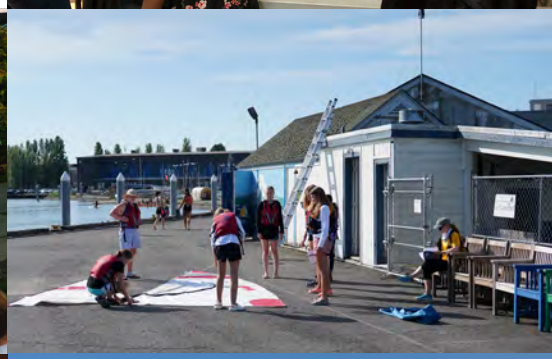
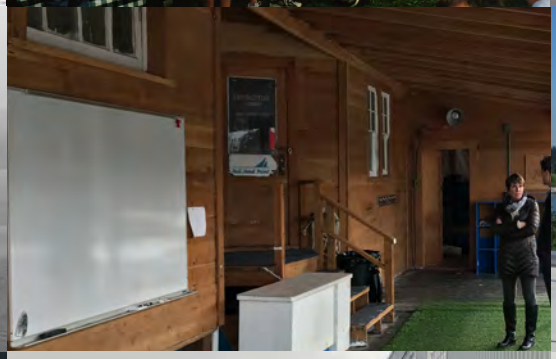
MILLER HULL

FEBRUARY 7, 2020
2018 MAJOR PROJECT CHALLENGE FUND
BUILDING 31 REHABILITATION STUDY

# Feasibility Report



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# 2018 MAJOR PROJECT CHALLENGE FUND
# BUILDING 31 REHABILITATION STUDY
# REPORT

## Report Contents

# 1.0 Executive Summary

## Work Authorization

The work herein has been funded through the Seattle Park District's 2018 Major Project Challenge Fund program and through Pro-Bono services provided by the Miller Hull Partnership, PAE Engineers and JMB Consulting Group LLC.

## Introduction

Seattle's Warren G. Magnuson Park occupies a peninsula of land emerging into Lake Washington south of Thornton Creek. Here, in the early 1900s, the U.S. Navy established an air base which would eventually support the Pacific Theater. The Navy dredged, filled, cut, cleared and paved the peninsula to become a significant airbase at the time war was declared in 1941. On the north shore of this air base sat a pier and boathouse. This boathouse, Building 31 (B31), was built to house a crash boat rescue squadron, responsible for rescuing airplanes and crew in distress on the waters of Lake Washington. Fortunately, this building was rarely used, and little accounts or records exist of its usage in its full capacity.

Today, B31 serves as the gritty backbone for one of Seattle's most vibrant and successful community sailing centers, Sail Sand Point (SSP). Here you will find instructors coordinating their daily safety plans, kids learning the difference between a beam reach and close hauled, high schoolers talking through the best way to hand exchange through a roll tack, open boaters on a second date, and race committees loading up buoys for a cold and stormy fall weekend. B31, as a functioning entity, is critical to the success of the North Shore Recreation Area's (NSRA) concept for a small boat sailing center. It serves as a hub for safety boats, staff, students, and volunteers of SSP who operate programs that serve more than 16,000 participants a year.[1]

While SSP has used B31 since 1999, the building was never actively designed to support a small boat sailing center. It was designed to support large, tall, crash boats operated by the Navy. At over 80 years old, the pile structure of B31 has deteriorated significantly since being driven before WWII. The extent of the deterioration and the methods required to remediate it have warranted a broader study of what an improved B31 would look like for both SSP and Seattle Parks and Recreation (SPR). This report outlines a starting point, assessing the existing conditions, constraints, program, and projected growth within Sail Sand Point's programming. At the end of this report, a preliminary design proposal is made, synthesizing information gained from months of meetings, research, conversations, and outreach.

## Executive Summary

This report comprises of work completed within Task 1 (Existing Conditions Analysis), Task 2 (Program Analysis) and Task 3 (Design Analysis and Options) of the Major Project Challenge Fund grant scope of work.

This project is small; however, it brings many complexities, regulatory agencies, stakeholders and passionate community members to the table, each with an important voice. This report outlines preliminary information critical to the process of rehabilitating B31. Information such as site history, geotechnical, structural, and ecological site background is presented herein. Additionally, the logistical considerations of rehabilitating B31, a structure completely over water, necessitated a thorough analysis of the potential pile replacement methods. Eleven different methods are presented within this report, one is advocated for as the preferred option for rehabilitation. This

[1] Sail Sand Point. Annual Report. 2019.

analysis can be found within Section 11 of this report. Furthermore, a preliminary code analysis in Section 10 is presented with key literature that outline some of the many constraints this project faces. Within Section 14, a design proposal is made outlining information and design strategies for the project. Section 17 outlines the next steps and action items to be completed after the culmination of this report.

The work within this report would not have been possible without the project team and many other community members, contractors, city staff, and colleagues who lent their input, volunteered on weekends, suggested approaches and invested themselves within the project for the community at Sail Sand Point and Magnuson Park.

