THE WATERFRONT DISTRICT (Formerly Known As NEW WHATCOM) REDEVELOPMENT PROJECT

EIS ADDENDUM

PORT OF BELLINGHAM

February 2010

PORT OF BELLINGHAM
Washington State

EIS ADDENDUM
THE WATERFRONT DISTRICT (Formerly Known As NEW WHATCOM) REDEVELOPMENT PROJECT

PORT OF BELLINGHAM
BELLINGHAM, WASHINGTON

Prepared for the Review and Comments of Citizens, Groups and Governmental Agencies

In Compliance with
The State Environmental Policy Act of 1971 (RCW 43.21C)
and the Port of Bellingham SEPA Policies and Procedures

February 2010

FACT SHEET

PROJECT TITLE

The Waterfront District (Formerly Known As New Whatcom) Redevelopment Project

PROPOSED ACTION

The Port of Bellingham (Port) has been analyzing long-term redevelopment opportunities for The Waterfront District (formerly known as New Whatcom) site. The Port and the City of Bellingham (City) are working together to formulate and implement a Master Development Plan that would, if approved and implemented, be intended to transform the Waterfront District into a new neighborhood with residences, shops, offices, marine and light industry, institutional uses (e.g. Western Washington University), as well as parks, trails and shoreline amenities along Bellingham Bay. The Master Development Plan would include substantial new opportunities for public access to the waterfront that do not exist under current conditions. For the purposes of environmental review, full buildout of the site is assumed to occur over a 20-year period; although full buildout of the site would be dependent on market conditions and would likely occur over a longer timeframe.

The Port also envisions entering into a Development Agreement with the City that will further guide long-term redevelopment of the project site. As part of its efforts to plan and redevelop the site, the Port will propose amendments to the Port's *Comprehensive Scheme of Harbor Improvements* incorporating the Master Development Plan. Concurrent with the adoption of a Development Agreement, it is expected that the City will adopt a new Sub-Area Plan for the area (to be known as *The Waterfront District Master Development Plan*), along with implementing land use regulations and a Planned Action Ordinance, allowing for a change from industrial to mixed use zoning.

The Waterfront District includes approximately 216.3 acres of contiguous waterfront property and adjacent aquatic area in central Bellingham. The adjacent aquatic area associated with the Waterfront District is included within the area analyzed in the *Whatcom Waterway Cleanup Site Supplemental EIS 2007*. Currently, the Port owns and/or manages approximately 148.9 acres on the site; the City owns approximately 21.2 acres and another approximately 46.2 acres of the site are held in State of Washington or private ownership.

The Port of Bellingham (Port) and the City of Bellingham (City) identified the following Proposed Actions for the site that would be necessary to implement the Waterfront District redevelopment vision:

Proposed Actions of the Port of Bellingham

- Approval of amendments to the Port's *Comprehensive Scheme of Harbor Improvements*.
- Development of a proposal to the City of Bellingham for a Master Development Plan (MDP) for the Waterfront District.
- Approval of a Development Agreement between the Port of Bellingham and the City of Bellingham.

Proposed Actions of the City of Bellingham

- Adoption of a Master Development Plan (MDP) for the Waterfront District (considered as a Subarea Plan under the Growth Management Act) allowing for a change in zoning from industrial to mixed-use.
- Adoption of Development Regulations for the Waterfront District.
- Approval of a Development Agreement between the City of Bellingham and the Port of Bellingham. The Development Agreement will reference the implementing regulations for the site, along with infrastructure requirements, phasing and development standards.
- Adoption of a Planned Action Ordinance.
- Approval of future permits for infrastructure improvements, construction projects, and redevelopment activities within the redevelopment area over the buildout period.

ENVIRONMENTAL REVIEW / ALTERNATIVES

To date, two environmental review documents under the State Environmental Policy Act (SEPA) have been issued for public review and comment by the Port of Bellingham in support of the Waterfront District (formerly known as New Whatcom) Redevelopment Project, including a Draft EIS issued in January 2008 and a Supplemental Draft EIS issued in October 2008. These documents are available for review on the Port of Bellingham website: www.portofbellingham.com/waterfrontredevelopment/projectupdates.

The 2010 Updated Preferred Alternative analyzed in this EIS Addendum reflects updates to the 2008 Preferred Alternative analyzed in the October 2008 Supplemental Draft EIS.

Draft EIS – January 2008

A Draft EIS (2008 DEIS) was issued in January 2008 that addressed the probable significant adverse impacts that could occur as a result of the approval by the Port of amendments to the *Comprehensive Scheme of Harbor Improvements*, adoption by the City of the Master Development Plan and implementing regulations, the approval of a Development Agreement between the Port and City, and potential future redevelopment activities on the site during a 20-year build-out horizon.

A range of alternatives are addressed in the 2008 DEIS that represent an overall envelope of potential redevelopment that the site could accommodate (Alternatives 1 through 4 in the DEIS). The 2008 DEIS recognized that features of the alternatives could be mixed and matched to arrive at the final Master Plan Development for the site.

Supplemental Draft EIS – October 2008

Subsequent to the issuance of the DEIS, Port staff, with input from the City, the public, and agencies, prepared a recommended proposal that serves as the current redevelopment concept for the site and a "Preferred Alternative". This Preferred Alternative is the subject of the Supplemental Draft EIS (2008 SDEIS) which was issued in October 2008. The mix of uses and level of redevelopment called for in the Preferred Alternative are within the range of redevelopment addressed in the 2008 DEIS (within the range analyzed under Alternatives 1 through 4). The 2008 Preferred Alternative represented a further refinement of the DEIS Alternatives in the following key areas:

- Redevelopment density and mix of uses
- Road System
- Grading/Stormwater Management Concept
- Parks and Shoreline Habitat Plan
- In-Water Work
- Sustainable Design Strategies
- Historic Buildings
- View Corridors
- Development Regulations

The 2008 SDEIS also addressed a “Straight Street Grid Option” as defined by the City of Bellingham. Refer to Chapter 2 for further details on the “Straight Street Grid Option” analyzed in the 2008 SDEIS.

2010 Updated Preferred Alternative (Subject of this EIS Addendum)

Subsequent to the issuance of the 2008 SDEIS, updates to the Preferred Alternative were made based on additional public/community input, continued coordination with the City of Bellingham, and evolving economic conditions. These updates resulted in the development of the 2010 Updated Preferred Alternative.

As indicated above, based on information provided in the 2008 SDEIS (including public input), additional community meetings and workshops, continued coordination between the City and the Port, and evolving economic conditions, the Port has prepared a recommended 2010 Updated Preferred Alternative for analysis in this EIS Addendum.

Similar to that described for the Preferred Alternative in the 2008 SDEIS, the 2010 Updated Preferred Alternative is intended to be a medium density, sustainable development that features a diversity of uses that are complimentary to the downtown Bellingham Central Business District, Old Town and surrounding neighborhoods; an infrastructure network that integrates with and connects the waterfront to the surrounding area; and, a system of parks, trails and open space that opens up the waterfront to the community.

In many respects, redevelopment under the 2010 Updated Preferred Alternative would be similar to that described in the 2008 SDEIS for the Preferred Alternative. For example, the following full buildout (assumed for environmental review purposes to be 2026) redevelopment assumptions for the 2010 Updated Preferred Alternative are the same as described in the 2008 SDEIS for the Preferred Alternative:

- Redevelopment Density
- Maximum Building Heights
- Public Parks & Open Space
- Shoreline Improvements
- Grading
- Number of Housing Units
- Anticipated Site Population
- Anticipated Site Employment
- Parking
- Sustainable Design
- Marina Configuration
- Rail Line Relocation

The redevelopment assumptions under the 2010 Updated Preferred Alternative that have been modified from those described in the 2008 SDEIS Preferred Alternative include:

- Road Grid
- View Corridors
- Historic Buildings/Structures
- PSE Encogen Plant

The Proposed Actions evaluated in this EIS Addendum are the same actions as those contemplated in the January 2008 DEIS and October 2008 SDEIS. Potential environmental impacts under the 2010 Updated Preferred Alternative are addressed in this EIS Addendum and compared to the 2008 SDEIS Preferred Alternative. This EIS Addendum, together with the 2008 DEIS, the 2008 SDEIS, and previous environmental documentation (see page vii) comprehensively analyze the environmental impacts of the Proposed Actions.

LOCATION

The Waterfront District lies within the City of Bellingham's Central Business District Neighborhood Planning area. The site is generally bounded by Bellingham Bay to the west, Roeder Ave. and State St. to the north and east, and the BNSF railroad corridor and bluff to the south. The Central Business District Neighborhood is generally bounded by the Columbia and Lettered Streets neighborhoods to the north; the Sunnyland and York neighborhoods to the east, and Cornwall Ave. and the Sehome and South Hill neighborhoods to the south.

PROPONENT/APPLICANT

Port of Bellingham

LEAD AGENCY

Port of Bellingham

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PERMITS AND APPROVALS

Port of Bellingham

- Approval of amendments to Port of Bellingham *Comprehensive Scheme of Harbor Improvements*.
- Development of a proposal to the City of Bellingham for a Master Development Plan (MDP) for the Waterfront District.
- Approval of a Development Agreement between the Port of Bellingham and City of Bellingham.

City of Bellingham

- Adoption of a Master Development Plan (MDP) for the Waterfront District (considered as a Subarea Plan per the Growth Management Act) allowing for a change in zoning from industrial to mixed-use.
- Approval of a Development Agreement between the Port of Bellingham and City of Bellingham. The Development Agreement will reference the implementing regulations for the site, along with infrastructure requirements, phasing and development standards.
- Adoption of Development Regulations for the Waterfront District.
- Adoption of a Planned Action Ordinance.
- Approval of future permits for infrastructure improvements, construction projects, and redevelopment activities within the Waterfront District over the buildout period potentially including, but not limited to:
    - Shoreline Management Act Substantial Development Permit Approval
    - Grading Permit Approval
    - Building Permit Approval
    - Mechanical Permit Approval
    - Plumbing Permit Approval
    - Electrical Permit Approval
    - Fire System Permit Approval
    - Street and other City Right-of-Way Use Permit Application Approval
    - Transportation Concurrency Application Approval
    - Stormwater Management Plan Approval

State of Washington

Department of Ecology
- Section 401 Water Quality Certification
- Shoreline Substantial Development Permit Approval
- Coastal Zone Management Certification
- Model Toxics Control Act (MTCA) Compliance

Department of Archaeological and Historical Preservation
- Executive Order 05-05 Consultation and Review

Department of Fish and Wildlife
- Hydraulic Project Approval

United States Army Corps of Engineers

- Section 401 Permit Approval
- Section 402 NPDES Permit Approval
- Section 10/ Section 404 Permit Approval
- Puget Sound Dredged Material Management Program Approval
- Section 106 Consultation and Review

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PREVIOUS ENVIRONMENTAL DOCUMENTS

Per WAC 197-11-620, this EIS Addendum supplements the Port of Bellingham, *New Whatcom Redevelopment Project Supplemental Draft EIS*, October 2008. This EIS Addendum together with the 2008 DEIS and 2008 SDEIS comprehensively address the environmental impacts of the Proposed Action.

This EIS Addendum builds upon and incorporates by reference the following environmental documents that are also incorporated by reference in the DEIS and SDEIS (2008): Department of Ecology, *Bellingham Bay Comprehensive Strategy Draft EIS*, July 1999; Department of Ecology, *Bellingham Bay Comprehensive Strategy Final EIS*, October 2000; Port of Bellingham, *SEPA Checklist for a Proposed Amendment to the Comprehensive Scheme of Harbor Improvements for Squalicum Harbor,* April 2004; City of Bellingham, *Final Environmental Impact Statement for: The City of Bellingham, Bellingham Urban Growth Area, Five-Year Review Areas and Whatcom County Urban Fringe Subarea,* July 2004; Department of Ecology, *Draft Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy, Whatcom Waterway Cleanup Site,* October 2006; Department of Ecology, *Final Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy, Whatcom Waterway Cleanup Site,* September 2007.

These documents are available for review at the Port of Bellingham, 1801 Roeder Ave., Bellingham, WA 98225.

LOCATION OF BACKGROUND INFORMATION

Background material and supporting documents are available at the Port of Bellingham, WA 1801 Roeder Ave., Bellingham, WA 98225 and at the City of Bellingham Planning Office, 210 Lottie St., Bellingham, WA 98225.

DATE OF EIS ADDENDUM ISSUANCE

February 8, 2010

DATE EIS ADDENDUM COMMENTS ARE DUE

March 10, 2010

EIS ADDENDUM PUBLIC HEARING

A public hearing has been scheduled for March 3, 2010, to receive verbal comments on the EIS Addendum, at the following time and location:

Date: March 3, 2010
Time: 7:00 PM
Place: Bellingham Cruise Terminal
355 Harris Ave., Bellingham, WA 98225

AVAILABILITY OF THE EIS ADDENDUM

Copies of the EIS Addendum have been distributed to agencies, organizations and individuals noted on the Distribution List. Copies of the EIS Addendum are also available for review at the following locations:

- Port of Bellingham, 1801 Roeder Ave., Bellingham, WA
- City of Bellingham, Planning Office, 210 Lottie St., Bellingham, WA
- Bellingham Central Library, 210 Central Way, Bellingham, WA

A limited number of printed copies may be purchased at the Port of Bellingham's Administrative Office at 1801 Roeder Ave. The purchase price is $27.00 per copy to cover printing costs.

The EIS Addendum can be reviewed and downloaded at the Port's web site under Latest News at: http://www.portofbellingham.com.

Persons interested in receiving a copy of the EIS Addendum on CD (no charge) should contact Mike Hogan at (360) 676-2500 or by e-mail at: Mikeh@portofbellingham.com.

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CHAPTER 1

Summary

CHAPTER 1

SUMMARY

1.1 INTRODUCTION

This chapter provides a summary of *The Waterfront District (formerly known as New Whatcom) Redevelopment Project EIS Addendum*. It briefly describes the project history and the 2010 Updated Preferred Alternative; and provides an overview of the probable significant environmental impacts, mitigation measures and significant unavoidable adverse impacts of the 2010 Updated Preferred Alternative. See **Chapter 2** of this EIS Addendum for a more detailed description of the 2010 Updated Preferred Alternative, and **Chapter 3** for a detailed presentation of probable significant impacts, mitigation measures and significant unavoidable adverse impacts.

This document is an Addendum to the Draft EIS (January 2008) and the Supplemental Draft EIS (October 2008) prepared for *The Waterfront District (formerly known as New Whatcom) Redevelopment Project*. The 2008 Draft EIS (2008 DEIS) evaluated three redevelopment alternatives and their environmental impacts and associated mitigation measures. The 2008 Supplemental Draft EIS (2008 SDEIS) evaluated two redevelopment alternatives (2008 Preferred Alternative and Straight Street Grid Option), and the environmental impacts and mitigation measures associated with each alternative.

Subsequent to the issuance of the 2008 SDEIS, updates to the 2008 Preferred Alternative were made based on additional public/community input, continued coordination with the City of Bellingham, and evolving economic conditions. Based on this information and continued coordination, the Port has prepared a recommended 2010 Updated Preferred Alternative for analysis in this EIS Addendum.

Many of the redevelopment assumptions under the 2010 Updated Preferred Alternative would be similar to that described in the 2008 SDEIS for the Preferred Alternative. Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative is intended to be a medium density, sustainable development that features a diversity of uses that are complementary to downtown; an infrastructure network that integrates with and connects the waterfront to the surrounding area; and, a system of parks, trails and open space that opens up the waterfront to the community. However, despite these similarities, certain redevelopment assumptions under the 2010 Updated Preferred Alternative have been modified from those described in the 2008 SDEIS Preferred Alternative (refer to **Figure 2-4** and **Figure 2-5** of Chapter 2 of this document). Based on those redevelopment assumptions that are similar and those assumptions that have been modified under the 2010 Updated Preferred Alternative, the following environmental analyses in the 2008 SDEIS would not change:

- Earth
- Water Resources
- Plants and Animals
- Environmental Health
- Land Use
- Relationship to Plans and Policies
- Population, Employment and Housing
- Public Services
- Utilities

As stated above, many of the redevelopment assumptions under the 2010 Updated Preferred Alternative would remain the same as those analyzed under the 2008 SDEIS Preferred Alternative and as result, the environmental analysis associated with those assumptions would also remain the same. However, for those assumptions that have been modified under the 2010 Updated Preferred Alternative, an updated analysis for those associated environmental elements is provided in this EIS Addendum. The following environmental elements are included in this EIS Addendum:

- Air Quality
- Noise
- Aesthetics
- Historic and Cultural Resources
- Transportation

1.2 2010 UPDATED PREFERRED ALTERNATIVE

The 2010 Updated Preferred Alternative is intended to be a medium density, sustainable development that features a diversity of uses that are complimentary to the Downtown Bellingham Central Business District; an infrastructure network that integrates with and connects the waterfront to the surrounding area; and, a system of parks, trails and open space that opens up the waterfront to the community. The 2010 Updated Preferred Alternative is intended to be consistent with the Port's objectives as defined in both the 2008 DEIS and the 2008 SDEIS.

In many respects, redevelopment under the 2010 Updated Preferred Alternative would be similar to the 2008 SDEIS Preferred Alternative. For example, the following full buildout redevelopment assumptions for the 2010 Updated Preferred Alternative would be the same as described for the 2008 SDEIS Preferred Alternative: redevelopment density; maximum building heights; shoreline improvements; grading; number of housing units; anticipated site population; anticipated site employment; parking; sustainable design; marina configuration; and, rail line relocation.

Redevelopment assumptions under the 2010 Updated Preferred Alternative that have been modified from those described under the 2008 SDEIS Preferred Alternative (based on public comment input, continued coordination with the City of Bellingham and evolving economic conditions) include: road grid; view corridors; historic buildings/structures; and, PSE Encogen Plant.

Refer to **Chapter 2** for further details on the 2010 Updated Preferred Alternative.

1.3 SUMMARY OF IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The following highlights the impacts, mitigation measures, and significant unavoidable adverse impacts that could potentially result from the 2010 Updated Preferred Alternative. Mitigation measures proposed in the 2008 DEIS and the 2008 SDEIS would also apply to the 2010 Updated Preferred Alternative. This summary is not intended to be a substitute for the complete discussion of each environmental element that is contained in **Chapter 3** of this EIS Addendum.

Air Quality

Impacts

Redevelopment under the 2010 Updated Preferred Alternative would result in similar air quality and GHG emission impacts to those described under the 2008 Preferred Alternative. The primary difference under the 2010 Updated Preferred Alternative would be the continued operation of the PSE Encogen Plant through 2026 (the 2008 SDEIS assumed PSE Encogen Plant operations would cease by 2026). Continued operation of the plant through 2026 would result in a longer duration of emissions on the site when compared to the 2008 Preferred Alternative; however, emissions would be monitored and regulated to ensure the safety of human health and no significant air quality impacts would be anticipated.

Mitigation Measures

Mitigation measures were identified for the 2008 SDEIS Preferred Alternative and these measures would also apply to the 2010 Updated Preferred Alternative. Because no additional significant impacts were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures would be warranted.

Significant Unavoidable Adverse Impacts

No significant adverse impacts to air quality would be anticipated from redevelopment under the 2010 Updated Preferred Alternative.

Noise

Impacts

Redevelopment under the 2010 Updated Preferred Alternative would result in operational noise sources and ambient noise level increases that would be similar to the 2008 Preferred Alternative. The continued operation of the PSE Encogen Plant through 2026 would not be anticipated to result in significant noise impacts to new adjacent onsite mixed uses.

Mitigation Measures

Mitigation measures were identified for the 2008 SDEIS Preferred Alternative and these measures would also apply to the 2010 Updated Preferred Alternative. Because no additional significant noise impacts were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures would be warranted.

Significant Unavoidable Adverse Impacts

No significant adverse noise impacts would be anticipated from redevelopment under the 2010 Updated Preferred Alternative.

Aesthetics/Light & Glare

Impacts

The potential for aesthetics/light and glare impacts under the 2010 Updated Preferred Alternative would be similar to those identified for the 2008 Preferred Alternative. No additional significant impacts beyond those identified in the 2008 SDEIS for the Preferred Alternative have been identified.

Mitigation Measures

Mitigation measures for potential aesthetics-related impacts were identified in the 2008 DEIS and in the 2008 SDEIS for the Preferred Alternative, and are applicable to the 2010 Updated Preferred Alternative. Because no significant impacts beyond those under the 2008 SDEIS Preferred Alternative were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures have been identified.

Significant Unavoidable Adverse Impacts

Similar to the 2008 SDEIS Preferred Alternative, redevelopment under the 2010 Updated Preferred Alternative would change the aesthetic character of the site from a primarily paved unoccupied/underutilized industrial site to a more dense urban, mixed-use development. Changes in aesthetic character would occur incrementally over the 20-year buildout period. The aesthetic/visual changes that would result from redevelopment of the site over the buildout period could be perceived by some to be significant and adverse; however, perceptions regarding such changes would ultimately be based on the subjective opinion of the viewer.

The 2010 Updated Preferred Alternative would create formal view corridors through portions of the site, where none currently exist; these are intended to preclude significant adverse visual impacts from long-term redevelopment.

Similar to the 2008 SDEIS Preferred Alternative, redevelopment on the site under the 2010 Updated Preferred Alternative would result in an increase in light and glare on the site. With implementation of the mitigation measures identified in the 2008 DEIS and 2008 SDEIS no significant light and glare impacts would be anticipated.

Historic and Cultural Resources

Impacts

The potential for impacts to historic and cultural resources under the 2010 Updated Preferred Alternative would be generally similar to those identified in the 2008 SDEIS Preferred Alternative, although seven buildings and structures would be temporarily held from demolition for possible retention/reuse in some manner in the future (based on further market and icon assessment). No additional significant impacts would be anticipated under the 2010 Updated Preferred Alternative.

Mitigation Measures

Mitigation measures for potential historic and cultural resource-related impacts were identified in the 2008 SDEIS for the Preferred Alternative, and are applicable to the 2010 Updated Preferred Alternative. Because no significant impacts beyond those under the 2008 SDEIS Preferred Alternative were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures have been identified.

Significant Unavoidable Adverse Impacts

With the implementation of the mitigation measures identified in the 2008 DEIS and 2008 SDEIS, no significant adverse impacts to historic and cultural resources would be anticipated to result from redevelopment under the 2010 Updated Preferred Alternative.

Transportation

Impacts

Similar to the 2008 SDEIS Preferred Alternative, all onsite intersections would operate at LOS E or better under the 2010 Updated Preferred Alternative with an adequate access point at Wharf Street, e.g., a bridge connection following the closure of the at-grade crossing in 2025, or substantial shifts in mode of transportation to pedestrian, bicycle, and transit by that time. At offsite intersections, the 2010 Updated Preferred Alternative with the potential Wharf Street bridge connection would have similar LOS operations to the 2008 Preferred Alternative analyzed in the 2008 SDEIS. Development without the Wharf Street bridge connection would likely cause some increase in delay at offsite intersections; however other intersections would improve because the Wharf Street access would be eliminated, thereby reducing vehicular conflicts in those areas.

Non-motorized facilities under the 2010 Updated Preferred Alternative would be similar to the 2008 SDEIS Preferred Alternative with some modifications to the onsite street network and overall non-motorized impacts would be similar to those discussed in the 2008 SDEIS.

Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative assumes the extension of the existing and planned future transit service onsite. With the Wharf Street bridge connection, there would be better overall transit circulation options for existing routes to circulate into and out of the site.

The 2010 Updated Preferred Alternative would eliminate all at-grade railroad crossings onsite with the relocation of the railroad and, as required under the terms of an agreement between the City and BNSF Railway, closure of the at-grade crossing at Wharf Street by 2025. The closure of all at-grade crossings would create safer conditions and would be an improvement over the 2008 SDEIS Preferred Alternative.

Full site development could be adequately accommodated without the Wharf Street bridge connection if a 30 percent non-auto mode share were achieved.

Mitigation Measures

Many of the mitigation measures previously identified in the 2008 DEIS and 2008 SDEIS have been included as part of the 2010 Updated Preferred Alternative or been incorporated into City improvement projects. Mitigation measures identified in this EIS Addendum build upon the 2008 DEIS and 2008 SDEIS mitigation strategies by addressing specific strategies as they relate to the 2010 Updated Preferred Alternative. Mitigation measures under the 2010 Updated Preferred Alternative include: street striping and channelization, street upgrades, intersection improvements, non-motorized improvements, traffic monitoring, and increasing the non-auto mode share (i.e. methods to achieve a 30 percent non-auto mode share are identified – the Wharf Street bridge connection would not be required if the 30 percent non-auto mode share were achieved). Refer to Section 3.5, **Transportation**, for further details on specific mitigation measures.

Significant Unavoidable Adverse Impacts

As described in the DEIS and SDEIS, the Updated Preferred Alternative would accommodate additional amounts of future development within the site which would contribute to travel demands and congestion along the onsite and offsite street system. The additional development and associated improvements would also increase traffic access and circulation in the area. This added congestion would contribute to measurably poorer performance of the transportation network, in terms of increased delays along several of the corridors and at some specific intersections. The increase in traffic and higher volumes of pedestrian and bicycles would result in more conflict points and increased hazards to safety. With the implementation of the identified mitigation measures, significant unavoidable adverse impacts would be prevented or substantially lessened.

CHAPTER 2

Description of the 2010 Updated Preferred Alternative

CHAPTER 2

DESCRIPTION OF THE 2010 UPDATED PREFERRED ALTERNATIVE

This chapter of the Waterfront District (formerly known as New Whatcom) Redevelopment Project EIS Addendum provides: 1) a summary of the environmental review documents (SEPA documents) issued for the project to date; 2) a summary of the Proposed Actions analyzed in the January 2008 Draft EIS (2008 DEIS) and the October 2008 Supplemental Draft EIS (2008 SDEIS); 3) a listing of the elements of the environment analyzed in the 2008 DEIS and 2008 SDEIS; 4) a summary of the process to define the 2010 Updated Preferred Alternative; 5) a brief description of the 2010 Updated Preferred Alternative and how the 2010 Updated Preferred Alternative relates to the Preferred Alternative in the 2008 SDEIS; 6) discussion on the intent of an Addendum under SEPA and why it is being prepared; 7) discussion on the environmental review and ongoing planning and decision-making process after this EIS Addendum; and, 8) a detailed discussion of the features of the 2010 Updated Preferred Alternative. Key concepts related to this EIS Addendum are presented below in question and answer format.

2.1 BACKGROUND

Q1 What environmental review documents have been issued for the Waterfront District (formerly known as New Whatcom) Redevelopment Project to date?

A1. To date, two environmental review documents under the State Environmental Policy Act (SEPA) have been issued for public review and comment by the Port of Bellingham in support of the Waterfront District (formerly known as New Whatcom) Redevelopment Project, including a Draft EIS issued in January 2008, and a Supplemental Draft EIS issued in October 2008.

Draft EIS - A Draft EIS (2008 DEIS) for the Waterfront District Redevelopment Project was issued by the Port of Bellingham in January 2008. The 2008 DEIS addresses the probable significant adverse impacts that could occur as a result of the approval by the Port of Bellingham of amendments to the Comprehensive Scheme of Harbor Improvements, adoption by the City of Bellingham of the Master Development Plan and implementing regulations, the approval of a Development Agreement between the Port and the City, and potential future redevelopment activities on the Waterfront District (formerly known as New Whatcom) site during a 20-year buildout horizon (20-year horizon was assumed for environmental review purposes).

At the time the 2008 DEIS was prepared and issued, a preferred Master Development Plan (MDP) for the site had not been determined. Accordingly, a range of alternatives are addressed in the 2008 DEIS that represent an overall envelope of potential redevelopment that the site could accommodate (Alternatives 1 through 4 in the 2008 DEIS). The 2008 DEIS recognizes that features of the alternatives could be mixed and matched to arrive at the final Master Plan Development for the site.

The Alternatives analyzed in the 2008 DEIS include: Alternative 1 (Higher Density Alternative) assuming approximately 7.5 million square feet of total floor space for mixed-use redevelopment; Alternative 2 (Medium Density Alternative) assuming approximately 6.0 million square feet of total mixed-use redevelopment; Alternative 3 (Lower Density Alternative) assuming approximately 4.0 million square feet of total mixed-use redevelopment; and, Alternative 4 (No Action Alternative) assuming continued industrial use under the existing zoning. The 2008 DEIS alternatives also consider a range of roadway and railroad configurations. All four 2008 DEIS alternatives assume the development of a marina in the aerated stabilization basin (ASB), located in Bellingham Bay in the western portion of the site.

Supplemental Draft EIS – In October 2008, the Port issued a Supplemental Draft EIS (2008 SDEIS) which analyzes project refinements made subsequent to issuance of the Draft EIS. Port staff, with input from the City, the public, and agencies, prepared a recommended Proposal that served as an updated redevelopment concept for the site; this concept is referred to as the "Preferred Alternative" in the 2008 SDEIS (refer to Chapter 2 of the 2008 SDEIS for a detailed description of the Preferred Alternative). The 2008 Preferred Alternative represented a refinement of the 2008 DEIS Alternatives 1 through 3 in terms of redevelopment density and mix of uses, road system, grading and stormwater management, parks and shoreline habitat, in-water work, historic buildings, view corridors, and development regulations. The Preferred Alternative in the 2008 SDEIS featured approximately 6.0 million square feet of mixed-use redevelopment, similar to 2008 DEIS Alternative 2. However, the 2008 Preferred Alternative differed from the 2008 DEIS Alternatives in that it was based on a modified, rotated street grid that was intended to provide for connections to downtown Bellingham, opportunities for formal view corridors and effective engineering solutions for bridging the bluff and the BNSF railroad corridor. The 2008 Preferred Alternative was the subject of the SDEIS issued in October 2008.

The 2008 SDEIS also addressed a "Straight Street Grid Option" as defined by the City. The key differences between the Straight Street Grid Option and the 2008 Preferred Alternative included: the orientation of the street grid and its connections to adjacent areas; the assumed building heights; the assumed retention of certain historic buildings; and, the assumption of view corridors along road rights-of-ways.

Q2. What are the Proposed Actions analyzed in the January 2008 Draft EIS, October 2008 Supplemental Draft EIS and in this EIS Addendum?

A2. The Port of Bellingham (Port) and the City of Bellingham (City) identified the following Proposed Actions for the site in the 2008 DEIS and 2008 SDEIS that would be necessary to implement the Waterfront District redevelopment vision:

Proposed Actions of the Port of Bellingham

- Approval of amendments to the Port's *Comprehensive Scheme of Harbor Improvements*.

- Development of a proposal to the City of Bellingham for a Master Development Plan (MDP) for the Waterfront District.

- Approval of a Development Agreement between the Port of Bellingham and the City of Bellingham.

Proposed Actions of the City of Bellingham

- Adoption of a Master Development Plan (MDP) for the Waterfront District (considered as a Subarea Plan under the Growth Management Act) allowing for a change in zoning from industrial to mixed-use.

- Adoption of Development Regulations for the Waterfront District.

- Approval of a Development Agreement between the City of Bellingham and the Port of Bellingham. The Development Agreement will reference the implementing regulations for the site, along with infrastructure requirements, phasing and development standards.

- Adoption of a Planned Action Ordinance.

- Approval of future permits for infrastructure improvements, construction projects, and redevelopment activities within the redevelopment area over the buildout period.

The Proposed Actions evaluated in this EIS Addendum are the same actions as those contemplated in the January 2008 DEIS and October 2008 SDEIS.

Q3. What elements of the environment were evaluated in the Draft EIS and Supplemental Draft EIS?

A3. The *New Whatcom Redevelopment Project* Draft EIS (January 2008) and Supplemental Draft EIS (October 2008) contain environmental analyses of the elements of the environment listed below; based on the public scoping process conducted in March/April 2007. Technical reports were prepared for several of these elements and are appended to the 2008 DEIS as Volume II and included in the 2008 SDEIS.

- Earth
- Air Quality
- Water Resources
- Plants and Animals
- Environmental Health
- Noise
- Historic and Cultural Resources
- Land Use
- Relationship to Plans & Policies
- Aesthetics
- Population, Employment & Housing
- Parks, Recreation & Open Space
- Transportation
- Public Services
- Utilities

Q4. What was the process to define the Updated Preferred Alternative described and analyzed in this EIS Addendum?

A4. Subsequent to the description and analysis of the Preferred Alternative in the 2008 SDEIS, updates to the 2008 Preferred Alternative were made based on additional public/community input, continued coordination with the City of Bellingham and evolving economic conditions. Highlights of the process and actions that led to the development of the 2010 Updated Preferred Alternative (the subject of this EIS Addendum) are presented below:

- Public input was received during the 30-day public comment period for the SDEIS, including a public hearing on November 6, 2008.

- Additional community meetings and workshops were sponsored by the Port, City and the Waterfront Advisory Group to discuss the Proposed Actions in October and November 2008.

- In the fall of 2008, the country was experiencing the most significant economic downturn since the Great Depression. In response, the federal government authorized funding under an Economic Stimulus program to support a broad scale recovery. On December 12, 2008 the Port Commission and City Council held a joint meeting to develop a request for federal funding of specific infrastructure projects within the Waterfront District under the federal Economic Stimulus program. The Port and City are continuing to pursue economic recovery funds for the project. An agreement was reached during that meeting on a package of infrastructure projects within the Waterfront District, including: 1) rebuilding infrastructure in the Marine Trades area; 2) supporting the Technology Development Center in the Marine Trades area; 3) rebuilding the Central Avenue connection; 4) relocating the railroad toward the bluff; 5) rebuilding the Cornwall Avenue bridge within its current right-of-way at an elevation that would accommodate the relocated railroad; 6) building a Wharf Street turn-around at State Street; and 7) making improvements to the Bellingham Shipping Terminal.

- In December of 2008 a group of nine local architects (Architect Group) agreed to provide an independent analysis of proposed redevelopment options for the Waterfront District site to the Port and City. In March of 2009 the group presented their findings at a joint meeting of the Port Commission and City Council. These findings included recommendations on sustainable strategies, street grid orientation, adaptive re-use of existing buildings and structures and other design features, and were favorably received by a majority of the members of the Commission and the Council. A key recommendation was to make Commercial Avenue an access point to the site along an east/west orientation.

- During March and April of 2009, Port and City staff met with Western Washington University representatives to develop viable infrastructure engineering solutions for the Waterfront District, consistent with the projects identified in the December 12, 2008 Economic Stimulus package, the recommendations of the Architect Group, public input, and the Waterfront Futures Group visioning processes. On April 20, 2009 a Proposed Planning Framework & Assumptions Proposal was presented to a joint meeting of the Port Commission and City Council for consideration. The proposal was approved by a majority of the Commission and Council as the basis for further waterfront planning and environmental analysis, pending further presentation to the public for review and comment.

- Public meetings on the Planning Framework & Assumptions were hosted by the Port and City on April 29, 2009 and by the Waterfront Advisory Group on May 13, 2009 and June 10 2009. Additionally, City staff presented the proposal to the Mayor's Neighborhood Advisory Committee (MNAC) along with two neighborhood associations during May 2009. Based on public input at these meetings, Amendment #6 to the Interlocal Agreement was prepared by Port and City staff and submitted for consideration by the Port Commission and City Council. The amendment adopted the Planning Framework and Assumptions as the basis for further waterfront planning and environmental review and provided budget direction, utilizing existing resources, for the next steps in the process. The amendment, including budget authorization, was approved by the Port Commission and City Council during separate meetings in June (City Council) and July (Port Commission) 2009.

  The Planning Framework and Assumptions provide the basis for the 2010 Updated Preferred Alternative described and evaluated in this EIS Addendum.

- Amendment #6 to the interlocal agreement between the Port and the City also provided budget and authorization to further analyze 11 structures within the Waterfront District for adaptive reuse potential. This analysis was performed and presented at several public meetings during the fall of 2009, including the City Council, Port Commission, Waterfront Advisory Group, and the City's Historic Preservation Commission. The results of this analysis area summarized in this EIS Addendum and included in **Appendix A**.

Q5 What is the 2010 Updated Preferred Alternative and how does it relate to the Preferred Alternative in the 2008 Supplemental Draft EIS?

A5. As indicated above, based on information provided in the 2008 SDEIS (including public input), additional community meetings and workshops, continued coordination between the City and the Port, and evolving economic conditions, the Port has prepared a recommended 2010 Updated Preferred Alternative for analysis in this EIS Addendum. Similar to that described for the Preferred Alternative in the 2008 SDEIS, the 2010 Updated Preferred Alternative is intended to be a medium density, sustainable development that features a diversity of uses that are complimentary to the downtown Bellingham Central Business District, Old Town, and surrounding neighborhoods; an infrastructure network that integrates with and connects the waterfront to the surrounding area; and, a system of parks, trails and open space that opens up the waterfront to the community. The 2010 Updated Preferred Alternative is intended to be consistent with the applicants (Port's) objectives, as defined in both the DEIS (January 2008) and the SDEIS (October 2008); refer to Question 2 of this Chapter for a listing of the Proposed Actions.

In many respects, redevelopment under the 2010 Updated Preferred Alternative would be similar to that described in the 2008 SDEIS for the Preferred Alternative. For example, the following full buildout redevelopment assumptions for the 2010 Updated

Preferred Alternative are the same as described in the 2008 SDEIS for the Preferred Alternative (refer to Chapter 2 of the 2008 SDEIS for detail on the redevelopment assumptions):

- Redevelopment Density (6 million square feet)[1]
- Maximum Building Heights (50 feet to 200 feet as defined for the various areas of the site)[2]
- Public Parks & Open Space (33 acres)
- Shoreline Improvements (including parks and shoreline habitat, shoreline restoration, and moorage features)
- Grading (up to 70,000 cubic yards of cut and 700,000 cubic yards of fill)
- Number of Housing Units (1,892 units)
- Anticipated Site Population (3,614 residents)
- Anticipated Site Employment (8,354 employees)
- Parking (approximately 12,900 spaces)[3]
- Sustainable Design (energy conservation, low-impact stormwater features, etc.)
- Marina Configuration (up to 460 slips)
- Rail Line Relocation (relocated by 2016)

The redevelopment assumptions under the 2010 Updated Preferred Alternative that have been modified from those described in the Preferred Alternative for the 2008 SDEIS (based on the public comment input, continued coordination with the City, and evolving economic conditions described under Question 4 above) include:

- Road Grid *(the road grid alignment has been refined subsequent to the 2008 SDEIS and is based on further coordination between the Port and City, and additional public input).*
- View Corridors *(the 2010 Updated Preferred Alternative included the elimination of five view corridors due to adjustments to right-of-way area and modifications to the Core Street Network).*
- Historic Buildings/Structures *(subsequent to the issuance of the 2008 SDEIS, further analysis was conducted to assess the potential for preservation and/or adaptive reuse of 11 existing buildings on the site).*
- PSE Encogen Plant *(subsequent to the issuance of the 2008 SDEIS, PSE informed the Port that they intend to continue plant operations through 2026 and beyond).*

As summarized below in **Table 2-1**, the characteristics of assumed redevelopment under the 2010 Updated Preferred Alternative are similar to the redevelopment assumptions under the Preferred Alternative in the 2008 SDEIS.

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[1] This level of density would be similar to that of Fairhaven with a range of building heights similar to that of downtown Bellingham.
[2] Maximum building height would vary by redevelopment area; on an overall basis, the range of building heights would be similar to that of downtown Bellingham.
[3] The total number of parking spaces on the site could be reduced through the Master Development Plan (MDP) and Development Regulation process.

Table 2-1
COMPARISON OF 2008 PREFERRED ALTERNATIVE AND 2010 UPDATED PREFERRED ALTERNATIVE

	2008 Supplemental Draft EIS - Preferred Alternative	2010 Supplemental Draft EIS Addendum - Updated Preferred Alternative
Redevelopment Density	6 million sq. ft.	6 million sq. ft.[4]
Maximum Building Height	50 ft. to 200 ft.	50 ft. to 200 ft.[5]
Public Parks & Open Space	33 acres	33 acres
Shoreline Improvements	Parks and shoreline habitat, shoreline restoration, and moorage features.	Parks and shoreline habitat, shoreline restoration, and moorage features.
Housing Units	1,892 units	1,892 units
Site Population	3,614 residents	3,614 residents
Site Employment	8,354 employees	8,354 employees
Grading	Up to 70,000 cubic yards of cut and 700,000 cubic yards of fill.	Up to 70,000 cubic yards of cut and 700,000 cubic yards of fill.
Parking	Approximately 12,900 spaces	Approximately 12,900 spaces (could be reduced through MDP and Development Regulation process).
Sustainable Design	Energy conservation features, low-impact stormwater features, etc.	Energy conservation features, low-impact stormwater features, etc.
Marina Configuration	Up to 460 slips	Up to 460 slips
Rail Line Relocation	Relocated by 2016	Relocated by 2016

[4] This level of density would be similar to that of Fairhaven with a range of building heights similar to that of downtown Bellingham.
[5] Maximum building height would vary by redevelopment area; on an overall basis, the range of building heights would be similar to that of downtown Bellingham.

Table 2-1 Continued

Road Grid	Angled street grid	Modified angled street grid and potential closure of Wharf Street railroad crossing.
View Corridors	Establishment of view corridors along rights-of-way/open space and via a combination of rights-of-way and building height limitations.	Establishment of view corridors along rights-of-way/open space and via a combination of rights-of-way and building height limitations. The configuration of view corridors would be somewhat different based on the updated roadway network.
Historic Buildings/Structures	Identification of five on-site buildings/structures that could potentially be retained or reused.	Identifies one structure to be retained; four buildings/portions of building temporarily held from demolition for possible retention/reuse based on market assessment; and, three structures temporarily held from demolition for retention/reuse based on icon assessment.
PSE Encogen Plant	Relocated by 2026.	Assumed that plant operations would continue onsite (based on feedback from PSE).

Source: New Whatcom Draft EIS, 2008 and CollinsWoerman, 2009.
Note: For environmental review purposes, full buildout of the project is assumed over a 20-year horizon (2026)

Q6. What is an EIS Addendum and why is it being prepared?

A6. According to WAC 197-11-600 and 197-11-706, an Addendum is an environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in an existing environmental document. Preparation of an Addendum is appropriate when a proposal has been modified and the changes are not expected to result in any new significant adverse impacts. An Addendum may be used at any time in the SEPA process. The Washington State Environmental Policy Act (SEPA) Rules (WAC 197-11-625) identify the procedures that shall be followed during the preparation of an EIS Addendum, including the following:

- An Addendum shall clearly identify the proposal for which it is written and the environmental document it adds to or modifies.
- An agency is not required to prepare a draft Addendum.

- An Addendum for a DEIS shall be circulated to recipients of the initial DEIS under WAC 197-11-455.

- If an Addendum to a Final EIS is prepared prior to any agency decision on a proposal, the addendum shall be circulated to the recipients of the Final EIS.

- Agencies are encouraged to circulate an Addendum to interested persons. Unless otherwise provided in these rules, however, agencies are not required to circulate an addendum.

An EIS Addendum is being prepared for the Waterfront District Redevelopment Project because the 2010 Updated Preferred Alternative includes only minor modifications to the Preferred Alternative described and analyzed in the 2008 SDEIS. These minor modifications are not anticipated to result in any new significant unavoidable adverse impacts.

Q7. What will occur after the issuance of this EIS Addendum?

A7. Although not required, a 30-day public comment period will follow the issuance of the EIS Addendum; written comments can be submitted during this 30-day period (see the **Fact Sheet** in this Supplemental Draft EIS Addendum for more information). A public hearing to obtain verbal comments on the EIS Addendum will be held as well (see the **Fact Sheet** in this EIS Addendum for date of the public hearing). Public and agency comments received on this EIS Addendum, as well as the comments received during the previously held 60-day comment period on the January 2008 DEIS and the 30-day comment period on the October 2008 SDEIS, will be included in a Final EIS (FEIS). Responses to all applicable comments will be provided in the FEIS.

Q8. What will occur after the issuance of the Final EIS?

A8. The DEIS, SDEIS, this EIS Addendum and the FEIS will be used as tools by the Port and City (along with other considerations, analyses and public input) to formulate a proposed Master Development Plan (MDP) and Subarea Plan for the Waterfront District, as well as the draft Development Agreement, draft Development Regulations and draft Planned Action Ordinance. Important steps in this process are summarized below.

Subsequent to the issuance of the Final EIS, a draft Master Development Plan (MDP) proposal, as well as draft Development Regulations and a draft Development Agreement, would be completed and circulated for public review. Ultimately, a proposed MDP and Subarea Plan will be submitted for review and approval.

The proposed MDP, along with other regulatory actions, will be reviewed by the Port Commission, City Planning Commission and City Council, as required. Public hearings will be held during the decision-making process and there will be ongoing opportunities for public input. Ultimately, the entire package of regulatory and planning actions will be considered for approval. The MDP, Development Agreement, Development Regulations and Planned Action Ordinance, if approved, will provide the framework for long-term redevelopment of the site.

Subsequent to the above approvals, permit applications for infrastructure improvements, construction projects and building redevelopment activities within the site will be submitted to the City and/or other agencies over the long-term buildout period. The City will determine whether each project is consistent with the approved MDP and other applicable regulations, as well as the Planned Action Ordinance, and will assess whether the environmental impacts and mitigation for these projects have been adequately addressed in the EIS. If so, further environmental analysis will not be required under SEPA and the City will make decisions on permits according to the appropriate process. For projects that require other state and federal permits, the appropriate agencies will review such projects and make decisions on the permits according to their applicable processes. These agencies will also determine if the EIS documents adequately covered the impacts/mitigation related to the specific projects. When approvals have been obtained from the City and agencies, multiple/phased construction and redevelopment projects would be implemented on the site.

2.2 Site Description

Existing Site

The Waterfront District includes approximately 216.3 acres of contiguous waterfront property and adjacent aquatic area in central Bellingham (see **Figure 2-1** for a vicinity map of the site and surrounding area and **Figure 2-2** for an aerial view of the site and surrounding area). The site is primarily developed in buildings, paved area and bulkhead/wharf (along the majority of the shoreline area) reflective of the site's history as an industrial operation and shipping and maritime industrial center on Bellingham Bay. Public pedestrian and vehicular access to the site is limited due to the former operations of the Georgia-Pacific Tissue Mill, the existing BNSF right-of-way, and other marine-related industrial uses.

Operations that are currently still on-going at the Waterfront District include the Bellingham Shipping Terminal, the PSE Encogen Plant, office buildings, and warehouse/maintenance buildings which are located to the south of the Whatcom Waterway. Industrial and marine-related industrial uses are located to the north of the Whatcom Waterway.

Proposed Redevelopment Areas

For descriptive purposes in the 2008 DEIS, the Waterfront District was divided into 10 redevelopment areas (Areas 1 - 10) comprising 180.4 acres (see 2008 DEIS Figure 2-4 for an illustration of these redevelopment areas). The 35.9-acre ASB area was also included within the site boundary and was referenced as Redevelopment Area 11 in the 2008 DEIS.

BLUMEN CONSULTING GROUP, INC	Figure 2-1 Vicinity Map	The Waterfront District EIS

BLUMEN CONSULTING GROUP, INC	Figure 2-2 Site Map	The Waterfront District EIS

Under the 2008 SDEIS Preferred Alternative, the site was no longer described in terms of the numbered redevelopment areas. Instead, the site was divided into five named redevelopment areas that reflect the type of uses proposed in each area under the 2008 Preferred Alternative. Below is a list of the redevelopment areas and their approximate areas (see **Figure 2-3** for a map illustrating the redevelopment areas).

- Marine Trades – 51 acres
- Downtown Waterfront – 44 acres
- Log Pond – 42 acres
- Shipping Terminal – 21 acres
- Cornwall Beach – 22 acres

The names of the redevelopment areas and their boundary locations would remain unchanged under the 2010 Updated Preferred Alternative. The total site acreage, including the approximately 36-acre ASB area, would remain at approximately 216 acres.

2.3 Updated Preferred Alternative

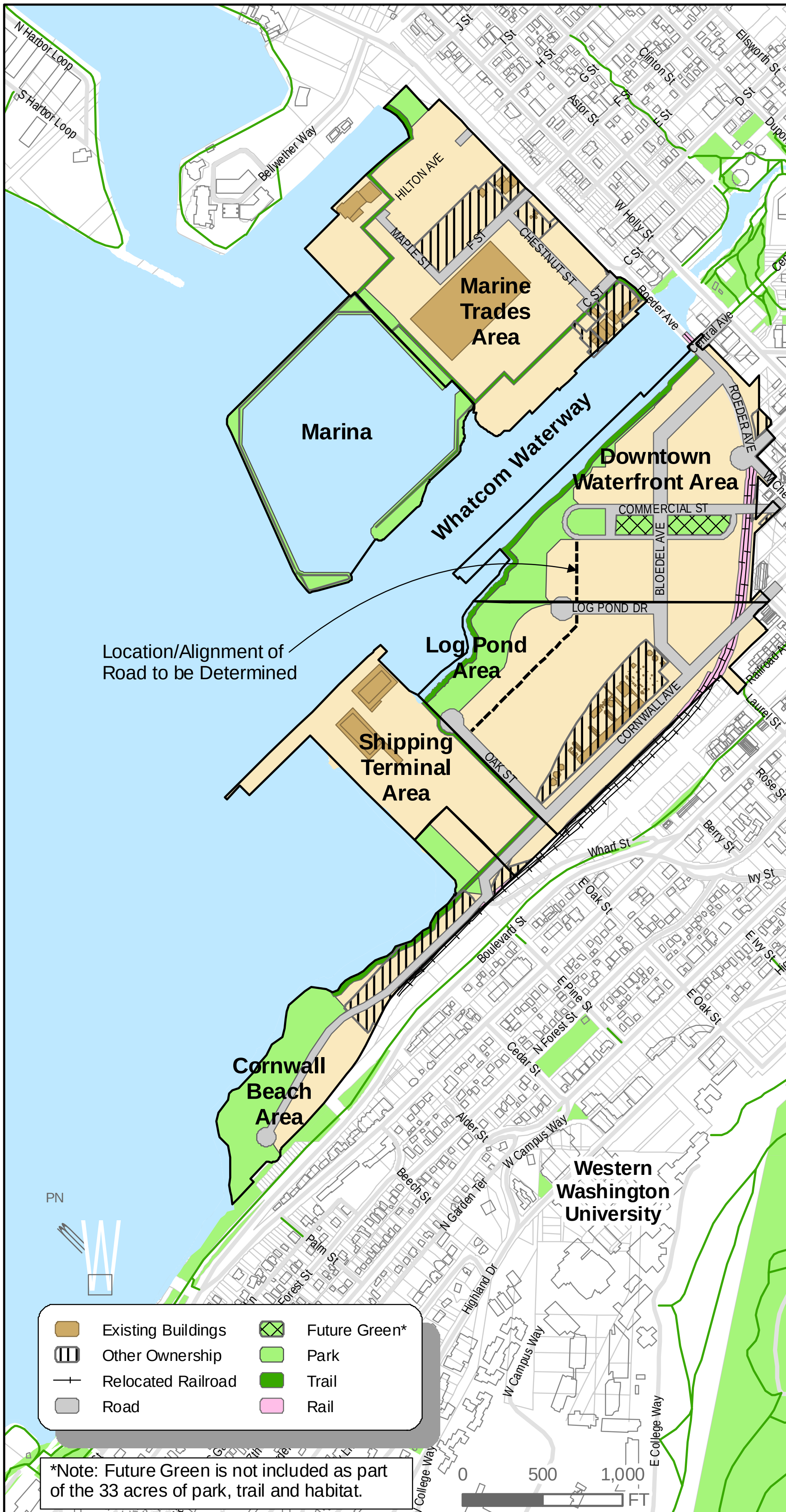
Subsequent to the issuance of the 2008 SDEIS, the Port staff formulated an Updated Preferred Alternative. The 2010 Updated Preferred Alternative is based on information provided in the 2008 SDEIS, ongoing public input, additional analysis and master planning, and coordination between the Port and the City, and evolving economic and fiscal conditions. The 2010 Updated Preferred Alternative is generally based on slight modifications to the 2008 SDEIS Preferred Alternative (refer to **Figure 2-3** for an illustration of the redevelopment areas on the site and **Figure 2-4** for an illustration of the proposed site plan under the 2010 Updated Preferred Alternative). Under the 2010 Updated Preferred Alternative, the majority of the development assumptions would remain the same as those analyzed under the 2008 SDEIS Preferred Alternative, including:

- Name and boundaries of the redevelopment areas (Marine Trades, Downtown Waterfront, Log Pond Area, Shipping Terminal Area, Cornwall Beach Area);
- Redevelopment density;
- Maximum building height;
- Public parks and open space;
- Shoreline improvements;
- Grading;
- Parking;
- Sustainable Design;
- Railroad relocation;
- Marina concept;
- Site population;
- Site Employment; and,
- On-site housing

BLUMEN CONSULTING GROUP, INC

Figure 2-3
The Waterfront District Redevelopment Areas

The Waterfront District EIS



AREA	Use	Total SF
Marine Trades 51.35 ACRES	Jobs	1,150,000
	Housing	450,000
	Goods & Services	90,000
	Subtotal	**1,690,000**
Downtown Waterfront 44.20 ACRES	Jobs	1,200,000
	Housing	930,000
	Goods & Services	87,500
	Subtotal	**2,217,500**
Log Pond 42.30 ACRES	Jobs	465,000
	Housing	410,000
	Goods & Services	156,900
	Subtotal	**1,031,900**
Shipping Terminal 20.80 ACRES	Jobs	530,000
	Housing	120,000
	Goods & Services	33,600
	Subtotal	**693,600**
Cornwall Beach 21.70 ACRES	Jobs	10,000
	Housing	360,000
	Goods & Services	7,000
	Subtotal	**367,000**
Total 180.35 ACRES	Jobs	3,355,000
	Housing	2,270,000
	Goods & Services	375,000
	Total	**6,000,000**
	Park, Trail & Habitat	**33 ac**

*Note: Future Green is not included as part of the 33 acres of park, trail and habitat.

*Note: The Marina is 35.93 acres and is not included as part of the 180.35 acres. Together the total area is 216.28 acres.

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Figure 2-4
Updated Preferred Alternative

The Waterfront District EIS

The 2010 Updated Preferred Alternative would also incorporate some modifications to the 2008 SDEIS Preferred Alternative, including:

- Modifications to the angled street network;
- Updated view corridors;
- Updated information on historic buildings/structures; and,
- Continued operation of the Puget Sound Energy (PSE) Encogen Plant through 2026.

As summarized in **Table 2-1**, the level of assumed redevelopment under the 2010 Updated Preferred Alternative would be similar to the redevelopment assumptions under the Preferred Alternative in the 2008 SDEIS.

Roadway Network

As described in the 2008 SDEIS, the Preferred Alternative included an angled street grid that would be rotated at the top of the bluff that divides the Waterfront District from downtown. The angled grid was intended to provide efficient connections to downtown and surrounding areas, opportunities for formal view corridors, and cost-effective engineering solutions for bridging the bluff and the BNSF railroad corridor (refer to Figure 2-6 of the 2008 SDEIS for an illustration of the 2008 Preferred Alternative street grid). Subsequent to the issuance of the 2008 SDEIS, updates to the angled street grid were made based on additional public comment/community input, continued coordination with the City, and evolving economic conditions.

The road grid under the 2010 Updated Preferred Alternative is based on modifications to the angled street network that was analyzed in the 2008 SDEIS Preferred Alternative (refer to **Figure 2-5** for an illustration of the roadway network under the Updated Preferred Alternative). Under the 2010 Updated Preferred Alternative, the street network within the Marine Trades Area (north of the Whatcom Waterway) would be similar to the 2008 Preferred Alternative and would include Hilton Avenue, Maple Street, F Street, Chestnut Street, and C Street. Within this area, F Street would remain the primary access roadway, with access also provided from Hilton Avenue and C Street.

For the areas to the south of the Whatcom Waterway, there would be up to five primary access point connections between the site and the existing roadway network, including:

- Central Avenue;
- Bay Street;
- Commercial Street;
- Cornwall Avenue; and,
- Wharf Street (to accommodate full buildout of the site, if necessary)

The Commercial Street connection would remain similar to the 2008 SDEIS Preferred Alternative and would be on the south side of the Commercial Street corridor. The Central Avenue and Cornwall Avenue and Bay Street connections would all be modified under the 2010 Updated Preferred Alternative.

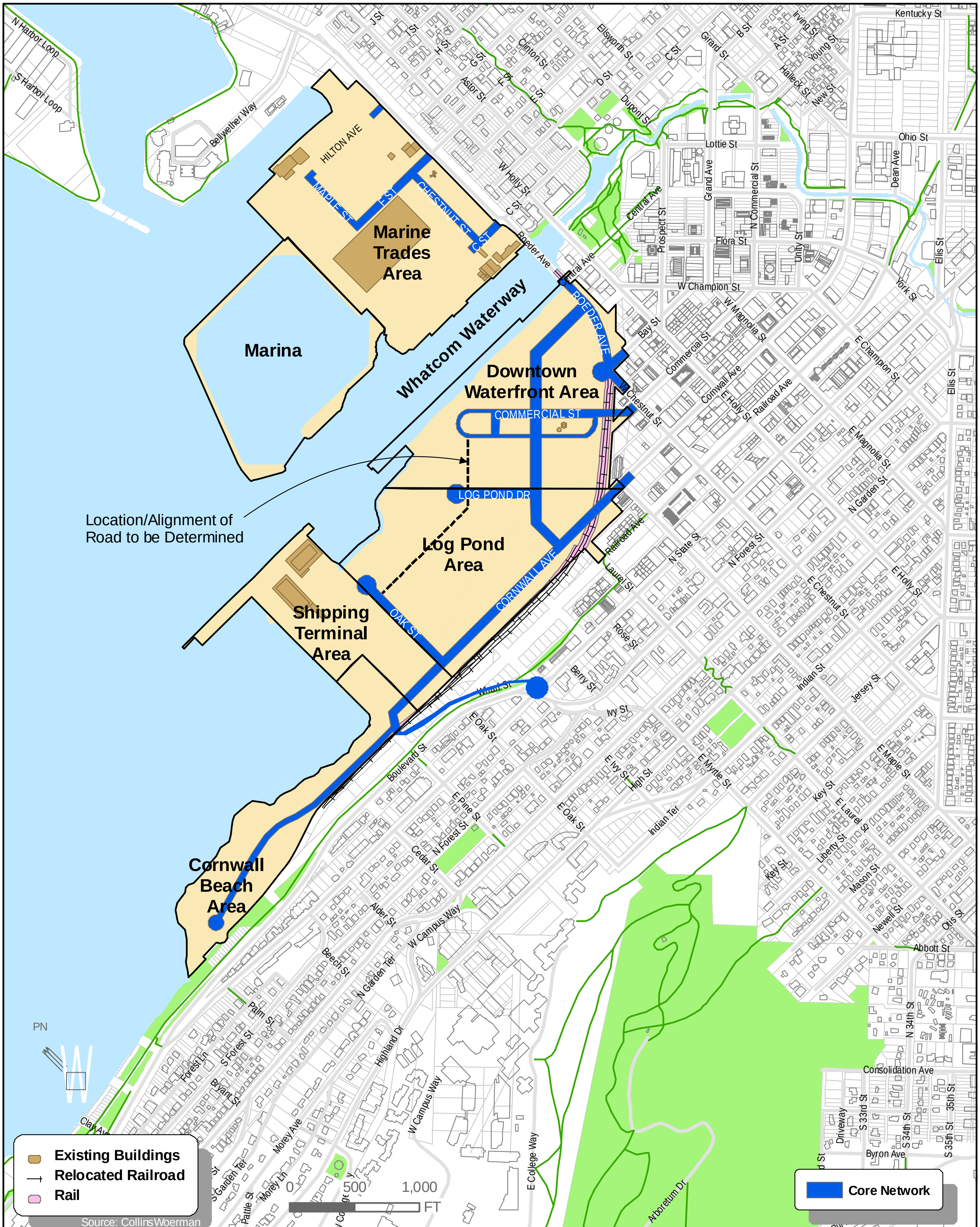

Figure 2-5
Core Street Network

The Waterfront District EIS

Under the 2010 Updated Preferred Alternative, the Central Avenue connection would be shifted to the southeast, on the south side of the existing Granary Building. The Cornwall Avenue bridge connection would be constructed substantially within its present alignment and three lanes would be provided (one southbound and two northbound). Bay Street would also be extended onto the site to provide direct access to an onsite parking structure. In addition, the 2010 Updated Preferred Alternative would include the development of Bloedel Avenue, Oak Street and Paper Avenue to provide improved onsite circulation; Paper Avenue is identified only as a connection between Log Pond Drive and Oak Street, with the exact alignment to be determined in the future by the Port and City in conjunction with WWU and private developer(s). The 2010 Updated Preferred Alternative also assumes that the existing Wharf Street at-grade railroad crossing would be closed by 2025 and that a Wharf Street bridge connection would be further considered, subject to additional environmental review and constructed to accommodate full buildout, if necessary.

The access point at Wharf Street would require an adjustment by 2025 under the terms of an agreement between the City and BNSF railway. Under that agreement, the at-grade crossing at Wharf Street would be closed by 2025. Depending on the level of development at that time, the Port and City would analyze the need for any additional transportation access to the Waterfront District. Options include: 1) further mode shifts toward pedestrian, bicycle, and transit; 2) a bridge connection above the railroad at Wharf Street for pedestrians, bicycles, transit, and/or cars; or 3) some combination of mode shifts and a bridge connection. This document provides analysis of this potential access, but further environmental review may be required prior to any decision on a specific transportation solution to the closure of the at-grade crossing at Wharf Street by 2025.

Refer to **Table 2-2** for a summary of roadway improvements under the 2010 Updated Preferred Alternative and a comparison to the 2008 SDEIS Preferred Alternative. See **Figure 2-6** for an illustration of roadway improvements under the 2010 Updated Preferred Alternative. Refer to Section 3.5, **Transportation**, for further analysis of the roadway network under the 2010 Updated Preferred Alternative.

View Corridors

The 2008 SDEIS Preferred Alternative identified two types of view corridors through the site, including: view corridors defined by rights-of-way and open space, and view corridors defined by a combination of rights-of-way and building height limits. These view corridors were intended to preserve and enhance visual connections to Bellingham Bay, Whatcom Waterway, and the waterfront from the Waterfront District site, Downtown, Old Town and the Lettered Streets areas.

The majority of the view corridors identified under the 2008 SDEIS Preferred Alternative would also be provided under the 2010 Updated Preferred Alternative. However, because of the modifications to the core street network the following view corridors included under the Preferred Alternative would not be provided as part of the Updated Preferred Alternative: Hilton Avenue View Corridor; C Street View Corridor; Bay Street View Corridor; Ivy Street View Corridor; and the Paper Avenue View Corridor.

Table 2-2
ROADWAY IMPROVEMENTS – 2008 PREFERRED ALTERNATIVE AND 2010 UPDATED PREFERRED ALTERNATIVE

Map ID[1]	2008 Preferred Alternative	2010 Updated Preferred Alternative
1	**Hilton Avenue** – Reconstruct roadway and install traffic signal at intersection with Roader Avenue	**Hilton Avenue** – Reconstruct as main access to industrial use and install traffic signal at intersection with Roader Avenue[3]
2	**F Street** – Reconstruct roadway and provide turn lanes at intersection with Roader Avenue	
3	**C Street –** Reconstruct roadway	**C Street –** Reconstruct roadway between Roeder Avenue and Chestnut Street and provide local access road south of Chestnut Street
4	**Maple Street / Chestnut Stree**t – Build connectors in Marine Trades Area[2]	**Maple Street / Chestnut Stree**t – Build connectors in Marine Trades Area between F Street and C Street and at F Street to the west[2]
5	**C Street with Roeder Avenue and Holly Street** – Install traffic signals, reconstruct C Street and rail crossing	
6	**Central Avenue/Bloedel Avenue** – Upgrade roadway and extend to Bloedel Avenue, extend Bloedel Avenue to Log Pond Drive, pedestrian corridor between Roeder Avenue and Holly Street	**Central Avenue/Bloedel Avenue** – Relocate Central Avenue to the south of the existing Granary Building. Provide access management with limited direct connections and minimal on-street parking. Restrict left-turns to and from driveways. Provide four lanes between Log Pond Drive and Cornwall Avenue to accommodate dual left turn lanes from Bloedel Avenue onto Cornwall Avenue. Include provisions for bicycle movement.
7	**Central Avenue/Roeder Avenue** – Install traffic signal	**Central Avenue/Roeder Avenue** –Align Central Avenue to the south of the Granary Building and install coordinated signal system at both the Central Avenue pedestrian crossing and the relocated vehicle access.
8	**Commercial Street** - Extend street beyond Paper Avenue	
9	**Commercial Street/Chestnut Street** – Upgrade traffic signal	
10	**Paper Avenue** – Build connector from Bay Street to Pine Street	**Paper Avenue** – Build connector from Commercial Street to Oak Street (alignment/ location of roadway to be determined).
11	**Cornwall Avenue Bridge** – Close roadway at railroad between Maple Street and Bloedel Avenue	**Cornwall Avenue Bridge** – Reconstruct Bridge to three lanes, provide a traffic signal at the Cornwall Avenue/Bloedel Avenue intersection, upgrade traffic signal at Cornwall Avenue/Chestnut Street intersection
12	**Cornwall Avenue South of Oak Road** –extend to Cornwall Beach Area	
13	**Relocate Railroad**	**Relocate Railroad,** close the at-grade railroad crossing with Wharf Street, and construct **Wharf Street Bridge** to accommodate full buildout, if necessary
14	**Wharf Street/State Street –** Construct roundabout	
15	**Oak Street –** Construct from Cornwall Avenue to Log Pond Drive	**Oak Street –** Construct between Paper Avenue and Cornwall Avenue with a cul-de-sac beyond Paper Avenue
16	**Bay Street** – Reconstruct bridge and connect to Bloedel Avenue	**Bay Street –** Extend to parking structure on-site
17	**Log Pond Drive** – Construct bridge to Cornwall Avenue extend to Oak Street	**Log Pond Drive** – Construct from Bloedel Avenue to Paper Avenue
18	**Maple Street/Cornwall Avenue** – Upgrade Maple Street including intersection traffic control at Cornwall Avenue, State Street, and Forest Street	

Source: The Transpo Group, 2010.
[1] Map ID numbers correspond with Figure 2-6
[2] Roads do not connect to Maple Street and Chestnut Street off-site
[3] A traffic signal would not be installed until the intersection meets appropriate traffic signal warrants
Note: Shading indicates improvements that have been modified under the 2010 Updated Preferred Alternative.

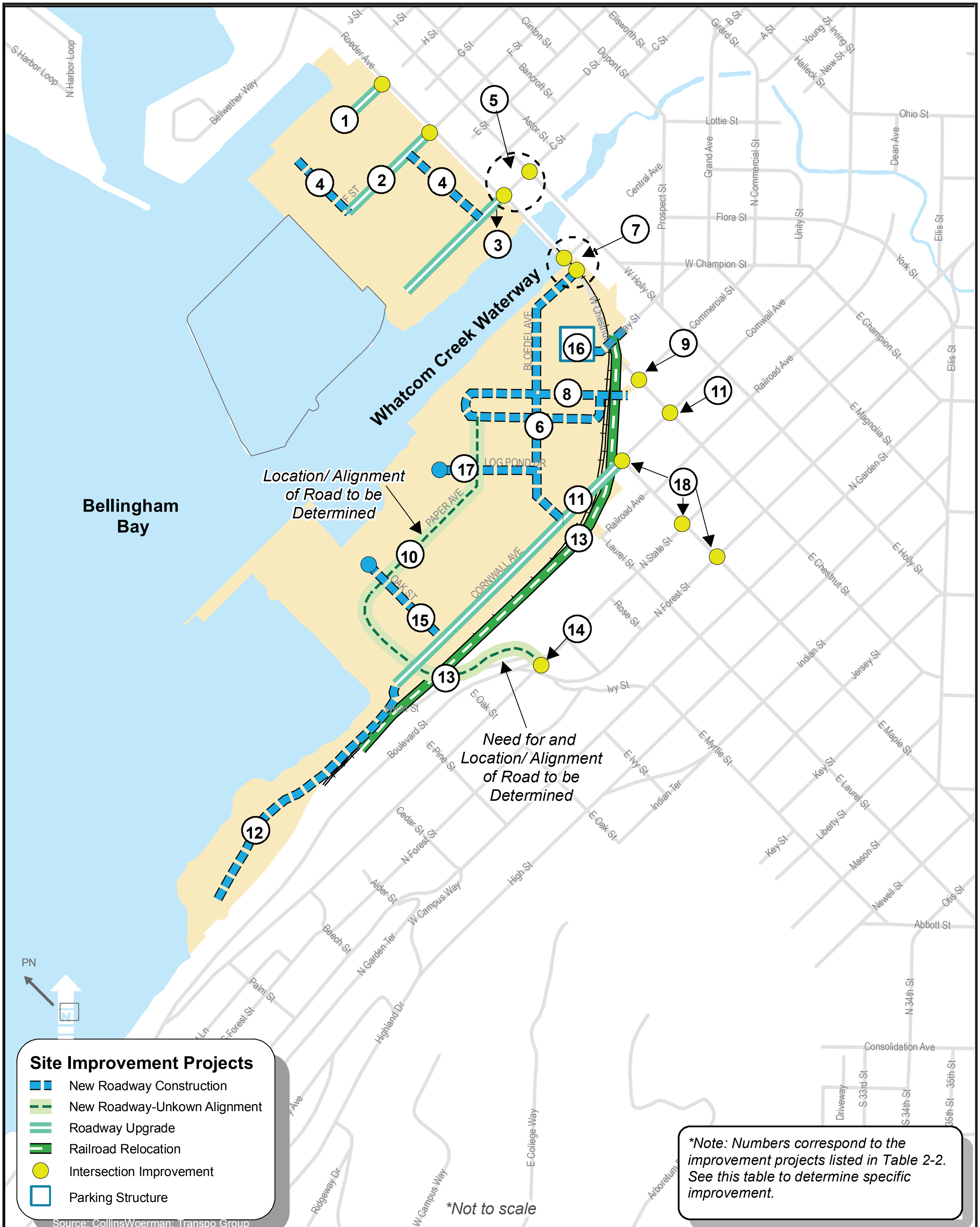

Figure 2-6
Roadway Infrastructure Improvements

The Waterfront District EIS

The following view corridors identified in the 2008 SDEIS for the Preferred Alternative would also be provided under the 2010 Updated Preferred Alternative:

- F Street
- Central Avenue
- Commercial Street
- Commercial Street Green
- Bloedel Avenue
- Cornwall Avenue
- Log Pond Drive
- Oak Street

See **Figure 2-7** for an illustration of view corridors under the 2010 Updated Preferred Alternative and Section 3.3, **Aesthetics**, for further analysis of views corridors and viewpoint locations.

Historic Buildings and Structures

The 2008 SDEIS identifies 10 on-site structures at least 40 years of age that could potentially be retained or reused in some capacity with redevelopment of the site under the 2008 Preferred Alternative. The following structures were assumed to be retained in the 2008 SDEIS, including the Port's assigned number for the building: Bellingham Builders Supply Company Office (#3); Kodiak Fish Company Building (#4); Old Granary Building (#7); Shipping Terminal Pier (No Port #, #8 in DEIS Historic Resources Report); Barking/Chipping Plant (#8); Building J/Storage Unit (#9B); Vitamins, Inc. Building (#10); Boardmill Building (#12); Digester Building (#13); and, High Density Tanks (#49)

Under the 2008 Preferred Alternative, the 2008 SDEIS indicates that the viability for reuse/relocation of these structures would be determined based on further analysis, including the consideration of structural, economic, environmental and locational factors.

Subsequent to issuance of the 2008 SDEIS, further analysis has been conducted for this EIS Addendum to assess the potential for preservation and/or adaptive reuse of 11 existing structures at least 40 years old on the Waterfront District site. The assessment includes consideration of historic resource value, cost of construction, market feasibility and compatibility with other planning objectives for the Waterfront District (see **Appendix A** for the Adaptive Reuse Assessment).

According to the assessment, none of these structures would be financially viable for reuse in the current economic climate or in a potentially improved economy. However, the assessment indicates that four structures could potentially be viable for retention, reuse or relocation should economic conditions improve in the future (see **Figure 2-8** for the location of these structures). The assessment recommends that these structures be temporarily held from demolition in the near term to evaluate future market and economic conditions and further determine whether the structures would be economically viable for retention or reuse. Due to public health and safety concerns with these unreinforced masonry structures, they are recommended for controlled demolition at the time surrounding properties are redeveloped, or as necessary to support other infrastructure and environmental cleanup actions, if market conditions at the time of redevelopment do not indicate such improvements are financially viable. The assessment also recommends that the three iconic structures and equipment be held from demolition pending further evaluation as iconic structures.

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Figure 2-7
View Corridors

The Waterfront District EIS

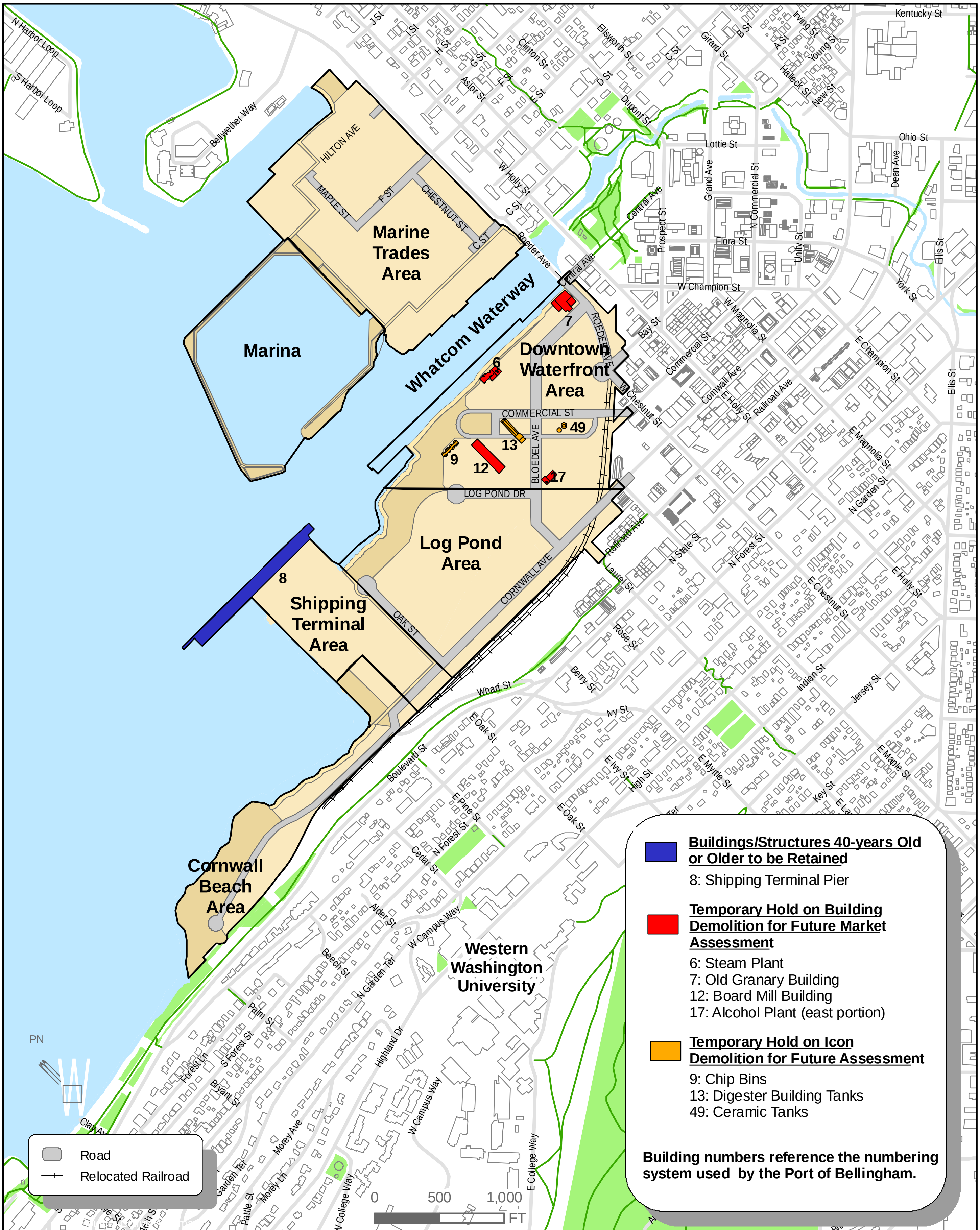

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Figure 2-8
Historic Structures Potentially to be Retained/Reused

The Waterfront District EIS

Based on the results of the Adaptive Reuse Assessment, as well as the 2008 DEIS Historic Resources Report, the Port has determined that the following structure would be retained with proposed redevelopment of the Waterfront District site under the 2010 Updated Preferred Alternative:

- Shipping Terminal Pier (No Port #, #8 in the DEIS Historic Resources Report)

The following buildings/portions of buildings would be temporarily held from demolition for possible retention/reuse in some manner in the future (based on further market assessment):

- Steam Plant (#6)
- Old Granary Building (#7)
- Board Mill Building (#12)
- Alcohol Plant – East Portion (#17)

And, the following structures would be temporarily held from demolition for possible retention/reuse in some manner in the future (based on further icon assessment):

- Chip Bins (#9)
- Digester Tanks (#13)
- High Density Tanks (#49)

Final decisions on the specific removal or potential reuse of the buildings/structures to be temporarily held would be made in the future in conjunction with a future developer and/or in conjunction with infrastructure development (see **Appendix A** for details). If further market/icon assessments indicate that no economically viable uses are available, these buildings/structures could be demolished as part of development of the site. No other buildings within the Waterfront District are currently being considered for long-term preservation or adaptive reuse.

PSE Encogen Plant

Under the 2008 SDEIS Preferred Alternative, it was assumed that the Puget Sound Energy (PSE) Encogen Plant would be operational in the year 2016 and would cease operations at the existing location by 2026. It was assumed under the 2008 Preferred Alternative that new mixed-use redevelopment could occur in proximity to the operating PSE Encogen Plant under the year 2016 condition and that the PSE Encogen site would be redeveloped with mixed-uses by 2026.

Subsequent to the issuance of the 2008 SDEIS, PSE notified the Port that they plan to continue plant operations on the site through 2026 and beyond. The continued operation of the PSE Encogen Plant through 2026 would be anticipated to result in conditions similar to those identified in the 2008 SDEIS for the year 2016. See Section 3.1, **Air Quality**, and Section 3.2, **Noise**, for further analysis of noise and air quality issues with the continued operation of the PSE Encogen Plant.

CHAPTER 3

Comparison of Environmental Impacts

CHAPTER 3

COMPARISON OF ENVIRONMENTAL IMPACTS

This document is an Addendum to the Draft EIS (January 2008) and the Supplemental Draft EIS (October 2008) prepared for the *Waterfront District (formerly known as New Whatcom) Redevelopment Project*. The 2008 Draft EIS (2008 DEIS) evaluated three development alternatives and their environmental impacts and associated mitigation measures. The 2008 Supplemental Draft EIS (2008 SDEIS) evaluated two development alternatives (Preferred Alternative and Straight Street Grid Option), and the environmental impacts and mitigation measures associated with each alternative. Information contained in these documents is hereby incorporated by reference.

According to the SEPA Rules[1], an Addendum is an environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts in the existing environmental document. The 2008 SDEIS Preferred Alternative and the 2010 Updated Preferred Alternative in this EIS Addendum need not be identical but must have similar elements that provide a basis for comparing environmental consequences[2].

The overall level of development under the 2010 Updated Preferred Alternative is no greater than that identified under the 2008 SDEIS Preferred Alternative and the potential for environmental impacts would be similar in level and type to those identified in the 2008 SDEIS. Therefore, the 2010 Updated Preferred Alternative does not substantially change the analysis of significant impacts in the 2008 SDEIS and the 2008 SDEIS provides the basis for comparing environmental conditions.

Scope of EIS Addendum

As described in Chapter 2, many of the redevelopment assumptions under the 2010 Updated Preferred Alternative would be similar to that described in the 2008 SDEIS for the Preferred Alternative. Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative is intended to be a medium density, sustainable development that features a diversity of uses that are complementary to downtown; an infrastructure network that integrates with and connects the waterfront to the surrounding area; and, a system of parks, trails and open space that opens up the waterfront to the community. However, despite these similarities, certain redevelopment assumptions under the 2010 Updated Preferred Alternative have been modified from those described in the 2008 SDEIS Preferred Alternative. Based on those redevelopment assumptions that are similar and those assumptions that have been modified under the 2010 Updated Preferred Alternative, the following environmental analyses in the 2008 SDEIS would not change:

- Earth
- Water Resources
- Plants and Animals
- Environmental Health
- Land Use
- Relationship to Plans and Policies
- Population, Employment and Housing
- Public Services
- Utilities

[1] WAC 197-11-706
[2] RCW 43.21C.034

This EIS Addendum provides an updated environmental analysis for those environmental elements that have changed as a result of the 2010 Updated Preferred Alternative redevelopment assumptions. The following environmental elements are included in this EIS Addendum:

- Air Quality
- Noise
- Aesthetics
- Historic and Cultural Resources
- Transportation

Each element of the environment analyzed in this chapter contains information on the following: a description of existing conditions; a brief summary of environmental impacts indentified in the 2008 SDEIS; a comparison of environmental conditions under the 2010 Updated Preferred Alternative with those indentified under the 2008 SDEIS Preferred Alternative; listing of any mitigation measures for the 2010 Updated Preferred Alternative beyond those identified in the 2008 SDEIS; and a comparison of significant unavoidable adverse impacts identified for the 2010 Updated Preferred Alternative with those identified in the 2008 SDEIS.

3.1 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section of the EIS Addendum compares the probable significant impacts from the 2010 Updated Preferred Alternative (2010 EIS Addendum) on air quality to those analyzed under the 2008 Preferred Alternative in the 2008 SDEIS, and identifies any new mitigation.

3.1.1 Affected Environment

The existing Waterfront District (formerly known as New Whatcom) site is mostly unoccupied, although the site supports some industrial uses, including the Bellingham Shipping Terminal, PSE Encogen Plant, and marine industrial operations. Onsite sources of air emissions are considered to contribute limited amounts of air pollution to the existing ambient conditions in the area. As indicated in the 2008 DEIS, typical existing sources of air emissions in the site area include automobile and truck traffic, railroad activity and locomotives, marine vessels, and a variety of industrial sources including the PSE Encogen Plant; existing emissions from the PSE Encogen Plant currently comply with applicable air quality requirements. Existing sources of emissions and air quality conditions on the New Whatcom site and in the site vicinity have generally remained the same as presented in the 2008 DEIS and 2008 SDEIS.

Existing greenhouse gas (GHG) emission sources on the Waterfront District site are limited due to the on-going transition of the site from heavy industrial uses to other uses and the current vacant status of numerous buildings. Existing GHG emission sources primarily include on-going industrial/marine industrial uses, office and warehouse buildings, and the PSE Encogen Plant.

