322 Second Avenue	Rendezvous/Jewel Box (B.F. Shearer Co.)		Not eligible
H-035A	2324–2326 Second Avenue	Suyama Peterson Deguchi		Not eligible
H-036A	2327 Second Avenue	City Hostel (William Tell Hotel)		SL; eligible NRHP
H-037A	2331 Second Avenue	Buckley's (MGM-Loew's)		SL; eligible NRHP
H-038A	2334 Second Avenue	Marrakesh		Not eligible
H-039A	304 Bell Street	Adams Apartments		Eligible NRHP and SL
H-040A	314 Bell Street	Vacant		Not eligible
H-041A	2313 Third Avenue	Matt Talbot Center/ Traugott Terrace		Not eligible
H-042A	2323 Third Avenue	Binder Products		Not eligible
H-043A	2330 Third Avenue	Seattle Custom Framing		Not eligible
H-044A	2333 Third Avenue	SKB Architects		Not eligible
H-045A	2313 Fourth Avenue	Two Bells Bar and Grill		Eligible NRHP
H-046A	2321 Fourth Avenue	Fleming Apartments		Not eligible
H-047A	2325 Fourth Avenue	Community Psychiatric Clinic		Not eligible
H-048A	2407 First Avenue	Form Space Atelier/Low-income Housing Institute		Not eligible
H-049A	2419 First Avenue	Ace Hotel (Glaser Building/Latona Hotel)		Eligible NRHP and SL
H-050A	87 Wall Street	Ilium Building (Butterfield Trunk Company)		Not eligible
H-051A	2402 Second Avenue	Lexington-Concord Apartments		Eligible NRHP and SL
H-052A	2412–2416 Second Avenue	Windermere		Not eligible
H-053A	2418 Second Avenue	Windermere		Not eligible
H-054A	2401 Third Avenue	US Bank		Eligible NRHP and SL
H-055A	420 Wall Street	Devonshire Apartments		Eligible NRHP and SL

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-056A	500 Wall Street	Archstone Belltown (Grosvenor House)		Eligible NRHP and SL
H-057A	500 Denny Way	Carol Edward, Attorney		Not eligible
H-058A	501 Denny Way	Faulkenbury & Wright Cleaners		Not eligible
H-059A	508 Denny Way	Fat City German Motor Specialties	X	Not eligible
H-060A	112 Fifth Avenue N.	Vacant		Not eligible
H-061A	118 Fifth Avenue N.	Vacant (Seattle Electric Works)		Not eligible
H-062A	124 Fifth Avenue N.	Vacant		Not eligible
H-063A	131 Taylor Avenue N.	Vacant		Not eligible
H-064A	500 John Street	Graham Lundberg & Peschel		Not eligible
H-065A	206 Fifth Avenue N.	The Funhouse		Not eligible
H-066A	223 Taylor Avenue N.	TW Telecom		Not eligible
H-067A	44 S. Nevada Street	Port of Seattle		Not eligible
H-068A	2320 First Avenue	Barnes Building		NRHP, SL
H-069A	2326 First Avenue	Austin Bell Building		NRHP, SL
H-070A	2401 First Avenue	Hull Building		NRHP, SL
H-071A	2101–2105 First Avenue	Guiry Hotel		NRHP, SL
H-072A	2111 First Avenue	Schillestad Building		NRHP, SL
H-073A	420 Blanchard Street	Windham Apartments		NRHP, SL
H-074A	2030 First Avenue	First and Lenora Building (Marine Auto Service & Garage)		Not eligible
H-075A	2226 Third Avenue	Seville Building		Not eligible
H-076A	2230 Third Avenue	Kelly's Restaurant		Not eligible
H-317	2411 Alaskan Way	Edgewater Hotel		Not eligible
H-318	2501 Elliott Avenue/ 10 Wall Street	Skyway Luggage		Not eligible
H-319	2611 Alaskan Way	Pier 69		Not eligible
H-320	2601 Elliott Avenue	Real Networks (American Can Company)		Not eligible
H-321	2801 Alaskan Way	Pier 70 (Ainsworth and Dunn)		Not eligible
H-322	2800 Elliott Avenue	Old Spaghetti Factory		Eligible NRHP and SL

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-323	2800 First Avenue	Labor Temple		SL; eligible NRHP
H-324	2800 Third Avenue/ 325 Denny Way	Wells Fargo Bank		Not eligible
H-325	2934 Western Avenue	Bavarian Meats		Not eligible
H-326	2905 First Avenue	Bremer Apartments		Not eligible
H-327	2933 Second Avenue	Windermere Apartments		Not eligible
H-328	3131 Elliott Avenue	Northwest Work Lofts		Not eligible
H-330	307 Broad Street	Car Toys		Not eligible
H-331	200 Second Avenue N.	Pacific Science Center		SL; eligible NRHP
H-332	400 Broad Street	Space Needle		SL; eligible NRHP
H-333	204 Denny Way	Frol Building		Not eligible
H-334	351 Denny Way	Unocal Station		Not eligible
H-336	766 John Street	Denny Park Lutheran Church		Eligible NRHP and SL
H-337	210 Dexter Avenue N.	Denny Place Center		Not eligible
H-338	222 Dexter Avenue N.	Vacant		Not eligible
H-339	228 Dexter Avenue N.	Patricia Cameron Gallery		Not eligible
H-340	766 Thomas Street	Single family		Not eligible
H-341	777 Thomas Street	Graphic Options		Not eligible
H-342	300 Dexter Avenue N.	Wilderman Refrigeration		Not eligible
H-343	312 Dexter Avenue N.	GCA Services Group		Not eligible
H-344	400 Dexter Avenue N.	Little Red Bistro		Not eligible
H-345	406 Dexter Avenue N.	Joseph Mayer clock		SL; not eligible NRHP
H-346	420 Dexter Avenue N.	United Reprographics		Not eligible
H-347	430 Dexter Avenue N.	Seattle Automotive, Inc.		Not eligible
H-348	801 Dexter Avenue N.	Vacant		Not eligible
H-349	901 Dexter Avenue N.	Vacant		Not eligible
H-350	217 Eighth Avenue N.	Vacant		Not eligible
H-351	223 Eighth Avenue N.	Bernard Import Auto Works		Not eligible
H-353	401 Eighth Avenue N.	Display Products		Not eligible
H-354	433 Eighth Avenue N.	Glazer's Digital		Not eligible
H-355	503 Westlake Avenue N.	Antique Liquidators		Not eligible

Exhibit A-1. Inventory of Buildings and Structures Built In or Before 1963 Within the Area of Potential Effects (continued)

ID Number	Address	Current Name (Historic Name)	Areaway	Designation
H-356	507 Westlake Avenue N.	MBI Systems		Not eligible
H-357	515 Westlake Avenue N.	Vacant		Not eligible
H-358	603 Roy Street	Rhino Linings of Seattle		Not eligible
H-359	801 Mercer Street	Brotman Building (Washington Natural Gas)		Not eligible
H-360	900 Roy Street	Tin Cup Coffee		Not eligible
H-361	614 Valley Street	Duplex		Not eligible
H-362	615 Valley Street	Valley House		Not eligible
H-363	622 Valley Street	Horizon Church Recreation Center		Not eligible
H-364	810 Sixth Avenue N.	Horizon Church		Not eligible
H-365	822 Sixth Avenue N.	Triplex		Not eligible
H-366	902 Sixth Avenue N.	Duplex		Not eligible
H-367	910 Sixth Avenue N.	Single family residence		Not eligible
H-368	920 Sixth Avenue N.	Apartment building		Not eligible
H-369	606 Aloha Street	Single family residence		Not eligible
H-370	921 Aurora Avenue N.	Lab 921		Not eligible
H-371	605 Fifth Avenue N.	Auditorium Apartments		Not eligible
H-372	Republican Street east of Aurora Avenue	Lake Union Sewer Tunnel		Eligible NRHP

Notes: NHL = National Historic Landmark
NRHP = National Register of Historic Places
PMHD = Pike Place Market Historic District
PSHD = Pioneer Square Historic District
PSPD = Pioneer Square Preservation District (local)
SL = Seattle landmark

ATTACHMENT B

Tables of Ethnographic References

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Exhibit B-1. Ethnographic Locations in the Study Area Vicinity Based on Waterman (2001)

No.	Orthography: Waterman 2001 (Lushootseed[1])	Translation	Description
12	Tcɛ′dkedäd	Lying curled on a pillow	A small promontory in Ballard, just at the entrance of Salmon Bay, referring to the shape of the sand spilt. This area was used to gather clams.
12a	ClIco′lutisd (šilšulucid)	Mouth of cilco′l	Where Salmon Bay empties into Shilshole Bay.
13	ClIco′l (šilšul)	Like shoving a thread through a bead, threading a bead, threading or inserting something	Metaphorically refers to how the narrow estuary invades the shoreline. Also refers to Salmon Bay and a village on the north side of Salmon Bay inhabited by a Duwamish band called the Cilcol-a′bc (or Shul-shale) Tribe. Salmon Bay was used by Native American to access Lake Union and Lake Washington.
14	Bltlda′kt (betedaq)	A king of supernatural power	A small creek entering the north side of Salmon Bay, above the Fremont bridge, where shamans held dances. This is the "power," which enabled one to go to the underworld to regain a guardian spirit. (Description does not match map: Fremont Bridge crosses the west end of Lake Union, not Salmon Bay.)
15	Qw3ϕla′stab	A small bush with white flowers and black berries	A small creek, smaller than the one above, entering the same inlet as above. (Description does not match map: Fremont Bridge crosses the west end of Lake Union, not Salmon Bay.)
16	Hwiwa′lqu	Large, having lots of water	A creek draining down a straight gully into the south side of Salmon Bay from the area around Discovery Park (Fort Lawton).
17	Pka′dzEltcu	Thrust far out	West Point, name refers to the way the point juts into the sound.
18	LE′plEpl (Ce′e?); also La′pub and TcE′tla	Rock, boulder	Fourmile Rock, a boulder in the water at the foot of Magnolia Bluff. Mentioned in a myth where Sta′kub could take a drag net made of cedar and hazel branches and throw it over this rock while standing on the distant beach.
19	TLo′xwatL-qo	Land otter water	A small creek draining down a gully now occupied by a paved road from Fort Lawton, flowing only in wet weather.