## Project Team

| | |
|---|---|
| Seattle Parks and Recreation (SPR) | Oliver Bazinet, Senior Planner<br>Kevin Bergsrud, Senior Planning and Development Specialist<br>David Graves, Senior Planner<br>Brian Judd, Manager, Magnuson Park |
| Sail Sand Point (SSP) | Seth Muir, Executive Director<br>Travis Harth, Facilities Committee<br>Leigh Wager, Facilities Committee<br>Kelly Pratt, Facilities Committee |
| Miller Hull Partnership (MHP) | Glen Stellmacher<br>Mat Albores, AIA, LEED AP<br>Ida Fraser<br>Connor Stein<br>Brian Court, AIA<br>Kristen Dotson, LEED AP BD+C<br>Chris Hellstern, AIA, LFA, LEED AP BD +C |
| Reid Middleton | Jon Padvorac, P.E.<br>Katherine Brawner, P.E.<br>Corbin Hammer, P.E., S.E. |
| Dowbuilt | Coby Vardy |
| PAE | Allan Montpellier, PE, LEED AP<br>Daniella Moreano Wahler, PE, LEED AP<br>Michael Kim, PE<br>Chelsea Guenette, LEED GA<br>Carmen Cejudo, PE, LEED AP, CCP<br>Lindsay Hoefert<br>Colleen Hess |
| JMB Consulting Group | Jon Bayles |

## Acronyms/ Abbreviations

The following acronyms and abbreviations are utilized within this repor

| Abbreviation | Description |
|---|---|
| B11 | Building 11 |
| B31 | Building 31 |
| B275 | Building 275 |
| BGT | Burke Gillman Trail |
| CF | Construction Feasibility |
| COE | U.S. Army Corps of Engineers |
| CPARB | Capital Projects Advisory Review Board |
| ECY | Washington State Department of Ecology |
| Env. | Environmental |
| ESA | Endangered Species Act |
| ESU | Evolutionary Significant Unit |
| ETFE | Ethylene tetrafluoroethylene film |
| GSF | Gross Square Footage |
| HABS | Historic American Buildings Survey |
| HAER | Historic American Engineering Record |
| HALS | Historic American Landscapes Survey |
| HARP | Historic and Archaeological Resources Protection |
| HI | Historical Impact |
| HS | Health and Safety |
| ILFI | International Living Futures Institute |
| JARPA | Joint Aquatic Resource Permit Application |
| LCC | Life Cycle Cost |
| LiDAR | Light Detection and Ranging |
| LPB | Landmarks Preservation Board |
| NAS | Naval Air Station |
| NSPS | Naval Station Puget Sound |
| NSRA | North Shore Recreation Area |
| MHP | Miller Hull Partnership |
| MPCF | Major Project Challenge Fund |
| SDN | Seattle Department of Neighborhoods |
| PS | Programming Success |
| S | Sustainability |
| SF | Square Foot (Feet) |
| SI | Site Impacts |
| SMC | Seattle Municipal Code |
| SPU | Seattle Public Utilities |
| SSP | Sail Sand Point |
| SPARC | Sand Point Application Review Committee |
| SP-NAS-LD | Sand Point Naval Air Station Landmark District |
| SPOD | Sand Point Overlay District |
| SPR | Seattle Department of Parks and Recreation |
| Secretary's Standards | Secretary of the Interior's Standards for the Treatment of Historic Properties |
| T.I. | Tennant Improvement |
| WDAHP | Washington Department of Archaeology and Historic Preservation |
| WA F&W | Washington State Department of Fish and Wildlife |
| WRIA 8 | Water Resource Inventory Area 8 |

# 2.0 Methodology

## Introduction

In essence, this report consists of work executed over the course of three Tasks. These Tasks included, in chronological order occurring first within this phase to last within this phase of work:

1. Task 1: Existing Conditions Analysis
2. Task 2: Programming Analysis
3. Task 3: Design Analysis and Options

Task 1 and 2 were completed concurrently. After studying the existing conditions and engaging in a program analysis, the team synthesized this information into the design strategies for future work on B31 within Task 3.

## Historic Research

The scope of historical research focused directly on B31. While, information was found on other surrounding historic structures, it was largely not pursued as a thread of inquiry. A number of sources were reviewed and pursued within this process, some primary, some secondary and some tertiary sources. These sources are identified within Appendix A. The journey of discovery often lead to King County Archives, or the National Archives, or to other resources only to turn up empty handed. Little information has been found that conveys how B31 was used over time. SPR holds a collection of original drawings for the building, however there is dispute in some of the drawings over what was built and what was drawn and not executed. Overall, the team was able to construct a chronology of change with respect to B31 as it has morphed over time. This documentation is presented within Section 4.0 Site History of this report. A considerable debt is due to Kevin Bergsrud of SPR, who through countless exchanges clarified the historic relationships and conditions of NAS Seattle.