3.1.2 Impacts

2008 Supplemental Draft EIS

Construction

Construction activities under the 2008 Preferred Alternative would be phased over the buildout period and would result in temporary short-term construction-related air emissions. These temporary emissions would not be expected to be significant.

Operation

Air Quality

Operational emissions under the 2008 Preferred Alternative would result from traffic emissions, as well as non-road emissions from rail operations, marine vessels, and point sources (stationary sources including industrial uses, marine industrial uses, etc.). The PSE Encogen Plant would remain operational in 2016 and would cease operations by 2026. Operation of the plant through 2016 is not anticipated to result in significant impacts to potential new onsite uses. While plant emissions are monitored by the Northwest Clean Air Agency (NWCAA) to ensure the protection of human health, the closure of the PSE Encogen Plant by 2026 would result in a reduction of approximately 76 tons of criteria pollutant emissions. Under the 2008 Preferred Alternative, significant impacts from operational emissions would not be anticipated.

Greenhouse Gas Emissions

Redevelopment would result in greenhouse gas (GHG) emissions over the lifespan of the project and on an annual basis. Given the commitment to develop the site as a LEED-Neighborhood Design project and relative to historical emissions at the site from industrial sources, GHG emissions would likely be reduced.

2010 EIS Addendum

Construction

Construction activities under the 2010 Updated Preferred Alternative would be similar to those described under the 2008 Preferred Alternative. Redevelopment would be phased over the buildout of the site and would result in temporary short-term construction air emissions. Construction air emissions would likely be lower under the 2010 Updated Preferred Alternative due to the fact that the PSE Encogen Plant would remain on the site and no building demolition activities associated with this building would occur. As a result, it is anticipated that temporary construction air emission impacts would be lower under the 2010 Updated Preferred Alternative and no significant impacts would be anticipated.

Operation

Air Quality

Under the 2010 Updated Preferred Alternative, automobile traffic volumes are anticipated to be similar to the 2008 Preferred Alternative and it is anticipated that automobile emissions would be similar under the 2010 Updated Preferred Alternative; emissions from railroad operations and marine vessels would also be similar to the 2008 Preferred Alternative.

In general, redevelopment levels on the site would be similar to the 2008 Preferred Alternative; however, the primary difference as it relates to air quality would be the continued operation of the PSE Encogen Plant beyond 2026. Emissions from the Encogen Plant represent a minor part of the total criteria pollutants in Whatcom County and would be regulated by the NWCAA and the Department of Ecology (Ecology) to ensure that emission levels are acceptable for human health and the environment. The 2008 DEIS analyzed conditions for the year 2016 under Alternatives 1-3 assuming that new mixed uses on the site would be located in proximity to the operating PSE Encogen Plant (the 2008 SDEIS also assumed continued operation of the PSE Encogen Plant in the year 2016). As described in the 2008 DEIS for the year 2016 condition for Alternatives 1-3, significant impacts would not be anticipated for new onsite mixed-uses located in proximity to the PSE Encogen Plant in the year 2026 under the 2010 Updated Preferred Alternative.

Greenhouse Gas Emissions

Subsequent to the issuance of the DEIS, GHG rules were implemented by the EPA and are now administered locally by Ecology with deadlines for compliance in 2010. New regulations are found in WAC 173-441 which requires that owners or operators of the following facilities perform an emission inventory of 2009 GHG and report the results to Ecology by October 31, 2010:

- A fleet of on-road motor vehicles that emits at least 2,500 metric tons of greenhouse gases a year in Washington. The state's largest motor vehicle fleets will meet this threshold. They include trucking and delivery fleets, rental car companies, large customer service fleets (such as phone, cable or power companies), and large government-agency fleets.

- A source or combination of sources that emits at least 10,000 metric tons of greenhouse gases a year in the state. Washington's largest factories and power facilities will meet this threshold. They include refineries, pulp and paper mills, cement kilns, some lumber mills, large food processors, and some entities that use fossil fuels to generate power, steam, heat or cooling. Large fleets of aircraft, marine vessels or rail equipment also must report if they emit at least 10,000 metric tons of greenhouse gases a year in the state.

Because the PSE Encogen Plant is a fossil fuel electrical power generation plant, it will likely meet this threshold and be required to perform a GHG emission inventory. The long-term use of the PSE Encogen Plant is expected to produce more GHG emissions than if the Encogen Plant was closed and the site redeveloped in 2026 as assumed in the 2008 DEIS and 2008 SDEIS. However, because greenhouse gas impacts are studied on a global scale, specific impacts within the redevelopment area are not evaluated as a part of GHG emissions reporting. As under current conditions, operation of the PSE Encogen Plant would be anticipated to comply with current and future GHG regulations and no significant impacts are anticipated.

3.1.3 Conclusion

Redevelopment under the 2010 Updated Preferred Alternative would result in similar air quality and GHG emission impacts to those described under the Preferred Alternative in the 2008 SDEIS. The primary difference under the 2010 Updated Preferred Alternative would be the continued operation of the PSE Encogen Plant beyond 2016. Operation of the plant would result in increased emissions on the site when compared to the 2008 Preferred Alternative; however, emissions would be monitored and regulated by applicable agencies to ensure the safety of human health and the environment. No significant impacts to air quality would be anticipated.

3.1.4 Mitigation Measures

Mitigation measures were identified for the Preferred Alternative in the 2008 SDEIS and these measures would also apply to the 2010 Updated Preferred Alternative. Because no additional significant impacts were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures would be warranted.

3.1.5 Significant Unavoidable Adverse Impacts

No significant adverse impacts to air quality would be anticipated from redevelopment under the 2010 Updated Preferred Alternative.

3.2 NOISE

This section of the EIS Addendum compares the probable significant impacts from the 2010 Updated Preferred Alternative (2010 EIS Addendum) on noise to those analyzed under the 2008 Preferred Alternative in the 2008 Supplemental Draft EIS (2008 SDEIS), and identifies any new mitigation.

3.2.1 Affected Environment

The existing Waterfront District (formerly known as New Whatcom) site is mostly unoccupied, although the site supports some industrial uses. Onsite noise sources (including noise from trucks and marine vessels) are considered to contribute limited noise to the existing ambient conditions in the area. The existing noise environment is typical of urban areas and is characterized by noise levels generated by vehicular traffic on nearby streets and highways, passing trains, occasional aircraft flyovers, barking dogs, lawn mowers, etc. Vehicular traffic on the existing roadway network is the dominant noise source in the area. Existing noise sources and noise conditions on the Waterfront District site and in the site vicinity have generally remained the same as presented in the 2008 DEIS and 2008 SDEIS.

The study area for the 2008 DEIS and 2008 SDEIS was comprised of 13 offsite receiver locations that were selected to represent groupings of sensitive noise receivers that share common characteristics such as elevation, location in the study area, or land use. An additional three onsite receiver locations were selected to represent groupings of new onsite sensitive receivers.

3.2.2 Impacts

2008 Supplemental Draft EIS

Construction

Redevelopment under the 2008 Preferred Alternative would result in temporary short-term construction-related noise impacts (particularly from pile-driving activities) over the phased buildout period. These noise impacts would be temporary in nature and are not anticipated to be significant.

Operation

Operational noise under the 2008 Preferred Alternative would primarily consist of vehicular traffic, human activity, mechanical equipment, light/marine industrial activities, marina activities, and railroad operations. Under the 2008 Preferred Alternative there would be a reduction in noise associated with industrial uses. The PSE Encogen Plant would remain operational in 2016 and would cease operation by 2026. Operation of the plant through 2016 would result in noise sources associated with plant activities; however, such noise is not anticipated to result in significant impacts to adjacent new mixed-uses. In general, ambient noise level increases would occur as a result of redevelopment; however, these increases are not anticipated to be significant.

Traffic noise associated with redevelopment under the 2008 Preferred Alternative would generally fall within the range of volumes analyzed in the DEIS. Worst-case noise increases during the PM peak hour would generally range between 1 and 2 dBA over existing noise levels and significant impacts to offsite and onsite noise receivers would not be anticipated.

2010 EIS Addendum

Construction

Construction activities under the 2010 Updated Preferred Alternative would be similar to those described under the 2008 Preferred Alternative. Redevelopment would be phased over the buildout of the site and would result in temporary short-term construction noise. Construction noise would likely be lower under the 2010 Updated Preferred Alternative due to the fact that the PSE Encogen Plant would remain on the site and no building demolition activities associated with this facility would occur. As a result, it is anticipated that temporary construction noise impacts would be lower under the 2010 Updated Preferred Alternative and no significant impacts would be anticipated.

Operation

Redevelopment under the 2010 Updated Preferred Alternative would include a similar mix of land uses, densities, and traffic volumes to those assumed under the 2008 Preferred Alternative. As a result, operational noise sources and ambient noise level increases would also be similar to the 2008 Preferred Alternative. Similar to the 2008 DEIS and 2008 SDEIS year 2016 conditions assuming new mixed-uses in proximity to the operating PSE Encogen Plant, continued operation of the PSE Encogen Plant through 2026 would not be anticipated to result in significant noise impacts to new onsite mixed uses located in proximity to the plant. Future noise levels on and around the site would adhere to the Department of Ecology Environmental Noise Regulations and significant noise impacts under the 2010 Updated Preferred Alternative would not be anticipated.

3.2.3 Conclusion

Redevelopment under the 2010 Updated Preferred Alternative would result in operational noise sources and ambient noise level increases that would be similar to the Preferred Alternative analyzed in the 2008 SDEIS. The continued operation of the PSE Encogen Plant through 2026 would not be anticipated to result in significant noise impacts to new adjacent onsite mixed uses.

3.2.4 Mitigation Measures

Mitigation measures were identified for the Preferred Alternative in the 2008 SDEIS and these measures would also apply to the 2010 Updated Preferred Alternative. Because no additional significant noise impacts were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures would be warranted.

3.2.5 Significant Unavoidable Adverse Impacts

No significant adverse noise impacts would be anticipated from redevelopment under the 2010 Updated Preferred Alternative.

3.3 AESTHETICS

This section of the EIS Addendum compares the probable significant impacts from the 2010 Updated Preferred Alternative (2010 EIS Addendum) on aesthetics to those analyzed under the 2008 Preferred Alternative in the 2008 Supplemental Draft EIS (2008 SDEIS), and identifies any new mitigation.

3.3.1 Affected Environment

As described in the 2008 DEIS, the general visual character of the site is varied, reflecting large expanses of mostly paved unoccupied area interspersed by areas of industrial building development; approximately 72 percent of the site is vacant (does not contain buildings). In general, the visual character of the site transitions from highly developed area with numerous buildings in the northern and eastern portions of the site (Marine Trades and Downtown Waterfront Areas) with fewer buildings and more vacant area to the west (Log Pond, Shipping Terminal and Cornwall Beach Areas).

Lighting conditions on the site are indicative of the primarily unoccupied and underutilized industrial environment. However, portions of the site are occupied by buildings, activities and operations that emit light, including: pole-mounted lights and exterior building lights associated with the GP mill, pole-mounted lights within the paved area associated with the Bellingham Shipping terminal, pole-mounted lights and exterior building lights associated with uses in the Marine Trades Area, and security lighting associated with the PSE Encogen facility.

In general, the current visual and lighting characteristics of the Waterfront District (formerly known as the New Whatcom) site are as described in the January 2008 DEIS and in the October 2008 SDEIS.

3.3.2 Impacts

2008 Supplemental Draft EIS

Section 3.10 of the 2008 SDEIS indicates that redevelopment under the 2008 Preferred Alternative would transform the aesthetic character of the Waterfront District site from a vacant and underutilized industrial site, to a new urban neighborhood with a mix of land uses and open space. Redevelopment of the site under the 2008 SDEIS Preferred Alternative would express a visual character reflecting increased building density (up to 6 million square feet of building space) and building heights (ranging from 50[1] to 200 feet in height). The aesthetic character of the majority of the shoreline areas of the site would change from industrial wharf and bulkhead areas to public open space containing parks, trails and habitat areas.

The 2008 SDEIS Preferred Alternative identified two types of formal view corridors through the site, including: view corridors defined by rights-of-ways and open space, and view corridors defined by a combination of rights-of-ways and building height limits. These view corridors were intended to preserve and enhance view connections to Bellingham Bay, Whatcom Waterway and the waterfront from the Waterfront District site, Downtown, Old Town and the Lettered

[1] *All buildings within the 200 foot shoreline zone would be allowed an outright maximum height of 35 feet and could be granted a maximum height of 50 feet.*

Streets areas. The 2008 SDEIS Preferred Alternative contained a total of 15 designated view corridors.

To illustrate anticipated visual conditions under the 2008 Preferred Alternative, the 2008 SDEIS included visual simulations representing views of site redevelopment from 10 viewpoints representative of views from the surrounding area[2].

The visual analysis in the 2008 SDEIS (page 3.10-41) concluded that "although the character of the site would substantially change over the 20-year buildout period under the 2008 Preferred Alternative, this assessment does not indicate if a particular change in visual character would be adverse. The determination as to whether a particular change could be adverse should be defined by the subjective perceptions of an individual viewer. For example, some viewers could perceive the change in character of the site from vacant/industrial to an urban redevelopment with a range of uses as a negative impact, while others could perceive this change as a positive condition. On an overall basis, positive or negative perceptions related to visual aesthetic character would likely be defined by the quality and consistency of building design, the public spaces that are created and the "pedestrian-friendliness" of the site."

The 2008 SDEIS (page 3.10-40) also indicates that the 2008 Preferred Alternative would result in new light and glare sources on the site, indicative of an urban mixed-use neighborhood. The 2008 SDEIS indicates that new light and glare sources would be typical of an urban environment and significant impacts would not be anticipated.

2010 EIS Addendum

Views

The types of new uses and level of redevelopment on the Waterfront District site under the 2010 Updated Preferred Alternative would be similar to that identified in the 2008 SDEIS for the Preferred Alternative and the potential for aesthetics related impacts under the 2010 Updated Preferred Alternative would be similar in type and level to those identified in the 2008 SDEIS.

Similar to that described in the 2008 SDEIS for the Preferred Alternative, the 2010 Updated Preferred Alternative would transform the aesthetic character of the Waterfront District site from a unoccupied and underutilized industrial site, to a new urban neighborhood with a mix of land uses and open space. Redevelopment of the site under the 2010 Updated Preferred Alternative would express a visual character reflecting increased building density (up to 6 million square feet of building space) and building heights (ranging from 50[3] to 200 feet in height). The aesthetic character of the majority of the shoreline areas of the site would change from industrial wharf and bulkhead areas to public open space containing parks, trails and habitat areas, similar to that described in the 2008 SDEIS for the Preferred Alternative.

Under the 2010 Updated Preferred Alternative, the majority of the view corridors through the site described and analyzed under the 2008 SDEIS Preferred Alternative would be included under the 2010 Updated Preferred Alternative.

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[2] *The 10 visual simulations in the SDEIS were in addition to the 14 simulations provided in the January 2008 Draft EIS.*

[3] *All buildings within the 200 foot shoreline zone would be allowed an outright maximum height of 35 feet and could be granted a maximum height of 50 feet.*

The following view corridors through the site identified in the 2008 SDEIS for the Preferred Alternative would be provided under the 2010 Updated Preferred Alternative:

- F Street
- Central Avenue
- Commercial Street
- Commercial Street Green
- Bloedel Avenue
- Cornwall Avenue
- Log Pond Drive
- Oak Street

Views of site redevelopment under the 2010 Updated Preferred Alternative would be similar to those illustrated in 9 of the 10 visual simulations provided in the 2008 SDEIS for the Preferred Alternative. However, the updated roadway network under the 2010 Updated Preferred Alternative would result in somewhat different visual conditions from 2008 SDEIS Viewpoint 9 (E. Maple Street and Cornwall Avenue).

Figure 3.3.1 illustrates the view under the 2010 Updated Preferred Alternative from the intersection of E. Maple Street and Cornwall Avenue looking west (Viewpoint 9). As shown in the figure, the existing view includes Cornwall Avenue and associated railing in the foreground, with paved area and existing buildings in the Downtown Waterfront and Log Pond areas to the north. Limited views of Bellingham Bay and Lummi Island are available across the site in the distance. A limited view of the tip of South Hill is also available in the background.

Compared to the 2008 SDEIS Preferred Alternative roadway network (that did not include the segment of Cornwall Avenue between approximately Rose Street on the west and E Maple Street on the east), the 2010 Updated Preferred Alternative would generally retain the existing alignment of Cornwall Avenue through the site and provide greater views to Bellingham Bay than under the 2008 SDEIS Preferred Alternative.

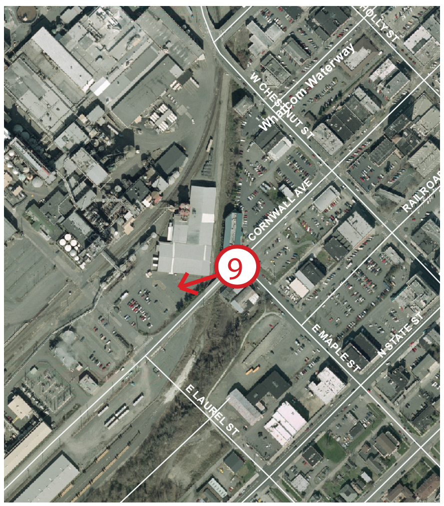
Views from this viewpoint under the 2010 Updated Preferred Alternative (**Figure 3.3.1**) would include the Cornwall Avenue corridor through the site to Bellingham Bay. Views down the diagonal Log Pond Drive, flanked by building development, to Bellingham Bay would also be available; buildings on the east side of Log Pond Drive could be up to 200 feet in height and buildings on the west side of Log Pond Drive could be up to 100 feet in height. As illustrated in this figure, views of Bellingham Bay framed by buildings would be provided along the Cornwall Avenue and Log Pond view corridors. As under the 2008 Preferred Alternative, portions of the existing views across the site to Bellingham Bay and Lummi Island would be obstructed by redevelopment under the 2010 Updated Preferred Alternative. The existing limited view of the tip of South Hill would not be affected.

The proposed Master Development Plan (MDP) and Development Regulations would also include maximum building heights and design guidelines that would help to protect view corridors through the Waterfront District site.

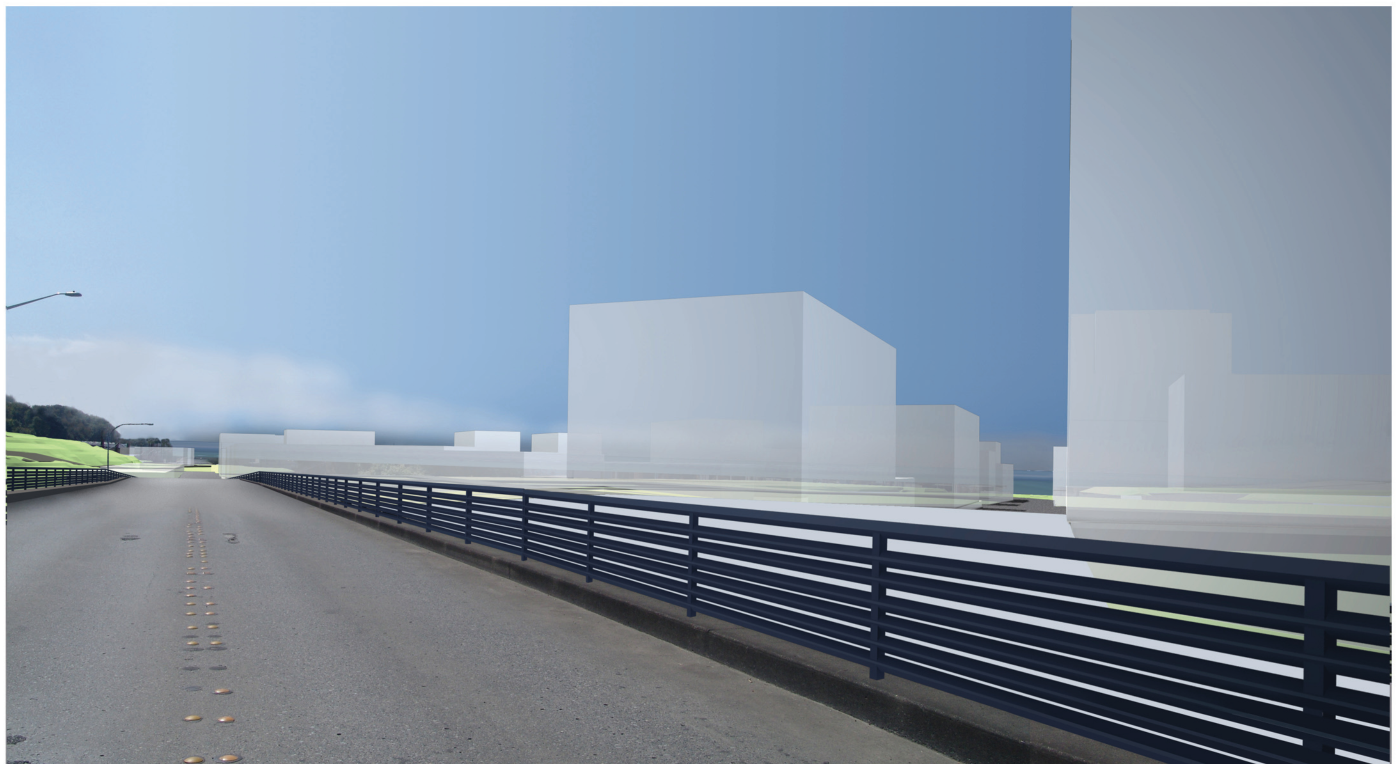
Viewpoint 9

Existing

This simulation is a conceptual representation and is not reflective of a specific project design



Map depicting location of Viewpoint 9



Preferred Alternative

Source: PRIMEDIA GROUP

BLUMEN CONSULTING GROUP, INC

Figure 3.3-1
Viewpoint 9 - E. Maple Street and Cornwall Avenue
Updated Preferred Alternative

The Waterfront District EIS

Light and Glare

Similar to that under the 2008 Preferred Alternative, the 2010 Updated Preferred Alternative would result in new light and glare sources on the site, indicative of an urban mixed-use neighborhood.

Because it is assumed that the PSE Encogen facility would remain in operation to and beyond 2026, lighting associated with the facility would be visible from certain new mixed uses on the site, similar to conditions assumed for the 2016 condition in the 2008 DEIS and 2008 SDEIS. Because light form the PSE Encogen facility is assumed to remain similar to existing conditions and the facility would be surrounded on three sides by roadways (Cornwall Avenue, Oak Street and Bloedel Avenue), significant impacts to new uses on the site from Encogen facility lighting would not be anticipated.

Overall, the type and level of light and glare under the 2010 Updated Preferred Alternative would be similar to that under the 2008 SDEIS Preferred Alternative and significant impacts would not be anticipated.

3.3.3 Conclusion

The potential for impacts under the 2010 Updated Preferred Alternative in relation to aesthetics, views, light and glare would be similar to that identified in the 2008 SDEIS for the Preferred Alternative; no additional significant impacts beyond those identified for the Preferred Alternative in the 2008 SDEIS have been identified for the 2010 Updated Preferred Alternative.

3.3.4 Mitigation Measures

Mitigation measures for potential aesthetics-related impacts were identified in the 2008 DEIS and in the 2008 SDEIS for the Preferred Alternative, and are applicable to the 2010 Updated Preferred Alternative. Because no significant impacts beyond those under the 2008 SDEIS Preferred Alternative were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures have been identified.

3.3.5 Significant Unavoidable Adverse Impacts

Similar to the 2008 SDEIS Preferred Alternative, redevelopment under the 2010 Updated Preferred Alternative would change the aesthetic character of the site from a primarily paved unoccupied/underutilized industrial site to a more dense urban, mixed-use development. Changes in aesthetic character would occur incrementally over the 20-year buildout period. The aesthetic/visual changes that would result from redevelopment of the site over the buildout period could be perceived by some to be significant and adverse; however, perceptions regarding such changes would ultimately be based on the subjective opinion of the viewer.

The 2010 Updated Preferred Alternative would create formal view corridors through portions of the site, where none currently exist; these are intended to preclude significant adverse visual impacts from long-term redevelopment.

Similar to the 2008 SDEIS Preferred Alternative, redevelopment on the site under the 2010 Updated Preferred Alternative would result in an increase in light and glare on the site. With implementation of the mitigation measures identified in the 2008 DEIS and 2008 SDEIS no significant light and glare impacts would be anticipated.

3.4 HISTORIC AND CULTURAL RESOURCES

The following section summarizes and updates the description of existing historic and cultural resource conditions on and in the vicinity of the site from the January 2008 DEIS. The section compares the probable significant impacts from the 2010 Updated Preferred Alternative (2010 EIS Addendum) on historic and cultural resources to those analyzed under the Preferred Alternative in the October 2008 SDEIS, and identifies any new mitigation. This section is based on the 2010 *Waterfront District Adaptive Re-Use Assessment* contained in **Appendix A** to this EIS Addendum.

3.4.1 Affected Environment

The 2008 DEIS describes the general site history of the New Whatcom (aka Waterfront District) site and site vicinity dating back to pre-history occupation by the Lummi Nation and Nooksack Indian Tribe, and identifies existing historic resources and potential archaeologically significant areas on the site and within the site vicinity (only those buildings assumed to remain on the site subsequent to completion of Georgia Pacific (GP) demolition plans are considered as "existing" buildings/structures). Twenty-two (22) buildings/structures on the Waterfront District site are identified as being at least 40 years of age (the period of 40 years or older was used to include buildings close to reaching the 50-year threshold for eligibility as a National Register of Historic Places (NRHP) resource; see DEIS Section 3.11 and Appendix L to the DEIS for details); the 2008 DEIS concludes that 13 of these 22 buildings/structures could be potentially eligible for local, state or national historic registers. None of these buildings/structures are currently listed on any historic registers, however. The State Department of Archaeology and Historic Preservation provides the final opinion as to the potential eligibility and listing status of on-site resources.

Subsequent to its closure of operations in 2007, GP continued with its demolition program on the site. The 2008 SDEIS indicates that the Port had preliminary plans to demolish three structures (that are at least 40 years of age) in conjunction with GP demolition activities. However, demolition of these buildings has been suspended pending the completion of the Final EIS for the Waterfront District and further consideration of the *2010 Waterfront District Adaptive Re-Use Assessment* Report recommendations (see **Appendix A** for further details).

The Adaptive Reuse Assessment prepared for this EIS Addendum identifies one additional on-site building at least 40 years of age: the Steam Plant (see **Figure 2-8** for the location of this building)

3.4.2 Impacts

2008 Supplemental Draft EIS

Construction

As the 2008 SDEIS describes, construction of the New Whatcom Redevelopment Project could result in potential impacts to historic and cultural resources located on the site and in the site vicinity. In addition to the five structures 40-years or older assumed to be retained in the 2008 DEIS (i.e. Bellingham Builders Supply Company Office - #3; Kodiak Fish Company Building - #4; Shipping Terming Pier; Building J/Storage Unit – #9B; and Vitamins, Inc, Building - #10), the

2008 SDEIS identifies five on-site structures at least 40 years of age that could potentially be retained or reused in some capacity with redevelopment of the site under the 2008 Preferred Alternative. The following additional buildings/structures were assumed to be retained in the 2008 SDEIS: Old Granary Building (#7); Barking/Chipping Plant (#8); Board Mill Building (#12); Digester Building (#13); and, High Density Tanks (#49).

The 2008 SDEIS indicates that potential reuse or retention opportunities for all or some of these structures could include: the retention of the existing structure and reuse in its current configuration; reuse of the building's original materials; and/or, relocation and preservation of industrial equipment or features. The 2008 SDEIS indicates that additional analysis would determine the level of reuse potential for each structure.

During construction, listed historic resources in the vicinity of the site could potentially experience indirect impacts from construction-related activities. Alteration of views from off-site historic resources could occur. However, a majority of these views from historic resources towards the site and Bellingham Bay are currently affected by existing buildings and structures. Any alteration would not be anticipated to reduce the historic value of these resources, and no significant impacts would result. Below-grade construction, utility installation and/or removal of existing waterfront features and relocation of the railroad corridor could create the potential to expose or disturb Native American and archaeological materials. To the extent that any below-grade work is required, such work could adversely affect potential archaeological materials located within the Waterfront District site area. With implementation of the construction mitigation listed in the 2008 DEIS and 2008 SDEIS, significant impacts to off-site resources would not be anticipated.

Operation

As the 2008 SDEIS indicates, no direct impacts to listed historic resources in the site vicinity would be anticipated as a result of operation of the 2008 Preferred Alternative. Increased levels of air pollution, noise, and vibration could occur in the vicinity of off-site historic resources; however, these levels are not anticipated to be significant. New buildings on the Waterfront District site could alter existing views from off-site historic resources; however, a majority of these views are currently affected by existing buildings. The historic value of these resources is not dependent upon views to and beyond the Waterfront District site. Therefore, alteration of existing views, if any, would not be anticipated to reduce the historic value of these resources.

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Adaptive Reuse Assessment

Subsequent to issuance of the 2008 SDEIS, further analysis has been conducted for this 2010 EIS Addendum to assess the potential for preservation and/or adaptive reuse of existing structures on the Waterfront District site. In addition to the five structures assumed to be retained in the 2008 DEIS, the assessment examines the potential for retention/reuse of 11 existing on-site structures at least 40 years old. Historic resource value, cost of construction, market feasibility and compatibility with other planning objectives for the Waterfront District site are considered in the assessment (see **Appendix A** for details on the methodology used for the assessment). The following 11 on-site structures were further assessed for this EIS Addendum: Steam Plant (#6); Old Granary Building (#7); Barking and Chipping Plant (#8); Chip Bins (#9);

Board Mill Building (#12); Digester Building (#13); Pulp Screen Room (#14); Bleach Plant (#15); Alcohol Plant (#17); Pulp Storage Building (#37); and, the High Density Tanks (#49).

Background documentation on the 11 on-site structures analyzed in the *2010 Waterfront District Adaptive Re-Use Assessment Report* (including the Port's assigned number for the building) was submitted to the Washington State Department of Historic Preservation (DAHP) to request preliminary findings of eligibility (or lack thereof) as NRHP resources. Documentation was submitted to DAHP for the following structures: Boiler House (#6)*; Granary Building/WA Egg and Poultry Building (#7)*; Barking/Chipping Plant (#8)*; Chip Bins (#9); Board Mill Building (#12)*; Digester Building (#13)*; Screen Room (#14)*; Bleach Plant (#15)*; Alcohol Plant (#17)*; Pulp Storage Building (#37)*; and, High Density Tanks (#49). DAHP determined that all of these structures, except the Granary Building, are eligible for listing on the NRHP as properties that contribute to a historic district. Nine of these resources (noted with asterisks) are also individually eligible for listing on the NRHP (see **Appendix A1** for a copy of the letter from DAHP).

The *2010 Waterfront District Adaptive Re-Use Assessment* determined that none of these structures would be financially viable for reuse in the current economic climate or in a potentially improved economy in approximately 5 years. The fundamental reason for this determination is that the onsite structures were constructed to house industrial equipment and operations, and the structures do not contain floors and utilities (plumbing, heating, etc.) typical of older buildings that have been successfully reused in other areas.

In addition, the Assessment indicates that it is unlikely that the structures identified as potentially viable for reuse (i.e. the Steam Plant, Old Granary Building, Board Mill Building, and Alcohol Plant – East Portion) could form a coherent historic district (see **Appendix A2** for additional detail).

However, the Port recognizes the historic value of structures on the site, and, based on structural, architectural, and economic evaluations conducted as part of the *2010 Waterfront District Adaptive Re-Use Assessment*, four (4) structures have been identified as having the potential for retention or reuse should economic conditions allow in the future. The four structures identified include: Steam Plant (#6); Old Granary Building (#7); Board Mill Building (#12); and, Alcohol Plant – East Portion (#17). In addition, three structures are identified as potential heritage icons, including: Chip Bins (#9); Digester Tanks (#13); and, the High Density Tanks (#49). See **Figure 2-8** for the location of these structures.

Thus, based on their structural and architectural characteristics, the assessment recommends that the following structures could be held onsite in the near term to further evaluate market and economic conditions, and whether the structures would be economically viable for retention/reuse/relocation at a future date: Steam Plant (#6); Old Granary Building (#7); Board Mill Building (#12); and, Alcohol Plant – East Portion (#17). Due to public health and safety concerns with these unreinforced masonry structures, they are recommended for controlled demolition at the time surrounding properties are redeveloped, or as necessary to support other infrastructure and environmental cleanup actions, if market conditions at the time of redevelopment do not indicate such improvements are financially viable. In addition, the assessment also recommends that the three identified iconic structures and equipment be held in the near term pending further icon assessment.

Construction

Based on the results of the 2010 Adaptive Reuse Assessment, as well as the 2008 DEIS historic and cultural resource analysis, the Port has determined that the structure **would be <u>retained</u>** with proposed redevelopment of the New Whatcom site:

- Shipping Terminal Pier (No Port #, #8 in the 2008 DEIS Historic Resources Report)

The following structures/portions of structures would be **temporarily held from demolition for possible <u>retention/reuse</u> in some manner in the future** (based on further market assessment):

- Steam Plant (#6)
- Old Granary Building (#7)
- Board Mill Building (#12)
- Alcohol Plant – East Portion (#17)

And, the following structures would be **temporarily held from demolition for possible <u>retention/reuse</u> in some manner in the future** (based on further icon evaluation at the time of redevelopment):

- Chip Bins (#9)
- Digester Tanks (#13)
- High Density Tanks (#49)

Final decisions on the specific removal or potential reuse of the structures to be temporarily held from demolition would be made in the future in conjunction with a future developer and/or in conjunction with infrastructure development (see **Appendix A** for details). Due to public health and safety concerns with these unreinforced masonry structures, they are recommended for controlled demolition at the time surrounding properties are redeveloped, or as necessary to support other infrastructure and environmental cleanup actions, if market conditions at the time of redevelopment do not indicate such improvements are financially viable. No other buildings within the Waterfront District are currently being considered for long-term preservation or adaptive reuse.

Impacts to off-site historic resources under both construction and operation of the 2010 Updated Preferred Alternative would be similar to those described in the 2008 SDEIS under the Preferred Alternative. Construction impacts would occur incrementally and would not be expected to be significant. Alteration of views from off-site historic resources could occur. However, a majority of these views from historic resources toward the site and Bellingham Bay are currently affected by existing buildings and structures. Any alteration would not be anticipated to reduce the historic value of these resources, and no significant impacts would result.

Similar to the 2008 Preferred Alternative, the 2010 Updated Preferred Alternative could result in below-grade excavation for buildings and/or utilities, as well as removal of waterfront features and relocation of the railroad corridor to the bluff. These construction activities could result in potential impacts to pre-contact or ethnohistoric Native American resources. With implementation of the mitigation measures listed in the 2008 DEIS and 2008 SDEIS, significant impacts would not be expected.

Operation

See above under Construction. No further impacts to historic and/or cultural resources would be expected with operation of the 2010 Updated Preferred Alternative.

3.4.3 Conclusion

The potential for impacts to historic and cultural resources under the 2010 Updated Preferred Alternative would be similar to those identified in the 2008 SDEIS for the Preferred Alternative; no additional significant impacts beyond those identified for the Preferred Alternative in the 2008 SDEIS have been identified for the 2010 Updated Preferred Alternative.

3.4.4 Mitigation Measures

Mitigation measures for potential historic and cultural resource-related impacts were identified in the 2008 SDEIS for the Preferred Alternative, and are applicable to the 2010 Updated Preferred Alternative. Because no significant impacts beyond those under the 2008 SDEIS Preferred Alternative were identified for the 2010 Updated Preferred Alternative, no additional mitigation measures have been identified.

3.4.5 Significant Unavoidable Adverse Impacts

With implementation of the mitigation measures identified in the 2008 DEIS and 2008 SDEIS, no significant adverse impacts to historic and cultural resources would be anticipated to result from redevelopment under the 2010 Updated Preferred Alternative.

3.5 TRANSPORTATION

This section of the EIS Addendum compares the probable significant impacts from the 2010 Updated Preferred Alternative on transportation to those analyzed under the 2008 Preferred Alternative in the 2008 SDEIS, and identifies any new or increased significant impacts and/or mitigation. This section is based on *The Waterfront District (Formerly New Whatcom) Transportation Discipline Report (2009)* contained in **Appendix C** to this EIS Addendum.

3.5.1 Affected Environment

A study area for the transportation analysis in the 2008 Draft EIS (2008 DEIS) and 2008 Supplemental Draft EIS (2008 SDEIS) was developed in conjunction with the City of Bellingham to represent the locations most likely to be impacted by redevelopment of The Waterfront District site. The analysis focused on the immediate area of The Waterfront District site, but also includes major corridors outside the vicinity of the site that would likely serve as access to and from the site. The offsite study area primarily includes transportation facilities within six to eight blocks of the site, as well as Interstate 5 (I-5) interchanges serving regional traffic. This study area would also be used as part of the analysis in this EIS Addendum.

The onsite and immediately adjacent affected environment would remain the same as described in the 2008 DEIS and 2008 SDEIS and include major roadways such as Roeder Avenue, Chestnut Street, and Cornwall Avenue. All intersections currently operate at LOS E or better during the PM peak hour. No pedestrian or bicycle facilities are located on the site. The Burlington Northern Santa Fe (BNSF) Railway runs parallel to Cornwall Avenue and Roeder Avenue along the site frontage and enters the site along the southern boundary.

The offsite affected environment would also remain similar to the 2008 DEIS and 2008 SDEIS. A total of 32 intersections are located in the offsite study area, all of which operate at LOS E or better during the PM peak hour. Bicycle routes and multi-use trails are located in the surrounding area of the site and sidewalks for pedestrian access are available on both sides of most streets. Parking is also located in the vicinity of the site, including approximately 1,100 on-street parking spaces within ¼ mile of the site; off-street parking is also available downtown. Freight trains travel through the site serving local industries in the City of Bellingham.

3.5.2 Impacts

2008 Supplemental Draft EIS

Construction

Construction traffic under the 2008 SDEIS Preferred Alternative would impact the existing street system and would consist of truck traffic bringing soil, equipment and materials to the site, as well as construction employees commuting to and from the site. There could be intermittently heavy truck traffic particularly during grading operations onsite. Impacts to the existing street network associated with truck traffic during grading operations would be similar to or less than those indentified for the 2008 DEIS Alternatives. Truck traffic would likely use existing truck routes in the City and could temporarily increase conflicts between trucks and other travel modes during the initial infrastructure construction period and periodically over the long-term buildout of the site. In general, construction traffic volumes would be lower than operational traffic volumes.

Operation

Under the 2008 Preferred Alternative, as described in the 2008 SDEIS, there would be an overall increase in net new trips to and from the site. Onsite and offsite roadway and intersection operations would vary by 2026; certain roadways and intersections would exhibit a decline in LOS, while others would improve due to assumed transportation improvements, including new access connections, traffic control and channelization at various intersections (See 2008 SDEIS Table 3.12-5 and Table 3.12-6 for a summary of onsite and offsite roadway and intersection operations under the 2008 Preferred Alternative).

Assumed onsite access improvements would create the necessary vehicle capacity to support the buildout of six million square feet of mixed uses and the number of PM peak hour vehicle trips that would be generated to and from the site. Additional offsite improvements would be needed to address congestion and operational deficiencies, particularly along Roeder Avenue/Chestnut Street and Holly Street. In some cases, these improvements would be required to accommodate future growth in the area, with or without redevelopment on the site.

Parking demand associated with redevelopment on the site would be accommodated by approximately 12,892 parking spaces that would be provided throughout the site area. Redevelopment of the site would also provide an extensive pedestrian and bicycle friendly environment that would accommodate the approximately 14,000 daily pedestrian/bicycle trips that would be generated by new mixed use development.

Redevelopment on the Waterfront District site would generate approximately 4,200 daily transit rider trips. An increase in transit service in the site vicinity, as well as service and stops on the site would be needed to support future growth on the site.

The BNSF railway would be relocated during redevelopment on the site and would create safer overall rail conditions. Construction of bridge crossings at Commercial Street, Bay Street and Log Pond Drive would provide additional crossings over the railroad tracks and provide access to the areas south of the Whatcom Waterway.

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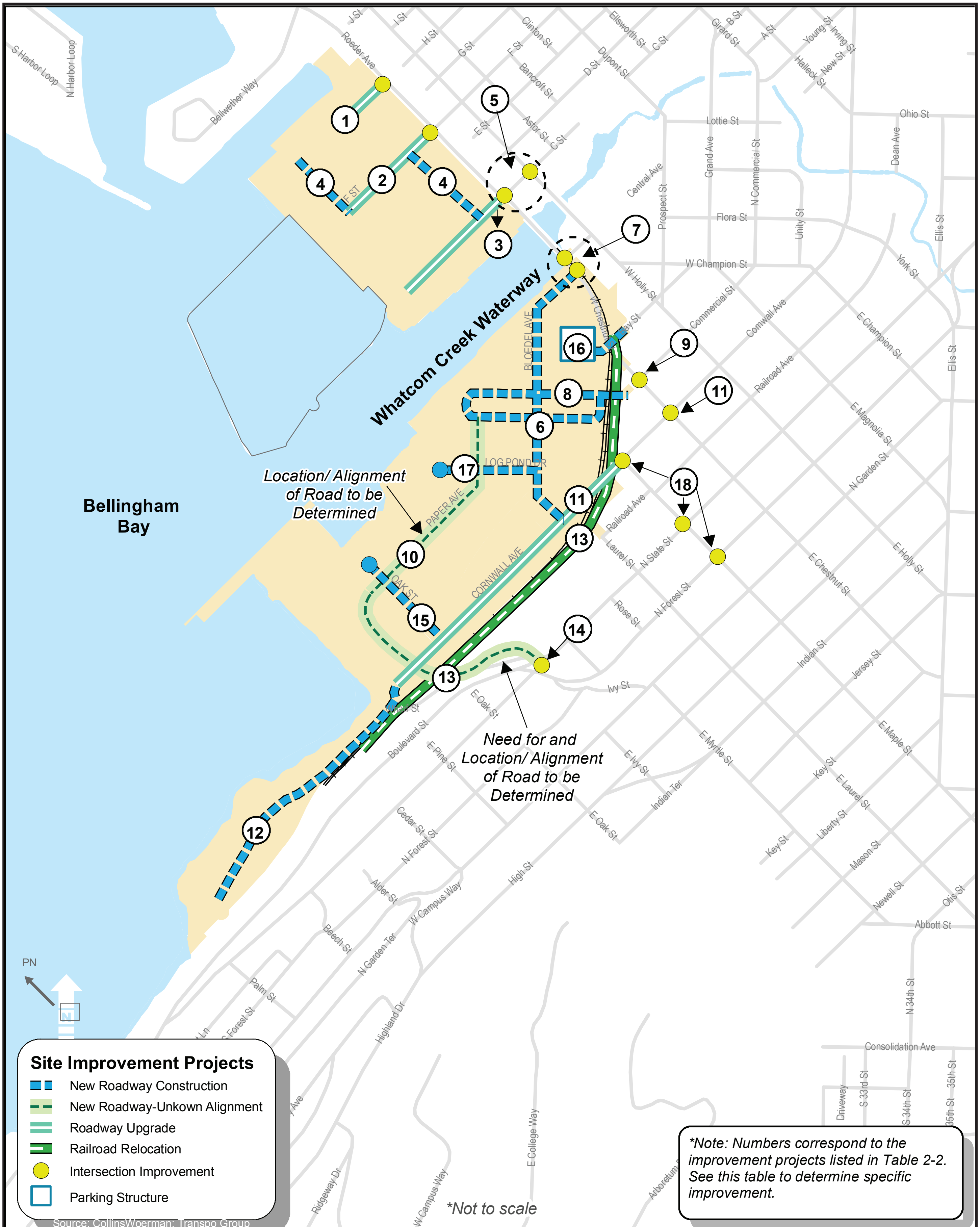
The road grid under the 2010 Updated Preferred Alternative is based on modifications to the street network that was analyzed in the 2008 SDEIS Preferred Alternative. While the 2008 Preferred Alternative and 2010 Updated Preferred Alternative remain very similar, the on-site street system and access locations have been modified slightly in the 2010 Updated Preferred Alternative (refer to **Table 2-2** for a comparison of roadway improvements under the 2008 Preferred Alternative and 2010 Updated Preferred Alternative and **Figure 3.5-1** for an illustration of roadway improvements under the 2010 Updated Preferred Alternative).



BLUMEN CONSULTING GROUP, INC

Figure 3.5-1
Updated Preferred Alternative
Infrastructure Improvements

The Waterfront District EIS

The modifications relate to the alignment of the on-site street system, along with the closure or grade-separation of the Wharf Street railroad crossing by 2025[1] (see discussion on page 3.5-7). Closure of the crossing would eliminate one access point to the site and could require building a Wharf Street bridge connection, which was originally evaluated in the DEIS. Further environmental review of this issue is anticipated prior to any decision on a specific transportation solution to the closure of the at-grade crossing at Wharf Street by 2025. Parking provided on The Waterfront District site would be similar to the 2008 Preferred Alternative and would accommodate the demand associated with redevelopment of the site.

Programmed and Planned Transportation Improvements

Marine Trades Area

The onsite street system for the Marine Trades area would be very similar to the 2008 Preferred Alternative. Access to the Marine Trades area (north of the Whatcom Waterway) would continue to be provided via Hilton Avenue, F Street and C Street. Internal circulation within the Marine Trades area would be enhanced by extensions of Chestnut Street and Maple Street between C Street and Hilton Avenue. However the primary circulation streets would continue to be C Street, F Street, and Hilton Avenue. The following provides a general description of the roadway infrastructure improvements that are different between the 2010 Updated Preferred Alternative and 2008 Preferred Alternative (refer to **Figure 3.5-1** for an illustration of the roadway improvements).

- **Hilton Avenue (1) –** Similar to the 2008 Preferred Alternative, the Hilton Avenue access would be signalized at Roeder Avenue. Signalization would not occur until traffic volumes warrant such control. For the 2010 Updated Preferred Alternative, this roadway would likely serve as the primary access to a large industrial use within the Marine Trades area. The road would be constructed to industrial standards to be compatible with marine trade uses. Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of this road or adjacent to this roadway. Under the 2010 Updated Preferred Alternative there would be no east-west connection (Chestnut Street) between Hilton Avenue and F Street.

- **Maple Street and Chestnut Street (4) –** Both the 2008 Preferred Alternative and 2010 Updated Preferred Alternative would classify these roadways as industrial streets. Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of these roads or adjacent to these roadways. The 2010 Updated Preferred Alternative would change the circulation within the Marine Trades area by eliminating the east-west connection (Chestnut Street) between Hilton Avenue and F Street. Similar to the 2008 Preferred Alternative, the 2010 Updated Preferred Alternative would provide an east-west connection between F Street and C Street (called Chestnut Street) as well as from F Street to the west (called Maple Street).

- **C Street (3)** – For the 2010 Updated Preferred Alternative, the C Street connection would be retained and the roadway would be reconstructed; however, south of the Chestnut Street connection, this roadway would be constructed as a local access road.

[1] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks.

Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of this road or adjacent to this roadway.

Downtown Waterfront, Log Pond, Shipping Terminal and Cornwall Beach Areas

Access to the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas would be provided by Central Avenue, Bay Street, Commercial Street, Cornwall Avenue and potentially Wharf Street[2] (see Wharf Street discussion on page 3.5-7). For the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas, Bloedel Avenue, Paper Avenue, and Oak Street would be constructed to provide improved on-site circulation. New bridges would be built for the Cornwall Avenue, Commercial Street, and potentially Wharf Street corridors. Bay Street would likely provide direct access to an on-site parking structure. The 2010 Updated Preferred Alternative continues to assume the relocation of the BNSF railroad corridor. Refer to **Table 2-2** for a comparison of roadway improvements under the 2010 Updated Preferred Alternative and the 2008 Preferred Alternative. The following provides a general description of the roadway infrastructure improvements that are different between the 2010 Updated Preferred Alternative and 2008 Preferred Alternative (refer to **Figure 3.5-1** for an illustration of the roadway improvements).

- **Bloedel Avenue (6) –** For the 2010 Updated Preferred Alternative this roadway would remain similar to the 2008 Preferred Alternative except that there would be a higher emphasis on access management with fewer direct access points to driveways. For stop controlled side streets and driveways, left-turn access would likely be restricted. In addition, less on-street parking would be allowed due to more conflicting modal movements (i.e., transit, pedestrian, and bicycle) along the corridor. The corridor segment between Log Pond Drive and Cornwall Avenue, which was not included under the 2008 Preferred Alternative, would be four lanes wide to accommodate dual left turn movements from Bloedel Avenue onto Cornwall Avenue.

- **Central Avenue/Roeder Avenue (7)** – Similar to the 2008 Preferred Alternative, with the 2010 Updated Preferred Alternative, this intersection would be signalized and Central Avenue between Holly Street and Roeder Avenue would be converted into a pedestrian corridor. The closure of Central Avenue (between Holly Street and Roeder Avenue) as a vehicular access would eliminate the safety and operational issues that would occur due to the offset intersections. The 2010 Updated Preferred Alternative would realign Central Avenue to the south of the existing Granary Building along Roeder Avenue requiring both intersections where Central Avenue meets Roeder Avenue to be signalized and coordinated.

- **Paper Avenue (10)** – The 2010 Updated Preferred Alternative would remove the segment of Paper Avenue between Commercial Street and Bay Street. In addition, the segment of Paper Avenue south of Commercial Street may follow a slightly different alignment than under the 2008 Preferred Alternative, but otherwise still provide a similar connection south to Oak Street; Paper Avenue is identified only as a connector between Log Pond Drive and Oak Street, with the exact alignment to be determined in the future by the Port and City in conjunction with WWU and private developer(s).

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[2] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks. The need for the Wharf Street bridge connection would depend on the achievement of the 30 percent alternative mode share.

- **Cornwall Avenue/Cornwall Bridge (11) –** The 2010 Updated Preferred Alternative would use the present alignment and reconstruct the Cornwall Bridge to provide three lanes (one southbound lane and two northbound lanes) by 2026. The third northbound lane would end at Maple Street as a right-turn only lane. The Cornwall Avenue/Chestnut Street intersection would be reconfigured to provide a northbound left-turn lane and shared through/right-turn lane.

- **Wharf Street (13) –** With the 2010 Updated Preferred Alternative, the existing Wharf Street at-grade railroad crossing would be closed with the relocation of the railroad. A Wharf Street bridge connection would potentially be constructed from the site to the State Street/Forest Street/Boulevard Street intersection to accommodate build out of the site[3].

- **Bay Street (16) –** The 2010 Updated Preferred Alternative would extend Bay Street from Chestnut Street into a parking structure on-site.

- **Log Pond Drive (17) –** For the 2010 Updated Preferred Alternative this roadway would extend from Bloedel Avenue southwest into the site. However, it would no longer continue to Oak Street to the south, but connects to a network of internal local streets serving as access to and from the adjoining development parcels.

In comparison to the 2008 Preferred Alternative, the 2010 Updated Preferred Alternative would improve access to Maple Street at Cornwall Avenue with the provision of a right-turn drop lane. In addition, access would be improved to the site by providing a parking structure at Bay Street instead of connecting this roadway to Bloedel Avenue.

Construction Impacts

Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative would be constructed over an extended period with full build-out assumed by 2026. As discussed in the 2008 DEIS and 2008 SDEIS, fill and other materials as well as equipment would be brought to the site via barge and/or truck with a majority likely via barges. As a conservative estimate, the analysis of construction impacts assumes construction traffic would use the street system and consist of trucks bringing and removing equipment and materials as well as construction employees coming to and from the site. Construction impacts under the 2010 Updated Preferred Alternative would be similar to those analyzed in the 2008 DEIS and 2008 SDEIS.

Operational Impacts

The operational impacts under the 2010 Updated Preferred Alternative are compared to the 2008 SDEIS Preferred Alternative for year 2026 conditions. The Marine Trades street system and access for both the 2008 Preferred Alternative and 2010 Updated Preferred Alternative are very similar and operational impacts would be the same. This evaluation focuses on the operations related to the redevelopment areas south of Whatcom Waterway where there are some differences between the 2008 Preferred Alternative and 2010 Updated Preferred Alternative. Both onsite and offsite operations are summarized relative to the transportation

[3] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks. The need for the Wharf Street bridge connection would depend on the achievement of the 30 percent alternative mode share.

system including the street system, non-motorized facilities, transit, and rail. Parking impacts are expected to be the same as documented in the 2008 SDEIS, and are not presented.

The operational impacts are evaluated using the methodologies described in the 2008 DEIS and 2008 SDEIS. In general, the 2010 Updated Preferred Alternative would result in similar or the same operations as the 2008 Preferred Alternative. Therefore, the evaluation presents only those aspects that would be different and provides an understanding of the transportation system performance under both the 2010 Updated Preferred Alternative and the 2008 Preferred Alternative.

Wharf Street Bridge Connection and Closure Evaluation

As part of the design process for relocation of the railroad, BNSF has indicated that the at-grade crossing at Wharf Street would be closed in conjunction with the relocation process by 2025. Closing the at-grade crossing would result in no vehicle, pedestrian, bicycle, or transit access via the Wharf Street corridor. Therefore, the 2010 Updated Preferred Alternative assumes possible construction of the Wharf Street bridge connection previously evaluated in the 2008 DEIS.

To gain an understanding of what the closure of Wharf Street means in terms of operational impacts, an evaluation of the 2010 Updated Preferred Alternative both with and without the Wharf Street bridge connection is provided. There would be no change in offsite impacts between the 2008 Preferred Alternative documented in the 2008 SDEIS and 2010 Updated Preferred Alternative with the Wharf Street bridge connection. However, the closure of Wharf Street without providing the bridge connection (or a Wharf Street connection) would re-route traffic to the Maple Street and Cornwall Avenue/Chestnut Street corridors. Therefore, operational impacts are presented for both the onsite and offsite conditions to provide an understanding of the impacts of closing Wharf Street and not constructing the bridge connection.

The closure of Wharf Street without construction of the bridge connection would result in insufficient capacity to accommodate full development under the 2010 Updated Preferred Alternative based on the mode share and vehicle demand assumed in both the 2008 DEIS and 2008 SDEIS. Therefore, a greater non-auto mode share would be necessary to eliminate the need for the Wharf Street bridge connection. Strategies to attain a greater non-auto mode share to reduce vehicle demand are further described in the mitigation strategies section of this report.

Street System

The 2010 Updated Preferred Alternative 2026 PM peak hour travel forecasts were used to evaluate intersection operations. Impacts to the street system are measured by determining intersection level-of-service (LOS). **Table 3.5-1** provides a comparison of the 2008 Preferred Alternative and the 2010 Updated Preferred Alternative onsite and offsite intersection operations for year 2026 for only those locations expected to change from the results presented in the SDEIS (refer to **Figure 3.5-1** for intersection locations). Detailed LOS worksheets for locations that would change with the 2010 Updated Preferred and a LOS summary for all study intersections and comparison to the 2008 DEIS and 2008 SDEIS alternatives are provided in **Appendix C**.

Table 3.5-1
2026 PM PEAK HOUR INTERSECTION OPERATIONS WITH AND WITHOUT WHARF STREET[1]

	Preferred Alternative			Updated Preferred Alternative – With Wharf St			Updated Preferred Alternative – Without Wharf St		
Study Intersections	**LOS[2]**	**Delay[3]**	**V/C[4] or WM[5]**	**LOS**	**Delay**	**V/C or WM**	**LOS**	**Delay**	**V/C or WM**
Onsite									
4. Roeder Avenue/Central Avenue[6]	C	21	0.95	E	68	1.02	E	68	1.02
5. West Chestnut St/Bay St/Roeder Ave	D	39	0.90	D	40	0.93	D	36	0.93
6. West Chestnut St/Commercial St	C	30	0.91	C	29	0.91	C	28	0.91
7. East Chestnut St/Cornwall Ave	E	80	1.13	E	78	1.13	F	85	1.19
9. Bloedel Ave/Bay St	C	29	0.68	-	-	-	-	-	-
10. Bloedel Ave/Commercial St	C	29	0.79	C	23	0.58	C	26	0.73
16. Bloedel Avenue/Log Pond Drive	C	32	0.84	C	18	NB	C	18	NB
19. Bloedel Ave/Cornwall Ave	-	-	-	C	32	0.70	D	41	0.98
Offsite									
10. East Holly Street/Cornwall Avenue	C	29	0.92	C	34	0.92	C	34	0.93
12. East Chestnut Street/North State Street	B	14	0.58	B	19	0.58	B	19	0.61
13. East Chestnut Street/North Forest Street	B	17	0.68	B	18	0.68	B	19	0.68
11. East Chestnut St/Railroad Ave	B	17	0.48	B	17	0.48	B	10	0.50
25. N Forest St/ N State St/Boulevard St/Wharf St[7]	E	58	N/A	E	58	N/A	A	9	N/A

Source: Transpo Group (September 2008 and October 2009)
Note: Study intersection numbers correspond with the map on Figure 3.5-1

1. Results are shown for those locations where intersection operations could change as a result of the 2010 Updated Preferred Alternative.
2. Level of service, based on 2000 *Highway Capacity Manual* methodology.
3. Average delay in seconds per vehicle.
4. Volume-to-capacity ratio reported for signalized intersections.
5. Worst movement for unsignalized intersections.
6. The 2010 Updated Preferred Alternative incorporates the effects of the pedestrian signal on this location to provide a worst case analysis of operations. When there are no pedestrian calls, the overall intersection operations would be better.
7. Assumes installation of a roundabout.

As shown in **Table 3.5-1**, all onsite locations would operate at LOS E or above for both the 2008 Preferred Alternative and the 2008 Updated Preferred Alternative with the Wharf Street bridge connection. The analysis of the Central Avenue/Roeder Avenue intersection accounts for the coordinated pedestrian and vehicle signal, which results in LOS E operations. This presents a worst case analysis of traffic operations at this location since it assumes a pedestrian call would occur during each signal cycle. The need for pedestrian crossings is not likely to occur each signal cycle, and without the influence of the pedestrian crossing time, the Central Avenue/Roeder Avenue intersection would operate at LOS C during the PM peak hour. The closure of Wharf Street would put additional pressure on the remaining site access locations including the Chestnut Street/Cornwall Avenue intersection which would degrade to LOS F. Maintaining an access location at Wharf Street allows for a broader distribution of the traffic among the access locations and improves circulation and access to the site, as compared to without the access.

For all scenarios, the overall onsite intersection LOS would operate at LOS E or better at all locations with the Wharf Street bridge connection and most locations without the bridge connection, however there would still be some congestion at the site access locations. This congestion would generally include vehicle queuing, waiting through multiple signal cycles, limited driveway egress/ingress, and poor general and emergency vehicle access. Contributing to the congestion at the access locations along Roader Avenue and Chestnut Street are the large number of vehicles travelling along those corridors under existing and No Action conditions (refer to the 2008 DEIS and 2008 SDEIS for existing and No Action deficiencies). Increasing the size of the roadways or intersections to improve operations would not align with the proposed character of the development and would require significant private property takes. Therefore, mitigation strategies to reduce the volume of auto traffic to and from the site are explored in the mitigation section to improve access and circulation to and on the site and to encourage alternative modes.

At offsite intersections, the 2010 Updated Preferred Alternative with the Wharf Street bridge connection would have similar operations during the PM peak hour in 2026 to the 2008 SDEIS Preferred Alternative.

The closure of Wharf Street would likely cause some increase in delay at the Chestnut Street/Cornwall Avenue and Bloedel Avenue/Cornwall Avenue intersections. This increase in intersection delay would be due to vehicles previously using Wharf Street re-routing to Chestnut Street, Cornwall Avenue, and Maple Street. In addition, the re-routing of vehicles with the Wharf Street closure would contribute to the already congested conditions along Chestnut Street. Intersection operations at the North Forest Street/North State Street/Boulevard Street intersection would improve because the Wharf Street leg would be eliminated from the roundabout reducing the vehicular conflicts at this location.

Non-Motorized

The non-motorized facilities for the 2010 Updated Preferred Alternative would be similar to that described in the 2008 SDEIS for the 2008 Preferred Alternative with some differences related to modifications of the on-street street network. Bloedel Avenue would be the primary vehicular corridor through the site; therefore, with the increase in traffic volumes, vehicle and pedestrian conflicts and safety issues would likely increase along Bloedel Avenue for the 2010 Updated Preferred Alternative. The connection at Bay Street would require pedestrians to go through the parking structure to access the site; making this access less direct than the 2008 Preferred Alternative in the 2008 SDEIS. However, the parking structure would provide elevators increasing the accessibility to and from the site for persons with disabilities. The relocation of the Central Avenue access to the south of the Granary Building would require both intersections where Central Avenue meets Roeder Avenue to be signalized and coordinated.. The increase in pedestrian activity with the new corridor and proposed redevelopment combined with the high traffic volumes along Roeder Avenue would result in additional vehicle-pedestrian conflicts and safety issues with this signalized crossing or other pedestrian enhancements. Therefore, with the 2010 Updated Preferred Alternative, traffic signals would be required at both intersections where Central Avenue meets Roeder Avenue and would need to be timed to operate as one coordinated signal system. This would allow both pedestrians and vehicular traffic to circulate safely.

The closure of Wharf Street without construction of the bridge connection would make accessing the site to and from the southeast more difficult as pedestrians and bicyclists would be required to use a more circuitous route with Maple Street as the primary non-motorized connection. The bridge connection would provide pedestrians and bicyclists from the southeast with a more direct route to and from the site. It would also eliminate the at-grade intersection with Wharf Street and Cornwall Avenue reducing conflicts between vehicular and non-motorized traffic. Bicycle access to and from the site would be enhanced with bicycle lanes along Cornwall Avenue and shared lanes (i.e., markings painted to indicate shared auto/bicycle use for the travel lane) along Maple Street with or without the bridge connection. These bicycle facilities would provide a direct connection between the site and downtown and Western Washington University.

Future development and the consequent increase in vehicular volumes are expected to proportionally increase observed conflicts with pedestrians and bicyclists that exist today. Similar to the 2008 Preferred Alternative, the 2010 Updated Preferred Alternative would enhance pedestrian and bicycle usage on and around the site as part of its overall development plan through provision of sidewalks, trails, and bicycle facilities. Therefore, overall non-motorized impacts are expected to be similar to those disclosed for the 2008 Preferred Alternative in the 2008 SDEIS.

Transit

Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative anticipates an extension of the existing and planned future transit service onsite via Hilton Avenue and F Street within the Marine Trades Area and Commercial Street, Bloedel Avenue and Cornwall Avenue within the other redevelopment areas south of the Whatcom Waterway. Ideally an existing transit route would be re-routed to circulate within the site, which would minimize the need for transfers. With the Wharf Street bridge connection, there would be better overall transit circulation options for existing routes to circulate into and out of the site. There would be a period when Wharf Street is closed and the bridge connection is not constructed, which would prevent existing routes on the State Street and Forest Street corridors from easily circulating into and out of the site. In addition, it may be difficult for transit to access the site with the 2010 Updated Preferred Alternative and the 2008 SDEIS Preferred Alternative due to congestion anticipated in and around the site access routes. Strategies to make transit a viable alternative to the automobile are discussed in the mitigation portion of this section.

Rail

The 2008 Preferred Alternative assumed the at-grade crossing with Wharf Street would remain. The 2010 Updated Preferred Alternative would eliminate all at-grade railroad crossings on-site with the relocation of the railroad and the construction of the Wharf Street bridge connection. The closure of the Wharf Street at-grade crossing under the 2010 Updated Preferred Alternative would create safer overall conditions for rail, vehicles, bicyclists, and pedestrians and would be an improvement over the 2008 Preferred Alternative analyzed in the 2008 SDEIS.

3.5.3 Conclusion

Similar to the 2008 SDEIS Preferred Alternative, all onsite intersections would operate at LOS E or better under the 2010 Updated Preferred Alternative with the Wharf Street bridge connection and would operate at LOS E or better at most locations without the bridge connection. At offsite intersections, the 2010 Updated Preferred Alternative with the Wharf Street bridge connection would have similar LOS operations to the 2008 Preferred Alternative analyzed in the SDEIS. Development without the Wharf Street bridge connection would likely cause some increase in delay at offsite intersections; however other intersections would improve because the Wharf Street access would be eliminated, thereby reducing vehicular conflicts in those areas.

Non-motorized facilities under the 2010 Updated Preferred Alternative would be similar to the 2008 SDEIS Preferred Alternative with some modifications to the onsite street network and overall non-motorized impacts would be similar to those discussed in the 2008 SDEIS.

Similar to the 2008 SDEIS Preferred Alternative, the 2010 Updated Preferred Alternative assumes the extension of the existing and planned future transit service onsite. With the Wharf Street bridge connection, there would be better overall transit circulation options for existing routes to circulate into and out of the site.

The 2010 Updated Preferred Alternative would eliminate all at-grade railroad crossings onsite with the relocation of the railroad and construction of the Wharf Street bridge connection. The closure of all at-grade crossings would create safer conditions and would be an improvement over the 2008 SDEIS Preferred Alternative.

3.5.4 Mitigation Measures

The 2008 DEIS and 2008 SDEIS provide an overview of the mitigation measures and strategies to address identified significant impacts. The 2008 SDEIS also included the required phasing for implementing the onsite and offsite infrastructure improvements. This section replaces the previous mitigation measures and phasing presented in the 2008 DEIS and 2008 SDEIS. Many of the previously identified mitigation measures have been included in the 2010 Updated Preferred Alternative or have been incorporated into City improvement project plans.

The operational and management mitigation strategies described in the 2008 DEIS for each transportation mode would continue to apply to the 2010 Updated Preferred Alternative (see Table 3.12-16 in the 2008 DEIS). They included strategies the City could implement to better accommodate anticipated growth throughout the downtown area with or without The Waterfront District Redevelopment. This section builds on the 2008 DEIS and 2008 SDEIS mitigation strategies by addressing specific strategies as they relate to the 2010 Updated Preferred Alternative.

Mitigation Measures

As with both the 2008 DEIS and 2008 SDEIS, mitigation measures are presented to reduce or eliminate impacts for both the onsite and offsite study area transportation system. A majority of the mitigation measures recommended in the 2008 DEIS and 2008 SDEIS have been included as part of the 2010 Updated Preferred Alternative. These mitigation measures include improvements along Cornwall Avenue, Maple Street, C Street at Roeder Avenue and Holly Street, and upgrades to traffic control at access locations. Therefore, few additional mitigation measures are warranted for the 2010 Updated Preferred Alternative. **Table 3.5-2** summarizes the off-site improvements and the level of development that could be accommodated with the improvements.

Holly Street Striping, Access, Channelization, and Parking Plan

The Holly Street corridor provides access to the Marine Trades area from downtown. The corridor currently provides one travel lane in each direction northeast of Bay Street turn lanes in places, and on-street parking. With additional development in the Marine Trades area and in Old Town, the existing channelization of the corridor should be revised to better accommodate greater turning movements in the future. The Port should work with the City to evaluate additional turn lanes at C Street and consider restricting certain turn movements along the corridor between F Street and Champion Street. The evaluation should consider the C Street and F Street corridors, along with Roeder Avenue to identify the best overall striping, access, parking and channelization plan for the area. In addition to channelization, consideration should be given to the corridor parking plan including potential impacts to on-street parking and alternate parking locations, if necessary.

Maple Street Upgrades

With the closure of Wharf Street and no bridge connection, Maple Street would need to play a more significant role as an access point to and from the site for both vehicular and non-motorized traffic. As described in the 2008 SDEIS, the Maple Street corridor would need to be upgraded with traffic control improvements at Cornwall Avenue, State Street, and Forest Street. In addition, enhanced pedestrian facilities and shared lanes would be provided for both bicycle and vehicular traffic. The 2010 Updated Preferred Alternative would provide a traffic signal at the Maple Street/Cornwall Avenue intersection with a northbound right-turn drop lane along Cornwall Avenue at Maple Street. These improvements would facilitate walking and biking between Western Washington University (WWU) as well as allow for vehicular traffic to and from the south and east to access the site without needing to circulate through downtown.

Cornwall Avenue/Chestnut Street Intersection Improvement

Similar to the 2008 DEIS and 2008 SDEIS, improvements are recommended at the Cornwall Avenue/Chestnut Street intersection to provide additional capacity with the 2010 Updated Preferred Alternative. The northbound approach would be re-striped to accommodate a dedicated left-turn lane and a shared through/right-turn lane. Along with these improvements, the signal would need to be upgraded to accommodate the northbound protected left-turn.

Non-Motorized Improvements

As described in the 2008 DEIS and 2008 SDEIS, several corridors will provide important pedestrian and bicycle links between the site and downtown or WWU. Facilities along these corridors would need to be improved to accommodate the increase in pedestrian and bicycle traffic. Improvements include the addition of bicycle lanes, wider shoulders, or shared lanes. The 2010 Updated Preferred Alternative would provide shared lanes along Maple Street to facilitate shared bicycle and vehicle use as well as enhance the pedestrian facilities along this corridor. In addition, Central Avenue would be a pedestrian corridor between Roeder Avenue and Holly Street. Traffic signals would be required at both intersections where Central Avenue meets Roeder Avenue and would need to be timed to operate as one coordinated signal system. This would allow both pedestrians and vehicular traffic to circulate safely.

Transit Strategy

The Port and City could work with WTA to develop a strategy to provide transit service to and from the site. This strategy would consider the feasible capital investment for an increased fleet and transit facilities, as well as the available operating funds for the transit system. The availability of funding could be balanced with the desire to achieve a greater non-auto mode share. Potential transit routes and frequency of service should be evaluated and identified. The strategy could take into consideration operations both with and without Wharf Street.

Biennial Traffic Monitoring Program

As discussed later in the mitigation strategies section, a greater non-auto mode share would help address circulation issues onsite and at the site access locations. The actual mode share achievement would be monitored through biennial surveys of both the Marine Trades area and the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. Data collection for the biennial monitoring program should be conducted during the PM peak hour and include the following components:

- **Traffic Counts**. Daily and peak hour traffic counts at all site access locations.
- **Vehicle Classification Counts**. Daily and peak hour vehicle classification counts at the site access locations including trucks, autos, and transit.
- **Pedestrian and Bicycle Counts**. Peak hour pedestrian and bicycle counts at each site access location.

The ability to achieve certain mode splits is influenced by the land uses within the site. Therefore, separate monitoring should be conducted for the Marine Trades area since it would contain industrial and marine uses, which typically have a higher auto use due to the nature of the land use. The data collected for each site would be used to confirm when improvements are required as shown in **Table 3.5-2** and make adjustments to the Waterfront Concurrency Service Area (CSA) to account for infrastructure improvements and mode splits. In addition, the data will assist in understanding whether mode share targets are being achieved. The ability to meet or exceed mode share targets may reduce the level of infrastructure improvements required to serve the site. Conversely, the inability to meet mode share targets may require a reduction in the overall level of development accommodated on-site or other improvements to increase capacity to accommodate development.

Designated Truck Routes

Construction traffic would have temporary offsite impacts due to the importing and exporting of materials and equipment to and from the site. Although barges would likely be used to transport a majority of the material and equipment, some trucks and employee vehicles would enter and exit the site via the local street system. Designated truck routes should be determined, and the routes should be used by all construction traffic to minimize impacts to the local street system. The designated routes would likely utilize Cornwall Avenue, Central Street, and Wharf Street for truck access to and from the site. Truck routes would need to change over time as access points are opened and closed with the construction of different phases of the project. In particular, the closure of Wharf Street would increase the construction traffic along the Cornwall Avenue corridor. Construction impacts would be temporary, occurring during the phased construction of the development.

Phasing of Infrastructure Improvements

As The Waterfront District site is developed, infrastructure improvements would be needed to accommodate the traffic generated by the project. **Table 3.5-2** provides a summary of the 2010 Updated Preferred Alternative transportation infrastructure phasing plan as well as the capacity of that system (defined by vehicle trips and anticipated density of development). The phasing examines the Marine Trades area separate from the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas.

As described in the 2008 SDEIS, the capacity of the roadway network is based on the total outbound PM peak hour vehicular capacity (i.e., existing on-site vehicle trips plus net new project-related vehicle trips). The outbound direction generates the highest demand during the PM peak hour for the assumed set of land uses. This capacity represents the maximum number of outbound weekday PM peak hour trips that could be accommodated with the assumed infrastructure improvements.

Table 3.5-2
2010 UPDATED PREFERRED ALTERNATIVE PHASING OF TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS AND ASSOCIATED DEVELOPMENT CAPACITY[1]

Project Sequence	Onsite Improvements	Offsite Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4]
		Marine Trades Area		
	Existing Street Network[5]		**400**	**0.6**
1	Reconstruct Hilton Avenue and C Street.	Signalize C Street intersections with Roeder Avenue and Holly Street and provide turn lanes along C Street. Signalize Hilton Avenue/Roeder Avenue intersection and provide turn lanes along Hilton Avenue.	700	1.1
2	Upgrade F Street and build Chestnut Street from Hilton Avenue to C Street. Provide left-turn lane along F Street at Roeder Avenue.		800	1.3
3		Upgrade Roeder Avenue between Hilton Avenue and C Street with additional drop/turn lanes at major intersections[6].	950	1.5
4		Improve Holly Street from F Street to Champion Street to provide turn lanes or restrict movements at intersections.	1,070	1.7

Table 3.5-2 Continued

Project Sequence	Onsite Improvements	Offsite Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4]
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas				
	Existing Street Network[5]		**975**	**1.7**
1		Signalize intersection at Central Avenue and Roeder Avenue.	1,025	1.8
2		Build Roundabout at Wharf/State /Boulevard intersection.	1,325	2.3
3	Demolish Cornwall Avenue Bridge[7]		650	1.1
4	Rebuild Cornwall Avenue Bridge with bike facilities and 3-lanes. Relocate BNSF Railroad and close at grade Wharf Street.		825	1.4
5	Build Bloedel Avenue from Commercial Street to Cornwall Avenue. Build the Commercial Street loop and Long Pond Drive.	Provide a northbound left-turn lane and shared through/right-turn lane, and upgrade traffic signal at Cornwall Avenue/Chestnut Street Signalize Maple Street/Cornwall Avenue and upgrade Maple Street with shared lanes and enhanced pedestrian facilities.	1,050	1.8
6	Build Bloedel Avenue from Central Avenue to Commercial Street		1,200	2.1
7	Construct Commercial Street Bridge and extend to Bloedel Avenue.		1,550	2.7
8	Build Oak Street / Paper Avenue to Log Pond Drive.		1,650	2.9
9	Build Bay Street Access	Signalize Bay Street/Chestnut Street	2,150	3.7
10	Build Wharf Street bridge connection		2,700	4.7
Total Development Capacity with No Bridge Connection			***3,220***	***5.4***
Total Development Capacity with Bridge Connection			***3,770***	***6.4***

Source: Transpo Group (October 2009)

1. The infrastructure phasing addresses the Marine Trades Area separate from the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The offsite improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips related to the distribution of land use proposed i.e., 1,240,000 square-feet of commercial, 375 residential units, and 460 slips for the Marine Trades area and 2,490,000 square-feet of commercial use and 1,517 residential units for the other redevelopment areas. This square-footage is related to the specific redevelopment area(s) noted, not the total Waterfront District site and assumes mode splits consistent with the City of Bellingham Comprehensive Plan goals
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Additional right-of-way needed for this improvement would be taken from the Waterfront (south) side of Roeder Avenue (i.e., the project site).
7. The removal of the Cornwall Avenue Bridge decreases the site infrastructure capacity.

As shown in **Table 3.5-2**, with construction of all of the proposed infrastructure, including the Wharf Street bridge connection, approximately 6.4 million square-feet of proposed development could be accommodated. The 2010 Updated Preferred Alternative is proposing up to 6.0 million square-feet; therefore, the proposed infrastructure would be sufficient to accommodate this development. Construction of the Wharf Street bridge connection would be needed to accommodate the density unless a greater mode shift to transit or walk/bike occurred, reducing the amount of vehicular traffic generated.

Mitigation Strategies

The operational and management strategies described in the 2008 DEIS and 2008 SDEIS for each transportation mode would also apply to the 2010 Updated Preferred Alternative (see Table 3.12-16 in the 2008 DEIS). The mitigation strategies described below build on the 2008 DEIS and 2008 SDEIS to reduce or eliminate impacts for both the onsite and offsite study area. Specifically more aggressive mode share targets have been identified that if achieved, would eliminate the need for the Wharf Street bridge connection. Transit facilities and services, which are also presented in the 2008 DEIS and 2008 SDEIS, have been re-emphasized to highlight their importance in achieving the aggressive mode share targets.

Increase Non-Auto Mode Share

A significant amount of transportation infrastructure improvements are included as part of the 2010 Updated Preferred Alternative. Even with these improvements, congestion will continue throughout the downtown area and at the site access locations. While the congestion will meet the City intersection level-of-service standards, it will affect how vehicles, pedestrians, bicyclists, and buses circulate through the site. The primary mitigation strategy to improve onsite circulation and access conditions is to have more aggressive mode share targets for non-auto modes. This mitigation strategy is intended to reduce congestion and the need for greater infrastructure improvements, including the Wharf Street bridge connection.

Possible Mode Share Targets

Additional analysis of congestion and mode share indicates that the overall Waterfront District Redevelopment would need to achieve an approximately 30 percent non-auto mode share, as compared to the City's Comprehensive Plan target mode share of 25 percent by 2022 that was assumed for the alternatives analyzed in the 2008 DEIS and 2008 SDEIS, to reduce congestion onsite and allow for better circulation. This would also allow the Port to develop the site to its proposed density without the construction of the Wharf Street bridge connection. Refer to **Appendix C** for an illustration of the mode share assumptions by land use. Please note that the illustration provided in **Appendix C** assumes a transit mode share of 10 to 15 percent, although it would be possible to achieve similar results with a higher walk/bike/other mode share; the main point is that a 30 percent non-auto share would be necessary to accommodate full buildout without the Wharf Street bridge connection.

Providing a transit mode share of 10 to 15 percent would require significant increases in transit service and facilities. This would require significant capital and operating investments to provide additional transit buses as well as support the operations. In addition, it could be challenging to provide sufficient transit service as well as integrate with existing service without the Wharf Street connection. Existing transit service in the vicinity of the site is primarily between Fairhaven and the downtown via Route 401 (the Red Line). The Red Line could be re-routed from Fairhaven to The Waterfront District and then downtown using Wharf Street. However, without Wharf Street re-routing the Red Line would likely not be feasible; therefore, an additional circulator route would be needed within The Waterfront District to and from downtown. The circulator route would require all passengers to transfer to access other destinations beyond the downtown.

For the 2010 Updated Preferred Alternative it is assumed that WWU would occupy approximately 400,000 square-feet of space within the redevelopment. As a conservative estimate, the analysis assumes WWU mode share is consistent with commercial and residential uses. WTA and WWU estimate 80 percent of the student trips will be made using a non-auto mode; therefore, the assumed traffic generation for WWU could be considered conservative and will help towards achieving the overall 30 percent non-auto goal. WTA's highest student transit demands occur during the morning (between 8:00 to 10:00 a.m.) and afternoon (1:00 to 2:00 p.m.) periods. During the evening peak periods, student transit demand is as much as 30 percent less than the morning and afternoon demands. Therefore, the conservative mode share assumptions for students recognizes that their transit demand is typically peaks outside of the PM peak period (i.e. the analysis time period).

Evaluation of Greater Non-Auto Mode Share

Implementation of strategies to achieve a 30 percent non-auto mode share would reduce the overall site trip generation by approximately 750 net new PM peak hour trips (refer to **Appendix C** for detailed trip generation estimates with the 30 percent non-auto mode split). **Table 3.5-3** shows the PM peak hour intersection operations with and without the 30 percent mode shift.

As shown in **Table 3.5-3**, shifting auto trips to non-auto modes would greatly improve intersection operations. On-site vehicle queues and congestion would also be reduced allowing for improved circulation within and to and from the site. The improvement in onsite circulation would allow for improved transit circulation and help make transit a viable option for travel.

The analysis of the 2010 Updated Preferred Alternative with the closure of Wharf Street shows that if a 30 percent non-auto mode split was achieved it would not be necessary to construct the Wharf Street bridge connection to accommodate vehicular traffic on-site associated with full buildout. Although operations along Bloedel Avenue would be slightly worse than with the bridge connection, vehicle queues would be manageable and transit would be able to adequately circulate through the site.

Table 3.5-3
2010 UPDATED PREFERRED ALTERNATIVE – 2026 ONSITE INTERSECTION OPERATIONS – WITH AND WITHOUT 30 PERCENT MODE SHIFT

Study Intersections[1]	LOS[2]	Delay[3]	V/C[4] or WM[5]	LOS[2]	Delay[3]	V/C[4] or WM[5]
	With Wharf St			With Wharf Street – Mode Shift		
4. Roeder Avenue/Central Avenue[6]	E	68	1.02	B	17	0.85
5. West Chestnut St/Bay St/Roeder Ave	D	44	0.93	C	34	0.80
6. West Chestnut St/Commercial St	C	29	0.91	C	25	0.79
7. East Chestnut St/Cornwall Ave	E	78	1.13	D	47	0.98
10. Bloedel Ave/Commercial St	C	23	0.58	C	20	0.55
16. Bloedel Avenue/Log Pond Drive	C	18	NB	C	15	NB
19. Bloedel Ave/Cornwall Ave	C	32	0.70	C	31	0.62
Study Intersections[1]	**LOS[2]**	**Delay[3]**	**V/C[4] or WM[5]**	**LOS[2]**	**Delay[3]**	**V/C[4] or WM[5]**
	Without Wharf St			Without Wharf Street – Mode Shift		
4. Roeder Avenue/Central Avenue[6]	E	68	1.02	B	13	0.85
5. West Chestnut St/Bay St/Roeder Ave	D	39	0.93	C	28	0.80
6. West Chestnut St/Commercial St	C	28	0.91	C	24	0.79
7. East Chestnut St/Cornwall Ave	F	85	1.19	D	44	0.98

Table 3.5-3 Continued

Study Intersections[1]	LOS[2]	Delay[3]	V/C[4] or WM[5]	LOS[2]	Delay[3]	V/C[4] or WM[5]
	Without Wharf St			Without Wharf Street – Mode Shift		
10. Bloedel Ave/Commercial St	C	26	0.73	C	23	0.69
16. Bloedel Avenue/Log Pond Drive	C	18	NB	C	15	NB
19. Bloedel Ave/Cornwall Ave	D	41	0.98	C	30	0.89

Source: Transpo Group (October 2009)
Note: Study intersection numbers correspond with the map on Figure 3.5-1

1. Results are shown for those locations where intersection operations would change as a result of the 2010 Updated Preferred Alternative.
2. Level of service, based on 2000 Highway Capacity Manual methodology.
3. Average delay in seconds per vehicle.
4. Volume-to-capacity ratio reported for signalized intersections.
5. Worst movement for unsignalized intersections
6. The 2010 Updated Preferred Alternative incorporates the effects of the pedestrian signal on this location to provide a worst case analysis of operations. When there are no pedestrian calls, the overall intersection operations would be better. .