Exhibit B-1. Ethnographic Locations in the Study Area Vicinity Based on Waterman (2001) (continued)

No.	Orthography: Waterman 2001 (Lushootseed[1])	Translation	Description
20	Silaqwotsid (s?ileq<ucid)	Talking; mouth of edge of water	The mouth of the creek draining into Smith Cove.
21	T3E'kEp (teqep)	Aerial net for snaring ducks	A creek flowing into Smith Cove and a camping place where duck snares were set to take advantage of the flyway between Elliott Bay and Lake Union over the low area south of Queen Anne Hill.
22	Baba'kwob	Prairie	An open space or series of spaces in the forest near Belltown.
23	Djidjilä'l[3]lltc (d>d>elai)	A little place where one crosses over	A promontory topped by a few trees with a lagoon behind it, an area that is now roughly S. Washington Street to S. King Street, and First Avenue S. to Second Avenue S. A trail led from the beach on Elliott Bay to the lagoon. There was a village on each side of the promontory.
24	Tux pa'ctEb	Place for setting things out	A little spit or beach at the edge of the easternmost of the mouths of the Duwamish River.
25	Teta'lks (tetalXqs)	A little strong point	A small promontory on an island. The place is said to have been used as a lookout point by the Indians, who built a stockade there. (Thrush [2002] places this farther south in Georgetown and associates it with the midden found at the [redacted] Also says it is buried [redacted])
26	Slu'wiL (slu?w≈)	A perforation for a canoe, a short cut, a canoe pass	The slough passing to the south of the island (#25) above. In this case, the word refers to a grassy marsh intersected with channels, into and through which canoes can be pushed.
27	XwEg3 (tetalXqs)	Slough	The largest of the branches into which the Duwamish River divides at its mouth.
28	Q3ulg3ula'di (qelqeladi?)	Shaggy, tangled; uprooted tree/stump	A place on the shore of the slough (#27) where there were a lot of snags so that no one could land.
29	Ts3E'kas (Ceqas)	Muddy; something dirty	Harbor Island, a flat surrounded by watercourses and rather marshy. George Si'towal, an informant, lived in a float house here with his wife until they died in 1920.

Exhibit B-1. Ethnographic Locations in the Study Area Vicinity Based on Waterman (2001) (continued)

No.	Orthography: Waterman 2001 (Lushootseed[1])	Translation	Description
29a	Ha3a'pus	None	A small creek draining across a flat on the west side of the Duwamish River.
30	Tul3a'ltu or (Tu?elal?x)	Herring's house; herring house	A village site on the west bank of the Duwamish, at the foot of the bluff of West Seattle.
31	Tua'wi	Trout	Longfellow Creek draining into Young's Cove in West Seattle.
32	CuxutsE'xud (sexueXed)	Something to split with; by means of splitting	A small creek draining down a little gully near Luna Park in West Seattle.
33	SqwEdqs (sq<edqs)	Promontory at the foot of something; waterfall point	The sand spit under the bluffs of Duwamish Head.
34	SbEkwabEqs (sbaq<abqs)	Prairies	Alki Point, as the sandy promontory jutting out half a mile from the shoreline had many open places among the trees.
35	Tux qo'tEb (dexquteb)	Places of disease	A depression a mile or more inland from Duwamish Head containing a cranberry swamp.
36	T3EsbEd ('tesbid)	A winter house or cold weather place	A small creek south of Alki Point. There was a brickyard at this location.
37	GwEl (Gal)	To capsize, capsize	Another small creek south of #36.
58	Gwa'xwop	Outlet	A stream draining Lake Union into Salmon Bay.
59	Ctclwa't-qo (axadq<u?)	Place where one whips the water; whip water, club water	A small creek just east of the railroad bridge in Ballard. People would hit the water with sticks to drive the fish into the narrow brook where they were easily captured.
60	Stɛ'tciL	A prop	The promontory jutting into the north shore of Lake Union; referring to the way it seems to lean against the opposite shore. Where Gas Works Park is today.
61	Baqwob (baq<ab)	Prairie	An open space near Lake Union, at the north abutment of the Latona Bridge (University Bridge).
62	Waq3e'q3ab (waQwaQab)	Frog; like a frog	A small creek entering Lake Union just east of the Latona Bridge (University Bridge).
63	Sqwitsqs (sq<icqs)	Little promontory; down river promontory	A small promontory jutting into Lake Union where the boat house of the University Boat Club now stands.

Exhibit B-1. Ethnographic Locations in the Study Area Vicinity Based on Waterman (2001) (continued)

No.	Orthography: Waterman 2001 (Lushootseed[1])	Translation	Description
65	DutLEc	None	Green Lake; where suckers and perch were taken in basket traps. Salmon also spawned here.
139	Swa'tsugwlL	To lift up a canoe, to shove [a canoe]; to lift a canoe, to pull a canoe	The portage between Lake Union and Lake Washington. Boats would be pushed as far as possible up the creek connecting Lake Union and Lake Washington, then carried the rest of the way.
140	SpaLxad (spa≈Xad)	Marsh, wet flats, bog, wetland	The flats at the south end of Portage Bay of Lake Union, facing the University of Washington campus.
141	Sxwuba'bats (saxebabac)	Place where jumping occurred, jump over a solid object	A place on the shore of Lake Union, opposite Gas Works Park, where the shore was covered with logs, which one had to jump over.
142	StL3ep (s'ep)	Deep	A place just south of #141 above where the beach is very abrupt.
143	Cta'qwcld (ca?k<Sed)	A trail descends to the water	A place at the south end of Lake Union where a trail from Elliott Bay came down the hill to Lake Union. This is where David Denny's sawmill stood.
144	TL3pe'lgwlL ('epalg<i≈)	Deep for canoes	A bluff at the foot of Lake Union on the southern shore.

Note: [1]These names appear in the typeface Times Lushootseed, a typeface specifically designed for this language.

Exhibit B-2. Locations Named in Archival Sources

No.	Name or Type	Citations	Description/Comment
1	*Baba'kwob* (see also Muck-Muck-Wum)	Dorpat 1984, 2006 Thrush 2002 Waterman 2001	"Prairie" – also mentioned by Thrush (2002) as being near Bell's house, which was between Bell, Battery, First, and Second. Dorpat (2006) quotes Buerge as saying the name refers to the meadows between Queen Anne and Denny Hills, from the bay to Lake Union. Dorpat (1984) places marshes and meadows and a gathering place near Denny's cabin, where the Seattle Center is now (see also #21 below). Dorpat (2006) believes this suggests that the meadow and the beach campsite (Muck-Muck-Wum, see below) are not the same. Native accounts place two medium-sized longhouses here (Dorpat 2006). Thrush (2002) places a group of about 30 camping along the beach in 1856. Dorpat (2006) quotes Buerge as saying two "architectural forms" shown on an 1868 photo of the city are the remains of a longhouse. These remains are on the bluff between the Bell Street Ravine and Battery Street. Other accounts (Dorpat 2006) put Curley's band "encamped about one mile north of Seattle" in 1856. Burge, quoted in Dorpat (2006), suggests this may be *Baba'kwob*.
2	Encampment	Dorpat 2006	The site of Denny's House was used as a gathering place for potlatches. According to the 1856 General Land Office (GLO), Denny's cabin was at [redacted] Perhaps related to *Baba'kwob* above.
3	Encampment	Bass 1937	A large Native American camp of several families built near Westlake on the shore of Lake Union, circa 1880. It included a "big house" made of cedar slabs and bark.
4	*a?kʷsed* Elliott Bay – Lake Union Trail	Dorpat 2006 Waterman 2001	Trail from *Baba'kwob* to Lake Union. Based on an 1879 T-Sheet, may follow Bell Street Ravine to Bell Street, then north to approximately Dexter Avenue. May also follow the wagon road shown on the 1856 GLO. The GLO places it farther northwest. Dorpat quotes Denny as having been led across this trail.
5	Burials	Thrush 2002	Builders and graders unearth several bodies wrapped in cedar bark in Belltown, 1876 and 1878.
6	Encampment	Wilse circa 1898	Photograph from circa 1898 showing Native encampment on the beach in canoes with tents and wood shacks, entitled "Arrival of Indians for hop picking." A copy of the same photo in the Hamilton-Seattle collection is captioned "Canoes & Indians, foot of Vine, Cedar, & Broad Sts – 1882–86."