## Stakeholders – Building Community Plan

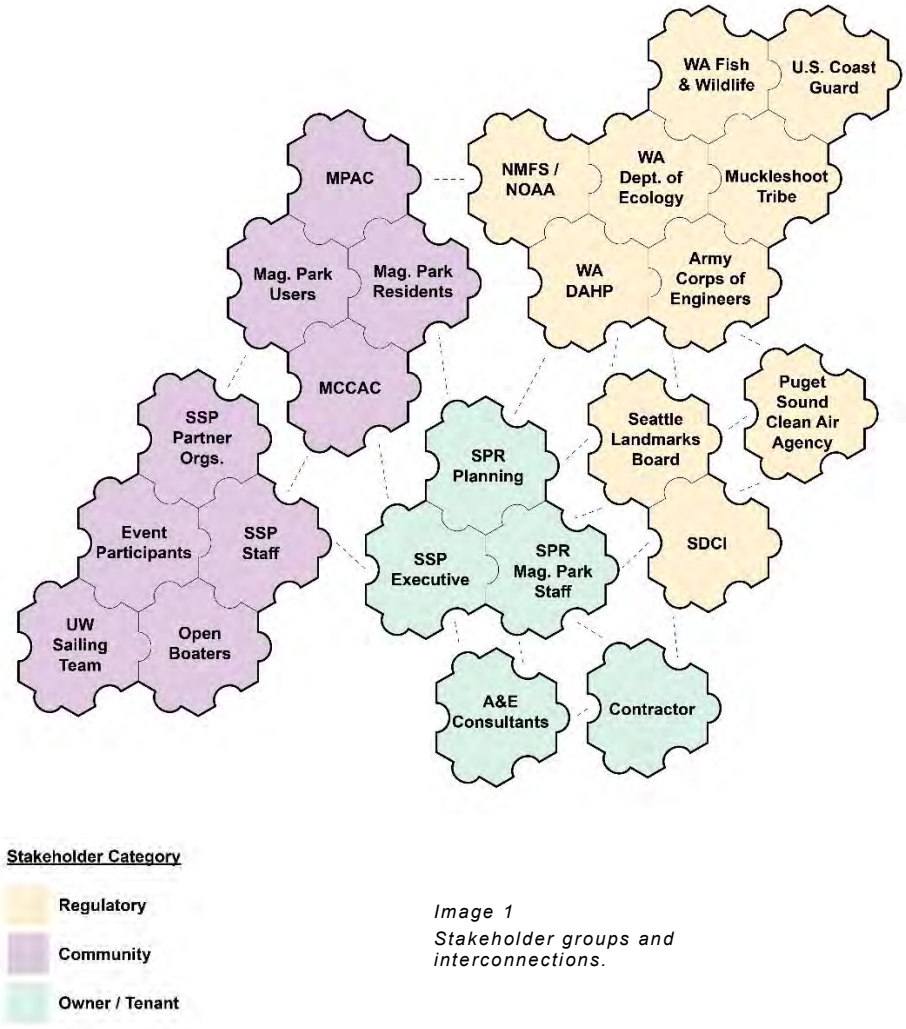



*Image 1*
*Stakeholder groups and interconnections.*

At the onset of this project, it became clear that a range of stakeholders with diverse interests were critical to the success of the project. A preliminary identification of these stakeholders was reviewed by SSP and SPR. Further stakeholders were added. Once identified, the team generated a Building Community Plan, which targeted each stakeholder group with outreach events and solicitation. During these events, further stakeholders were identified and added to the Building Community Plan. At this point in time, the project team has identified 27 stakeholder groups that contain further organizations within. These groups are outlined below:

| # | Stakeholder Group |
|---|---|
| 1 | Seattle Parks and Recreation, Capital Projects & Planning |
| 2 | Sail Sand Point, Executive, Board, Facilities Committee |
| 3 | Seattle Parks and Recreation, Magnuson Park Staff |
| 4 | Sand Point Historic District Council / Seattle Landmarks Preservation Board |
| 5 | Washington State Dept of Archaeology and Historic Preservation |
| 6 | Army Corps of Engineers |

| | |
|---|---|
| 7 | Muckleshoot Tribe |
| 8 | WA Dept of Fish and Wildlife (F&W) |
| 9 | Seattle Department of Construction and Inspections |
| 10 | Sail Sand Point Staff |
| 11 | Magnuson Park Residents |
| 12 | Magnuson Park Advisory Council |
| 13 | Magnuson Community Center Advisory Council |
| 14 | Magnuson Park Users / Neighborhood Community / Friends of Magnuson Park |
| 15 | Puget Sound Clean Air Agency |
| 16 | Partner Organizations |
| 17 | Community Organizations |
| 18 | Duwamish Tribe |
| 19 | Regatta Sailors / Parents / Participants / Race Committee |
| 20 | Summer Sail Campers / Parents |
| 21 | Open Boaters |
| 22 | UW Sailing Team |
| 23 | Offsite Facilities / Residents |
| 24 | Major Donors, Sponsors, Former Board Members |
| 25 | Boat Yard Clients/ Renters |
| 26 | Watersports Facility Leaders |
| 27 | Pile Contractors |

*Table 1*
*Stakeholder groups*

To date, the project team has met with many of the identified stakeholders and solicited feedback on the project at multiple community events organized by SSP and SPR. Within the next phase, the project team will continue to engage and solicit feedback from stakeholders within the process.