Achieving a 30 percent non-auto mode share would result in the ability to accommodate more development on-site with each phase of transportation infrastructure improvements. **Table 3.5-4** expands on **Table 3.5-2** (Updated Preferred Alternative Phasing of Transportation Infrastructure Improvements and Associated Development Capacity) by providing the development capacity without and with a 30 percent non-auto mode shift. As shown in the **Table 3.5-4**, if a 30 percent non-auto mode split was achieved then the development could be accommodated without construction of the bridge connection. With the reduction in vehicle trip generation associated with the 30 percent non-auto mode split, approximately 6.5 million square-feet of development could be accommodated; the 2010 Updated Preferred Alternative assumes a maximum of six million square feet.

Based on the results of the biennial traffic monitoring, **Table 3.5-4** would be updated to show how much development could be accommodated with the mode splits measured.

Table 3.5-4
2010 UPDATED PREFERRED ALTERNATIVE PHASING OF TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS AND ASSOCIATED DEVELOPMENT CAPACITY WITH AND WITHOUT 30 PERCENT MODE SHIFT

Project Sequence	Onsite Improvements	Offsite Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4] Without Mode Shift	With Mode Shift
		Marine Trades Area			
	Existing Street Network[5]		**400**	**0.6**	**0.7**
1	Reconstruct Hilton Ave. and C St.	Signalize C .St. intersections with Roeder Ave and Holly St. and provide turn lanes along C St. Signalize Hilton Ave./Roeder Ave. intersection and provide turn lanes along Hilton Ave.	700	1.1	1.3
2	Upgrade F St. and build Chestnut St. from Hilton Ave. to C St. Provide left-turn lane along F St. at Roeder Ave.		800	1.3	1.5

Table 3.5-4 Continued

Project Sequence	Onsite Improvements	Offsite Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4]	
3		Upgrade Roeder Ave. between Hilton Ave. and C St. with additional drop/turn lanes at major intersections[6].	950	1.5	1.7
4		Improve Holly St. from F St. to Champion St. to provide turn lanes or restrict movements at intersections[7].	1,070	1.7	2.0
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas					
	Existing Street Network[5]		**975**	**1.7**	**2.0**
1		Signalize intersection at Central Ave. and Roeder Ave.	1,025	1.8	2.1
2		Build Roundabout at Wharf/State /Boulevard intersection.	1,325	2.3	2.7
3	Demolish Cornwall Ave. Bridge[8]		650	1.1	1.3
4	Rebuild Cornwall Ave. Bridge with bike facilities and 3-lanes. Relocate BNSF Railroad and close at grade Wharf St.		825	1.4	1.7
5	Build Bloedel Ave. from Commercial St. to Cornwall Ave. Build the Commercial St. loop and Long Pond Dr.	Provide a northbound left-turn lane and shared through/right-turn lane, and upgrade traffic signal at Cornwall Ave./Chestnut St. Signalize Maple St./Cornwall Ave.and upgrade Maple St. with shared lanes and enhanced pedestrian facilities.	1,050	1.8	2.2
6	Build Bloedel Ave. from Central Ave. to Commercial St.		1,200	2.1	2.5
7	Construct Commercial St. Bridge and extend to Bloedel Ave.		1,550	2.7	3.2
8	Build Oak St. / Paper Ave. to Long Pond Dr.		1,650	2.9	3.4
9	Build Bay St. Access	Signalize Bay St./Chestnut St.	2,150	3.7	4.5
Total Development Capacity with No Bridge Connection and 30 Percent Non-Auto Mode Splits			***3,220***		***6.5***

Source: Transpo Group (October 2009)

1. The infrastructure phasing addresses the Marine Trades Area separate from the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The offsite improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips related to the distribution of land use proposed i.e., 1,240,000 square-feet of commercial, 375 residential units, and 460 slips for the Marine Trades area and 2,490,000 square-feet of commercial use and 1,517 residential units for the other redevelopment areas. This square-footage is related to the specific redevelopment area(s) noted, not the total Waterfront District site and assumes a 30 percent non-auto mode split.
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Additional right-of-way needed for this improvement would be taken from the Waterfront (south) side of Roeder Avenue (i.e., the project site).
7. On-street parking would likely be removed to accommodate this improvement.
8. The removal of the Cornwall Avenue Bridge decreases the site infrastructure capacity.

Incorporate Transit Facilities and Services

A key element of shifting trips to non-auto modes is providing improved transit facilities and high-quality service. The Port and City will work with WTA in partnership with WWU to develop a transit strategy that is functional for all users. It will be important that the routes within the redevelopment area connect to the rest of the City and region to reduce the number of transfers and encourage greater transit use.

Circulation within the site, and to and from the site, would need to be accommodated. Ideally an existing transit route would be re-routed to circulate within the site minimizing the need for transfers. If an existing route was not re-routed and an exclusive Waterfront District route was needed, it might be difficult for WTA to allocate additional bus hours to provide the frequent service that would be needed. In addition, not re-routing an existing circulation route would require transit users to transfer in downtown to all other destinations. This short distance transfer could make transit less attractive as it might be easier to walk to the transit station. The Wharf Street bridge connection would allow for better overall transit circulation options; closing Wharf Street prevents existing routes on the State Street and Forest Street corridors from easily circulating into and out of the site.

Providing adequate capacity is also critical for shifting users to transit. A high transit demand may require bus only lanes and/or transit priority to achieve the headways required to accommodate the demand. For example, with the 30 percent non-auto mode split including a transit mode split of 15 percent (see illustration on page 17 of **Appendix C**), this is equivalent to an approximately ten minute headway for the peak direction. It is likely that the highest demand would only occur during the peak periods; therefore, a potential way to accommodate this demand is by providing bus only lanes using parking lanes with restrictions during the peak periods to accommodate the bus lane. Bus only lanes would require enforcement to ensure vehicles are not parked during the peak hour; therefore, the challenges of bus only lanes and other transit facilities will need to be fully vetted as a transit strategy is developed.

As described in the 2008 DEIS and 2008 SDEIS, transit amenities would be provided on-site including bus shelters, bus turnouts, layover areas, and transit kiosks. These amenities would make transit a more attractive mode.

3.5.5 Significant Unavoidable Adverse Impacts

As described in the 2008 DEIS and 2008 SDEIS, the 2010 Updated Preferred Alternative would accommodate additional amounts of future development within the site which would contribute to travel demands and congestion along the onsite and offsite street system. The additional development and associated improvements would also increase traffic access and circulation in the area. This added congestion would contribute to measurably poorer performance of the transportation network, in terms of increased delays along several of the corridors and at some specific intersections. The increase in traffic and higher volumes of pedestrian and bicycles would result in more conflict points and increased hazards to safety. With the implementation of the identified mitigation measures, significant unavoidable adverse impacts would be prevented or substantially lessened.

CHAPTER 4

Distribution List

CHAPTER 4
DISTRIBUTION LIST

Federal Agencies
United States Army Corps of Engineers
United States Environmental Protection Agency*
United States Fish & Wildlife Service
United States National Oceanic and Atmospheric Administration

State Agencies
Washington State Department of Archaeology & Historic Preservation
Washington State Department of Community, Trade and Economic Development*
Washington State Department of Ecology
Washington State Department of Fish and Wildlife
Washington State Department of Natural Resources
Washington State Department of Transportation

Tribes
Lummi Nation
Nooksack Tribe

Regional Agencies
Northwest Clean Air Agency
Puget Sound Partnership

Local Agencies, Commissions/Associations and Other Entities
Bellingham School District*
Cascade Natural Gas*
City of Bellingham
- Mayor
- City Council
- Planning Commission
- Staff
- Mayor's Neighborhood Advisory Commission
- CBD Neighborhood Association*
- Lettered Streets Neighborhood Association*
- Sehome Neighborhood Association*
- South Hill Neighborhood Association*

Port of Bellingham
- Port Commissioners
- SEPA Official
- Staff

Puget Sound Energy*
Waterfront Advisory Group
Western Washington University
Whatcom County Planning and Development Services
Whatcom Transit Authority

Public Libraries
City of Bellingham Library

All commentors on the DEIS and SDEIS received a notice of availability.

Received Notice of Availability

APPENDICES

Appendix A	Waterfront District Adaptive Re-Use Assessment
Appendix A1	Department of Archaeology and Historic Preservation Letter
Appendix A2	Johnson Architecture and Planning January 20, 2010 Letter
Appendix B	Historic Resources Table
Appendix C	Transportation Discipline Report

APPENDIX A

Waterfront District Adaptive Re-Use Assessment

Waterfront District Adaptive Reuse Assessment

Port of Bellingham & City of Bellingham
15 December 2009

Johnson Architecture + Planning LLC
KPFF Consulting Engineers
Lorig Associates, LLC

Table of Contents

Appendix

The role of the Consultants responsible for this document is to advise the Port of Bellingham as to the potential for adaptive re-use as part of the Waterfront District redevelopment of eleven industrial buildings formerly owned by the Georgia Pacific Corporation. The Consultant's role is advisory only, and the Consultant's advice is not considered an act for purposes of liability under the Consultants' agreement with the Port of Bellingham.

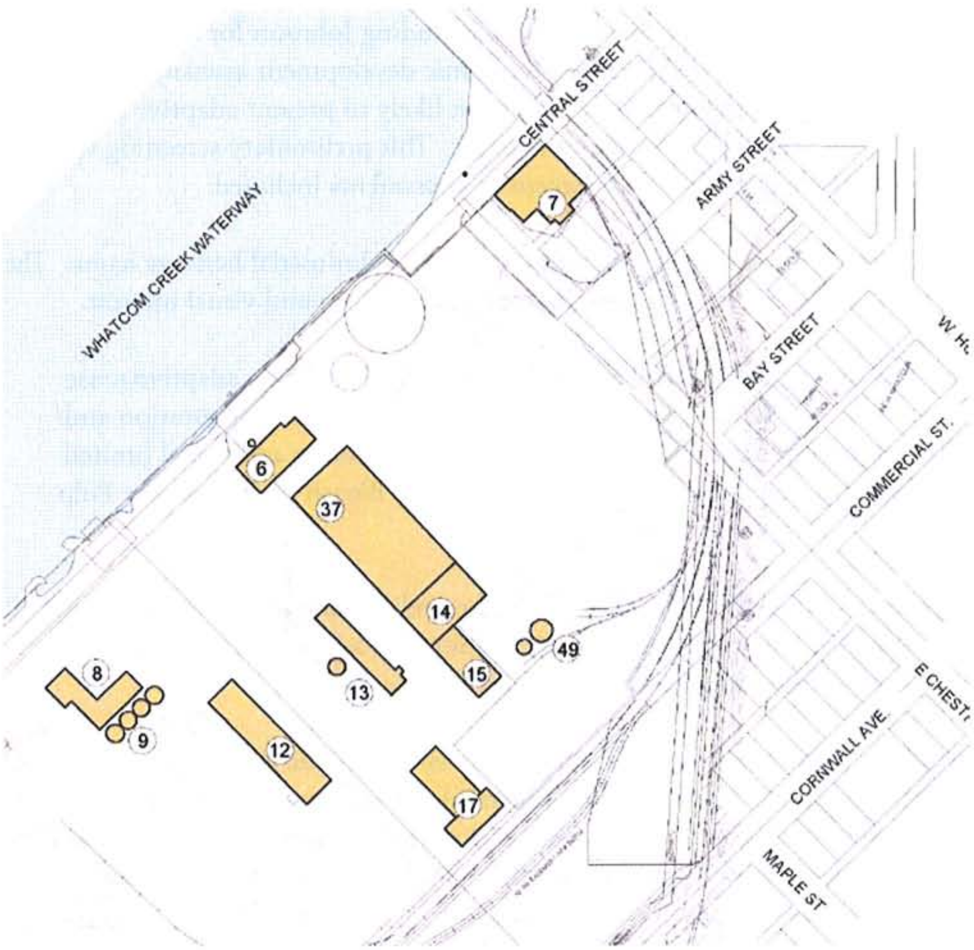
Johnson Architecture + Planning LLC
KPFF Consulting Engineers
Lorig Associates, LLC

15 December 2009

Executive Summary

The intent of this study was to assess the potential for preservation and adaptive reuse of eleven structures on the former Georgia-Pacific Pulp & Paper Mill property in Bellingham, WA. The assessment included consideration of historic resources, cost of construction, market feasibility and compatibility with other planning objectives for the Waterfront District. The analysis builds on previous work, including a building assessment performed for the Port of Bellingham in 2004 during pre-purchase due diligence and subsequent analysis of historic resources for environmental review of master planning proposals under the State Environmental Policy Act.

Executive Summary of Recommendations



Temporary Hold for Future Market Assessment
(demolish if not viable)
#6 Steam Plant
#7 Granary
#12 Board Mill
#17 Alcohol Plant- East

Temporary Hold for Icon Assessment
#9 Chip Bins
#13 Digester Tanks
#49 High Density Tanks

Demolish in Near Term
#6 Steam Plant Chimney
#8 Bark & Chip Plant
#14 Pulp Screen Room
#15 Bleach Plant
#17 Alcohol Plant- West
#37 Pulp Storage

Methodology
The assessment methodology employed a series of screens to evaluate the reuse potential for each building. The structures were reviewed in three consecutive phases. The first phase was intended to identify those structures that were physically and/or structurally unlikely to support reuse. Therefore, a preliminary screening and survey was conducted that eliminated structures that were unlikely to be viable adaptive reuse candidates due to fundamental flaws in building design and construction or because of a uniquely problematic condition. The second phase was a more detailed assessment of the structural, architectural and functional potential of the remaining structures. The third phase was an economic assessment of remaining structures for market-based uses, relative to estimated costs for adaptive reuse and within the context of planned uses, as outlined in the Proposed Planning Framework.

Phase 1: Preliminary Screening
A preliminary screening of all structures was conducted by the full team, including Johnson for architectural evaluation, KPFF for structural assessment and Lorig Associates for economic development assessment. The intent of this early screening was to identify those structures that were most likely to present adaptive reuse potential and those whose physical condition was unlikely to support reuse. This preliminary screening was done independently of any site development plan. Preliminary screening assessments included:

- Two structures were identified/or confirmed as having potential value as industrial heritage icons: The High Density Tanks and the Chip Bins, due to their identifiable building form and visual interest.

- Three structures were identified by this preliminary screening as having little or no adaptive reuse value for typical, market-driven uses, due to their poor structural condition, plan configuration and/or functional adaptability. Therefore, these structures did not warrant expending additional limited resources to analyze further. These structures were: Barking & Chipping, Bleach Plant, and the Pulp Screen Room.

- While not identified as a good candidate for adaptive reuse in the preliminary assessment phase, the Pulp Storage Building was identified as having potential for relocation and adaptive reuse as an open retail or display/event space, given its light, open structural system, height and size.

- Additionally, the Board Mill was identified in the preliminary assessment phase and by previous analysis by Western Washington University, as having reuse potential, for market-driven or institutional use. Its viability for reuse is due to its condition, regular structural system, building form and condition and, therefore, we concur with WWU's analysis that the structure should be temporarily retained for a market review or future institutional assessment.

- Four structures were identified during the preliminary screening as having potential viability for adaptive use, but required further, more detailed assessments. These structures were: The Old Granary, the Steam Plant, the Digester Building, and the Alcohol Building. These structures posed potentially manageable structural challenges, reasonable floor plate configuration and scale and, therefore, were subjected to further assessment. The Board Mill, because of the comprehensive previous reports, did not require further analysis as part of this study.

Phase 2: Detailed Assessments
Structural and architectural assessments for the Old Granary, the Steam Plant, the Digester Building and the Alcohol Building were completed. Structural assessments included original document review and investigation and observations of foundation, lateral and gravity systems based on current codes and practices. Architectural assessment included code review, building component assessment (e.g. masonry) and suitability for specific types of uses. "Test for fit" conceptual plans were prepared to evaluate building efficiency.

The potential impact of the preferred site development plan as described in the Proposed Planning Framework was considered during this detailed analysis phase.

The structural and architectural assessments were used to define assumptions for improvements to each building that would be required to meet current building codes, adaptive reuse objectives and commercially viable design features. These assumptions were used as the basis for cost and market analysis in Phase 3.

Phase 3: Economic Analysis
The four structures that were identified as potentially viable for adaptive reuse in the second phase work (Granary, Steam Plant, Digester, and Alcohol Building) were assessed for their economic viability based on current market income and cost projections and incorporating the most likely, market-based uses. Individual cost estimates were prepared based on the architectural and structural opinions developed in Phase 2.

The economic assessment concluded that, based on current Bellingham market economics, none of the four structures are likely to provide an adequate return on investment. The study recognized, however, that the current economic trends are unusually poor, and that, given the likely long term time frame of the Waterfront District redevelopment, the economic trends may change for the better. To assess the effect of possible improved economy, the study attempted a five-year "look-ahead" for several of these structures. The result of this five-year "look-ahead" assessment concluded that the restoration of these structures is not economically viable at that time. The potential for continued improvements in economic conditions has been reflected in our recommendations.
The eligibility of the individual structures for historic tax credits, or the collection of structures as a tax-credit eligible district was assessed as part of the economic analysis. It is our opinion that there are few individually eligible structures on the site, the Old Granary and possibly the Digester Building being exceptions.

We are also of the opinion that, with the removal of several of the structures that have been identified as not physically and/or structurally viable for adaptive reuse, there is likely not a sufficient coherent district to qualify for tax-credits.

Recommendations for Preserving the Historical Identity of the Waterfront District
Our recommendations for preserving the historical identity of the Georgia Pacific property, operations and structures within the context of the Waterfront District redevelopment are summarized below. These recommendations take into consideration the current state of the regional and national economy and the likely phased planning and construction of the future District: We recommend:

- Placing a temporary hold on the following structures until such time as Waterfront District development requires their removal or the market allows economically viable redevelopment.
  - #6 Steam Plant
  - #7 Old Granary
  - #12 Board Mill
  - #17 Alcohol Plant, East Portion

- Preserve iconic structures and equipment

- Establish an on-site public display of historical and industrial artifacts to honor the past uses, structures, industrial inventions, and the cultural and community importance of the site.

- Establish an on-site public display of the Georgia Pacific Mill files, records and drawings

- Salvage and re-use masonry, structural steel and metal components

- Recycle demolition debris into materials for new site structures and construction

Recommendations:
Our recommendations are provided on a structure-by-structure basis. This recognizes that there is not a viable coherent historic district that would necessitate retaining one or more structures of marginal or no viability to assure district status. These recommendations also recognize that none of the structures are expected to be financially viable for adaptive reuse for commercial, residential or light industrial uses in the current economic market or the projected five-year economic market.

	Building	Recommendations and Notes
	**6. Steam Plant**	**Temporarily hold for future market assessment.** **Demolish if not viable or if development requires.** Notes: Demolition of chimney recommended immediately due to public safety concerns. Georgia-Pacific owns structure Port of Bellingham owns land.
	**7. Old Granary**	**Temporarily hold for future market assessment.** **Demolish if not viable or if development requires.** **Seek proposals for redevelopment in near-term.** Notes: Recommend entire structure for redevelopment. Recommend Central Street be located on east side of building.
	**8. Barking & Chipping Plant**	**Demolish in near-term.** Notes: Significant industrial equipment should be preserved.
	**9. Chip Bins**	**Temporarily hold for future assessment.** **Demolish if not viable or if development requires.** Notes: Located within potential institutional use area.
	**12. Board Mill**	**Temporarily hold for future assessment.** **Demolish if not viable or if development requires.** Notes: Located within potential institutional use area.
	**13. Digester Building**	**Demolish structure in near term.** **Consider preservation of 1-3 digester tanks as historic icon park feature.** Notes: Conflicts with proposed planning framework.

	Building	Recommendations and Notes
	**14. Pulp Screen Room**	**Demolish in near-term.** Notes: Selected industrial equipment should be preserved for display.
	**15. Bleach Plant**	**Demolish in near-term.** Notes: Selected industrial equipment should be preserved for display.
	**17. Alcohol Plant**	**Temporarily hold eastern portion for future market assessment. Demolish if not viable or if development requires.** Notes: Western portion to be demolished in near-term
	**37. Pulp Storage**	**Demolish or relocate in near-term.** Notes: Potential reuse as a display or event pavilion in new location
	**49. High Density Tanks**	**Preserve as Icon: Develop preservation cost and feasibility plan in near term.** Notes: Proposed Planning Framework assumes preservation of tanks as historic theme within the Commercial Green.

1. Project Intent

The redevelopment planning for a new Waterfront District on the former Georgia-Pacific property raised the important question of whether the incorporation of the existing industrial structures on site was architecturally, structurally and economically viable. This study, The Waterfront District Adaptive Reuse Study, has been directed by the Port of Bellingham and the City of Bellingham to assess the eleven major structures remaining on the site for their potential adaptive reuse in light of the overall redevelopment effort.

The study team was directed to assess the structures independently of the current planning effort and separately assess the effect of the preferred site development framework plan and the working assumptions that have guided the planning process. The consulting team reviewed the existing reports and documents regarding the Waterfront District. A list of these documents is included in Appendix A. This assessment builds on the previous work, including the 2004 Georgia Pacific Due Diligence Existing Building Assessment and the 2008 Draft and Supplemental Draft Environmental Impact Statements.

The study team was also directed to assess the viability of the structures to accommodate marketable uses, using all available economic tools, including potential qualification for specific tax relief programs as individual landmark structures, as a coherent historic district and/or as a qualifying urban redevelopment.

The report that follows provides a summation of the structural, architectural and economic assessment methodologies, findings and recommendations.

2. Project Background

The Waterfront District property was originally developed as a pulp and paper mill in the early 1930's, by a local Bellingham businessman, Ossian Anderson. The Whatcom Waterway was filled incrementally and the Mill was planned as an extension of the central Bellingham business district, although separated by the existing bluff. The original pulp and paper processing structures were built from 1935 to 1938 and, unusually, the industrial equipment was enclosed by screening structures with masonry walls with glass block or steel sash window openings.

The Mill was purchased by the Georgia-Pacific Company in 1963 and was operated and expanded continuously until 2007, when inflated energy costs forced its closure of the remaining paper mill operations. Subsequent to the plant closure, the Port of Bellingham acquired the property from Georgia-Pacific in January 2005 and began the planning process for a new Waterfront District along the Whatcom Waterway.

In 2005 the Port and Georgia-Pacific performed coordinated operations to clear equipment and materials from the property, including demolition and removal of selected industrial structures and equipment. Based on earlier assessments, eleven structures that had apparent potential as historic structures, cultural icons or for adaptive reuse were protected from demolition. Those remaining eleven structures are the objects of this study.

3. Planning assumptions

In the spring of 2009, the Port and City reached an agreement on a substantial list of overall "Planning Framework Assumptions". These assumptions, summarized below are defined in Appendix A.

- Long term effort
- Engineering feasibility
- Waterfront Futures Group/Community engagement
- Community connections
- Street grid
- Complete streets
- View corridors
- LEED standards
- WWU accommodation
- Existing operations supported
- Existing structures assessment
- BNSF rail lines relocation
- Environmental remediation

These planning framework guidelines were used to test the viability of the existing structures in the context of the overall Waterfront District planning effort.

There were also several other issues of mutual agreement between the Port of Bellingham and the City of Bellingham. Most relevant to this study was the agreement to work constructively with Western Washington University on the design of a new campus on the waterfront, including the potential adaptive reuse of the Board Mill. However, the schedule for any WWU development is in question, due to current economic conditions, so any reuse of the Board Mill building by the University is uncertain.

The Draft Waterfront District Development Regulations were used as part of the architectural analysis of the reuse of the eleven structures. In particular, on-site parking requirements from the draft regulations were used in lieu of City of Bellingham current standards. (Appendix B.)

The parking counts in this report are estimates for use in the financial viability analysis of several selected structures. The consulting team recognizes that the draft regulations have not been adopted into the current land use code. It should be noted that any future development will need to readdress the parking requirements based on current regulations.

4. Methodology

Overview:
The eleven structures on the Georgia-Pacific property were designed to house widely different functions. While many of the structures are similar in architecture and construction materials and type, the structures were broadly different in physical condition.

The study methodology was organized in recognition of the diverse quality of the eleven structures. Three phases of investigation were defined.

First Phase: Preliminary Screening
The first phase was a preliminary screening of all the structures to characterize their condition and their general viability. This phase roughly categorized the structures into three groups:

- Those structures with little likely potential for economic reuse
- Those structures with unique, iconic or very evident potential
- Those structures that needed detailed investigation to determine their realistic viability.

Second Phase: Technical and Architectural Analysis
The second phase was a more detailed structural and architectural assessment of those structures that were identified in Phase 1 as needing further investigation. There were four structures so identified: #6 Steam Plant, #7 Granary, #13 Digester Building and #17 Alcohol Plant.

Third Phase: Economic Analysis
The third phase was an economic assessment of the structures investigated in Phase 2. The economic analysis was based on a market assessment of the Bellingham economy, the likely projected demand for alternative uses and the current economic and financial environment. Additionally, projections were made speculatively five years out.

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5. Phase 1: Preliminary Screening

Preliminary Screening
The preliminary screening of the eleven structures was conducted by the full consulting team. The screening process began with a thorough reading of the available documentation of the site's history, previous site assessments and the on-going planning process.

A search of the archived construction documents produced the original plans for most of the eleven structures and useful drawings for all of them, except the High Density Tanks. The construction drawings were especially valuable for assessing the structural design of the original foundation and piling systems. A sample selection of relevant original documents is presented in Appendix C.

The consulting team toured all eleven of the buildings on at least two occasions. The site inspections included a survey of existing conditions, evidence of deterioration, structural gravity, lateral and foundation systems where visible, industrial equipment installations, assessment of architectural possibilities, opportunities for the reintroduction of building mechanical and electrical systems and structural and architectural suitability for alternative uses.

Photo documentation of all the buildings was conducted with selected photos presented throughout this report. Files of all the photo documentation have been provided to the Port.

Opportunities for preservation of industrial equipment and/or architectural elements were also assessed and photographed. A list of many of the more interesting or important historical elements (in the opinion of the consulting team) is presented in Appendix D.

General Observations
The field inspections and review of original documents produced a number of general observations about the majority of the structures on site. These observations apply to the eight red brick structures on the site.

• Structure vs. Building as the best description:
The report consistently uses the word "structure" rather than "building" to describe the eight red brick-clad facilities. In general, the brick exterior of these structures was provided as weather-protection and visual screens for the enclosed industrial equipment. According to historic reports, the facades were built to give the impression of urban buildings when viewed from the city above. Thus their essential character is such that they are not typical industrial buildings with solid floor systems, vertical circulation, mechanical and electrical systems and/or regular window openings.

- Structural similarity:

The structures are constructed with very similar structural systems, structural steel gravity systems resting on wood pile foundations, with masonry infill. Exterior structural elements are typically encased in masonry and are not visible for inspection. In almost all cases, there is no specifically designed lateral-force resisting system. Also, from a review of documents, there is little or no upwards vertical force-resisting system attaching the structure to the foundation.

- Material similarity:

The structures are clad in a very uniform and unique "dual" brick masonry (i.e. each brick is two common bricks in height) that is no longer manufactured. The masonry appears to be consistently a reasonably hard-fired, cored brick unit installed in double wythes. No reinforcement or relieving angles at floors or horizontal members appear to be present. Mortar appears to be generally in good condition.

- Mechanical and electrical systems:

There are very limited mechanical and electrical systems installed in these buildings for the purposes of human comfort, temperature control or sanitation.

- Poor site soils:

The property is composed of loose, non-structural fill material on beach/intertidal deposits over bedrock. This soil is subject to liquefaction and lateral spreading during an earthquake event.

The Granary, the Chip Bins and the High Density Tanks are unique structures on the site and are distinct from the red brick structures. Many of the general observations do not specifically apply.

The Granary is the one facility that clearly meets the definition of "building." While it apparently has poor soils like the other structures, it has a competent foundation and most of the general observations do not apply.

The Chip Bins and the High Density Tanks are clearly not designed for human occupancy and thus meet the standard definition of "structure". Like the red brick structures they share poor soil conditions and have little or no attachments to their foundations to resist uplift forces. Other general observations do not apply.

Preliminary Assessments and Screening

The consulting team reviewed each of the eleven structures and evaluated them on the basis of five significant elements in each four categories: Waterfront District goals (but not the Planning Framework map), technical concerns, architectural/design concerns and economic concerns.

The specific review categories and concerns were:

Category 1. Waterfront District Development Goals Analysis:

- Supports overall Planning Framework goals
- Supports public uses/public access
- Historic preservation benefits/values
- Support potential Historic District
- Supports sustainability efforts

Category 2. Technical Analysis:

- Civil engineering: supports site development planning
- Structural: Gravity system assessment
- Structural: Lateral system assessment
- Structural: Foundation system assessment
- Building and Life/Safety Code Compliance

Category 3. Architectural/Adaptive-use Design Analysis:

- Reuse adaptability
- Structural adaptability
- Building systems adaptability
- Amenity: site location, views, etc
- Historic significance

Category 4. Economic Analysis:

- Viable uses
- Tax credit eligibility
- Total development costs
- Return on Equity (ROE) / created value
- Development risk assessment

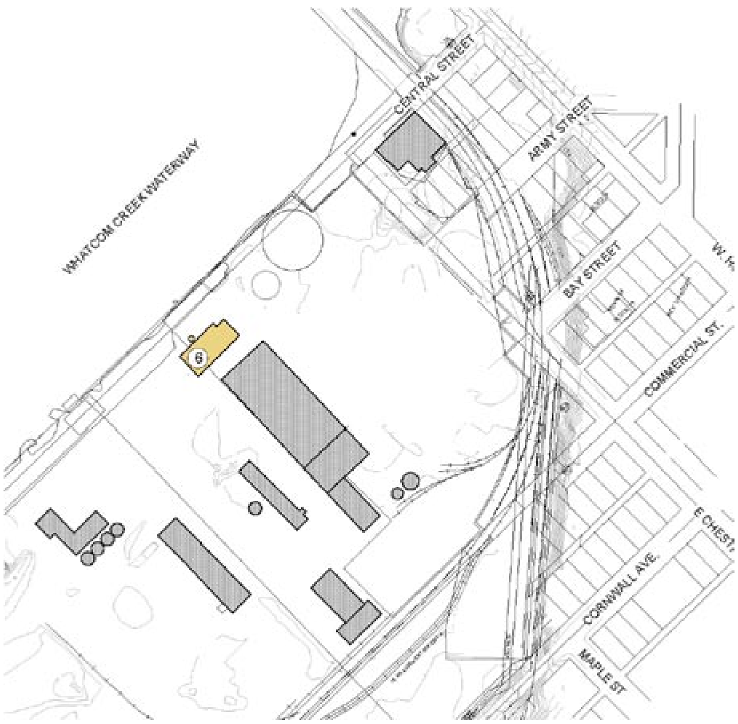
Preliminary Screening Scoring System
The scoring used a simple color code of green, yellow and red. The following pages present a preliminary analysis for each individual scoring category. Individual line items are not weighed equally and are not numerically averaged. This scoring method is simply a means to sift through the structures quickly to determine which ones require a closer review. The results of the overall preliminary assessment are presented in the next section, "Preliminary Screening Results."

• Green: The structure supports or meets - or can meet - this item without unusual effort beyond normal rehabilitation.

• Yellow: The structure can support or meet this item but only with significant effort to bring it into compliance.

• Red: The structure does not support or meet this item and it is unlikely that a reasonable effort would bring it into compliance.

#6 Steam Plant



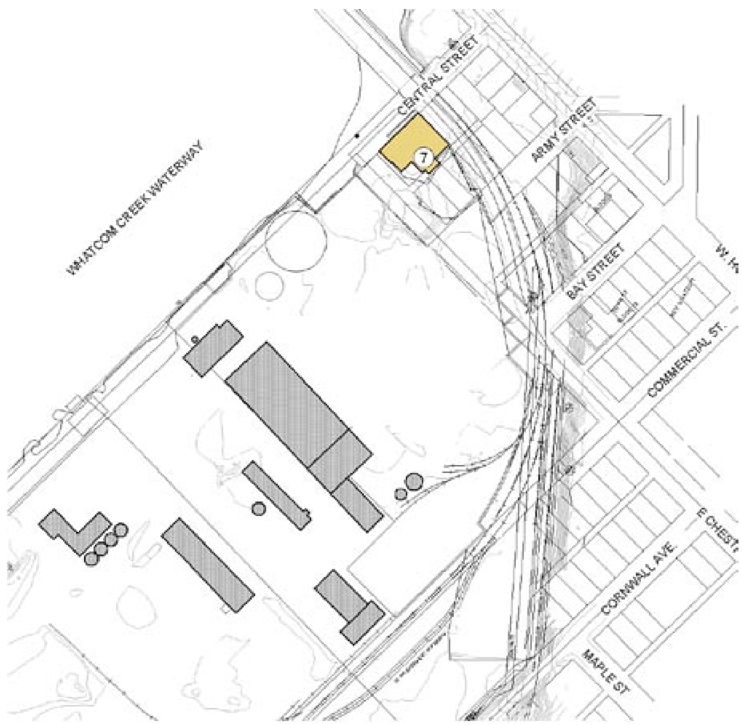
Prelim Building Assessment Screens

	Screens		6. Steam Plant
1. Development Goals	1 A	Supports Overall Goals	Yellow
	1 B	Public Use/Access	Yellow
	1 C	Historic Value	Yellow
	1 D	Supports Historic District	Green
	1 E	Sustainability Value	Yellow
2. Technical Analysis	2 A	Site Development	Green
	2 B	Gravity Systems	Yellow
	2 C	Lateral Systems	Yellow
	2 D	Foundation Systems	Yellow
	2 E	Code Compliance: Main Structure	Yellow
		Smoke Stack	Red
3. Design Analysis	3 A	Reuse Adaptability	Green
	3 B	Structural Adaptibility	Green
	3 C	Systems Adaptibility	Yellow
	3 D	Amenity	Yellow
	3 E	Historic Significance	Yellow
4. Economic Analysis	4 A	Viable Uses	Green
	4 B	Tax Credit Eligibility	Red
	4 C	Total Costs	Red
	4 D	ROE/Created Value	Red
	4 E	Risk Assessment	Red

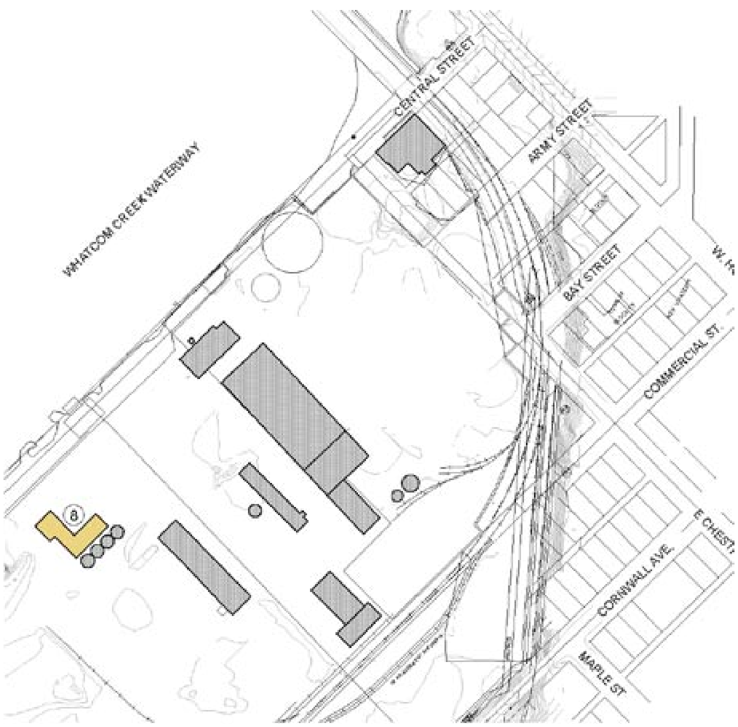
#7 Old Granary/Egg Co-op

Prelim Building Assessment Screens

		Screens	7. Old Granary
1. Development Goals	1 A	Supports Overall Goals	🟢
	1 B	Public Use/Access	🟢
	1 C	Historic Value	🟢
	1 D	Supports Historic District	🟡
	1 E	Sustainability Value	🟢
2. Technical Analysis	2 A	Site Development	🟢
	2 B	Gravity Systems	🟢
	2 C	Lateral Systems	🟡
	2 D	Foundation Systems	🟢
	2 E	Code Compliance	🟢
3. Design Analysis	3 A	Reuse Adaptability	🟢
	3 B	Structural Adaptibility	🟢
	3 C	Systems Adaptibility	🟡
	3 D	Amenity	🟢
	3 E	Historic Significance	🟢
4. Economic Analysis	4 A	Viable Uses	🟢
	4 B	Tax Credit Eligibility	🟡
	4 C	Total Costs	🔴
	4 D	ROE/Created Value	🟡
	4 E	Risk Assessment	🟡



#8 Barking & Chipping



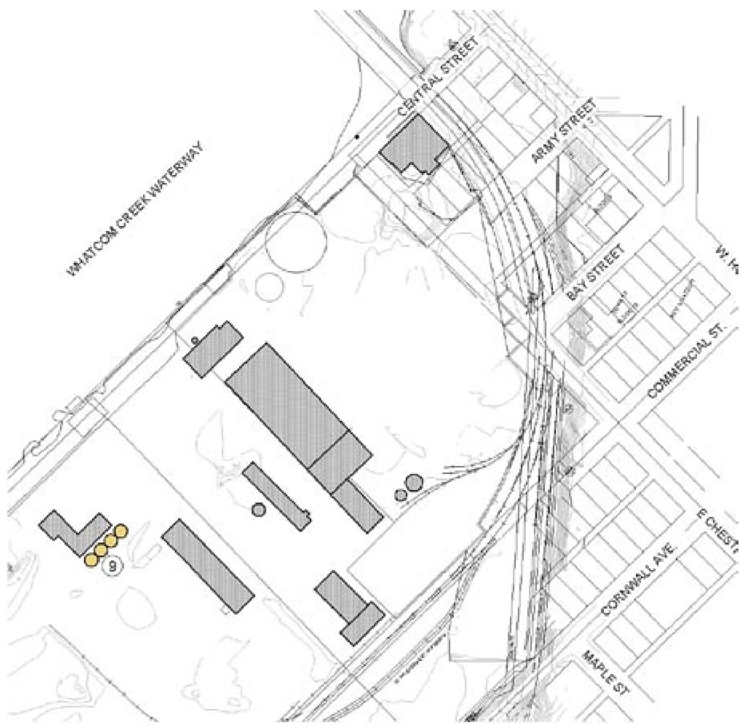
Prelim Building Assessment Screens

		Screens	8. B & C Plant
1. Development Goals	1 A	Supports Overall Goals	Yellow
	1 B	Public Use/Access	Green
	1 C	Historic Value	Green
	1 D	Supports Historic District	Yellow
	1 E	Sustainability Value	Yellow
2. Technical Analysis	2 A	Site Development	Red
	2 B	Gravity Systems	Yellow
	2 C	Lateral Systems	Red
	2 D	Foundation Systems	Red
	2 E	Code Compliance	Red
3. Design Analysis	3 A	Reuse Adaptability	Red
	3 B	Structural Adaptibility	Red
	3 C	Systems Adaptibility	Yellow
	3 D	Amenity	Yellow
	3 E	Historic Significance (equipment only)	Green
4. Economic Analysis	4 A	Viable Uses	Red
	4 B	Tax Credit Eligibility	Red
	4 C	Total Costs	Red
	4 D	ROE/Created Value	Red
	4 E	Risk Assessment	Red

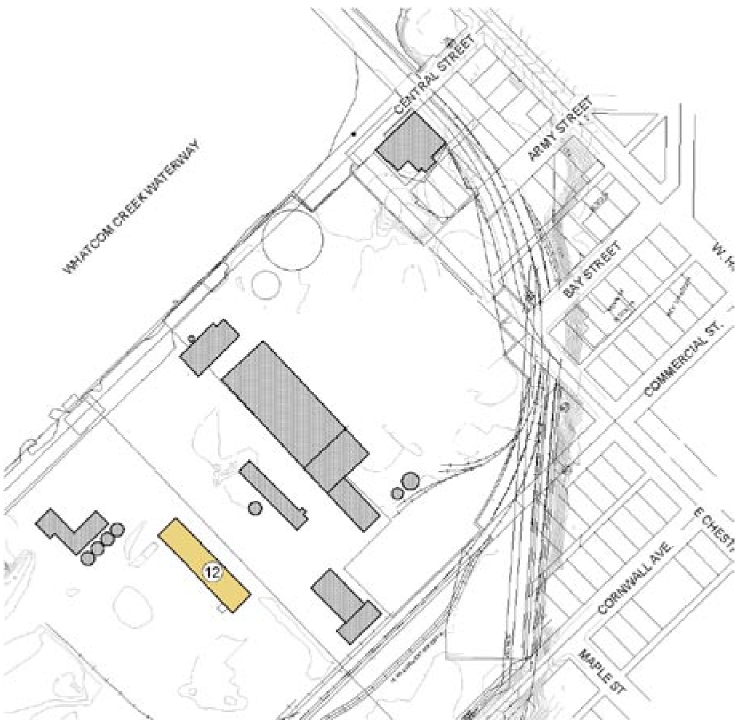
#9 Chip Bins

Prelim Building Assessment Screens

		Screens	9. Chip Bins
1. Development Goals	**1 A**	Supports Overall Goals	🟢
	1 B	Public Use/Access	🔴
	1 C	Historic Value	🟡
	1 D	Supports Historic District	🟢
	1 E	Sustainability Value	🟡
2. Technical Analysis	**2 A**	Site Development	🟢
	2 B	Gravity Systems	🟢
	2 C	Lateral Systems	🟡
	2 D	Foundation Systems	🔴
	2 E	Code Compliance	🟡
3. Design Analysis	**3 A**	Reuse Adaptability	🟡
	3 B	Structural Adaptibility	🟡
	3 C	Systems Adaptibility	🔴
	3 D	Amenity	🔴
	3 E	Historic Significance	🟡
4. Economic Analysis	4 A	Viable Uses	🟡
	4 B	Tax Credit Eligibility	🔴
	4 C	Total Costs	🔴
	4 D	ROE/Created Value	🔴
	4 E	Risk Assessment	🔴



#12 Board Mill



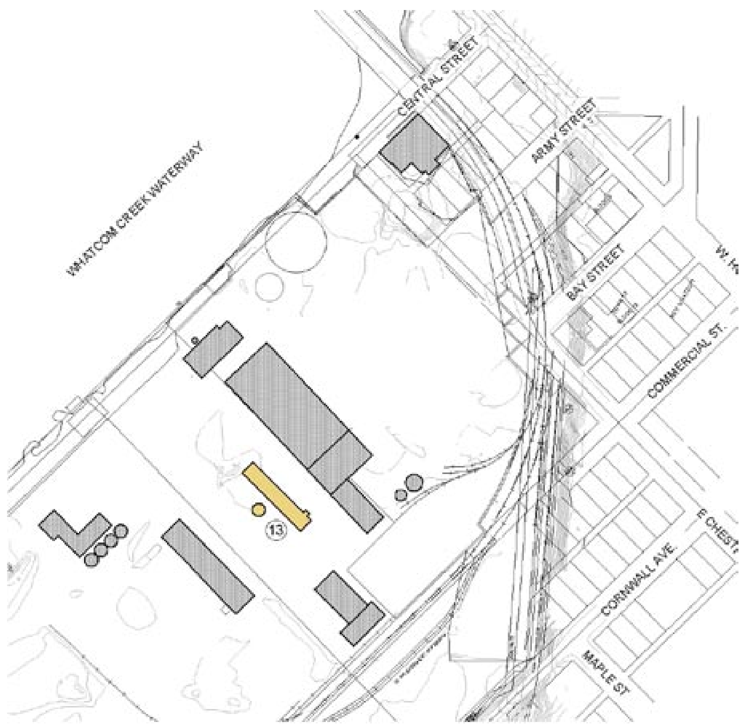
Prelim Building Assessment Screens

		Screens	12. Board Mill
1. Development Goals	**1 A**	Supports Overall Goals	
	1 B	Public Use/Access	
	1 C	Historic Value	
	1 D	Supports Historic District	
	1 E	Sustainability Value	
2. Technical Analysis	**2 A**	Site Development	
	2 B	Gravity Systems	
	2 C	Lateral Systems	
	2 D	Foundation Systems	
	2 E	Code Compliance	
3. Design Analysis	**3 A**	Reuse Adaptability	
	3 B	Structural Adaptibility	
	3 C	Systems Adaptibility	
	3 D	Amenity	
	3 E	Historic Significance	
4. Economic Analysis	4 A	Viable Uses	
	4 B	Tax Credit Eligibility	
	4 C	Total Costs	
	4 D	ROE/Created Value	
	4 E	Risk Assessment	

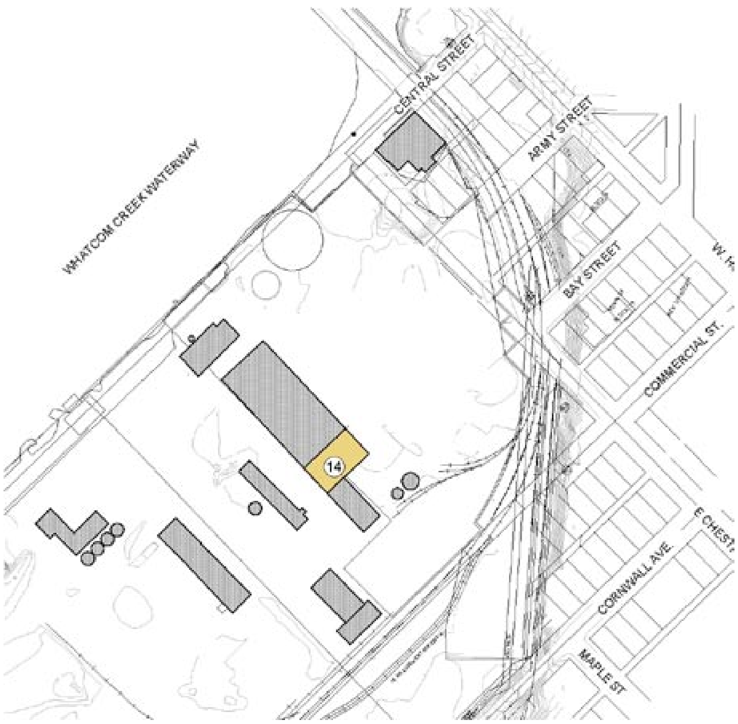
#13 Digester Building

Prelim Building Assessment Screens

		Screens	13. Digester Bldg
1. Development Goals	**1 A**	Supports Overall Goals	
	1 B	Public Use/Access	
	1 C	Historic Value	
	1 D	Supports Historic District	
	1 E	Sustainability Value	
2. Technical Analysis	**2 A**	Site Development	
	2 B	Gravity Systems	
	2 C	Lateral Systems	
	2 D	Foundation Systems	
	2 E	Code Compliance	
3. Design Analysis	**3 A**	Reuse Adaptability	
	3 B	Structural Adaptibility	
	3 C	Systems Adaptibility	
	3 D	Amenity	
	3 E	Historic Significance	
4. Economic Analysis	4 A	Viable Uses	
	4 B	Tax Credit Eligibility	
	4 C	Total Costs	
	4 D	ROE/Created Value	
	4 E	Risk Assessment	



#14 Pulp Screen Room



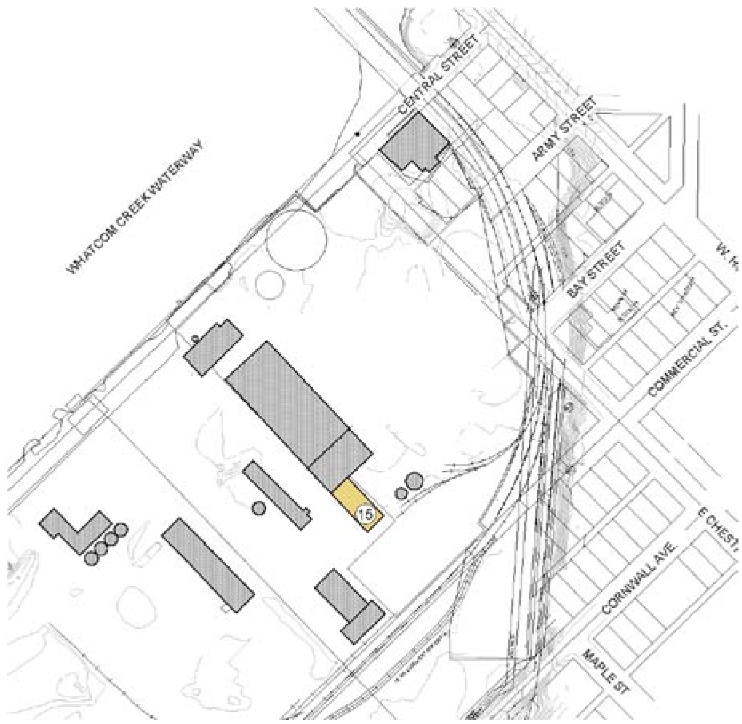
Prelim Building Assessment Screens

		Screens	14. Pulp Screen Rm
1. Development Goals	1 A	Supports Overall Goals	Red
	1 B	Public Use/Access	Red
	1 C	Historic Value	Red
	1 D	Supports Historic District	Green
	1 E	Sustainability Value	Yellow
2. Technical Analysis	2 A	Site Development	Red
	2 B	Gravity Systems	Green
	2 C	Lateral Systems	Yellow
	2 D	Foundation Systems	Yellow
	2 E	Code Compliance	Yellow
3. Design Analysis	3 A	Reuse Adaptability	Red
	3 B	Structural Adaptibility	Red
	3 C	Systems Adaptibility	Red
	3 D	Amenity	Red
	3 E	Historic Significance	Red
4. Economic Analysis	4 A	Viable Uses	Red
	4 B	Tax Credit Eligibility	Red
	4 C	Total Costs	Red
	4 D	ROE/Created Value	Red
	4 E	Risk Assessment	Red

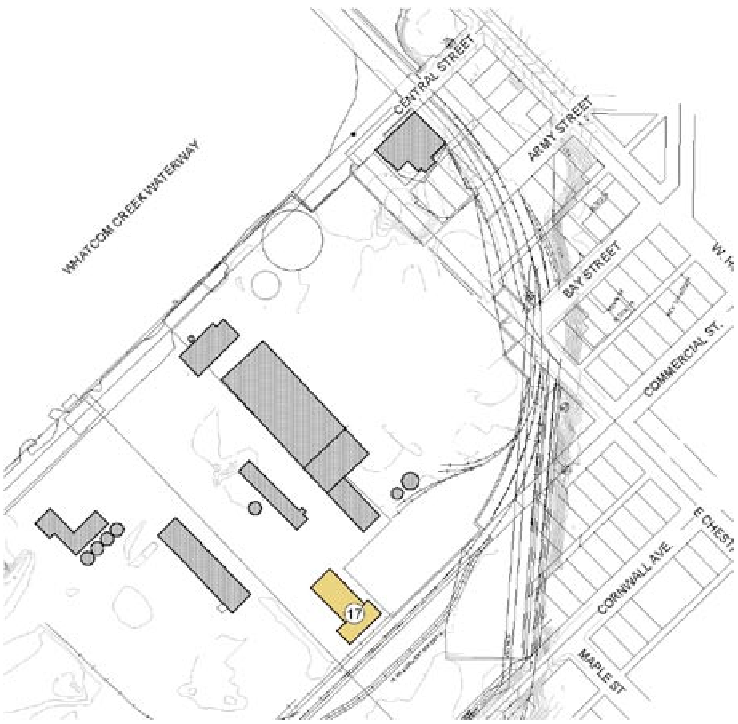
#15 Bleach Plant

Prelim Building Assessment Screens

		Screens	15. Bleach Plant
1. Development Goals	**1 A**	Supports Overall Goals	🔴
	1 B	Public Use/Access	🔴
	1 C	Historic Value	🟡
	1 D	Supports Historic District	🟢
	1 E	Sustainability Value	🔴
2. Technical Analysis	**2 A**	Site Development	🔴
	2 B	Gravity Systems	🟢
	2 C	Lateral Systems	🔴
	2 D	Foundation Systems	🟡
	2 E	Code Compliance	🟡
3. Design Analysis	**3 A**	Reuse Adaptability	🔴
	3 B	Structural Adaptibility	🔴
	3 C	Systems Adaptibility	🔴
	3 D	Amenity	🔴
	3 E	Historic Significance	🟡
4. Economic Analysis	4 A	Viable Uses	🔴
	4 B	Tax Credit Eligibility	🔴
	4 C	Total Costs	🔴
	4 D	ROE/Created Value	🔴
	4 E	Risk Assessment	🔴



#17 Alcohol Plant



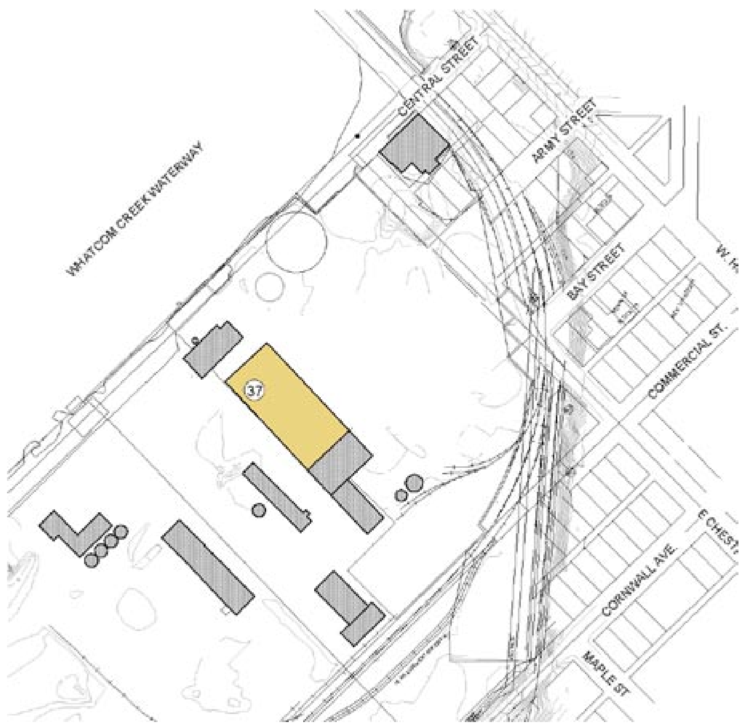
Prelim Building Assessment Screens

		Screens	17. Alcohol Plant
1. Development Goals	1 A	Supports Overall Goals	
	1 B	Public Use/Access	
	1 C	Historic Value	
	1 D	Supports Historic District	
	1 E	Sustainability Value	
2. Technical Analysis	2 A	Site Development	
	2 B	Gravity Systems	
	2 C	Lateral Systems	
	2 D	Foundation Systems	
	2 E	Code Compliance	
3. Design Analysis	3 A	Reuse Adaptability	
	3 B	Structural Adaptibility	
	3 C	Systems Adaptibility	
	3 D	Amenity	
	3 E	Historic Significance	
4. Economic Analysis	4 A	Viable Uses	
	4 B	Tax Credit Eligibility	
	4 C	Total Costs	
	4 D	ROE/Created Value	
	4 E	Risk Assessment	

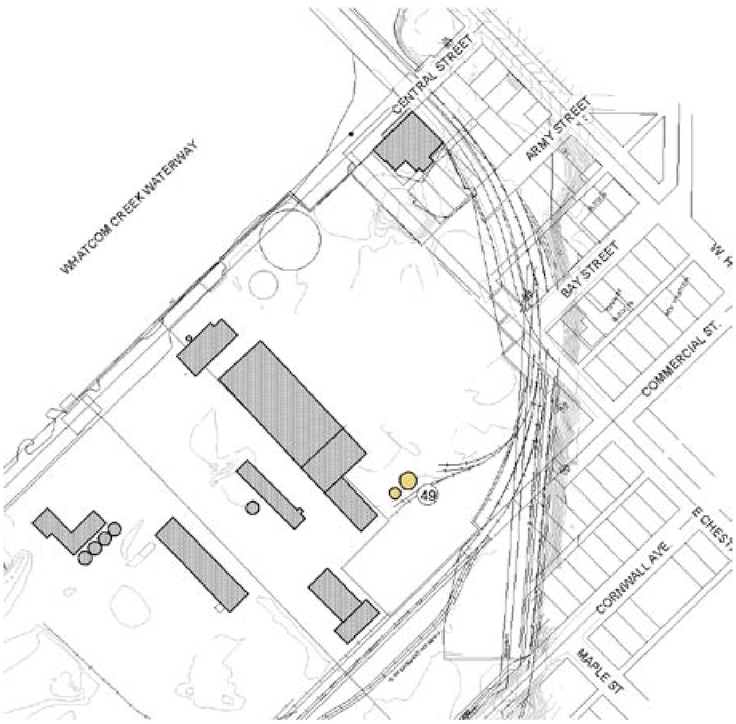
#37 Pulp Storage

Prelim Building Assessment Screens

	Screens	37. Pulp Storage
1. Development Goals	**1 A** Supports Overall Goals	🟢
	1 B Public Use/Access	🟢
	1 C Historic Value	🟡
	1 D Supports Historic District	🟡
	1 E Sustainability Value	🟢
2. Technical Analysis	**2 A** Site Development	🟡
	2 B Gravity Systems	🟢
	2 C Lateral Systems	🟡
	2 D Foundation Systems	🟢
	2 E Code Compliance	🟢
3. Design Analysis	**3 A** Reuse Adaptability	🟢
	3 B Structural Adaptibility	🟢
	3 C Systems Adaptibility	🟢
	3 D Amenity	🟡
	3 E Historic Significance	🟡
4. Economic Analysis	4 A Viable Uses	🟢
	4 B Tax Credit Eligibility	🔴
	4 C Total Costs	🔴
	4 D ROE/Created Value	🔴
	4 E Risk Assessment	🔴



#49 High Density Tanks



Prelim Building Assessment Screens

		Screens	49. HD Tanks
1. Development Goals	1 A	Supports Overall Goals	Green
	1 B	Public Use/Access	Green
	1 C	Historic Value	Green
	1 D	Supports Historic District	Green
	1 E	Sustainability Value	Yellow
2. Technical Analysis	2 A	Site Development	Yellow
	2 B	Gravity Systems	Yellow
	2 C	Lateral Systems	Yellow
	2 D	Foundation Systems	Yellow
	2 E	Code Compliance	Yellow
3. Design Analysis	3 A	Reuse Adaptability	Red
	3 B	Structural Adaptibility	Yellow
	3 C	Systems Adaptibility	Red
	3 D	Amenity	Green
	3 E	Historic Significance	Green
4. Economic Analysis	4 A	Viable Uses	Red
	4 B	Tax Credit Eligibility	Red
	4 C	Total Costs	Red
	4 D	ROE/Created Value	Red
	4 E	Risk Assessment	Red

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Preliminary Screening Results

Structures Assessed as Not Viable for Adaptive Reuse
A primary purpose of the screening process was to identify those structures that had “fatal flaws” and had a very low potential for adaptive reuse. Three structures were identified by the consulting team as having very low or no viability for adaptation for any reasonable, market-based uses or functions. These structures were:

- #8 Barking & Chipping Plant: Although this structure had been identified in early reports as having reuse potential and/or landmark value, our assessment is that, due to the exceptional difficulty of removing the industrial equipment, the unusual and small building floor plate, and the limited structural capabilities of the structure that the adaptive reuse for market-based uses would be very difficult.

- #14 Pulp Screen Room: This structure, situated in between two other structures was determined to have little viable reuse potential due to the condition of the ground floor, including the presence of numerous large concrete vaults, the exceptionally dense structural system and the damage from industrial processes to the exterior.

- #15 Bleach Plant: Like the Screen Room, the Bleach Plant has a very encumbered ground floor and substantial exterior damage. Additionally, the floor systems are highly use-specific and the upper volume, while dramatic, is structurally vulnerable. Adaptive reuse would very likely be excessively costly.

Structures with Unique Character or Previously Analyzed
Several structures were identified requiring no further detailed analysis because of previous reuse assessments and/or their unique character. These structures were:

- #7 Chip Bins: These structures have a moderate iconic presence on the site, and were deemed to be relatively structurally competent. While too unique in their configuration to support an independent use, they may have viability as part of a larger complex. The structures had been previously assessed in a study by Western Washington University.

- #12 Board Mill. This structure had been previously assessed in a study by Western Washington University, and found potentially viable for adaptive reuse. Our field survey supported this opinion.

• #37 Pulp Storage: This structure, largely an empty steel-framed shell, was assessed as having a viable structural system for the accommodation of open retail and/or events. Site redevelopment and grading changes, however, may compromise the structure in its present location.

• #49 High Density Tanks: These unusual and highly visible tanks have been assessed previously as having iconic status on the site. Our assessment supports the previous opinions.

Selected Structures for Further Assessment
Four structures were deemed as needing further assessment in order to justifiably assess their adaptive reuse potential. These structures were:

• #6 Steam Plant:
This structure offers a floor-plate that has typically viable dimensions, two reasonably intact facades and reasonable floor to ceiling heights. There is also significant interior equipment that would require demolition and/or unique accommodation as part of a redevelopment plan. It also is located in a desirable place on the property.

• #7 Old Granary/Egg Co-op:
The Granary, located along an existing street, has a reasonably viable structural system, an accessible location, an interesting building form and useable floor-plate dimensions. It is also likely eligible for historic status.

• #13 Digester Building:
The tallest structure on the site, the Digester Building also contains some of the largest and most impressive industrial equipment. The structure height and floor-plate dimensions offer architectural opportunities. Demolition without significant damage or accommodation of the digester tanks is a concern.

• #17 Alcohol Plant:
The Alcohol Plant, from an adaptive reuse standpoint is two different structures. The open tank room to the west has structural concerns and limited use options. The eastern portion has reasonable floor-plate dimensions and intact facades with regular openings. The structure has unique lateral and foundation system concerns. It is a relatively small building.

Building-by-Building Screening Summaries
The preliminary assessment for the eleven subject structures is presented on the following pages. Bullet point comments summarize the primary concerns of each consulting team member.

#6 Steam Plant

Potential Uses: Mixed-use residential, office

Major Issues:

Structural-
Equipment removal damages floor system
Chimney should be removed now
Incomplete floor systems
Lateral system non-existent

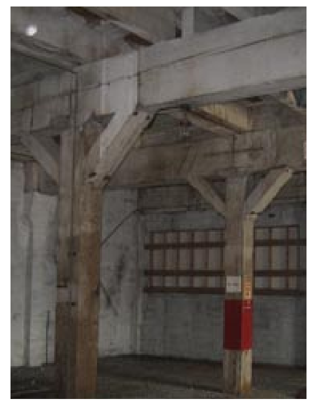
Architectural-
Good building form, width and depth
Reasonable structural grid for reuse options
Good exterior openings

Economic/Development
Good waterfront location
Potential for mixed-use commercial/residential

Building Size:

Existing footprint GSF=	+/- 12,500
Overall dimensions=	75'x160'-8" (column grid)

#7 Old Granary/Egg Co-op



Potential Uses: Restaurant, retail, pub, public meeting place, office

Major Issues:

Structural-
Robust structural system below street
Partial renovation requires structural assistance
Preservation of wood structure needs assessment
Structural system appropriate for redevelopment

Architectural-
Interesting building configuration, iconic form
Good floor heights, width and depth
Reasonable structural grid for reuse options
Interesting interior spaces and exterior openings

Economic/Development
Strong identity
Requires less infrastructure
Historic tax credit adds value
Potential for mixed-use commerical

Building Size:

Existing footprint GSF=	+/- 13,750
Overall dimensions=	100’ x 125’ (column grid)

#8 Barking & Chipping Plant

Potential Uses: N/A

Major Issues:

Structural-
High level plan irregularity
Many discontinuous diaphragms
Removal of equipment will damage structure

Architectural-
Difficult building form for building uses
Minimal interior structure, no useful floor systems
Reasonable exterior openings
Specialized use potential only (e.g. museum)

Economic/Development
May have value as specialized use
Removed from core "neighborhood"

Building Size:

Existing footprint GSF=	+/- 11,203
Overall dimensions=	127' x 49'
	59'-6" x 59'-6"
	40' x 36'

#9 Chip Bins

Potential Uses: Icon

Major Issues:

Structural-
E-W lateral deficiency
Will likely need foundation improvement if preserve

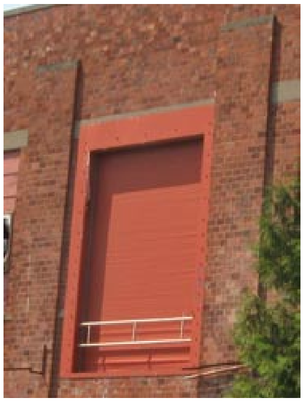
Architectural-
Iconic building shape
Difficult building form for typical uses
Minimum interior structure, no useful floor systems

Economic/Development
No viable use identified
Site icon value
May be viable as part of future project

Building Size:

Existing footprint GSF=	+/- 6,080
Overall dimensions=	165'-6" x 44'

#12 Board Mill



Potential Uses:	Institutional, office, retail
Major Issues:	**Structural-** Adaptability reasonable Foundation system needs improvement N-S lateral capacity more deficient than E-W **Architectural-** Good building form for typical uses Reasonable structural grid and exterior openings May accommodate additional floors (separately structured) **Economic/Development** Assumption: not available for private developers Potential for institutional uses
Building Size:	Existing footprint GSF= +/- 21,950 Overall dimensions= 72'-4.5" x 303'-3.5" (F.O. wall to F.O. wall)

#13 Digester Building

Potential Uses: Icon, mixed-use residential, boutique hotel

Major Issues:

Structural-
Significant foundation work needed
N-S lateral capacity is much more deficient than E-W
Removal of equipment damaging

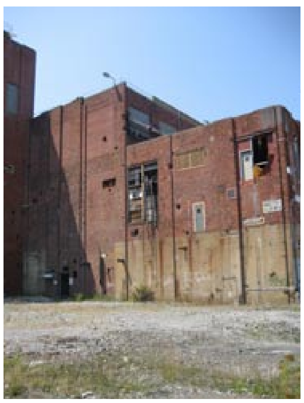
Architectural-
Dramatic building form
Adaptable for residential or hospitality uses
Minimal interior structure, few floor systems
Potential for reasonable exterior openings

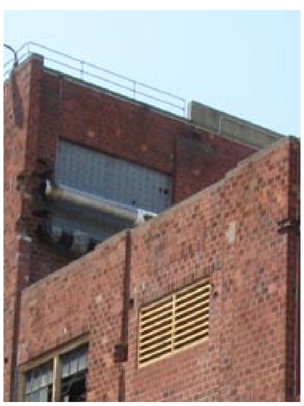
Economic/Development
Best potential for residential or hospitality

Building Size:

Existing footprint GSF=	+/- 9,360
Overall dimensions=	40’ x 234’ (column grid)

#14 Pulp Screen Room





Potential Uses: N/A

Major Issues:

Structural-
Floor systems are complex and customized (difficult to re-configure without major overhaul)
Very heavy constructed original structure
First floor vaults essentially are "permanent"

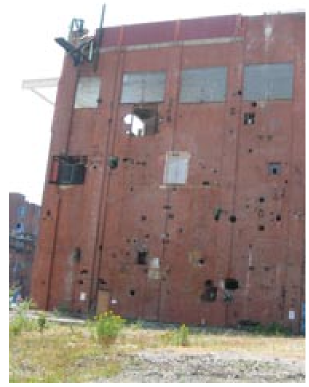
Architectural-
Very difficult ground floor for reuse
Difficult structural and floor system for reuse
Exterior walls on two sides only
Interesting/dramatic upper floor spaces

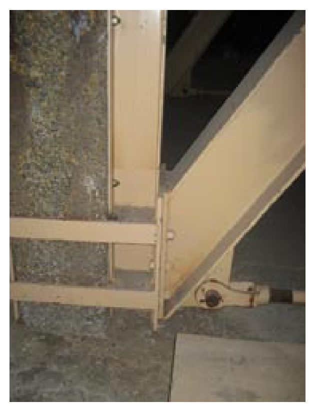
Economic/Development
No viable use identified

Building Size:

Existing footprint GSF=	+/- 15,360
Overall dimensions=	96' x 160' (column grid)

#15 Bleach Plant





Potential Uses: N/A

Major Issues:

Structural-
Floor systems are very customized and difficult to re-work
Difficult lower floor customized with concrete 'permanent' vaults
Top story is a lateral concern with limited current resistance

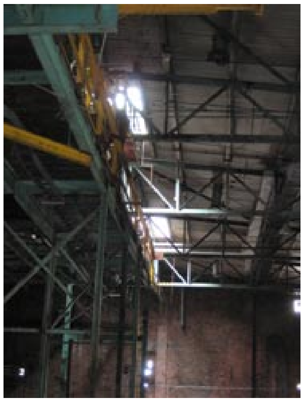
Architectural-
Very difficult ground floor for reuse
Difficult floor system for reuse
Exterior walls in poor condition
Interesting/dramatic upper floor spaces

Economic/Development
No viable use identified

Building Size:

Existing footprint GSF=	+/- 10,032
Overall dimensions=	152' x 66' (column grid)

#17 Alcohol Plant



Potential Uses: Mixed-use residential, office

Major Issues:

Structural-
Tall portion has foundation issues from lateral overturning
Shorter portion good candidate for removal and relocation

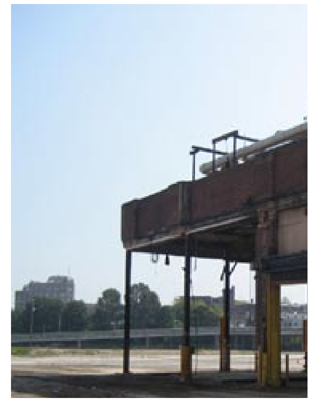
Architectural-
Building configuration, width and depth, workable for reuse
Exterior openings reasonable for residential reuse
Industrial floor grating viable for flooring reuse
Western open bay not practical for reuse

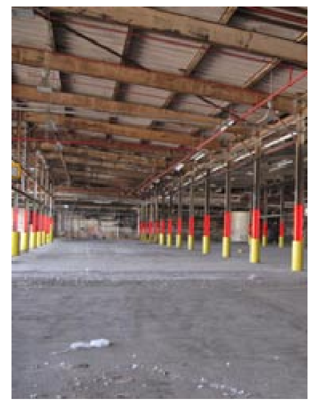
Economic/Development
May have value as specialized use, e.g. small theater (western bay)
Eastern portion has potential for mixed-use commercial/ residential (small development)

Building Size:

Existing footprint GSF=	+/- 17,575
Overall dimensions=	141’-6” x 50’
	75’ x 140’ (column grid)

#37 Pulp Storage





Potential Uses: Commercial/retail, museum, warehouse/storage

Major Issues:

Structural-
Framing very viable as potential relocate (split or whole structure)
Materials look in good condition and seem viable for reuse

Architectural-
Building configuration, width and depth workable for reuse
Potential for relocation/re-building

Economic/Development
Potential for commercial uses

Building Size:

Existing footprint GSF=	+/- 54,400
Overall dimensions=	160' x 340' (column grid)

#49 High Density Tanks

Potential Uses:	Icon
Major Issues:	**Structural-** Limited information on the existing structure Potential ground plane elevation adjustment issues Foundation improvements will likely be necessary in any re-use situation **Architectural-** Iconic form **Economic/Development** Not viable use identified Site icon value
Building Size:	Existing footprint GSF= N/A Overall dimensions= 34'Ø 44'Ø

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6. Phase 2: Detailed Assessments of Selected Structures

Methodology of Assessments
Structural and architectural assessments for the Old Granary, the Steam Plant, the Digester Building and the Alcohol Building were completed by KPFF and by Johnson Architecture & Planning.

Structural Assessment
Structural assessments included original document review and investigations and observations of foundation, lateral and gravity systems based on current codes and practices. Existing document review and on-site inspection, including posted floor-loading limitations provided the background information. No destructive testing was done or investigation of hidden conditions. Coordination with the architectural analysis allowed assessment of the likely necessary accommodation of lateral systems, gravity loads and additional infill floor levels or additions/expansions of the structure. In Appendix E, we have included observations and recommendations regarding the non-load bearing, unreinforced masonry walls (URM) and the poor soils that are potential hazards during a seismic event.

Architectural assessment included code review, building component assessment (e.g. masonry) and suitability for specific types of uses. "Test for fit" conceptual plans were prepared to evaluate building efficiency. The test-for-fit diagrams use assumed standard modules for the most likely viable use to assess whether the structure's floor-plate dimensions, structural grid, floor-to-floor heights and window opening patterns allow for effective reuse without significant alteration of unusual costs. In several cases, additions to the existing structure were considered to improve floor-plate efficiency and/or the scale of the project. The predicted net and gross square footages, total leasable area and for residential uses unit count and average unit sizes were calculated.

It should be noted that the floor-plan tests were performed for uses identified by the economic consultants, Lorig Associates, as the most likely economically viable and with the greatest market demand. Specialized uses of the structures (e.g. museums, theaters, community centers and the like) were not assessed. The complete test-for-fit diagrams are presented in Appendix F.

The structural and architectural assessments and "test-for-fit" diagrams were combined with a narrative scope of work and provided to the team cost-estimating consultant, Matson/Carlson. These construction cost estimates are included in Appendix G.

Special Considerations: Demolition and Masonry Restoration
The likely impact of demolition costs and of masonry restoration, including seismic upgrades to the existing unreinforced masonry walls (URM), were considered as unique issues and potential unusual costs for rehabilitation.

The consulting team obtained opinions from Nuprecon LP, widely recognized as experts in selective demolition for rehabilitation and reuse projects, and Fairweather Masonry, experts in masonry restoration.

Nuprecon provided estimates for the removal of the industrial equipment in the Steam Plan, Digester Building and the Alcohol Plant. Fairweather provided an assessment on the likely unit costs for creating new window and door openings, performing masonry infill and repair and for salvaging, cleaning and palletizing the existing masonry units for reuse.

This information was provided to the cost estimation team and considered in the overall architectural assessment.

Historic Designations: Individual Structure and Historic District Eligibility

For the purposes of the adaptive reuse and economic analysis, the consulting team, including project historic preservation specialist, Kate Krafft of Krafft & Krafft Architecture & CRM, took into consideration whether the subject structures were potentially eligible for listing in local landmark and/or Nation Register of Historic Places registers. Based on prior studies of the structures and property, we considered the potential viability of a coherent historic district and/or individual designations. Our purpose was to determine whether rehabilitation and adaptive use projects involving eligible structures could potentially utilize historic preservation financial incentive programs (federal investment tax credits and local special tax valuation). However, in order to qualify for these incentive programs all rehabilitation and adaptive use work would need to follow The Secretary of Interior's Standards for Rehabilitation.

Individual Structure Designations
It is the opinion of the consulting team that, absent a coherent historic district, it is unlikely that most of the eleven structures would be individually eligible for local landmark and/or National Register designation.

Two structures stand out as likely candidates for nomination and designation: The Old Granary/Egg Co-operative and the High Density Tanks.

The Digester Building, because of its prominence on the site, and its remarkable industrial process equipment, may be a candidate for nomination and designation at the local and/or national level.

#7 Old Granary/
Egg Co-op

#49 High Density Tanks

#13 Digester Building

Historic District Eligibility
As a result of the preliminary screening, in which several structures were found to have no viable reuse potential, we have considered the potential of the remaining structures to form a coherent historic district. We have presented background documentation to the Washington State Office of Historic Preservation for a Determination of Eligibility. As of the writing of this report, we have not received a response.

Detailed Assessment Summary
The following pages contain a detailed Assessment Summary of the four selected buildings.

#6 Steam Plant

Structurally, the Steam Plant is considered reasonably stable due to its building form and height/width proportions, although it will require lateral system and foundation improvements. Gravity systems are apparently adequate to support new uses with the potential insertion of new floors or an upper story addition, assuming existing foundations are adequate.

The free-standing chimney has a very narrow height-to-width ratio and little apparent resistance to overturning forces, and should be removed as soon as possible for public safety concerns.

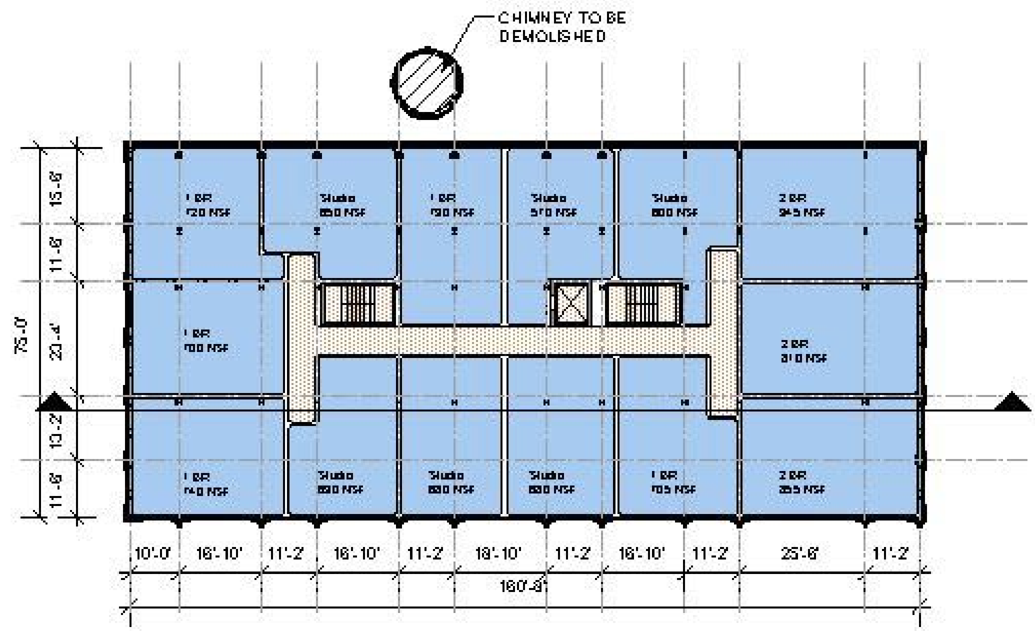
Architecturally, the Steam Plant offers a very reasonable building form and a workable building depth of 75' which accommodates residential design very well. The building footprint of 12,500 SF is effective although smaller than the ideal for offices. The exterior façade is reasonably intact on two elevations. The western façade is badly damaged and would need complete rebuilding. The furnaces, industrial equipment, piping and sheet metal chases and ducts would necessarily need to be almost completely removed.

In order to make a redevelopment project efficient and of a reasonable scale, the redevelopment test assumed that the upper floors would be built-out with new construction to the full footprint of the structure.

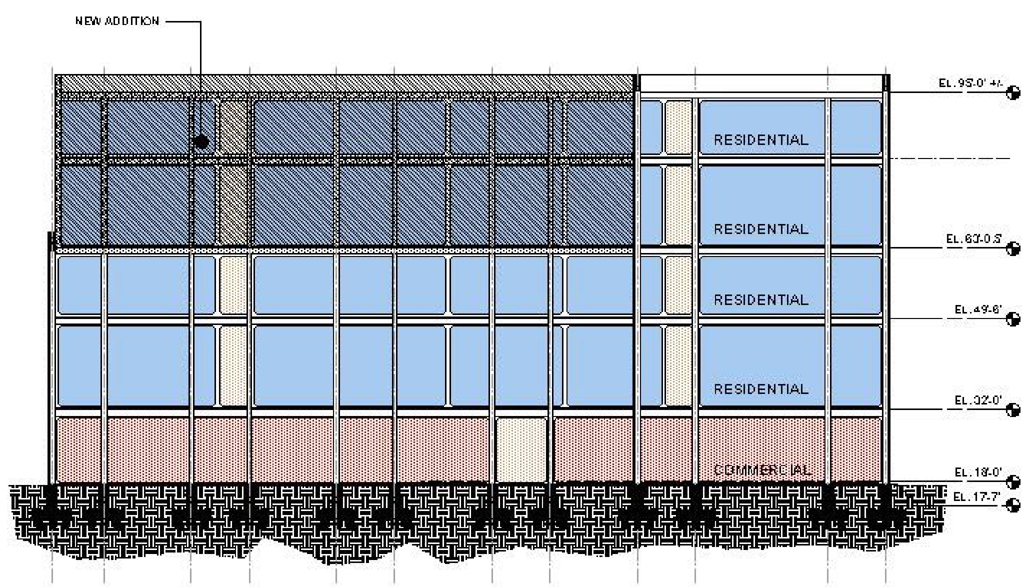
Summary of Potential Redevelopment Test
The architectural programmatic test-for-fit analysis for the Steam Plant assumed a redevelopment with a ground floor of commercial/retail uses and leased residential apartments on the upper floors.

The estimated development capacity of the Steam Plant is:

Building Dimensions	75' x 161'
Gross Square Footage, including addition:	60,400 SF
Net Leasable Commercial SF	10,250 SF
Net Leasable Residential SF	40,000 SF
Residential Apartments	56 Units
Parking Estimate	77 Stalls



Steam Plant, Test-for-fit Plan



Steam Plant, Test-for-fit Section

 # 7 Old Granary/Egg Co-operative

The Granary building, structurally, presents a more unique and robust foundation of the eleven structures. The heavy concrete base structure appears to be in good condition as do the wood-framed upper stories. The proportions of the building, being relatively low and wide, as well as the square footprint are beneficial to stability. There will necessarily need to be improvements to the lateral system for the entire structure and to the wood-framed high-bay grain bins, if additional floors are constructed in that area.

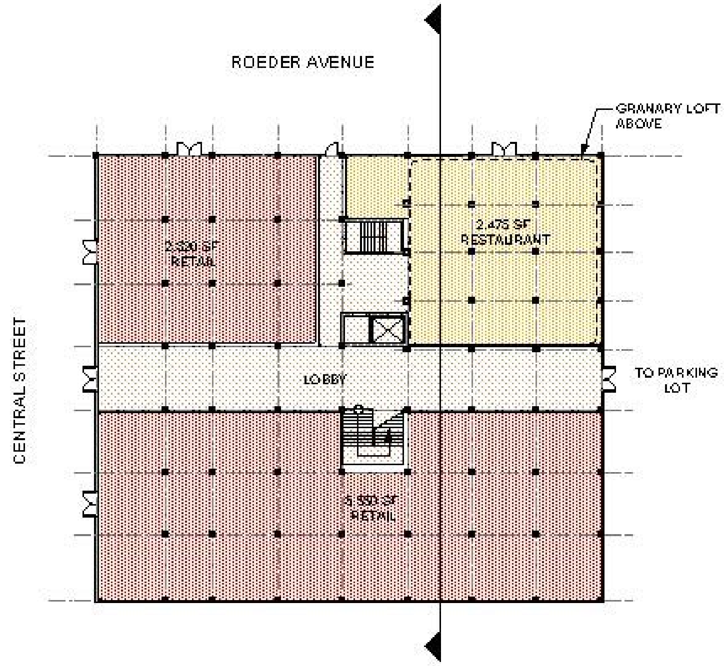
Architecturally, the Granary offers very useful floor plates with potential public access on three sides. Floor to ceiling heights are adequate for retail or office functions. The exterior offers opportunities to provide window openings within the architectural context of the lower floors of the original structure. The clerestory light monitor adds significantly to the quality of the 2nd Floor. Reuse of the granary "tower" will be more challenging as new floors would have to be constructed, vertical circulation provided and new window openings will be required.