Exhibit B-2. Locations Named in Archival Sources (continued)

No.	Name or Type	Citations	Description/Comment
7	Muck-Muck-Wum, Mukinkum	Bass 1937 Dorpat 2006	Encampment on the beach [redacted] May be the same as *Baba'kwob* (see #1 above). Thrush (2002) says that Mukinkum is an anglicized version of *Babkʷab*.
8	Encampment	Dorpat 2006	Princess Angeline's shack in the 1880s.
9	*Bo'lots* or *Bu?lac*	Harrington circa 1909, cited in LAAS 2004 Thrush 2002	The area from the waterfront "way back" between Pike and University Street, perhaps a reference to springs in the area. Thrust (2002) calls this *Bu?lac* and places it between Front, Second, University, and Union Streets. Also where Denny built his house.
10	Encampment	Bass 1937 Thrush 2002	Encampment in the 1850s in Arthur Denny's pasture, between Front, Second, University, and Union Streets.
11	Burial	LAAS 2004	Cites Denny 1909; burial [redacted]
12	Cemetery	Bass 1937 Dorpat 2006	Described as bring on the bluff [redacted] beside the ravine. Early photos and topographic maps show the ravine cutting into [redacted] with bluffs on [redacted] Bass (1937) says that the "high bluff on the south side [redacted] was an Indian burial ground," and that the bluffs have been lowered by grading.
13	Encampment, Tzee-tzee-lal-litch	Bass 1937	According to Bass, there was a spring and a sandy beach [redacted] where the Native Americans camped. Bass says the spot was called Tzee-tzee-lal-litch, although this is what Kellogg (1912) called the encampment farther south (see Djidjdkila'lltc, [#20] below).
14	Burial	Dorpat 2006	Dorpat recounts discoveries of Native American burials [redacted]
15	Encampment	Phelps 1855–1856	Native encampment, between Yesler's mill and the stockade [redacted] Phelps's map marks this as being "Curley Camp." See also *Baba'kwob* (#1).
16	Trail	Buerge 1981	Trail from Elliott Bay to Renton.
17	Trail	Kellogg 1912	Trail between Elliott Bay and tidal lagoon, near S. Main Street, between First and Second Avenues.
18	Ballast Island	Bass 1937 Dorpat 2006 Sanborn Map Company 1888, sheet 2 Soule circa 1891	[redacted] Native Americans would gather here before traveling inland to pick hops (first hops harvested in 1866). After 1900, this island was almost entirely inhabited by S'Klallam people (Thrush 2002).

Exhibit B-2. Locations Named in Archival Sources (continued)

No.	Name or Type	Citations	Description/Comment
19	Encampment	Glover 1878	A native encampment on the beach [redacted]
20	*Djidjdkil'lltc* Tseettsal-al-ich	Kellogg 1912 Phelps 1855–1856 Thrush 2002 Waterman 2001 Watt 1959	Encampment [redacted] Also shown on the Phelps map circa 1856, and described in a letter by Vivian Carkeek. Watt (1959), in *Four Wagons West*, quotes Denny as seeing the ruins of an Indian hut on the headland south of the stream that would become Yesler Way. Bureau of Indian Affairs records from 1856 also describe an encampment of 40 behind Madam Damnable's (in the same place shown on the Phelps map) (Thrush 2002). See also #13 above.
21	Dancehouse	Crow 1926, cited in WSDOT et al. 2004	May be related to Djidjdkila'lltc (#20); reported to be [redacted]
22	Encampment	Thrush 2002	Seasonal hop pickers on the tidelands south of Yesler's mill and the lava beds in the 1880s.
23	Encampment	Kellogg 1912 Thrush 2002	"Back behind the marsh at the beach was an Indian camp and a small stream of fresh water came down from the hill" (Kellogg 1912). [redacted] In 1878, an encampment on a "sand reef" (Thrush 2002) across from S. Main Street at the edge of the sawdust flat (the now filled lagoon).
24	Landing place	Anderson 1898	Photo shows a Native American woman with a basket standing near a canoe, captioned "This Indian squaw was photographed in 1898 by Oliver P. Anderson [redacted]" May be posed.

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ATTACHMENT C

Memorandum of Agreement for Bored Tunnel Alternative (Preferred Alterative)

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MEMORANDUM OF AGREEMENT
Among
FEDERAL HIGHWAY ADMINISTRATION
WASHINGTON STATE HISTORIC PRESERVATION OFFICER
And
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
To
RESOLVE THE ADVERSE EFFECTS OF
THE ALASKAN WAY VIADUCT REPLACEMENT PROJECT

WHEREAS, The Washington State Department of Transportation (WSDOT) will construct the Alaskan Way Viaduct Replacement Project (the Project) by replacing portions of State Route 99, a north-south elevated highway passing through the City of Seattle, WA, with a proposed north-south bored tunnel; and

WHEREAS, the U.S. Department of Transportation, Federal Highway Administration (FHWA) plans to provide assistance to the Project pursuant to the Federal-Aid Highway Program as described in Title 23 USC §101 et seq.; and

WHEREAS, FHWA has determined that the Project is an undertaking, as defined in 36 CFR §800.16(y), and thus is subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 USC §470f and its implementing regulations, 36 CFR §800; and

WHEREAS, FHWA and WSDOT have consulted with the Washington State Historic Preservation Officer (SHPO), interested and affected Native American tribes, and other parties with a demonstrated interest in the effects of the Project on historic properties pursuant to 36 CFR §800.2; and

WHEREAS, FHWA and WSDOT, in consultation with the SHPO, the tribes, and the consulting parties, have identified historic properties within the Area of Potential Effects (APE) in compliance with 36 CFR §800.4; and

WHEREAS, FHWA, in consultation with the SHPO, has determined that the undertaking will have an adverse effect to historic properties, consisting of historic buildings and archaeological sites, listed in or eligible for listing in the National Register of Historic Places (National Register) in compliance with 36 CFR §800.5; and

WHEREAS, the affected historic properties include the Alaskan Way Viaduct/Battery Street Tunnel, two contributing properties to the Pioneer Square Historic District, the Polson Building and the Western Building, the Pioneer Square Historic District, archaeological site 45KI924, and a portion of the historic Lake Union Sewer Line; and

WHEREAS, the adverse effects of the Project to the Alaskan Way Viaduct/Battery Street Tunnel have been resolved by means of a separate Memorandum of Agreement (MOA) between FHWA, WSDOT, and the SHPO; and

WHEREAS, FHWA has invited the Advisory Council on Historic Preservation (ACHP) to participate in consultations concerning the effects of the Project on historic properties and resolution of adverse effects, and ACHP has declined to participate in such consultations; and

WHEREAS, FHWA has consulted with the following federally recognized Native American tribes regarding the undertaking and its potential to affect historic properties of religious and cultural significance to the tribes:

> Muckleshoot Indian Tribe, Suquamish Tribe, Tulalip Tribes, Snoqualmie Indian Tribe, the Confederated Bands and Tribes of the Yakama Nation, Jamestown S'Klallam, Port Gamble S'Klallam, and Lower Elwha Klallam; and

WHEREAS, FHWA, in response to interest in the Project identified through tribal consultation, has invited the Muckleshoot Indian Tribe, the Suquamish Tribe, the Tulalip Tribes, the Snoqualmie Indian Tribe, and the Confederated Bands and Tribes of the Yakama Nation, hereafter the tribes, to be concurring parties to this MOA; and

WHEREAS, this MOA is not intended to impair or waive any obligations or rights of any party to the agreement under applicable state or federal laws regarding archaeological resources, cultural resources, human remains, or historic sites; and

WHEREAS, FHWA, has consulted with King County, WA; City of Seattle, WA; the National Trust for Historic Preservation; the Washington Trust for Historic Preservation; Historic Seattle; The Alliance for Pioneer Square; 4Culture; and, Benjamin and Lois Mayers and has invited them to be concurring parties to this MOA; and

WHEREAS, this Project remains controversial, and as such, execution of this Agreement as a concurring party does not necessarily indicate that the party has a particular view regarding the preferred alternative, but rather indicates the desire of such parties to remain involved in implementation of the terms of this Agreement; and

WHEREAS, under the *First Amended Programmatic Agreement Implementing Section 106 of the National Historic Preservation Act for the Federal-aid Highway Program in Washington State Administered by the Federal Highway Administration,* FHWA, ACHP, WSDOT, and SHPO have agreed to delegate certain authorities relating to Section 106 of the NHPA to WSDOT for Federal-aid Highway projects in Washington State; and

WHEREAS, WSDOT, acting on behalf of FHWA, will carry out the terms of this MOA; however, FHWA will be responsible for ensuring that all the requirements of the MOA are met; and

WHEREAS, WSDOT will ensure that a qualified Cultural Resources Specialist, as defined in the *First Amended Programmatic Agreement Implementing Section 106 of the National Historic Preservation Act for the Federal-aid Highway Program in Washington State Administered by the Federal Highway Administration,* oversees the implementation of all commitments contained in this Agreement for the duration of the Project.

NOW THEREFORE, FHWA, SHPO and WSDOT, agree that the Project shall be implemented with the following stipulations in order to take into account the effects of the Project on historic properties.

Background

A map of the APE for the Project, as determined after consultation with the consulting parties, appears as Appendix A of this MOA.

The historic properties identified within the APE for the Project are described in the second *Supplemental Draft Environmental Impact Statement, Appendix I, Historic, Cultural, and Archaeological Resources Discipline Report Alaskan Way Viaduct Replacement Project,* published in October 2010.

The stipulations below use the term "DAHP" (Washington State Department of Archaeology & Historic Preservation) when referring to participation by SHPO and DAHP staff.