### Existing Conditions Documentation – LiDAR

At the culmination of reviewing the original historic drawings held by SPR, it became clear that no as-built documentation existed of the building within its current configuration and condition. The intent of the LiDAR scanning was to capture the existing conditions accurately and comprehensively within a single day-long scanning session. This LiDAR scan would serve as a background for as-built documentation. In addition, the process of LiDAR scanning was able to create new forms of graphic representation of the project and a comprehensive 3D colored model of the site for future use and exploration. While LiDAR scanning is not recognized as a durable medium within the HABS/HAER/HALS process, it is recognized as an efficient way of geometrically capturing information within a historic context.[2]

To save costs on the scan, the team elected to complete the entire LiDAR scan within the span of one day from sunrise to sunset. While this creates interesting issues with shadows within the coloration of the point cloud, it does not affect the accuracy of the data. A full and comprehensive scan was completed of the site. Further information about the LiDAR scanning process can be found in Appendix C.

[2] Lavoie, Catherine and Dana Lockett. Producing HABS/HAER/HALS Measured Drawings from Laser Scans: The Pros and Cons of Using Laser Scanning for Heritage Documentation. National Park Service

### Pile Treatment Solutions: Options and Assessment

At the onset of the project, many variables, problems, options, approaches, and opportunities arose that will act to shape the preferred path to rehabilitating B31. It became clear that a more analytical approach to decision making was required beyond verbal discussion and presentation of the options. Each option has distinct advantages and disadvantages. These would need to be cataloged and assessed as a whole in order to move forward within the process.

The design team has engaged in a similar approach to assessment while working with the U.S. Forest Service. Within their work, a decision-making methodology called, “Choosing by Advantages” is utilized within the value analysis process. This process begins by identifying the most important criteria within a project. These criteria for the rehabilitation of B31 were identified through conversations with SPR and SSP staff, WDAHP, SDN, contractors and building users. They include considerations of health and safety, programming and space use, life cycle cost, site impacts, sustainability, construction feasibility, and historical impacts. Each identified solution is then analyzed based on each of these criteria. At the culmination of analysis, the project team is able to select a preferred option based on the identified advantages and disadvantages of each approach. Within the process presented herein, the project team has utilized a streamlined “Choosing by Advantages” approach, by ranking each option according to a semi-quantitative matrix of values assigned to each criteria. In the end, an option is advanced based on its cumulative advantages within each of the criteria.

### Design

At the culmination of Task 1 and 2, the project team agreed to study three potential options for the rehabilitation of B31. They could be considered, as adequate, good, and best approaches to the project from a programmatic success standpoint. Using information gained from the previous two tasks, the project team consulted with SPR and SSP throughout the design phase to arrive at three options for the potential rehabilitation of B31. In addition to work proposed to B31, a number of site work scope items surfaced as a need during the design phase. These site work items are described and quantified further within Section 15 of this report.

## 3.0 Project Scope

### Summary

While the base scope of the project included an analysis of B31, through discussions with SSP and SPR, it became clear that a “campus-wide” approach to thinking was required. SSP operates within a “campus” of infrastructure that defines the North Shore Recreation Area (NSRA) of Magnuson Park. This includes Building 11 (B11) (Offices and “Equipment Bay”), Building 275 (B275) (“Opti-Land”), B31, the boat yard, the pier, the boat ramps, floats and B11 restrooms.

The ultimate scope of alterations affecting B31 will affect this campus environment as well. Recognizing this campus approach presents additional opportunities for developing a vibrant NSRA for the public, SPR and SSP. It is understood that SSP will need to expand facilities at B275 (“Optiland”) in order to accommodate for the current demand of Opti sailing instruction. This is explicitly identified within this report, however not pursued beyond that identification. The scope of rehabilitation of B31 will necessitate tenant improvement (T.I.) work within B11. Through the course of discussions with SPR and SSP, effects to Pier 1 are also possible through the undertaking of green storm water management systems on the pier itself, landscape features that deter swimming and jumping off the pier, remediation that mitigates and manages storm water runoff from the pier’s asphalt surface, remediation that may remove impervious area or toxic materials, inclusion of site furnishings for viewing and spectating events, resurfacing the pier to increase the site’s albedo, etc.

The scope of work and effects on B11, Pier 1, or B275 are not considered within this report.

# 4.0 Site History

### Introduction

B31 has been a continuum of evolution, not a static entity over time. The numerous additions and demolitions to the building's primary covered moorage volume have acted to serve specific needs through short moments in time. These needs were often eclipsed by others, resulting in a building whose character has changed frequently since originally constructed in 1938. What has remained constant, and what truly defines the building is its use. In 1938, it was built to provide covered moorage for crash boats[3] and other boats supporting NAS Seattle seaplane operations.[4] Later in its life, B31 supported Navy's Morale Welfare and Recreation as covered moorage for berthing private pleasure craft.[5] Today, it is used by Sail Sand Point as covered moorage for safety boats, storage, teaching space, and changing rooms.

Note: The national registration period of significance is between 1929-1945.

[3] Seattle Parks and Recreation, Building 31 Drawing Archive, Drawing 55212 (NAS Drawing 2921)
[4] Building 31, Sand Point Historic District HABS Documentation, 2005. Pg 1.
[5] Ibid. Pg 1.