We have presumed that the Granary/Egg Co-op Building is eligible for listing as an historic structure and architectural assumptions for adaptive reuse have been made in that context.

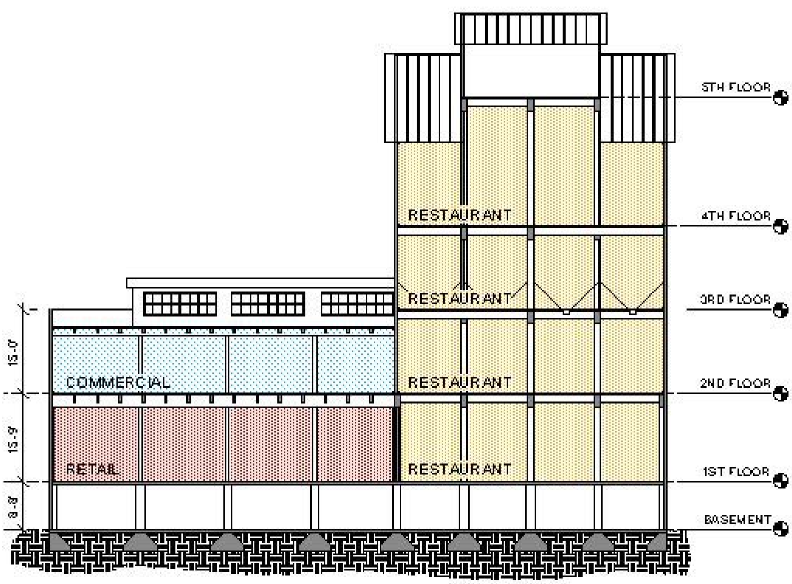
Summary of Potential Redevelopment Test
The architectural programmatic analysis for the Granary/Egg Co-op Building assumes that the entire structure is redeveloped, with a new Central Street located to the east or west of the structure. The Granary would have storage uses in the basement, a ground floor of commercial/retail uses and offices and a restaurant/pub on the upper floors.

The estimated development capacity of the enlarged Granary/Egg Co-op Building is:

Building Dimensions	111' x 126'
Gross Square Footage, including addition:	49,500 SF
Net Leasable Commercial SF	31,750 SF
Net Leasable Restaurant SF	7,650 SF
Parking Estimate	83 Stalls



Granary, Test-for-fit Plan



Granary, Test-for-fit Section

#13 Digester Building

The Digester Building poses unique structural challenges due to its height, its narrow north-south dimension and its lack of any lateral-force resisting system except for the most recent east bay. New lateral force-resisting elements would be required, connected to new pile foundations with the ability to resist uplift. These new pilings would likely need to be placed external to the existing structure to provide an adequate base. Gravity loads seem adequate, given the high industrial floor loads posted in the structure, for the addition of several new floors with residential or office loading. The exterior masonry needs to be positively braced to the structure. The tanks and most of the other industrial equipment are independently supported and can be removed without damaging the structure. However the support for chip feed bins at the upper levels appear to be integrated into the exterior masonry and removal of these bins will require restructuring of those areas. The large digester tanks cannot be removed intact without damaging the surrounding structure.

Redevelopment strategy
Architecturally, the Digester offers challenges and opportunities for ground floor commercial space with residential or hospitality uses on the upper floors. The building dimensions are such that redevelopment plans would be with relatively inefficient single-loaded corridors. Building efficiency can be increased by constructing new vertical circulation elements (i.e. two stairs and two elevators) on the exterior of the structure. Exterior openings are minimal at present, with many original openings having been bricked in. The façade design of repetitive pilasters, however, does allow for the regular placement of new openings. With the re-opening of the original windows and the careful addition of new windows, adequate light can be provided for residential or hospitality functions. It appears feasible to leave the lower portion of the digester tanks (some or all) as features in the retail spaces.

We have presumed that the Digester Building may be individually eligible for listing as an historic structure and architectural assumptions for adaptive reuse have been made in that context.

Alternative redevelopment strategy
Due to the narrow width of the Digester, we also investigated the addition of a new structure with an identical footprint abutting the existing structure. The addition of this structure essentially doubled the leasable square-footage of the building, provided structural opportunities for bracing the existing structure and did not require additional vertical circulation elements. There is significantly increased efficiency and lower costs per square foot of the new construction, in this strategy. However, it is likely, in our opinion, such an alteration would not qualify for historic tax credits, which would significantly affect its economic viability.

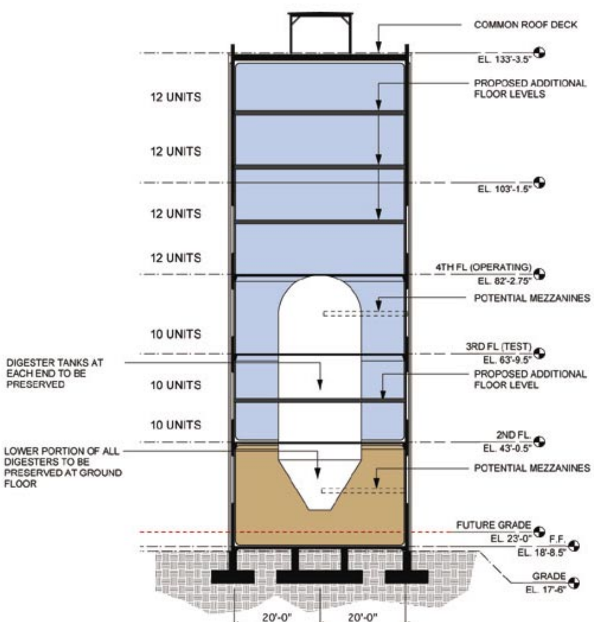
Alternative to Adaptive Reuse: Protection of Industrial Equipment and History.
The adaptive re-use of the Digester Building as a mixed-use residential and commercial structure appears technically feasible, with some structural challenges. However, economic viability is far from assured. Should the structure not be economically viable, the preservation of the industrial equipment should be strongly considered.

Summary of Potential Redevelopment Test

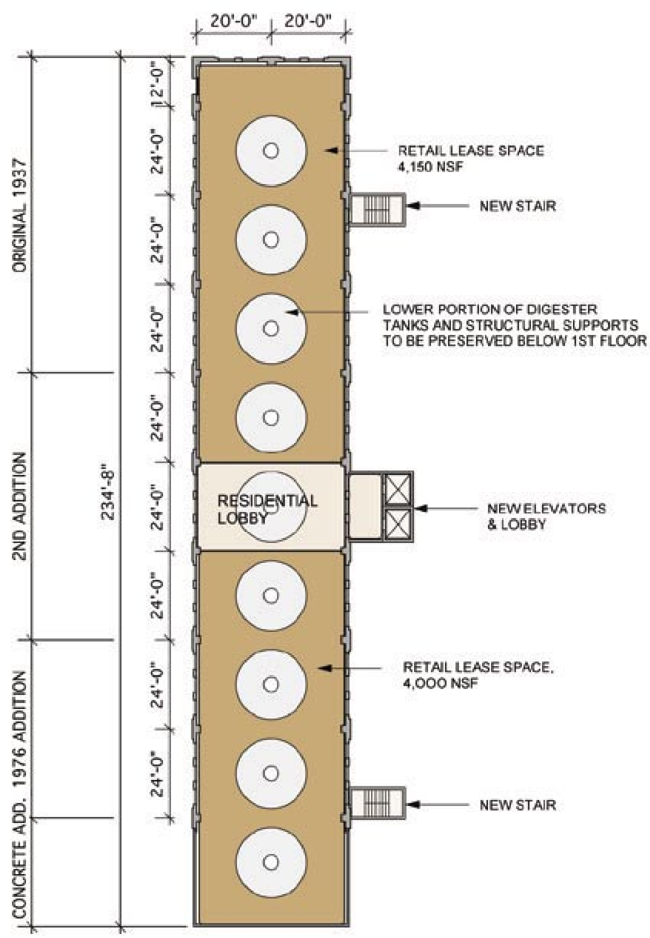
The architectural and programmatic testing of the Digester Building is based on the adaptive reuse of the Digester Building without addition or expansion as a mixed-use residential and commercial building. The building would have a ground floor of commercial/retail uses and leased residential apartments on the upper floors.

The estimated development capacity of the enlarged Digester Building is:

Building Dimensions	40’ x 235’
Gross Square Footage:	84,000 SF
Net Leasable Commercial SF	8,150 SF
Net Leasable Residential SF	64,720 SF
Residential Apartments	78 Units
Parking Estimate	94 Stalls



Digester Building, Test-for-fit Section



Digester Building, Test-for-fit Plan

#17 Alcohol Plant

The Alcohol Plant also poses structural challenges, although less extreme than the Digester, due to its height compared to a relatively narrow east-west dimension. Like the Digester, there is no lateral force-resisting system and the foundations do not resist over-turning. It is likely that a new lateral system can be incorporated within the footprint of the structure as part of a redevelopment plan. The existing industrial floor loads, as posted, are likely adequate to support additional floors of residential or office use and is to be verified with additional geotechnical study.

The open bay that forms the western half of the structure is constructed with very tall, un-braced columns, supporting a long-span truss roof with concrete panels forming the roof structure. This structure would need significant additional bracing to meet current code requirements to remain at its existing location. The addition of new floor structures would require independent gravity load systems and foundations.

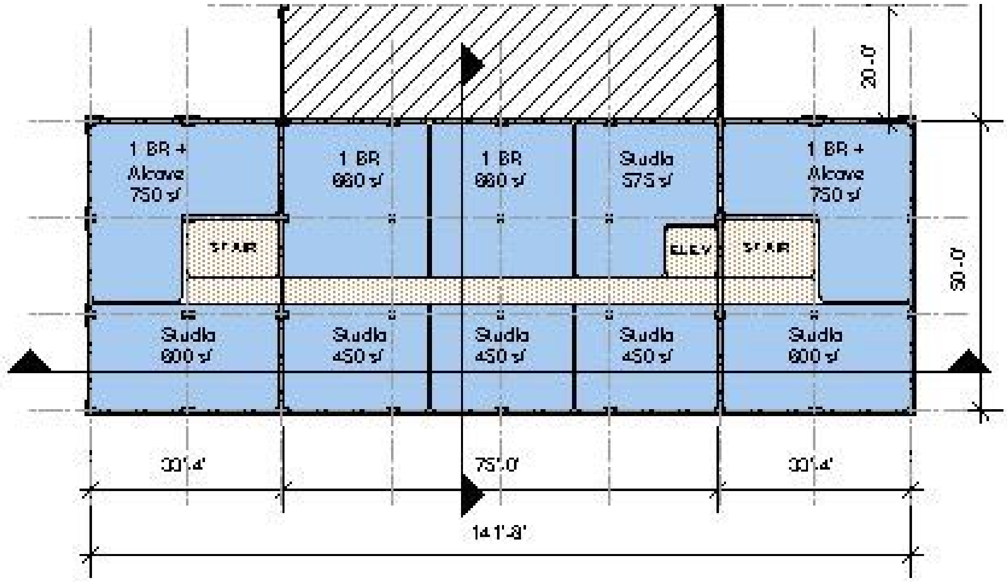
Architecturally, the Alcohol Plant offers the potential for very open, loft like residential or office development over a commercial ground floor, with the addition of new floors and in certain locations mezzanines. The structure is, however, relatively small with a narrow east-west dimension, making efficient development somewhat difficult. Redevelopment would also require new vertical circulation elements, including two stairs and an elevator.

To increase the size and efficiency of the structure for redevelopment, we have proposed adding additional floor area in the upper-level setbacks on the north and south ends of the structure, giving the entire structure a uniform footprint.

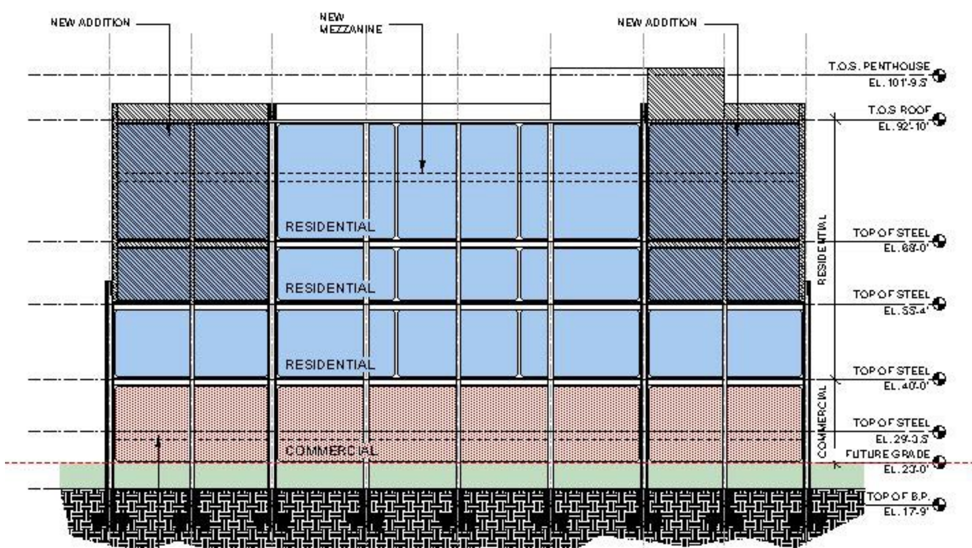
Summary of Potential Redevelopment Test
The architectural programmatic test-for-fit analysis for the Alcohol Plant assumed a redevelopment with a ground floor of commercial/retail uses and leased residential apartments on the upper floors.

The estimated development capacity of the Alcohol Plant- Eastern Portion is:

Building Dimensions	50’ x 142’
Gross Square Footage, including addition:	31,950 SF
Net Leasable Commercial SF	5,800 SF
Net Leasable Residential SF	20,800 SF
Residential Apartments	30 Units
Parking Estimate	42 Stalls



Alcohol Plant, Test-for-fit Plan



Alcohol Plant, Test-for-fit Section

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7. Phase 3: Economic Considerations and Assessments:

The structural and architectural assessments were used to define assumptions for improvements to each building that would be required to meet current building codes, adaptive reuse objectives and commercially viable design features. These assumptions were used as the basis for cost and market analysis in Phase 3.

Economic Assessment Methodology:
The economic team was asked to consider the potential and challenges of the structures as contributions to development activities from a financial and developer's perspective. To achieve this, Lorig undertook the following activities:

• Conducted a three hour site development workshop involving all Lorig development staff and selected outside experts to brainstorm potential development ideas and approaches for the site including and excluding the structures. Participants in the workshop were provided background material and past studies on the area for the workshop in advance, including historic and community information and case studies of other like areas in the country. This workshop generated a number of ideas, not constrained by economic or engineering data about the site and thus served as a vision of what "could be" without consideration of practical market constraints.

• Economic trend data for the area was also considered. Most interesting is that the area is entering a downward trend that will continue for some time. For example, according to the Bureau of Labor Statistics, the unemployment rate in Bellingham MSA has increased from 4.8% in September 2008 to 7.8% in September 2009. This trend clearly has impact on the viability of development in the area in the short term.

• Lorig staff conducted extensive and personal research on current market data in the Bellingham area including apartment rental rates, condominium sale prices and land value assessments (see Appendix H) in addition to using Hebert Research's Demand Research Summary Report dated July 2007 obtained through the Port of Bellingham. Lease absorption rates lease, construction costs and a number of past economic studies were also considered. The economic team met with several developers and potential tenants in a development on the site. Based on our market analysis, our own and the community vision for the site, our best experience in similar developments, construction cost estimates provided by Matson/Carlson, the building specifications and identified uses for the structures (commercial/retail, multifamily, market-rate rentals, condominiums, and hospitality) provided by Johnson Architecture and Planning, current market comparables, and interviews with local experts, Lorig developed multiple draft proforma analysis and one final for the four structures (Old Granary, Steam Plant, Digester Building and Alcohol Building) that were selected through the preliminary screening approach. This proforma analysis has been provided in a separate document.

• Real estate development is highly sensitive to the condition of the local and regional economy surrounding the development. The current state of the economy in which we find ourselves currently makes development exceptionally challenging due to the current instability in the real estate market, the inability to secure bank financing and the difficulty to attract and generate equity investors. These factors are significant constraints making it difficult to generate sufficient return on equity investment needed for the redevelopment of the Port of Bellingham's waterfront site. Yet these are the realities of today's market and therefore were used as the base case of the economic analysis used in this report.

• At the request of the Port of Bellingham, Lorig Associates also conducted an economic analysis based on projections for a time in the future (we assumed a 5 year look-ahead) when the economic conditions improve and the real estate development environment is likely more typical and stable. This "better times" scenario utilizes the following assumptions:

-Population growth in the Bellingham and surrounding areas returns to the levels projected in past studies and actually experienced prior to the past few years.
-Projected increase in demand for housing from retiring individuals looking for maritime-area (waterfront) living accommodations and selecting the Bellingham area materializes.
-General housing demand increases rental and sale pricing which in turn supports higher construction costs and cycles to shrink supply of existing housing from 2009 levels creating more demand further pushing up rental rates.
-The banking sector stabilizes making capital more readily available and under more favorable interest and security requirements.
-The return on investment/equity in real estate increases to the point of attracting equity investment capital.
-The overall economy in the Bellingham area begins once again to grow at rates predicted in the past thereby bringing job growth, greater levels of income and disposable/discretionary expenditures.
-Returned economic stability and growth allows the State of Washington and thereby Western Washington University to commit to current campus expansion plans and the related capital expenditures.

Results and Conclusions
The proforma analyses described above served as the major driver in our assessment of the building economic viability statements included in the building by building assessments that appear elsewhere in this report. Each proforma analysis was ultimately judged based upon the return on equity (ROE) afforded an equity investor assuming a 10-year ownership per industry standard. The full proformas for each of the four structures are too large to be attached to this report, but are available for review through the Port of Bellingham. The following Scenario Matrix is a summary of the full proformas and indicates the assumptions used to assess the economic viability for each structure, its use and includes the amount of debt, tax credit equity, investor equity and return on equity (ROE) for the renovation of each building.

The outcome of the economic assessment is that restoration of these structures is not economically viable under current or future market conditions. Typically, a 15% ROE is needed to attract investors and none of the structures meet that threshold. The ROE, for each of the four structures, ranges from -3.13% to 0.37%. Keep in mind that the assumptions in the proformas are liberal in that they assume new market tax credits as well as historic tax credits will be applicable and available. Additionally, the cost necessary to create functional and safe spaces out of the structures is higher than the cost required to build a new building. This in turn requires the spaces in the historic structures to command more rent than a new building. The market comparables demonstrate that the opposite appears to be true: newer buildings in Bellingham provide more rent per square foot. The proforma analyses concludes that in both current and 'better times" market conditions, the restoration of the existing structures will not generate an ROE that will attract investors. Restoration of these four structures is not economically viable now or in the future. New construction in the future is more feasible.

Scenario Matrix

Waterfront District Bellingham, WA
Prepare by: Lorig Associates, LLC

CURRENT MARKET

Building Name	Building # / Scenario	Tax Credits?	Development Cost	Net Rentable SF (NRSF)	Dev Cost per NRSF	Residential Units	Commercial SF	Debt	Tax Credit Equity	Equity	Return on Equity
Granary	7	NMTC & Historic TC	14,317,251	26,850	$ 533.23	0	26,850	3,816,256	4,490,838	6,010,157	-0.38%
Steam Plant	6	NMTC & Historic TC	21,872,001	50,310	$ 434.74	56	10,250	5,016,505	7,768,145	9,087,350	0.37%
Digester	13 / Full	NMTC & Historic TC	31,344,699	64,700	$ 484.46	78	8,150	6,268,246	8,368,576	16,707,878	-2.98%
Alcohol Plant	17	NMTC & Historic TC	14,869,044	26,145	$ 568.71	30	5,785	2,737,835	5,306,469	6,824,741	-3.13%

Assumptions:
- Land acquisition cost estimated at $35 per sf.
- Design layout, unit count, square footage provided by Johnson Architecture and Planning.
- Hard cost construction estimate provided by Matson Carlson Cost Consultants.
- Residential units are "for rent" instead of "for sale".
- Residential unit rents : Studio $1.28, 1 Bedroom $1.25, 2 Bedrooms $1.00.
- Retail rents : $17/sf/yr with $10/sf of tenant improvement allowance. In the Granary analysis the Restaurant has $16/sf/yr rent with $50/sf tenant improvement allowance.
- Office rents : $22/sf/yr with $10/sf of tenant improvement allowance.
- 3% inflation on revenue and expenses.
- Construction loan terms : 6.50% interest, 30 amortization, 1.25 debt service coverage ratio (DSCR), 70% loan to value (LTV).
- Permanent loan terms : 5.50% interest, 30 amortization, 1.25 debt service coverage ratio (DSCR), 80% loan to value (LTV).
- New Market Tax Credit (NMTC) equity amount is calculated by 60% x 39% x applicable construction costs. The availablility and amount of the credits will vary.
- Historic Tax Credit (Historic TC) equity amount is calculated by 20% x 90% x applicable construction costs. The availablility and amount of the credits will vary.
- Return on Equity reflects a sale after 10 years of stabilized operation.

FUTURE MARKET / aka "Better Times"

Building Name	Building # / Scenario	Tax Credits?	Development Cost	Net Rentable SF (NRSF)	Dev Cost per NRSF	Residential Units	Commercial SF	Debt	Tax Credit Equity	Equity	Return on Equity
Granary	7	NMTC & Historic TC	17,353,287	26,850	$ 646.30	0	26,850	5,634,045	5,302,017	6,417,225	3.16%
Steam Plant	6	NMTC & Historic TC	24,867,037	50,310	$ 494.28	56	10,250	6,514,886	8,915,354	9,436,798	2.15%
Digester	13 / Full	NMTC & Historic TC	35,178,741	64,700	$ 543.72	78	8,150	7,267,965	9,575,854	18,334,922	-2.49%
Alcohol Plant	17	NMTC & Historic TC	16,889,839	26,145	$ 646.01	30	5,785	3,566,455	6,088,022	7,235,363	-1.64%

Assumptions:
- Residential unit rents : Studio $1.40, 1 Bedroom $1.37, 2 Bedrooms $1.10.
- Retail rents : $25/sf/yr with $20/sf of tenant improvement allowance. In the Granary analysis the Restaurant has $23/sf/yr rent with $75/sf tenant improvement allowance.
- Office rents : $30/sf/yr with $20/sf of tenant improvement allowance.
- Escalated the hard cost construction estimate provided by Matson Carlson Cost Consultants by 15%.
- Construction loan terms : 6.00% interest, 30 amortization, 1.20 debt service coverage ratio (DSCR), 80% loan to value (LTV).
- Permanent loan terms : 5.00% interest, 30 amortization, 1.20 debt service coverage ratio (DSCR), 80% loan to value (LTV).

8. Coordination with the Proposed Planning Framework

Adaptive Reuse and the Proposed Site Development Planning Framework
The impact on adaptive reuse potential of the Proposed Planning Framework was considered during the detailed analysis phase. In particular, the proposed primary road layout (i.e. the Bloedel Avenue and Commercial Street alignments and street sections), the site grading concepts and the proposed Commercial Green were all considered for their effect on the existing structures and their potential for viable reuse.

The adaptive reuse team made several suggestions for the consideration of the Port and the Waterfront District planning team as to how best accommodate the adaptive reuse of the existing viable structures, and/or preserve them in the near term for future consideration.

- Consider shifting the proposed right-of-way of Central Street to the east side of the Granary Building, to allow for the potential redevelopment of the whole structure.

- Consider adjusting the alignment of Bloedel Avenue slightly westward to avoid the southwest corner of the Alcohol Plant, allowing the potential redevelopment of the eastern portion of the structure.

- Consider shifting the proposed Commercial Green to the north side of Commercial Avenue, allowing the Digester Building to remain intact.

- Consider postponing final decisions on the alignment of Paper Avenue to allow future consideration of the Board Mill.

Recommendations
Through discussions with and analysis by the planning team members, including an assessment report on impacts and costs/benefits to the Planning Framework by the master-planning consultant (See Appendix I), the Adaptive Reuse consultant team recommends:

- Locating Central Street to the east side of the Granary.

- Adjusting Bloedel Avenue to the west.

- Postponing a decision on the alignment of Paper Avenue be strongly considered.

- Maintaining Commercial Green in its current location as site for historic icons.

9. Recommendations

Structure by Structure Recommendations:
Our recommendations are based on our structure-by-structure analysis and assessment of economic viability in the near future. We subsequently analyzed the effect of the planning framework on the individual structures as discussed in Section 8.

Our final recommendations incorporate several findings and/or conditions:

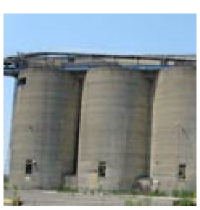
- That individually, only the Granary and potentially the Digester meet the standards for historic tax credit eligibility.

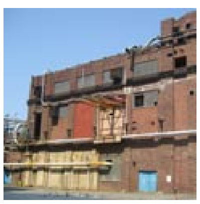
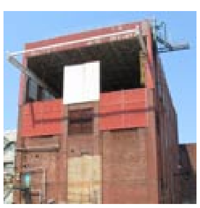
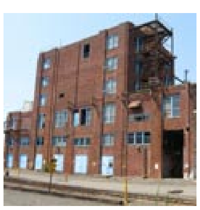
- That the potentially viable structures together do not form a coherent historic district.

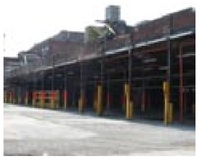
- That adjustments to the recommended framework plan, as described in Section 8, are accepted and implemented.

- That none of the structures are expected to be financially viable for adaptive reuse for commercial, residential or light industrial uses in the current economic market.

- That changing economic conditions may allow some structures to be economically viable.

	Building	Recommendations and Notes
	**6. Steam Plant**	**Temporarily hold for future market assessment. Demolish if not viable or if development requires.** Notes: Demolition of chimney recommended immediately due to public safety concerns. Georgia-Pacific owns structure Port of Bellingham owns land. Not economically viable at this time. Potential for mixed-use residential or office.
	**7. Old Granary**	**Temporarily hold for future market assessment. Demolish if not viable or if development requires. Seek proposals for redevelopment in near-term.** Notes: Recommend entire structure for redevelopment. Recommend Central Street be located on east side of building. Not economically viable at this time. Potential for restaurant, retail, pub, public meeting place.
	**8. Barking & Chipping Plant**	**Demolish in near-term.** Notes: Significant industrial equipment should be preserved. Not economically viable at this time. Floor plate configuration difficult for new uses.
	**9. Chip Bins**	**Temporarily hold for future assessment. Demolish if not viable or if development requires.** Notes: Located within potential institutional use area. No economic viability as stand-alone structure. Potential iconic component of larger project.

	Building	Recommendations and Notes
	**12. Board Mill**	**Temporarily hold for future assessment.** **Demolish if not viable or if development requires.** Notes: Located within potential institutional use area. Not economically viable.
	**13. Digester Building**	**Demolish structure in near term.** **Consider preservation of 1-3 digester tanks as historic icon park feature.** Notes: Conflicts with proposed planning framework. Not economically viable at this time.
	**14. Pulp Screen Room**	**Demolish in near-term.** Notes: Selected industrial equipment should be preserved for display. Not economically viable. Floor plate configuration difficult for new uses.
	**15. Bleach Plant**	**Demolish in near-term.** Notes: Selected industrial equipment should be preserved for display. Not economically viable. Floor plate configuration difficult for new uses.
	**17. Alcohol Plant**	**Temporarily hold eastern portion for future market assessment. Demolish if not viable or if development requires.** Notes: Western portion to be demolished in near-term. Not economically viable at this time. Potential for mixed-use residential or office.

	Building	Recommendations and Notes
	**37. Pulp Storage**	**Demolish or relocate in near-term.** Notes: Potential reuse as a display or event pavilion in new location. Not economically viable.
	**49. High Density Tanks**	**Preserve as Icon: develop preservation cost and feasibility plan in near term.** Notes: Proposed Planning Framework assumes preservation of tanks as historic theme within the Commercial Green. Effects of site re-grading must be considered.

10. Historical Identity and Sustainable Practices

Recommendations for Preserving the Historical Identity of the Waterfront District
The consultant team was asked to recommend ways in which the Port and City of Bellingham could preserve the historical identity of the site, particularly the industrial heritage of the pulp processing and paper making operations. The consulting team's recommendations for preserving the site's historical identity are structured to reflect three separate conditions:

Adapted structures:
Any structures that area ultimately offered for development proposals for new adaptive uses should have a specific preservation plan for their primary architectural character. If the structures are determined eligible for landmark status, the offering packaged should mandate The Secretary of Interior's Standards for Rehabilitation. If the structures are determined not eligible for landmark status, the Port and the City should consider the incorporation of design guidelines, including use of similar masonry, architectural detailing, and protection of specific features within the development standards and regulations for selected projects within the Waterfront District.

Preserved icons:
The iconic structures on site, in particular the High Density Tanks (and potentially the Chip Bins), should have near-term protection and long-term preservation plans prepared. Near-term protection plans should include water-intrusion protection and public safety. Long-term preservation should include weatherization, structural repairs, including foundation investigation, cleaning and restoration and accommodation into site development and re-grading plans.

Preserved and displayed industrial process equipment:
Maintaining the history of the industrial processes will be a challenge for two reasons: First, the demolition of non-viable structures will require careful salvage and protection of specific items of equipment and second, on a potentially different time line, the redevelopment of the existing structures will require the careful removal and storage of tanks and equipment. In both cases, there are selected pieces of industrial equipment and artifacts that tell the history and explain the process of pulp and paper-making.

The preservation of the history of the Waterfront District could be augmented by the retention and an on-site public display of GP Mill files, records and unique industrial equipment, such as paper machines, log handling and pulp processing equipment, and other tanks, piping and materials unique to the industrial paper-mill operations.

In our opinion, the steel structure and masonry that comprises structure #37, Pulp Storage, deserves strong consideration for removal, reuse and salvage. For example, the materials could be incorporated within the construction of a new building at a more appropriate location within the Waterfront District. This new building could be used for the preservation of historic equipment and artifacts, as well as displays and photographs of the property's history and process.

Sustainable Practices
For best demolition and salvage practices, we recommend including in any demolition contract, requirements for the evaluation, salvage and protection of useful structural materials, including masonry, structural steel and metal components. Contract terms should require demolished debris be recycled to the greatest extent possible (e.g. paving aggregate) or sold for other appropriate secondary uses.

Salvaged materials should include:

Masonry:
The brick masonry used on site is apparently a custom-manufactured dual brick made by Lowell Brick in Everett, Washington. This company has been closed since the early 1970's. The existing undamaged brick should be salvaged, cleaned and palletized for future reuse on site.

Structural Steel:
The structural steel that is visible on site is in apparent good condition. As demolition proceeds, it should be evaluated by a structural engineer for reuse potential in on-site development or sold as scrap.

Miscellaneous Steel Fabrications
There are large quantities of steel grating, decking, stairs and other elements. These should be assessed for the potential to be stockpiled intact for reuse in new construction and or sold for reuse off-site.

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Waterfront District Adaptive Reuse Assessment
Port of Bellingham & City of Bellingham

Reference Document List

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ICF Jones and Stokes. August 2008, *Pre-Development Preservation Strategy and Mitigation Considerations for Potential Historic Resources*: a report prepared for the Port of Bellingham.

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Status Heery International Inc., October 2007, *Western Washington University's Presence in the Bellingham Waterfront Phase 2 and 2A*: a report prepared for Western Washington University.

The Waterfront District

Proposed Planning Framework

4/20/09

- Core Street Grid
- Additional Arterial
- View Corridor
- Full Built-out Park Plan
- Structure to be Retained for Further Consideration
- High Speed Bike Lane

Proposed Planning Framework and Planning Assumptions (attached)

DRAFT

4/20/09

The Waterfront District

PROPOSED PLANNING FRAMEWORK ASSUMPTIONS

- **Long term planning effort –** Recognition that the Waterfront will be developed over the next 30 to 40 years, so a plan needs to remain flexible and predictable but within a defined framework. Final decisions will be made only after publication of the Final Environmental Impact Statement.
- **Engineering Feasibility –** Ensure any proposed planning framework is feasible and realistic from an engineering/construction perspective.
- **Waterfront Futures Group –** Vision and Framework Plan, and Guiding Principles (below) represent the community vision for the Waterfront District.
  (1) Reinforce the inherent qualities of each place on the waterfront
  (2) Restore the health of land and water
  (3) Improve waterfront access
  (4) Promote a healthy and dynamic waterfront economy (via flexible zoning and improved permitting)
- **Community Connections –** The Waterfront District should be designed to provide close connections with existing neighborhoods and create an economic lift to downtown Bellingham.
- **Street Grid –** Develop a "Core Street Grid" to use as a planning framework to inform other planning areas. Street planning should enhance the waterfront experience through effective solar orientation of streets and infrastructure and include transit access sufficient to support WWU.
- **Complete Streets** - Street design will be adjusted to land uses and encourage multi-modal activities such as pedestrian, bicycle and transit use. "Green" streets will include features to enhance open spaces, low impact stormwater management, traffic calming and connections to public parks.
- **Block Size and View Corridors –** Block sizes in the completed mixed use development will be similar to existing downtown Bellingham. Create new view corridors aligned with existing and proposed street grid.
- **LEED Neighborhood –** The planning project is accepted as a potential U.S. Green Building Council LEED Neighborhood Pilot. The LEED ND project is an important component of the strategy for environmental, economic and community sustainability for The Waterfront District. The deadline for final application for certification is due in July 2009 (extension is not anticipated).
- **Western Washington University –** Accommodate a proposed WWU campus on south side of waterway as an anchor tenant and incorporate WWU identified requirements, e.g. no arterial through campus and no arterial between campus and water.

- **Existing Operations –** It is assumed that the Port's Bellingham Shipping Terminal and PSE's Encogen Plant will continue industrial operations into the long-term future.
- **Existing Structures –** Review architects' suggestions and community input regarding the remaining on site buildings and structures which were part of the now inactive pulp and paper mill operations. The architects recommended retaining five structures, including the Granary Building, the Steam Plant, the Board Mill Building, the Barking and Chipping Facility, and the ceramic-tiled Pulp Storage Tanks for consideration of potential adaptive reuse, or as memorials to the industrial history of the waterfront. Retaining other iconic structures and as part of an historical memorial is also under consideration.
- **BNSF Railroad –** The main line of the BNSF RR should be relocated as close to the bluff at the eastern edge of the site as possible. Evaluate options for including a high speed bike trail following relocated rail line.

4/20/09

The Waterfront District

OTHER AREAS OF CONCEPTUAL AGREEMENT

- **Port/City Partnership –** The Port Commission and City Council remain committed to the redevelopment of The Waterfront District, consistent with interlocal agreements and amendments from 2004 to 2009.
- **Clean Ocean Marina –** Cleanup and redevelopment of the wastewater treatment lagoon (Aerated Stabilization Basin, or ASB) should be performed to provide for a new community marina, including public park and shoreline habitat features.
- **Building Heights –** New structures within The Waterfront District will be allowed within a range of maximum building heights varying from 35 feet to 200 feet, depending on location, as specified in final plans and development regulations that will preserve primary view corridors, densities and setbacks.
- **Shorelines –** The transition from historically industrial activities to mixed use offers opportunities for shoreline cleanup and restoration that should be part of the master plan. As indicated by the architects, the plan should include natural shorelines, habitat restoration, and an active water's edge with a mix of urban waterfront experiences and overlooks.
- **WWU and adaptive reuse –** WWU plans to pursue for adaptive reuse the Board Mill Building and the Barking & Chipping Facility.
- **Alternative planning –** Explore alternative planning options if WWU is unable to move forward with plans for its waterfront development.

The Waterfront District

RECOMMENDED GOALS FOR NEXT STEPS

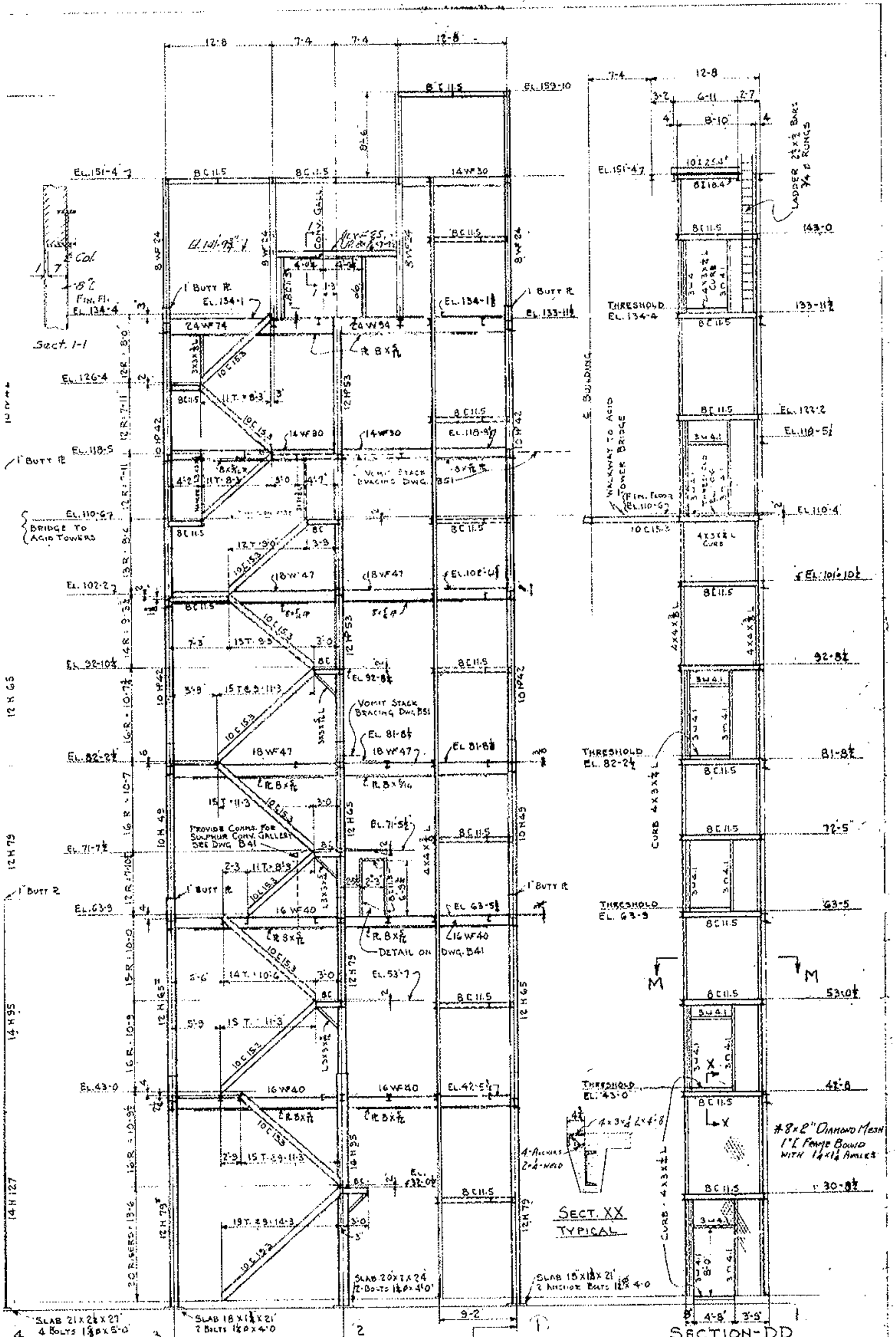
If City Council and Port Commission adopt the proposed Planning Framework and Planning Assumptions as a basis to move the Waterfront master planning process forward for further public review and consideration, the recommended next steps would be:

- **Amendment to the Interlocal Agreement –** Provide a proposed amendment to the existing Interlocal Agreement for consideration by the Port Commission and City Council, including budget authorization and estimated schedule for completing the Master Plan, FEIS, Development Agreement and Implementation Agreement.
- **Draft Master Plan** - Create a draft Master Plan for public review and comment, based on the proposed planning framework and planning assumptions.
- **Environmental Review –** Evaluate the draft Master Plan, as the preferred alternative for completion of a Final Environmental Impact Statement (FEIS) for the Waterfront District. If future proposed projects conform to the features analyzed and mitigation required in the FEIS, then no additional environmental review would be required.
- **Draft Development Agreement and Draft Implementation Agreement –** Complete these draft agreements between the Port and City for the Waterfront District, including, by way of example, the height and bulk of buildings, land uses, densities, block sizes, view corridors, setbacks, parking ratios, architectural design requirements, infrastructure and phasing, SEPA mitigation and other requirements.
- **Design Review** - Develop a clear and efficient process for design review to provide certainty to the community and potential public and private investors in The Waterfront District.

SUMMARY OF DRAFT WATERFRONT DISTRICT DEVELOPMENT REGULATIONS

Land Uses	
Waterfront District Mixed-Use	General mixed-use category for entire Waterfront District
Four Subzones: • Marine Industrial • Institutional Mixed • Commercial Mixed • Residential Mixed	Sub-zone boundaries shown in Figure A Specific uses in each subzone are listed in Table 1 No residential use allowed in Marine Industrial. Other sub-Districts are mix of commercial, residential.
Density and Height	
Minimum Site Area	None
Density	1-4 FAR per Figure B and Table 2 Density Bonuses
Maximum Building Height	35-200 feet per Figure C, with view corridors limited to 35 feet, and additional design criteria for tall towers.
Building Setbacks	No minimum
Floor Area Ratios (FAR)	FAR= Gross floor area of building space, excluding parking, mechanical, and elevators, divided by site ground area.
Base/ Maximum FAR	1.0 Base- 3.0 Max FAR in Marine Industrial Subzones 2.0 Base- 4.0 Max in Marine Trades Commercial Area 2.0 Base- 4.0 Max in Cornwall & Log Pond Area 3.0 Base- 5.0 Max in Downtown Subzone Area
FAR Bonuses	Maximum of 2 FAR bonus per building site, per Table 2
Design Standards	Design review for all areas except marine industrial uses within Marine Industrial subzone, if setback and screened.
Maximum Street Wall Height within 15 feet of public ROW	35' adjacent to C St, F St. Hilton St. view corridors 45 ' adjacent to view corridors in Down Town, Log Pond No building step backs along Commercial St. Green
Minimum Ceiling Height	14 feet for street level retail space
Tower Spacing	Towers over 100' tall must be spaced 80' apart
Max Floor Plate for Tall buildings	14,000 square feet for building portion over 100' 25,000 square feet for building portion over 75'
Building entrance spacing	75' maximum along public streets
Ground Floor Residential	Elevate ground floor residential 24" above sidewalk.
Weather Protection	5' wide minimum cover over 80% of street frontage

Blank Walls	Blank walls 50' or longer must provide wall modulation, window, door, landscaping, art work or design feature.
Ground Floor Details	All buildings adjacent to a public ROW shall provide <u>at least four</u> of the following elements: • Projecting window sills • Pedestrian scale signs • Exterior lighting sconces • Containers or window boxes • Interesting materials or architectural detailing • Artwork, sculpture, mural or water feature • Historic icons or interpretive displays • Benches or outdoor seating • Distinctive windows/ doors • Clock or information kiosk
Commercial Street Frontage	Min 20' depth commercial or civic use on ground floor street fronts in Commercial and Institutional Subzones
Transparency	50% glass façade along ROWs, parks, trails
Maximum Building Setbacks	Building front wall contiguous with sidewalk in Commercial and Residential subzones, other than 20' for recessed doors, seating and public plazas
Sustainable Design	Efficient outdoor lighting, reduce light pollution Use low water fixtures, reduce outdoor water usage Allow local food production Energy efficient buildings, fixtures and lighting Provide recycling facilities, recycle construction waste Commute trip reduction facilities or techniques
Minimum Parking Spaces	Residential: 1 parking space per unit Commercial and Institutional: 1 space per 500 SF Eating, drinking establishments: 1 space per 200' Churches or auditoriums- 1 space per 4 seats Hotels: 1 space per two rentable rooms Industrial, warehouse- 1 space per 5,000 SF Marinas: 1 space per two boat slips. Boat launches: 20 spaces for each ramp lane. 15% bicycle or car pool spaces Reduction for shared parking 25% reduction for bike, transit, CTR facilities
Parking Standards	Locate surface lots at side or rear. Max surface lot size- 2 acres Pedestrian walk way from parking lot to building
Complete Streets	COMPLETE CROSS SECTIONS AND STANDARDS
Landscaping	Minimum 40' Street Tree Spacing One tree per 20 cars in surface lots Screen parking lots, garages, waste disposal facilities
Signage	Same as Old Town



SECTION-CC

A	9-7-37	CAS	Added Framing for Chip Conv. in Sect. CC El. 134'-4"
B			
C			

REVISIONS

CAVIN, MARSHALL & BARR

CONSULTING INDUSTRIAL ENGINEERS

823 Puget Sound Bank Bldg. — Tacoma, Wash.

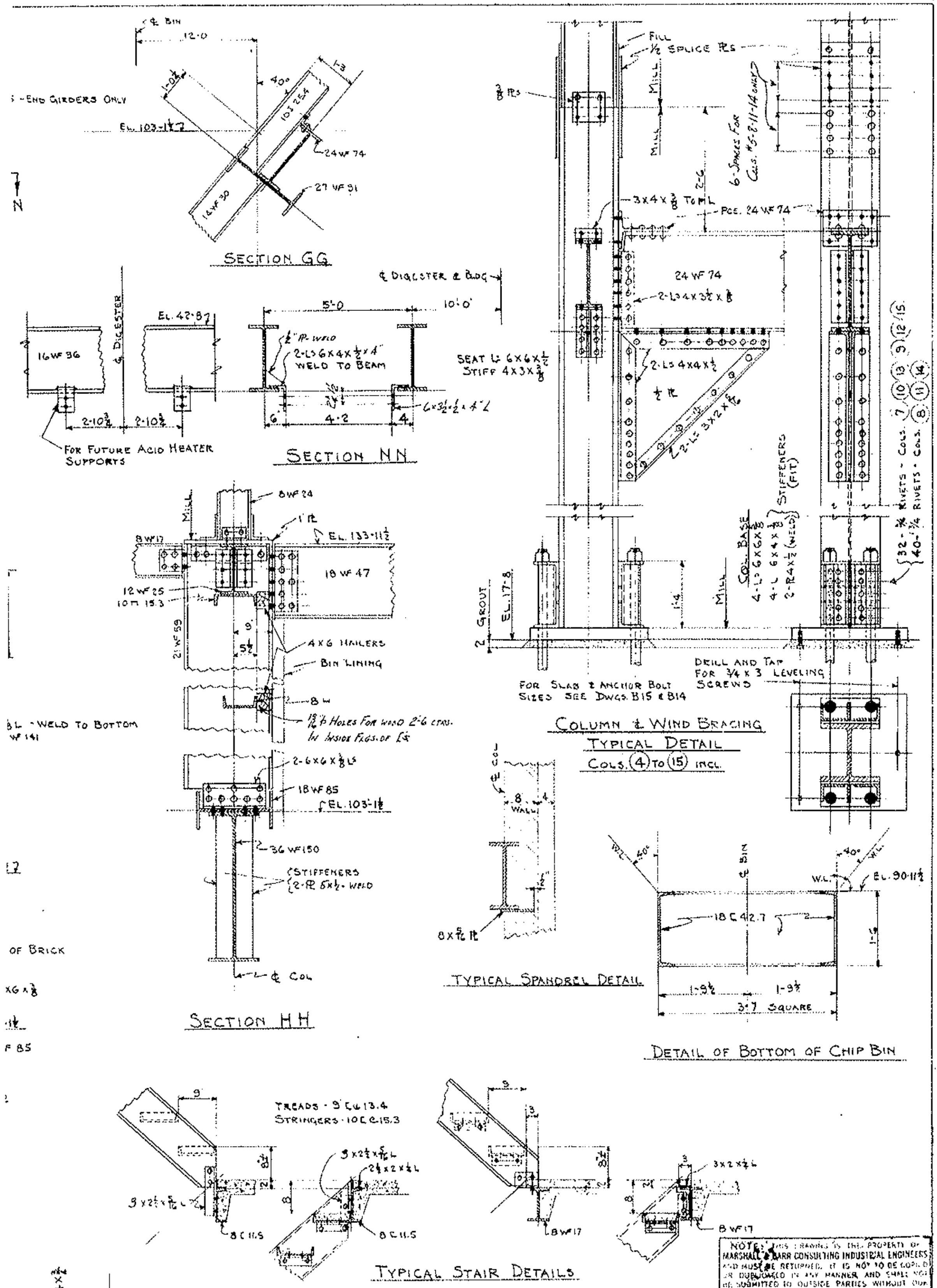
TITLE: Digester Bldg.-Steel Framing-Sections

JOB: 40,000 Ton Unbleached Sulphite Mill

OWNER: Puget Sound Pulp & Timber Co

LOCATION: Bellingham Wash — SCALE: 3/16"=1'-0"

MADE BY	CHKD. BY	APPROVED BY	JOB NO.	DRAWING NO.	ISSUE
E.W.F. 6-18-37	C.W.B. 7/26/37		101	B15	A



REFERENCES
STEEL FRAMING PLANS - DWG. B14
SECTIONS THRU BLDG. - DWG. B15

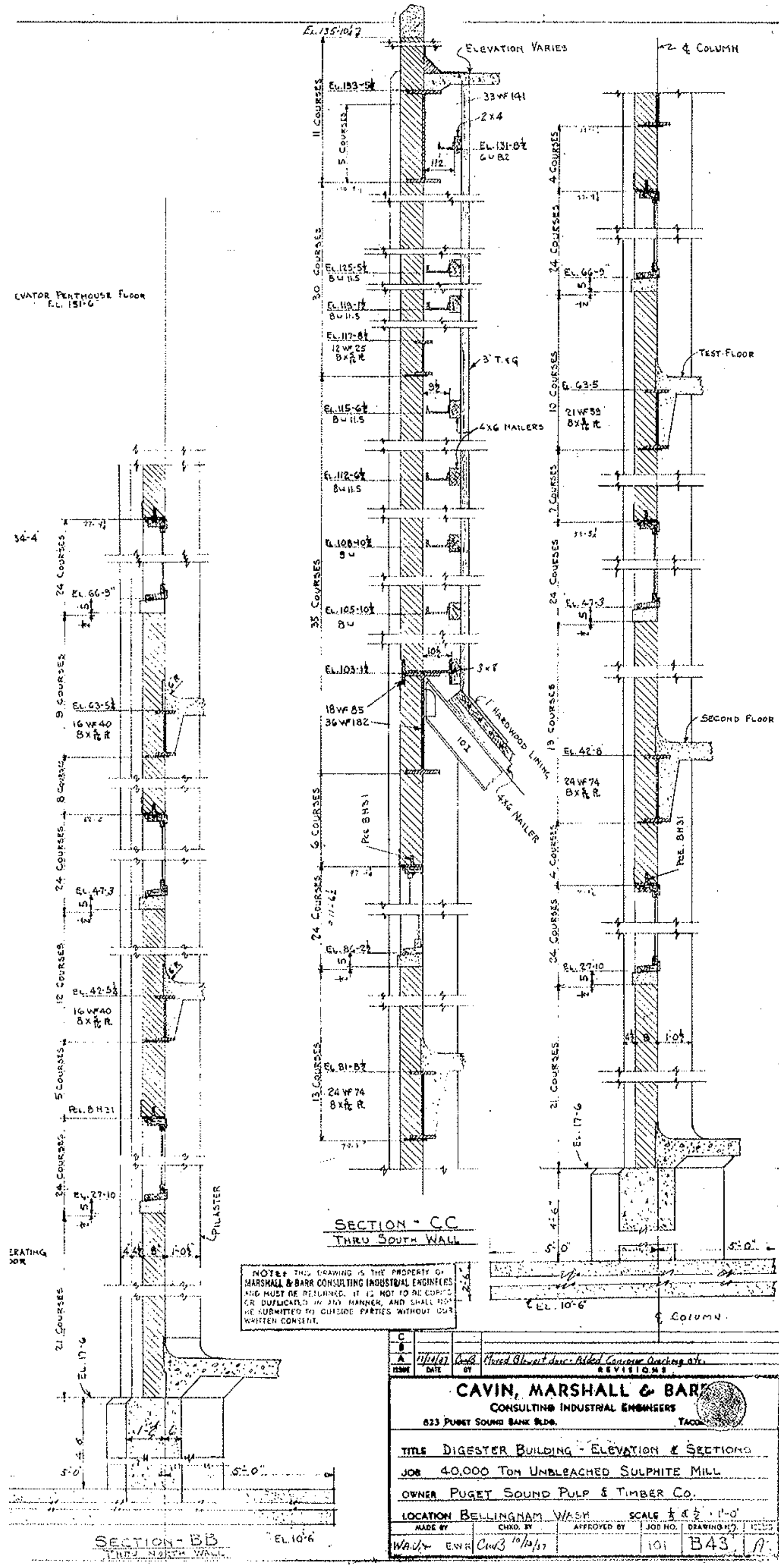
NOTES
RIVETS 3/4 Φ; HOLES 13/16 UNLESS NOTED

ISSUE	DATE	BY	REVISIONS
C			
B			
A			

CAVIN, MARSHALL & BARR
CONSULTING INDUSTRIAL ENGINEERS
628 PUGET SOUND BANK BLDG.

TITLE DIGESTER BLDG - STEEL FRAMING - SECTIONS
JOB 40,000 TON UNBLEACHED SULPHITE PLANT
OWNER PUGET SOUND PULP & TIMBER CO.
LOCATION BELLINGHAM, WASH. SCALE 1/8 - 1/4 - 3/4" - 1'-0"

MADE BY	CHK'D BY	APPROVED BY	JOB NO.	DRAWING NO.	REV.
E.W.F.	CMB 5/6/37		101	B30	


SECTION - BB
THRU NORTH WALL
SECTION - CC
THRU SOUTH WALL
ELEVATION VARIES
¢ COLUMN
TEST FLOOR
SECOND FLOOR
PILASTER
1" HARDWOOD LINING
4x6 NAILER
4x6 NAILERS
3" T.&G.
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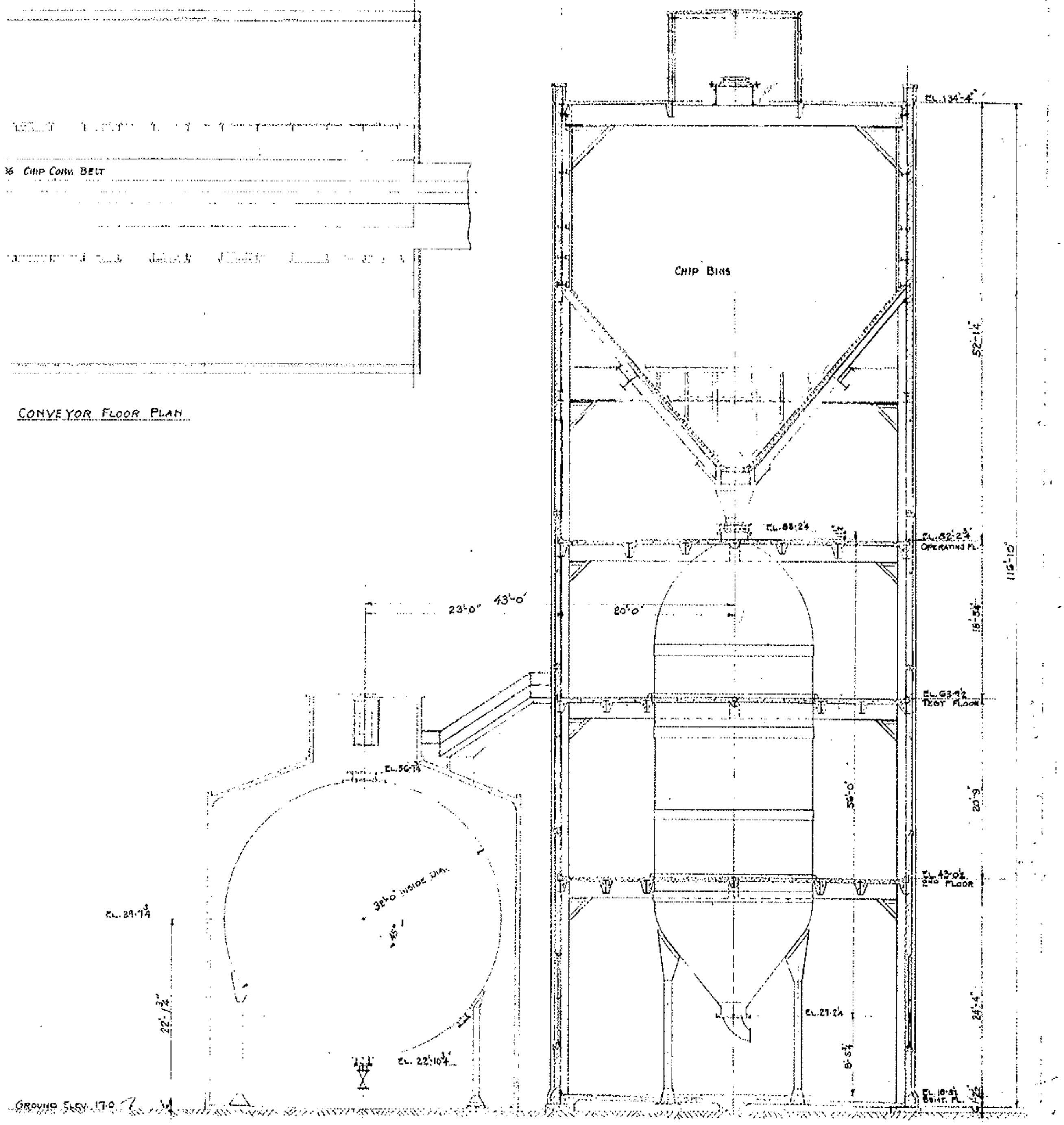
REVISIONS
CAVIN, MARSHALL & BARR
CONSULTING INDUSTRIAL ENGINEERS
823 PUGET SOUND BANK BLDG.
TITLE DIGESTER BUILDING - ELEVATION & SECTIONS
JOB 40,000 TON UNBLEACHED SULPHITE MILL
OWNER PUGET SOUND PULP & TIMBER CO.
LOCATION BELLINGHAM, WASH.
SCALE 1/8 & 1/2 = 1'-0"
JOB NO. 101
DRAWING NO. B43
A



Conveyor Floor Plan

Cross Section thru Digester & Accumulator

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ISSUE	...	BY	REVISIONS
C			
B			
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CAVIN, MARSHALL & BARR
CONSULTING INDUSTRIAL ENGINEERS
823 Puget Sound Bank Bldg. Tacoma, Wash.

TITLE Digester Bldg.- Typical Sections
JOB 40,000 Ton Unbleached Sulphite Mill
OWNER Puget Sound Pulp & Timber Co.
LOCATION Bellingham, Wash. SCALE 1/8"=1'-0

MADE BY	CHK'D BY	APPROVED BY	JOB NO	DRAWING NO	ISSUE
H.A.K.	H.M. 4/20-37		101	B-37	

#6 Steam Plant








Appendix D: Industrial Equipment & Historical Elements

#8 Barking & Chipping

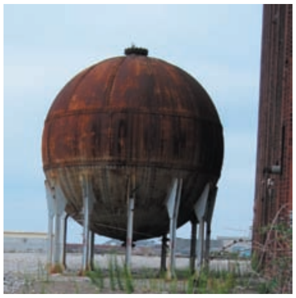







Appendix D: Industrial Equipment & Historical Elements

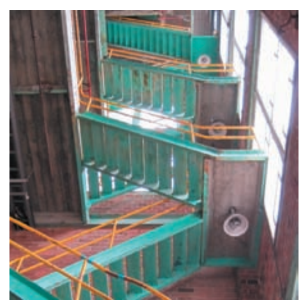
#13 Digester Building






#17 Alcohol Plant






6 Steam Plant

Structural Aspects:

- Building Structure
  - Steel beams/columns
  - No diaphragm (steel grating or voids)
  - Floors consist of reinforced concrete or steel grating
  - URM (non load bearing) perimeter façade. Relieved every floor. Neglect for lateral strength
  - S/SW side has BF (concentric). Composed of back to back angles. No other lateral system to counter act forces in braces. Ignore for analysis.
  - Foundation – expected timber piles with reinforced concrete pile caps
  - Roof – cast-in-place
  - West façade has differences in construction time periods
- Very large boilers in building
- Smoke Stack – very slender, major issues likely
  - No foundation info/drawings available for stack

Structural Recommendations:

- Remove the smoke stack prior to opening the local area to pedestrian traffic.

If structure determined to remain with adaptive reuse:

- Remove the existing mechanical equipment, boilers, and steel grating.
- Install steel floor systems where voids are created by removal of the boilers.
- Install metal deck systems with concrete fill where voids are created or where steel grating currently exists to reconstruct the floor system for reuse.
- Potentially, two new floors may be introduced on the south portion of the building to infill the rest of the structure. A steel framed system with concrete filled metal deck would likely be used. New columns would likely posted up from the existing framing where necessary.
- Remove and replace existing slab at grade below the boilers.
- Provide strong backs to the URM walls over the entire upper story, the entire west façade (if not penetrated with windows), and approximately 25% of the rest of the façade.
- Install lateral framing bays (equal each face) in each building axis (likely consisting of steel braced frames).
- Improve connections along same lines of retrofitted lateral frames.

If structure determined to remain without adaptive reuse:

- Provide strong backs to the URM walls over the entire upper story, the entire west façade (if not penetrated with windows), and approximately 25% of the rest of the façade.
- Close structure to all non-authorized entrance.

7 Granary

Structural Aspects:

- Building Structure
  - Possible multiple additions and/or renovations at various points in time.
  - Wood framed interior with exterior concrete perimeter bearing walls for a majority of the original structure.
  - 1st floor, basement slab, columns and exterior walls in between are substantial, cast in place concrete.
  - The hopper area (NW corner) is constructed from wood (from foundation).
  - First floor framing is composed of a two way flat plate with drop caps and fluted column capitals on octagonal columns.
  - Second floor framing is composed of heavy timber framing
  - Third floor is lighter timber framing with perimeter concrete walls.
  - Perimeter walls of the hopper changes to a corrugated metal exterior.
  - An additional 4th floor has light timber framing, the south and east faces are concrete (potentially north as well) and the west face looks to be hollow clay tile with numerous window openings.
- Limited information on building.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- Provide waterproofing system along West wall or provide drainage system to reduce overflow water.
- Remove top story of main building (east half) or provide one bay on the west face of wood shear panel w/ appropriate hardware.
- Provide plywood layer on each floor on top of the existing wood flooring (w/new attachments).
- Install a new frame w/diagonal struts at the skylight and adequately attach to the surrounding structure.
- Provide structural hardware at the skylight opening and perimeter walls to anchor wood systems.
- Infill additional bay(s) with structural wall at the ground floor.
- Install additional lateral system and associated connection hardware in Northeast corner/hopper at the upper floors (connect to existing concrete walls below).
- Remove of the CMU structure to the south.

If structure determined to remain without adaptive reuse:

- Close structure to all non-authorized entrance
- Analyze perimeter wall system for unbraced requirements
- Either remove upper Northeast corner above 3rd story elevation or install suitable bracing system to protect the existing structure without a lateral system.
- Tie all floor systems adequately to the exterior perimeter walls.

8 Barking and Chipping

Structural Aspects:

- Building Structure
  - In plan, a z-shaped building with 3 stories (1 large story with mezzanines).
  - Rooftop penthouse of unknown composition. The west-most portion has a slightly higher roof level than the rest, approximately 8'.
  - Steel framed with concrete and steel grating floors. Extensive equipment remains in place, interrupting the framing and floor systems. No access to the 2nd story.
  - Roof composed of precast concrete panels framing to steel beams below. Horizontal diagonal bracing seen at locations. The west-most portions appeared to be only steel grating floors. The east portion is concrete with encased steel beams.

Structural Recommendations:

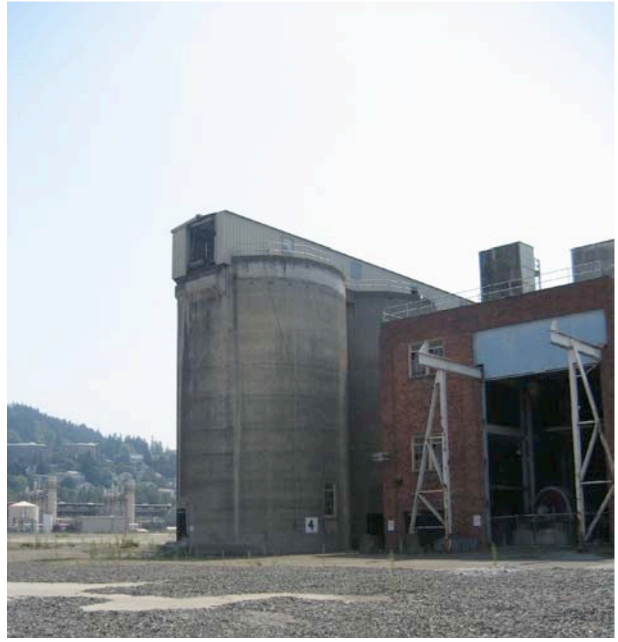
If structure determined to remain with adaptive reuse:

- Remove the existing equipment and existing steel grating.
- Lateral system is required - the size of which may be larger due to the large story heights.
- Columns likely need strengthening to accommodate the increase in axial demand.
- Beams occurring at the reentrant corners likely need strengthening from lateral system demands.
- Connections at the reentrant corners would likely need retrofitting to transfer the forces.
- Potentially new floors introduced in the East and West portions of the building for infill. This would likely be the case where steel grating is removed also.
- Provide strong backs to the URM walls over the entire building.
- The south portion of the West-most face needs a new façade.
- Masonry detailing would need to be developed for any new floors for any potential movement induced damage.

If structure determined to remain without adaptive reuse:

- With more study/information, perimeter foundations would likely need augmentation for lateral demand. This would be designed for stability and would allow the structure to remain without occupancy.
- Close structure to all non-authorized entrance.

9 Chip Bins



Structural Aspects:

- Approximately 20' in diameter concrete CIP cylinders. There are large openings as access points on the West faces. Internal ribs are present which appear to be reinforced with longitudinal reinforcement. The ribs stop at the base of the seat for the steel chip bins inside and serve as bearing points.
- The bins appear cast integral with each other and have an interior doorway between them. They meet on the tangents and a short portion of the areas between them appear to be filled and integral with the sidewalls.
- Access to the top was not possible.
- The steel chip bins prevent any visual observation from the underside. The exterior view reveals a top penthouse housing a conveyor system, which possibly fed the bins via hole(s) in the roof.
- The roof appears CIP concrete with conveyor penetrations.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- Perimeter foundations would likely require retrofitting for lateral stability. A new reinforced concrete pile cap would likely be needed to tie the existing and new foundations together.

If structure determined to remain without adaptive reuse:

- With more study/information, perimeter foundations would likely need augmentation for lateral demand. This would be designed for stability and would allow the structure to remain without occupancy.
- Close structure to all non-authorized entrance.

12 Board Mill

Structural Aspects:

- Building Structure
  - 2 story building approximately 350'x70' wide
  - The 1st elevated story is steel framed with a concrete floor. East end of the building has large existing concrete tanks that seem to support the floor above in this area. The column grid in the West area is extremely tight. Some columns are eliminated to the East.
  - The 2nd story of the building is a large open space with one interior column line. Most of the columns below are discontinuous and only support the 1st elevated floor. The columns span approximately 30'. The beams supporting the roof are continuous across the interior column. Horizontal beams run the length of the building on the interior and exterior columns (maybe for crane usage).
  - The roof structure is precast concrete panels landing on steel purlins to steel frames. At some locations, horizontal diagonal bracing exists just below the roof line connecting the roof structure together.
  - The perimeter walls appear to be non-load bearing URM and also appear to be from different construction dates, as their color varies. Previously existing windows appear to have been infilled.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- The existing roof may need removal and replace with a metal deck roofing to both lighten the structure and provide a consistent material for a designed diaphragm.
- New floors, if introduced, would likely be from steel framed system with concrete filled metal deck. The same system would likely be used where steel grating is removed. Existing pile foundations may limit the ability to add floors.
- A new lateral system (estimated as a braced frame) is likely necessary. They would be placed on the perimeter in each direction.
- Connections at the lines of the lateral system would be retrofitted to transfer the forces.
- Perimeter foundations at new lateral systems would likely need retrofitting. A new pile cap would be needed to tie the existing and new pile foundations together.
- The new interior bay of installed lateral system would require a new grade beam for the width of the building (approximately 70' plus approximately 20'). The slab on grade at this area would need to be both excavated and repaired at this location.
- The building's URM walls would likely need supplementary strong backs over the entire building.
- Masonry detailing would need to be developed for any new floors to prevent movement induced damage.
- Masonry impacts/repairs would likely occur as a result of placement of the lateral system.
- The removal of the interior tanks would likely be necessary and the subsequent reframing of any involved building structure.

If structure determined to remain without adaptive reuse:

- Close structure to all non-authorized entrance.

13 Digester

Structural Aspects:

- Building Structure
  - Composed of different buildings jointed and constructed at different times.
  - The overall structure is approximately 230’x40’ wide. It is 6 stories tall (approximately 125’). It is composed of approximately 9 bays with the last bay (East-most) being constructed to the most recent code. The first three bays are the original and the 2nd three were built to match. The next set of two were added later and are not as tall.
  - The floors are constructed of steel beams with concrete slabs spanning between.
  - Large digester tanks occur in each bay. These are approximately 12’ in diameter. These interrupt the floor system, causing large voids. On the 3rd floor the digesters end and the chip bins above are present. The bins are hung from the framing above and do not bear on the interior columns. A horizontal wide flange runs the length of the building and wide-flange struts frame from this back to the columns.
  - The East-most bay is the newest construction and has concentrically braced frames in the East-West direction and moment resisting frames in the perpendicular direction. There is an expansion/isolation joint between the two buildings (runs full height).
  - The roof is composed of precast concrete panels for the west-most 6 bays. The other three bays have metal deck for roofing.
  - Façade – double wythe URM looks to be relieved at each floor.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- The removal of the digesters would reduce the demands on the foundations. If a portion of the digesters is determined to remain, recommend a symmetric pattern as relating to the building axis (ie, one digester left at each end).
- Three new floors are a possible re-use recommendation, added above the third floor. These would likely be steel framing with concrete filled metal deck. This framing could also be used at places where the digesters are removed. Existing pile foundations may limit the addition of new floors.
- A new lateral system composed possibly of bays of braced frames or reinforced concrete shearwalls each direction would likely need to be installed.
- Connections at the lines of the lateral system would be retrofitted to transfer the forces.
- Perimeter foundations where the lateral systems land would likely need be retrofitting using new piles and pile caps to tie the existing and new systems together.
- The URM walls will likely need retrofitted strong backs over the entire building.
- Masonry detailing would need to be developed for any new floors to prevent movement induced damage.
- New mechanical equipment placed on the roof would require structural steel framing posting off existing columns.
- In the event that the existing concrete addition (East-most) remains, the expansion/seismic joint between the structures may be filled and the buildings connected with steel struts occurring at the columns on each floor.
- Stair wells may be re-constructed of pre-fabricated metal stairs with structural steel support framing to lighten structure.
- New elevator(s) would likely need to be installed.

- The accumulator may remain at its current location unchanged. If to be relocated, new foundations would be needed.

If structure determined to remain without adaptive reuse:

- The removal of the digesters/chip bins would be recommended to reduce the demands on the foundations.
- A new lateral system to brace any remaining portions of the building would likely be necessary to prevent damage to the structure and/or surrounding structures during a seismic event. This system may be external bracing reaching up the wall system (possible steel frame with concrete foundations and/or piles).
- The tying together of the two portions of the buildings may be recommended for structural stability.
- Recommend perimeter fencing for an approximate perimeter of the structure's height plus nominal distance.
- Close structure to all non-authorized entrance.

14 Pulp Screen Room

Structural Aspects:

- Building Structure
  - Concrete framed for the 1st and 2nd story. Square columns with deep girders and smaller joists.
  - 1st story - Existing concrete vaults are located on the first floor, which look to support the floor system above. They are very large, approximately half the total building footprint. The interior space between tanks is framed with columns and beams. Vaults look to act as a lateral system for 1st floor.
  - The 2nd floor is a concrete slab with a tall story. Internal bays have structural bracing for added crane (north south direction).
  - The 3rd floor is a concrete slab with concrete beams and columns.
  - Roof – two different heights. Both had wood joists framing to steel girders. The South side has beams and wood post columns. The North side is steel framed with beams and an extremely high ceiling. Roof is looks light and flexible.
  - Façade – URM appears to be relieved at every floor with the outer wythe landing on a steel ledger at the bottom of perimeter concrete beams and the interior landing on the concrete slab.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- The addition is likely of strong backs to the URM walls over the entire building.
- The additional of a continuous plywood diaphragm at the roof with positive connections to the existing steel beams.
- Recommend the removal of the lower level roof.
- The installation of a possible braced frame system consisting of cables/rods with connections to the existing concrete structure below.
- Recommend the addition of a concrete topping slab to infill the 2nd floor or remove the added thickness/slopes/curbs to provide a consistent floor plate.
- Infill the existing exterior skin penetrations with masonry restoration

If structure determined to remain without adaptive reuse:

- The addition is likely of strong backs to the URM walls over the entire building would be used to prevent skin degradation and/or fall hazards during a seismic event.
- Close structure to all non-authorized entrance.

15 Bleach Plant

Structural Aspects:

- Building Structure
  - Approximately 65' wide x 150' long
  - The 1st and 2nd elevated stories are concrete framed with the top story being steel framed
  - The lowest story has large vaults likely supporting the 1st elevated story. There are large concrete columns located on 1st floor—assumed to be a result of the large machinery and the imposed reactions on the 2nd elevated floor.
  - The 1st elevated floor system appears to be a heavy concrete slab and deep concrete beams.
  - The 2nd story has a large braced frame on the two middle bays underneath previous likely large machinery on the 3rd floor.
  - The roof is steel framed with large trusses spanning the entire width of the building. The bottom of steel is approximately 45' from the floor slab. These are supported by steel columns oriented strong to the truss and have intermediate bracing in the weak axis at approximately 20' and 45' elevations.
  - A concrete framed mezzanine exists on the eastern 1/3 of this floor.
  - The roof is composed of precast concrete panels spanning between steel purlins. Horizontal diagonal bracing exists at the lowest chord of the truss.
  - The perimeter walls are non-load bearing URM. These appear to be relieved at the intermediate column bracing.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- The existing roof would likely be removed and replaced with a metal deck roofing to reduce weight and provide a continuous diaphragm.
- If program does not support the existing interior tank structures, the tanks should be selectively removed and replacement framing constructed back for deck support.
- New floors, if introduced, would likely be steel framed with concrete filled metal deck. New columns introduced to align with columns below.
- Existing pile foundations may limit the ability to add floors.
- A new lateral system (likely braced frames) would likely be added on the perimeter in each direction with an internal bay in the North-South direction.
- Connections at the lines of the lateral system would likely be retrofitted to transfer the forces.
- The likely addition of strong backs to the URM walls over the entire building would be used to prevent skin degradation and/or fall hazards during a seismic event.
- The east face would likely need replacement/repair for the masonry skin.
- Masonry impacts would occur as a result of placement of the lateral system.

If structure determined to remain without adaptive reuse:

- Brace or provide out-of-plane structures for the unbraced columns, beams, and masonry forming the upper-most space on the East end of the building.
- Close structure to all non-authorized entrance.

17 Alcohol Plant

Structural Aspects:

- Building Structure – appears to be 4 different interconnected buildings.
  - The 1st building on the North face is 2 stories with steel framing. It has a large 1st story, approximately 20' tall. The floors above are steel framed with a concrete floor slab.
  - The 2nd building on the West face is a 1 story building with steel framing. The roof is composed of long span (approximately 75') steel trusses approximately 40' in the air. Wood beams span between the trusses with wood planking in between. Large tanks are housed in this building and appear to be supported on wood blocking and/or pile foundations.
  - The 3rd building on the East face is a 4 story structure. It is steel framed on all floors. The floors are concrete spanning between steel joists. Large floor openings exist on portions for existing and pre-existing steel tanks. Steel mezzanines exist throughout and are largely steel grating. The steel columns are spliced approximately 2' above the floor line.
  - The 4th building appears to be a mirror of the 1st building across East-West axis of the building.
- All interconnected buildings have a perimeter, non-load bearing URM.

Structural Recommendations:

- Both segments may need to be treated separately, as their connection may prove to be a concern to the overall performance of the building. Also, the creation of a joint is possible that may allow both to remain.

<u>If the Warehouse is determined to remain with adaptive reuse:</u>

- There may be an option to completely disassemble and relocate the entire existing portion of the building to another site within the property. If option exercised, new foundations and new roof diaphragm would be likely.
- The existing roof should be removed and replaced with a metal deck roofing to reduce weight and provide a continuous diaphragm.
- A new lateral system (likely, a braced frame) would likely be added on the perimeter.
- Connections at the lines of the lateral system would likely be retrofitted to transfer the forces.
- Perimeter foundations are likely necessary where the new lateral systems land (possibly between column lines). A new concrete pile cap would likely be needed to tie the existing and new pile foundations together.
- The likely addition of strong backs to the URM walls over the entire building would be used to prevent skin degradation and/or fall hazards during a seismic event.
- Masonry impacts would occur as a result of placement of the lateral system.
- A new façade would be required on the currently shared east end of the building (if separated segments).
- A new concrete slab is required.

<u>If the Taller East Structure is determined to remain with adaptive reuse:</u>

- New floors, if introduced, would likely be a steel framed system with concrete filled metal deck . This would also be used at places where steel grating is removed or where current voids exist at the upper levels. New columns (where necessary) would need to align with columns below (2 PSF).

The existing columns would receive additional bracing or material added to them (1 PSF). Existing pile foundations may limit the ability to add floors.

- A new lateral system (likely braced frames) would be added on the perimeter in each direction.
- Connections at the lines of the lateral system would likely be retrofitted to transfer the forces.
- Perimeter foundations where the lateral systems land (East and West faces of the 'taller' portion) would likely need retrofitting. A new pile cap would likely need to tie the existing and new pile foundations together.
- The likely addition of strong backs to the URM walls over the entire building would be used to prevent skin degradation and/or fall hazards during a seismic event.
- Masonry detailing would need to be developed for any new floors to prevent movement induced damage.
- Masonry impacts would occur as a result of placement of the lateral system.
- Masonry along north & south faces, at upper stories, to be removed if exterior upper floors are added. New cladding system to be added along the perimeter of those added faces/stories consisting of brick veneer on steel studs backup.

If full structure determined to remain without adaptive reuse:

- Establish the capacity/demand on the foundations (and possible activity to correct) for design lateral loading.
- Close structure to all non-authorized entrance.

37 Pulp Storage (machine shop)

Structural Aspects:

- Building structure
  - 1 story steel framed warehouse type structure.
  - South side – nearly identical but newer framing system.
  - East end – truss structure (4 bays) on east end. No intermediate columns.
  - Roof – precast concrete panels on steel purlins landing to structural steel framing. Horizontal diagonal x-bracing in roof.
  - Façade: North and West faces open. All others full height URM walls.
- Appears to be two buildings connected to each other - one looked like future addition

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- The existing roof should be removed and replaced with a metal deck roofing to reduce weight and provide a continuous diaphragm.
- If the building is possibly split and relocated, the resultant segments would both need multiple bays of lateral systems, depending on length of each building. This would most likely be composed of a rod or cable x-bracing system in its simplest form. A new column line to replace the shared column would most likely match the existing one. New foundations would be necessary for the relocated segments (with a new pile cap to tie the foundation systems together).
- If the building remains in same location, foundation alterations are likely to support an upgraded lateral system - with a need for more study to determine the extent.
- The existing masonry would likely require strong backs to the URM walls over the entire building brick faces and parapets.

If structure determined to remain without adaptive reuse:

- A new lateral system to brace any remaining portions of the building would likely be necessary to prevent damage to the structure and/or surrounding structures during a seismic event. This system may be external bracing reaching to the roof system (possibly a steel frame with concrete foundations and augercast piles/spread footings).
- Close structure to all non-authorized entrance.

49 High Density Tanks

Structural Aspects:

- North Tank
  - North tank approximately 25' diameter lower portion, with 40' diameter upper portion
  - The mortar of North tank looks in good condition
  - Limited penetrations occurring on the South face.
- South Tank
  - Tank approximately 30' diameter
  - The mortar looks to be in a slightly weakened condition (verified by scratch test). Some mortar flaking potentially due to the storage of bleached pulp in the tank
  - Numerous penetrations occurring almost on the ¼ points around base.
  - Additional angles placed around the base of the structure with angle and epoxy embedment into concrete foundation 'cap'.
- Façade – Both have exterior-grade, glazed/sealed brick in good condition
- The tops of the tanks appear to be precast concrete sloped domes.
- Access to the tank interiors or tops was unavailable.

Structural Recommendations:

If structure determined to remain with adaptive reuse:

- Perimeter foundations where the lateral systems land would likely be retrofitted
- A new reinforced concrete pile cap would likely be needed to tie the existing and new pile foundations together (for both structures).
- The steel bridge between the two tank structures would likely be removed.

If structure determined to remain without adaptive reuse:

- The same foundation remediation as mentioned above would be recommended if they presented a fall hazard or, if possible, simply fencing off an approximate perimeter of the structure's height.
- Close structure to all non-authorized entrance.

00 Site Soils

Structural Aspects:

- Based upon a archive drawing search and study from existing materials from site structures, the site is composed of loose fill material on beach/intertidal deposits over bedrock. The soils are liquefiable with a moderate to high potential during a large earthquake event. Lateral spreading is a potential hazard as a result of the liquefiable soils at the site
- The soils look to have a low level of contamination as a result of the site historical uses.
- Based on information obtained in the existing structural drawings for several site structures, all appear to be supported on cedar or fir piles with reinforced concrete pile caps. Due to the inability to visually inspect and the lack of any apparent damage associated with typical foundation settlement, the piles are assumed to be in good condition.
- The pile layout plans have no information relating to the required depth of embedment and are therefore, assumed to be driven to resistance.

Structural Recommendations:

For the site:

- Options for soil remediation should be explored to mitigate liquefaction tendencies and improve individual structural performance.
- Options to reduce the tendency of the soil to laterally spread during a seismic event should be investigated, especially along the waterfront.