Stipulations

FHWA shall ensure that the following stipulations are carried out:

I. Requirements for all Historic Buildings

WSDOT will avoid or minimize direct adverse effects of the Project to historic buildings in the APE as described below.

A. Monitoring Historic Buildings

1. WSDOT, through its Design-Build contractor, will develop a deformation analysis report. The deformation analysis report will identify the amount of ground deformation that each individual building within the zone of influence can tolerate. The zone of influence is the area within the APE in which ground deformation resulting from the Project may occur. The report will include the historic buildings listed in Appendix B. Appendix C presents a map showing the location of these historic buildings within the zone of influence. At a minimum, the deformation analysis report will include:

    a The proposed type and location of instrumentation and installation methods used to monitor the historic buildings within the zone of influence before, during and after the proposed tunneling to verify that ground deformations are within predicted and tolerable limits (See Stipulation I.B below). At a minimum, the monitoring instrumentation and installation will be as follows:

(i) Multiple Point Borehole Extensometer (MPBX) - MPBXs will be located approximately every 50 feet from S. King Street to Spring Street and every 100 feet from Spring Street to Thomas Street;

(ii) Inclinometer - Inclinometers will be approximately located at every cross street relatively perpendicular to the tunnel, decreasing in frequency with increasing distance away from the centerline of the tunnel; and

(iii) Near Surface Settlement Points (NSSP) - NSSP will be located approximately every 50 feet from S. King Street to Spring Street and approximately every 25 feet (skipping locations where an MPBX is located) from Spring Street to Thomas Street.

2. Sixty-two buildings within the zone of influence will be monitored for deformation. (Note: In some cases, two or more "buildings" are actually a single structure and must be monitored as such). A list of the historic buildings along with the preliminary instrumentation required for monitoring is provided in Appendix B. WSDOT, through its Design-Builder will refine the preliminary instrumentation, as design progresses.

3. WSDOT, through its Design-Builder, will monitor these historic buildings for the duration of the proposed tunneling scheduled for completion by the end of 2015. It is expected that all historic buildings will be monitored for a period of twelve (12) to eighteen (18) months after the tunnel boring machine passes underneath the historic buildings. If deformation monitoring indicates continued progressive settlement at that time, WSDOT would extend monitoring.

B. Settlement Management Plan

1. WSDOT requires the Design-Builder to prepare a settlement management plan for each building prior to start of the proposed tunneling. These plans use the analysis from the deformation analysis report to establish building specific "Alert" and "Maximum" ground deformation thresholds. Settlement management plans will identify the general actions to be taken by the Design-Builder during tunnel boring if the "Alert" threshold is triggered. If those actions do not prevent additional ground deformation from occurring, and "Maximum" thresholds are triggered, additional measures will be implemented to arrest ground movement. These measures include, but are not limited to, tail-skin grouting, pressure adjustments to the cutting head, grouting through the tunnel lining, and grouting from the surface adjacent to the affected building. The measures will be developed at the time the trigger occurs, and will be designed specifically to address the problem at hand. At a minimum, the settlement management plans will include the measures to be taken by the Design-Builder, as applicable, to:

a. Limit further ground movement;

b. Limit further decrease (or increase) in groundwater and piezometric levels;

c. Control vibrations;

d. Add instrumentation or change reading frequency as appropriate;

e. Maintain the structural integrity of adjacent structures and utilities;

f. Develop an emergency response plan / traffic / utility diversion or other contingency plans;

g. Develop communication protocols / notification procedures;

h. Develop the criteria for action if deformations continue to increase beyond "Alert" and "Maximum" thresholds; and

i. Identify, when construction has been stopped, the criteria for resuming construction after corrective measures have been implemented.

2. Settlement will be monitored on a continual basis during tunnel boring by a monitoring team. The monitoring team will meet daily during the tunnel boring to ensure that corrective actions are taken, if needed, during the tunnel boring operation in accordance with the settlement management plans for each building. WSDOT will provide the names and qualifications of the monitoring team members to DAHP and the other consulting parties.

3. WSDOT will provide to DAHP and the other consulting parties the settlement management plans for each historic building as they are completed.

4. Should the "Maximum" thresholds be triggered as identified in the settlement management plan for any historic building, WSDOT and FHWA will notify DAHP.

5. WSDOT, FHWA and DAHP will agree on a licensed architect with a background in historic architecture who meets the professional qualifications standards cited in Stipulation VI to review the settlement management plan for each historic building as and when appropriate.

C. Claims and Repairs to Historic Buildings

WSDOT, in consultation with DAHP, will establish a claims and repair process by which owners of buildings, including historic buildings, can file claims for damages to their properties that may result from the Project.

1. WSDOT, in consultation with DAHP, will ensure that an architect with a background in historic architecture meeting the requirements of Stipulation VI will participate in the claims and repairs process involving any historic buildings within the APE. This will include claims review, damage inspections, cost estimates, repair recommendations, and damage repair.

2. WSDOT will ensure that all repair work on historic buildings shall follow the Secretary of the Interior's Standards for the Treatment of Historic Properties and shall be done in compliance with the City of Seattle's Municipal Code, as appropriate, with review and approval, as required, by the Seattle Landmarks Preservation Board, the Pioneer Square Preservation Board, the Pike Place Market Historical Commission; or DAHP, for National Register eligible but not locally designated buildings.

3. The claims and repair process will include the following:

    a. The damage claim submittal process;

    b. The process by which damage claims will be inspected and evaluated;

    c. The process for and personnel involved in preparing damage evaluations, repair cost estimates, findings and recommendations;

    d. The process for making and documenting repairs based on the reported cost estimates and recommendations; and

    e. The process for making appeals.

4. The claims and repair process will be in effect for the duration of the proposed tunneling scheduled for completion by the end of 2015. Property owners will retain the right to file a claim if damage is detected post-construction and the owner believes it to be a result of tunneling.

D. Emergency Situations

In the unlikely event that any one of the historic buildings listed in Appendix B suffers significant structural damage warranting emergency measures, the following steps will be taken:

1. WSDOT, through its Design-Builder, shall take immediate steps to stabilize the building and protect the public.

2. FHWA and WSDOT shall reopen Section 106 consultation with DAHP and the other consulting parties. Efforts to avoid, minimize, or mitigate adverse

effects will be developed on a case-by-case basis in consultation with DAHP and the other consulting parties.

3. WSDOT shall consult with DAHP and the other consulting parties, as well as the property owner. WSDOT will explain the steps taken to stabilize the building and the nature and extent of the damage to the building and its historic characteristics. WSDOT, in consultation with DAHP and the other consulting parties, shall determine what, if any, mitigation is warranted.

4. If WSDOT determines that mitigation is warranted, WSDOT will consult with the property owner, DAHP and the other consulting parties to prepare and implement a mitigation plan. Mitigation will be conducted in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

II. Additional Requirements for Historic Buildings within the Pioneer Square Historic District

WSDOT will avoid, minimize, or mitigate the direct adverse effects of the Project to historic buildings that are contributing elements to the Pioneer Square Historic District (PSHD). The following measures will resolve the direct adverse effects of the Project to PSHD as described below.

A. 1 Yesler Way Building

WSDOT will avoid direct adverse effects of the Project to the 1 Yesler Way Building in the following manner.

1. Install micro piles below grade to the west of the western wall of the 1 Yesler Way Building prior to the proposed Project tunneling.

2. Monitor the 1 Yesler Way Building in accordance with the monitoring provisions in Stipulation I.A. See Appendix B for building specific monitoring information.

3. Follow the provisions for intervention, if warranted, in accordance with the settlement management plan developed under Stipulation I.B.

4. Follow the claims and repair process, if warranted, in accordance with Stipulation I.C.

5. Ensure that all work is done in compliance with the City of Seattle's Municipal Code, as appropriate, with review and approval, as required, by the Pioneer Square Preservation Board.

B. Polson Building

WSDOT will minimize the adverse effects of the Project to the Polson Building in the following manner.

1. Inject compensation grouting below grade to offset any settlement from the proposed tunneling.

2. Monitor the Polson Building in accordance with the monitoring provisions in Stipulation I.A. See Appendix B for building specific monitoring information.

3. Follow the provisions for intervention, if warranted, in accordance with the settlement management plan developed under Stipulation I.B.

4. Follow the claims and repair process, if warranted, in accordance with Stipulation I.C.

5. Ensure that all work is done in compliance with the City of Seattle's Municipal Code, as appropriate, with review and approval, as required, by the Pioneer Square Preservation Board.

C. Western Building

1. WSDOT will mitigate the adverse effects of the Project to the Western Building by implementing a building protection solution that achieves the following outcomes:

   a. Provides reasonable assurance that the building will be returned to the owner at the conclusion of the proposed tunneling in a condition essentially comparable to the pre-tunnel condition with only minor repair required;

   b. Protects the Polson Building from potential damage that may be a consequence of damage to the Western Building; and

   c. Protects the public.

2. WSDOT has prepared a conceptual design that demonstrates the feasibility of achieving the outcomes stated above. The principal elements of the design include:

   a. Foundation stabilization;

   b. Stabilization of cracked columns, beams, and walls;

c. Positive connection of floors, beams, and columns;

d. Temporary interior shoring and bracing;

e. A temporary exterior steel frame; and

f. A regime of compensation grouting.

3. All work associated with the Western Building stabilization will be accomplished in consultation with DAHP and in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Any necessary repair work following tunneling activities and removal of temporary shoring and bracing will be accomplished in consultation with DAHP and in accordance with the Secretary's Standards.