*Image 2*
Postcard showing Mount Rainier from Lake Washington circa 1903.[6]

## Pre-Contact

"Lake Washington was formed approximately 12,000 years ago during the retreat of the Vashon glacier. The glacier carved deep fissures into underlying bedrock, which were subsequently filled with water and formed Lake Washington."[7]

The contemporary Puget Sound region's first human inhabitants were indigenous peoples. These included the Duwamish, Muckleshoot, Suquamish and other nations. People who inhabited the contemporary Sand Point peninsula at Mud Lake (filled over by the Navy) were known as **wɪstalbabš** (Sand People). A settlement and longhouse at modern day Thornton Creek was called, **dx̫ʷx̌ʊ́bəd** (Silenced Place). To the South was a bay called **slag̫ʷlag̫ʷac** (Much-Inner-Cedar-Bark). This was a place for gathering cedar bark. It was later named Pontiac Bay. The shore between **dx̫ʷx̌ʊ́bəd** and **slag̫ʷlag̫ʷac** was called **x̫ʷix̫ʷiyaq̫ʷayas** (Hunt-by-Looking-at-the-Water). This name suggests that the shore was used for hunting deer and other animals at the waters' edge. "Historically, Native Americans fished in Lake Washington and hunted and gathered vegetables in the area. The first European settlers logged the surrounding forests, farmed adjacent lowlands, and used the lake to transport coal and lumber from the surrounding hills into the growing city of Seattle."[8] For a guide to pronunciation in **dx̫ʷləšucid** (Lushootseed) see Appendix D.

[6] City of Seattle, Shoreline Characterization Report, 2010.
[7] Thrush, Coll. Native Seattle: Histories from the Crossing-Over Place. University of Washington, 2007.
[8] City of Seattle, Shoreline Characterization Report, 2010.

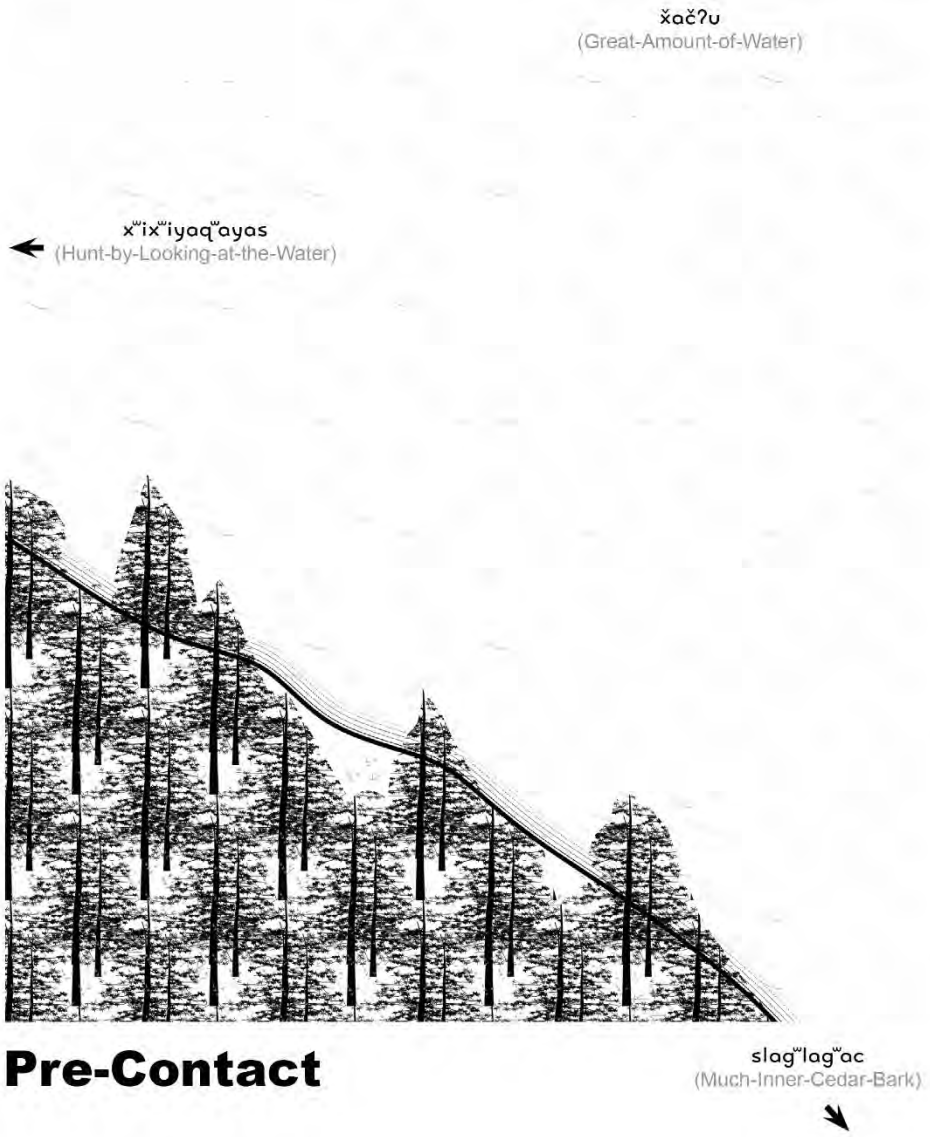

x̌ač?u
(Great-Amount-of-Water)
xʷixʷiyaqʷayas
(Hunt-by-Looking-at-the-Water)
Pre-Contact
slagʷlagʷac
(Much-Inner-Cedar-Bark)

*Image 3*
A day that shaped Seattle geomorphology for generations to come: the cutting of the Montlake cut.[9]

**1916**

The Ballard Locks are completed and the Montlake cut is made, draining Lake Washington into the Lake Washington Ship Canal.