For the area involved in a remediated or new structure:

- The use of foundation systems to isolate the structure from the soil (ie installed structural piles, deep foundations to bearing) should be considered as a primary method to successfully avoid their detrimental effects.
- Note the possible effects of differential movement between soil and building
- Note the effects of planned soil/grade alterations and details of elevated arterials on the ground plane, watertable, drainage systems, groundwater run-off collection and treatment, and elevation of building utility exits as compared to entrances to city utility collection systems.
- Where existing structures are to remain or be adapted, assessment of existing wood piles should be performed to verify condition and capacity.

00 Site Structures

Structural Aspects:

- Minimal information was recovered detailing the construction materials, techniques, and details associated with the existing site structures
- Minimal information was recovered detailing the foundations, connection details, secondary support systems, or assumed load transfer capacities for the existing foundation/substructure systems for any site structures.
- Based on information obtained in the existing structural drawings for several site structures, all appear to be supported on cedar or fir piles with reinforced concrete pile caps. Due to the inability to visually inspect and the lack of any apparent damage associated with typical foundation settlement, the piles are assumed to be in good condition.
- The pile layout plans have no information relating to the required depth of embedment and are therefore, assumed to be driven to resistance.
- Perimeter walls are often non-load bearing URM. They encapsulate steel columns and typically the perimeter framing members. No specific detailing of how the masonry is detailed into deck edge.
- Expected foundation on most structures expected as wood piles with reinforced concrete pile caps.
- Minimal information was recovered discussing the existing soil conditions, stratification, typification, or bearing capacities of existing site soils

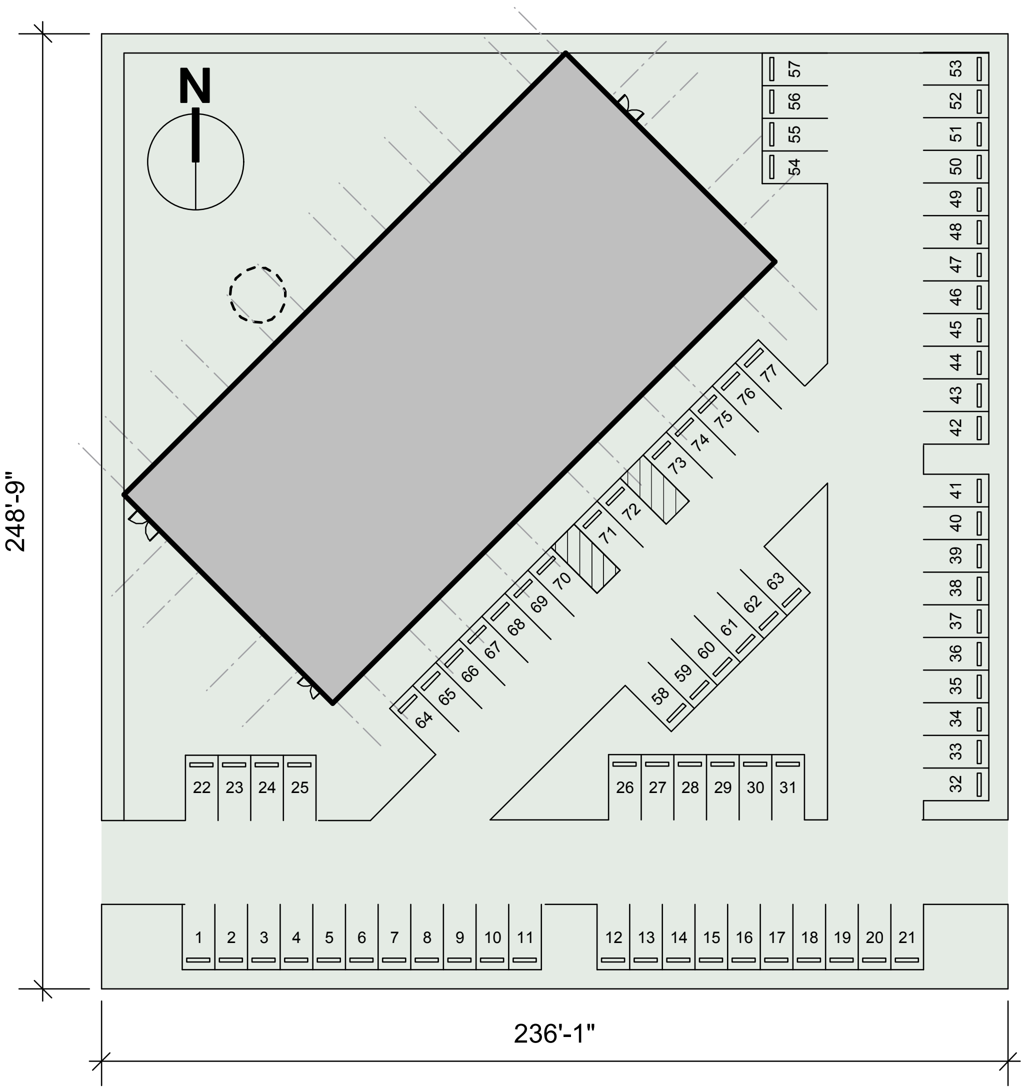
Structural Recommendations:

- Any adaptive reuse of an existing site structure will require more detailed structural analysis for gravity and lateral systems, load path and load path alterations for programmatic use, and foundation assessment for existing and future capacity for bearing, uplift, moment, and shear.
- Either remaining with or without adaptive re-use, site structures will often require a strong back system to support the existing URM (where exists),
- The addition of new, enlarged, or significantly altered floors or floor area to any existing site structure will require the assessment and potential analysis of the existing foundations and load path for feasibility.
- Any alteration to a site structure will likely require an assessment and/or alteration to the perimeter foundations for increases in lateral demand.
- The use of foundation systems to isolate the structure from the soil (ie installed structural piles, deep foundations to bearing) should be considered as a primary method to successfully avoid their detrimental effects.
- Where existing structures are to remain or be adapted, assessment of existing wood piles should be performed to verify condition and capacity.

#6 Steam Plant Test-for-Fit Diagrams

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



SITE PLAN

SCALE: 1" = 50'-0"

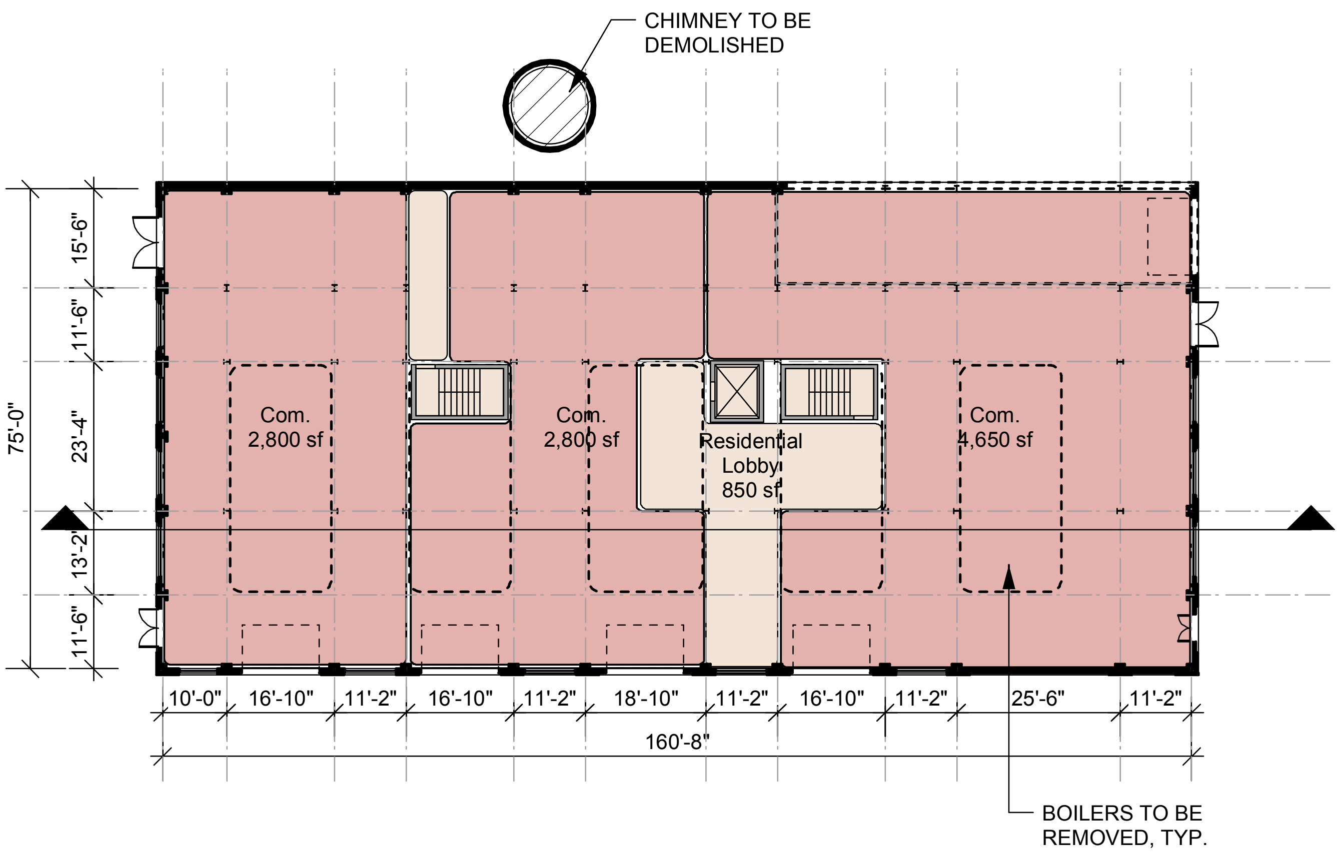
58,725 SF SITE AREA

56 RESIDENTIAL STALLS (1 PER UNIT)

21 COMMERCIAL STALLS (10,250/500 = 20.5)

77 STALLS

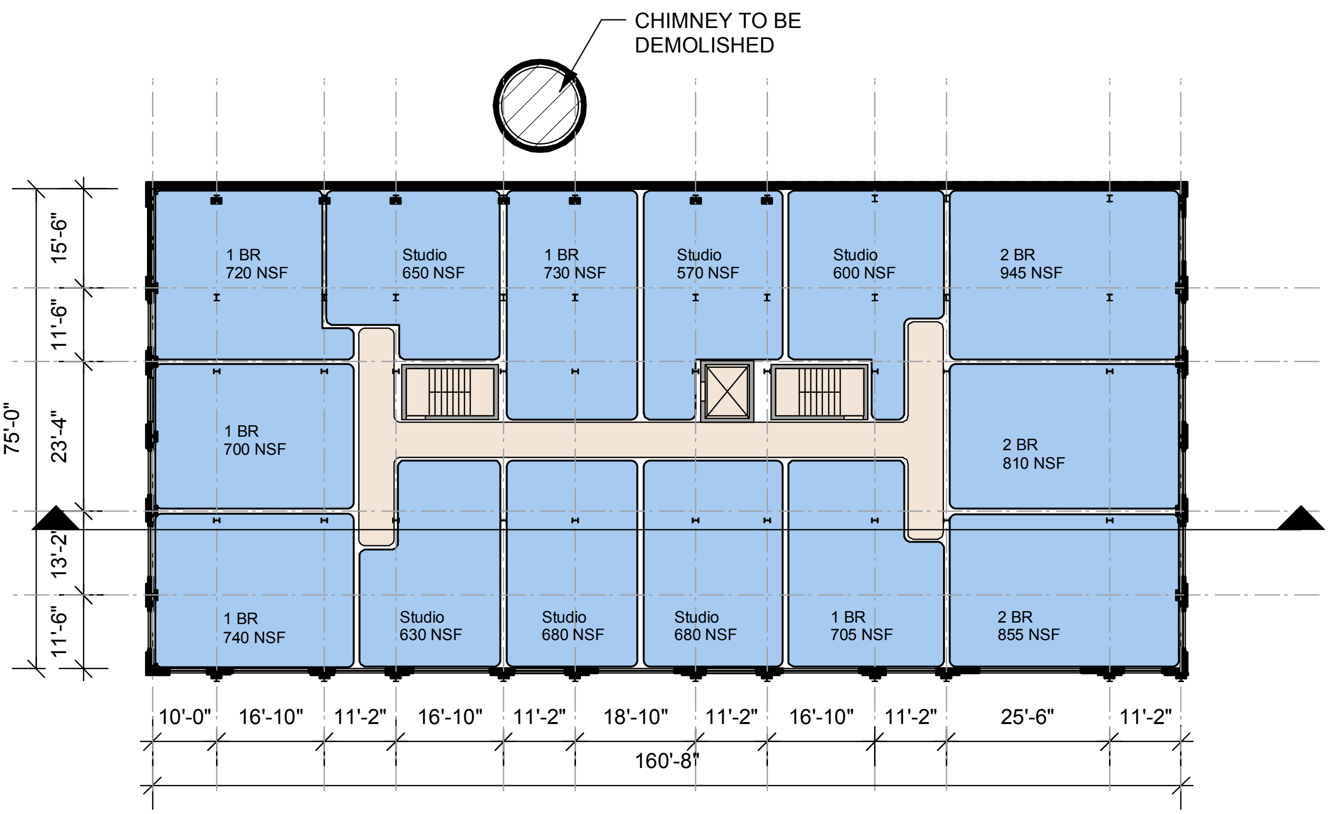
6. BOILER HOUSE/ STEAM PLANT



GROUND FLOOR PLAN
SCALE: 1" = 30'-0"

COMMERCIAL
12,500 GSF
10,250 NSF

6. BOILER HOUSE/ STEAM PLANT



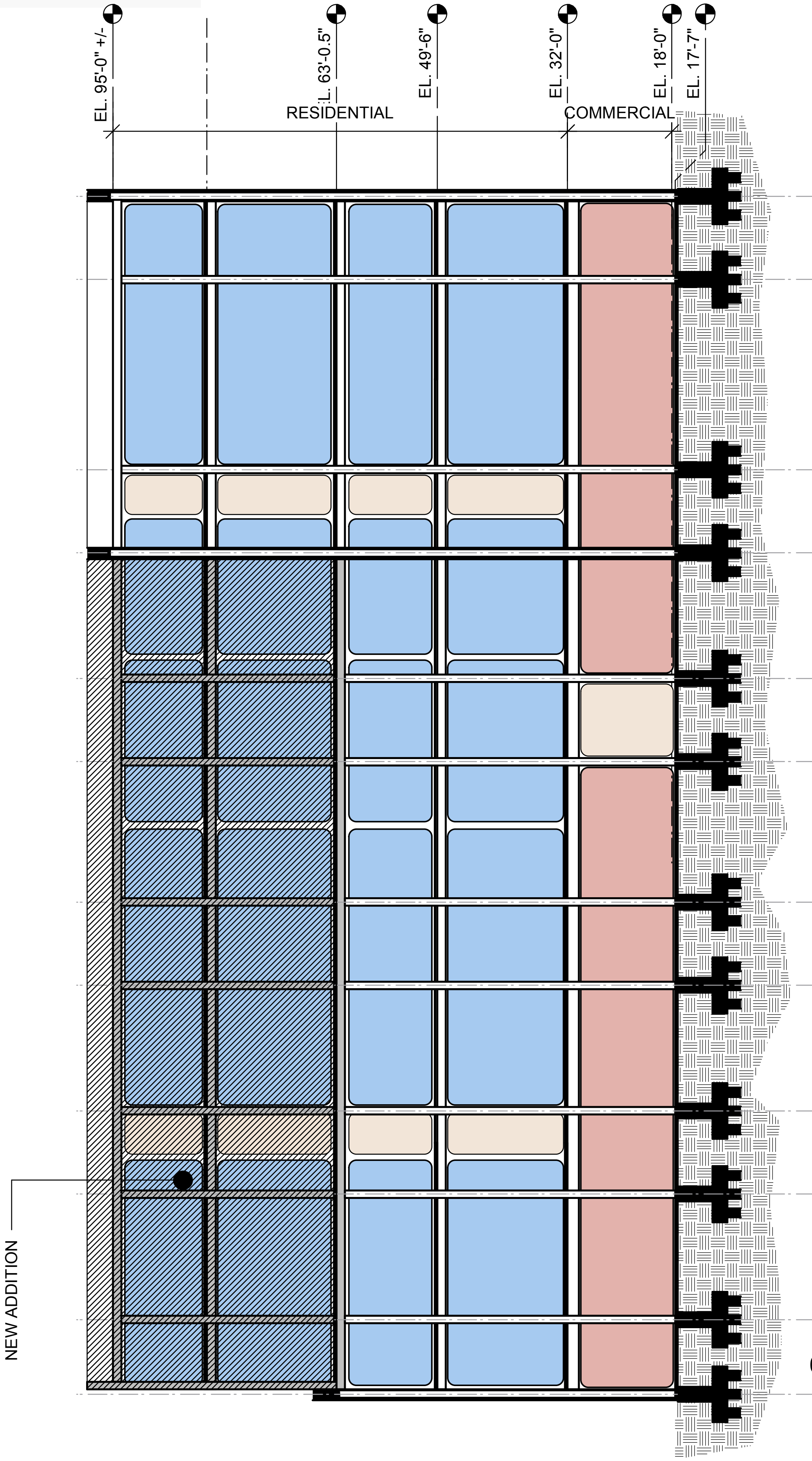
BOILER/ STEAM PLANT TYPICAL FLOOR PLAN
SCALE: 1" = 30'-0"

12,500 GSF
10,000 NSF
80% EFF.
14 UNITS/FL.
715 NSF AVG.

14 UNITS
2 BEDROOM: **3**
1 BEDROOM: **5**
STUDIO: **6**

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



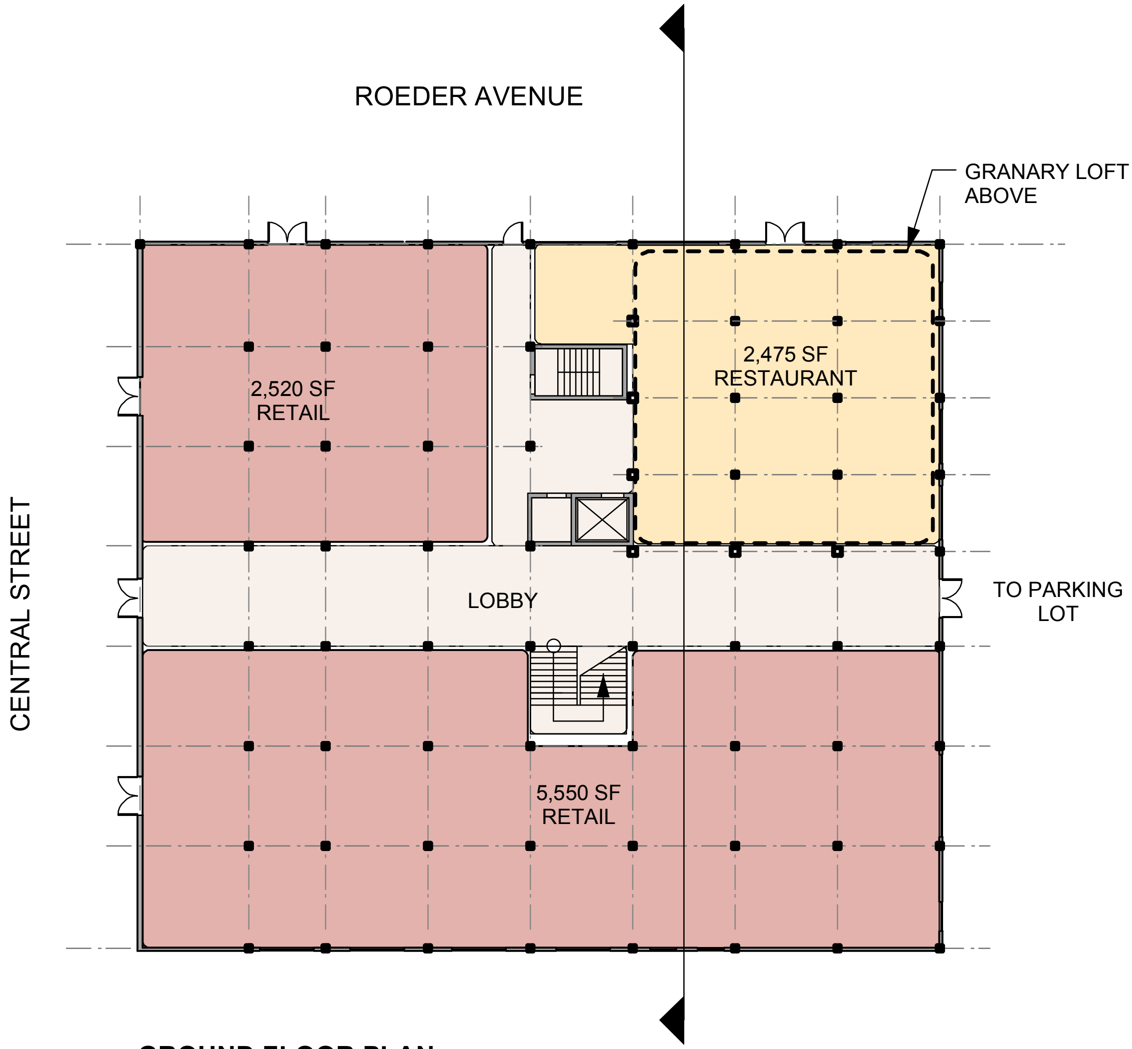
TRANSVERSE BUILDING SECTION
SCALE: 1" = 20'-0"

6. BOILER HOUSE/ STEAM PLANT

#7 Old Granary Test-for-Fit Diagrams

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



GROUND FLOOR PLAN
SCALE: 1" = 30'-0"

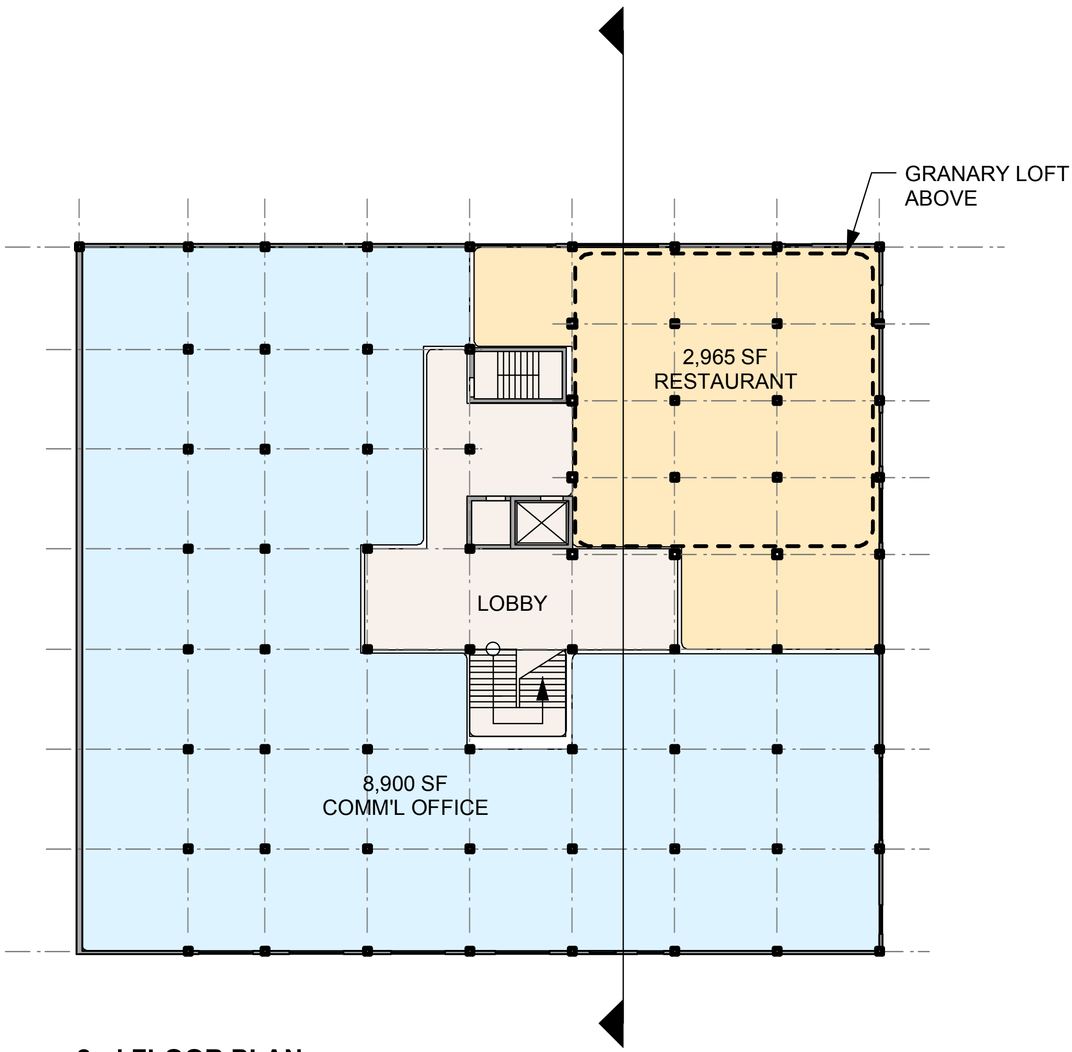
13,945 GSF
10,990 NSF

49 RESTAURANT STALLS (9,880/200 = 49.4)
34 COMMERCIAL STALLS (16,970/500 = 34)
83 STALLS

7. GRANARY

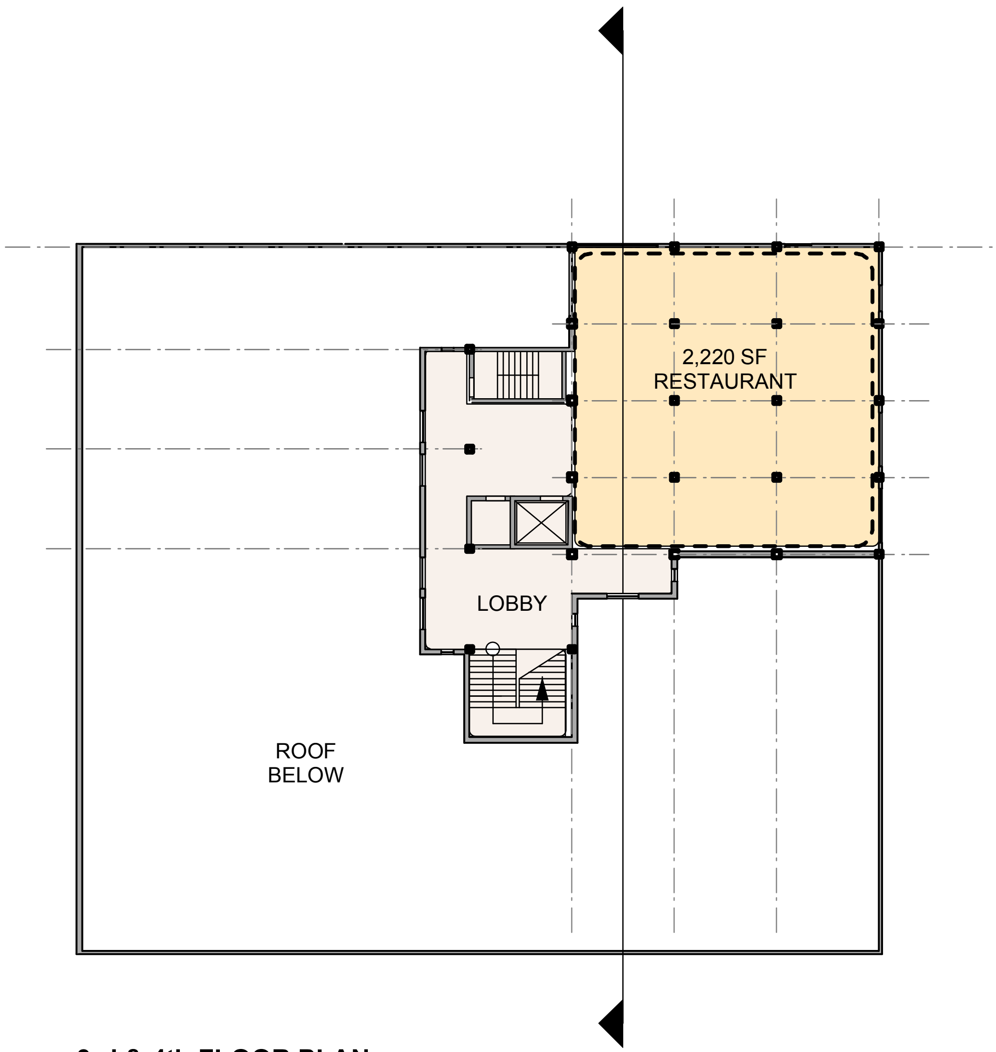
Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



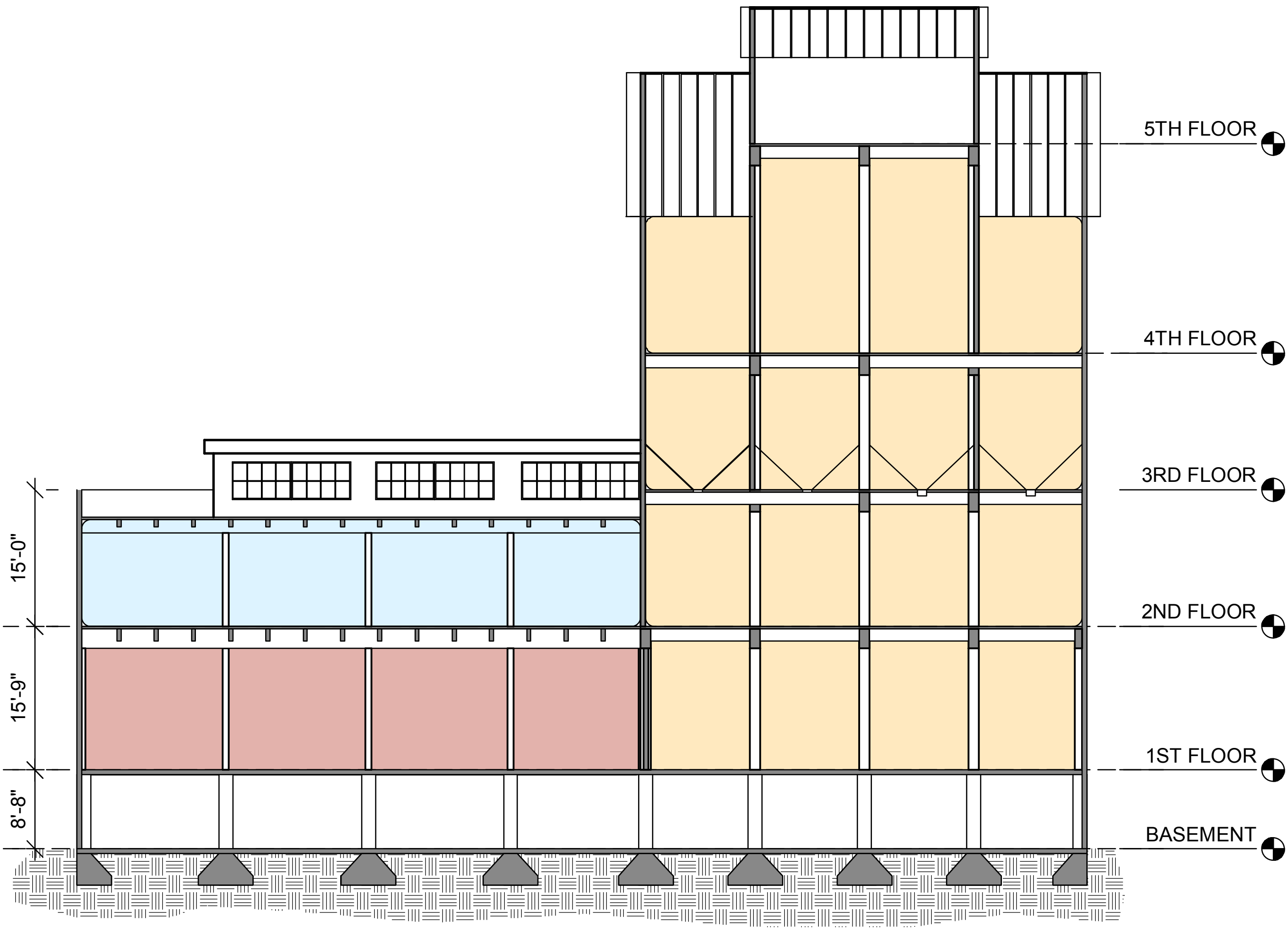
2nd FLOOR PLAN
SCALE: 1" = 30'-0"

13,945 GSF
11,865 NSF



3rd & 4th FLOOR PLAN
SCALE: 1" = 30'-0"

3,870 GSF (per floor)
2,2250 NSF (per floor)



BUILDING SECTION
SCALE: 1" = 20'-0"

#13 Digester Test-for-Fit Diagrams

PORT OF BELLINGHAM Washington State

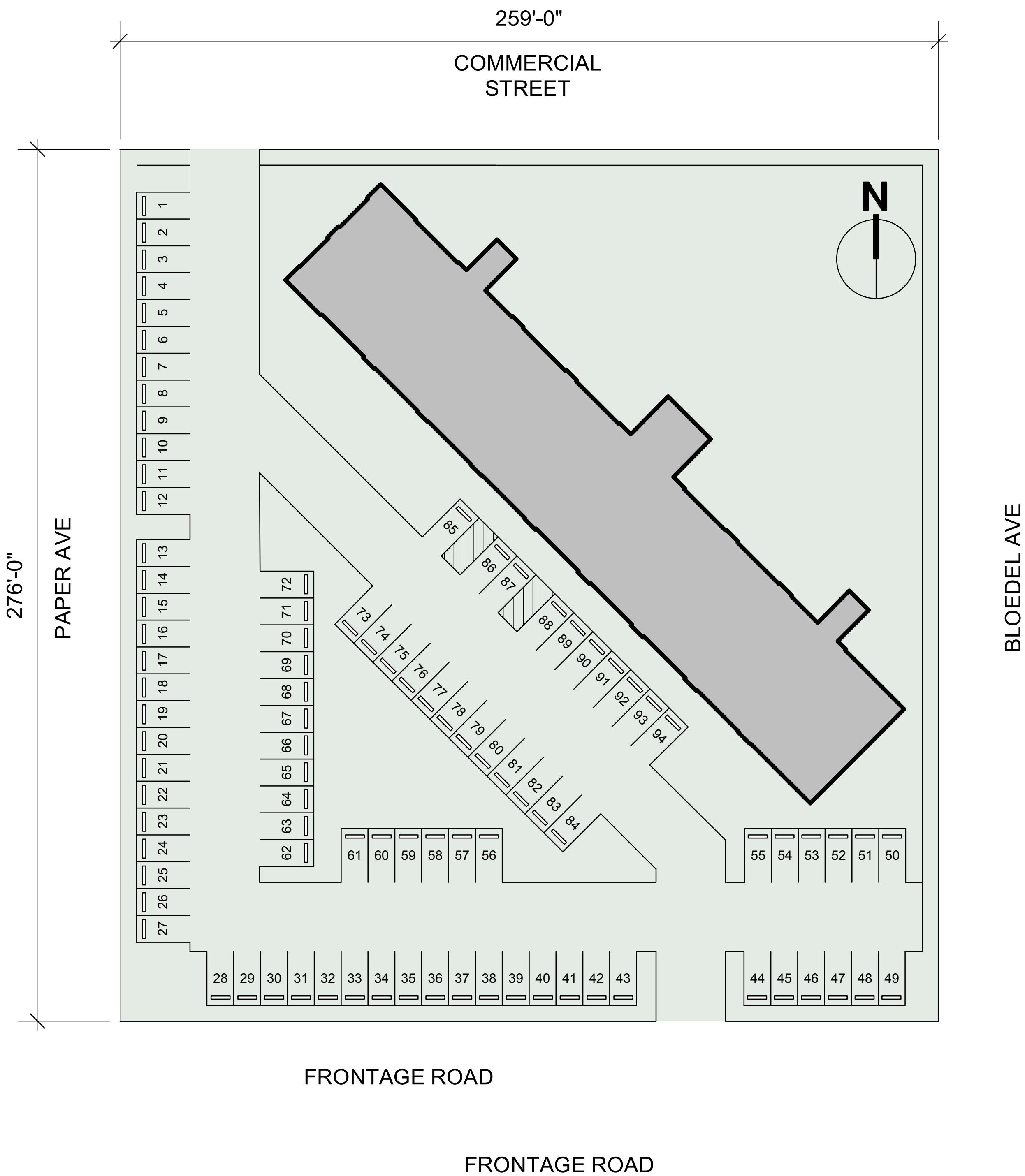
CITY OF BELLINGHAM WASHINGTON

Georgia Pacific Buildings Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009

JOHNSON ARCHITECTURE & PLANNING LLC

LORIG kpff



SITE PLAN

SCALE: 1" = 50'-0"

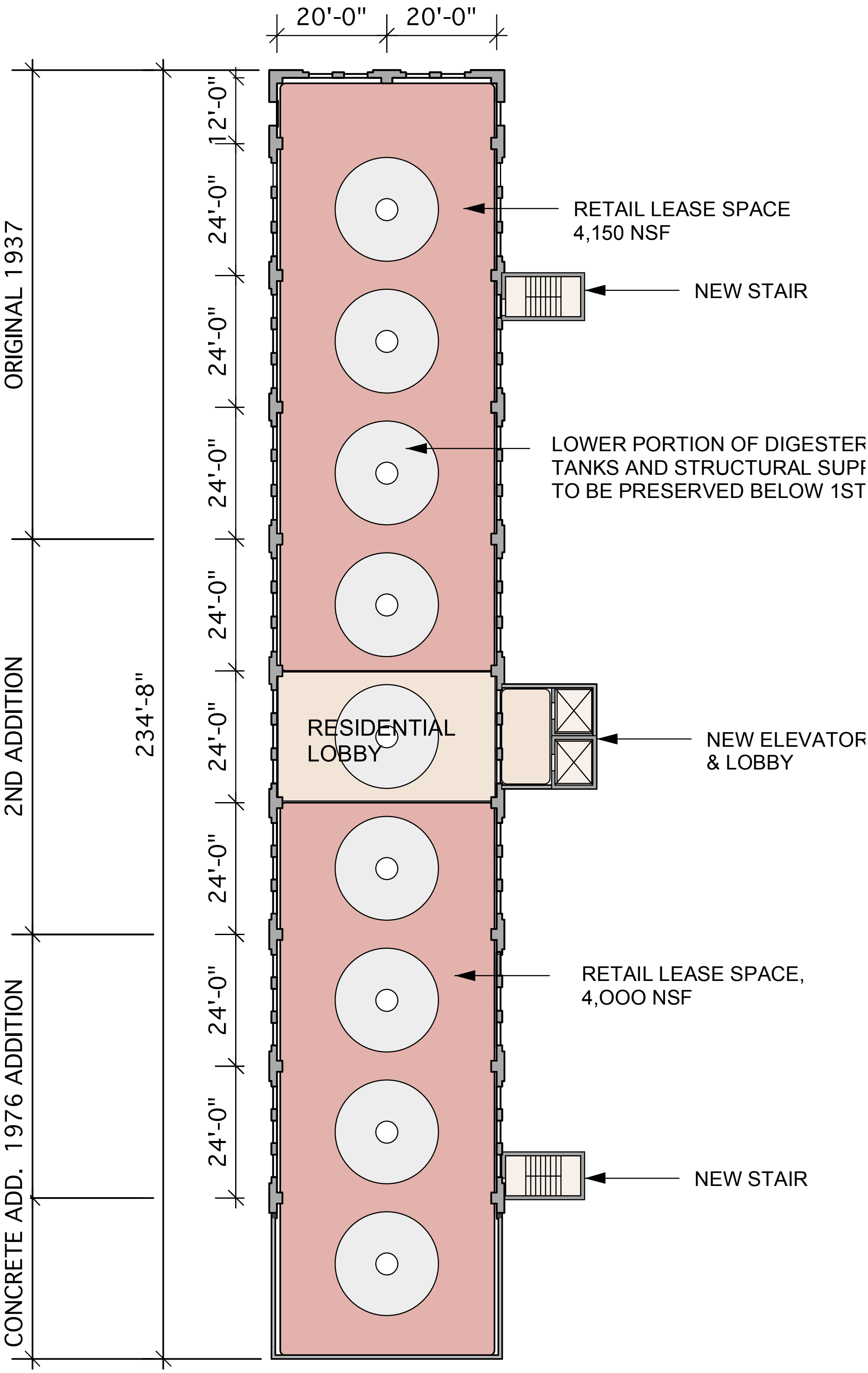
71,484 SF SITE AREA

78 RESIDENTIAL STALLS

16 COMMERCIAL STALLS (8,150/500 = 16.3)

94 STALLS

13. DIGESTER BUILDING



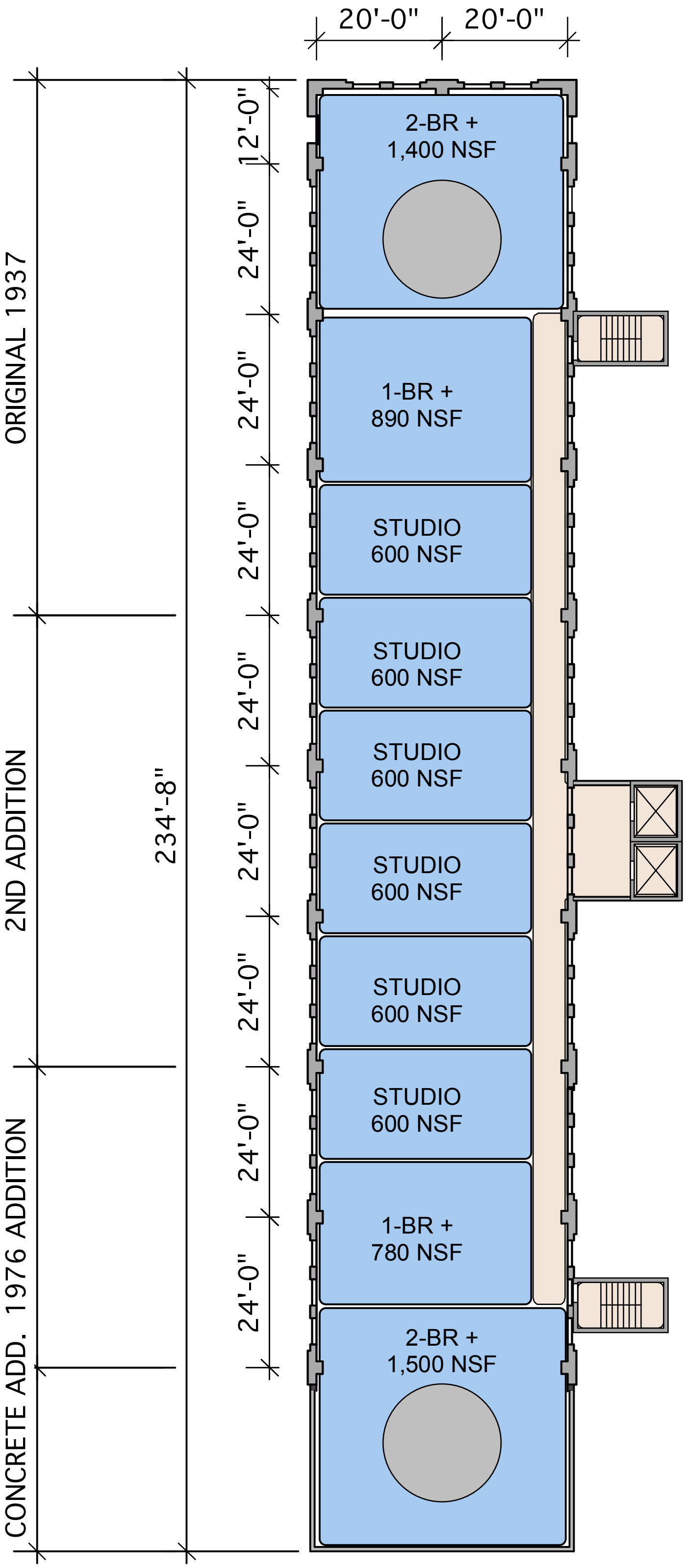
GROUND FLOOR PLAN
SCALE: 1" = 30'-0"

10,500 GSF
8,150 NSF

13. DIGESTER BUILDING

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



LEVELS 2-4 FLOOR PLAN

SCALE: 1" = 30'-0"

10,500 GSF
8,170 NSF

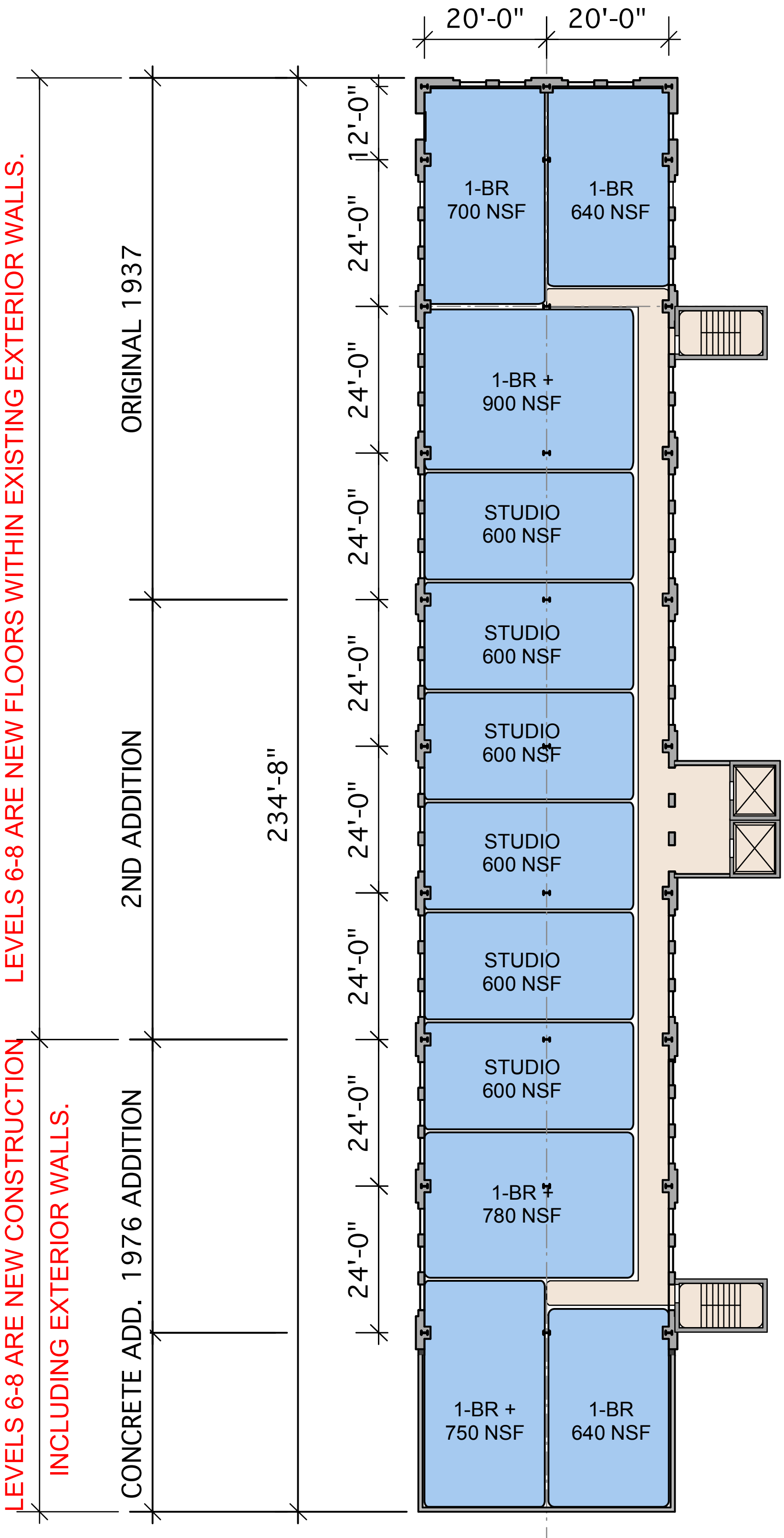
10 RESIDENTIAL UNITS

2 BEDROOM: 2
1 BEDROOM: 2
STUDIO: 6

13. DIGESTER BUILDING

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009

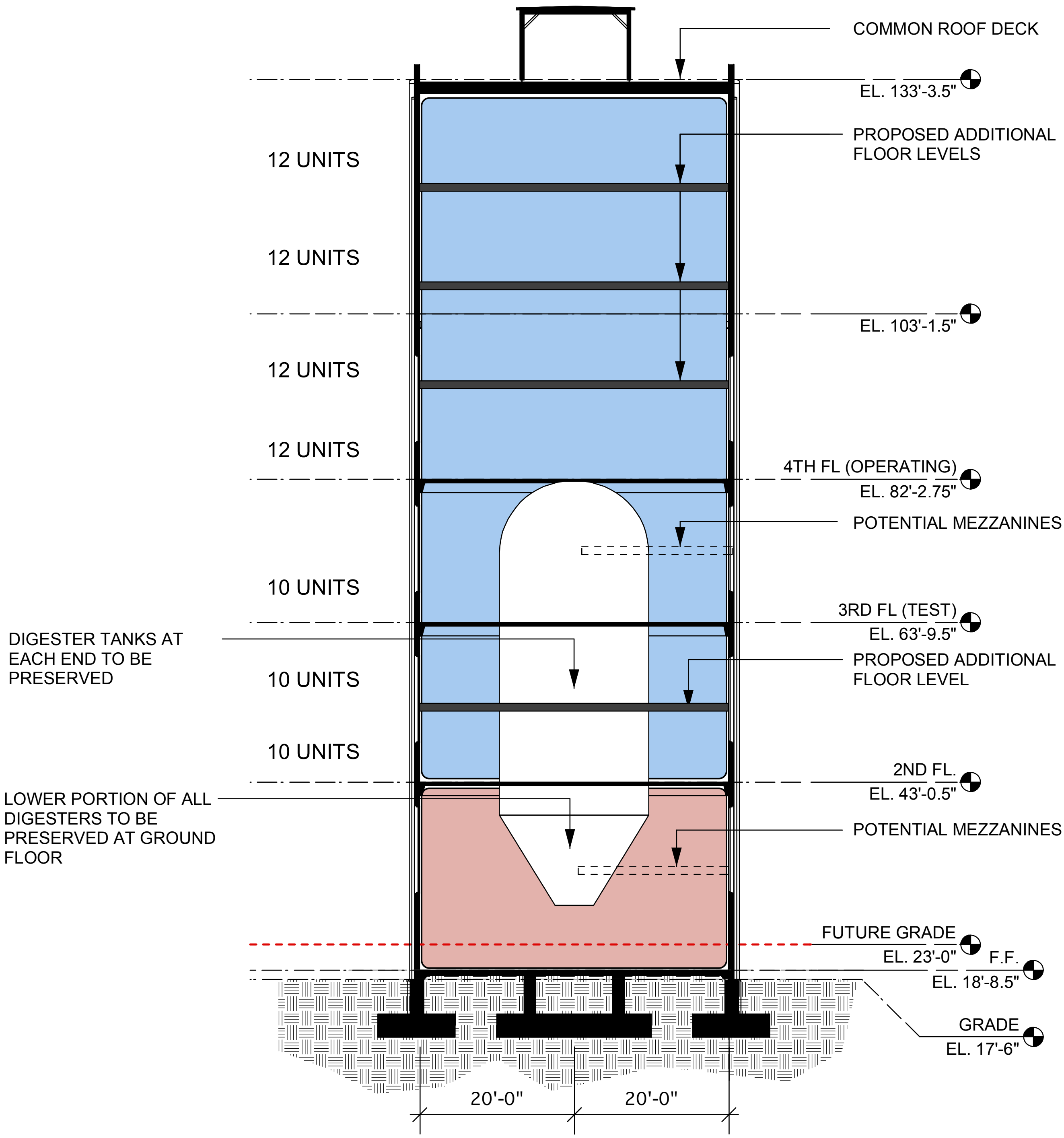


LEVELS 5-8 FLOOR PLAN
SCALE: 1" = 30'-0"

10,500 GSF
8,010 NSF

12 RESIDENTIAL UNITS
2 BEDROOM: 0
1 BEDROOM: 6
STUDIO: 6

13. DIGESTER BUILDING



BUILDING SECTION
SCALE: 1" = 20'-0"

#13 Digester w/Addition Test-for-Fit Diagrams

PORT OF BELLINGHAM Washington State

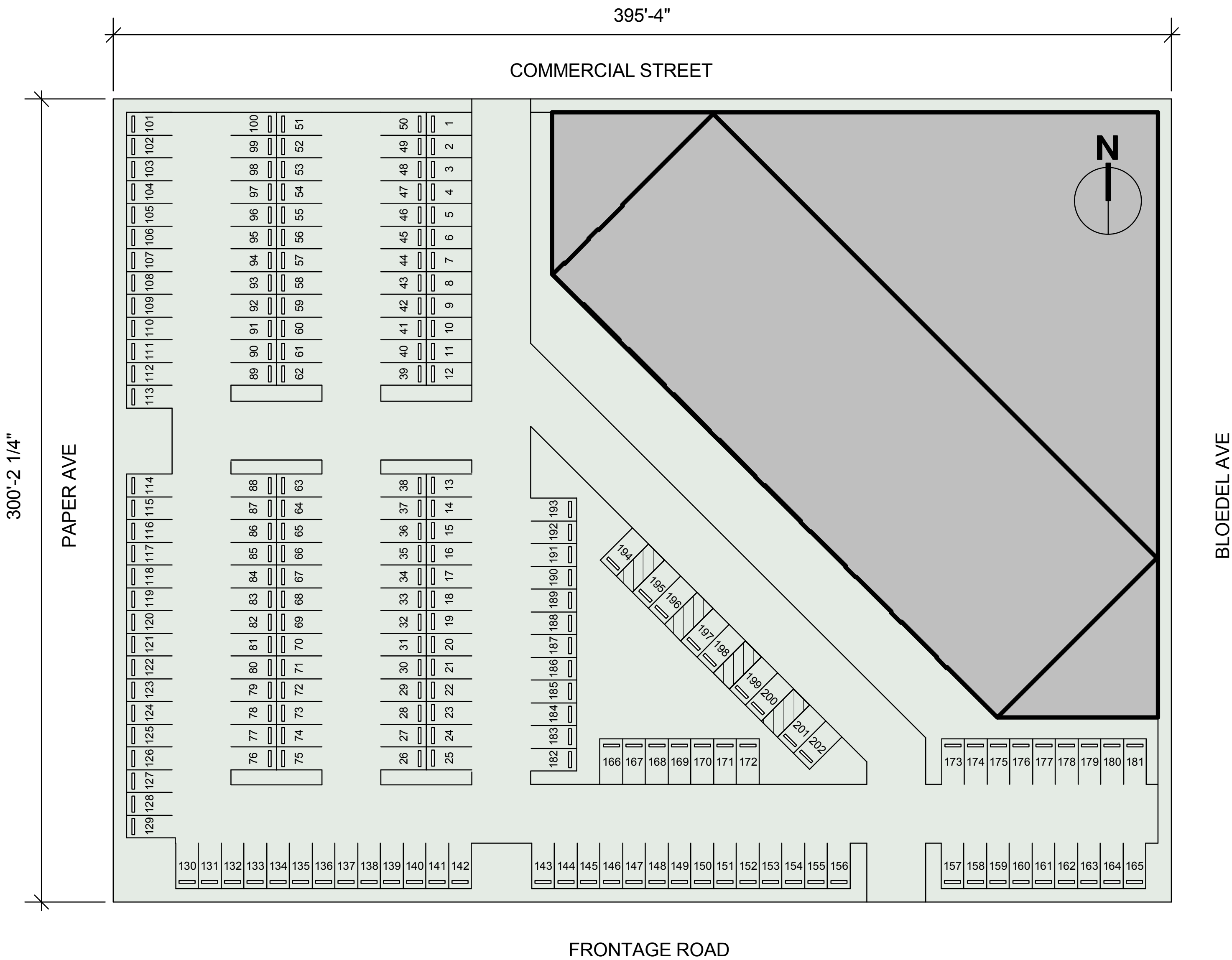
CITY OF BELLINGHAM WASHINGTON

Georgia Pacific Buildings Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009

JOHNSON ARCHITECTURE & PLANNING LLC

LORIG kpff



SITE PLAN

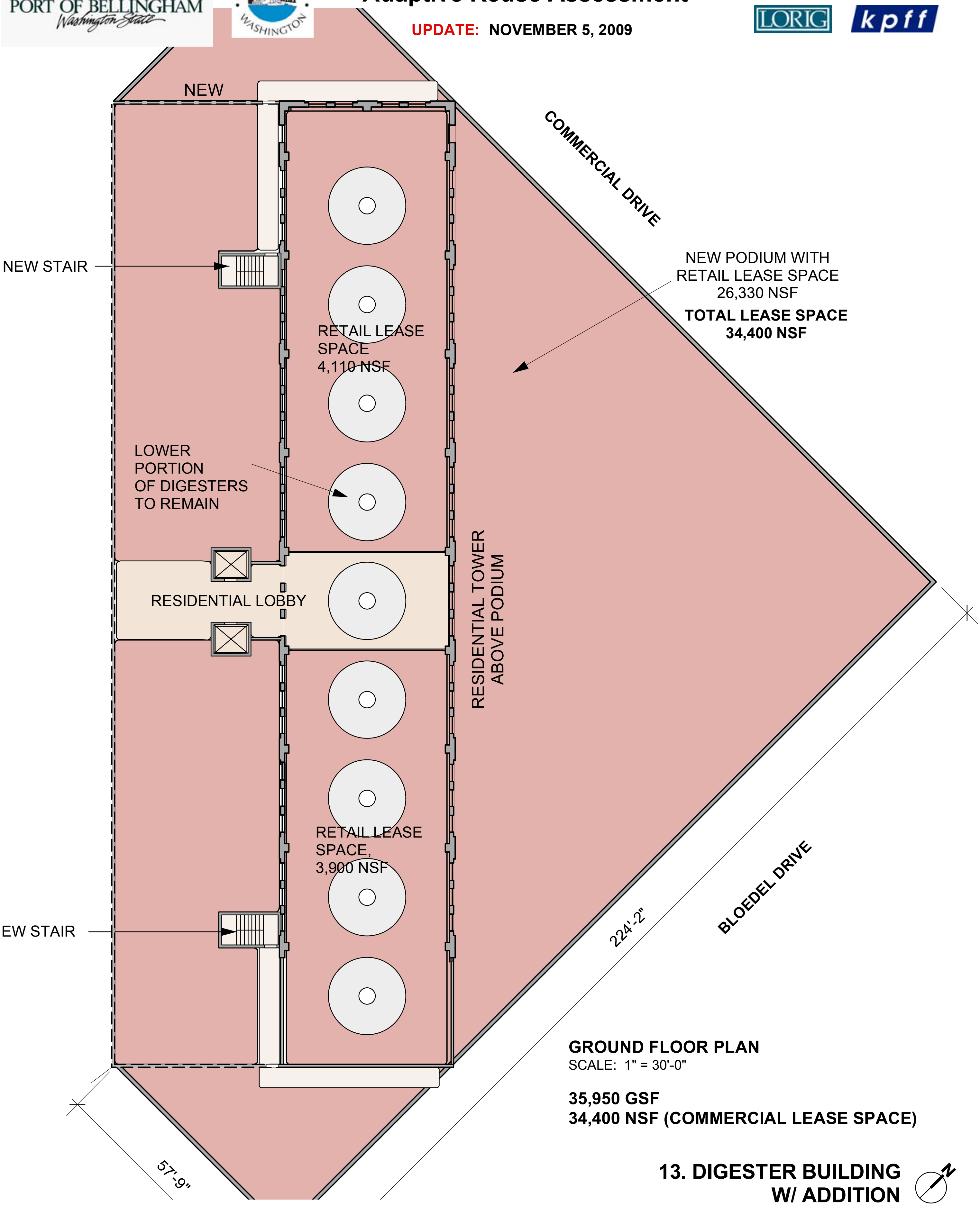
SCALE: 1" = 60'-0"

118,680 SF SITE AREA
133 RESIDENTIAL STALLS (1 PER UNIT)
69 COMMERCIAL STALLS (34,400/500 = 68.8)
202 TOTAL STALLS

13. DIGESTER BUILDING W/ ADDITION

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



GROUND FLOOR PLAN
SCALE: 1" = 30'-0"

35,950 GSF
34,400 NSF (COMMERCIAL LEASE SPACE)

13. DIGESTER BUILDING W/ ADDITION

PORT OF BELLINGHAM
Washington State

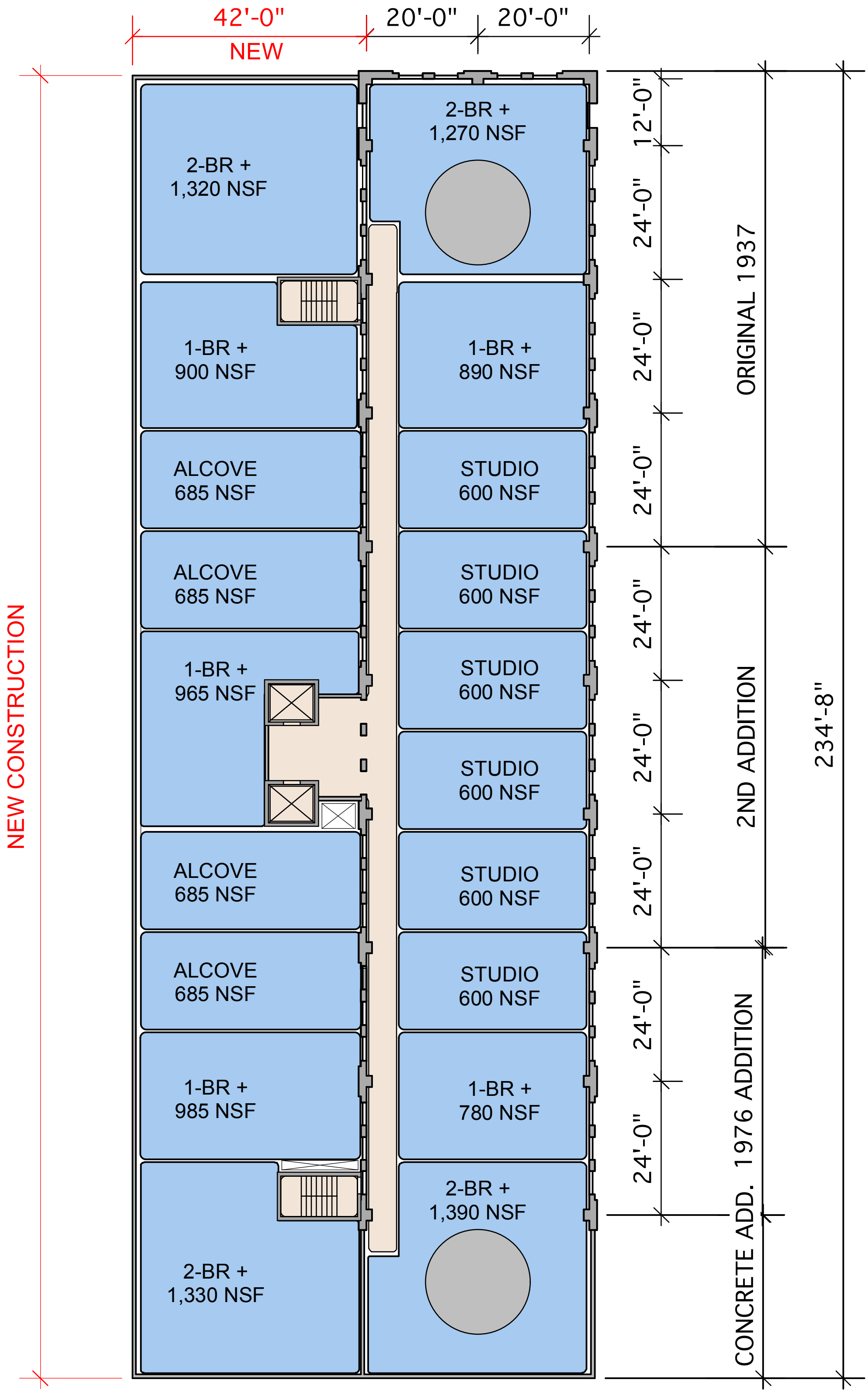
CITY OF BELLINGHAM WASHINGTON

Georgia Pacific Buildings Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009

JOHNSON ARCHITECTURE & PLANNING LLC

LORIG kpff



LEVELS 2-4 FLOOR PLAN
SCALE: 1" = 30'-0"

19,475 GSF
16,170 NSF

19 RESIDENTIAL UNITS

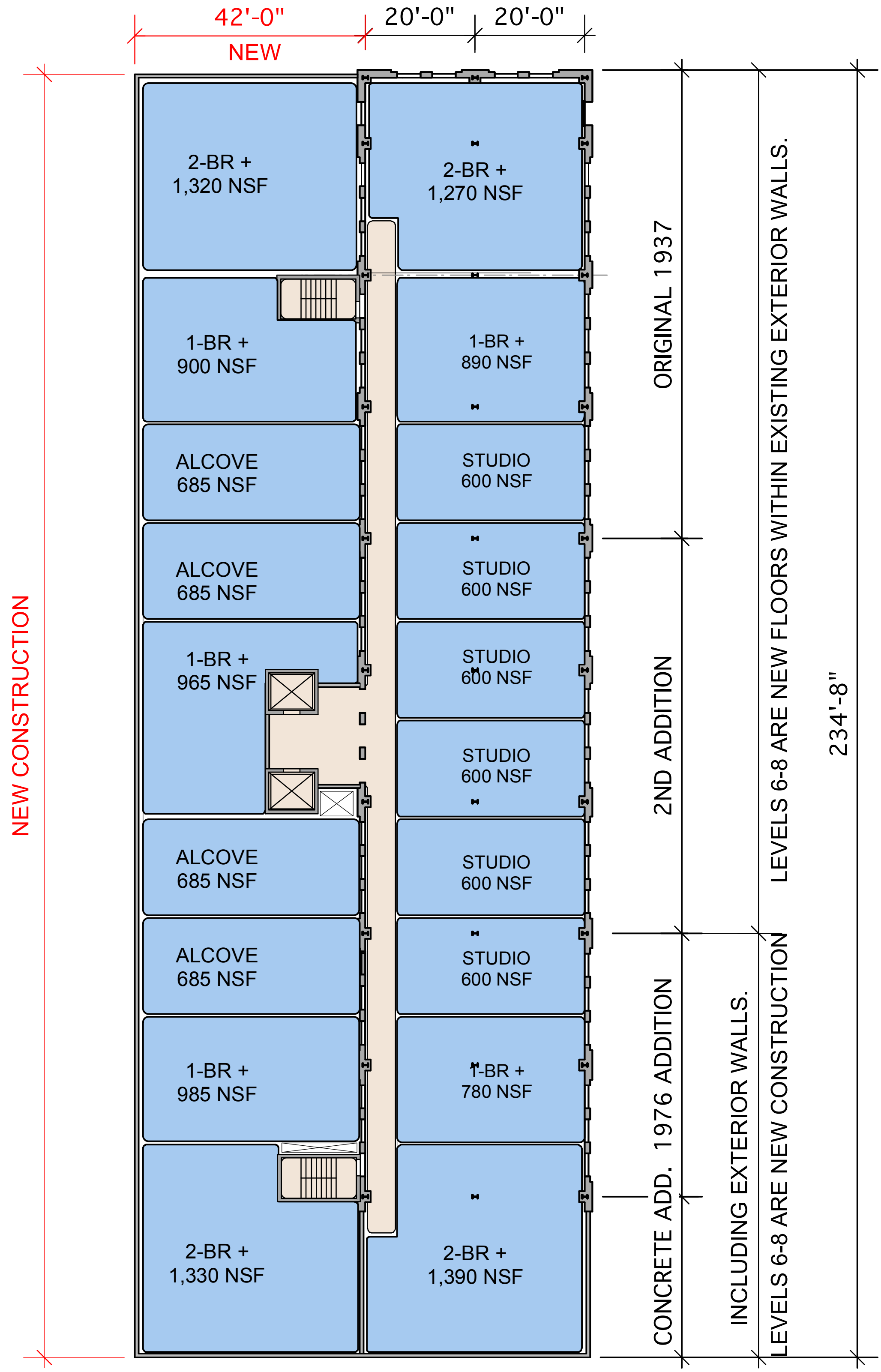
2 BEDROOM:	4
1 BEDROOM:	5
ALCOVE:	4
STUDIO:	6

13. DIGESTER BUILDING W/ ADDITION

N

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



LEVELS 5-8 FLOOR PLAN
SCALE: 1" = 30'-0"

19,475 GSF
16,170 NSF

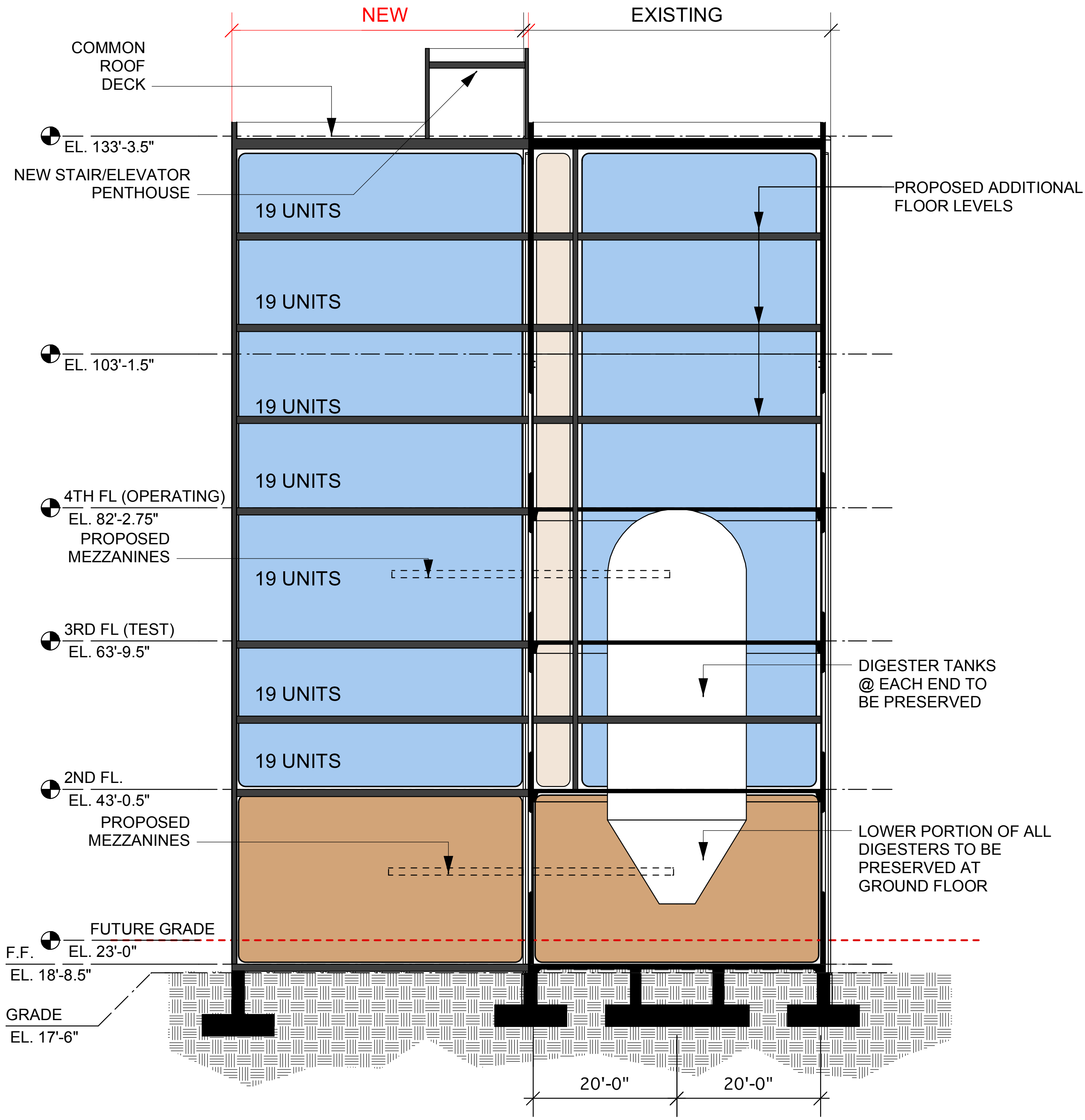
19 RESIDENTIAL UNITS

2 BEDROOM:	4
1 BEDROOM:	5
ALCOVE:	4
STUDIO:	6

13. DIGESTER BUILDING W/ ADDITION

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009



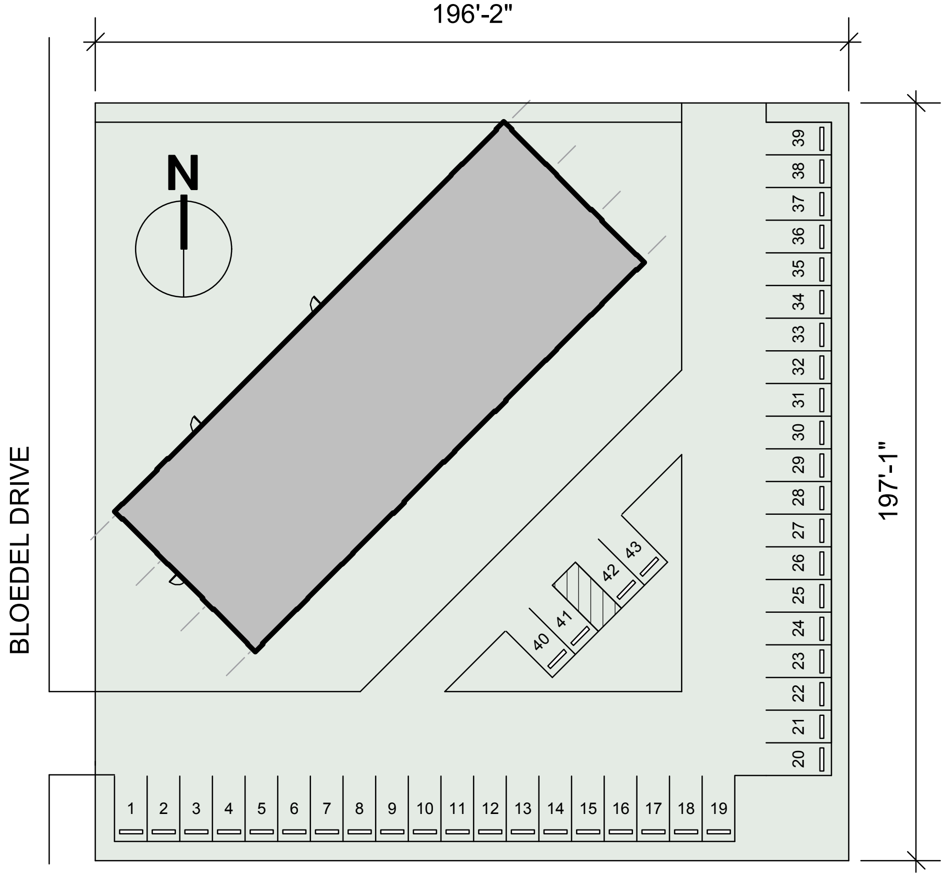
BUILDING SECTION
SCALE: 1" = 20'-0"

13. DIGESTER BUILDING W/ ADDITION

#17 Alcohol Plant Test-for-Fit Diagrams

Georgia Pacific Buildings
Adaptive Reuse Assessment

UPDATE: NOVEMBER 5, 2009

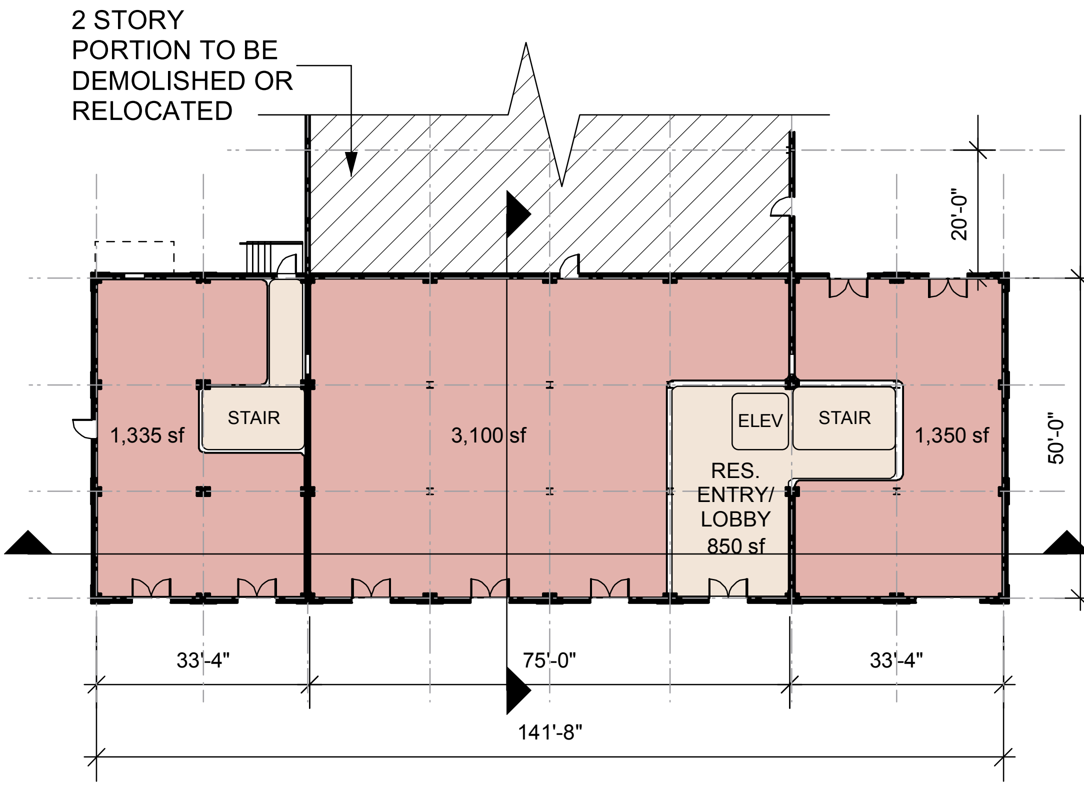


SITE PLAN

SCALE: 1" = 50'-0"

38,660 SF SITE AREA
30 RESIDENTIAL STALLS (1 PER UNIT)
12 COMMERCIAL STALLS (5,750/500 = 12)
42 STALLS REQ'D (43 SHOWN)

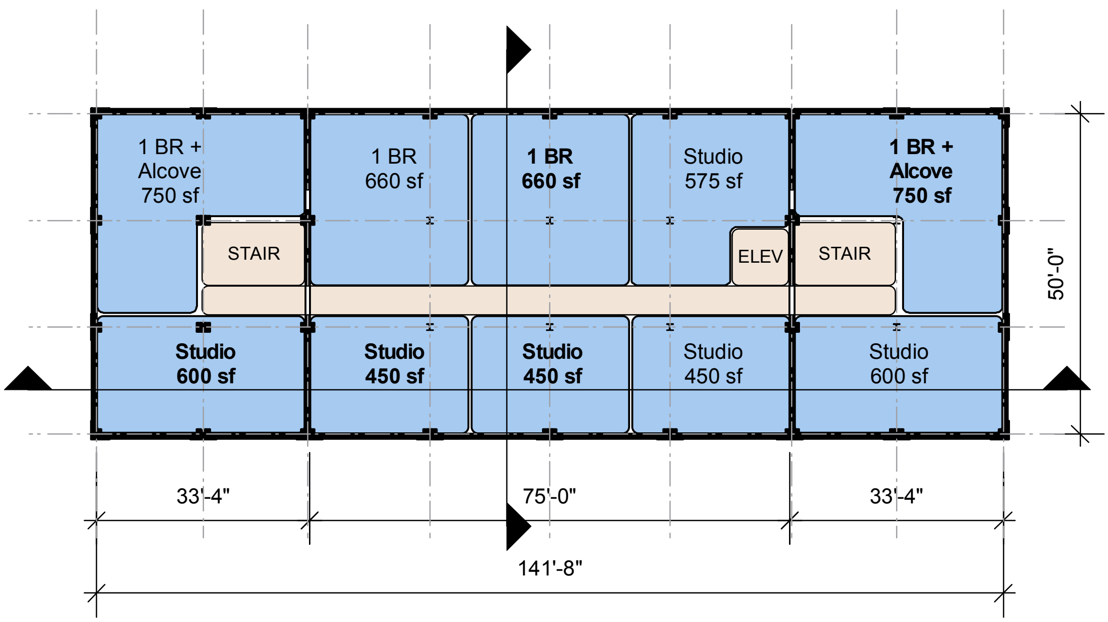
17. ALCOHOL PLANT



FIRST FLOOR PLAN
SCALE: 1" = 30'-0"

7,400 GSF
5,785 NSF

17. ALCOHOL PLANT



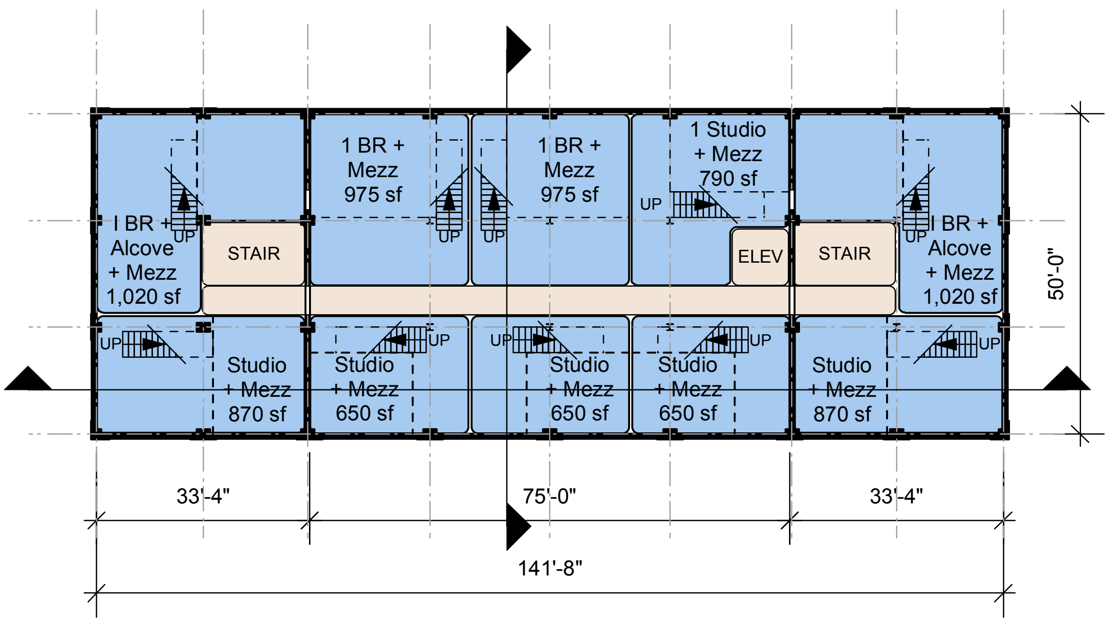
TYPICAL FLOOR PLAN
SCALE: 1" = 30'-0"