4. Additionally WSDOT will:

a. Monitor the Western Building in accordance with the monitoring provisions in Stipulation I.A. See Appendix B for building specific monitoring information;

b. Follow the provisions for intervention, if warranted, in accordance with the settlement management plan developed under Stipulation I.B;

c. Follow the claims and repair process, if warranted, in accordance with Stipulation I.C; and

d. Ensure that all work is done in compliance with the City of Seattle's Municipal Code, as appropriate, with review and approval, as required, by the Pioneer Square Preservation Board.

III. Requirements for the Pioneer Square Historic District

WSDOT will avoid potential indirect adverse effects that may occur to PSHD as a result of the Project by developing and implementing a number of plans and opening a project information center, as further described below. The purpose of these efforts is to inform and educate the community, both within and outside of PSHD, about the Project and about the steps WSDOT will take to avoid disruption to PSHD during the Project.

A. Communication Plan

1. The following are the Project goals for the communication plan:

a. Inform the public, business owners, and residents about Project-related construction in and near PSHD;

b. Assist the community in navigating through and around PSHD during different phases of Project construction; and

c. Provide an opportunity for the community to offer feedback on WSDOT's ongoing communication efforts.

2. To achieve these goals, WSDOT has developed and annually updates a neighborhood communications plan, which provides customized communication and outreach to those affected by Project-related construction. Some of the methods listed below have already been implemented by WSDOT, and will continue in PSHD as long as they are effective. These methods include:

a. Monthly articles in The Alliance for Pioneer Square (The Alliance) newsletter;

b. Links to The Alliance and Pioneer Square websites;

c. Neighborhood-specific email updates;

d. Door-to-door outreach;

e. Participation in neighborhood events;

f. Information booths; and

g. New Pioneer Square Blog updates.

B. Project Information Center

1. The following are the Project goals for the project information center:

a. Create a place that draws visitors to PSHD and educates them about the past, present, and future of PSHD;

b. Provide a Project information resource to the public, as well as the residents and businesses in PSHD;

c. Enhance WSDOT's public outreach and communication efforts for the Project; and

d. Spotlight the unique historical, archaeological, and engineering aspects of the Project.

2. To achieve these goals, WSDOT will:

a. Locate the project information center within PSHD;

b. Use the project information center to provide information and educational opportunities to the public, the residents, and businesses in PSHD;

c. Staff the project information center and provide space to The Alliance, and other community organizations, as appropriate, to distribute informational materials related to PSHD;

d. Provide, in consultation with The Alliance, information about the Project, PSHD, businesses, coming events and attractions, walking tours, and other relevant information;

e. Work with The Alliance to support their ongoing efforts to promote PSHD;

f. Develop educational displays on the history and archaeology recovered during the Project, including a display of artifacts;

g. Provide information about and displays on the design and construction of the proposed bored tunnel;

h. Offer space to other projects in the vicinity, such as the Waterfront Seattle and Elliott Bay Seawall projects, to provide information to the public;

i. Coordinate with the Klondike Museum to identify possible sharing of resources, volunteer historians, connections with local schools, and hours of operation;

j. Prepare and circulate a plan describing the purpose, goals, and implementation for the project information center to DAHP and the other consulting parties in the summer of 2011;

k. Set a goal to open the project information center in the fall of 2011, and open the project information center no later than the beginning of proposed tunneling; and

l. Keep the project information center open until the conclusion of significant Project-related construction activities within and adjacent to PSHD.

C. Marketing Activities

WSDOT will coordinate with The Alliance to develop and implement marketing activities directed to the public outside of PSHD in accordance with the process described below. The marketing activities will communicate to the public that

PSHD will be open for business for the duration of significant Project-related construction activities within and adjacent to PSHD.

1. The following are the Project goals for the marketing activities:

    a. Spread the message that PSHD is an attractive, historically vibrant neighborhood, and the internationally unique Project-related construction that is happening in real time is yet another reason to come to PSHD;

    b. Highlight positive things that are going on in PSHD such as events, unique offerings, sales, and educational opportunities; and

    c. Increase the availability of Project information to visitors to PSHD as well as residences and local businesses within PSHD.

2. To achieve these goals WSDOT will:

    a. Work with The Alliance to integrate the project's marketing efforts with theirs, creating and implementing a seamless package of marketing materials and activities.

    b. With The Alliance, prepare materials and implement activities that may include:

        (i) Brochures, fliers, maps and banners;

        (ii) Video, websites, podcasts and social media; and

        (iii) Advertising on radio and television and in other media.

    c. Conduct a series of discussions with The Alliance and others as appropriate to ensure that the marketing activities are identified and implemented on the same timeframe as the project information center, and in conjunction with The Alliance's marketing activities.

    d. Meet at regular intervals with The Alliance and others as appropriate to determine the marketing program effectiveness, allowing for adjustments as indicated by our collective experience.

D. Traffic Management and Construction Coordination Plan

1. The following are the Project goals for the traffic management and construction coordination plan:

a. Facilitate efficient movement of vehicles to and through PSHD during construction; and

b. Avoid potential conflict between construction projects that overlap in time and space.

2. To achieve these goals, WSDOT is in the process of developing and implementing a traffic management and construction coordination plan for the Project area, including PSHD. The purpose of this plan is to proactively reach out to local businesses, residents and the media about lane and road closures, detours and loss of parking, and other potential Project-related disruptions to travel. WSDOT is currently working with other agencies to ensure construction is coordinated among various projects in PSHD, the SODO neighborhood, and throughout the region. Elements of the plan include the following:

   a. Regular meetings to coordinate construction activities with the Seattle Department of Transportation (SDOT), Seattle City Light (SCL), Sound Transit, King County Metro, the Port of Seattle and others;

   b. Regular meetings with Qwest and Safeco Fields' management to coordinate advance special event schedules;

   c. Regular construction coordination briefings with other agencies including SDOT, the Seattle Police Department (SPD), King County Metro and SCL to provide a three week construction look ahead, a chance to voice concerns about any upcoming closures, and a chance to ask the Project Engineer questions about upcoming construction;

   d. Regular emails concerning construction closure information sent to other agencies and posted to the WSDOT and SDOT websites;

   e. Media relations and public outreach campaigns to alert drivers of upcoming construction closures;

   f. Targeted emails or visits from Project staff to residents and businesses nearest to construction work to alert those individuals most directly affected by upcoming construction;

   g. Interagency communications protocols with SDOT, SPD, SCL, the Port of Seattle, and King County Metro to ensure that agencies are in contact at all times to effectively address unforeseen issues or incidents affecting traffic near or through work zones; and

h. Traffic information provided to drivers via electronic message boards, the web, email updates, or other media as appropriate to alert travelers to and through the Project area.

IV. Requirements for Archaeological Sites and Sensitive Areas

WSDOT will avoid, minimize and mitigate the adverse effects of the Project on archaeological sites eligible for listing in the National Register and archaeologically sensitive areas that have the potential to contain archaeological deposits eligible for listing in the National Register through the development of an Archaeological Treatment Plan (Treatment Plan).

A. Treatment Plan – General Requirements

WSDOT, in consultation with DAHP, King County, the tribes and other consulting parties, will prepare a Treatment Plan for the Project. The Treatment Plan will guide the actions of cultural resources professionals, who meet the requirements of Stipulation VI, during its implementation for all identified archaeological sites, archaeologically sensitive areas, and all areas to be monitored for significant archaeological deposits.

1. The Treatment Plan shall:

a. Describe the Project actions affecting the sites and sensitive areas;

b. Describe the sites and sensitive areas;

c. Summarize the natural and cultural setting of the sites and sensitive areas;

d. Summarize the geomorphology of the area;

e. Summarize previous archaeological investigations relevant to the sites and sensitive areas;

f. Identify the research domains for sites 45KI958 and 45KI924 and the archaeologically sensitive areas;

g. Identify feature types, other information bearing deposits, and/or artifacts needed to address the research domains for the sites and sensitive areas;

h. Describe appropriate field and analytical methods to be used for archaeological testing and data recovery;

i. Outline reporting requirements;

j. Provide for the collection of display quality artifacts from archaeological deposits that are not eligible for listing in the National Register;

k. Describe curation arrangements for recovered archaeological materials;

l. Describe measures to disseminate information to the public; and

m. Explain that all archaeological investigations will be conducted by archaeologists with a background in either historic archaeology or prehistoric archaeology, as appropriate, meeting the requirements of Stipulation VI.

2. Unanticipated Archaeological Discoveries

A plan for unanticipated archaeological discoveries made during construction will be developed as part of the Treatment Plan. The unanticipated archaeological discovery plan shall:

a. Describe pre-construction requirements to educate Project personnel and construction contractors about archaeological resources;

b. Describe what steps will be taken to secure and protect a discovery;

c. Describe what steps will be taken to notify WSDOT of a discovery; and

d. Describe the procedures WSDOT will follow in determining the National Register eligibility of the discovery and the Project's potential for adverse effect. These procedures will include the following requirements:

(i) WSDOT will make its determinations of eligibility and effect in consultation with DAHP, as well as the tribes if the discovery is Native American in origin;

(ii) If WSDOT determines the discovery is eligible for listing in the National Register and may be adversely affected, WSDOT will consult with DAHP, King County, and other consulting parties, as well as the tribes if the discovery is Native American in origin, to determine appropriate treatment of the archaeological deposits;

(iii) WSDOT will consult with the tribes if Native American archaeological deposits or cultural materials are discovered to ensure that treatment of the discovery may be monitored by tribal personnel if so desired by the tribes; and

(iv) WSDOT will obtain approval by DAHP in accordance with permit requirements under RCW 27.53 for removal of any archaeological deposits determined eligible for listing in the National Register.