"As the Ship Canal was built, the Cedar River was diverted into southern Lake Washington. This aided in flood reduction in the City of Renton at the south end of the lake, but the historical outlet of the lake, the Black River, effectively dried up. When lock construction was completed, the water level in Lake Washington dropped about 10 feet, resulting in the exposure of 1,330 acres of previous shallow water habitat, a 7 percent reduction in the lake's surface area, a 12.8 percent reduction in the lake shoreline length, and the elimination of most of the shoreline wetlands. This rerouting also changed the configuration of tributary confluences with the lake. Other associated marsh habitats, such as those of the Black River in the south and the Sammamish River in the north, were also eliminated."[10]

[9] University of Washington Libraries, Special Collections, UW2382.
[10] City of Seattle, *Shoreline Characterization Report*, 2010.

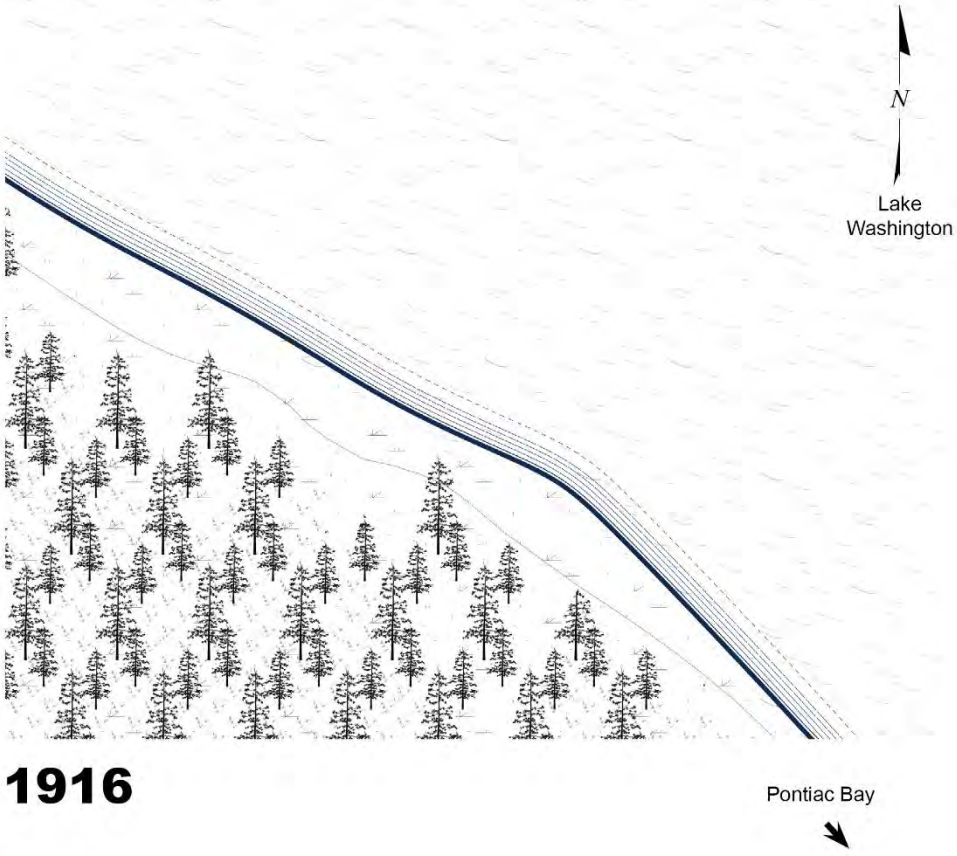

N
Lake
Washington
1916
Pontiac Bay

*Image 4*
Construction of Pier 1, later named Building 321, in 1938.[11]

**1938**

At this time, the construction of Pier 1 begins. “The 100,000-gallon fuel tank (Building 12C) supplying the boilers was refueled by railroad tanker cars and by barge/ship at Pier No. 1. A pipeline (now abandoned) connected the pier to the 100,000-gallon UST.”[12] Building 12 was located upland within the Naval Air Station.