7,400 GSF
5,950 NSF

PER FLOOR

1 BEDROOM + ALCOVE :	**2**
1 BEDROOM:	**2**
STUDIO:	**6**

17. ALCOHOL PLANT



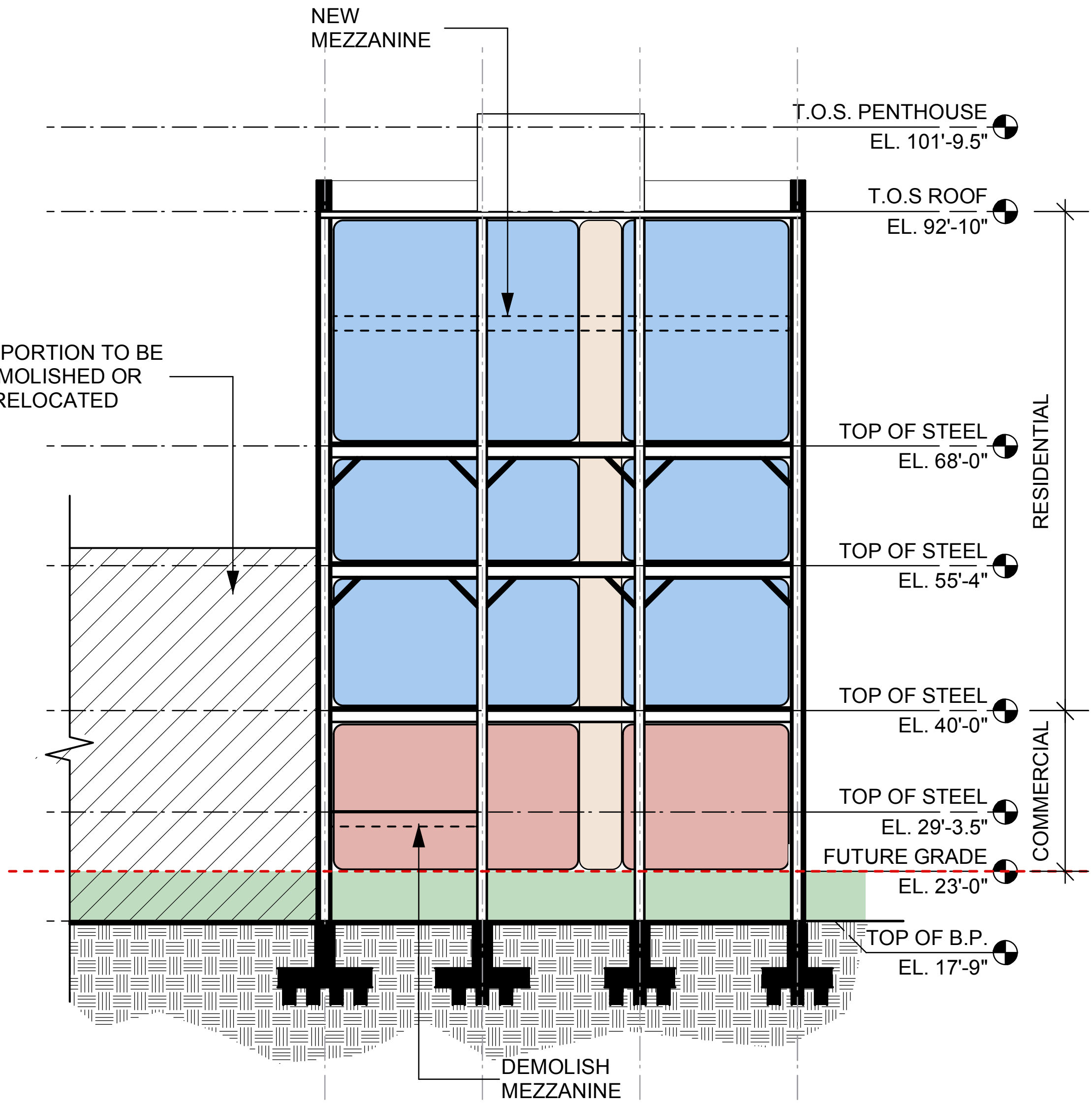
FOURTH FLOOR PLAN
SCALE: 1" = 30'-0"

7,400 GSF
8,470 NSF

10 UNITS WITH MEZZANINES

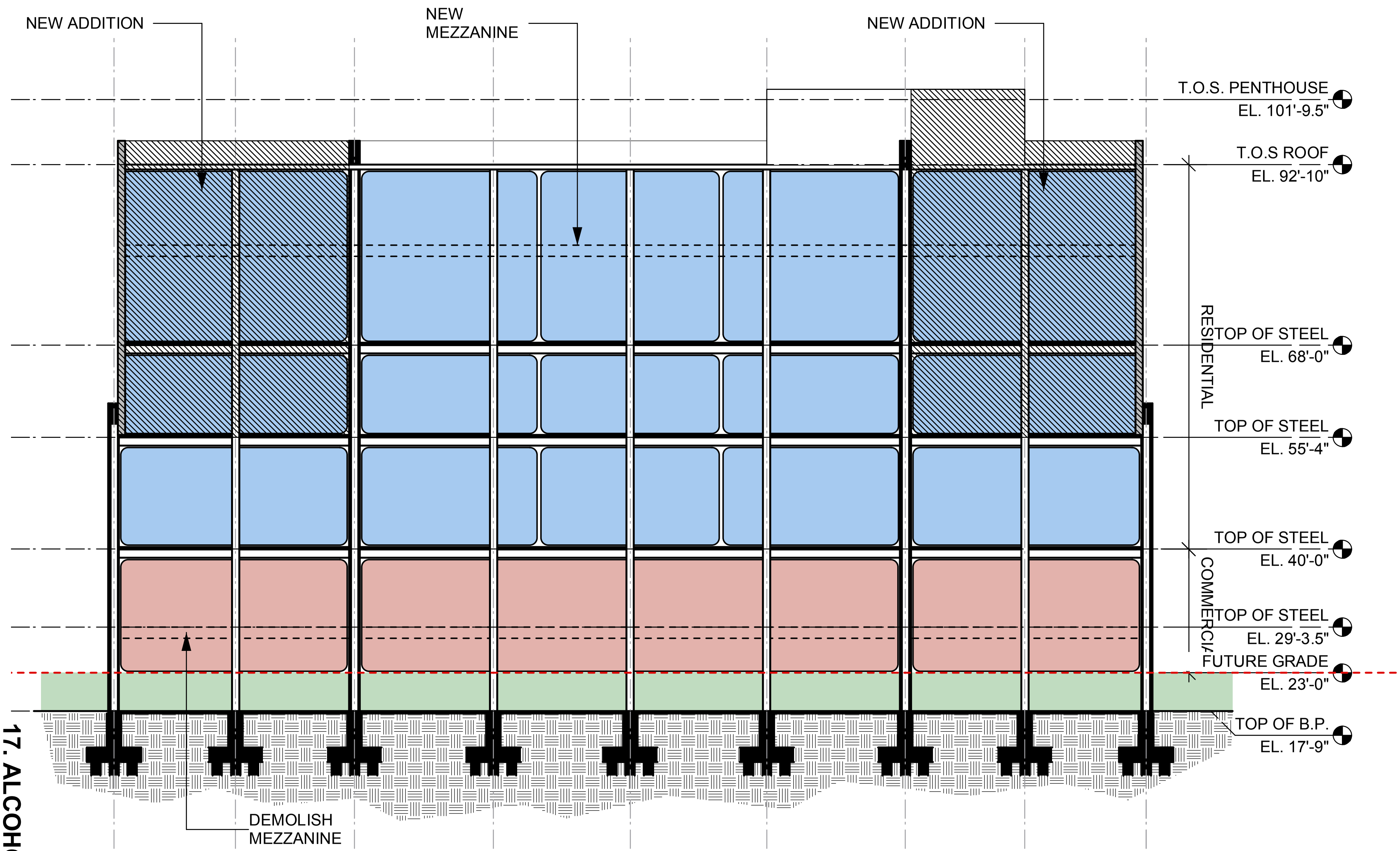
1 BEDROOM + ALCOVE :	**2**
1 BEDROOM:	**2**
STUDIO:	**6**

17. ALCOHOL PLANT



BUILDING SECTION
SCALE: 1" = 20'-0"

17. ALCOHOL PLANT



TRANSVERSE BUILDING SECTION
SCALE: 1" = 20'-0"

17. ALCOHOL PLANT

Summary of Cost Estimates

Adaptive Re-Use Johnson Architecture & Planning
Port of Bellingham Matson Carlson Cost Consultants
SD Level Budget Estimate REV 11/30/09 11/9/09

Description	#6 Steam Plant	#13 Digester	#13 Digester w/ Addition	#17 Alcohol Plant	AVERAGE COSTS
BUILDING SUMMARY					
Demolition	$800,850	$1,115,940	$1,083,180	$818,045	
Structural Upgrades	$2,492,583	$2,303,280	$2,761,983	$1,096,223	
Floor Framing	$289,800	$815,160	$1,993,084	$282,206	
Roof Framing	$100,800	$34,560	$321,000	$44,400	
Stair Systems	$80,000	$128,000	$112,000	$120,000	
Exterior Closure	$1,226,960	$2,058,976	$3,553,256	$954,128	
Roofing	$207,400	$188,400	$615,700	$143,800	
Interior Doors & Partitions	$615,344	$841,583	$1,510,838	$441,649	
Interior Finishes	$678,811	$924,426	$1,665,212	$376,034	
Specialties & Casework	$216,430	$285,200	$457,308	$139,605	
Appliances	$211,500	$390,000	$513,150	$114,000	
Furnishings & Equipment	$33,680	$39,900	$60,500	$28,008	
Elevator	$112,500	$382,500	$360,000	$90,000	
Mechanical	$759,245	$957,710	$1,684,229	$442,784	
Electrical	$956,925	$1,250,750	$2,459,363	$514,681	
TOTAL DIRECT COST	$8,782,828	$11,716,384	$19,150,802	$5,605,565	
General Conditions	$702,626	$937,311	$1,532,064	$448,445	
Tower Crane for 12 months	$200,000	$248,000	$248,000	$200,000	
Overhead & profit	$948,545	$1,265,370	$2,068,287	$605,401	
TOTAL COST @ TODAY'S BID	**$10,634,000**	**$14,167,065**	**$22,999,152**	**$6,859,411**	
Gross Square Feet	62,500	84,000	172,275	32,125	
$/GSF	**$170.14**	**$168.66**	**$133.50**	**$213.52**	*$171.46*

Adaptive Re-Use Johnson Architecture & Planning

Port of Bellingham Matson Carlson Cost Consultants

SD Level Budget Estimate REV 11/30/09 11/9/09

Description	#6 Steam Plant	#13 Digester	#13 Digester w/ Addition	#17 Alcohol Plant	AVERAGE COSTS
SITEWORK SUMMARY					
Site Preparation	$413,138	$981,193	$1,223,711	$499,756	
Site Drainage Systems	$184,610	$284,050	$449,766	$95,276	
Site Sanitary Sewer System	$44,800	$51,600	$51,600	$51,600	
Water & Fire Water	$53,600	$54,500	$54,500	$54,500	
Site Gas	$26,600	$27,500	$27,500	$27,500	
Site Electrical	$379,800	$456,600	$456,600	$371,000	
Site Improvements	$253,505	$343,075	$406,518	$196,103	
Landscaping	$51,850	$217,604	$51,850	$45,213	
TOTAL DIRECT COST	$1,407,903	$2,416,123	$2,722,045	$1,340,947	
General Conditions	$112,632	$193,290	$217,764	$107,276	
Overhead & profit	$152,053	$260,941	$293,981	$144,822	
TOTAL COST @ TODAY'S BID	**$1,672,588**	**$2,870,354**	**$3,233,789**	**$1,593,045**	
Gross Square Feet	46,255	60,984	82,730	31,260	
$/GSF	**$36.16**	**$47.07**	**$39.09**	**$50.96**	$43.32
TOTAL BID	**12,306,588**	**17,037,418**	**26,232,941**	**8,452,456**	

#6 Steam Plant Cost Estimate

Adaptive Re-Use Johnson Architecture & Planning
Port of Bellingham Matson Carlson Cost Consultants
SD Level Budget Estimate 11/9/09

Description		Quantity	Unit	Unit Price	Sub-Total	TOTAL
SQUARE FOOT ANALYSIS				**SF (Existing)**	**SF new**	*TOTAL*
	Level 1			12,500	0	*12,500*
	Level 2			12,500	0	*12,500*
	Level 3			12,500	0	*12,500*
	Level 4			4,100	8,400	*12,500*
	Level 5			4,100	8,400	*12,500*
56 Units		**TOTAL**		**45,700**	**16,800**	**62,500**
BUILDING SUMMARY						
Demolition		45,700	SF	17.52		$800,850
Structural Upgrades		45,700	SF	54.54		$2,492,583
Floor Framing		16,800	SF	17.25		$289,800
Roof Framing		8,400	SF	12.00		$100,800
Stair Systems		10	FLIGHTS	8,000.00		$80,000
Exterior Closure		36,554	SF	33.57		$1,226,960
Roofing		12,500	SF	16.59		$207,400
Interior Doors & Partitions		62,500	GSF	10.16		$635,144
Interior Finishes		62,500	GSF	10.86		$678,811
Specialties & Casework		62,500	GSF	3.46		$216,430
Appliances		62,500	GSF	4.48		$280,000
Furnishings & Equipment		62,500	GSF	0.54		$33,680
Elevator		5	STOP			$112,500
Mechanical		62,500	GSF	12.15		$759,245
Electrical		62,500	GSF	15.31		$956,925
TOTAL DIRECT COST						**$8,871,128**
General Conditions			8%			$709,690
Tower Crane for 12 months		1	LS	200,000.00		$200,000
Overhead & profit			10%			$958,082
TOTAL COST @ TODAY'S BID		**62,500**	**GSF**	**171.82**		**$10,738,900**

Adaptive Re-Use
Port of Bellingham
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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK SUMMARY					
Site Preparation	46,255	SF	8.93		$413,138
Site Drainage Systems	31,225	SF	5.91		$184,610
Site Sanitary Sewer System	320	LF	140.00		$44,800
Water & Fire Water	480	LF	111.67		$53,600
Site Gas	480	LF	55.42		$26,600
Site Electrical	1	LS	379,800.00		$379,800
Site Improvements	10,000	SF	25.35		$253,505
Landscaping	5,000	SF	10.37		$51,850
TOTAL DIRECT COST					**$1,407,903**
General Conditions		8%			$112,632
Overhead & profit		10%			$152,053
TOTAL COST @ TODAY'S BID					**$1,672,588**

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
ESTIMATE DETAIL					
Demolition/Building Preparation					**$800,850**
Exterior Demolition					
Demo rooftop equip, stacks, sheetmetal, etc	12,500	SF	8.00	$100,000	HAZMAT???
Demo (e) roofing	12,500	SF	2.50	$31,250	HAZMAT???
Demo windows	6,144	SF	5.00	$30,720	HAZMAT???
Demo exterior doors	12	EA	150.00	$1,800	
Demo canopy	160	LF	25.00	$4,000	
Salvage ships ladder	2	EA	250.00	$500	
Salvage platforms & gratings	1	LS	25000.00	$25,000	
Saw cut (e) brick "wings"	295	LF	25.00	$7,375	
Saw cut/demo damaged brick (20%)	5,412	SF	10.00	$54,118	
Sawcut brick for new doors, windows, louvers	40	loc	400.00	$16,000	
Interior Demolition					
Gut interiors	45,700	GSF	3.50	$159,950	
Salvage stairs	16	FLIGHTS	2500.00	$40,000	

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Salvage grating & catwalks	11,425	SF	5.00	$57,125	
Load, haul & dump debris	5,000	CY	45.00	$225,012	
Recycle costs included in load, haul & dump - Recycle/salvage credits not included				$0	
Hazmat demo allowance	1	LS	48000.00	$48,000	
Structural Upgrades				$0	**$2,492,583**
Demolition					
Demo/Slavage floor grating	16,200	SF	25.00	$405,000	
Saw cut/demo slab for new pilings & foundations	20	LOC	500.00	$10,000	
Demo slab under boiler	2,000	SF	2.00	$4,000	
Demo steel members	200	LF	25.00	$5,000	
Demo conc walls - new openings	12	EA	500.00	$6,000	
New floor openings	10	EA	500.00	$5,000	
Load, haul & dump debris	128	CY	75.00	$9,583	
Piles					
Driven augercast piles	1,600	LF	140.00	$224,000	
Concrete Work					
Patch slab on grade at new lile caps	2,000	SF	6.50	$13,000	
Replace slab on grade (at boiler demo)	2,000	SF	6.50	$13,000	
Pile caps & grade beams: earthwork,conc, form, rebar	200	CY	680.00	$136,000	
Drill & grout rebar into (e) grade beams & pile caps	960	LOC	25.00	$24,000	
New elevator pit	1	EA	6000.00	$6,000	
New shear walls	20,000	SF	25.00	$500,000	
New concrete beam	600	LF	120.00	$72,000	
Floor & Roof Framing				$0	
Infill floor framing: steel joists, mtl decking, concrete topping	22,500	SF	25.00	$562,500	
X-Bracing allowance	35	TON	4800.00	$168,000	
Strong back system	25,000	SF	6.50	$162,500	
Floor & roof to wall ties	480	EA	250.00	$120,000	
Struts, plates, ledgers, lintels, etc - allowance	1,200	LF	25.00	$30,000	
Drill & grout epoxy anchors in to (e) concrete	700	EA	10.00	$7,000	
Misc demo, hardware, weld, drill, gout, metals	1	LS	10000.00	$10,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Floor Framing					**$289,800**
new floor framing at addition					
floor 4 & 5: Steel joists, metal deck, concrete topping, sound batts	16,800	SF	16.00	$268,800	
Acoustical batts	16,800	SF	1.25	$21,000	
Roof Framing					**$100,800**
new roof framing at addition					
Steel joists, metal deck	8,400	SF	12.00	$100,800	
Stair Systems					**$80,000**
Exit stairs including railings	10	FLIGHT	8,000.00	$80,000	
Exterior Closure					**$1,226,960**
Masonry Work					
Clean (e) brick walls using Non-Historic Standards	27,275	SF	2.00	$54,551	
Replace brick using slavaged brick (20%)	5,412	SF	44.00	$238,119	
Re-point brick (10%)	2,728	SF	10.00	$27,275	
Seal brick	27,275	SF	2.00	$54,551	
Scaffolding allowance	1	LS	30000.00	$30,000	
Remaining Work					
2x6 studs @16" oc as furring	27,275	SF	2.85	$77,735	
R21 Bat insulation to perim furred walls	27,275	SF	1.00	$27,275	
GWB to furred walls	27,275	SF	2.15	$58,642	
New studs, ply, insul, GWB to addition walls	9,278	SF	7.50	$69,587	
New window - installed, lintel, flash & caulk	80	EA	1200.00	$96,000	
Exterior doors - alum, glazed	8	EA	1600.00	$12,800	
Exterior doors, hollow metal	4	EA	1300.00	$5,200	
Exterior doors - overhead	4	EA	5000.00	$20,000	
Access control: keypad entry allowance	2	LOC	2500.00	$5,000	
Metal siding over rain screen panels	9,269	SF	25.00	$231,725	
Storefront glazing	2,400	SF	65.00	$156,000	
Louvers	500	SF	125.00	$62,500	
Roofing					**$207,400**
New roofing system w/associated vents, drains, flashing, etc	12,500	SF	14.00	$175,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
New skylights		EA	2000.00	$0	
New entry canopy	400	SF	75.00	$30,000	
Roof hatch & access ladder	2	EA	1,200.00	$2,400	
Interior Doors & Partitions					**$635,144**
Studs & furring	55,682	SF	2.00	$111,364	
GWB to walls - light texture, level 4	97,500	SF	2.00	$195,000	
Add for 2nd layer	26,400	SF	1.00	$26,400	
Sound batts to walls	26,400	SF	0.45	$11,880	
Elevator shaft walls	3,000	SF	8.00	$24,000	
OH Coiling doors: 6070	2	EA	2,800.00	$5,600	
HM doors (18 GA), HM frame & hardware	10	EA	1,450.00	$14,500	
SCW rated Entry door, HM frame & hardware	56	EA	1,200.00	$67,200	
SCW interior unit door, wood frame, hardware	100	EA	1,090.00	$109,000	
HCW 4668 bi pass closet door	100	EA	450.00	$45,000	
Interior storefront glazing	260	SF	55.00	$14,300	
SCW door, frame, hardware at common level	10	EA	1,090.00	$10,900	
Interior Finishes					**$678,811**
Floor Finishes					
Grind 1st floor slab smooth	10,500	SF	1.50	$15,750	
Floor finish allowance at residential floors	48,000	SF	4.00	$192,000	
Floor finish at level 1 = tenant improvements - tenant areas included above					
Trim allowance	62,500	GSF	0.40	$25,000	
Wall Finishes				$0	
Wainscoating	5,120	SF	5.00	$25,600	
Tub & Shower surround - fiberglass	56	EA	480.00	$26,880	
Paint walls	124,775	SF	0.75	$93,581	
Ceiling Finishes				$0	
Sound insulation to floor/ceiling assembly	50,000	SF	1.00	$50,000	
GWB Ceiling & resilient channel	62,500	SF	3.50	$218,750	
Interior ceiling painting	62,500	SF	0.50	$31,250	
Specialties & Casework					**$216,430**

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
TP dispenser allowance at public toilets	6	EA	45.00	$270	
Towel bar allowance	56	EA	45.00	$2,520	
Grab bar	24	EA	250.00	$6,000	
Mirror allowance	62	EA	80.00	$4,960	
Fire extinguisher & cabinets	12	EA	450.00	$5,400	
Medicine cabinet	56	EA	250.00	$14,000	
Robe hook allowance	112	EA	25.00	$2,800	
Shower curtain & rod allowance	56	EA	85.00	$4,760	
Unit Signage	56	EA	120.00	$6,720	
Code signage	1	LS	5,000.00	$5,000	
Shelf & pole	260	LF	25.00	$6,500	
Kitchen base unit w/plam top	397	LF	140.00	$55,580	
Kitchen wall unit	621	LF	100.00	$62,100	
Hall bench	24	LF	80.00	$1,920	
cb, tb, cg, tv bracket, misc allowance	1	LS	10,000.00	$10,000	
Lounge, meeting, break room casework allowance	1	LS	12,000.00	$12,000	
Reception casework allowance	22	LF	450.00	$9,900	
Storage shelving allowance	1	LS	6,000.00	$6,000	
Appliances					**$280,000**
Stove/oven	56	EA	800.00	$44,800	
Vent hood/microwave combo	56	EA	1,250.00	$70,000	
Refrigerator	56	EA	1,200.00	$67,200	
Dishwasher	56	EA	500.00	$28,000	
Laundry appliances allowance	56	EA	1,250.00	$70,000	
Furnishings & Equipment					**$33,680**
mailboxes	60	EA	150.00	$9,000	
Window coverings: blinds	1,920	SF	4.00	$7,680	
Mini Kitchen Equipment at conference	1	LS	10,000.00	$10,000	
Trash Chute System: 60 LF shaft, 5 stations	1	LS	7,000.00	$7,000	
Elevator					**$112,500**
Hydraulic passenger elevator	5	STOPS	22,500.00	$112,500	

Adaptive Re-Use
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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Mechanical					**$759,245**
Wet pipe sprinklering systems	62,500	SF	3.25	$203,125	
Plumbing - units	280	FXT	950.00	$266,000	
Plumbing - common	28	FXT	1,350.00	$37,800	
rough-ins	6	EA	550.00	$3,300	
Floor drains	68	EA	550.00	$37,400	
HVAC @ level 1	10,500	SF	12.00	$126,000	
HVAC at Level 2 thru 5 corridors	7,000	SF	6.50	$45,500	
Elec heating @ units - see elc					
Exhaust fans at units	56	EA	280.00	$15,680	
stove hoods ventilate to ext walls	56	EA	265.00	$14,840	
Exhaust fans	12	EA	800.00	$9,600	
Electrical					**$956,925**
power service and distribution	1	LS	40000	$40,000	
power receptacles and circuiting	62,500	SF	3.00	$187,500	
lighting, circuiting and controls	62,500	SF	6.00	$375,000	
Electrical heating - unit heaters	100	EA	600.00	$60,000	
mechanical connections	62,500	SF	1.50	$93,750	
CCTV/Security System	1	LS	21,600.00	$21,600	
Intercom/PA system	68	stns	225.00	$15,300	
Door card reader system	68	EA	800.00	$54,400	
Fire alarm & Radon Alarm	62,500	SF	1.75	$109,375	
TOTAL DIRECT COST				$8,871,128	$8,871,128

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK DETAIL					
Site Preparation	*46,255*	*SF*			**$413,138**
Demo (e) pavings	46,255	SF	2.50	$115,638	
Raise site x 2' - imported structural fill	4,000	CY	40.00	$160,000	
Parge & waterproof building perimeter	2,000	SF	25.00	$50,000	
Load, haul & dump	611	CY	45.00	$27,500	
Erosion control during construction	1	LS	20,000.00	$20,000	
Temp shoring allowance		none required		$0	
Demo utilities allowance	1	LS	40,000.00	$40,000	
Site Drainage Systems					**$184,610**
Storm drainage allowance	30,000	SF	6.00	$180,000	
Connect to roof drains & fdn drains	7	loc	80.00	$560	
Connect to (e) SD in street	1	EA	800.00	$800	
Footing drain at bldg foundation wall	500	LF	6.50	$3,250	
Site Sanitary Sewer System					**$44,800**
6" PVC w/trench, excavate & backfill	320	LF	85.00	$27,200	
Man holes	2	EA	7,500.00	$15,000	
Clean outs	4	EA	250.00	$1,000	
Connect to existing	2	loc	800.00	$1,600	
Water & Fire Water					**$53,600**
Pipe & earthwork	480	LF	45.00	$21,600	
Fire hydrant	6	EA	4,500.00	$27,000	
Meter	1	EA	5,000.00	$5,000	
Site Gas					**$26,600**
Pipe & earthwork	480	LF	45.00	$21,600	
Meter	1	EA	5,000.00	$5,000	
Site Electrical					**$379,800**
Overhead power service	1	LS	40,000.00	$40,000	
Transformer	1	EA	85,000.00	$85,000	
Main Meter	2	EA	5,000.00	$10,000	
unit meters	56	EA	2,400.00	$134,400	

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Parking lot lights	24	EA	4,000.00	$96,000	
Landscape lighting	12	EA	1,200.00	$14,400	
Site Improvements					**$253,505**
Sidewalks	10,000	SF	4.00	$40,000	
Trash enclosure	1	LS	85,000.00	$85,000	
Equipment pads	240	SF	4.00	$960	
ACP parking paving system w/striping	30,000	SF	3.75	$112,500	
PCC bumpers	77	EA	85.00	$6,545	
Directional signage & parking signage	8	EA	450.00	$3,600	
HC curb cut	2	EA	450.00	$900	
Driveway curb cut	2	EA	2,000.00	$4,000	
Landscaping					**$51,850**
Fine grading	5,000	SF	0.45	$2,250	
Import topsoil	300	CY	32.00	$9,600	
Landscaping & irrigation	5,000	SF	8.00	$40,000	
TOTAL DIRECT COST				$1,407,903	$1,407,903

#13 Digester Cost Estimate

Adaptive Re-Use BUILDING #13 DIGESTER Johnson Architecture & Planning
Port of Bellingham Matson Carlson Cost Consultants
SD Level Budget Estimate REV 11/30/09 11/9/09

Description		Quantity	Unit	Unit Price		Sub-Total	TOTAL
SQUARE FOOT ANALYSIS							
	Level 1			10,500	GSF		
	Level 2			10,500	GSF		
	Level 3		new	10,500	GSF		
	Level 4 & 5			21,000	GSF		
	Level 6		new	10,500	GSF		
	Level 7			10,500	GSF		
	Level 8			10,500	GSF		
53 Units		**TOTAL**		**84,000**	**GSF**		
BUILDING SUMMARY							
Demolition		67,840	SF	16.45			$1,115,940
Structural Upgrades		67,840	SF	33.95			$2,303,280
Floor Framing		30,480	SF	26.74			$815,160
Roof Framing		2,880	SF	12.00			$34,560
Stair Systems		16	FLIGHTS	8,000.00			$128,000
Exterior Closure		65,088	SF	31.63			$2,058,976
Roofing		9,200	SF	20.48			$188,400
Interior Doors & Partitions		84,000	GSF	10.02			$841,583
Interior Finishes		84,000	GSF	11.01			$924,426
Specialties & Casework		84,000	GSF	3.40			$285,200
Appliances		84,000	GSF	4.64			$390,000
Furnishings & Equipment		84,000	GSF	0.48			$39,900
Elevator		16	STOP				$382,500
Mechanical		84,000	GSF	11.40			$957,710
Electrical		84,000	GSF	14.89			$1,250,750
TOTAL DIRECT COST							**$11,716,384**
General Conditions			8%				$937,311
Tower Crane for 12 months		1	LS	248,000.00			$248,000
Overhead & profit			10%				$1,265,370
TOTAL COST @ TODAY'S BID		**84,000**	**GSF**	**168.66**			**$14,167,065**

Adaptive Re-Use
Port of Bellingham
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Johnson Architecture & Planning
Matson Carlson Cost Consultants
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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK SUMMARY					
Site Preparation	60,984	SF	16.09		$981,193
Site Drainage Systems	46,465	SF	6.11		$284,050
Site Sanitary Sewer System	400	LF	129.00		$51,600
Water & Fire Water	500	LF	109.00		$54,500
Site Gas	500	LF	55.00		$27,500
Site Electrical	1	LS	456,600.00		$456,600
Site Improvements	10,000	SF	34.31		$343,075
Landscaping	15,000	SF	14.51		$217,604
TOTAL DIRECT COST					**$2,416,123**
General Conditions		8%			$193,290
Overhead & profit		10%			$260,941
TOTAL COST @ TODAY'S BID					**$2,870,354**

ESTIMATE DETAIL

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Demolition/Building Preparation					**$1,115,940**
Exterior Demolition					
Demo (e) fire escape stairs	15	RUNS	1200.00	$18,000	
Demo rooftop penthouse	800	GSF	85.00	$68,000	
Demo platforms	240	SF	15.00	$3,600	
Demo rooftop equip, stacks, sheetmetal, etc	9,200	SF	5.00	$46,000	
Demo (e) roofing	9,200	SF	2.50	$23,000	HAZMAT???
Demo windows	3,000	SF	5.00	$15,000	HAZMAT???
Demo exterior doors	8	EA	150.00	$1,200	
Salvage ships ladder	1	EA	400.00	$400	
Saw cut/demo damaged brick (20%)	9,824	SF	10.00	$98,240	
Sawcut brick for new doors, windows, louvers	80	loc	500.00	$40,000	
Interior Demolition				$0	
Saw cut/shore digester tank at 2nd floor level	9	EA	2500.00	$22,500	
Add connections to remaining tank bottom	9	EA	4000.00	$36,000	
Demo remaining portion of digester tanks: 12' dia x 40' tall	9	EA	15000.00	$135,000	

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Gut interiors	84,000	GSF	3.50	$294,000	
Salvage stairs	7	FLIGHTS	2500.00	$17,500	
Salvage grating & catwalks	24,500	SF	5.00	$122,500	
Load, haul & dump debris	3,000	CY	45.00	$135,000	
Recycle costs included in load, haul & dump - Recycle/salvage credits not included				$0	
Hazmat demo allowance	1	LS	40000.00	$40,000	
Structural Upgrades					**$2,303,280**
Demolition					
Saw cut/demo slab for foundations upgrades & misc	9,200	SF	10.00	$92,000	
Demo steel members	400	LF	25.00	$10,000	
Demo conc walls - new openings	10	EA	500.00	$5,000	
New floor openings	16	EA	500.00	$8,000	
Load, haul & dump debris	370	CY	75.00	$27,750	
Foundations					
Upgrade foundations: earthwork,conc, form, rebar	400	CY	680.00	$272,000	
New elevator pit	2	EA	6000.00	$12,000	
New stair foundations	400	SF	25.00	$10,000	
Concrete Work					
Replace slab on grade	9,200	SF	6.50	$59,800	
Drill & grout rebar into (e) grade beams & pile caps	960	LOC	25.00	$24,000	
New shear walls	7,488	SF	25.00	$187,200	
New concrete beam	600	LF	120.00	$72,000	
Floor & Roof Framing				$0	
Infill floor framing: steel joists, mtl decking, concrete topping	1,600	SF	25.00	$40,000	
X-Bracing allowance	180	TON	4800.00	$864,000	
Strong back system	49,120	SF	6.50	$319,280	
Floor & roof to wall ties	959	EA	250.00	$239,750	
Struts, plates, ledgers, lintels, etc - allowance	1,800	LF	25.00	$45,000	
Drill & grout epoxy anchors in to (e) concrete	900	EA	10.00	$9,000	
Misc demo, hardware, weld, drill, gout, metals	1	LS	6500.00	$6,500	
Floor Framing					**$815,160**

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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
New floor framing at addition	5,760	SF	16.00	$92,160	
Infill floor frmg: Steel joists, metal deck, concrete topping, sound batts	24,720	SF	25.00	$618,000	
Acoustical batts	84,000	SF	1.25	$105,000	
Roof Framing					**$34,560**
new roof framing at addition					
Steel joists, metal deck	2,880	SF	12.00	$34,560	
Stair Systems					**$128,000**
Exit stairs including railings	16	FLIGHT	8,000.00	$128,000	
Exterior Closure					**$2,058,976**
Masonry Work					
Clean (e) brick walls using Non-Historic Standards	49,120	SF	2.00	$98,240	
Replace brick using slavaged brick (20%)	9,824	SF	44.00	$432,256	
Re-point brick (10%)	4,912	SF	10.00	$49,120	
Seal brick	49,120	SF	2.00	$98,240	
Scaffolding allowance	1	LS	30000.00	$30,000	
Concrete Work					
Clean (e) concrete walls using Non-Historic Standards	10,080	SF	2.00	$20,160	
Seal concrete	10,080	SF	2.00	$20,160	
Scaffolding allowance		included above		$0	
Adddition Walls				$0	
Ext Wall assembly at stair & elevator	13,200	SF	32.50	$429,000	
Remaining Work					
2x6 studs @16" oc as furring	59,200	SF	2.85	$168,720	
R21 Bat insulation to perim furred walls	59,200	SF	1.00	$59,200	
GWB to furred walls	59,200	SF	2.15	$127,280	
New studs, ply, insul, GWB to addition walls	6,000	SF	7.50	$45,000	
New window - installed, lintel, flash & caulk	100	EA	1200.00	$120,000	
Exterior doors - alum, glazed	4	EA	1600.00	$6,400	
Exterior doors, hollow metal	4	EA	1300.00	$5,200	
Exterior doors - overhead	1	EA	5000.00	$5,000	
Access control: keypad entry allowance	1	LOC	2500.00	$2,500	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Metal siding over rain screen panels	6,000	SF	25.00	$150,000	
Storefront glazing	2,000	SF	65.00	$130,000	
Louvers	500	SF	125.00	$62,500	
Roofing					**$188,400**
New roofing system w/associated vents, drains, flashing, etc	10,500	SF	14.00	$147,000	
New skylights		EA	2000.00	$0	
New entry canopy	400	SF	75.00	$30,000	
Loading canopy	200	SF	45.00	$9,000	
Roof hatch & access ladder	2	EA	1,200.00	$2,400	
Interior Doors & Partitions					**$841,583**
Studs & furring	77,557	SF	2.00	$155,114	
GWB to walls - light texture, level 4	155,114	SF	2.00	$310,228	
Add for 2nd layer	36,911	SF	1.00	$36,911	
Sound batts to walls	36,911	SF	0.45	$16,610	
Elevator shaft walls	3,000	SF	8.00	$24,000	
OH Coiling doors: 6070	1	EA	2,800.00	$2,800	
HM doors (18 GA), HM frame & hardware	10	EA	1,450.00	$14,500	
SCW rated Entry door, HM frame & hardware	78	EA	1,200.00	$93,600	
SCW interior unit door, wood frame, hardware	120	EA	1,090.00	$130,800	
HCW 4668 bi pass closet door	78	EA	450.00	$35,100	
Interior storefront glazing	240	SF	55.00	$13,200	
SCW door, frame, hardware at common level	8	EA	1,090.00	$8,720	
Interior Finishes					**$924,426**
Floor Finishes					
Grind 1st floor slab smooth	8,500	SF	1.50	$12,750	
Floor finish allowance at residential floors	62,000	SF	4.00	$248,000	
Floor finish at level 1 = tenant improvements - tenant areas included above					
Trim allowance	84,000	GSF	0.40	$33,600	
Wall Finishes				$0	
Wainscoating	12,880	SF	5.00	$64,400	
Tub & Shower surround - fiberglass	78	EA	480.00	$37,440	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Paint walls	214,314	SF	0.75	$160,736	
Ceiling Finishes				$0	
Sound insulation to floor/ceiling assembly	73,500	SF	1.00	$73,500	
GWB Ceiling & resilient channel	73,500	SF	3.50	$257,250	
Interior ceiling painting	73,500	SF	0.50	$36,750	
Specialties & Casework					**$285,200**
TP dispenser allowance at public toilets	6	EA	45.00	$270	
Towel bar allowance	78	EA	45.00	$3,510	
Grab bar	34	EA	250.00	$8,500	
Mirror allowance	78	EA	80.00	$6,240	
Fire extinguisher & cabinets	20	EA	450.00	$9,000	
Medicine cabinet	78	EA	250.00	$19,500	
Robe hook allowance	156	EA	25.00	$3,900	
Shower curtain & rod allowance	78	EA	85.00	$6,630	
Unit Signage	78	EA	120.00	$9,360	
Code signage	1	LS	7,500.00	$7,500	
Shelf & pole	362	LF	25.00	$9,050	
Kitchen base unit w/plam top	553	LF	140.00	$77,420	
Kitchen wall unit	865	LF	100.00	$86,500	
Hall bench	24	LF	80.00	$1,920	
cb, tb, cg, tv bracket, misc allowance	1	LS	10,000.00	$10,000	
Lounge, meeting, break room casework allowance	1	LS	10,000.00	$10,000	
Reception casework allowance	22	LF	450.00	$9,900	
Storage shelving allowance	1	LS	6,000.00	$6,000	
Appliances					**$390,000**
Stove/oven	78	EA	800.00	$62,400	
Vent hood/microwave combo	78	EA	1,250.00	$97,500	
Refrigerator	78	EA	1,200.00	$93,600	
Dishwasher	78	EA	500.00	$39,000	
Laundry appliances allowance	78	EA	1,250.00	$97,500	
Furnishings & Equipment					**$39,900**

Adaptive Re-Use | Johnson Architecture & Planning
Port of Bellingham | Matson Carlson Cost Consultants
SD Level Budget Estimate | REV 11/30/09 | 11/9/09

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
mailboxes	82	EA	150.00	$12,300	
Window coverings: blinds	2,400	SF	4.00	$9,600	
Mini Kitchen Equipment at conference	1	LS	10,000.00	$10,000	
Trash Chute System: 100 LF shaft, 7 stations	1	LS	8,000.00	$8,000	
Elevator					**$382,500**
Hydraulic passenger elevator	17	STOPS	22,500.00	$382,500	
Mechanical					**$957,710**
Wet pipe sprinklering systems	84,000	SF	3.25	$273,000	
Plumbing - units	390	FXT	950.00	$370,500	
Plumbing - common	28	FXT	1,350.00	$37,800	
rough-ins	6	EA	550.00	$3,300	
Floor drains	90	EA	550.00	$49,500	
HVAC @ level 1	10,500	SF	12.00	$126,000	
HVAC at Level 2 thru 8 corridors	7,000	SF	6.50	$45,500	
Elec heating @ units - see elc					
Exhaust fans at units	78	EA	280.00	$21,840	
stove hoods ventilate to ext walls	78	EA	265.00	$20,670	
Exhaust fans	12	EA	800.00	$9,600	
Electrical					**$1,250,750**
power service and distribution	1	LS	40000	$40,000	
power receptacles and circuiting	84,000	SF	3.00	$252,000	
lighting, circuiting and controls	84,000	SF	6.00	$504,000	
Electrical heating - unit heaters	120	EA	600.00	$72,000	
mechanical connections	84,000	SF	1.50	$126,000	
CCTV/Security System	1	LS	17,500.00	$17,500	
Intercom/PA system	90	stns	225.00	$20,250	
Door card reader system	90	EA	800.00	$72,000	
Fire alarm & Radon Alarm	84,000	SF	1.75	$147,000	
TOTAL DIRECT COST				$11,716,384	$11,716,384

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL

Adaptive Re-Use | Johnson Architecture & Planning
Port of Bellingham | Matson Carlson Cost Consultants
SD Level Budget Estimate | REV 11/30/09 | 11/9/09

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK DETAIL					
Site Preparation	*71,484*	*SF*			**$981,193**
Demo (e) pavings	60,984	SF	2.50	$152,460	
Raise site x 6' - imported structural fill	15,885	CY	40.00	$635,413	
Parge & waterproof building perimeter	3,300	SF	25.00	$82,500	
Load, haul & dump	1,129	CY	45.00	$50,820	
Erosion control during construction	1	LS	20,000.00	$20,000	
Temp shoring allowance		none required		$0	
Demo utilities allowance	1	LS	40,000.00	$40,000	
Site Drainage Systems					**$284,050**
stormdrainage allowance	46,465	SF	6.00	$278,790	
Connect to roof drains & fdn drains	7	loc	80.00	$560	
Connect to (e) SD in street	1	EA	800.00	$800	
Footing drain at bldg foundation wall	600	LF	6.50	$3,900	
Site Sanitary Sewer System					**$51,600**
6" PVC w/trench, excavate & backfill	400	LF	85.00	$34,000	
Man holes	2	EA	7,500.00	$15,000	
Clean outs	4	EA	250.00	$1,000	
Connect to existing	2	loc	800.00	$1,600	
Water & Fire Water					**$54,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Fire hydrant	6	EA	4,500.00	$27,000	
Meter	1	EA	5,000.00	$5,000	
Site Gas					**$27,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Meter	1	EA	5,000.00	$5,000	
Site Electrical					**$456,600**
Overhead power service	1	LS	40,000.00	$40,000	
Transformer	1	EA	85,000.00	$85,000	
Main Meter	2	EA	5,000.00	$10,000	
unit meters	78	EA	2,400.00	$187,200	

Adaptive Re-Use Johnson Architecture & Planning
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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Parking lot lights	30	EA	4,000.00	$120,000	
Landscape lighting	12	EA	1,200.00	$14,400	
Site Improvements					**$343,075**
Sidewalks	10,000	SF	4.00	$40,000	
Trash enclosure	1	LS	85,000.00	$85,000	
Equipment pads	240	SF	4.00	$960	
Loading dock	1	LS	90,000.00	$90,000	
ACP parking paving system w/striping	29,020	SF	3.75	$108,825	
PCC bumpers	94	EA	85.00	$7,990	
Directional signage & parking signage	10	EA	450.00	$4,500	
HC curb cut	4	EA	450.00	$1,800	
Driveway curb cut	2	EA	2,000.00	$4,000	
Landscaping					**$217,604**
Fine grading	21,965	SF	0.45	$9,884	
Import topsoil	1,000	CY	32.00	$32,000	
Landscaping & irrigation	21,965	SF	8.00	$175,720	
TOTAL DIRECT COST				$2,416,123	$2,416,123

#13 Digester w/Addition Cost Estimate

Adaptive Re-Use BUILDING #13 FULL DIGESTER Johnson Architecture & Planning
Port of Bellingham Matson Carlson Cost Consultants
SD Level Budget Estimate 11/9/09

Description		Quantity	Unit	Unit Price	Sub-Total	TOTAL
SQUARE FOOT ANALYSIS				**Existing**	**New**	**TOTAL**
	Level 1			9,200	26,750	35,950
	Level 2			9,200	10,275	19,475
	Level 3			9,200	10,275	19,475
	Level 4			9,200	10,275	19,475
	Level 5			9,200	10,275	19,475
	Level 6			9,200	10,275	19,475
	Level 7			6,320	13,155	19,475
	Level 8			6,320	13,155	19,475
133 Units		**TOTAL**		**67,840**	**104,435**	**172,275**
BUILDING SUMMARY						
Demolition		67,840	SF	15.97		$1,083,180
Structural Upgrades		67,840	SF	40.71		$2,761,983
Floor Framing		104,435	SF	19.08		$1,993,084
Roof Framing		13,155	SF	24.40		$321,000
Stair Systems		14	FLIGHTS	8,000.00		$112,000
Exterior Closure		102,640	SF	34.62		$3,553,256
Roofing		35,950	SF	17.13		$615,700
Interior Doors & Partitions		172,275	GSF	8.77		$1,510,838
Interior Finishes		172,275	GSF	9.67		$1,665,212
Specialties & Casework		172,275	GSF	2.65		$457,308
Appliances		172,275	GSF	2.98		$513,150
Furnishings & Equipment		172,275	GSF	0.35		$60,500
Elevator		16	STOP			$360,000
Mechanical		172,275	GSF	9.78		$1,684,229
Electrical		172,275	GSF	14.28		$2,459,363
TOTAL DIRECT COST						**$19,150,802**
General Conditions			8%			$1,532,064
Tower Crane for 12 months		1	LS	248,000.00		$248,000
Overhead & profit			10%			$2,068,287
TOTAL COST @ TODAY'S BID		**172,275**	**GSF**	**133.50**		**$22,999,152**

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK SUMMARY					
Site Preparation	82,730	SF	14.79		$1,223,711
Site Drainage Systems	46,827	SF	9.60		$449,766
Site Sanitary Sewer System	400	LF	129.00		$51,600
Water & Fire Water	500	LF	109.00		$54,500
Site Gas	500	LF	55.00		$27,500
Site Electrical	1	LS	456,600.00		$456,600
Site Improvements	10,000	SF	40.65		$406,518
Landscaping	5,000	SF	10.37		$51,850
TOTAL DIRECT COST					**$2,722,045**
General Conditions		8%			$217,764
Overhead & profit		10%			$293,981
TOTAL COST @ TODAY'S BID					**$3,233,789**

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
ESTIMATE DETAIL					
Demolition/Building Preparation					**$1,083,180**
Exterior Demolition					
Demo (e) fire escape stairs	14	RUNS	1200.00	$16,800	
Demo rooftop penthouse	800	GSF	85.00	$68,000	
Demo platforms	240	SF	15.00	$3,600	
Demo rooftop equip, stacks, sheetmetal, etc	9,200	SF	5.00	$46,000	
Demo (e) roofing	9,200	SF	2.50	$23,000	HAZMAT???
Demo windows	3,000	SF	5.00	$15,000	HAZMAT???
Demo exterior doors	8	EA	150.00	$1,200	
Salvage ships ladder	1	EA	400.00	$400	
Saw cut/demo damaged brick (20%)	9,824	SF	10.00	$98,240	
Sawcut brick for new doors, windows, louvers	80	loc	500.00	$40,000	
Interior Demolition				$0	
Saw cut/shore digester tank at 2nd floor level	9	EA	2500.00	$22,500	
Add connections to remaining tank bottom	9	EA	4000.00	$36,000	
Demo remaining portion of digester tanks: 12' dia x 40' tall	9	EA	15000.00	$135,000	
Gut interiors	67,840	GSF	3.50	$237,440	
Salvage stairs	7	FLIGHTS	2500.00	$17,500	
Salvage grating & catwalks	24,500	SF	5.00	$122,500	
Load, haul & dump debris	3,000	CY	45.00	$135,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Recycle costs included in load, haul & dump - Recycle/salvage credits not included				$0	
Hazmat demo allowance	1	LS	65000.00	$65,000	
Structural Upgrades					**$2,761,983**
Demolition					
Saw cut/demo slab for foundations upgrades & misc	9,200	SF	10.00	$92,000	
Demo steel members	400	LF	25.00	$10,000	
Demo conc walls - new openings	10	EA	500.00	$5,000	
New floor openings	16	EA	500.00	$8,000	
Load, haul & dump debris	370	CY	75.00	$27,778	
Foundations					
Upgrade foundations: earthwork,conc, form, rebar	400	CY	680.00	$272,000	
New elevator pit	2	EA	6000.00	$12,000	
New stair foundations	400	SF	25.00	$10,000	
Ground floor addition foundations	26,750	SF	12.00	$321,000	
Concrete Work					
Ground floor addition slab on grade	26,750	SF	4.50	$120,375	
Replace slab on grade	9,200	SF	8.00	$73,600	
Drill & grout rebar into (e) grade beams & pile caps	960	LOC	25.00	$24,000	
New shear walls	7,488	SF	25.00	$187,200	
New concrete beam	600	LF	120.00	$72,000	
Floor & Roof Framing				$0	
Infill floor framing: steel joists, mtl decking, concrete topping	1,600	SF	25.00	$40,000	
X-Bracing allowance	180	TON	4800.00	$864,000	
Strong back system	49,120	SF	6.50	$319,280	
Floor & roof to wall ties	959	EA	250.00	$239,750	
Struts, plates, ledgers, lintels, etc - allowance	1,800	LF	25.00	$45,000	
Drill & grout epoxy anchors in to (e) concrete	900	EA	10.00	$9,000	
Misc demo, hardware, weld, drill, gout, metals	1	LS	10000.00	$10,000	
Floor Framing					**$1,993,084**
New floor framing at addition	79,715	SF	16.00	$1,275,440	
Infill floor frmg: Steel joists, metal deck, concrete topping, sound batts	24,720	SF	25.00	$618,000	
Acoustical batts	79,715	SF	1.25	$99,644	
Roof Framing					**$321,000**
new roof framing at addition					
Steel joists, metal deck	26,750	SF	12.00	$321,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Stair Systems					**$112,000**
Exit stairs including railings	14	FLIGHT	8,000.00	$112,000	
Exterior Closure					**$3,553,256**
Masonry Work					
Clean (e) brick walls using Non-Historic Standards	49,120	SF	2.00	$98,240	
Replace brick using slavaged brick (20%)	9,824	SF	44.00	$432,256	
Re-point brick (10%)	4,912	SF	10.00	$49,120	
Seal brick	49,120	SF	2.00	$98,240	
Scaffolding allowance	1	LS	30000.00	$30,000	
Concrete Work				$0	
Clean (e) concrete walls using Non-Historic Standards	10,080	SF	2.00	$20,160	
Seal concrete	10,080	SF	2.00	$20,160	
Scaffolding allowance		included above		$0	
Adddition Walls				$0	
Ext Wall assembly at stair & elevator	13,200	SF	32.50	$429,000	
New ext walls at 1st floor addition - mostly glazing	9,088	SF	55.00	$499,840	
Remaining Work at Floors 2 thru 8 Additions & Furr (e) Walls					
2x6 studs @16" oc as furring	59,200	SF	2.85	$168,720	
R21 Bat insulation to perim furred walls	59,200	SF	1.00	$59,200	
GWB to furred walls	59,200	SF	2.15	$127,280	
New studs, ply, insul, GWB to addition walls	32,352	SF	7.50	$242,640	
New window - installed, lintel, flash & caulk	200	EA	1200.00	$240,000	
Exterior doors - alum, glazed	12	EA	1600.00	$19,200	
Exterior doors, hollow metal	8	EA	1300.00	$10,400	
Exterior doors - overhead	1	EA	5000.00	$5,000	
Access control: keypad entry allowance	1	LOC	2500.00	$2,500	
Metal siding over rain screen panels	32,352	SF	25.00	$808,800	
Storefront glazing	2,000	SF	65.00	$130,000	
Louvers	500	SF	125.00	$62,500	
Roofing					**$615,700**
New roofing system w/associated vents, drains, flashing, etc	35,950	SF	14.00	$503,300	
New skylights	40	EA	2000.00	$80,000	
New entry canopy	400	SF	75.00	$30,000	
Roof hatch & access ladder	2	EA	1,200.00	$2,400	
Interior Doors & Partitions					**$1,510,838**

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Studs & furring	132,245	SF	2.00	$264,490	
GWB to walls - light texture, level 4	264,490	SF	2.00	$528,979	
Add for 2nd layer	62,938	SF	1.00	$62,938	
Sound batts to walls	62,938	SF	0.45	$28,322	
Elevator shaft walls	3,000	SF	8.00	$24,000	
OH Coiling doors: 6070	1	EA	2,800.00	$2,800	
HM doors (18 GA), HM frame & hardware	10	EA	1,450.00	$14,500	
SCW rated Entry door, HM frame & hardware	133	EA	1,200.00	$159,600	
SCW interior unit door, wood frame, hardware	266	EA	1,090.00	$289,940	
HCW 4668 bi pass closet door	133	EA	450.00	$59,850	
Interior storefront glazing	240	SF	55.00	$13,200	
SCW door, frame, hardware at common level	8	EA	1,090.00	$8,720	
Walls & doors at new 1st floor addition - allowance, minimal	26,750	SF	2.00	$53,500	
Interior Finishes					**$1,665,212**
Floor Finishes					
Grind 1st floor slab smooth	8,500	SF	1.50	$12,750	
Floor finish allowance at residential floors	136,325	SF	4.00	$545,300	
Floor finish at level 1 = tenant improvements - tenant areas included above					
Trim allowance	136,325	GSF	0.40	$54,530	
Wall Finishes				$0	
Wainscoating	12,880	SF	5.00	$64,400	
Tub & Shower surround - fiberglass	133	EA	480.00	$63,840	
Paint walls	323,690	SF	0.75	$242,767	
Ceiling Finishes				$0	
Sound insulation to floor/ceiling assembly	136,325	SF	1.00	$136,325	
GWB Ceiling & resilient channel	136,325	SF	3.50	$477,138	
Interior ceiling painting	136,325	SF	0.50	$68,163	
Specialties & Casework					**$457,308**
TP dispenser allowance at public toilets	6	EA	45.00	$270	
Towel bar allowance	133	EA	45.00	$5,985	
Grab bar	68	EA	250.00	$17,000	
Mirror allowance	133	EA	80.00	$10,640	
Fire extinguisher & cabinets	20	EA	450.00	$9,000	
Medicine cabinet	133	EA	250.00	$33,250	
Robe hook allowance	266	EA	25.00	$6,650	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Shower curtain & rod allowance	133	EA	85.00	$11,305	
Unit Signage	133	EA	120.00	$15,960	
Code signage	1	LS	7,500.00	$7,500	
Shelf & pole	618	LF	25.00	$15,438	
Kitchen base unit w/plam top	943	LF	140.00	$132,003	
Kitchen wall unit	1,475	LF	100.00	$147,488	
Hall bench	24	LF	80.00	$1,920	
cb, tb, cg, tv bracket, misc allowance	1	LS	15,000.00	$15,000	
Lounge, meeting, break room casework allowance	1	LS	12,000.00	$12,000	
Reception casework allowance	22	LF	450.00	$9,900	
Storage shelving allowance	1	LS	6,000.00	$6,000	
Appliances					**$513,150**
Stove/oven	133	EA	800.00	$106,400	
Vent hood/microwave combo	133	EA	1,250.00	$166,250	
Refrigerator	133	EA	1,200.00	$159,600	
Dishwasher	133	EA	500.00	$66,500	
Laundry appliances allowance	6	set	2,400.00	$14,400	
Furnishings & Equipment					**$60,500**
mailboxes	142	EA	150.00	$21,300	
Window coverings: blinds	4,800	SF	4.00	$19,200	
Mini Kitchen Equipment at conference	1	LS	10,000.00	$10,000	
Trash Chute System: 100 LF shaft, 10 stations	1	LS	10,000.00	$10,000	
Elevator					**$360,000**
Hydraulic passenger elevator	16	STOPS	22,500.00	$360,000	
Mechanical					**$1,684,229**
Wet pipe sprinklering systems	172,275	SF	3.25	$559,894	
Plumbing - units	665	FXT	950.00	$631,750	
Plumbing - common	28	FXT	1,350.00	$37,800	
rough-ins	6	EA	550.00	$3,300	
Floor drains	145	EA	550.00	$79,750	
HVAC @ level 1 - common	9,200	SF	12.00	$110,400	
HVAC @ level 1 - TI areas	26,750	SF	5.00	$133,750	
HVAC at Level 2 thru 8 corridors	7,000	SF	6.50	$45,500	
Exhaust fans at units	133	EA	280.00	$37,240	
stove hoods ventilate to ext walls	133	EA	265.00	$35,245	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Exhaust fans	12	EA	800.00	$9,600	
Electrical					**$2,459,363**
power service and distribution	1	LS	60000	$60,000	
power receptacles and circuiting	172,275	SF	3.00	$516,825	
lighting, circuiting and controls	172,275	SF	6.00	$1,033,650	
Electrical heating - unit heaters	205	EA	600.00	$122,769	
mechanical connections	172,275	SF	1.50	$258,413	
CCTV/Security System	1	LS	21,600.00	$21,600	
Intercom/PA system	145	stns	225.00	$32,625	
Door card reader system	140	EA	800.00	$112,000	
Fire alarm & Radon Alarm	172,275	SF	1.75	$301,481	
TOTAL DIRECT COST				$19,150,802	$19,150,802

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
		SITEWORK DETAIL			
Site Preparation	*82,730*	*SF*			**$1,223,711**
Demo (e) pavings	70,000	SF	2.50	$175,000	
Raise site x 6' - imported structural fill	18,384	CY	40.00	$735,378	
Parge & waterproof building perimeter	7,800	SF	25.00	$195,000	
Load, haul & dump	1,296	CY	45.00	$58,333	
Erosion control during construction	1	LS	20,000.00	$20,000	
Temp shoring allowance		none required		$0	
Demo utilities allowance	1	LS	40,000.00	$40,000	
Site Drainage Systems					**$449,766**
stormdrainage allowance	73,326	SF	6.00	$439,956	
Connect to roof drains & fdn drains	7	loc	80.00	$560	
Connect to (e) SD in street	1	EA	800.00	$800	
Footing drain at bldg foundation wall	1,300	LF	6.50	$8,450	
Site Sanitary Sewer System					**$51,600**
6" PVC w/trench, excavate & backfill	400	LF	85.00	$34,000	
Man holes	2	EA	7,500.00	$15,000	
Clean outs	4	EA	250.00	$1,000	
Connect to existing	2	loc	800.00	$1,600	
Water & Fire Water					**$54,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Fire hydrant	6	EA	4,500.00	$27,000	
Meter	1	EA	5,000.00	$5,000	
Site Gas					**$27,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Meter	1	EA	5,000.00	$5,000	
Site Electrical					**$456,600**
Overhead power service	1	LS	40,000.00	$40,000	
Transformer	1	EA	85,000.00	$85,000	
Main Meter	2	EA	5,000.00	$10,000	
unit meters	78	EA	2,400.00	$187,200	
Parking lot lights	30	EA	4,000.00	$120,000	
Landscape lighting	12	EA	1,200.00	$14,400	
Site Improvements					**$406,518**
Sidewalks	10,000	SF	4.00	$40,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Trash enclosure	1	LS	85,000.00	$85,000	
Equipment pads	240	SF	4.00	$960	
ACP parking paving system w/striping	67,730	SF	3.75	$253,988	
PCC bumpers	202	EA	85.00	$17,170	
Directional signage & parking signage	10	EA	450.00	$4,500	
HC curb cut	2	EA	450.00	$900	
Driveway curb cut	2	EA	2,000.00	$4,000	
Landscaping					**$51,850**
Fine grading	5,000	SF	0.45	$2,250	
Import topsoil	300	CY	32.00	$9,600	
Landscaping & irrigation	5,000	SF	8.00	$40,000	
TOTAL DIRECT COST				$2,722,045	$2,722,045

#17 Alcohol Plant Cost Estimate

Adaptive Re-Use BUILDING #17 ALCOHOL PLANT Johnson Architecture & Planning

Port of Bellingham Matson Carlson Cost Consultants

SD Level Budget Estimate 11/9/09

Description		Quantity	Unit	Unit Price	Sub-Total	TOTAL
SQUARE FOOT ANALYSIS				**Existing**	**New**	*TOTAL*
	Level 1			7,400		7,400
	Level 2			7,400		7,400
	Level 3			3,700	3,700	7,400
	Level 4			3,700	3,700	7,400
	Level Mezz				2,525	2,525
30 Units		**TOTAL**		**22,200**	**9,925**	**32,125**
BUILDING SUMMARY						
Demolition		22,200	SF	36.85		$818,045
Structural Upgrades		22,200	SF	49.38		$1,096,223
Floor Framing		9,925	SF	28.43		$282,206
Roof Framing		3,700	SF	12.00		$44,400
Stair Systems		16	FLIGHTS	7,500.00		$120,000
Exterior Closure		29,920	SF	31.89		$954,128
Roofing		7,400	SF	19.43		$143,800
Interior Doors & Partitions		32,125	GSF	14.00		$449,749
Interior Finishes		32,125	GSF	11.71		$376,034
Specialties & Casework		32,125	GSF	4.35		$139,605
Appliances		32,125	GSF	4.67		$150,000
Furnishings & Equipment		32,125	GSF	0.87		$28,008
Elevator		4	STOP			$90,000
Mechanical		32,125	GSF	13.78		$442,784
Electrical		32,125	GSF	16.02		$514,681
TOTAL DIRECT COST						**$5,649,665**
General Conditions			8%			$451,973
Tower Crane for 12 months		1	LS	200,000.00		$200,000
Overhead & profit			10%			$610,164
TOTAL COST @ TODAY'S BID		**32,125**	**GSF**	**215.15**		**$6,911,801**

Adaptive Re-Use | Johnson Architecture & Planning
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SD Level Budget Estimate | 11/9/09

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK SUMMARY					
Site Preparation	31,260	SF	15.99		$499,756
Site Drainage Systems	25,773	SF	3.70		$95,276
Site Sanitary Sewer System	400	LF	129.00		$51,600
Water & Fire Water	500	LF	109.00		$54,500
Site Gas	500	LF	55.00		$27,500
Site Electrical	1	LS	371,000.00		$371,000
Site Improvements	10,000	SF	19.61		$196,103
Landscaping	5,000	SF	9.04		$45,213
TOTAL DIRECT COST					**$1,340,947**
General Conditions		8%			$107,276
Overhead & profit		10%			$144,822
TOTAL COST @ TODAY'S BID					**$1,593,045**

ESTIMATE DETAIL

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Demolition/Building Preparation					**$818,045**
Exterior Demolition					
Demo building - 2 story	22,200	GSF	7.50	$166,500	
Demo rooftop water tank	1	EA	5000.00	$5,000	
Demo platforms	400	SF	15.00	$6,000	
Demo rooftop equip, stacks, sheetmetal, etc	7,400	SF	10.00	$74,000	
Demo (e) roofing	7,400	SF	2.50	$18,500	HAZMAT???
Demo windows	2,000	SF	5.00	$10,000	HAZMAT???
Demo exterior doors	40	EA	150.00	$6,000	
Salvage ships ladder	1	EA	400.00	$400	
Saw cut/demo damaged brick (20%)	4,272	SF	10.00	$42,720	
Sawcut brick for new doors, windows, louvers	48	loc	500.00	$24,000	
Interior Demolition				$0	
Demo boiler	1	LS	25000.00	$25,000	
Gut interiors	22,200	GSF	3.50	$77,700	
Salvage stairs	8	FLIGHTS	2500.00	$20,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Salvage grating & catwalks	10,000	SF	5.00	$50,000	
Load, haul & dump debris	4,605	CY	45.00	$207,225	
Recycle costs included in load, haul & dump - Recycle/salvage credits not included				$0	
Hazmat demo allowance	1	LS	85000.00	$85,000	
Structural Upgrades					**$1,096,223**
Demolition					
Saw cut/demo slab for foundations upgrades & misc	1,000	SF	10.00	$10,000	
Demo steel members	300	LF	25.00	$7,500	
New floor openings	6	EA	500.00	$3,000	
Load, haul & dump debris	78	CY	75.00	$5,833	
Foundations					
Upgrade foundations: earthwork,conc, form, rebar	45	CY	680.00	$30,600	
New elevator pit	1	EA	6000.00	$6,000	
New stair foundations	400	SF	25.00	$10,000	
Concrete Work					
Replace slab on grade	1,000	SF	6.50	$6,500	
Drill & grout rebar into (e) grade beams & pile caps	48	LOC	25.00	$1,200	
New shear walls	7,050	SF	25.00	$176,250	
New concrete beam	600	LF	120.00	$72,000	
Floor & Roof Framing				$0	
Infill floor framing: steel joists, mtl decking, concrete topping	1,600	SF	25.00	$40,000	
X-Bracing allowance	80	TON	4800.00	$384,000	
Strong back system	21,360	SF	6.50	$138,840	
Floor & roof to wall ties	620	EA	250.00	$155,000	
Struts, plates, ledgers, lintels, etc - allowance	1,240	LF	25.00	$31,000	
Drill & grout epoxy anchors in to (e) concrete	1,200	EA	10.00	$12,000	
Misc demo, hardware, weld, drill, gout, metals	1	LS	6500.00	$6,500	
Floor Framing					**$282,206**
New floor framing	9,925	SF	16.00	$158,800	
Infill floor frmg: Steel joists, metal deck, concrete topping, sound batts	3,700	SF	25.00	$92,500	
Acoustical batts	24,725	SF	1.25	$30,906	

Adaptive Re-Use | Johnson Architecture & Planning
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Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Roof Framing					**$44,400**
new roof framing at addition					
Steel joists, metal deck	3,700	SF	12.00	$44,400	
Stair Systems					**$120,000**
Exit stairs including railings	16	FLIGHT	7,500.00	$120,000	
Exterior Closure					**$954,128**
Masonry Work					
Clean (e) brick walls using Non-Historic Standards	21,360	SF	2.00	$42,720	
Replace brick using slavaged brick (20%)	4,272	SF	44.00	$187,968	
Re-point brick (10%)	2,136	SF	10.00	$21,360	
Seal brick	21,360	SF	2.00	$42,720	
Scaffolding allowance	1	LS	30000.00	$30,000	
Adddition Walls				$0	
Ext Wall assembly at addition	8,560	SF	32.50	$278,200	
Remaining Work					
2x6 studs @16" oc as furring	21,360	SF	2.85	$60,876	
R21 Bat insulation to perim furred walls	21,360	SF	1.00	$21,360	
GWB to furred walls	21,360	SF	2.15	$45,924	
New window - installed, lintel, flash & caulk	60	EA	1200.00	$72,000	
Exterior doors - alum, glazed	8	EA	1600.00	$12,800	
Exterior doors, hollow metal	4	EA	1300.00	$5,200	
Exterior doors - overhead	1	EA	5000.00	$5,000	
Access control: keypad entry allowance	1	LOC	2500.00	$2,500	
Storefront glazing	1,200	SF	65.00	$78,000	
Louvers	380	SF	125.00	$47,500	
Roofing					**$143,800**
New roofing system w/associated vents, drains, flashing, etc	7,400	SF	14.00	$103,600	
New skylights		EA	2000.00	$0	
New entry canopy	400	SF	75.00	$30,000	
Loading canopy	200	SF	45.00	$9,000	
Roof hatch & access ladder	1	EA	1,200.00	$1,200	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Interior Doors & Partitions					**$449,749**
Studs & furring	39,773	SF	2.00	$79,546	
GWB to walls - light texture, level 4	79,546	SF	2.00	$159,091	
Add for 2nd layer	22,946	SF	1.00	$22,946	
Sound batts to walls	22,946	SF	0.45	$10,326	
Elevator shaft walls	4,000	SF	8.00	$32,000	
OH Coiling doors: 6070	1	EA	2,800.00	$2,800	
HM doors (18 GA), HM frame & hardware	10	EA	1,450.00	$14,500	
SCW rated Entry door, HM frame & hardware	30	EA	1,200.00	$36,000	
SCW interior unit door, wood frame, hardware	48	EA	1,090.00	$52,320	
HCW 4668 bi pass closet door	48	EA	450.00	$21,600	
Interior storefront glazing	180	SF	55.00	$9,900	
SCW door, frame, hardware at common level	8	EA	1,090.00	$8,720	
Interior Finishes					**$376,034**
Floor Finishes					
Grind 1st floor slab smooth	7,400	SF	1.50	$11,100	
Floor finish allowance at residential floors	24,725	SF	4.00	$98,900	
Floor finish at level 1 = tenant improvements - tenant areas included above					
Trim allowance	32,125	GSF	0.40	$12,850	
Wall Finishes				$0	
Wainscoating	7,896	SF	5.00	$39,480	
Tub & Shower surround - fiberglass	30	EA	480.00	$14,400	
Paint walls	100,906	SF	0.75	$75,679	
Ceiling Finishes				$0	
Sound insulation to floor/ceiling assembly	24,725	SF	1.00	$24,725	
GWB Ceiling & resilient channel	24,725	SF	3.50	$86,538	
Interior ceiling painting	24,725	SF	0.50	$12,363	
Specialties & Casework					**$139,605**
TP dispenser allowance at public toilets	6	EA	45.00	$270	
Towel bar allowance	60	EA	45.00	$2,700	
Grab bar	12	EA	250.00	$3,000	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Mirror allowance	38	EA	80.00	$3,040	
Fire extinguisher & cabinets	12	EA	450.00	$5,400	
Medicine cabinet	30	EA	250.00	$7,500	
Robe hook allowance	60	EA	25.00	$1,500	
Shower curtain & rod allowance	30	EA	85.00	$2,550	
Unit Signage	30	EA	120.00	$3,600	
Code signage	1	LS	7,500.00	$7,500	
Shelf & pole	139	LF	25.00	$3,482	
Kitchen base unit w/plam top	213	LF	140.00	$29,775	
Kitchen wall unit	333	LF	100.00	$33,268	
Hall bench	24	LF	80.00	$1,920	
cb, tb, cg, tv bracket, misc allowance	1	LS	10,000.00	$10,000	
Lounge, meeting, break room casework allowance	1	LS	10,000.00	$10,000	
Reception casework allowance	18	LF	450.00	$8,100	
Storage shelving allowance	1	LS	6,000.00	$6,000	
Appliances					**$150,000**
Stove/oven	30	EA	800.00	$24,000	
Vent hood/microwave combo	30	EA	1,250.00	$37,500	
Refrigerator	30	EA	1,200.00	$36,000	
Dishwasher	30	EA	500.00	$15,000	
Laundry appliances allowance	30	EA	1,250.00	$37,500	
Furnishings & Equipment					**$28,008**
mailboxes	36	EA	150.00	$5,400	
Window coverings: blinds	1,152	SF	4.00	$4,608	
Mini Kitchen Equipment at conference	1	LS	10,000.00	$10,000	
Trash Chute System: 100 LF shaft, 5 stations	1	LS	8,000.00	$8,000	
Elevator					**$90,000**
Hydraulic passenger elevator	4	STOPS	22,500.00	$90,000	
Mechanical					**$442,784**
Wet pipe sprinklering systems	32,125	SF	3.25	$104,406	
Plumbing - units	150	FXT	950.00	$142,500	

Adaptive Re-Use | Johnson Architecture & Planning
Port of Bellingham | Matson Carlson Cost Consultants
SD Level Budget Estimate | 11/9/09

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Plumbing - common	20	FXT	1,350.00	$27,000	
rough-ins	6	EA	550.00	$3,300	
Floor drains	42	EA	550.00	$23,100	
HVAC @ level 1	7,400	SF	12.00	$88,800	
HVAC at Level 2 thru 4 corridors	4,512	SF	6.50	$29,328	
Elec heating @ units - see elc					
Exhaust fans at units	30	EA	280.00	$8,400	
stove hoods ventilate to ext walls	30	EA	265.00	$7,950	
Exhaust fans	10	EA	800.00	$8,000	
Electrical					**$514,681**
power service and distribution	1	LS	40000	$40,000	
power receptacles and circuiting	32,125	SF	3.00	$96,375	
lighting, circuiting and controls	32,125	SF	6.00	$192,750	
Electrical heating - unit heaters	48	EA	600.00	$28,800	
mechanical connections	32,125	SF	1.50	$48,188	
CCTV/Security System	1	LS	17,500.00	$17,500	
Intercom/PA system	34	stns	225.00	$7,650	
Door card reader system	34	EA	800.00	$27,200	
Fire alarm & Radon Alarm	32,125	SF	1.75	$56,219	
TOTAL DIRECT COST				$5,649,665	$5,649,665

Adaptive Re-Use
Port of Bellingham
SD Level Budget Estimate

Johnson Architecture & Planning
Matson Carlson Cost Consultants
11/9/09

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
SITEWORK DETAIL					
Site Preparation	*31,260*	*SF*			**$499,756**
Demo (e) pavings	31,260	SF	2.50	$78,150	
Raise site x 6' - imported structural fill	6,889	CY	40.00	$275,556	
Parge & waterproof building perimeter	2,400	SF	25.00	$60,000	
Load, haul & dump	579	CY	45.00	$26,050	
Erosion control during construction	1	LS	20,000.00	$20,000	
Temp shoring allowance		none required		$0	
Demo utilities allowance	1	LS	40,000.00	$40,000	
Site Drainage Systems					**$95,276**
stormdrainage allowance	15,246	SF	6.00	$91,476	
Connect to roof drains & fdn drains	5	loc	80.00	$400	
Connect to (e) SD in street	1	EA	800.00	$800	
Footing drain at bldg foundation wall	400	LF	6.50	$2,600	
Site Sanitary Sewer System					**$51,600**
6" PVC w/trench, excavate & backfill	400	LF	85.00	$34,000	
Man holes	2	EA	7,500.00	$15,000	
Clean outs	4	EA	250.00	$1,000	
Connect to existing	2	loc	800.00	$1,600	
Water & Fire Water					**$54,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Fire hydrant	6	EA	4,500.00	$27,000	
Meter	1	EA	5,000.00	$5,000	
Site Gas					**$27,500**
Pipe & earthwork	500	LF	45.00	$22,500	
Meter	1	EA	5,000.00	$5,000	
Site Electrical					**$371,000**
Overhead power service	1	LS	40,000.00	$40,000	
Transformer	1	EA	85,000.00	$85,000	
Main Meter	2	EA	5,000.00	$10,000	
unit meters	53	EA	2,400.00	$127,200	

Description	Quantity	Unit	Unit Price	Sub-Total	TOTAL
Parking lot lights	20	EA	4,000.00	$80,000	
Landscape lighting	24	EA	1,200.00	$28,800	
Site Improvements					**$196,103**
Sidewalks	10,000	SF	4.00	$40,000	
Trash enclosure	1	LS	85,000.00	$85,000	
Equipment pads	240	SF	4.00	$960	
ACP parking paving system w/striping	15,246	SF	3.75	$57,173	
PCC bumpers	42	EA	85.00	$3,570	
Directional signage & parking signage	10	EA	450.00	$4,500	
HC curb cut	2	EA	450.00	$900	
Driveway curb cut	2	EA	2,000.00	$4,000	
Landscaping					**$45,213**
Fine grading	5,000	SF	0.45	$2,250	
Import topsoil	93	CY	32.00	$2,963	
Roof deck planters		FOIO			
Landscaping & irrigation	5,000	SF	8.00	$40,000	
TOTAL DIRECT COST				$1,340,947	$1,340,947

Retail Market Survey: Bellingham

10.19.09

Building Name				Bellingham National Bank	Laube Hotel/Apts	Mt. Baker Professional Bldg
Address	110 E Chestnut St Bellingham, WA	105 Grand Ave Bellingham, WA	1511 N. State St. Bellingham, WA	101 E Holly St. Bellingham, WA	1228 N State St. Bellingham, WA	1229 Cornwall Ave Bellingham, WA
phone #	(360) 303-8693		(360) 224-5282	(425) 974-4204	(360) 319-8358	(360) 920-3283
fax #						
Type	Retail	Retail	Retail/Office	Retail	Retail	Office
sq.ft	2800	6000	1164	320 - 1425	2860	28,352
current rent	$14/s.f. NNN	$8.5/s.f.	$16/s.f.	$480 - $2135/month	$12/s.f. NNN	$13.5/s.f.
rent per sq.ft. available						
parking	3 spots included					
Building Features	Modern building 2 bathrooms Nice modern kitchen Move in ready			Historic building Air conditioned	Has venting & floor drains for restaurant use highly visible street	includes all utilities except phone and internet front door security system weekly janitorial
Neighborhood amenities	Central downtown location Close to I-5 Close to UWW			CBD location	CBD location	Landmark downtown location
Property Age		1920	2005			1925

Retail Market Survey: Bellingh				
10.19.09				
Building Name	Puget Sound Energy Building	Crown Plaza Building	Gaston Bay Building	Morse Hardware Building
Address	1319 N State St. Bellingham, WA	114 W Magnolia Bldg Bellingham, WA	2925 RoederAve Bellingham, WA	1025 N State St. Bellingham, WA
phone #	(360) 676-4866	(360) 671-4200	(360) 671-4200	(360) 671-4200
fax #				
Type	Office	Retail	Office	Retail/office
sq.ft	500 - 20,000	62,665	22,992	6000 x 2
current rent	$11 - 14/s.f.	$13.5/s.f.	$16 - $19/s.f.	$8/s.f.
rent per sq.ft. available				
parking				
Building Features	Under renovation	Historic building	360 degree views of bay LEED Gold expansive windows Roof deck	Historic building downtown location
Neighborhood amenities	Central downtown location	Next to Federal Bldg & Mt. Baker Theatre Close to city offices	Water front location	One block from Farmer's Mkt
Property Age		1929	2008	1900

Residential Market Survey for: Bellingham						
Building Name	**South Hill Apartments**	**McKenzie Square**	***Walton Place Apartments**	**The Edge Condos**	**Drake Condominiums**	**Cypress Place Condo**
website	http://www.livingatsouthhill.com/					
Address	255 N Forest Street Bellingham, WA	1440 10th St. Bellingham, WA	1511 N. State St. Bellingham, WA	950 Lincoln St. Bellingham, WA	3111 New Market St. Bellingham, WA	680 32nd St. Bellingham, WA
phone #	360.734.2691			360-647-3499		
size	STUDIO	STUDIO		STUDIO	STUDIO	STUDIO
sq.ft	450 - 600				644	
current rent	$650 - $750				$900	
previous rent						
rent per sq.ft.	**$1.25 - $1.44**				**$1.40**	
available						
size	1 BR 1 BA	1 BR 1 BA	1 BR 1 BA	1 BR 1 - 1.5 BA	1 BR 1BA	1 BR 1 BA
sq.ft	500 - 1100	651	575	787 - 997		
current rent	$750 - $1200	$819 - $919	$522 - $643	$700 - $1025		
previous rent						
rent per sq.ft.	**$1.09 - $1.50**	**$1.26 - $1.41**	**$0.90 - $1.18**	**$1.02 - $.89**		
available						
size	2 BR - 1-2 BA	2 BR 2 BA	2 BA 2 BA	2 BR 1 BA/2 BA	2 BR 1-2 BA	2 BR 1 BA/2 BA
sq.ft	900 - 1500	985 - 1207	896			850
current rent	$950 - $1300	$1460 - $2290	$770			$995
previous rent						
rent per sq.ft.	**$.087 - $1.05**	**$1.48 - $1.90**	**$0.86**			**$1.17**
available						
parking	included	$25/month	included	included	included	included
Apartment Features	utilities included onsite laundry bay windows wood flooring overlooking Bellingham Bay Community BBQ	utilities included washer dryer designer kitchens private deck	utilities included washer dryer business center resident lounge air conditioning	granite countertops washer dryer fireplace stainless appliances hardwood floors private deck 18ft ceilings two stories - loft	utilities included washer dryer granite countertops stainless appliances free internet	washer dryer fireplace stainless appliances fitness center club house
Neighborhood amenities	between Fairhaven & downtown Close to WWU	Good freeway access Near by shopping/dining	Business Center Community Room Roof deck ***affordable housing**	Next to WWU park n ride minutes to Downtown shuttle to WWU	Part of Barkley Village mixed use neighborhood	Near downtown shuttle service to WWU
Property Age	1920's building renovated		2009	2009	2008	2006
Units	122	60	51		36	144

Port of Bellingham
Simple Feasibility by Net Rentable Square Feet (NRSF)

Basic Loan Terms	
Interest Rate	6%
DSCR	1.25
Amortization Period	30

Monthly Income per NRSF					$ 1.25 [1]			
Plus: Monthly Other Income per NRSF					$ 0.16 [2]			
Less: Monthly Expenses per NRSF	$ 1.25	X	37%	=	$ (0.46) [3]			
Monthly NOI per NRSF					$ 0.95			
Monthly NOI per NRSF					$ 0.95			
Less: Monthly Debt Service per NRSF	$ 0.95	/	1.25	=	$ (0.76)			
Monthly Cash Flow per NRSF					$ 0.19			
Annual Cash Flow per NRSF	$ 0.19	X	12	=	$ 2.27			
Divided: by Capitalization Rate [2]					6.15% [4]			
Supportable Equity per NRSF						$ 36.98		
Supportable Debt per NRSF						$129.93		
Supportable Development Costs per NRSF							**$ 166.90**	

[1] See market study.
[2] Monthly other income per NRSF in scenarios 6, 3short, 3full, & 17 were $0.09, $0.12, $0.11 & $0.16.
[3] See expense estimate worksheet.
[4] Telephone conversation with Bellingham Appraiser. Stated residential with marine view is 6% to 6.3%.

Port of Bellingham

Expense Estimate

- Data is from the March 2009 issue of the Dupre & Scott Apartment Expense Report.
- The data is of properties with greater than 20 units and built since the year 2000.

			Annual		Annual			Expense
Area		SF	Income	Expense	Income/SF	Expense/SF	NOI/SF	/ Income
Snohomish	Median	925	14,175	4,651	15.32	5.03	10.30	33%
King	Median	844	15,147	5,709	17.95	6.76	11.18	38%
Pierce	Median	910	13,285	4,593	14.60	5.05	9.55	35%
Other Western WA	Median	964	11,584	4,969	12.02	5.15	6.86	43%
							Average	**37%**

Port of Bellingham

Condominium Sales Comparables *(4/19/09 to 10/19/09)*

Address	Unit #	Sale Date	Sales Price	Net SF	Sales Price per Net SF	Bedrooms	Bathrooms	Year Built	Comments
1015 Railroad Ave	508	6/29/09	279,000	912	**$ 305.92**	2	1.75	2005	View
1000 High St	201	6/15/09	275,000	930	**$ 295.70**	2	1.75	2008	View
1000 High St	102	9/2/09	259,000	912	**$ 283.99**	2	1.75	2008	View
1000 High St	101	5/15/09	250,000	930	**$ 268.82**	2	1.75	2008	View
1000 High St	205	7/15/09	210,000	729	**$ 288.07**	2	1.5	2008	View
1015 Railroad Ave	412	7/20/09	204,000	675	**$ 302.22**	1	1	2005	View
1000 High St	106	4/29/09	195,000	744	**$ 262.10**	2	1.75	2008	View
1031 N State St	301	5/21/09	183,000	832	**$ 219.95**	2	1	2006	
				Average	**$ 278.35**				

MEMO

DATE • November 10, 2009

TO	CC	
X		**Mike Stoner** The Port of Bellingham 1801 Roeder Avenue Bellingham, WA 98227
	X	**FILE**

FROM • Steve Schlenker, Tim Bissmeyer **REGARDING •** Johnson Architecture Report Recap

PROJECT • The Waterfront District **PROJECT NUMBER •** PORT0306012

MEMO

1.0 Introduction

In October 2009, Johnson Architecture & Planning, LLC provided preliminary input to the Port and City project management team on the adaptive reuse potential of eleven inactive industrial buildings and structures within the Waterfront District. These discussions included an inquiry by Johnson Architecture regarding the planning feasibility of several possible adjustments to the street grid described in the Proposed Planning Framework in order to retain the potential opportunity for adaptive reuse of four existing structures. The buildings included the Granary Building, the Alcohol Plant, the Board Mill, and the Digester Building, each with a different mix of assets and liabilities, all of which were determined to require construction costs in excess of market value. The Port and City project team directed lead planner CollinsWoerman to evaluate the advantages and disadvantages of these proposed adjustments relative to other planning criteria in the Waterfront District. This technical memo presents our analysis and recommendations.