3. Archaeological Monitoring

A plan for archaeological monitoring during construction will be developed as part of the Treatment Plan. The archaeological monitoring plan shall:

a. Describe the general archaeological monitoring procedures to be followed during construction anywhere archaeological monitoring is needed within the APE. The monitoring plan will also describe the specific monitoring procedures to be followed at:

(i) Each archaeological site;

(ii) Each archaeologically sensitive area;

(iii) The location of micro piles to be installed at the Western Building;

(iv) The location of the grouting shaft to be excavated at the Western and the Polson buildings; and

(v) The location of any other grouting shafts that may be determined necessary as additional measures to arrest ground movement as referenced in Stipulation I.B.1.

b. Describe how the monitoring procedures will be coordinated with construction at each monitoring location; and

c. Describe the procedures WSDOT will follow if the archaeological monitor identifies deposits that are potentially eligible for listing in the National Register. These procedures will include the following requirements:

(i) If upon inspection WSDOT confirms the presence of archaeological deposits eligible for listing in the National Register, WSDOT will declare the deposits an unanticipated archaeological discovery and will follow the provisions of Stipulation IV.A.2.

4. Unanticipated Discovery of Human Remains

A plan for the unanticipated discovery of human remains will be developed as part of the Treatment Plan. In order to comply with permit requirements under RCW 27.53, DAHP shall approve the plan for the unanticipated discovery of human remains. The plan for the unanticipated discovery of human remains will inform Project personnel about the requirements relating

to the inadvertent discovery of human skeletal remains under RCW 27.44.055 and RCW 68.60.55, and will provide Project personnel with a clear understanding of the process to be followed. The plan for the unanticipated discovery of human remains shall:

a. Describe pre-construction requirements to educate Project personnel and construction contractors about human remains. These requirements will include the following:

   (i) WSDOT will ensure that a handout is developed for distribution to the construction crews that explains the legal requirements to report discovery of human remains and the procedures that must be followed in a discovery situation.

b. Describe what steps will be taken to secure and protect a discovery of human remains;

c. Describe what steps will be taken to notify the coroner, local law enforcement, and DAHP; and

d. Describe what steps will be taken by either the coroner or DAHP, including the protocol followed by DAHP, if the human remains are determined to be Native American in origin. These steps will include the following:

   (i) If Native American human remains are discovered, DAHP shall work closely with affected tribes regarding the protection, treatment and disposition of the remains in accordance with applicable state law.

   (ii) WSDOT shall ensure that the location of any inadvertently discovered Native American human remains is not released to the public in accordance with applicable state and federal law.

B. Treatment Plan – Specific Requirements

In addition to the general requirements outlined in Stipulation IV.A, the Treatment Plan will contain the following requirements for specific archaeological sites and archaeologically sensitive areas as follows.

1. Site 45KI958 - SDOT Maintenance Yard Site

Historic archaeological site 45KI958, located in the North Portal construction area, may be eligible for listing in the National Register; however, this must be determined during construction. For this reason, the Treatment Plan shall:

a. Describe the methods that will be used to test the site for National Register eligibility, as required under Stipulation IV.A.1.h;

b. Describe the procedures that WSDOT will follow in determining National Register eligibility and effect if archaeological deposits are encountered. These procedures will include the following requirements:

(i) WSDOT will consult with DAHP to determine the National Register eligibility of the site and the potential for adverse effects;

(ii) If, following consultation, WSDOT determines the site is eligible for listing in the National Register, and may be adversely affected, WSDOT will consult with DAHP, King County, and other consulting parties and conduct data recovery in accordance with the Treatment Plan; and

(iii) WSDOT will obtain approval by DAHP in accordance with permit requirements under RCW 27.53 for removal of any archaeological deposits determined eligible for listing in the National Register.

2. Site 45KI924 - Dearborn South Tideland Site

Historic archaeological site 45KI924, located in the South Portal construction area, will be adversely affected by Project construction. Site 45KI924 is National Register eligible; however, those portions of the site that will be affected by the undertaking may not contain archaeological deposits that contribute to the site's eligibility. For this reason, the Treatment Plan shall:

a. Describe procedures to be followed for archaeological monitoring during construction, as required under Stipulation IV.A.3;

b. Describe the procedures WSDOT will follow if archaeological deposits are encountered. The procedures will include the following requirements:

(i) WSDOT, in consultation with DAHP, will determine whether or not the archaeological deposits contribute to the National Register eligibility of site 45KI924;

(ii) If WSDOT determines the deposits do contribute to the National Register eligibility of site 45KI924, and these deposits may be adversely affected, WSDOT will consult with DAHP, King County, and other consulting parties, and conduct data recovery in accordance with the Treatment Plan; and

(iii) WSDOT will obtain approval by DAHP in accordance with permit requirements under RCW 27.53 for removal of any archaeological deposits determined eligible for listing in the National Register.

3. Archaeologically Sensitive Areas

WSDOT has identified four archaeologically sensitive areas within the APE that have the potential to contain National Register eligible historic properties. Each of these areas will require archaeological monitoring and / or investigation during construction. The Treatment Plan will outline the procedures to be followed for monitoring and / or investigation at each archaeologically sensitive area. The archaeologically sensitive areas are described below.

a. Archaeologically Sensitive Area 1, North Portal construction area. WSDOT has identified site 45KI958 and a buried peat horizon at the location of the North Portal construction area. These deposits may contain prehistoric and historic archaeological deposits that could be revealed during Project construction activities. As outlined in Stipulation IV.B.1, site 45KI958 will be investigated for National Register eligibility. As part of this investigation, additional testing of the buried peat horizon will also be conducted. Monitoring and investigation procedures for Archaeologically Sensitive Area 1 will be outlined in the Treatment Plan.

b. Archaeologically Sensitive Area 2, South Portal construction area. WSDOT has identified site 45KI924 and a buried tidal flat at the South Portal construction area. These deposits may contain prehistoric and historic archaeological deposits that could be revealed during Project construction activities. As outlined in Stipulation IV.B.2, the limited portion of site 45KI924 that will be affected by construction will be monitored for the presence of deposits that are eligible for listing in the National Register. In addition to the monitoring of site 45KI924, the location of the buried tidal flat in this area will be exposed and investigated during Project construction to determine if archaeological deposits are present. Monitoring and investigation procedures for Archaeologically Sensitive Area 2 will be outlined in the Treatment Plan.

c. Archaeologically Sensitive Area 3, Yesler Way to Seneca Street. WSDOT has identified a buried tidal flat between Yesler Way and Seneca Street. These deposits may contain buried historic and prehistoric archaeological deposits that could be revealed during construction of a compensation grout shaft. The elevations at which this shaft intersects with potential archaeological deposits will be investigated and monitored during construction. Monitoring and investigation procedures for Archaeologically Sensitive Area 3 will be outlined in the Treatment Plan.

d. Archaeologically Sensitive Area 4, Pike Street to Bell Street. WSDOT has identified buried anthropogenic deposits between Pike Street and Bell Street along the current Alaskan Way Viaduct alignment. The deposits may contain buried historic and prehistoric archaeological deposits. The deposits may be affected by the relocation of utilities. Construction activities with the potential to intersect these deposits will be monitored. Monitoring procedures for Archaeologically Sensitive Area 4 will be outlined in the Treatment Plan.

V. Requirements for Other Historic Properties

A portion of the Lake Union Sewer Line, constructed between 1891 and 1894, is in the North Portal construction area. FHWA and WSDOT, in consultation with DAHP, have determined that the Lake Union Sewer Line is eligible for listing in the National Register. Approximately five feet of a brick-lined manhole, which is a contributing element of the Lake Union Sewer Line, will be removed resulting in an adverse effect to the historic property. WSDOT will mitigate the adverse effect of the Project to the Lake Union Sewer Line by recording the structure and researching its history as part of a National Register nomination form that WSDOT will prepare. DAHP and King County, the owner of the resource, will receive a copy of the nomination form upon completion.

VI. Qualifications

FHWA and WSDOT shall ensure that all investigations performed in compliance with the terms of this MOA shall be conducted by, or under the supervision of, a person who meets the Secretary of the Interior's Standards and Guidelines for professional qualifications in history, architecture, architectural history, historic architecture or archaeology, as applicable, described in the Federal Register: June 20, 1997 (Volume 62, Number 119, pages 33707-33723).

VII. Continued Consultation

Following the execution of this MOA, and for the duration of the Project, WSDOT will continue to meet with the consulting parties to review the performance of this MOA.

A. WSDOT will consult with the consulting parties at the following times:

   1. After draft completion of the Treatment Plan for review and comment;

   2. Every three months (Quarterly); or,

   3. At the request of the consulting parties collectively or individually.

B. WSDOT will facilitate field visits for the consulting parties upon request.

C. WSDOT will continue to meet separately with the tribes on a monthly basis. Tribal members are welcome to participate in the quarterly meetings with the consulting parties or to request an individual meeting with WSDOT at any time.

VIII. Dispute Resolution

A. All signatories and concurring parties to this MOA shall strive to address and resolve disagreements informally.

B. In the event that informal resolution cannot be achieved, any signatory or concurring party to this MOA may object in writing to FHWA or WSDOT regarding any action carried out or proposed with respect to implementation of this MOA. The agency receiving the objection shall, within 10 days, initiate consultation with the objecting party to resolve the objection.