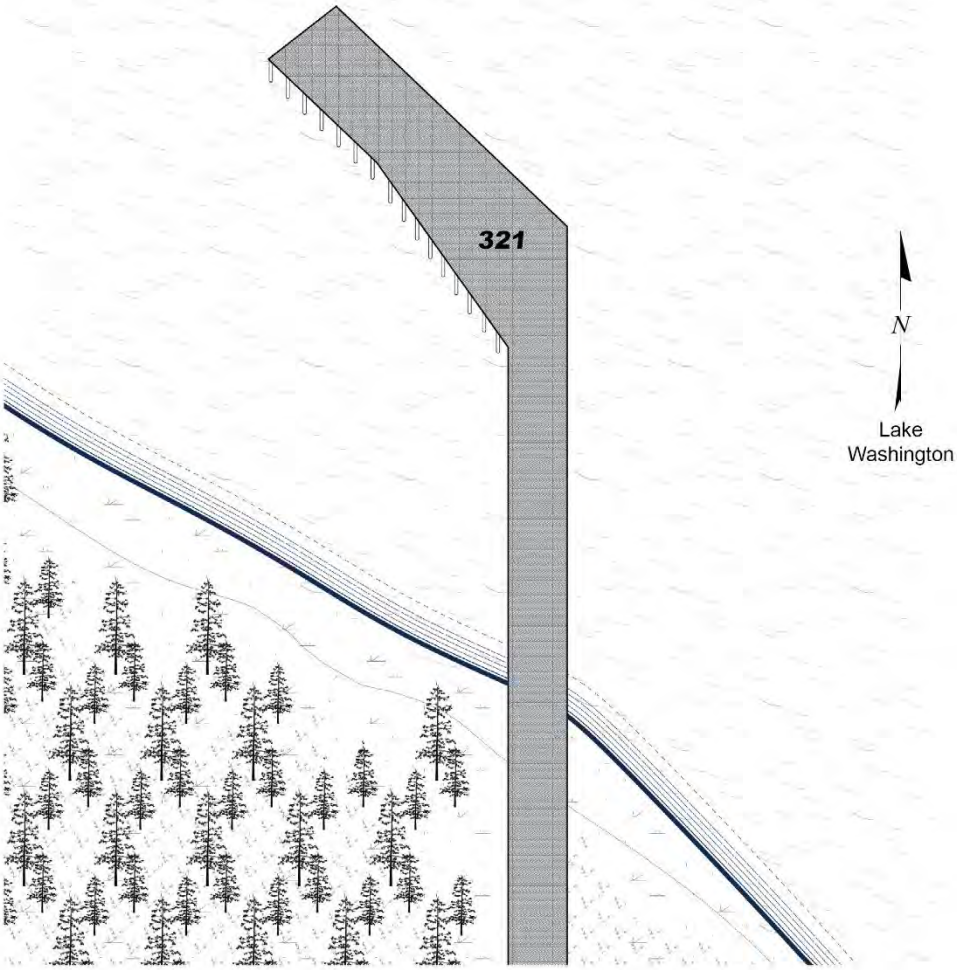
“The Navy used to bring in a fuel barge to the bulk pier and pumped oil up to building 12 oil storage tanks, and there are underground storage tanks still there.”[13]

King County adopted its first Zoning Code in 1937.

[11] National Archives photo no.71-CA-507-C-3.Taken April 1938.

[12] Shoreline Characterization Report

[13] Interview with Robert Nick Feyko. 2014 Final Radiological Preliminary Assessment Report, Naval Facilities Engineering Command Northwest, 2016.




**1938**

New Construction
Existing Structure
Demolished Structure

Building Legend ID# - Description
321 - Pier 1

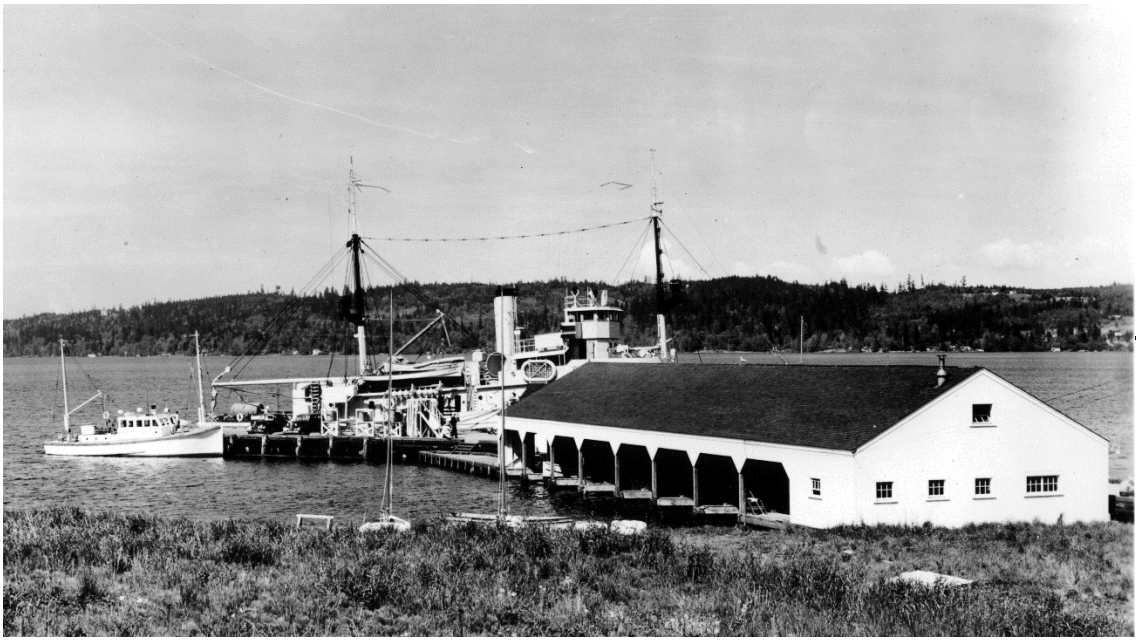


*Image 5*
Building 31, constructed in its first iteration and form in 1938.[14]