2.0 Methodology

The Proposed Planning Framework is undergoing further environmental review as a preferred alternative for the Waterfront District and is expected to form the basis for a Draft Sub Area Plan. The Sub Area Plan is intended to be flexible over time within a defined set of planning and regulatory criteria, still to be determined. Johnson Architecture suggested four specific adjustments to the Proposed Planning Framework based on their analysis. The Port and City's current draft planning assumptions were used in this evaluation to ensure that any adjustments to the transportation network were consistent with the Proposed Planning Framework. It is important to note that while none of the eleven inactive industrial buildings or structures were determined to be economically feasible for adaptive reuse in the current market place, reflection of the site's history through development is an important theme in the Waterfront District planning effort.

2.1 Proposed Adjustments to the Proposed Planning Framework:

1. **Central Street**: Consider locating the permanent access point at Central Street on the southeast side of the Granary Building to temporarily retain the building for potential adaptive reuse.

2. **Bloedel Avenue**: Consider adjusting Bloedel Avenue to temporarily retain the East portion of the Alcohol Plant for potential adaptive reuse.

3. **Paper Avenue**: Consider postponing a decision on the location of Paper Avenue to temporarily retain the Board Mill for potential adaptive reuse.

4. **Commercial Street Green**: Consider relocating the Commercial Street Green to the north side of Commercial Avenue to temporarily retain the Digester Building for potential adaptive reuse.

2.2 Evaluation Criteria:

- **Long term planning effort** – Recognition that the Waterfront District will be developed over the next 30 to 40 years. The Sub Area Plan needs to accommodate multiple development cycles; be flexible and predictable but within a defined framework.
- **Engineering Feasibility** – Ensure any proposed planning framework is feasible and realistic from an engineering/construction perspective.
- **Waterfront Futures Group** – The WFG Guiding Principles represent the community vision for the Waterfront District, including:
  (1) Reinforce the inherent qualities of each place on the waterfront
  (2) Restore the health of land and water
  (3) Improve waterfront access
  (4) Promote a healthy and dynamic waterfront economy
- **Community Connections** – The Waterfront District should be designed to provide close connections with existing neighborhoods and create an economic lift to downtown Bellingham.
- **Street Grid** – Develop a "Core Street Grid" to use as a planning framework to inform other planning areas. Street planning should enhance the waterfront experience through effective solar orientation of streets and infrastructure and include transit access sufficient to support WWU.
- **Complete Streets** - Street design will be adjusted to land uses and encourage multi-modal activities such as pedestrian, bicycle and transit use. "Green" streets will include features to enhance open spaces, low impact stormwater management, traffic calming and connections to public parks.
- **Block Size and View Corridors** – Block sizes in the completed mixed use development will be similar to existing downtown Bellingham. Create new view corridors aligned with existing and proposed street grid.
- **LEED Neighborhood** – The planning project is accepted as a potential U.S. Green Building Council LEED Neighborhood Pilot. The LEED ND project is an important component of the strategy for environmental, economic and community sustainability for The Waterfront District.
- **Western Washington University** – Accommodate a proposed WWU campus on south side of waterway as an anchor tenant and incorporate WWU planning priorities.
- **Existing Operations** – It is assumed that the Port's Bellingham Shipping Terminal and PSE's Encogen Plant will continue industrial operations into the long-term future.
- **Existing Structures** – Review the Bellingham Architects Group's suggestions and community input regarding the remaining buildings and structures which were part of the now inactive pulp and paper mill operations. The Architects recommended retaining five structures, including the Granary Building, the Steam Plant, the Board Mill Building, the Barking and Chipping Facility, and the ceramic-tiled Pulp Storage Tanks for consideration of potential adaptive reuse, or as memorials to the industrial history of the waterfront. Retaining other iconic structures and as part of an historical memorial is also under consideration.
- **BNSF Railroad** – The main line of the BNSF RR should be relocated as close to the bluff at the eastern edge of the site as possible.

3.0 Summary of Findings

3.1. Proposed Central Street Adjustment

Summary: Central Street is an established right-of-way on the northwest side of the Granary Building which has been identified as the temporary entrance to the northern portion of the Waterfront District. Johnson Architecture's evaluation suggested relocating the permanent access point for Central Street to the southeast side of the Granary Building and converting the existing pier supported bridge into a pedestrian walkway to maximize the potential adaptive reuse value of the building.

Analysis: Both the current Central Street right-of-way and the proposed alternative location on the southeast side of the Granary Building present long-term engineering feasibility challenges. The current right-of-way is too narrow to support a roadway plus planned pedestrian sidewalks and bike lanes. Increasing the width of Central Street in its current location would have additional project costs related to habitat mitigation and integration with the Whatcom Waterway cleanup. The proposed alternative location would have increased infrastructure costs as well due to the elevation of the Roeder/Central intersection and proximity to the curve in Roeder Avenue. Also if future reconstruction of the Bay Street/Roeder Avenue intersection is required to increase clearance height for the railroad easement, the elevation alignment of the alternate Central Avenue location may need to be raised which would add infrastructure cost and potentially present conflicts with any development that has occurred along the alternate Central Avenue location.

Adjusting Central Street provides a number of evaluation criteria benefits. The existing right-of-way could be developed as a unique public access opportunity or removed to support habitat restoration efforts. A community wharf would serve as a distinctive gate on the north end the Waterfront District, increase public access to the water and offer better pedestrian connectivity to Maritime Heritage Park. The proximity of the Central Street wharf to the former Citizen's Dock could be used to help celebrate the industrial history of the waterfront. Alternatively, removing the Central Street wharf and replacing the over-water structure with a soft-bank shoreline would improve the quality and complexity of shallow water habitat for juvenile salmon and their prey species.

Recommendation: Relocate the permanent access point for Central Street to the southeast side of the Granary Building taking into consideration future impacts of replacement of the Bay Street/Roeder Avenue intersection and convert the existing pier supported bridge into a pedestrian walkway to allow retention of the Granary Building for potential adaptive reuse.

3.2. Proposed Bloedel Avenue Adjustment

Summary: The preferred location of Bloedel Avenue runs through the western portion of the Alcohol Plant. Consider adjusting Bloedel Avenue to retain the eastern portion of the Alcohol Plant for potential adaptive reuse.

Analysis: The eastern portion of the Alcohol Plant can be retained during construction of Bloedel Avenue but it could compromise other planning objectives due to the fact the structure is 10' below the proposed elevation of Bloedel. Subsequently this would create a depression directly adjacent to the sidewalk in the heart of the Waterfront District and add additional infrastructure costs for retainage of the street at the Alcohol Plant location. If the Alcohol Plant is raised or if the existing ground floor becomes a basement configuration this concern could be mitigated. The Alcohol Plant parcel would not be perpendicular to Bloedel, but non-uniform parcels can create authentic development opportunities.

Recommendation: Adjust Bloedel Avenue slightly westward and temporarily retain the eastern portion of the Alcohol Plant for potential adaptive reuse until such time the impacts to the construction of Bloedel are fully analyzed.

3.3. Proposed Paper Avenue Adjustment

Summary: Consider adjusting Paper Avenue to accommodate to potential adaptive reuse of the Board Mill by Western Washington University within the proposed new waterfront campus.

Analysis: WWU is currently evaluating the adaptive reuse potential of the Board Mill as part of a planned waterfront extension campus. The specific location of Paper Avenue between Commercial Street and Log Pond Drive can be deferred to future detailed campus planning by WWU. WWU is a key anchor tenant and infrastructure should be designed to help accommodate their extension campus requirements. Paper Avenue could be shifted east or west to avoid the Board Mill without significantly compromising the street network. The pending environmental review of the Proposed Planning Framework street grid can assume the future existence of this important interior arterial, but does not need to define its exact location.

Recommendation: Defer the decision on the exact location of Paper Avenue to incorporate WWU planning activities, and temporarily retain the Board Mill for potential adaptive reuse.

3.4. Proposed Commercial Street Green Adjustment

Summary: Consider relocating the Commercial Street Green from its current location south of Commercial Street to a new location north of Commercial Street Adjusting the Commercial Street Green in this way would allow the Digester Building to be temporarily retained for potential adaptive reuse.

Analysis: Relocating the Commercial Street Green compromises a number of evaluation criteria including the ability of this space to function as a reflection of the industrial history of the waterfront. In its current location, Commercial Street Green is strategically positioned to include the iconic ceramic tiled tanks at the entrance to the waterfront in a location where their existing elevation relative to the proposed street grade can be mitigated without additional infrastructure cost and to accommodate other historically significant industrial icons throughout the large public open space. The Digester Building is, by itself, architecturally significant but adaptive reuse is estimated to require costs that significantly exceed market value. It would likely require significant alteration to the building's exterior to meet engineering and building regulations, including the addition of multi-story occupied space. This modification would diminish its historical value. However, Johnson Architecture has described other options for structural changes that could add significantly to the story of mill site history and connections to the waterfront in the Commercial Street Green. Under the Digester Building's red brick façade are technological significant steel riveted tanks built in the 1930's which were once used to power the local economy. These visually impressive tanks could be retained as supported structures, complementing the iconic ceramic tiled tanks to the east. Commercial Street Green would function as a reflection of the industrial history of the waterfront with architectural icons that would be immediately recognizable as the heart of the Waterfront District.

Relocating the Commercial Street Green to the north would also compromise a number of other evaluation criteria. It would disconnect WWU from this 220-foot wide road/park connection extending from downtown to the water and complicate bus connectivity via Whatcom Transit Authority. The Commercial Street Green is designed to serve as a permanent visual connection from downtown to the water and views in the alternate location would be compromised by existing development along the bluff adjacent to Chestnut Street. The alternate location would reduce opportunities to create view corridors and pedestrian connections between Bay Street and the Granary Building. Retaining the Digester Building for adaptive reuse could compromise development in an area critical to successful development of the waterfront and reduce the overall economic viability of the project. Relocating the Commercial Street Green also decreases the effective solar orientation of streets and infrastructure, places a road within 200 feet of the shoreline, and requires some larger block sizes. All of which are inconsistent with overall planning objectives.

Commercial Street Green is intended to be the vibrant heart of the waterfront. Project for Public Spaces, a nonprofit organization helping people create and sustain public places that build communities recommends providing ten experiences to make a great destination. To that end, this re-evaluation of the Commercial Street Green has raised an interesting new concept for "activating" the intersection between Commercial Street and Bloedel Avenue. A key planning objective is to activate this four corner intersection. However, the broad expanse of the Commercial Street Green may create a pedestrian/retail disconnection between one side of the Green and the other. A potential solution to this problem may be the relocation of a portion of the structural framework of the Pulp Storage facility to the Commercial Street Green. This structure is primarily an interior steel armature and a single remaining brick wall. It could be relocated within the Commercial Street Green, between the Digester Tanks and the Ceramic Tile Tanks and adapted for ground floor retail activity. This adaptive reuse could be the opportunity to help make the intersection between Bloedel and Commercial a great public space within the Commercial Street Green, but would require additional research to determine its financial feasibility and view impacts.

Recommendation: Maintain Commercial Street Green in its current location. Also explore opportunities to coordinate the historic artifact use of the Digester Tanks, the Ceramic Tile Tanks, and consideration of the potential adaptive reuse of a portion of the structural framework of the Pulp Storage building within the Commercial Street Green.

4.0 Conclusions

The suggestions of the Johnson Architecture & Planning have been evaluated to determine whether they warrant adjustments to the Proposed Planning Framework street grid to accommodate temporary retention of four specific structures for future market demand.

CollinsWoerman's analysis concludes that minor adjustments to the street grid can be accomplished in the following areas to support three of these suggestions, including:

- Adjusting Central Street to retain the Granary Building for further consideration.
- Adjusting Bloedel Avenue to retain the eastern portion of the Alcohol Plant for further consideration.
- Deferring the final decision on the location of Paper Avenue to incorporate WWU consideration of potential adaptive reuse of the Board Mill.

Relocation of the Commercial Street Green to the north of Commercial Avenue in order to allow potential adaptive reuse of the Digester Building is not recommended. This proposed adjustment creates too many compromises to the overall package of planning objectives for the Waterfront District. CollinsWoerman instead recommends that the Commercial Street Green remain in its current location and consideration should be given to retaining a portion of the Digester Tanks in their current location as an iconic historic artifact, complimenting the Ceramic Tile Tanks.

Consideration should also be given to dismantling and salvaging the Pulp Storage Building for potential adaptive reuse somewhere on the site. Further study will be required to determine the feasibility and location for the adaptive reuse of the Pulp Storage Building.

APPENDIX A1

Department of Archaeology and Historic Preservation Letter

STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

January 7, 2010

Ms. Kate Krafft
Krafft & Krafft
PO Box 99268
Seattle, WA 98139

In future correspondence please refer to:
Log: 010710-06-WH
Property: Georgia Pacific Pulp Mill - DOE
Re: Determined Eligible

Dear Ms. Krafft:

Thank you for contacting our office. I have reviewed the materials you provided to our office regarding the Georgia Pacific Pulp Mill in Bellingham.

It is our understanding that as of today the following buildings/resources are still extant on the GP site:

Boiler House (#6)	WA Egg & Poultry Bldg (#7)
Barking & Chipping Plant (#8)	Chip Bins (#9)
Board Mill (#12)	Digesters (#13)
Screen Rm (#14)	Bleach Plant (#15)
Alcohol Plant (#17)	Pulp Storage (#37)
High Density Tanks (#49)	

After careful evaluation I have determined that all of the above resources (minus the WA Egg & Poultry Bldg) are Eligible for listing on the National Register of Historic Places as properties that contribute to a historic district. These resources are significant under criterion "A" for their broad association to the industrial development of Bellingham and under criteria "C", as resources that embody the distinctive characteristics of a type, period and/or method of construction. To that group, I would also add the Warf, as an important contributing element to this district. It is important to note that the collection of resources (no matter how big, or small) is key in telling the story about how the plant operated. This also includes the grid pattern of the street layout.

Several of these resources are also individually Eligible for listing on the National Register. These include:

Boiler House (#6)	Barking & Chipping Plant (#8)
Board Mill (#12)	Digesters (#13)

Screen Rm (#14) Bleach Plant (#15)
Alcohol Plant (#17) Pulp Storage (#37)
Such properties represent examples of their building types.

Due to the different history associated with the WA Egg & Poultry Building, this resource is also individually Eligible for the National Register, but would not be considered part of a potential historic district focused around the resources associated with the Georgia Pacific Pulp Mill.

Intact historic industrial complexes in WA State are very, very rare, and we would encourage the City of Bellingham and the Port, to carefully weigh their options for the preservation and rehabilitation of the site. Retention of the resources can offer a uniquely Bellingham experience, that can both serve as a heritage tourist site and an economic boom for the community. Examples of the successful rehabilitation of industrial sites include Albers Mill in Tacoma, and the Steam Plant Square in Spokane.

I look forward to further consultation regarding long term effects to the site. Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me.

Sincerely,

Michael Houser
State Architectural Historian
(360) 586-3076
michael.houser@dahp.wa.gov

CC: Katie Franks, City of Bellingham
Mayor Dan Pike
Fred Seeger, Interim Executive Director – Port of Bellingham

APPENDIX A2

Johnson Architecture and Planning
January 20, 2010 Letter

JOHNSON
ARCHITECTURE
& PLANNING LLC

2124 THIRD AVENUE
SUITE 200
SEATTLE, WA 98121
206-448-7580
FAX 448-8977

20 January, 2010

Mr. Mike Stoner
Project Manager,
Port of Bellingham
1801 Roeder Avenue
Bellingham, WA 98225

Mr. Les Reardanz
Assistant City Attorney
City of Bellingham
210 Lottie St.
Bellingham, WA, 98225

RE: Letter regarding National Historic Register eligibility from Washington State Department of Archaeology and Historic Preservation, dated 7 January 2010

Dear Mike and Les,

This letter summarizes our interpretation of and response to the letter from the Department of Archaeology and Historic Preservation (DAHP) dated 7 January 2010. The DAHP letter was in response to a formal request for a determination of eligibility made by our consulting team's historic preservation specialist, Kate Krafft on November 3, 2009. The DAHP letter conveyed the agency's opinion regarding the eligibility of the remaining buildings and resources on the former Georgia Pacific Pulp Mill site.

DAHP made three separate findings:

1. That the collection of 10 Georgia Pacific buildings/resources (exclusive of the Washington Egg & Poultry Building (Old Granary, #7)) are eligible for listing in the National Register of Historic Places (NRHP) as properties that contribute to an historic district.

2. That eight of the 10 Georgia Pacific buildings are individually eligible for listing on the National Register.

3. That the Washington Egg & Poultry Building (Old Granary, #7) is individually eligible for listing on the National Register.

In the following, we will address each of these findings and provide our assessment of how they may or may not affect the findings in our recent assessment of these structures.

1. Contributing Resources within a NRHP Historic District

The determination that the full collection of buildings and resources is potentially eligible for listing as a NRHP Historic District is not a surprise. We concur with their determination that the Georgia Pacific structures do form a potentially eligible district as identified by a prior historic preservation consultant team.

We also note that the DAHP considered the underlying street grid, extending the downtown Bellingham pattern across the site, to be an integral part of the site and a potential district designation. We concur that the street grid, which appears on the original Occian Anderson site plans, is an important aspect of the overall pulp mill design and of the very unusual commitment to integrate the Mill into the urban context of Bellingham. We also note that the planning framework developed for the new Waterfront District relies on an alternate street grid that, while it resolves many potential site development issues important for providing access and infrastructure to the site, is in substantial but necessary conflict with the original extended street grid.

What the DAHP letter does not address is the integrity and potential eligibility of a collection of fewer than the extant 10 buildings/resources as an NRHP Historic District. It is our opinion that if several of the core buildings (e.g. The Bleach Plant and The Screen Room) were demolished, a cohesive district would be significantly weakened. We also believe that the importance of the collection of industrial equipment is key to understanding the scale and the inventiveness of the industrial processes.

Nonetheless, in our analysis of the economic viability of adaptive reuse for the Georgia Pacific structures, we assumed that the historic tax credits would be available to a redeveloper of the property. Even with the use of tax credits, redevelopment is clearly not economically viable at this time.

2. Properties Individually Eligible for NRHP Listing

The DAHP letter indicates that they believe 8 of the buildings/resources are eligible for listing on the National Register. These buildings/resources are the Steam Plant, the Barking & Chipping Building, the Board Mill, the Digester, the Bleach Plant, the Screen Room, the Alcohol Plant and the Pulp Storage Building.

We are somewhat surprised by this finding. It is our opinion that the buildings were designed as screening facades and were intended to be viewed and appreciated at a substantial distance, and individually they do not clearly express or demonstrate the industrial processes. However, as noted above, we did assume that historic tax credits would be available for the redevelopment of these structures. We also assumed that rehabilitation and adaptive use would be undertaken in conformance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties.*

Our report recommends that five of these buildings (the Steam Plant, the Board Mill, the Digester, the Alcohol Plant and the Pulp Storage Building) may have viable alternative uses but that adaptive reuse, at this time, is not economically viable. We recommend that these buildings be temporarily retained by the Port to allow for reconsideration at a later date under potentially better economic conditions.

We also have recommended that three of these buildings (the Barking & Chipping Building, the Bleach Plant and the Screen Room) be demolished. We have determined that it is not feasible to adapt them architecturally or structurally for any viable economic reuse.

We are a bit surprised at one inclusion and one exclusion in the DAHP list.

The Pulp Storage Building is included on the DAHP potentially eligible list. This building is a useful structure, but its equipment and its functional role in the industrial process has been lost. It has been substantially damaged due to adjacent demolition, and is reduced to two altered facades and a structural steel frame. Outside of the context of an Historic District, the Pulp Storage Building seems to be, in our opinion, a marginal candidate for NRHP listing. However, we recommend that the Port temporarily retain this building and consider relocating it as the site redevelops, possibly as an event pavilion or museum.

The exclusion that surprised us was DAHP not mentioning the High Density Tanks as potentially eligible for listing. These tanks, in our opinion, are potentially the most architecturally interesting structures on the site, and possibly the most recognizable and unique of all the structures. They are as integral to the pulp and paper-making process as any of the other buildings/resources on site, and their shape is a clear expression of their function. We recommend protecting and rehabilitating these two structures.

We have recommended that elements of the industrial equipment within all of these buildings be retained for potential public display of the pulp and paper mill processes.

3. The Washington Egg & Poultry Building (Old Granary, #7)

The DAHP letter concludes that the Washington Egg & Poultry Building (Old Granary, #7) is eligible for individual listing on the National Register. Our analysis of this building has assumed that the building is eligible for NRHP listing and could potentially utilize historic preservation investment tax credits. While our analysis shows that redevelopment is currently economically marginal, we recommend that the Port make strong efforts to support the redevelopment of this building.

Conclusion

The letter of findings by the DAHP regarding the NRHP eligibility of the Georgia Pacific Pulp Mill buildings/resources does not change our analysis or our recommendations.

Our report on the adaptive reuse potential of the eleven buildings/resources on the Georgia Pacific Pulp Mill site is, we believe, a realistic investigation of their architectural, structural and economic viability. In our analysis, we assumed that historic preservation investment tax credits could be available to all of the buildings/structures, and that adjustments to the framework plan for the new Waterfront District could be made to accommodate such historic preservation efforts. Even so, we did not find that any of the buildings/structures on the site were currently economically viable for redevelopment. We did find that six structures may have the architectural and structural potential for successful adaptive reuse under significantly improved economic conditions at some future date.

Please contact me if you have any questions about this matter.

Sincerely

Stevan Johnson
Principal
Johnson Architecture & Planning

cc: Kate Krafft, Krafft & Krafft
Bryan Tokarczyk, KPFF
Tom Fitzsimmons, Lorig Associates
Kimberley Orr, Lorig Associates

APPENDIX B

Historic Resources Table

STATUS OF ON-SITE BUILDINGS/STRUCTURES AT LEAST 40 YEARS OF AGE

On-site Bldgs./Structures At Least 40 Years of Age (Port #)	**DEIS Alts. 1 - 3 Bldgs./Structures At Least 40 Yrs. of Age To be Retained/Reused**	**SDEIS Preferred Alt. Bldgs./Structures At Least 40 Yrs. of Age To be Retained/Reused**
Bloedel Donovan Office (E)		
Frame Drying Unit (E3)		
Frame Storage Unit (E4)		
Pump House (E5)		
Shipping Terminal Pier (No Port #)	**Retain**[1]	Potentially Retain/Reuse[2]
921 Cornwall Building (50)		
Vitamins Inc. Bldg. (10)	**Retain**[1]	Potentially Retain/Reuse[2]
Bellingham Bldrs. Supply Co. (3)	**Retain**[1]	Potentially Retain/Reuse[2]
Kodiak Fish Co. Bldg. (4)	**Retain**[1]	Potentially Retain/Reuse[2]
Bldg. J/Storage Unit (9B)	**Retain**[1]	Potentially Retain/Reuse[2]
Old Granary Bldg. (7)		Potentially Retain/Reuse[2]
Barking and Chipping Plant (8)		Potentially Retain/Reuse[2]
Chip Bins (9)		
Board Mill Bldg. (12)		Potentially Retain/Reuse[2]
Digester Bldg. (13)		Potentially Retain/Reuse[2]
Pulp Storage Building (37)		
Pulp Screen Room (14)		
Bleach Plant (15)		
Alcohol Plant (17)		
High Density/Ceramic Tanks (49)		Potentially Retain/Reuse[2]
Wharf (No Port #)		
Effluent Clarifier (51)		
Steam Plant (6)[3]		

[1] For worst-case analysis purposes, DEIS Alternatives 1 – 3 assumed that 17 of the 22 buildings identified in the DEIS as at least 40 years of age could potentially be removed.

[2] The Preferred Alternative in the SDEIS assumed that 10 buildings onsite at least 40 years of age could potentially be retained, reused or relocated/preserved in some manner.

[3] The Steam Plant was not identified as a building/structure at least 40 years of age in the DEIS. However, the Adaptive Re-Use Assessment prepared for this EIS Addendum confirmed that this building meets this criterion (see **Appendix A**).

APPENDIX C

Transportation Discipline Report

APPENDIX C: THE WATERFRONT DISTRICT (FORMERLY NEW WHATCOM) REDEVELOPMENT TRANSPORTATION DISCIPLINE REPORT

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

Prepared for:

Port of Bellingham and City of Bellingham

January 2010

Prepared by:
Transpo Group, Inc.
11730 118th Avenue NE, Suite 600
Kirkland, WA 98034-7120
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www.thetranspogroup.com

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Introduction

This Addendum to the Transportation Discipline Report builds on the work completed as part of both the *New Whatcom Redevelopment Project Supplemental Draft Environmental Impact Statement* (SDEIS) published in September 2008 and the *New Whatcom Redevelopment Project Draft Environmental Impact Statement* (DEIS) published in January 2008. It presents transportation analyses of the Updated Preferred Alternative which includes several changes to the on-site street system previously identified in the SDEIS as the Preferred Alternative. The analysis identifies transportation impacts associated with the Updated Preferred Alternative and compares them to the previous Preferred Alternative. As in the previous documents, infrastructure phasing and mitigation strategies are outlined to accommodate the projected growth in travel demand resulting from the Updated Preferred Alternative.

Report Organization and Content

The analysis methodology and affected environment are presented in the January 2008 *Appendix N: New Whatcom Redevelopment Transportation Discipline Report* to the DEIS, and are consistent with the SDEIS. The land use assumptions and forecasting methodology are summarized in the SDEIS. The analysis methodology and existing conditions have not changed and are, therefore, not discussed further in this report. In addition, land use assumptions have not changed and are only summarized in the report. The remainder of this report comprises the following components:

- **Impacts and Alternatives Comparison** describes the future impacts of the Updated Preferred Alternative on different components of the transportation system, and then compares them to the impacts of the Preferred Alternative originally presented in the SDEIS.
- **Mitigation Strategies and Phasing** presents the required mitigation measures and infrastructure phasing to address the identified impacts and accommodate the level of development. It also includes an evaluation of mode share goals that would assist in lessoning the amount of on-site infrastructure necessary to serve the development.

Updated Preferred Alternative Description

This Addendum to the SDEIS focuses on the items that have changed since completion of both the DEIS and SDEIS. While the Preferred Alternative and Updated Preferred Alternative remain very similar, the on-site street system and access locations have been modified slightly in the Updated Preferred Alternative. The modifications relate to the alignment of the on-site street system, along with the closure or grade-separation of the Wharf Street railroad crossing by 2025[1] (see discussion on page 8). Closure of the crossing would eliminate one access point to the site and could require building the Wharf Street bridge connection, which was originally evaluated in the DEIS.

[1] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks.

On-site Street System Description

Access to the Marine Trades area would continue to be provided via Hilton Avenue, F Street and C Street. Central Avenue, Bay Street, Commercial Street, Cornwall Avenue and Wharf Street would provide access for the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. Internal circulation within the Marine Trades area would be enhanced by extensions of Chestnut Street and Maple Street between C Street and Hilton Avenue. However, the primary circulation streets would continue to be C Street and F Street. For the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas, Bloedel Avenue, Paper Avenue, and Oak Street would be constructed to provide improved on-site circulation. New bridges would be built for the Cornwall Avenue, Commercial Street, and potentially Wharf Street corridors[2] (see discussion on page 8). Bay Street would likely provide direct access to an on-site parking structure. The Updated Preferred Alternative continues to assume the relocation of the BNSF railroad corridor.

Land Use and Development Description

As mentioned previously, the land use for the Updated Preferred Alternative is assumed to remain the same as described for the Preferred Alternative in the SDEIS. However the following provides a brief summary of the intended uses and description of the site:

- The site would contain up to 6 million square feet of mixed-use development.
- 3.4 million square feet of development would be institutional, office, light industrial, and marina uses. This includes Western Washington University (WWU).
- 2.3 million square feet would be multi-family residential development.
- 375,000 square feet of development would be retail or restaurant uses.
- The remaining area would include approximately 33 acres of public parks, trails, and open space.
- Major pedestrian connections would be provided along Commercial Street, which would be a “Green Street” including open space and a pedestrian-oriented environment, and the existing Central Avenue right-of-way between Holly Street and Roeder Avenue, which would be converted to a pedestrian corridor.
- Bicycle facilities would be provided along all roadways within the development as well as along Roeder Avenue along the project frontage.
- A parks and trails system would be developed along Bellingham Bay and a short trail would be constructed along C Street to Roeder Avenue.

[2] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks. The need for the Wharf Street flyover would depend on the achievement of the 30 percent alternative mode share.

Impacts and Alternatives Comparison

This chapter describes future 2026 conditions for the transportation systems within the study area under the Updated Preferred Alternative. The Preferred Alternative, presented in the SDEIS, establishes the baseline information for system performance against which the Updated Preferred Alternative is compared. The revised on-site transportation facilities were assumed to be in place by 2026 and were accounted for in the evaluation of the Updated Preferred Alternative. The analysis was based on a set of performance measures for each of the main modal components, consistent with those used in the SDEIS and DEIS.

This section focuses on changes between the Preferred Alternative described in the SDEIS and the Updated Preferred Alternative described herein. Analysis and discussion is provided for changes that would occur as a result of the Updated Preferred Alternative, and where no change is proposed, the DEIS and SDEIS are referenced as appropriate.

It is assumed that future 2016 conditions would remain consistent with the information disclosed in the SDEIS and are not presented in this report.

Programmed and Planned Transportation Improvements

This evaluation includes transportation improvements assumed to be in place in both the on-site and off-site study area. The majority of the off-site improvements for the Updated Preferred Alternative are the same as those described in the DEIS and SDEIS. Since the completion of the SDEIS, the City has installed a traffic signal at the E Chestnut Street/Railroad Avenue intersection. Therefore, the intersection analysis assumes the traffic signal for the Updated Preferred Alternative analysis. The evaluation in the SDEIS did not include the traffic signal at the E Chestnut Street/Railroad Avenue intersection; however, to provide a more accurate comparison this study revised the intersection analysis to include the traffic signal for the Preferred Alternative.

The Updated Preferred Alternative on-site infrastructure improvements are based on coordination between the Port of Bellingham, City of Bellingham, and the project team. The street systems proposed for the Updated Preferred Alternative would provide connections to the off-site transportation system as well as access and circulation to and through the site.

Table 1 shows a comparison of the street system improvements assumed for the Preferred Alternative and the Updated Preferred Alternative. Figure 1 illustrates the street system improvements for the Updated Preferred Alternative (see SDEIS for illustration of Preferred Alternative street system). The numbers in the table and the descriptions on the next page correspond to Figure 1.

The following provides a general description of the assumed roadway infrastructure for **only** those facilities that are different between the Updated Preferred Alternative and the Preferred Alternative:

Marine Trades

- **Hilton Avenue (1) –** Similar to the Preferred Alternative, the Hilton Avenue access would be signalized at Roeder Avenue. Signalization would not occur until traffic volumes warrant such control. For the Updated Preferred Alternative, this roadway would likely serve as the primary access to a large industrial use within the Marine Trades area. The road would be constructed to industrial standards to be compatible with marine trade uses. Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of this road or adjacent to this roadway. There would be no east-west connection (Chestnut Street) between Hilton Avenue and F Street for the Updated Preferred Alternative.
- **Maple Street and Chestnut Street (4) –** Both the Preferred Alternative and Updated Preferred Alternative would classify these roadways as industrial streets. Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of these roads or adjacent to these roadways. The Updated Preferred Alternative would change the circulation within the Marine Trades area by eliminating the east-west connection (Chestnut Street) between Hilton Avenue and F Street. Similar to the Preferred Alternative, the Updated Preferred Alternative would provide an east-west connection (called Chestnut Street) between F Street and C Street as well as from F Street to the west (called Maple Street).
- **C Street (3)** – For the Updated Preferred Alternative, the C Street connection would be retained and the roadway would be reconstructed; however, south of the Chestnut Street connection, this roadway would be constructed as a local access road. Pedestrian and bicycle facilities would be provided along the shoreline in the vicinity of this road or adjacent to this roadway.

Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Redevelopment Areas

- **Bloedel Avenue (6) –** For the Updated Preferred Alternative this roadway would remain similar to the Preferred Alternative except that there would be a higher emphasis on access management with fewer direct access points to driveways. For stop controlled side streets and driveways, left-turn access would likely be restricted. In addition, less on-street parking would be allowed due to more conflicting modal movements (i.e., transit, pedestrian, and bicycle) along the corridor. The corridor segment between Log Pond Drive and Cornwall Avenue, which did not exist under the Preferred Alternative, would be four lanes wide to accommodate dual left turn movements from Bloedel Avenue onto Cornwall Avenue.
- **Central Avenue/Roeder Avenue (7)** – Similar to the Preferred Alternative, with the Updated Preferred Alternative, this intersection would be signalized and Central Avenue between Holly Street and Roeder Avenue would be converted into a pedestrian corridor. The closure of Central Avenue (between Holly Street and Roeder Avenue) as a vehicular access would eliminate the safety and operational issues that would occur due to the offset intersections. The Updated Preferred Alternative would realign Central Avenue to the south of the existing Granary

Building along Roeder Avenue and require both intersections where Central Avenue meets Roeder Avenue to be signalized and coordinated.

- **Paper Avenue (10)** – The Updated Preferred Alternative would remove the segment of Paper Avenue between Commercial Street and Bay Street. In addition, the segment of Paper Avenue south of Commercial Street may follow a slightly different alignment than under the Preferred Alternative, but otherwise still provide a similar connection south to Oak Street.
- **Cornwall Avenue/Cornwall Bridge (11) –** The Updated Preferred Alternative would use the present alignment and reconstruct the Cornwall Bridge to provide three lanes (one southbound lane and two northbound lanes) by 2026. The third northbound lane would end at Maple Street as a right-turn only lane. The Cornwall Avenue/Chestnut Street intersection would be reconfigured to provide a northbound left-turn lane and shared through/right-turn lane.
- **Wharf Street (13) –** With the Updated Preferred Alternative, the existing Wharf Street at-grade railroad crossing would be closed with the relocation of the railroad. A Wharf Street bridge connection would potentially be constructed from the site to the State Street/Forest Street/Boulevard Street intersection to accommodate build out of the site[3].
- **Bay Street (16) –** The Updated Preferred Alternative would extend Bay Street from Chestnut Street into a parking structure on-site.
- **Log Pond Drive (17) –** For the Updated Preferred Alternative this roadway would extend from Bloedel Avenue southwest into the site. However, it would no longer continue to Oak Street to the south, but connect to a network of internal local streets serving as access to and from the adjoining development parcels.

In comparison to the Preferred Alternative, the Updated Preferred Alternative would improve access to Maple Street at Cornwall Avenue with provision of a right-turn drop lane. In addition, access would be improved to the site by providing a parking structure at Bay Street instead of connecting this roadway to Bloedel Avenue. The items above are further highlighted in Table 1 to better emphasize the differences between the two alternatives.

[3] The closure of Wharf Street is required as part of the agreement between BNSF and the City for the relocation of the railroad tracks. The need for the Wharf Street flyover would depend on the achievement of the 30 percent alternative mode share.

Table 1. Roadway Infrastructure Improvements by Alternative

Map ID[1]	Preferred Alternative	Updated Preferred Alternative
1	**Hilton Avenue** – Reconstruct roadway and install traffic signal at intersection with Roader Avenue	**Hilton Avenue** – Reconstruct as main access to industrial use and install traffic signal at intersection with Roader Avenue[3]
2	**F Street** – Reconstruct roadway and provide turn lanes at intersection with Roader Avenue	
3	**C Street –** Reconstruct roadway	**C Street –** Reconstruct roadway between Roeder Avenue and Chestnut Street and provide local access road south of Chestnut Street
4	**Maple Street / Chestnut Stree**t – Build connectors in Marine Trades Area[2]	**Maple Street / Chestnut Stree**t – Build connectors in Marine Trades Area between F Street and C Street and at F Street to the west[2]
5	**C Street with Roeder Avenue and Holly Street** – Install traffic signals, reconstruct C Street and rail crossing	
6	**Central Avenue/Bloedel Avenue** – Upgrade roadway and extend to Bloedel Avenue, extend Bloedel Avenue to Log Pond Drive, pedestrian corridor between Roeder Avenue and Holly Street	**Central Avenue/Bloedel Avenue** – Relocate Central Avenue to the south of the existing Granary Building. Provide access management with limited direct connections and minimal on-street parking. Restrict left-turns to and from driveways. Provide four lanes between Log Pond Drive and Cornwall Avenue to accommodate dual left turn lanes from Bloedel Avenue onto Cornwall Avenue. Include provisions for bicycle movement.
7	**Central Avenue/Roeder Avenue** – Install traffic signal	**Central Avenue/Roeder Avenue** –Align Central Avenue to the south of the Granary Building and install coordinated signal system at both the Central Avenue pedestrian crossing and the relocated vehicle access.
8	**Commercial Street** - Extend street beyond Paper Avenue	
9	**Commercial Street/Chestnut Street** – Upgrade traffic signal	
10	**Paper Avenue** – Build connector from Bay Street to Pine Street	**Paper Avenue** – Build connector from Commercial Street to Oak Street (alignment/ location of roadway to be determined).
11	**Cornwall Avenue Bridge** – Close roadway at railroad between Maple Street and Bloedel Avenue	**Cornwall Avenue Bridge** – Reconstruct Bridge to three lanes, provide a traffic signal at the Cornwall Avenue/Bloedel Avenue intersection, upgrade traffic signal at Cornwall Avenue/Chestnut Street intersection
12	**Cornwall Avenue South of Oak Road** –extend to Cornwall Beach Area	
13	**Relocate Railroad**	**Relocate Railroad,** close the at-grade railroad crossing with Wharf Street, and potentially construct **Wharf Street Bridge Connection**
14	**Wharf Street/State Street –** Construct roundabout	
15	**Oak Street –** Construct from Cornwall Avenue to Log Pond Drive	**Oak Street –** Construct between Paper Avenue and Cornwall Avenue with a cul-de-sac beyond Paper Avenue
16	**Bay Street** – Reconstruct bridge and connect to Bloedel Avenue	**Bay Street –** Extend to parking structure on-site
17	**Log Pond Drive** – Construct bridge to Cornwall Avenue extend to Oak Street	**Log Pond Drive** – Construct from Bloedel Avenue to Paper Avenue
18	**Maple Street/Cornwall Avenue** – Upgrade Maple Street including intersection traffic control at Cornwall Avenue, State Street, and Forest Street	

Source: Transpo Group (October 2009)
Shading = Improvements that have been modified in the Updated Preferred Alternative.
1. Numbers correspond to Figure 1 showing the Updated Preferred Alternative street system. The Preferred Alternative street system is shown in the draft SDEIS.
2. Roads do not connect to Maple Street and Chestnut Street off-site.
3. A traffic signal would not be installed until the intersection meets appropriate signal warrants.

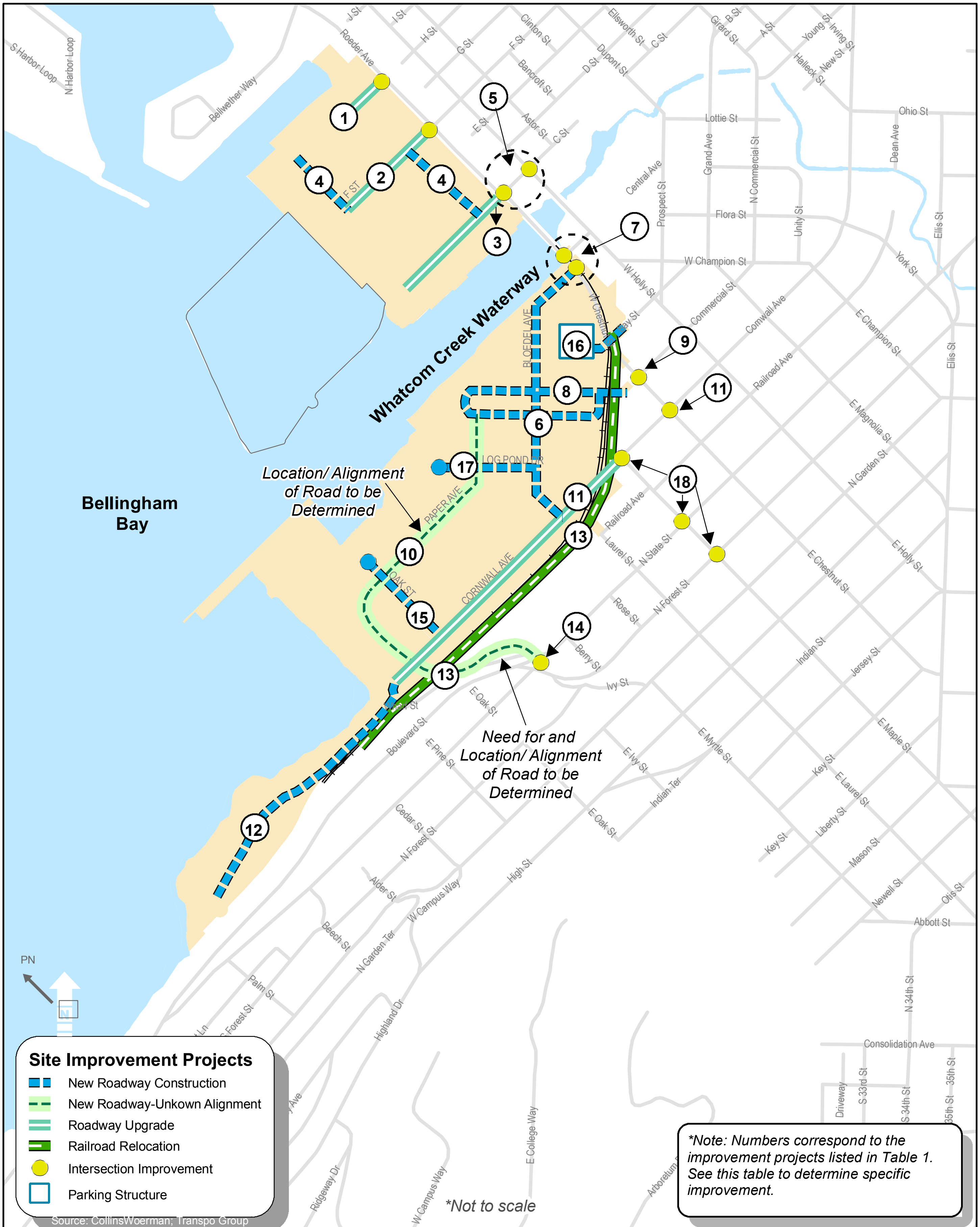


Figure 1
Updated Preferred Alternative
Infrastructure Improvements

New Whatcom Redevelopment SEIS

Construction Impacts

Similar to the Preferred Alternative, the Updated Preferred Alternative would be constructed over an extended period with full build-out assumed by 2026. As discussed in the DEIS and SDEIS, fill and other materials as well as equipment would be brought to the site via barge and/or truck with a majority likely via barges. As a conservative estimate, the analysis of construction impacts assumes construction traffic would use the street system and consist of trucks bringing and removing equipment and materials as well as construction employees coming to and from the site. Construction impacts of the Updated Preferred Alternative would be the same as those disclosed in the DEIS and SDEIS.

Operations Impacts

This section discusses the operations for the Updated Preferred Alternative as compared to the Preferred Alternative for year 2026 conditions. The Marine Trades street system and access for both the Preferred Alternative and Updated Preferred Alternative are very similar and operational impacts would be the same. This evaluation focuses on the operations related to the redevelopment areas south of Whatcom Creek Waterway where differences between the Preferred Alternative and Updated Preferred Alternative would change the analysis results. Both on-site and off-site operations are summarized relative to the transportation system including the street system, non-motorized facilities, transit, and rail. Parking impacts are expected to be the same as documented in the SDEIS, and are not presented.

The operations impacts are evaluated using the methodologies described in the DEIS and SDEIS. In general, the Updated Preferred Alternative would result in similar or the same operations as the Preferred Alternative. Therefore, the evaluation presents only those aspects that would be different and provides an understanding of the transportation system performance under both the Updated Preferred Alternative and the Preferred Alternative.

Wharf Street Bridge Connection and Closure Evaluation

As part of the design process for relocation of the railroad, BNSF has indicated that the at-grade crossing at Wharf Street needs to be closed in conjunction with the relocation. Closing the at-grade crossing would result in no vehicle, pedestrian, bicycle, or transit access via the Wharf Street corridor. Therefore, the Updated Preferred Alternative assumes possible construction of the Wharf Street bridge connection previously evaluated in the DEIS.

To provide an understanding of what the closure of Wharf Street means in terms of operational impacts, this study evaluates the Updated Preferred Alternative both with and without the Wharf Street bridge connection. There would be no change in off-site impacts between the Preferred Alternative documented in the SDEIS and Updated Preferred Alternative with the Wharf Street bridge connection. However, the closure of Wharf Street without providing the flyover (or a Wharf Street connection) would re-route traffic to the Maple Street and Cornwall Avenue/Chestnut Street corridors. Therefore, operational impacts are presented for both the on and off-site conditions providing an understanding of the impacts of closing Wharf Street and not constructing the flyover.

The closure of Wharf Street without construction of the flyover would result in insufficient capacity to accommodate full development under the Updated Preferred Alternative based on the mode share and vehicle demand assumed in both the DEIS and SDEIS. Therefore, a greater non-auto mode share would be necessary to eliminate the need for the Wharf Street bridge connection. Strategies to attain a greater non-auto mode share to reduce vehicle demand are further described in the mitigation strategies section of this report.

Street System

The Updated Preferred Alternative 2026 PM peak hour travel forecasts were used to evaluate intersection operations. Impacts to the street system are measured by determining intersection level-of-service (LOS). Table 2 provides a comparison of the Preferred Alternative and the Updated Preferred Alternative on-site and off-site intersection operations for year 2026 for only those locations expected to change from the results presented in the SDEIS. Detailed LOS worksheets for locations that would change with the Updated Preferred Alternative are provided in Appendix M-2. In addition, a LOS summary for all study intersections and comparison to the DEIS and SDEIS alternatives is also provided in Appendix M-2. As discussed previously, the Updated Preferred Alternative was evaluated both with and without the Wharf Street bridge connection.

As shown in the table, all on-site locations would operate at LOS E or above for both the Preferred Alternative and the Updated Preferred Alternative with the Wharf Street bridge connection. The analysis of the Central Avenue/Roeder Avenue intersection accounts for the coordinated pedestrian and vehicle signal, which results in LOS E operations. This presents a worst case analysis of traffic operations at this location since it assumes a pedestrian call would occur during each signal cycle. The need for pedestrian crossings is not likely to occur each signal cycle, and without the influence of the pedestrian crossing time, the Central Avenue/Roeder Avenue intersection would operate at LOS C during the PM peak hour.

The closure of Wharf Street would put additional pressure on the remaining site access locations including the Chestnut Street/Cornwall Avenue intersection which would degrade to LOS F. Maintaining an access location at Wharf Street allows for a broader distribution of the traffic among the access locations and improves circulation and access to the site, as compared to without the access.

For all scenarios, the overall on-site intersection LOS would operate at LOS E or better at all locations with the Wharf Street bridge connection and most locations without the bridge connection, however there would still be some congestion at the site access locations. This congestion would generally include vehicle queuing, waiting through multiple signal cycles, limited driveway egress/ingress, and poor general and emergency vehicle access. Contributing to the congestion at the access locations along Roader Avenue and Chestnut Street are the large number of vehicles travelling along those corridors under existing and No Action conditions (refer to the DEIS and SDEIS for existing and No Action deficiencies). Increasing the size of the roadways or intersections to improve operations would not align with the proposed character of the development and would require significant private property takes. Therefore, mitigation strategies to reduce the volume of auto traffic to and from the site are explored in the mitigation section to improve access and circulation to and on the site and to encourage alternative modes.

At off-site intersections, the Updated Preferred Alternative with the Wharf Street bridge connection would have similar operations during the PM peak hour in 2026 to the Preferred Alternative.

The closure of Wharf Street would likely cause some increase in delay at the Chestnut Street/Cornwall Avenue and Bloedel Avenue/Cornwall Avenue intersections. This increase in intersection delay would be due to vehicles previously using Wharf Street would re-route to Chestnut Street, Cornwall Avenue, and Maple Street. In addition, the re-routing of vehicles with the Wharf Street closure would contribute to the already congested conditions along Chestnut Street. Intersection operations at the North Forest Street/North State Street/Boulevard Street intersection would improve because the Wharf Street leg would be eliminated from the roundabout reducing the vehicular conflicts at this location.

Table 2. 2026 PM Peak Hour Intersection Operations with and without Wharf Street[1]

	Preferred Alternative			Updated Preferred Alternative – With Wharf St			Updated Preferred Alternative – Without Wharf St		
Study Intersections	**LOS[2]**	**Delay[3]**	**V/C[4] or WM[5]**	**LOS**	**Delay**	**V/C or WM**	**LOS**	**Delay**	**V/C or WM**
On-Site									
4. Roeder Avenue/Central Avenue[6]	C	21	0.95	E	68	1.02	E	68	1.02
5. West Chestnut St/Bay St/Roeder Ave	D	39	0.90	D	40	0.93	D	36	0.93
6. West Chestnut St/Commercial St	C	30	0.91	C	29	0.91	C	28	0.91
7. East Chestnut St/Cornwall Ave	E	80	1.13	E	78	1.13	F	85	1.19
9. Bloedel Ave/Bay St	C	29	0.68	-	-	-	-	-	-
10. Bloedel Ave/Commercial St	C	29	0.79	C	23	0.58	C	26	0.73
16. Bloedel Avenue/Log Pond Drive	C	32	0.84	C	18	NB	C	18	NB
19. Bloedel Ave/Cornwall Ave	-	-	-	C	32	0.70	D	41	0.98
Off-Site									
10. East Holly Street/Cornwall Avenue	C	29	0.92	C	34	0.92	C	34	0.93
12. East Chestnut Street/North State Street	B	14	0.58	B	19	0.58	B	19	0.61
13. East Chestnut Street/North Forest Street	B	17	0.68	B	18	0.68	B	19	0.68
11. East Chestnut St/Railroad Ave	B	17	0.48	B	17	0.48	B	10	0.50
25. N Forest St/ N State St/Boulevard St/Wharf St[7]	E	58	N/A	E	58	N/A	A	9	N/A

Source: Transpo Group (September 2008, October 2009, January 2010)
1. Results are shown for those locations where intersection operations could change as a result of the Updated Preferred Alternative.
2. Level of service, based on 2000 *Highway Capacity Manual* methodology.
3. Average delay in seconds per vehicle.
4. Volume-to-capacity ratio reported for signalized intersections.
5. Worst movement for unsignalized intersections.
6. The Updated Preferred Alternative incorporates the effects of the pedestrian signal on this location to provide a worst case analysis of operations. When there are no pedestrian calls, the overall intersection operations would be better.
7. Assumes installation of a roundabout.

Non-Motorized

The non-motorized facilities for the Updated Preferred Alternative would be similar to that described for the Preferred Alternative with some differences related to modifications of the on-street street network. Bloedel Avenue would be the primary vehicular corridor through the site; therefore, with the increase in traffic volumes, vehicle and pedestrian conflicts and safety issues would likely increase along Bloedel Avenue for the Updated Preferred Alternative. The connection at Bay Street would require pedestrians to go through the parking structure to access the site; making this access less direct than the Preferred Alternative in the SDEIS. However, the parking structure would provide elevators increasing the accessibility to and from the site for persons with disabilities. The relocation of the Central Avenue access to the south of the

Granary Building would require both intersections where Central Avenue meets Roeder Avenue to be signalized and coordinated. The increase in pedestrian activity with the new corridor and proposed redevelopment combined with the high traffic volumes along Roeder Avenue would result in additional vehicle-pedestrian conflicts and safety issues without this signalized crossing or other pedestrian enhancements. Therefore, with the Updated Preferred Alternative, traffic signals will be required at both intersections where Central Avenue meets Roeder Avenue and will need to be timed to operate as one coordinated signal system. This will allow both pedestrians and vehicular traffic to circulate safely.

The closure of Wharf Street and not constructing the bridge connection would make accessing the site to and from the southeast more difficult as pedestrians and bicyclists would be required to use a more circuitous route with Maple Street as the primary non-motorized connection. The bridge connection would provide pedestrians and bicyclists from the southeast with a more direct route to and from the site. It would also eliminate the at-grade intersection with Wharf Street and Cornwall Avenue reducing conflicts between vehicular and non-motorized traffic. Bicycle access to and from the site would be enhanced with bicycle lanes along Cornwall Avenue and shared lanes (i.e., markings painted to indicate shared auto/bicycle use for the travel lane) along Maple Street with or without the bridge connection. These bicycle facilities would provide a direct connection between the site and downtown and Western Washington University.

Future development and the consequent increase in vehicular volumes are expected to proportionally increase observed conflicts with pedestrians and bicyclists that exist today. Similar to the Preferred Alternative, the Update Preferred Alternative would enhance pedestrian and bicycle usage on and around the site as part of its overall development plan through provision of sidewalks, trails, and bicycle facilities. Therefore, overall non-motorized impacts are expected to be similar to those disclosed in the SDEIS.

Transit

Similar to the Preferred Alternative, the Updated Preferred Alternative anticipates an extension of the existing and planned future transit service on-site via Hilton Avenue and F Street within the Marine Trades Area and Commercial Street, Bloedel Avenue and Cornwall Avenue within the other redevelopment areas. Ideally an existing transit route would be re-routed to circulate within the site, which would minimize the need for transfers. With the Wharf Street bridge connection, there would be better overall transit circulation options for existing routes to circulate into and out of the site. There would be a period when Wharf Street is closed and the bridge connection is not constructed, which will prevent existing routes on the State Street and Forest Street corridors from easily circulating into and out of the site. In addition, it may be difficult for transit to access the site with the Updated Preferred Alternative and the Preferred Alternative in the SDEIS due to congestion anticipated in and around the site access routes. Strategies to make transit a viable alternative to the automobile are discussed in the mitigation section.

Rail

The Preferred Alternative assumed the at-grade crossing with Wharf Street would remain. The Updated Preferred Alternative would eliminate all at-grade railroad crossings on-site with the relocation of the railroad and construction of the Wharf Street bridge connection. The closure of the Wharf Street at-grade crossing would create safer overall conditions for rail, vehicles, bicyclists, and pedestrians and is an improvement over the Preferred Alternative.

Mitigation Strategies and Phasing

The DEIS and SDEIS provided an overview of the mitigation measures and strategies to address identified significant impacts. The SDEIS also included the required phasing for implementing the on- and off-site infrastructure improvements. This section replaces the previous mitigation measures and phasing presented in the DEIS and SDEIS. Many of the previously identified mitigation measures have been included in the Updated Preferred Alternative or have been incorporated into City improvement project plans.

The operational and management mitigation strategies described in the DEIS for each transportation mode would continue to apply to the Updated Preferred Alternative (see Table 3.12-16 in the DEIS). They included strategies the City could implement to better accommodate anticipated growth throughout the downtown area with or without The Waterfront District Redevelopment. This section simply builds on the DEIS and SDEIS mitigation strategies by addressing specific strategies as they relate to the Updated Preferred Alternative.

Mitigation Measures

As with both the DEIS and SDEIS, mitigation measures are presented to reduce or eliminate impacts for both the on-site and off-site study area transportation system. A majority of the mitigation measures recommended in the DEIS and SDEIS have been included as part of the Updated Preferred Alternative. These mitigation measures include improvements along Cornwall Avenue, Maple Street, C Street at Roeder Avenue and Holly Street, and upgrades to traffic control at access locations. Therefore, few additional mitigation measures are warranted for the Updated Preferred Alternative. Table 3 summarizes the off-site improvements and the level of development that could be accommodated with the improvements.

Holly Street Striping, Access, Channelization, and Parking Plan

The Holly Street corridor provides access to the Marine Trades site from the downtown. The corridor currently provides one travel lane in each direction northeast of Bay Street, turn lanes in places, and on-street parking. With additional development in the Marine Trades area and in Old Town, the existing channelization of the corridor should be revised to better accommodate greater turning movements in the future. The Port should work with the City to evaluate additional turn lanes at C Street and consider restricting certain turn movements along the corridor between F Street and Champion Street. The evaluation should consider the C Street and F Street corridors, along with Roeder Avenue to identify the best overall striping, access, parking, and channelization plan for the area. In addition to channelization, consideration should be given to the corridor parking plan including potential impacts to on-street parking and alternate parking locations, if necessary.

Maple Street Upgrades

With the closure of Wharf Street and no bridge connection, Maple Street would need to play a more significant role as an access point to and from the site for both vehicular and non-motorized traffic. As described in the SDEIS, the Maple Street corridor would need to be upgraded with traffic control improvements at Cornwall Avenue, State Street, and Forest Street. In addition, enhanced pedestrian facilities and shared lanes would be provided for both bicycle and vehicular traffic. The Updated Preferred Alternative would provide a traffic signal at the Maple Street/Cornwall Avenue intersection with a northbound right-turn drop lane along

Cornwall Avenue at Maple Street. These improvements would facilitate walking and biking between Western Washington University (WWU) as well as allow for vehicular traffic to and from the south and east to access the site without needing to circulate through downtown.

Cornwall Avenue/Chestnut Street Intersection Improvement

Similar to the DEIS and SDEIS, improvements are recommended at the Cornwall Avenue/Chestnut Street intersection to provide additional capacity with the Updated Preferred Alternative. The northbound approach would be re-striped to accommodate a dedicated left-turn lane and a shared through/right-turn lane. Along with these improvements, the signal would need to be upgraded to accommodate the northbound protected left-turn.

Non-Motorized Improvements

As described in the DEIS and SDEIS, several corridors will provide important pedestrian and bicycle links between the site and downtown or WWU. Facilities along these corridors would need to be improved to accommodate the increase in pedestrian and bicycle traffic. Improvements include the addition of bicycle lanes, wider shoulders, or shared lanes. The Updated Preferred Alternative would provide shared lanes along Maple Street to facilitate shared bicycle and vehicle use as well as enhance the pedestrian facilities along this corridor. In addition, Central Avenue would be a pedestrian corridor between Roeder Avenue and Holly Street. Traffic signals will be required at both intersections where Central Avenue meets Roeder Avenue and will need to be timed to operate as one coordinated signal system. This will allow both pedestrians and vehicular traffic to circulate safely.

Transit Strategy

The Port and City should work with WTA to develop a strategy to provide transit service to and from the site. This strategy would consider the feasible capital investment for an increased fleet and transit facilities, as well as the available operating funds for the transit system. The availability of funding should be balanced with the desire to achieve a greater non-auto mode share. Potential transit routes and frequency of service should be evaluated and identified. The strategy should take into consideration operations both with and without Wharf Street.

Biennial Traffic Monitoring Program

As discussed later in the mitigation strategies section, a greater non-auto mode share would help address circulation issues on-site and at the site access locations. The actual mode share achievement would be monitored through biennial surveys of both the Marine Trades area and the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas. Data collection for the biennial monitoring program should be conducted during the PM peak hour and include the following components:

- **Traffic Counts**. Daily and peak hour traffic counts at all site access locations.
- **Vehicle Classification Counts**. Daily and peak hour vehicle classification counts at the site access locations including trucks, autos, and transit.
- **Pedestrian and Bicycle Counts**. Peak hour pedestrian and bicycle counts at each site access location.

The ability to achieve certain mode splits is influenced by the land uses within the site. Therefore, separate monitoring should be conducted for the Marine Trades area since it would contain industrial and marine uses, which typically have a higher auto use due to the nature of the land use. The data collected for each site would be used to confirm when improvements are required as shown in Table 3 and make adjustments to the Waterfront Concurrency Service Area (CSA) to account for infrastructure improvements and mode splits. In addition, the data will assist in understanding whether mode share targets are being achieved. The ability to meet or exceed mode share targets may reduce the level of infrastructure improvements required to serve the site. Conversely, the inability to meet mode share targets may require a reduction in the overall level of development accommodated on-site or other improvements to increase capacity to accommodate development.

Designated Truck Routes

Construction traffic would have temporary off-site impacts due to the importing and exporting of materials and equipment to and from the site. Although barges would likely be used to transport a majority of the material and equipment, some trucks and employee vehicles would enter and exit the site via the local street system. Designated truck routes should be determined, and the routes should be used by all construction traffic to minimize impacts to the local street system. The designated routes would likely utilize Cornwall Avenue, Central Street, and Wharf Street for truck access to and from the site. Truck routes would need to change over time as access points are opened and closed with the construction of different phases of the project. In particular, the closure of Wharf Street would increase the construction traffic along the Cornwall Avenue corridor. Construction impacts would be temporary, occurring during the phased construction of the development.

Phasing of the Infrastructure Improvements

As The Waterfront District site is developed, infrastructure improvements would be needed to accommodate the traffic generated by the project. Table 3 provides a summary of the Updated Preferred Alternative transportation infrastructure phasing plan as well as the capacity of that system (defined by vehicle trips and anticipated density of development). The phasing examines the Marine Trades area separate from the Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach redevelopment areas.

As described in the SDEIS, the capacity of the roadway network is based on the total outbound PM peak hour vehicular capacity (i.e., existing on-site vehicle trips plus net new project-related vehicle trips). The outbound direction generates the highest demand during the PM peak hour for the assumed set of land uses. This capacity represents the maximum number of outbound weekday PM peak hour trips that could be accommodated with the assumed infrastructure improvements.

Table 3. Updated Preferred Alternative Phasing of Transportation Infrastructure Improvements and Associated Development Capacity[1]

Project Sequence	On-Site Improvements	Off-Site Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4]
Marine Trades Area				
	Existing Street Network[5]		**400**	**0.6**
1	Reconstruct Hilton Avenue and C Street.	Signalize C Street intersections with Roeder Avenue and Holly Street and provide turn lanes along C Street. Signalize Hilton Avenue/Roeder Avenue intersection and provide turn lanes along Hilton Avenue.	700	1.1
2	Upgrade F Street and build Chestnut Street from Hilton Avenue to C Street. Provide left-turn lane along F Street at Roeder Avenue.		800	1.3
3		Upgrade Roeder Avenue between Hilton Avenue and C Street with additional drop/turn lanes at major intersections[6].	950	1.5
4		Improve Holly Street from F Street to Champion Street to provide turn lanes or restrict movements at intersections.	1,070	1.7

Project Sequence	On-Site Improvements	Off-Site Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4]
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas				
	Existing Street Network[5]		**975**	**1.7**
1		Signalize intersection at Central Avenue and Roeder Avenue.	1,025	1.8
2		Build Roundabout at Wharf/State /Boulevard intersection.	1,325	2.3
3	Demolish Cornwall Avenue Bridge[7]		650	1.1
4	Rebuild Cornwall Avenue Bridge with bike facilities and 3-lanes. Relocate BNSF Railroad and close at grade Wharf Street.		825	1.4
5	Build Bloedel Avenue from Commercial Street to Cornwall Avenue. Build the Commercial Street loop and Long Pond Drive.	Provide a northbound left-turn lane and shared through/right-turn lane, and upgrade traffic signal at Cornwall Avenue/Chestnut Street Signalize Maple Street/Cornwall Avenue and upgrade Maple Street with shared lanes and enhanced pedestrian facilities.	1,050	1.8
6	Build Bloedel Avenue from Central Avenue to Commercial Street		1,200	2.1
7	Construct Commercial Street Bridge and extend to Bloedel Avenue.		1,550	2.7
8	Build Oak Street / Paper Avenue to Long Pond Drive.		1,650	2.9
9	Build Bay Street Access	Signalize Bay Street/Chestnut Street	2,150	3.7
10	Build Wharf Street Bridge Connection		2,700	4.7
Total Development with No Wharf Street Bridge Connection			***3,220***	***5.4***
Total Development with Wharf Street Bridge Connection			***3,770***	***6.4***

Source: Transpo Group (October 2009)
1. The infrastructure phasing addresses the Marine Trades Area separate from the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The off-site improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips related to the distribution of land use proposed i.e., 1,240,000 square-feet of commercial, 375 residential units, and 460 slips for the Marine Trades area and 2,490,000 square-feet of commercial use and 1,517 residential units for the other redevelopment areas. This square-footage is related to the specific redevelopment area(s) noted, not the total New Whatcom site and assumes mode splits consistent with the City of Bellingham Comprehensive Plan goals
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Additional right-of-way needed for this improvement would be taken from the Waterfront (south) side of Roeder Avenue (i.e., the project site).
7. The removal of the Cornwall Avenue Bridge decreases the site infrastructure capacity.

As shown in the table, with construction of all the proposed infrastructure, including the Wharf Street bridge connection, approximately 6.4 million square-feet of proposed development could be accommodated. The Updated Preferred Alternative is proposing up to 6.0 million square-feet; therefore, the proposed infrastructure would be sufficient to accommodate this development. Construction of the Wharf Street bridge connection would be needed to accommodate the density unless a greater mode shift to transit or walk/bike occurred, reducing the amount of vehicular traffic generated.

Mitigation Strategies

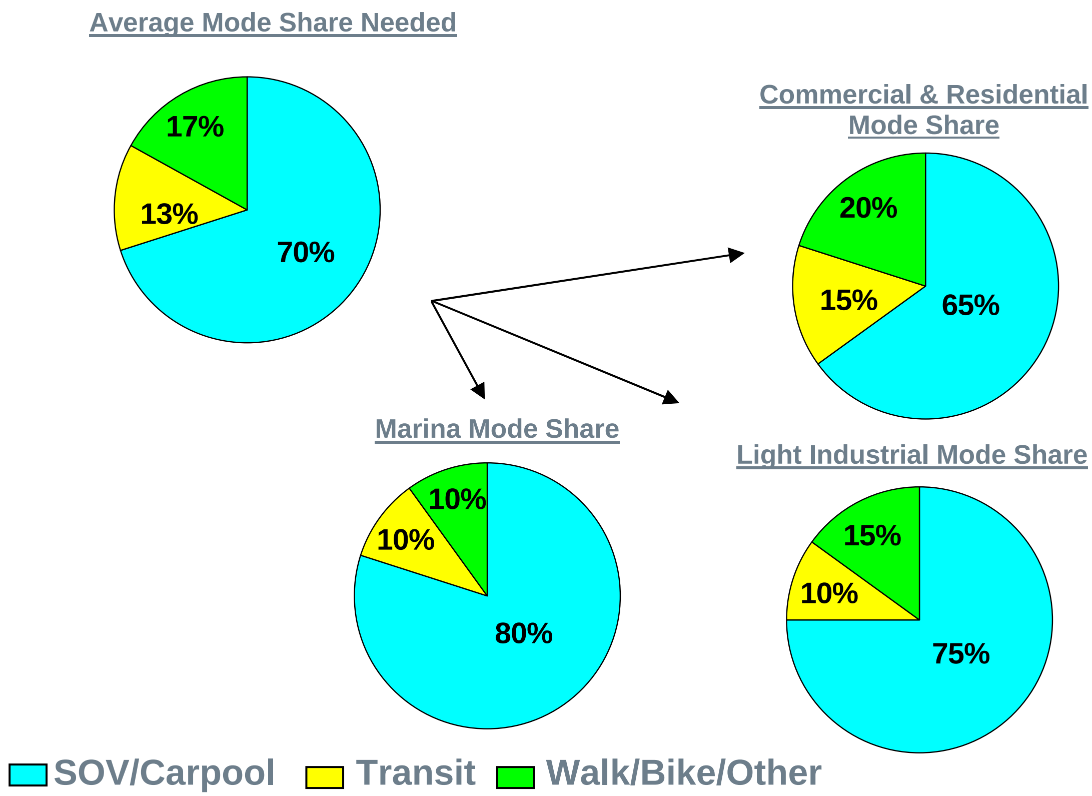
The operational and management strategies described in the DEIS and SDEIS for each transportation mode would also apply to the Updated Preferred Alternative (see Table 3.12-16 in the DEIS). The mitigation strategies described below build on the DEIS and SDEIS to reduce or eliminate impacts for both the on-site and off-site study area. Specifically more aggressive mode share targets have been identified that if achieved, would eliminate the need for the Wharf Street bridge connection. Transit facilities and services, which are also presented in the DEIS and SDEIS, have been re-emphasized to highlight their importance in achieving the aggressive mode share targets.

Increase Non-Auto Mode Share

A significant amount of transportation infrastructure improvements are included as part of the Updated Preferred Alternative. Even with these improvements, congestion will continue throughout the downtown area and at the site access locations. While the congestion will meet the City intersection level-of-service standards, it will affect how vehicles, pedestrians, bicyclists, and buses circulate through the site. The primary mitigation strategy to improve on-site circulation and access conditions is to have more aggressive mode share targets for non-auto modes. This mitigation strategy is intended to reduce congestion and the need for greater infrastructure improvements, including the Wharf Street bridge connection.

Possible Mode Share Targets

Additional analysis of congestion and mode share indicates that the overall New Whatcom Redevelopment would need to achieve an approximately 30 percent non-auto mode share, as compared to the City's Comprehensive Plan target mode shares assumed for the alternatives analysis, to reduce congestion on-site and allow for better circulation. This would also allow the Port to develop the site to its proposed density without the construction of the Wharf Street bridge connection. The following illustrates the mode share assumptions by land use used for the analysis. This mode share is for illustrative purposes; it is possible to achieve the same results with a higher walk/bike/other mode share rather than the 10 to 15 percent transit mode share. The main point of the illustration is that a 30 percent non-auto share would need to be achieved.



* The mode share shown is for illustrative purposes. The main point of the illustration is that a 30 percent non-auto share would need to be achieved.

Providing a transit mode share of 10 to 15 percent will require significant increases in transit service and facilities. This will require significant capital and operating investments to provide additional transit buses as well as support the operations. In addition, it could be challenging to provide sufficient transit service as well as integrate with existing service without the Wharf Street connection. Existing transit service in the vicinity of the site is primarily between Fairhaven and the downtown via Route 401 (the Red Line). The Red Line could be re-routed from Fairhaven to The Waterfront District and then downtown using Wharf Street. However, without Wharf Street re-routing the Red Line would likely not be feasible; therefore, an additional circulator route would be needed within The Waterfront District to and from downtown. The circulator route would require all passengers to transfer to access other destinations beyond the downtown.

For the Updated Preferred Alternative it is assumed that WWU would occupy approximately 400,000 square-feet of space within the redevelopment. As a conservative estimate, the analysis assumes WWU mode share is consistent with commercial and residential uses. WTA and WWU estimate 80 percent of the student trips will be made using a non-auto mode; therefore, the assumed traffic generation for WWU could be considered conservative and will help towards achieving the overall 30 percent non-auto goal. WTA's highest student transit demands occur during the morning (between 8:00 to 10:00 a.m.) and afternoon (1:00 to 2:00 p.m.) periods. During the evening peak periods, student transit demand is as much as 30 percent less than the morning and afternoon demands. Therefore, the conservative mode share assumptions for students recognizes that their transit demand is typically peaks outside of the PM peak period (i.e. the analysis time period).

Evaluation of Greater Non-Auto Mode Share

Implementation of strategies to achieve a 30 percent non-auto mode share would reduce the overall site trip generation by approximately 750 net new PM peak hour trips. Appendix C provides detailed trip generation estimates with the 30 percent non-auto mode split. Table 4 shows the PM peak hour intersection operations with and without the 30 percent mode shift. Detailed LOS worksheets are provided in Appendix M-1.

As shown in Table 4, shifting auto trips to non-auto modes would greatly improve intersection operations. On-site vehicle queues and congestion would also be reduced allowing for improved circulation within and to and from the site. The improvement in on-site circulation would allow for improved transit circulation and help make transit a viable option for travel.

The analysis of the Updated Preferred Alternative with the closure of Wharf Street shows that if a 30 percent non-auto mode split was achieved it would not be necessary to construct the Wharf Street bridge connection to accommodate vehicular traffic on-site. Although operations along Bloedel Avenue would be slightly worse than with the bridge connection, vehicle queues would be manageable and transit would be able to adequately circulate through the site.

Table 4. Updated Preferred Alternative 2026 On-Site Intersection Operations – With and Without 30 Percent Mode Shift

Study Intersections[1]	LOS[2]	Delay[3]	V/C[4] or WM[5]	LOS[2]	Delay[3]	V/C[4] or WM[5]
	With Wharf St			With Wharf Street – Mode Shift		
4. Roeder Avenue/Central Avenue[6]	E	68	1.02	B	13	0.85
5. West Chestnut St/Bay St/Roeder Ave	D	44	0.93	C	31	0.80
6. West Chestnut St/Commercial St	C	29	0.91	C	25	0.79
7. East Chestnut St/Cornwall Ave	E	78	1.13	D	47	0.98
10. Bloedel Ave/Commercial St	C	23	0.58	C	20	0.55
16. Bloedel Avenue/Log Pond Drive	C	18	NB	C	15	NB
19. Bloedel Ave/Cornwall Ave	C	32	0.70	C	31	0.62
	Without Wharf St			Without Wharf Street – Mode Shift		
4. Roeder Avenue/Central Avenue[6]	E	68	1.02	B	13	0.85
5. West Chestnut St/Bay St/Roeder Ave	D	39	0.93	C	28	0.80
6. West Chestnut St/Commercial St	C	28	0.91	C	24	0.79
7. East Chestnut St/Cornwall Ave	F	85	1.19	D	44	0.98
10. Bloedel Ave/Commercial St	C	26	0.73	C	23	0.69
16. Bloedel Avenue/Log Pond Drive	C	18	NB	C	15	NB
19. Bloedel Ave/Cornwall Ave	D	41	0.98	C	30	0.89

Source: Transpo Group (October 2009)
1. Results are shown for those locations where intersection operations would change as a result of the Updated Preferred Alternative.
2. Level of service, based on 2000 *Highway Capacity Manual* methodology.
3. Average delay in seconds per vehicle.
4. Volume-to-capacity ratio reported for signalized intersections.
5. Worst movement for unsignalized intersections.
6. The Updated Preferred Alternative incorporates the effects of the pedestrian signal on this location to provide a worst case analysis of operations. When there are no pedestrian calls, the overall intersection operations would be better.

Achieving a 30 percent non-auto mode share would result in the ability to accommodate more development on-site with each phase of transportation infrastructure improvements. Table 5 expands on Table 3 (Updated Preferred Alternative Phasing of Transportation Infrastructure Improvements and Associated Development Capacity) by providing the development capacity without and with a 30 percent non-auto mode shift. As shown in the table, if a 30 percent non-auto mode split was achieved then the development could be accommodated without construction of the bridge connection. With the reduction in vehicle trip generation associated with the 30 percent non-auto mode split, approximately 6.5 million square-feet of development could be accommodated.

Through the biennial traffic monitoring Table 5 would be updated to show how much development could be accommodated with the mode splits measured.

Table 5. Updated Preferred Alternative Phasing of Transportation Infrastructure Improvements and Associated Development Capacity without and with 30 Percent Mode Shift[1]

Project Sequence	On-Site Improvements	Off-Site Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4] Without Mode Shift	With Mode Shift
		Marine Trades Area			
	Existing Street Network[5]		**400**	**0.6**	**0.7**
1	Reconstruct Hilton Avenue and C Street.	Signalize C Street intersections with Roeder Avenue and Holly Street and provide turn lanes along C Street. Signalize Hilton Avenue/Roeder Avenue intersection and provide turn lanes along Hilton Avenue.	700	1.1	1.3
2	Upgrade F Street and build Chestnut Street from Hilton Avenue to C Street. Provide left-turn lane along F Street at Roeder Avenue.		800	1.3	1.5
3		Upgrade Roeder Avenue between Hilton Avenue and C Street with additional drop/turn lanes at major intersections[6].	950	1.5	1.7
4		Improve Holly Street from F Street to Champion Street to provide turn lanes or restrict movements at intersections.	1,070	1.7	2.0

Project Sequence	On-Site Improvements	Off-Site Improvements[2]	PM Peak Hour Outbound Vehicle Capacity[3]	Approximate Development in Millions of sf[4] Without Mode Shift	With Mode Shift
Downtown Waterfront, Log Pond, Shipping Terminal, and Cornwall Beach Areas					
	Existing Street Network[5]		**975**	**1.7**	**2.0**
1		Signalize intersection at Central Avenue and Roeder Avenue.	1,025	1.8	2.1
2		Build Roundabout at Wharf/State /Boulevard intersection.	1,325	2.3	2.7
3	Demolish Cornwall Avenue Bridge[7]		650	1.1	1.3
4	Rebuild Cornwall Avenue Bridge with bike facilities and 3-lanes. Relocate BNSF Railroad and close at grade Wharf Street.		825	1.4	1.7
5	Build Bloedel Avenue from Commercial Street to Cornwall Avenue. Build the Commercial Street loop and Long Pond Drive.	Provide a northbound left-turn lane and shared through/right-turn lane, and upgrade traffic signal at Cornwall Avenue/Chestnut Street Signalize Maple Street/Cornwall Avenue and upgrade Maple Street with shared lanes and enhanced pedestrian facilities.	1,050	1.8	2.2
6	Build Bloedel Avenue from Central Avenue to Commercial Street		1,200	2.1	2.5
7	Construct Commercial Street Bridge and extend to Bloedel Avenue.		1,550	2.7	3.2
8	Build Oak Street / Paper Avenue to Long Pond Drive.		1,650	2.9	3.4
9	Build Bay Street Access	Signalize Bay Street/Chestnut Street	2,150	3.7	4.5
Total Development with No Wharf Street Bridge Connection and 30 Percent Non-Auto Mode Splits			***3,220***		***6.5***

Source: Transpo Group (October 2009)

1. The infrastructure phasing addresses the Marine Trades Area separate from the Downtown Waterfront, Log Pong, Shipping Terminal, and Cornwall Beach Areas.
2. The off-site improvements represent those improvements needed to support the redevelopment.
3. Outbound vehicle trips represent peak direction of travel during the PM peak hour. This capacity represents the maximum number of weekday PM peak hour trips that could be accommodated without additional infrastructure.
4. Approximate square-footage is provided for reference and is based on the outbound vehicle trips related to the distribution of land use proposed i.e., 1,240,000 square-feet of commercial, 375 residential units, and 460 slips for the Marine Trades area and 2,490,000 square-feet of commercial use and 1,517 residential units for the other redevelopment areas. This square-footage is related to the specific redevelopment area(s) noted, not the total New Whatcom site and assumes a 30 percent non-auto mode split.
5. Existing street network assumes roadway and intersections as they are today with no improvements or upgrades.
6. Additional right-of-way needed for this improvement would be taken from the Waterfront (south) side of Roeder Avenue (i.e., the project site).
7. The removal of the Cornwall Avenue Bridge decreases the site infrastructure capacity.

Incorporate Transit Facilities and Services

A key element of shifting trips to non-auto modes will be by providing improved transit facilities and high-quality service. The Port and City will work with WTA in partnership with WWU to develop a transit strategy that is functional for all users. It will be important that the routes within the redevelopment area connect to the rest of the City and region to reduce the number of transfers and encourage greater transit use.

Circulation within the site, and to and from the site, would need to be accommodated. Ideally an existing transit route would be re-routed to circulate within the site minimizing the need for transfers. If an existing route was not re-routed and an exclusive New Whatcom route was needed, it might be difficult for WTA to allocate additional bus hours to provide the frequent service that would be needed. In addition, not re-routing an existing circulation route would require transit users to transfer in downtown to all other destinations. This short distance transfer could make transit less attractive as it might be easier to walk to the transit station. The Wharf Street bridge connection would allow for better overall transit circulation options; closing Wharf Street prevents existing routes on the State Street and Forest Street corridors from easily circulating into and out of the site.

Providing adequate capacity will also be critical to shifting users to transit. A high transit demand may require bus only lanes and/or transit priority to achieve the headways required to accommodate the demand. For example, with the 30 percent non-auto mode split including a transit mode split of 15 percent (see illustration on page 17), this is equivalent to an approximately ten minute headway for the peak direction. It is likely that the highest demand would only occur during the peak periods; a potential way to accommodate this demand is by providing bus only lanes using parking lanes with restrictions during the peak periods to accommodate the bus lane. Bus only lanes would require enforcement to ensure vehicles are not parked during the peak hour; therefore, the challenges of bus only lanes and other transit facilities will need to be fully vetted as a transit strategy is developed.

As described in the DEIS and SDEIS, transit amenities would be provided on-site including bus shelters, bus turnouts, layover areas, and transit kiosks. These amenities would make transit a more attractive mode.

Significant Unavoidable Adverse Impacts

As described in the DEIS and SDEIS, the Updated Preferred Alternative would accommodate additional amounts of future development within the site which would contribute to travel demands and congestion along the on-site and off-site street system. The additional development and associated improvements would also increase traffic access and circulation in the area. This added congestion would contribute to measurably poorer performance of the transportation network, in terms of increased delays along several of the corridors and at some specific intersections. The increase in traffic and higher volumes of pedestrian and bicycles would result in more conflict points and increased hazards to safety.