C. If after initiating such consultation FHWA or WSDOT determines that the objection cannot be resolved through consultation, FHWA shall forward all documentation relevant to the objection to ACHP, including the agency's proposed response to the objection.

D. Within 30 days after receipt of all pertinent documentation, ACHP shall exercise one of the following options:

   1. Advise FHWA that ACHP concurs with the agency's proposed response to the objection, whereupon FHWA will respond to the objection accordingly;

   2. Provide FHWA with recommendations, which the agency shall take into account in reaching a final decision regarding its response to the objection; or

   3. Notify FHWA that the objection will be referred for comment pursuant to 36 CFR §800.7(a)(4), and proceed to refer the objection and comment;

E. FHWA shall take the resulting comment into account in accordance with 36 CFR §800.7(c)(4), with reference only to the subject of the dispute.

F. FHWA's responsibility to ensure that all actions under this MOA that are not the subject of the dispute are carried out will remain unchanged.

IX. Amendment

Any signatory to this MOA may request that it be amended, whereupon the signatories will consult to reach a consensus on the proposed amendment. WSDOT and FHWA will seek input from the concurring parties on any proposed amendments. Any amendment to the MOA must be signed by all signatories.

X. Termination

A. Any signatory to this MOA may terminate it by providing a thirty-day written notice to the other parties, provided that the signatories and concurring parties will consult during the thirty-day period prior to termination to seek agreement on amendments or other actions that would avoid termination.

B. In the event of termination, FHWA shall comply with 36 CFR § 800 for all remaining actions under this MOA.

XI. Duration of Agreement

This MOA will continue in full force and effect until FHWA grants final acceptance of the Project and all terms of this MOA are met, unless the Project is terminated or authorization for the Project is rescinded.

SIGNATORIES:

Federal Highway Administration Date

_____ _____

Daniel M. Mathis, Division Administrator

Washington State Department of Transportation Date

_____ _____

Ron Paananen, Program Administrator

State Historic Preservation Officer Date

_____ _____

Allyson Brooks, Ph.D.

CONCURRING:

City of Seattle Date

_____ _____

Karen Gordon, City Historic Preservation Officer

King County Date

_____ _____

Julie Koler, County Historic Preservation Officer

National Trust for Historic Preservation Date

_____ _____

Anthea M. Hartig, Ph.D., Director, Western Office

Washington Trust for Historic Preservation Date

_____ _____

Jennifer Meisner, Executive Director

Historic Seattle Date

_____ _____

Kathleen Brooker, Executive Director

The Alliance for Pioneer Square Date

_____ _____

Leslie Smith, Executive Director

4Culture Date

_____ _____

Jim Kelly, Executive Director

Benjamin and Lois Mayers Date

_____ _____

Muckleshoot Indian Tribe Date

_____ _____

Honorable Chairperson Virginia Cross

Suquamish Tribe Date

_____ _____

Honorable Chairman Leonard Forsman

Tulalip Tribes Date

_____ _____

Honorable Chairman Melvin Sheldon

Snoqualmie Indian Tribe Date

_____ _____

Honorable Chairperson Shelley Burch

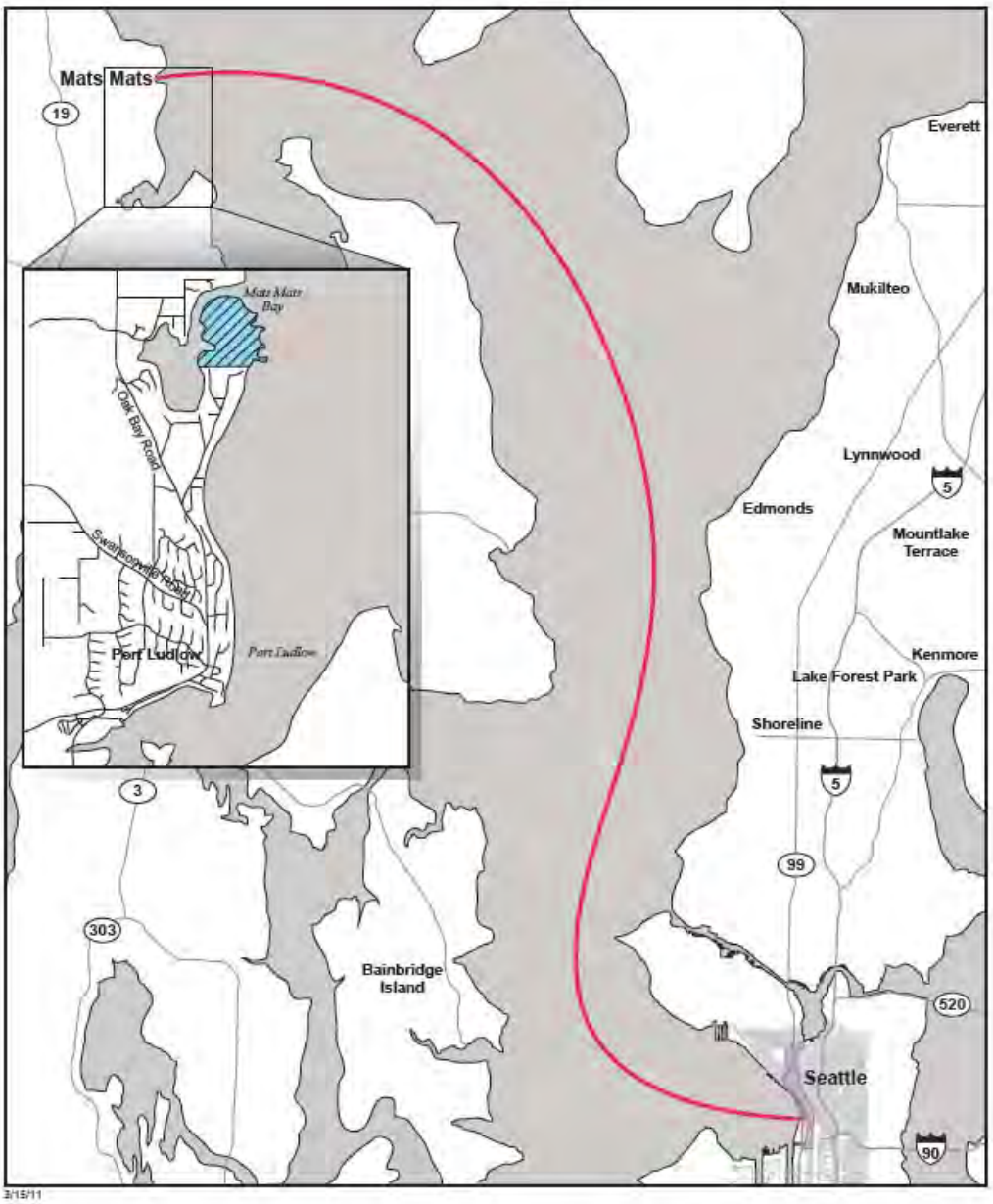
Confederated Bands and Tribes of the Yakama Nation Date

_____ _____

Honorable Chairman Harry Smiskin

ALASKAN WAY VIADUCT REPLACEMENT PROJECT,
MEMORANDUM OF AGREEMENT,
APPENDIX A: AREA OF POTENTIAL EFFECTS (1 OF 2)

ALASKAN WAY VIADUCT REPLACEMENT PROJECT,
MEMORANDUM OF AGREEMENT,
APPENDIX A: AREA OF POTENTIAL EFFECTS (2 OF 2)



ALASKAN WAY VIADUCT REPLACEMENT PROJECT, MEMORANDUM OF AGREEMENT, APPENDIX B: LIST OF HISTORIC BUILDINGS TO BE MONITORED

Key:
NRHP = National Register of Historic Places
SL = Seattle Landmark
PSHD = Pioneer Square Historic District
PPMHD = Pike Place Market Historic District

ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-056A	A110	500 Wall Street	Archstone Belltown (Grosvenor House)	6	8	12	2	NRHP eligible
H-055A	A112	420 Wall Street	Devonshire Apartments		8	12		NRHP eligible
H-045A	A119	2313 Fourth Avenue	Two Bells Bar and Grill (Two Bells Tavern)	6	4	6		NRHP eligible
H-039A	A123	304 Bell Street	Adams Apartments	4	4	6		NRHP eligible
H-223	A138	2132 Second Avenue	Castle Apartments	4	6	12		Eligible NRHP
H-012A	A141	2125 Second Avenue	Rivoli Apartments		4	2		Eligible NRHP
H-123	A158	911 Western Avenue	Maritime Building		7	6	2	Eligible NRHP
H-87	A160	1 Yesler Way	One Yesler Building (Bedford Hotel)	2	4	4		PSHD
H-056A	A167	500 Wall Street	Archstone Belltown (Grosvenor House)	6	6	8		NRHP eligible

ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-270	T065	120 Sixth Avenue N.	Seattle Housing Authority	2	4	4		NRHP eligible
H-264	T086	2334 Fourth Avenue	Fire Station No. 2	6	6	4		NRHP eligible, SL
H-261	T089	2302 Fourth Avenue	Franklin Apartments		4	8		NRHP eligible
H-227	T117	2124 Third Avenue	Swenson Say Faget (Rex Land Company)		4	2		Eligible NRHP
H-225	T128	2107 Third Avenue	Brasa (Metropolitan Printing Company)	4	4	4		SL, Eligible NRHP
H-206	T136	2000 Second Avenue	Palladian Apartments (Calhoun Hotel)		4	4		Eligible NRHP
H-216	T138	2025 Third Avenue	Pathé Building		4	2		Eligible NRHP
H-202	T147	1926 Second Avenue	Moore Hotel/Theater		5	8		NRHP, SL
H-197	T148	1902 Second Avenue	Josephinum (New Washington Hotel)		4	2		NRHP, SL
H-194	T151	1932 First Avenue	Terminal Sales Building	4	5	6	2	NRHP, SL
H-190	T154	1920 First Avenue	Oxford Apartments	4	4	6		Eligible NRHP