Appendix C-1: Intersection Level of Service Summary and Worksheets

Intersection Operations

Study Intersection	Existing			Preferred Alternative						Updated Preferred Alternative					
	2007			2016			2026			2016			2026		
	LOS[1]	Delay[2]	V/C[3] or WM[4]	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
On-Site															
1. Roeder Avenue/Hilton Avenue	C	16	NB	**F**	**>200**	**NB**	**F**	**>200**	**NB**	**F**	**>200**	**NB**	C	28	0.96
2. Roeder Avenue/F Street	B	17	0.32	D	49	0.76	**F**	**166**	**1.21**	D	49	0.76	**F**	**166**	**1.21**
3. Roeder Avenue/C Street	C	16	SB	C	24	0.62	C	26	0.87	C	24	0.62	C	26	0.87
4. Roeder Avenue/Central Avenue[6]	C	16	NB	B	16	0.80	C	21	0.95	B	16	0.80	E	68	1.02
5. West Chestnut Street/Bay Street/Roeder Avenue	E	40	SBL	**F**	**>200**	**SBL**	D	39	0.90	**F**	**>200**	**SBL**	D	40	0.93
6. West Chestnut Street/Commercial Street	B	11	0.39	B	16	0.71	C	30	0.91	B	16	0.71	C	29	0.91
7. East Chestnut Street/Cornwall Avenue	B	14	0.57	D	39	0.98	E	80	1.13	D	39	0.98	E	78	1.13
9. Bloedel Avenue/Bay Street	-	-	-	B	15	NB	C	29	0.68	-	-	-	-	-	-
10. Bloedel Avenue/Commercial Street	-	-	-	B	12	SB	C	29	0.79	B	12	SB	C	23	0.58
14. Cornwall Avenue/Wharf Street	-	-	-	B	12	SB	E	46	SB	B	12	SB	E	46	SB
15. Paper Avenue/Log Pond Drive	-	-	-	-	-	-	B	14	0.74	-	-	-	C	21	WB
16. Bloedel Avenue/Log Pond Drive	-	-	-	-	-	-	C	32	0.84	-	-	-	C	18	NB
17. Paper Avenue/Oak Street	-	-	-	-	-	-	A	9	NA	-	-	-	A	9	NA
18. Cornwall Avenue/Oak Street	-	-	-	-	-	-	B	11	EB	-	-	-	B	11	EB
19. Bloedel Avenue/Cornwall Avenue	-	-	-	-	-	-	-	-	-	-	-	-	C	32	0.70
Off-Site															
1.Meridian Street/Birchwood Avenue	D	40	0.72	E	64	0.88	**F**	**126**	**1.04**	E	64	0.88	**F**	**126**	**1.04**
2.Meridian Street/Squalicum Way	C	28	0.49	D	45	0.64	E	68	0.79	D	45	0.64	E	68	0.79
3.Broadway/Meridian Street/Girard Street	B	18	0.50	C	21	0.53	C	29	0.65	C	21	0.53	C	29	0.65
4.Broadway/Elm Street/Dupont Street.	A	8	0.50	B	18	0.67	C	24	0.75	B	18	0.67	C	24	0.75
5.Broadway/Eldridge Avenue/West Holly Street	A	8	0.58	A	9	0.65	B	15	0.84	A	9	0.65	B	15	0.84
6.West Holly Street/F Street	B	13	0.50	C	32	0.78	**F**	**89**	**1.14**	C	32	0.78	**F**	**89**	**1.14**
7.West Holly Street/ C Street	C	18	SB	C	27	0.54	C	32	0.83	C	27	0.54	C	32	0.83
8.Cornwall Avenue/Flora Street/York Street	B	13	0.68	C	22	0.76	D	53	1.00	C	22	0.76	D	53	1.00
9.Cornwall Avenue/East Magnolia Street	B	12	0.52	B	17	0.59	C	34	0.91	B	17	0.59	C	34	0.91
10.East Holly Street/Cornwall Avenue	B	16	0.53	B	17	0.67	C	29	0.92	B	17	0.67	C	34	0.92
11.East Chestnut Street/Railroad Avenue	E	44	SB	A	7	0.53	B	17	0.48	A	7	0.53	B	17	0.48
12.East Chestnut Street/North State Street	B	13	0.53	B	15	0.60	B	14	0.58	B	15	0.60	B	19	0.58
13.East Chestnut Street/North Forest Street	A	7	0.39	B	12	0.54	B	17	0.68	B	12	0.54	B	18	0.68
14.East Chestnut Street/Ellis Street	A	10	0.42	B	11	0.48	B	19	0.79	B	11	0.48	B	19	0.79
15.Lakeway Drive/Ellis Street/Jersey Street/East Holly Street	C	24	0.68	D	38	0.86	E	62	1.00	D	38	0.86	E	62	1.00
16.Lakeway Drive/I-5 Southbound Ramps	C	23	0.82	E	56	1.03	**F**	**104**	**1.17**	E	56	1.03	**F**	**104**	**1.17**
17.Lakeway Drive/King Street	D	39	0.73	D	47	0.78	E	69	0.83	D	47	0.78	E	69	0.83
18.Lakeway Drive/Lincoln Street	D	38	0.91	D	47	0.90	E	69	1.02	D	47	0.90	E	69	1.02
19.Iowa Street/Moore Street/I-5 Northbound Ramps	C	33	0.89	D	46	0.99	E	66	1.08	D	46	0.99	E	66	1.08
20.Iowa Street/King Street	B	17	0.62	B	20	0.74	C	30	0.87	B	20	0.74	C	30	0.87
21.North State Street/James Street/Iowa Street	**F**	**114**	**1.63**	**F**	**>200**	**2.80**	**F**	**>200**	**3.04**	**F**	**>200**	**2.80**	**F**	**>200**	**3.04**
22.North State Street/Ohio Street	C	20	0.65	D	40	0.87	**F**	**145**	**1.27**	D	40	0.87	**F**	**145**	**1.27**
23.North State Street/York Street	B	15	0.51	C	24	0.70	D	46	0.93	C	24	0.70	D	46	0.93
24.North State Street/East Laurel Street	B	11	WBL	B	14	WB	C	24	WB	B	14	WB	C	24	WB
25.North Forest Street/ North State Street/Boulevard Street/Wharf Street[7]	-	-	-	B	13	NA	E	58	NA	B	13	NA	E	58	NA
a. North Forest Street/North State Street/Boulevard Street	C	17	SBL	-	-	-	-	-	-	-	-	-	-	-	-
b. North State Street/Wharf Street	B	14	EB	-	-	-	-	-	-	-	-	-	-	-	-
26.North Forest Street/East Laurel Street	B	14	EB	E	37	EB	**F**	**>200**	**EB**	E	37	EB	**F**	**>200**	**EB**
27.North Forest Street/Ellis Street/York Street	B	18	0.54	C	23	0.69	C	34	0.84	C	23	0.69	C	34	0.84
28.South Samish Way/Elwood Avenue/Lincoln Street	B	18	0.64	D	39	0.89	E	70	1.11	D	39	0.89	E	70	1.11
29.South Samish Way/I-5 Southbound Off-Ramp/36th Street	C	26	0.66	C	31	0.75	C	35	0.82	C	31	0.75	C	35	0.82
30.North Samish Way/Bill McDonald Parkway	B	15	0.52	C	21	0.67	C	32	0.84	C	21	0.67	C	32	0.84
31.12th Street/Old Fairhaven Parkway	B	19	0.59	C	21	0.62	C	24	0.72	C	21	0.62	C	24	0.72
32.12th Street/Hawthorn Road/Parkridge Road	B	12	0.48	B	16	0.63	B	18	0.64	B	16	0.63	B	18	0.64

Source: The Transpo Group (August 2007)

Notes: **Bold and Underlined** - Indicates locations operating below LOS E.

The intersection operations for Alternatives 2 and 2A for on-site intersection numbers 1, 2, and 3 and all off-site intersections are the same and therefore not shown.

1. Level of service, based on 2000 *Highway Capacity Manual* methodology.
2. Average delay in seconds per vehicle.
3. Volume-to-capacity ratio reported for signalized intersections.
4. Worst movement for unsignalized intersections. This is not applicable (NA) to all-way stop and roundabout controlled intersections.
5. The intersection operations for Alternatives 2 and 2A for on-site intersection numbers 1, 2, and 3 and all off-site intersections are the same and therefore not shown.
6. In 2026, the Updated Preferred Alternative incorporates the effects of the pedestrian signal on this location to provide a worst case analysis of operations. When there are no pedestrian calls, the overall intersection operations would be better.
7. This intersection operates as two separate intersections in the field; therefore, the analysis was conducted as such. Assumed as one intersection with roundabout control for Preferred Alternative.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	1110	180	110	350	0	0	240	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.97			1.00			0.95	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.98			1.00			0.95	
Flt Protected					0.99			0.99			1.00	
Satd. Flow (prot)					3269			1774			1638	
Flt Permitted					0.99			0.68			1.00	
Satd. Flow (perm)					3269			1221			1638	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	245	1110	180	110	350	0	0	240	125
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	0	0	19	0
Lane Group Flow (vph)	0	0	0	0	1525	0	0	460	0	0	346	0
Confl. Peds. (#/hr)				80		80	80					80
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					50.0			42.0			42.0	
Effective Green, g (s)					50.0			42.0			42.0	
Actuated g/C Ratio					0.50			0.42			0.42	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1635			513			688	
v/s Ratio Prot					c0.47						0.21	
v/s Ratio Perm								c0.38				
v/c Ratio					0.93			0.90			0.50	
Uniform Delay, d1					23.4			27.0			21.3	
Progression Factor					1.00			1.13			0.56	
Incremental Delay, d2					11.1			19.9			1.0	
Delay (s)					34.5			50.5			13.0	
Level of Service					C			D			B	
Approach Delay (s)		0.0			34.5			50.5			13.0	
Approach LOS		A			C			D			B	

Intersection Summary			
HCM Average Control Delay	34.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	845	250	20	535	35	440	320	95	370	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1818	1531		1795		1711	1801	1531	1745	1711	
Flt Permitted		1.00	1.00		0.71		0.51	1.00	1.00	0.22	1.00	
Satd. Flow (perm)		1814	1531		1274		912	1801	1531	408	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	845	250	20	535	35	440	320	95	370	110	40
RTOR Reduction (vph)	0	0	117	0	2	0	0	0	77	0	13	0
Lane Group Flow (vph)	0	850	133	0	588	0	440	320	18	370	137	0
Confl. Peds. (#/hr)	10					10						10
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	2%	2%	2%	0%	2%	0%
Turn Type	Perm		Perm	Perm			pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		52.0	52.0		52.0		37.0	19.0	19.0	35.0	18.0	
Effective Green, g (s)		52.0	52.0		52.0		37.0	19.0	19.0	35.0	18.0	
Actuated g/C Ratio		0.52	0.52		0.52		0.37	0.19	0.19	0.35	0.18	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		943	796		662		481	342	291	370	308	
v/s Ratio Prot							0.16	0.18		c0.17	0.08	
v/s Ratio Perm		c0.47	0.09		0.46		0.17		0.01	c0.18		
v/c Ratio		0.90	0.17		0.89		0.91	0.94	0.06	1.00	0.44	
Uniform Delay, d1		21.7	12.6		21.4		27.8	39.9	33.2	28.2	36.5	
Progression Factor		0.67	1.00		1.26		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.0		14.5		21.9	32.2	0.1	46.8	1.0	
Delay (s)		16.0	12.7		41.5		49.7	72.1	33.3	75.0	37.6	
Level of Service		B	B		D		D	E	C	E	D	
Approach Delay (s)		15.2			41.5			56.2			64.2	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00			0.97	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			0.99	
Frt		0.98			0.98		1.00	0.96			0.96	
Flt Protected		0.99			1.00		0.95	1.00			0.97	
Satd. Flow (prot)		3366			1753		1711	1728			1614	
Flt Permitted		0.81			0.96		0.54	1.00			0.56	
Satd. Flow (perm)		2727			1693		973	1728			921	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
RTOR Reduction (vph)	0	10	0	0	5	0	0	14	0	0	18	0
Lane Group Flow (vph)	0	1275	0	0	425	0	100	266	0	0	337	0
Confl. Peds. (#/hr)	20					20				20		20
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			custom		
Protected Phases		2			2			3				
Permitted Phases	2			2			3			7	7	
Actuated Green, G (s)		54.4			54.4		37.6	37.6			37.6	
Effective Green, g (s)		54.4			54.4		37.6	37.6			37.6	
Actuated g/C Ratio		0.54			0.54		0.38	0.38			0.38	
Clearance Time (s)		4.0			4.0		4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1483			921		366	650			346	
v/s Ratio Prot								0.15				
v/s Ratio Perm		c0.47			0.25		0.10				c0.37	
v/c Ratio		0.86			0.46		0.27	0.41			0.97	
Uniform Delay, d1		19.5			13.9		21.7	23.0			30.7	
Progression Factor		0.93			1.43		1.00	1.00			1.00	
Incremental Delay, d2		3.2			0.2		0.4	0.4			41.0	
Delay (s)		21.4			20.0		22.1	23.4			71.8	
Level of Service		C			C		C	C			E	
Approach Delay (s)		21.4			20.0			23.1			71.8	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1100	165	0	0	0	295	280	70	125	250	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0			4.0	
Lane Util. Factor		0.95					1.00	1.00			1.00	
Frpb, ped/bikes		0.98					1.00	0.98			0.96	
Flpb, ped/bikes		0.99					1.00	1.00			0.99	
Frt		0.98					1.00	0.97			0.97	
Flt Protected		1.00					0.95	1.00			0.99	
Satd. Flow (prot)		3306					1711	1708			1664	
Flt Permitted		1.00					0.95	1.00			0.67	
Satd. Flow (perm)		3306					1711	1708			1137	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	1100	165	0	0	0	295	280	70	125	250	110
RTOR Reduction (vph)	0	11	0	0	0	0	0	7	0	0	10	0
Lane Group Flow (vph)	0	1329	0	0	0	0	295	343	0	0	475	0
Confl. Peds. (#/hr)	50		50				50		50	50		50
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Perm						Prot			Perm		
Protected Phases		2					8	3			7	
Permitted Phases	2									7		
Actuated Green, G (s)		38.0					15.0	54.0			35.0	
Effective Green, g (s)		38.0					15.0	54.0			35.0	
Actuated g/C Ratio		0.38					0.15	0.54			0.35	
Clearance Time (s)		4.0					4.0	4.0			4.0	
Vehicle Extension (s)		3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)		1256					257	922			398	
v/s Ratio Prot							c0.17	0.20				
v/s Ratio Perm		0.40									c0.42	
v/c Ratio		1.06					1.15	0.37			1.19	
Uniform Delay, d1		31.0					42.5	13.2			32.5	
Progression Factor		0.86					0.81	0.42			1.02	
Incremental Delay, d2		36.9					100.3	0.2			102.5	
Delay (s)		63.5					134.9	5.9			135.7	
Level of Service		E					F	A			F	
Approach Delay (s)		63.5			0.0			64.9			135.7	
Approach LOS		E			A			E			F	

Intersection Summary			
HCM Average Control Delay	78.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

24: E Chestnut St & Railroad Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1270	35	0	0	0	0	60	35	115	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.97			1.00	
Flpb, ped/bikes		1.00						1.00			0.99	
Frt		1.00						0.95			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		4900						1689			1772	
Flt Permitted		1.00						1.00			0.77	
Satd. Flow (perm)		4900						1689			1392	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	1270	35	0	0	0	0	60	35	115	100	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	26	0	0	0	0
Lane Group Flow (vph)	0	1398	0	0	0	0	0	69	0	0	215	0
Confl. Peds. (#/hr)	11		41						41	11		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm									Perm		
Protected Phases		6						4			8	
Permitted Phases	6									8		
Actuated Green, G (s)		71.6						20.4			20.4	
Effective Green, g (s)		71.6						20.4			20.4	
Actuated g/C Ratio		0.72						0.20			0.20	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		3508						345			284	
v/s Ratio Prot								0.04				
v/s Ratio Perm		0.29									c0.15	
v/c Ratio		0.40						0.20			0.76	
Uniform Delay, d1		5.6						33.0			37.5	
Progression Factor		1.93						1.00			1.00	
Incremental Delay, d2		0.0						0.3			11.0	
Delay (s)		10.9						33.3			48.4	
Level of Service		B						C			D	
Approach Delay (s)		10.9			0.0			33.3			48.4	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

25: E Chestnut St & N State St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1000	465	0	0	0	0	0	0	255	780	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0								4.0	4.0	
Lane Util. Factor		0.91								1.00	0.95	
Frpb, ped/bikes		0.98								1.00	1.00	
Flpb, ped/bikes		1.00								1.00	1.00	
Frt		0.95								1.00	1.00	
Flt Protected		1.00								0.95	1.00	
Satd. Flow (prot)		4612								1728	3455	
Flt Permitted		1.00								0.95	1.00	
Satd. Flow (perm)		4612								1728	3455	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1000	465	0	0	0	0	0	0	255	780	0
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	47	0	0
Lane Group Flow (vph)	0	1422	0	0	0	0	0	0	0	208	780	0
Confl. Peds. (#/hr)			40							40		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type										Split		
Protected Phases		2								4	4	
Permitted Phases												
Actuated Green, G (s)		51.0								41.0	41.0	
Effective Green, g (s)		51.0								41.0	41.0	
Actuated g/C Ratio		0.51								0.41	0.41	
Clearance Time (s)		4.0								4.0	4.0	
Lane Grp Cap (vph)		2352								708	1417	
v/s Ratio Prot		c0.31								0.12	c0.23	
v/s Ratio Perm												
v/c Ratio		0.60								0.29	0.55	
Uniform Delay, d1		17.4								19.8	22.5	
Progression Factor		0.84								1.00	1.00	
Incremental Delay, d2		1.1								1.1	1.5	
Delay (s)		15.7								20.8	24.0	
Level of Service		B								C	C	
Approach Delay (s)		15.7			0.0			0.0			23.2	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	1060	0	0	0	0	0	1095	135	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.95				
Frpb, ped/bikes		1.00						0.99				
Flpb, ped/bikes		1.00						1.00				
Frt		1.00						0.98				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		4967						3335				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		4967						3335				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1060	0	0	0	0	0	1095	135	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	1267	0	0	0	0	0	1220	0	0	0	0
Confl. Peds. (#/hr)	40								40			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Split											
Protected Phases	2	2						4				
Permitted Phases												
Actuated Green, G (s)		40.0						52.0				
Effective Green, g (s)		40.0						52.0				
Actuated g/C Ratio		0.40						0.52				
Clearance Time (s)		4.0						4.0				
Lane Grp Cap (vph)		1987						1734				
v/s Ratio Prot		c0.26						c0.37				
v/s Ratio Perm												
v/c Ratio		0.64						0.70				
Uniform Delay, d1		24.2						18.2				
Progression Factor		0.60						1.00				
Incremental Delay, d2		1.4						2.4				
Delay (s)		15.7						20.6				
Level of Service		B						C				
Approach Delay (s)		15.7			0.0			20.6			0.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1090	185	5	1010	255	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1765			1800	1709	
Flt Permitted	1.00			0.72	0.95	
Satd. Flow (perm)	1765			1295	1709	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1090	185	5	1010	255	10
RTOR Reduction (vph)	6	0	0	0	1	0
Lane Group Flow (vph)	1269	0	0	1015	264	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	66.0			66.0	26.0	
Effective Green, g (s)	66.0			66.0	26.0	
Actuated g/C Ratio	0.66			0.66	0.26	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1165			855	444	
v/s Ratio Prot	0.72				c0.15	
v/s Ratio Perm				c0.78		
v/c Ratio	1.09			1.19	0.59	
Uniform Delay, d1	17.0			17.0	32.4	
Progression Factor	0.12			0.97	1.00	
Incremental Delay, d2	41.8			89.8	2.1	
Delay (s)	43.7			106.2	34.5	
Level of Service	D			F	C	
Approach Delay (s)	43.7			106.2	34.5	
Approach LOS	D			F	C	

Intersection Summary			
HCM Average Control Delay	67.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

47: Commercial St & Bloedel Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	305	15	115	65	5	50	250	120	20	200	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1788		1711	1782		1711	1713		1711	1765	
Flt Permitted	0.95	1.00		0.95	1.00		0.49	1.00		0.34	1.00	
Satd. Flow (perm)	1711	1788		1711	1782		888	1713		610	1765	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	321	16	121	68	5	53	263	126	21	211	32
RTOR Reduction (vph)	0	2	0	0	3	0	0	18	0	0	6	0
Lane Group Flow (vph)	53	335	0	121	70	0	53	371	0	21	237	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	3.5	20.2		7.9	24.6		23.7	21.7		21.9	20.8	
Effective Green, g (s)	3.5	20.2		7.9	24.6		23.7	21.7		21.9	20.8	
Actuated g/C Ratio	0.05	0.30		0.12	0.37		0.35	0.32		0.33	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	540		202	655		339	556		218	549	
v/s Ratio Prot	0.03	c0.19		c0.07	0.04		c0.00	c0.22		0.00	0.13	
v/s Ratio Perm							0.05			0.03		
v/c Ratio	0.59	0.62		0.60	0.11		0.16	0.67		0.10	0.43	
Uniform Delay, d1	31.0	20.1		28.0	13.9		14.5	19.5		15.8	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.5	2.2		4.7	0.1		0.2	3.0		0.2	0.5	
Delay (s)	40.5	22.3		32.7	14.0		14.7	22.5		16.0	18.9	
Level of Service	D	C		C	B		B	C		B	B	
Approach Delay (s)		24.7			25.7			21.6			18.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

49: Bloedel Ave & Cornwall Ave

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	585	130	340	155	90	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.89	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3319	1531	1711	1801	1605	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3319	1531	1711	1801	1605	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	616	137	358	163	95	389
RTOR Reduction (vph)	0	105	0	0	134	0
Lane Group Flow (vph)	616	32	358	163	350	0
Turn Type		custom	Prot			
Protected Phases			5	2		
Permitted Phases	4	4			6	
Actuated Green, G (s)	23.2	23.2	25.1	68.8	39.7	
Effective Green, g (s)	23.2	23.2	25.1	68.8	39.7	
Actuated g/C Ratio	0.23	0.23	0.25	0.69	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	770	355	429	1239	637	
v/s Ratio Prot			c0.21	0.09		
v/s Ratio Perm	c0.19	0.02			c0.22	
v/c Ratio	0.80	0.09	0.83	0.13	0.55	
Uniform Delay, d1	36.2	30.1	35.5	5.4	23.2	
Progression Factor	1.00	1.00	1.00	1.00	0.70	
Incremental Delay, d2	6.0	0.1	13.1	0.2	0.9	
Delay (s)	42.2	30.2	48.6	5.6	17.3	
Level of Service	D	C	D	A	B	
Approach Delay (s)	40.0			35.1	17.3	
Approach LOS	D			D	B	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (vph)	0	1275	1265	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1801	1801			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1801	1801			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1275	1265	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1275	1265	0	0	0
Turn Type						
Protected Phases		4	8			
Permitted Phases						
Actuated Green, G (s)		66.0	66.0			
Effective Green, g (s)		66.0	66.0			
Actuated g/C Ratio		0.66	0.66			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1189	1189			
v/s Ratio Prot		c0.71	0.70			
v/s Ratio Perm						
v/c Ratio		1.07	1.06			
Uniform Delay, d1		17.0	17.0			
Progression Factor		0.90	0.65			
Incremental Delay, d2		43.2	30.9			
Delay (s)		58.5	42.0			
Level of Service		E	D			
Approach Delay (s)		58.5	42.0		0.0	
Approach LOS		E	D		A	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	34.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	15	225	485	20	375
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	340	15	225	485	20	375
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	485			365		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			355		1282	348
vC1, stage 1 conf vol					348	
vC2, stage 2 conf vol					935	
vCu, unblocked vol			266		1266	258
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		93	48
cM capacity (veh/h)			1204		293	724

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	355	225	485	395
Volume Left	0	225	0	20
Volume Right	15	0	0	375
cSH	1700	1204	1700	674
Volume to Capacity	0.21	0.19	0.29	0.59
Queue Length 95th (ft)	0	17	0	96
Control Delay (s)	0.0	8.7	0.0	17.6
Lane LOS		A		C
Approach Delay (s)	0.0	2.7		17.6
Approach LOS				C

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

15: W Holly St & Cornwall Ave

Preferred Alt (2026) PM Peak Hour - Without Wharf Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	245	1110	180	110	350	0	0	260	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frpb, ped/bikes					0.97			1.00			0.96	
Flpb, ped/bikes					1.00			0.99			1.00	
Frt					0.98			1.00			0.96	
Flt Protected					0.99			0.99			1.00	
Satd. Flow (prot)					3269			1775			1646	
Flt Permitted					0.99			0.66			1.00	
Satd. Flow (perm)					3269			1178			1646	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	245	1110	180	110	350	0	0	260	125
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	0	1525	0	0	460	0	0	368	0
Confl. Peds. (#/hr)				80		80	80					80
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type				Split			Perm					
Protected Phases				2	2			4			4	
Permitted Phases							4					
Actuated Green, G (s)					50.0			42.0			42.0	
Effective Green, g (s)					50.0			42.0			42.0	
Actuated g/C Ratio					0.50			0.42			0.42	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1635			495			691	
v/s Ratio Prot					c0.47						0.22	
v/s Ratio Perm								c0.39				
v/c Ratio					0.93			0.93			0.53	
Uniform Delay, d1					23.4			27.6			21.7	
Progression Factor					1.00			1.05			0.57	
Incremental Delay, d2					11.1			21.0			1.2	
Delay (s)					34.5			49.9			13.4	
Level of Service					C			D			B	
Approach Delay (s)		0.0			34.5			49.9			13.4	
Approach LOS		A			C			D			B	

Intersection Summary			
HCM Average Control Delay	34.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

21: E Chestnut St & Bay St

Preferred Alt (2026) PM Peak Hour - Without Wharf Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	845	250	20	535	35	440	320	95	370	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1818	1531		1795		1711	1801	1531	1745	1711	
Flt Permitted		1.00	1.00		0.71		0.51	1.00	1.00	0.22	1.00	
Satd. Flow (perm)		1814	1531		1274		912	1801	1531	408	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	845	250	20	535	35	440	320	95	370	110	40
RTOR Reduction (vph)	0	0	117	0	2	0	0	0	77	0	13	0
Lane Group Flow (vph)	0	850	133	0	588	0	440	320	18	370	137	0
Confl. Peds. (#/hr)	10					10						10
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	2%	2%	2%	0%	2%	0%
Turn Type	Perm		Perm	Perm			pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		52.0	52.0		52.0		37.0	19.0	19.0	35.0	18.0	
Effective Green, g (s)		52.0	52.0		52.0		37.0	19.0	19.0	35.0	18.0	
Actuated g/C Ratio		0.52	0.52		0.52		0.37	0.19	0.19	0.35	0.18	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		943	796		662		481	342	291	370	308	
v/s Ratio Prot							0.16	0.18		c0.17	0.08	
v/s Ratio Perm		c0.47	0.09		0.46		0.17		0.01	c0.18		
v/c Ratio		0.90	0.17		0.89		0.91	0.94	0.06	1.00	0.44	
Uniform Delay, d1		21.7	12.6		21.4		27.8	39.9	33.2	28.2	36.5	
Progression Factor		0.28	0.32		0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.5	0.0		14.5		21.9	32.2	0.1	46.8	1.0	
Delay (s)		7.6	4.1		35.4		49.7	72.1	33.3	75.0	37.6	
Level of Service		A	A		D		D	E	C	E	D	
Approach Delay (s)		6.8			35.4			56.2			64.2	
Approach LOS		A			D			E			E	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00			0.97	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			0.99	
Frt		0.98			0.98		1.00	0.96			0.96	
Flt Protected		0.99			1.00		0.95	1.00			0.97	
Satd. Flow (prot)		3366			1753		1711	1728			1614	
Flt Permitted		0.81			0.96		0.54	1.00			0.56	
Satd. Flow (perm)		2727			1693		973	1728			921	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
RTOR Reduction (vph)	0	10	0	0	5	0	0	14	0	0	18	0
Lane Group Flow (vph)	0	1275	0	0	425	0	100	266	0	0	337	0
Confl. Peds. (#/hr)	20					20				20		20
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			D.Pm		
Protected Phases		2			2			8				
Permitted Phases	2			2			8			8	8	
Actuated Green, G (s)		54.4			54.4		37.6	37.6			37.6	
Effective Green, g (s)		54.4			54.4		37.6	37.6			37.6	
Actuated g/C Ratio		0.54			0.54		0.38	0.38			0.38	
Clearance Time (s)		4.0			4.0		4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1483			921		366	650			346	
v/s Ratio Prot								0.15				
v/s Ratio Perm		c0.47			0.25		0.10				c0.37	
v/c Ratio		0.86			0.46		0.27	0.41			0.97	
Uniform Delay, d1		19.5			13.9		21.7	23.0			30.7	
Progression Factor		0.90			1.14		1.00	1.00			1.00	
Incremental Delay, d2		3.2			0.8		0.4	0.4			41.0	
Delay (s)		20.8			16.7		22.1	23.4			71.8	
Level of Service		C			B		C	C			E	
Approach Delay (s)		20.8			16.7			23.1			71.8	
Approach LOS		C			B			C			E	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1100	165	0	0	0	295	280	420	125	370	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0			4.0	
Lane Util. Factor		0.95					1.00	1.00			1.00	
Frpb, ped/bikes		0.98					1.00	0.93			0.97	
Flpb, ped/bikes		0.99					0.96	1.00			1.00	
Frt		0.98					1.00	0.91			0.98	
Flt Protected		1.00					0.95	1.00			0.99	
Satd. Flow (prot)		3306					1644	1530			1714	
Flt Permitted		1.00					0.39	1.00			0.50	
Satd. Flow (perm)		3306					679	1530			862	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	1100	165	0	0	0	295	280	420	125	370	110
RTOR Reduction (vph)	0	11	0	0	0	0	0	5	0	0	8	0
Lane Group Flow (vph)	0	1329	0	0	0	0	295	695	0	0	597	0
Confl. Peds. (#/hr)	50		50				50		50	50		50
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Perm						Perm			Perm		
Protected Phases		2						4			4	
Permitted Phases	2						4			4		
Actuated Green, G (s)		36.0					56.0	56.0			56.0	
Effective Green, g (s)		36.0					56.0	56.0			56.0	
Actuated g/C Ratio		0.36					0.56	0.56			0.56	
Clearance Time (s)		4.0					4.0	4.0			4.0	
Vehicle Extension (s)		3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)		1190					380	857			483	
v/s Ratio Prot								0.45				
v/s Ratio Perm		0.40					0.43				c0.69	
v/c Ratio		1.12					0.78	0.81			1.24	
Uniform Delay, d1		32.0					17.1	17.7			22.0	
Progression Factor		1.27					1.00	1.00			1.24	
Incremental Delay, d2		60.0					9.6	5.9			120.0	
Delay (s)		100.7					26.7	23.6			147.2	
Level of Service		F					C	C			F	
Approach Delay (s)		100.7			0.0			24.5			147.2	
Approach LOS		F			A			C			F	

Intersection Summary			
HCM Average Control Delay	84.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	125.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	1370	35	0	0	0	0	60	35	115	100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.91						1.00			1.00	
Frpb, ped/bikes		1.00						0.97			1.00	
Flpb, ped/bikes		1.00						1.00			0.99	
Frt		1.00						0.95			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		4904						1689			1772	
Flt Permitted		1.00						1.00			0.76	
Satd. Flow (perm)		4904						1689			1391	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	1370	35	0	0	0	0	60	35	115	100	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	26	0	0	0	0
Lane Group Flow (vph)	0	1498	0	0	0	0	0	69	0	0	215	0
Confl. Peds. (#/hr)	11		41						41	11		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm									Perm		
Protected Phases		2						4			8	
Permitted Phases	2									8		
Actuated Green, G (s)		71.7						20.3			20.3	
Effective Green, g (s)		71.7						20.3			20.3	
Actuated g/C Ratio		0.72						0.20			0.20	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		3516						343			282	
v/s Ratio Prot								0.04				
v/s Ratio Perm		0.31									c0.15	
v/c Ratio		0.43						0.20			0.76	
Uniform Delay, d1		5.8						33.1			37.6	
Progression Factor		0.56						1.00			1.00	
Incremental Delay, d2		0.0						0.3			11.5	
Delay (s)		3.3						33.4			49.1	
Level of Service		A						C			D	
Approach Delay (s)		3.3			0.0			33.4			49.1	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1040	525	0	0	0	0	0	0	255	780	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0								4.0	4.0	
Lane Util. Factor		0.91								1.00	0.95	
Frpb, ped/bikes		0.97								1.00	1.00	
Flpb, ped/bikes		1.00								1.00	1.00	
Frt		0.95								1.00	1.00	
Flt Protected		1.00								0.95	1.00	
Satd. Flow (prot)		4592								1728	3455	
Flt Permitted		1.00								0.95	1.00	
Satd. Flow (perm)		4592								1728	3455	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1040	525	0	0	0	0	0	0	255	780	0
RTOR Reduction (vph)	0	43	0	0	0	0	0	0	0	42	0	0
Lane Group Flow (vph)	0	1522	0	0	0	0	0	0	0	213	780	0
Confl. Peds. (#/hr)			40							40		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Turn Type										Split		
Protected Phases		2								4	4	
Permitted Phases												
Actuated Green, G (s)		51.0								41.0	41.0	
Effective Green, g (s)		51.0								41.0	41.0	
Actuated g/C Ratio		0.51								0.41	0.41	
Clearance Time (s)		4.0								4.0	4.0	
Lane Grp Cap (vph)		2342								708	1417	
v/s Ratio Prot		c0.33								0.12	c0.23	
v/s Ratio Perm												
v/c Ratio		0.65								0.30	0.55	
Uniform Delay, d1		18.0								19.8	22.5	
Progression Factor		0.80								1.00	1.00	
Incremental Delay, d2		1.3								1.1	1.5	
Delay (s)		15.7								20.9	24.0	
Level of Service		B								C	C	
Approach Delay (s)		15.7			0.0			0.0			23.3	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	245	1100	0	0	0	0	0	1095	115	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.95				
Frpb, ped/bikes		1.00						0.99				
Flpb, ped/bikes		1.00						1.00				
Frt		1.00						0.99				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		4969						3346				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		4969						3346				
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	1100	0	0	0	0	0	1095	115	0	0	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	1310	0	0	0	0	0	1202	0	0	0	0
Confl. Peds. (#/hr)	40								40			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Split											
Protected Phases	2	2						4				
Permitted Phases												
Actuated Green, G (s)		40.0						52.0				
Effective Green, g (s)		40.0						52.0				
Actuated g/C Ratio		0.40						0.52				
Clearance Time (s)		4.0						4.0				
Lane Grp Cap (vph)		1988						1740				
v/s Ratio Prot		c0.26						c0.36				
v/s Ratio Perm												
v/c Ratio		0.66						0.69				
Uniform Delay, d1		24.4						18.0				
Progression Factor		0.65						1.00				
Incremental Delay, d2		1.4						2.3				
Delay (s)		17.4						20.2				
Level of Service		B						C				
Approach Delay (s)		17.4			0.0			20.2			0.0	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1090	185	5	1010	255	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1765			1800	1709	
Flt Permitted	1.00			0.72	0.95	
Satd. Flow (perm)	1765			1295	1709	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1090	185	5	1010	255	10
RTOR Reduction (vph)	6	0	0	0	1	0
Lane Group Flow (vph)	1269	0	0	1015	264	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	66.0			66.0	26.0	
Effective Green, g (s)	66.0			66.0	26.0	
Actuated g/C Ratio	0.66			0.66	0.26	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1165			855	444	
v/s Ratio Prot	0.72				c0.15	
v/s Ratio Perm				c0.78		
v/c Ratio	1.09			1.19	0.59	
Uniform Delay, d1	17.0			17.0	32.4	
Progression Factor	0.12			1.00	1.00	
Incremental Delay, d2	41.8			89.8	2.1	
Delay (s)	43.7			106.8	34.5	
Level of Service	D			F	C	
Approach Delay (s)	43.7			106.8	34.5	
Approach LOS	D			F	C	

Intersection Summary			
HCM Average Control Delay	67.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

47: Commercial St & Bloedel Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	305	15	115	65	5	5	340	120	20	325	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1788		1711	1782		1711	1730		1711	1778	
Flt Permitted	0.95	1.00		0.95	1.00		0.37	1.00		0.23	1.00	
Satd. Flow (perm)	1711	1788		1711	1782		664	1730		411	1778	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	321	16	121	68	5	5	358	126	21	342	32
RTOR Reduction (vph)	0	3	0	0	3	0	0	21	0	0	5	0
Lane Group Flow (vph)	74	334	0	121	70	0	5	463	0	21	369	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.8	15.4		5.1	17.7		18.9	18.2		18.9	18.2	
Effective Green, g (s)	2.8	15.4		5.1	17.7		18.9	18.2		18.9	18.2	
Actuated g/C Ratio	0.05	0.28		0.09	0.32		0.34	0.33		0.34	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	86	497		158	569		240	568		157	584	
v/s Ratio Prot	0.04	c0.19		c0.07	0.04		0.00	c0.27		c0.00	0.21	
v/s Ratio Perm							0.01			0.04		
v/c Ratio	0.86	0.67		0.77	0.12		0.02	0.82		0.13	0.63	
Uniform Delay, d1	26.1	17.8		24.6	13.3		12.4	17.1		13.0	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	53.9	3.6		19.6	0.1		0.0	8.8		0.4	2.2	
Delay (s)	80.0	21.3		44.2	13.4		12.4	25.9		13.4	18.0	
Level of Service	F	C		D	B		B	C		B	B	
Approach Delay (s)		31.9			32.6			25.7			17.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

49: Bloedel Ave & Cornwall Ave

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	585	130	340	955	390	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3319	1531	1711	1801	1682	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3319	1531	1711	1801	1682	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	616	137	358	1005	411	389
RTOR Reduction (vph)	0	81	0	0	38	0
Lane Group Flow (vph)	616	56	358	1005	762	0
Turn Type		pm+ov	Prot			
Protected Phases	7	5	5	2		
Permitted Phases	4	7			6	
Actuated Green, G (s)	18.0	37.0	19.0	64.0	41.0	
Effective Green, g (s)	18.0	37.0	19.0	64.0	41.0	
Actuated g/C Ratio	0.20	0.41	0.21	0.71	0.46	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	664	697	361	1281	766	
v/s Ratio Prot	c0.19	0.02	c0.21	0.56		
v/s Ratio Perm		0.02			c0.45	
v/c Ratio	0.93	0.08	0.99	0.78	0.99	
Uniform Delay, d1	35.4	16.1	35.4	8.5	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.1	0.0	45.0	3.2	31.0	
Delay (s)	54.5	16.2	80.4	11.7	55.4	
Level of Service	D	B	F	B	E	
Approach Delay (s)	47.5			29.8	55.4	
Approach LOS	D			C	E	

Intersection Summary			
HCM Average Control Delay	41.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

75: Roeder Ave & Central Ped Crossing

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Volume (vph)	0	1275	1265	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1801	1801			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1801	1801			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1275	1265	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1275	1265	0	0	0
Turn Type						
Protected Phases		4	8			
Permitted Phases						
Actuated Green, G (s)		66.0	66.0			
Effective Green, g (s)		66.0	66.0			
Actuated g/C Ratio		0.66	0.66			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1189	1189			
v/s Ratio Prot		c0.71	0.70			
v/s Ratio Perm						
v/c Ratio		1.07	1.06			
Uniform Delay, d1		17.0	17.0			
Progression Factor		0.88	0.66			
Incremental Delay, d2		43.2	30.9			
Delay (s)		58.1	42.1			
Level of Service		E	D			
Approach Delay (s)		58.1	42.1		0.0	
Approach LOS		E	D		A	

Intersection Summary			
HCM Average Control Delay	50.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	34.0
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

89: Bloedel Ave & Log Pond

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	65	225	485	20	375
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	340	65	225	485	20	375
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	485			365		
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			405		1308	372
vC1, stage 1 conf vol					372	
vC2, stage 2 conf vol					935	
vCu, unblocked vol			261		1282	225
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			80		93	48
cM capacity (veh/h)			1152		289	720

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	405	225	485	395
Volume Left	0	225	0	20
Volume Right	65	0	0	375
cSH	1700	1152	1700	670
Volume to Capacity	0.24	0.20	0.29	0.59
Queue Length 95th (ft)	0	18	0	97
Control Delay (s)	0.0	8.9	0.0	17.8
Lane LOS		A		C
Approach Delay (s)	0.0	2.8		17.8
Approach LOS				C

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	845	250	20	535	35	440	320	95	370	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1818	1531		1795		1711	1801	1531	1745	1711	
Flt Permitted		1.00	1.00		0.89		0.53	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1815	1531		1601		963	1801	1531	425	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	4	760	225	18	482	32	396	288	86	333	99	36
RTOR Reduction (vph)	0	0	106	0	2	0	0	0	70	0	13	0
Lane Group Flow (vph)	0	764	119	0	530	0	396	288	16	333	122	0
Confl. Peds. (#/hr)	10					10						10
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	2%	2%	2%	0%	2%	0%
Turn Type	Perm		Perm	Perm			pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		52.9	52.9		52.9		36.1	18.3	18.3	34.1	17.3	
Effective Green, g (s)		52.9	52.9		52.9		36.1	18.3	18.3	34.1	17.3	
Actuated g/C Ratio		0.53	0.53		0.53		0.36	0.18	0.18	0.34	0.17	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		960	810		847		481	330	280	367	296	
v/s Ratio Prot							0.15	c0.16		c0.15	0.07	
v/s Ratio Perm		c0.42	0.08		0.33		0.15		0.01	0.16		
v/c Ratio		0.80	0.15		0.63		0.82	0.87	0.06	0.91	0.41	
Uniform Delay, d1		19.2	12.0		16.6		27.0	39.7	33.7	27.6	36.8	
Progression Factor		0.65	1.10		1.36		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.6	0.1		3.2		10.9	21.5	0.1	25.2	0.9	
Delay (s)		15.1	13.4		25.8		37.9	61.2	33.8	52.8	37.7	
Level of Service		B	B		C		D	E	C	D	D	
Approach Delay (s)		14.7			25.8			46.2			48.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00			0.97	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			0.99	
Frt		0.98			0.98		1.00	0.96			0.96	
Flt Protected		0.99			1.00		0.95	1.00			0.97	
Satd. Flow (prot)		3365			1752		1711	1728			1613	
Flt Permitted		0.84			0.97		0.55	1.00			0.57	
Satd. Flow (perm)		2838			1704		990	1728			937	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	122	900	135	9	328	50	90	184	68	166	50	104
RTOR Reduction (vph)	0	9	0	0	5	0	0	15	0	0	19	0
Lane Group Flow (vph)	0	1148	0	0	382	0	90	237	0	0	301	0
Confl. Peds. (#/hr)	20					20				20		20
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			custom		
Protected Phases		2			2			3				
Permitted Phases	2			2			3			7	7	
Actuated Green, G (s)		58.3			58.3		33.7	33.7			33.7	
Effective Green, g (s)		58.3			58.3		33.7	33.7			33.7	
Actuated g/C Ratio		0.58			0.58		0.34	0.34			0.34	
Clearance Time (s)		4.0			4.0		4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1655			993		334	582			316	
v/s Ratio Prot								0.14				
v/s Ratio Perm		c0.40			0.22		0.09				c0.32	
v/c Ratio		0.69			0.39		0.27	0.41			0.95	
Uniform Delay, d1		14.6			11.2		24.2	25.5			32.4	
Progression Factor		0.95			1.39		1.00	1.00			1.00	
Incremental Delay, d2		1.5			0.3		0.4	0.5			37.8	
Delay (s)		15.3			15.9		24.6	25.9			70.1	
Level of Service		B			B		C	C			E	
Approach Delay (s)		15.3			15.9			25.6			70.1	
Approach LOS		B			B			C			E	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

23: E Chestnut St & Cornwall Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1100	165	0	0	0	295	280	70	125	250	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0			4.0	
Lane Util. Factor		0.95					1.00	1.00			1.00	
Frpb, ped/bikes		0.98					1.00	0.98			0.96	
Flpb, ped/bikes		0.99					1.00	1.00			0.99	
Frt		0.98					1.00	0.97			0.97	
Flt Protected		1.00					0.95	1.00			0.99	
Satd. Flow (prot)		3306					1711	1708			1662	
Flt Permitted		1.00					0.95	1.00			0.74	
Satd. Flow (perm)		3306					1711	1708			1238	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	68	990	148	0	0	0	266	252	63	112	225	99
RTOR Reduction (vph)	0	11	0	0	0	0	0	9	0	0	10	0
Lane Group Flow (vph)	0	1195	0	0	0	0	266	306	0	0	426	0
Confl. Peds. (#/hr)	50		50				50		50	50		50
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Perm						Prot			Perm		
Protected Phases		2					8	3			7	
Permitted Phases	2									7		
Actuated Green, G (s)		38.0					15.0	54.0			35.0	
Effective Green, g (s)		38.0					15.0	54.0			35.0	
Actuated g/C Ratio		0.38					0.15	0.54			0.35	
Clearance Time (s)		4.0					4.0	4.0			4.0	
Vehicle Extension (s)		3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)		1256					257	922			433	
v/s Ratio Prot							c0.16	0.18				
v/s Ratio Perm		0.36									c0.34	
v/c Ratio		0.95					1.04	0.33			0.98	
Uniform Delay, d1		30.1					42.5	12.9			32.2	
Progression Factor		0.84					0.89	0.49			0.99	
Incremental Delay, d2		13.2					64.2	0.2			32.9	
Delay (s)		38.6					101.9	6.5			65.0	
Level of Service		D					F	A			E	
Approach Delay (s)		38.6			0.0			50.1			65.0	
Approach LOS		D			A			D			E	

Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

38: E Chestnut St & Central Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1090	185	5	1010	255	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1765			1800	1709	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1765			1794	1709	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	981	166	4	909	230	9
RTOR Reduction (vph)	5	0	0	0	2	0
Lane Group Flow (vph)	1142	0	0	913	237	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	68.9			68.9	23.1	
Effective Green, g (s)	68.9			68.9	23.1	
Actuated g/C Ratio	0.69			0.69	0.23	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1216			1236	395	
v/s Ratio Prot	c0.65				c0.14	
v/s Ratio Perm				0.51		
v/c Ratio	0.94			0.74	0.60	
Uniform Delay, d1	13.7			9.8	34.3	
Progression Factor	0.12			0.88	1.00	
Incremental Delay, d2	6.8			2.8	2.6	
Delay (s)	8.3			11.5	36.9	
Level of Service	A			B	D	
Approach Delay (s)	8.3			11.5	36.9	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

47: Commercial St & Bloedel Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	305	15	115	65	5	50	250	120	20	200	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1788		1711	1780		1711	1713		1711	1766	
Flt Permitted	0.95	1.00		0.95	1.00		0.54	1.00		0.39	1.00	
Satd. Flow (perm)	1711	1788		1711	1780		967	1713		707	1766	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	47	289	14	109	62	5	47	237	114	19	189	28
RTOR Reduction (vph)	0	1	0	0	3	0	0	18	0	0	6	0
Lane Group Flow (vph)	47	302	0	109	64	0	47	333	0	19	211	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	3.5	17.9		7.5	21.9		22.0	20.0		20.4	19.2	
Effective Green, g (s)	3.5	17.9		7.5	21.9		22.0	20.0		20.4	19.2	
Actuated g/C Ratio	0.06	0.29		0.12	0.35		0.35	0.32		0.33	0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	96	511		205	623		364	547		250	542	
v/s Ratio Prot	0.03	c0.17		c0.06	c0.04		c0.00	c0.19		0.00	0.12	
v/s Ratio Perm							0.04			0.02		
v/c Ratio	0.49	0.59		0.53	0.10		0.13	0.61		0.08	0.39	
Uniform Delay, d1	28.7	19.2		25.9	13.7		13.6	18.0		14.6	17.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	1.8		2.6	0.1		0.2	1.9		0.1	0.5	
Delay (s)	32.6	21.0		28.5	13.8		13.8	19.9		14.8	17.6	
Level of Service	C	C		C	B		B	B		B	B	
Approach Delay (s)		22.6			22.9			19.2			17.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

49: Bloedel Ave & Cornwall Ave

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	585	130	340	155	90	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.89	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3319	1531	1711	1801	1605	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3319	1531	1711	1801	1605	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	554	123	322	147	85	351
RTOR Reduction (vph)	0	96	0	0	129	0
Lane Group Flow (vph)	554	27	322	147	307	0
Turn Type		custom	Prot			
Protected Phases			5	2		
Permitted Phases	4	4			6	
Actuated Green, G (s)	21.6	21.6	23.9	70.4	42.5	
Effective Green, g (s)	21.6	21.6	23.9	70.4	42.5	
Actuated g/C Ratio	0.22	0.22	0.24	0.70	0.42	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	717	331	409	1268	682	
v/s Ratio Prot			c0.19	0.08		
v/s Ratio Perm	c0.17	0.02			c0.19	
v/c Ratio	0.77	0.08	0.79	0.12	0.45	
Uniform Delay, d1	36.9	31.3	35.7	4.8	20.4	
Progression Factor	1.00	1.00	1.00	1.00	0.62	
Incremental Delay, d2	5.2	0.1	9.6	0.2	0.5	
Delay (s)	42.1	31.4	45.3	5.0	13.2	
Level of Service	D	C	D	A	B	
Approach Delay (s)	40.1			32.7	13.2	
Approach LOS	D			C	B	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1275	1265	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1801	1801			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1801	1801			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	0	1148	1138	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1148	1138	0	0	0
Turn Type						
Protected Phases		4	8			
Permitted Phases						
Actuated Green, G (s)		68.9	68.9			
Effective Green, g (s)		68.9	68.9			
Actuated g/C Ratio		0.69	0.69			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1241	1241			
v/s Ratio Prot		c0.64	0.63			
v/s Ratio Perm						
v/c Ratio		0.93	0.92			
Uniform Delay, d1		13.3	13.1			
Progression Factor		0.85	0.76			
Incremental Delay, d2		10.3	8.9			
Delay (s)		21.6	18.9			
Level of Service		C	B			
Approach Delay (s)		21.6	18.9		0.0	
Approach LOS		C	B		A	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	31.1
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	15	225	485	20	375
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	306	14	202	436	18	338
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	485			365		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			320		1154	313
vC1, stage 1 conf vol					313	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			255		1135	248
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			84		95	55
cM capacity (veh/h)			1242		334	750

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	320	202	436	356
Volume Left	0	202	0	18
Volume Right	14	0	0	338
cSH	1700	1242	1700	705
Volume to Capacity	0.19	0.16	0.26	0.50
Queue Length 95th (ft)	0	15	0	72
Control Delay (s)	0.0	8.5	0.0	15.2
Lane LOS		A		C
Approach Delay (s)	0.0	2.7		15.2
Approach LOS				C

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	845	250	20	535	35	440	320	95	370	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected		1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1818	1531		1795		1711	1801	1531	1745	1711	
Flt Permitted		1.00	1.00		0.89		0.53	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1815	1531		1601		963	1801	1531	425	1711	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	4	760	225	18	482	32	396	288	86	333	99	36
RTOR Reduction (vph)	0	0	106	0	2	0	0	0	70	0	13	0
Lane Group Flow (vph)	0	764	119	0	530	0	396	288	16	333	122	0
Confl. Peds. (#/hr)	10					10						10
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	2%	2%	2%	0%	2%	0%
Turn Type	Perm		Perm	Perm			pm+pt		Perm	pm+pt		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		52.9	52.9		52.9		36.1	18.3	18.3	34.1	17.3	
Effective Green, g (s)		52.9	52.9		52.9		36.1	18.3	18.3	34.1	17.3	
Actuated g/C Ratio		0.53	0.53		0.53		0.36	0.18	0.18	0.34	0.17	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		960	810		847		481	330	280	367	296	
v/s Ratio Prot							0.15	c0.16		c0.15	0.07	
v/s Ratio Perm		c0.42	0.08		0.33		0.15		0.01	0.16		
v/c Ratio		0.80	0.15		0.63		0.82	0.87	0.06	0.91	0.41	
Uniform Delay, d1		19.2	12.0		16.6		27.0	39.7	33.7	27.6	36.8	
Progression Factor		0.33	0.36		1.04		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.6	0.1		3.2		10.9	21.5	0.1	25.2	0.9	
Delay (s)		8.9	4.5		20.5		37.9	61.2	33.8	52.8	37.7	
Level of Service		A	A		C		D	E	C	D	D	
Approach Delay (s)		7.9			20.5			46.2			48.5	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	1000	150	10	365	55	100	205	75	185	55	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		0.95			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.99		1.00	1.00			0.97	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			0.99	
Frt		0.98			0.98		1.00	0.96			0.96	
Flt Protected		0.99			1.00		0.95	1.00			0.97	
Satd. Flow (prot)		3365			1752		1711	1728			1613	
Flt Permitted		0.84			0.97		0.55	1.00			0.57	
Satd. Flow (perm)		2837			1704		991	1728			939	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	122	900	135	9	328	50	90	184	68	166	50	104
RTOR Reduction (vph)	0	9	0	0	5	0	0	15	0	0	19	0
Lane Group Flow (vph)	0	1148	0	0	382	0	90	237	0	0	301	0
Confl. Peds. (#/hr)	20					20				20		20
Heavy Vehicles (%)	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			D.Pm		
Protected Phases		2			2			8				
Permitted Phases	2			2			8			8	8	
Actuated Green, G (s)		58.1			58.1		33.9	33.9			33.9	
Effective Green, g (s)		58.1			58.1		33.9	33.9			33.9	
Actuated g/C Ratio		0.58			0.58		0.34	0.34			0.34	
Clearance Time (s)		4.0			4.0		4.0	4.0			4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1648			990		336	586			318	
v/s Ratio Prot								0.14				
v/s Ratio Perm		c0.40			0.22		0.09				c0.32	
v/c Ratio		0.70			0.39		0.27	0.41			0.95	
Uniform Delay, d1		14.7			11.3		24.0	25.3			32.2	
Progression Factor		0.87			1.11		1.00	1.00			1.00	
Incremental Delay, d2		1.5			0.8		0.4	0.5			36.1	
Delay (s)		14.3			13.3		24.5	25.8			68.2	
Level of Service		B			B		C	C			E	
Approach Delay (s)		14.3			13.3			25.4			68.2	
Approach LOS		B			B			C			E	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

23: E Chestnut St & Cornwall Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1100	165	0	0	0	295	280	420	125	370	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0			4.0	
Lane Util. Factor		0.95					1.00	1.00			1.00	
Frpb, ped/bikes		0.98					1.00	0.93			0.97	
Flpb, ped/bikes		0.99					0.96	1.00			1.00	
Frt		0.98					1.00	0.91			0.98	
Flt Protected		1.00					0.95	1.00			0.99	
Satd. Flow (prot)		3306					1634	1530			1714	
Flt Permitted		1.00					0.42	1.00			0.57	
Satd. Flow (perm)		3306					715	1530			990	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	68	990	148	0	0	0	266	252	378	112	333	99
RTOR Reduction (vph)	0	11	0	0	0	0	0	8	0	0	8	0
Lane Group Flow (vph)	0	1195	0	0	0	0	266	622	0	0	536	0
Confl. Peds. (#/hr)	50		50				50		50	50		50
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	0%	0%	0%
Turn Type	Perm						Perm			Perm		
Protected Phases		2						4			4	
Permitted Phases	2						4			4		
Actuated Green, G (s)		37.2					54.8	54.8			54.8	
Effective Green, g (s)		37.2					54.8	54.8			54.8	
Actuated g/C Ratio		0.37					0.55	0.55			0.55	
Clearance Time (s)		4.0					4.0	4.0			4.0	
Vehicle Extension (s)		3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)		1230					392	838			543	
v/s Ratio Prot								0.41				
v/s Ratio Perm		0.36					0.37				c0.54	
v/c Ratio		0.97					0.68	0.74			0.99	
Uniform Delay, d1		30.9					16.3	17.2			22.2	
Progression Factor		1.19					1.00	1.00			1.24	
Incremental Delay, d2		16.5					4.6	3.6			31.8	
Delay (s)		53.3					20.9	20.8			59.5	
Level of Service		D					C	C			E	
Approach Delay (s)		53.3			0.0			20.8			59.5	
Approach LOS		D			A			C			E	

Intersection Summary			
HCM Average Control Delay	43.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

38: E Chestnut St & Central Avenue

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1090	185	5	1010	255	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.99	
Flt Protected	1.00			1.00	0.95	
Satd. Flow (prot)	1765			1800	1709	
Flt Permitted	1.00			1.00	0.95	
Satd. Flow (perm)	1765			1794	1709	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	981	166	4	909	230	9
RTOR Reduction (vph)	5	0	0	0	2	0
Lane Group Flow (vph)	1142	0	0	913	237	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	68.9			68.9	23.1	
Effective Green, g (s)	68.9			68.9	23.1	
Actuated g/C Ratio	0.69			0.69	0.23	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1216			1236	395	
v/s Ratio Prot	c0.65				c0.14	
v/s Ratio Perm				0.51		
v/c Ratio	0.94			0.74	0.60	
Uniform Delay, d1	13.7			9.8	34.3	
Progression Factor	0.12			0.89	1.00	
Incremental Delay, d2	6.8			2.8	2.6	
Delay (s)	8.3			11.6	36.9	
Level of Service	A			B	D	
Approach Delay (s)	8.3			11.6	36.9	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

47: Commercial St & Bloedel Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	305	15	115	65	5	5	340	120	20	325	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	1788		1711	1780		1711	1730		1711	1778	
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.31	1.00	
Satd. Flow (perm)	1711	1788		1711	1780		793	1730		567	1778	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	66	289	14	109	62	5	5	322	114	19	308	28
RTOR Reduction (vph)	0	3	0	0	4	0	0	20	0	0	5	0
Lane Group Flow (vph)	66	300	0	109	63	0	5	416	0	19	331	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	2.7	13.4		3.8	14.5		18.4	17.8		18.4	17.8	
Effective Green, g (s)	2.7	13.4		3.8	14.5		18.4	17.8		18.4	17.8	
Actuated g/C Ratio	0.05	0.26		0.07	0.28		0.36	0.34		0.36	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	90	464		126	500		293	597		215	613	
v/s Ratio Prot	0.04	c0.17		c0.06	0.04		0.00	c0.24		c0.00	0.19	
v/s Ratio Perm							0.01			0.03		
v/c Ratio	0.73	0.65		0.87	0.13		0.02	0.70		0.09	0.54	
Uniform Delay, d1	24.1	17.0		23.6	13.8		10.8	14.6		11.3	13.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.3	3.1		42.0	0.1		0.0	3.5		0.2	0.9	
Delay (s)	50.4	20.1		65.7	13.9		10.9	18.1		11.4	14.5	
Level of Service	D	C		E	B		B	B		B	B	
Approach Delay (s)		25.5			46.0			18.0			14.4	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

49: Bloedel Ave & Cornwall Ave

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	585	130	340	955	390	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3319	1531	1711	1801	1682	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3319	1531	1711	1801	1682	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	554	123	322	905	369	351
RTOR Reduction (vph)	0	72	0	0	39	0
Lane Group Flow (vph)	554	51	322	905	681	0
Turn Type		pm+ov	Prot			
Protected Phases	7	5	5	2		
Permitted Phases	4	7			6	
Actuated Green, G (s)	17.1	35.2	18.1	59.1	37.0	
Effective Green, g (s)	17.1	35.2	18.1	59.1	37.0	
Actuated g/C Ratio	0.20	0.42	0.21	0.70	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	674	713	368	1264	739	
v/s Ratio Prot	c0.17	0.02	c0.19	0.50		
v/s Ratio Perm		0.02			c0.40	
v/c Ratio	0.82	0.07	0.88	0.72	0.92	
Uniform Delay, d1	32.1	14.7	32.0	7.5	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.0	0.0	20.0	2.0	16.8	
Delay (s)	40.1	14.7	52.0	9.5	39.1	
Level of Service	D	B	D	A	D	
Approach Delay (s)	35.5			20.6	39.1	
Approach LOS	D			C	D	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1275	1265	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1801	1801			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1801	1801			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	90%	90%	90%	90%	90%	90%
Adj. Flow (vph)	0	1148	1138	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1148	1138	0	0	0
Turn Type						
Protected Phases		4	8			
Permitted Phases						
Actuated Green, G (s)		68.9	68.9			
Effective Green, g (s)		68.9	68.9			
Actuated g/C Ratio		0.69	0.69			
Clearance Time (s)		4.0	4.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1241	1241			
v/s Ratio Prot		c0.64	0.63			
v/s Ratio Perm						
v/c Ratio		0.93	0.92			
Uniform Delay, d1		13.3	13.1			
Progression Factor		0.86	0.82			
Incremental Delay, d2		8.1	8.9			
Delay (s)		19.6	19.7			
Level of Service		B	B			
Approach Delay (s)		19.6	19.7		0.0	
Approach LOS		B	B		A	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	31.1
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	340	65	225	485	20	375
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	306	58	202	436	18	338
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (ft)	485			365		
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			364		1177	335
vC1, stage 1 conf vol					335	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			266		1149	234
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		95	54
cM capacity (veh/h)			1194		330	741

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	364	202	436	356
Volume Left	0	202	0	18
Volume Right	58	0	0	338
cSH	1700	1194	1700	697
Volume to Capacity	0.21	0.17	0.26	0.51
Queue Length 95th (ft)	0	15	0	73
Control Delay (s)	0.0	8.6	0.0	15.4
Lane LOS		A		C
Approach Delay (s)	0.0	2.7		15.4
Approach LOS				C

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix C-2: Project Land Use and Trip Generation with Mode Shift

Mode Split and Occupancy									
Mode	Census	Comp Plan 2022	Average	Office/ Institutional	Light Ind	Residential	Retail	Restaurant	Marina
Auto	84%	75%	70%	65%	75%	65%	65%	70%	80%
Transit	4%	6%	13%	15%	10%	15%	15%	10%	10%
Walk/Bike/ Other	12%	19%	18%	20%	15%	20%	20%	20%	10%
AVO	1.08		1.30	1.1	1.3	1.2	1.2	1.52	1.5
			68%						
			13%						
			19%						

Calculation of Daily Person Trip Rates			
Land Use	Vehicle	AVO	Person
Office	11.01	1.10	12.11
Institutional	8.11	1.10	8.92
Light Industri	6.97	1.30	8.36
Low-Rise	6.72	1.20	8.06
Mid-Rise	6.72	1.20	8.06
High-Rise	6.72	1.20	8.06
Retail	42.94	1.20	51.53
Restaurant	127.15	1.52	193.27
Boat Launch	2.96	1.5	4.44

Percent of Daily Trips During Peak Hours		
Land Use	PM	AM
Office	14%	14%
Institutiona	13%	15%
Light Indus	14%	13%
Low-Rise	9%	8%
Mid-Rise	9%	8%
High-Rise	9%	8%
Retail	9%	2%
Restaurant	9%	9%
Marina	6%	3%

Note: Based on ratio of ITE daily trip rate to peak hour trip rate.

ITE Vehicle Trip Rates		
Land Use	PM	AM
Office	1.49	1.55
R&D	1.08	1.24
Light Industrial	0.98	0.92
Low-Rise	0.62	0.51
Mid-Rise	0.62	0.51
High-Rise	0.62	0.51
Retail	3.75	1.03
Restaurant	10.92	11.52
Marina	0.19	0.08

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode			
				Auto	Transit	Walk/ Bike/Other	Total	Auto	Transit	Walk/ Bike/Other	Total
	Office	500,000	sf	3,936	908	1,211	6,055	551	127	170	848
	Institutional	100,000	sf	580	134	178	892	75	17	24	116
	Light Industrial	550,000	sf	3,449	460	689	4,598	483	64	97	644
	Low-Rise	167	du	875	202	269	1,346	79	18	24	121
	Mid-Rise	208	du	1,089	251	336	1,676	98	23	30	151
Marina Trade	High-Rise	0	du	0	0	0	0	0	0	0	0
	Retail	70,000	sf	2,345	541	721	3,607	211	49	65	325
	Restaurant	20,000	sf	2,706	387	772	3,865	244	35	69	348
	Boat Launch	460	berths	1,634	204	204	2,042	98	12	13	123
	Existing Area Trips	*353*	*emp*	*1,480*	*0*	*0*	*1,480*	*148*	*0*	*0*	*148*
	Internal Trips			*2,417*	*504*	*675*	*3,596*	*251*	*52*	*71*	*374*
	Net New Trips Subtotal			***12,717***	***2,583***	***3,705***	***19,005***	***1,440***	***293***	***421***	***2,154***
	Office	357,714	sf	2,816	650	866	4,332	394	91	121	606
	Institutional	323,646	sf	1,877	433	577	2,887	244	56	75	375
	Light Industrial	0	sf	0	0	0	0	0	0	0	0
	Low-Rise	0	du	0	0	0	0	0	0	0	0
	Mid-Rise	180	du	943	218	290	1,451	85	20	26	131
	High-Rise	260	du	1,362	314	420	2,096	123	28	38	189
	Retail	44,005	sf	1,474	340	454	2,268	133	31	40	204
	Restaurant	5,678	sf	768	110	219	1,097	69	10	20	99
	Existing Area Trips	*230*	*emp*	*970*	*0*	*0*	*970*	*97*	*0*	*0*	*97*
	Internal Trips			*1,344*	*337*	*436*	*2,117*	*143*	*36*	*46*	*225*
	Net New Trips Subtotal			***6,926***	***1,728***	***2,390***	***11,044***	***808***	***200***	***274***	***1,282***
	Office	79,821	sf	629	145	193	967	88	20	27	135
	Institutional	72,219	sf	419	97	128	644	55	13	16	84
	Light Industrial	0	sf	0	0	0	0	0	0	0	0
	Low-Rise	0	du	0	0	0	0	0	0	0	0
Downtown Waterfront	Mid-Rise	40	du	209	48	65	322	19	4	6	29
	High-Rise	58	du	304	70	93	467	27	6	9	42
	Retail	9,819	sf	329	76	101	506	30	7	9	46
	Restaurant	1,267	sf	172	25	48	245	15	2	5	22
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*300*	*75*	*97*	*472*	*32*	*8*	*10*	*50*
	Net New Trips Subtotal			***1,762***	***386***	***531***	***2,679***	***202***	***44***	***62***	***308***
	Office	161,910	sf	1,275	294	392	1,961	179	41	55	275
	Institutional	146,490	sf	850	196	261	1,307	111	26	33	170
	Light Industrial	0	sf	0	0	0	0	0	0	0	0
	Low-Rise	0	du	0	0	0	0	0	0	0	0
	Mid-Rise	81	du	424	98	131	653	38	9	12	59
	High-Rise	118	du	618	143	190	951	56	13	17	86
	Retail	19,918	sf	667	154	205	1,026	60	14	18	92
	Restaurant	2,570	sf	348	50	99	497	32	5	8	45
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*608*	*153*	*197*	*958*	*65*	*16*	*21*	*102*
	Net New Trips Subtotal			***3,574***	***782***	***1,081***	***5,437***	***411***	***92***	***122***	***625***

TAZ / Area	Land Use	PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
		In	Out	Total	In	Out	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total
	Office	85	416	501	127	618	745	551	127	170	848	441	60	501	682	93	775
	Institutional	10	58	68	16	92	108	87	20	27	134	66	13	79	103	21	124
	Light Industrial	45	327	372	65	474	539	449	60	89	598	304	41	345	445	61	506
	Low-Rise	43	23	66	68	36	104	70	16	22	108	12	46	58	17	68	85
	Mid-Rise	53	29	82	84	45	129	87	20	27	134	15	58	73	21	85	106
Marina Trade	High-Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	84	92	176	126	137	263	47	11	14	72	24	15	39	44	28	72
	Restaurant	98	63	161	133	85	218	244	35	69	348	84	77	161	120	110	230
	Boat Launch	39	26	65	52	35	87	49	6	6	61	11	22	33	12	25	37
	Existing Area Trips	*31*	*117*	*148*	*31*	*117*	*148*	*155*	*0*	*0*	*0*	*129*	*26*	*155*	*129*	*26*	*155*
	Internal Trips	*105*	*104*	*209*	*85*	*84*	*169*	*183*	*38*	*52*	*273*	*78*	*77*	*155*	*59*	*58*	*117*
	Net New Trips Subtotal	***321***	***813***	***1,134***	***555***	***1,321***	***1,876***	***1,246***	***257***	***372***	***2,030***	***750***	***229***	***979***	***1,256***	***407***	***1,663***
	Office	61	297	358	91	442	533	394	91	121	606	315	43	358	488	66	554
	Institutional	33	189	222	53	297	350	281	65	87	433	212	43	255	333	68	401
	Light Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	46	25	71	73	39	112	75	17	24	116	13	50	63	18	74	92
	High-Rise	67	36	103	105	56	161	109	25	34	168	18	73	91	27	106	133
	Retail	53	58	111	79	86	165	29	7	9	45	15	9	24	27	18	45
	Restaurant	27	18	45	38	24	62	69	10	20	99	23	22	45	34	31	65
	Existing Area Trips	*20*	*77*	*97*	*20*	*77*	*97*	*101*	*0*	*0*	*0*	*84*	*17*	*101*	*84*	*17*	*101*
	Internal Trips	*64*	*64*	*128*	*54*	*53*	*107*	*110*	*28*	*36*	*174*	*50*	*50*	*100*	*39*	*39*	*78*
	Net New Trips Subtotal	***203***	***482***	***685***	***365***	***814***	***1,179***	***746***	***187***	***259***	***1,293***	***462***	***173***	***635***	***804***	***307***	***1,111***
	Office	14	66	80	20	99	119	88	20	27	135	70	10	80	109	15	124
	Institutional	8	42	50	12	66	78	63	15	19	97	47	10	57	75	15	90
	Light Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Downtown Waterfront	Mid-Rise	10	6	16	16	9	25	17	4	5	26	3	11	14	4	16	20
	High-Rise	15	8	23	23	13	36	24	6	7	37	4	16	20	6	24	30
	Retail	12	13	25	18	19	37	7	2	1	10	4	2	6	6	4	10
	Restaurant	6	4	10	9	5	14	15	2	5	22	5	5	10	8	7	15
	Existing Area Trips	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips	*14*	*15*	*29*	*12*	*12*	*24*	*25*	*6*	*8*	*39*	*11*	*11*	*22*	*9*	*8*	*17*
	Net New Trips Subtotal	***51***	***124***	***175***	***86***	***199***	***285***	***189***	***43***	***56***	***288***	***122***	***43***	***165***	***199***	***73***	***272***
	Office	28	135	163	41	200	241	179	41	55	275	143	20	163	221	30	251
	Institutional	15	86	101	24	134	158	127	29	40	196	95	20	115	151	31	182
	Light Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mid-Rise	21	11	32	33	17	50	34	8	10	52	6	22	28	8	33	41
	High-Rise	31	16	47	47	26	73	49	11	16	76	8	33	41	12	48	60
	Retail	24	26	50	36	39	75	14	3	4	21	7	5	12	13	8	21
	Restaurant	13	8	21	17	11	28	32	5	8	45	11	10	21	16	14	30
	Existing Area Trips	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips	*29*	*29*	*58*	*24*	*24*	*48*	*50*	*13*	*16*	*79*	*23*	*23*	*46*	*18*	*17*	*35*
	Net New Trips Subtotal	***103***	***253***	***356***	***174***	***403***	***577***	***385***	***84***	***117***	***586***	***247***	***87***	***334***	***403***	***147***	***550***

TAZ / Area	Land Use	Size	Units	Daily Person Trips By Mode: Auto	Transit	Walk/ Bike/Other	Total	PM Peak Hour Person Trips By Mode: Auto	Transit	Walk/ Bike/Other	Total	PM Peak Hour Vehicle Trips Based on Person Trips: In	Out	Total	PM Peak Hour Vehicle Trips Based on ITE: In	Out	Total	AM Peak Hour Person Trips By Mode: Auto	Transit	Walk/ Bike/Other	Total	AM Peak Hour Vehicle Trips Based on Person Trips: In	Out	Total	AM Peak Hour Vehicle Trips Based on ITE: In	Out	Total
	Office	79,008	sf	622	144	191	957	87	20	27	134	13	66	79	20	98	118	87	20	27	134	70	9	79	107	15	122
	Institutional	27,645	sf	161	37	49	247	21	5	6	32	3	16	19	5	25	30	24	6	7	37	18	4	22	28	6	34
	Light Industrial	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	7	du	36	8	12	56	3	1	1	5	2	1	3	3	1	4	3	1	0	4	1	2	3	1	3	4
	Mid-Rise	44	du	231	53	71	355	21	5	6	32	12	6	18	18	9	27	18	4	6	28	3	12	15	4	18	22
5	High-Rise	22	du	115	27	35	177	10	2	4	16	5	3	8	9	5	14	9	2	3	14	2	6	8	2	9	11
	Retail	17,711	sf	593	137	183	913	53	12	17	82	21	23	44	32	34	66	12	3	3	18	6	4	10	11	7	18
	Restaurant	2,882	sf	390	56	111	557	35	5	10	50	14	9	23	19	12	31	35	5	10	50	12	11	23	17	16	33
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*312*	*75*	*101*	*488*	*31*	*8*	*10*	*49*	*14*	*13*	*27*	*11*	*11*	*22*	*22*	*5*	*7*	*34*	*10*	*9*	*19*	*8*	*7*	*15*
	Net New Trips Subtotal			***1,836***	***387***	***551***	***2,774***	***199***	***42***	***61***	***302***	***56***	***111***	***167***	***95***	***173***	***268***	***166***	***36***	***49***	***251***	***102***	***39***	***141***	***162***	***67***	***229***
	Office	69,843	sf	550	127	169	846	77	18	23	118	12	58	70	18	86	104	77	18	23	118	62	8	70	95	13	108
	Institutional	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Light Industrial	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	10	du	53	12	16	81	5	1	1	7	3	1	4	4	2	6	4	1	1	6	1	2	3	1	4	5
	Mid-Rise	42	du	220	51	68	339	20	5	6	31	11	6	17	17	9	26	18	4	5	27	3	12	15	4	17	21
Log Pond	High-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	20,112	sf	673	155	208	1,036	60	14	19	93	24	26	50	36	39	75	14	3	4	21	7	5	12	13	8	21
	Restaurant	3,455	sf	468	67	133	668	42	6	12	60	17	11	28	23	15	38	42	6	12	60	15	13	28	21	19	40
	Existing Area Trips	*20*	*emp*	*80*	*0*	*0*	*80*	*8*	*0*	*0*	*8*	*2*	*6*	*8*	*2*	*6*	*8*	*9*	*0*	*0*	*0*	*7*	*2*	*9*	*7*	*2*	*9*
	Internal Trips			*286*	*67*	*92*	*445*	*28*	*7*	*9*	*44*	*12*	*12*	*24*	*10*	*9*	*19*	*18*	*4*	*5*	*27*	*7*	*8*	*15*	*6*	*6*	*12*
	Net New Trips Subtotal			***1,598***	***345***	***502***	***2,445***	***168***	***37***	***52***	***257***	***53***	***84***	***137***	***86***	***136***	***222***	***128***	***28***	***40***	***205***	***74***	***30***	***104***	***121***	***53***	***174***
	Office	127,161	sf	1,001	231	308	1,540	140	32	44	216	22	105	127	32	157	189	140	32	44	216	112	15	127	173	24	197
	Institutional	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Light Industrial	10,436	sf	65	9	13	87	9	1	2	12	1	6	7	1	9	10	8	1	2	11	5	1	6	9	1	10
	Low-Rise	22	du	115	27	35	177	10	2	4	16	5	3	8	9	5	14	9	2	3	14	2	6	8	2	9	11
	Mid-Rise	57	du	298	69	92	459	27	6	8	41	15	8	23	23	12	35	24	6	7	37	4	16	20	6	23	29
7	High-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	29,881	sf	1,001	231	308	1,540	90	21	28	139	36	39	75	54	58	112	20	5	6	31	10	7	17	19	12	31
	Restaurant	5,321	sf	720	103	205	1,028	65	9	19	93	26	17	43	35	23	58	65	9	19	93	22	21	43	32	29	61
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*465*	*109*	*148*	*722*	*46*	*11*	*15*	*72*	*20*	*20*	*40*	*16*	*16*	*32*	*31*	*7*	*10*	*48*	*14*	*13*	*27*	*11*	*10*	*21*
	Net New Trips Subtotal			***2,735***	***561***	***813***	***4,109***	***295***	***60***	***90***	***445***	***85***	***158***	***243***	***138***	***248***	***386***	***235***	***48***	***71***	***354***	***141***	***53***	***194***	***230***	***88***	***318***
	Office	250,077	sf	1,968	454	606	3,028	276	64	84	424	43	208	251	63	310	373	276	64	84	424	221	30	251	341	47	388
	Institutional	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Light Industrial	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	36	du	189	44	57	290	17	4	5	26	9	5	14	14	8	22	15	3	5	23	3	10	13	4	14	18
	Mid-Rise	148	du	775	179	239	1,193	70	16	21	107	38	20	58	60	32	92	62	14	19	95	10	42	52	15	60	75
Log Pond	High-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	72,011	sf	2,412	557	742	3,711	217	50	67	334	87	94	181	130	140	270	48	11	15	74	24	16	40	45	29	74
	Restaurant	12,369	sf	1,674	239	478	2,391	151	22	42	215	60	39	99	82	53	135	151	22	42	215	51	48	99	74	68	142
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*1,021*	*240*	*327*	*1,588*	*100*	*24*	*32*	*156*	*42*	*43*	*85*	*35*	*34*	*69*	*64*	*15*	*20*	*99*	*28*	*27*	*55*	*21*	*21*	*42*
	Net New Trips Subtotal			***5,997***	***1,233***	***1,795***	***9,025***	***631***	***132***	***187***	***950***	***195***	***323***	***518***	***314***	***509***	***823***	***488***	***99***	***145***	***732***	***281***	***119***	***400***	***458***	***197***	***655***
	Office	364,467	sf	2,869	662	883	4,414	402	93	123	618	62	303	365	92	451	543	402	93	123	618	321	44	365	497	68	565
	Institutional	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Light Industrial	124,565	sf	781	104	156	1,041	110	15	21	146	10	75	85	15	107	122	101	14	20	135	69	9	78	101	14	115
	Low-Rise	92	du	482	111	149	742	44	10	13	67	24	13	37	37	20	57	38	9	12	59	6	26	32	9	38	47
Shipping Terminal	Mid-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	High-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	24,544	sf	822	190	253	1,265	74	17	23	114	30	32	62	44	48	92	16	4	5	25	8	5	13	15	10	25
	Restaurant	6,459	sf	874	125	249	1,248	78	11	23	112	31	20	51	43	28	71	78	11	23	112	27	24	51	38	36	74
	Existing Area Trips	*42*	*emp*	*230*	*0*	*0*	*230*	*23*	*0*	*0*	*23*	*6*	*17*	*23*	*6*	*17*	*23*	*21*	*0*	*0*	*0*	*16*	*5*	*21*	*16*	*5*	*21*
	Internal Trips			*848*	*194*	*261*	*1,303*	*96*	*22*	*29*	*147*	*42*	*42*	*84*	*34*	*34*	*68*	*73*	*17*	*22*	*112*	*32*	*33*	*65*	*25*	*25*	*50*
	Net New Trips Subtotal			***4,750***	***998***	***1,429***	***7,177***	***589***	***124***	***174***	***887***	***109***	***384***	***493***	***191***	***603***	***794***	***541***	***114***	***161***	***837***	***383***	***70***	***453***	***619***	***136***	***755***
	Office	10,000	sf	79	18	24	121	11	3	3	17	2	8	10	3	12	15	11	3	3	17	9	1	10	14	2	16
	Institutional	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Light Industrial	0	sf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Low-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cornwall Beach Area	Mid-Rise	300	du	1,572	363	483	2,418	142	33	43	218	77	41	118	121	65	186	125	29	39	193	21	83	104	31	122	153
	High-Rise	0	du	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Retail	2,000	sf	67	15	21	103	6	1	2	9	2	3	5	4	4	8	1	0	1	2	1	0	1	1	1	2
	Restaurant	5,000	sf	676	97	193	966	61	9	17	87	24	16	40	34	21	55	61	9	17	87	21	19	40	30	28	58
	Existing Area Trips	*0*	*emp*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	Internal Trips			*348*	*81*	*110*	*539*	*30*	*6*	*11*	*47*	*12*	*12*	*24*	*11*	*11*	*22*	*22*	*5*	*8*	*35*	*9*	*9*	*18*	*7*	*7*	*14*
	Net New Trips Subtotal			***2,046***	***412***	***611***	***3,069***	***190***	***40***	***54***	***284***	***93***	***56***	***149***	***151***	***91***	***242***	***176***	***36***	***52***	***264***	***43***	***94***	***137***	***69***	***146***	***215***

TAZ /				Daily Person Trips By Mode				PM Peak Hour Person Trips By Mode				PM Peak Hour Vehicle Trips Based on Person Trips			PM Peak Hour Vehicle Trips Based on ITE			AM Peak Hour Person Trips By Mode				AM Peak Hour Vehicle Trips Based on Person Trips			AM Peak Hour Vehicle Trips Based on ITE		
Area	Land Use	Size	Units	Auto	Transit	Walk/ Bike/Other	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total	Auto	Transit	Walk/ Bike/Other	Total	In	Out	Total	In	Out	Total
Sub-Total Project Trips																											
	Office	2,000,000	sf	15,745	3,633	4,843	24,221	2,205	509	677	3,391	342	1,662	2,004	507	2,473	2,980	2,205	509	677	3,391	1,764	240	2,004	2,727	373	3,100
	Institutional	670,000	sf	3,887	897	1,193	5,977	506	117	154	777	69	391	460	110	614	724	582	135	180	897	438	90	528	690	141	831
	Light Industrial	685,000	sf	4,295	573	858	5,726	602	80	120	802	56	408	464	81	590	671	558	75	111	744	378	51	429	555	76	631
	Low-Rise	334	du	1,750	404	538	2,692	158	36	48	242	86	46	132	135	72	207	139	32	43	214	25	92	117	34	136	170
	Mid-Rise	1,100	du	5,761	1,330	1,775	8,866	520	121	158	799	283	152	435	445	237	682	460	106	142	708	78	306	384	111	448	559
	High-Rise	458	du	2,399	554	738	3,691	216	49	68	333	118	63	181	184	100	284	191	44	60	295	32	128	160	47	187	234
	Retail	310,000	sf	10,383	2,396	3,196	15,975	934	216	288	1,438	373	406	779	559	604	1,163	208	49	62	319	106	68	174	194	125	319
	Restaurant	65,000	sf	8,796	1,259	2,507	12,562	792	114	225	1,131	316	205	521	433	277	710	792	114	225	1,131	271	250	521	390	358	748
	Boat Launch	460	berths	1,634	204	204	2,042	98	12	13	123	39	26	65	52	35	87	49	6	6	61	11	22	33	12	25	37
	Total Project Trips			**54,650**	**11,250**	**15,852**	**81,752**	**6,031**	**1,254**	**1,751**	**9,036**	**1,682**	**3,359**	**5,041**	**2,506**	**5,002**	**7,508**	**5,184**	**1,070**	**1,506**	**7,760**	**3,103**	**1,247**	**4,350**	**4,760**	**1,869**	**6,629**
Sub-Total Trip Reductions																											
	Existing Area Trips	645	emp	2,760	0	0	2,760	276	0	0	276	59	217	276	59	217	276	286	0	0	0	236	50	286	236	50	286
	Internal Trips			7,949	1,835	2,444	12,228	822	190	254	1,266	354	354	708	292	288	580	598	138	184	920	262	260	522	203	198	401
Net New Project Trips				***43,941***	***9,415***	***13,408***	***66,764***	***4,933***	***1,064***	***1,497***	***7,494***	***1,269***	***2,788***	***4,057***	***2,155***	***4,497***	***6,652***	***4,300***	***932***	***1,322***	***6,840***	***2,605***	***937***	***3,542***	***4,321***	***1,621***	***5,942***