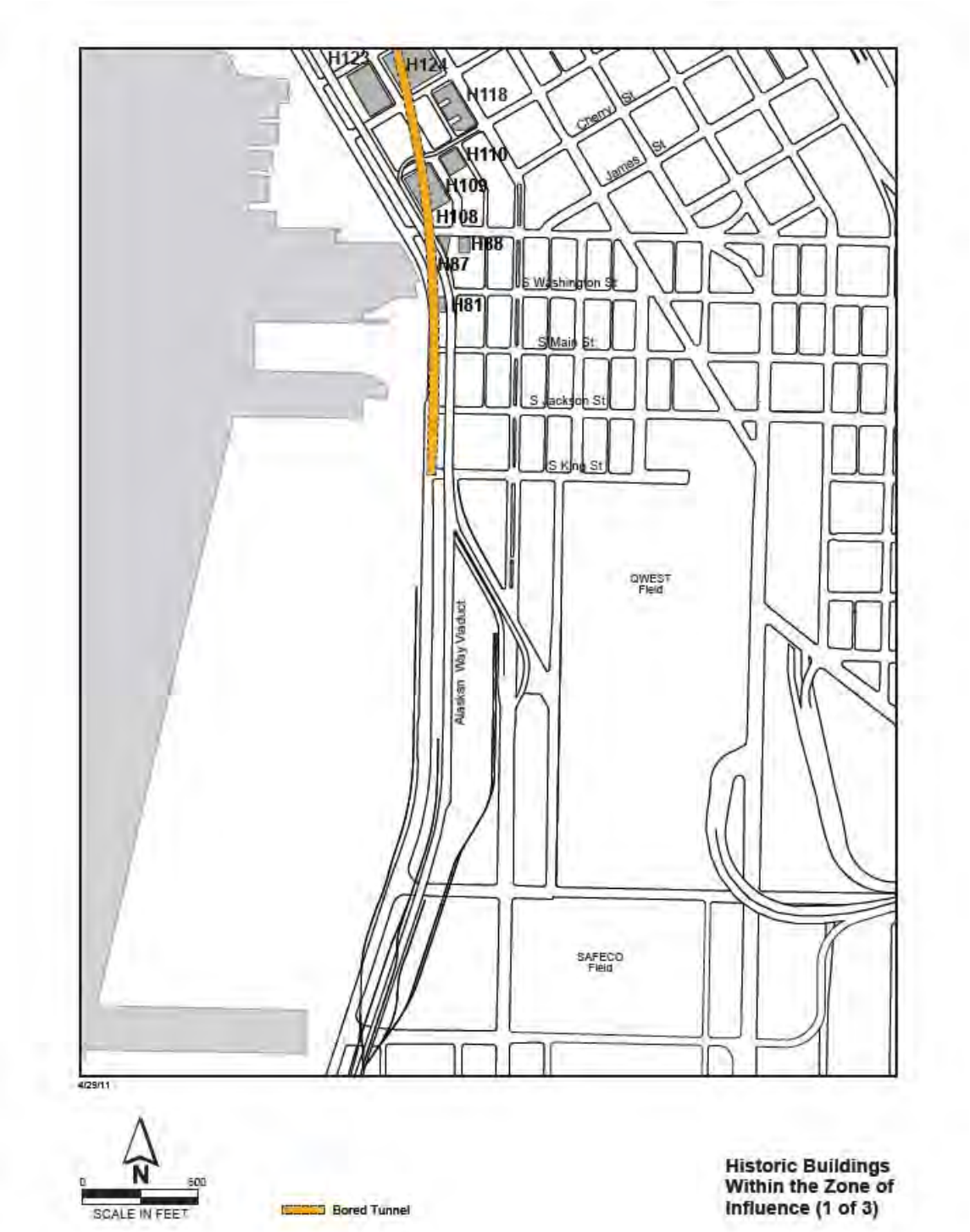
ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-203	T155	1927 Second Avenue	Terminal Sales Annex (Puget Sound News)	2	4	4		SL, Eligible NRHP
H-183	T160	1924 Pike Place	Soames Dunn Building		4	4		PPMHD
H-181	T161	1900 Pike Place/80 Stewart	Stewart House		4	2		PPMHD
H-195	T162	1931 First Avenue	Livingston Baker Apartments	2	4	2		PPMHD
H-188	T164	1923 First Avenue	Smith Block	2	4	2		PPMHD
H-189	T165	1921 First Avenue	Butterworth Building	2	4	2		PPMHD, NRHP
H-187	T166	1915 First Avenue	Alaska Trade Building	2	4	2		PPMHD, NRHP
H-186	T167	1901 First Avenue	Fairmount Apartments	4	4	6		PPMHD
H-176	T173	1600 Pike Place	Garden Center Building		4	4		PPMHD
H-180	T174	86 Pine Street	Inn at the Market	4	5	6		PPMHD
H-180	T175	86 Pine Street	Inn at the Market	2	4	6		PPMHD
H-168	T177	1534 Pike Place	Triangle Building		4	4		PPMHD
H-168	T178	1534 Pike Place	Triangle Building		4	4		PPMHD
H-166	T180	1531 First Avenue	Market House	4	4	4		PPMHD

ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-165	T182	1513 First Avenue	Sanitary Market	4	4	4		PPMHD
H-163	T183	1505 First Avenue	Corner Market	4	4	4		PPMHD
H-174	T184	107 Pine Street	Gatewood Apartments	4	6	12		NRHP eligible
H-175	T188	119 Pine Street	Doyle Building (J.S. Graham Store)		4	4		NRHP, SL
H-171	T191	1501 Second Avenue	Eitel Building		4	4		Eligible NRHP, SL
H-167	T192	1501 Pike Place	Pike Place Market Main Arcade		6	6		PPMHD
H-167	T193	1501 Pike Place	Pike Place Market Main Arcade		8	8		PPMHD
H-156	T194	1430 Western Avenue	La Salle Apartments		4	6		PPMHD
H-156	T198	1430 Western Avenue	La Salle Apartments		4	2		PPMHD
H-148	T203	84 Union Street (1400 Western Avenue)	Marketside Flats (U.S. Immigration Building)		4	4		NRHP, SL
H-157	T204	1423 First Avenue	Economy Market	4	6	8		PPMHD
H-142	T225	1216–1222 First Avenue	Diller Hotel		6	4		Eligible NRHP & SL
H-135	T230	1115–1117 First Avenue	Grand Pacific Hotel	6	10	12		NRHP, SL

ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-136	T230	1123 First Avenue	Colonial Hotel	3	5	6		NRHP, SL
H-134	T231	1107 First Avenue (94–96 Spring Street)	Watermark Tower (Colman Building)	6	6	12	4	SL
H-126	T234	1000–1024 Western Avenue	National Building	6	7	8		NRHP, SL
H-131	T235	1019–1023 First Avenue	Arlington North (Hotel Cecil)	6	4	4		NRHP, SL
H-129	T236	1013 First Avenue	Arlington South (Beebe Building)	6	4	4		NRHP, SL
H-127	T237	1001–1011 First Avenue	Alexis Hotel (Globe Building)	6	6	6		NRHP, SL
H-130	T238	1018 First Avenue	Holyoke Building		4	2		NRHP, SL
H-128	T239	1012 First Avenue	Schoenfeld Furniture Store Building		4	8		NRHP eligible
H-124	T243	901 First Avenue	Federal Office Building	6	6	16		NRHP
H-118	T247	801–821 First Avenue	Colman Building		5	6		NRHP, SL
H-109	T251	61 Columbia Street	Polson Building	6	4	20	4	PSHD
H-108	T252	619 Western Avenue	Western Building	6	4	30	4	PSHD
H-110	T253	83 Columbia Street	Journal Building		4	2		PSHD

ID Number	Bldg ID	Address	Current Name (Historical Name)	Automated Structure Monitoring Points	Minimum Manual Structure Monitoring Points	Minimum Crack Gauges	Minimum Tiltmeters	Historic Status
H-88	T276	77 Yesler Way	Pioneer Square Hotel (Yesler Hotel)		4	4		PSHD
H-81	T277	114 Alaskan Way S.	Prudential Building		4	6		PSHD

ALASKAN WAY VIADUCT REPLACEMENT PROJECT,
MEMORANDUM OF AGREEMENT,
APPENDIX C: MAP OF THE HISTORIC BUILDINGS WITHIN THE ZONE OF INFLUENCE (1 OF 3)



ALASKAN WAY VIADUCT REPLACEMENT PROJECT,
MEMORANDUM OF AGREEMENT,
APPENDIX C: MAP OF THE HISTORIC BUILDINGS WITHIN THE ZONE OF INFLUENCE (2 OF 3)

ALASKAN WAY VIADUCT REPLACEMENT PROJECT,
MEMORANDUM OF AGREEMENT,
APPENDIX C: MAP OF THE HISTORIC BUILDINGS WITHIN THE ZONE OF INFLUENCE (3 OF 3)