**1938**

The original covered moorage was constructed in 1938. It included eight 15' wide covered moorage bays and one 15' wide bay that included a "workshop," "stores," "toilet," and "quarters" that housed six bunks.[15] The original name for the structure is "Boat House." The Boat House would house crash boats, and boats who serviced seaplane operations at the air station.

At this point, adjacent Building 116 (Sewage Pumping Station) is constructed, as well as Building 13 (Garage and Storage Shed). In addition, a small boat pier, that was never given a Navy site ID #, was constructed.

[14] Naval History and Heritage Command. S-135 Naval Air Station Seattle Photo Collection. Boat Dock 1938.
[15] P.W. Drawing # 12911. Approved 3/29/1938.

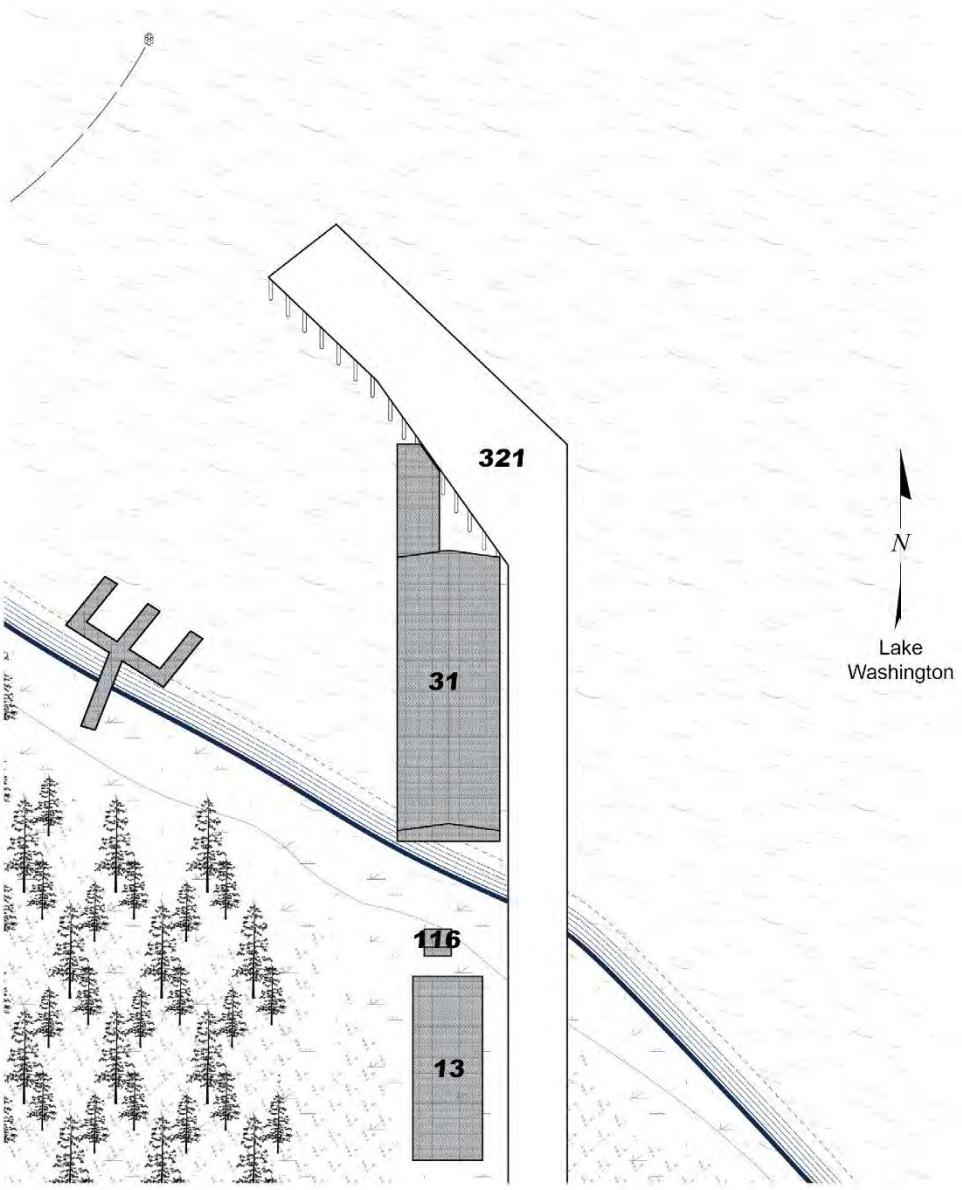
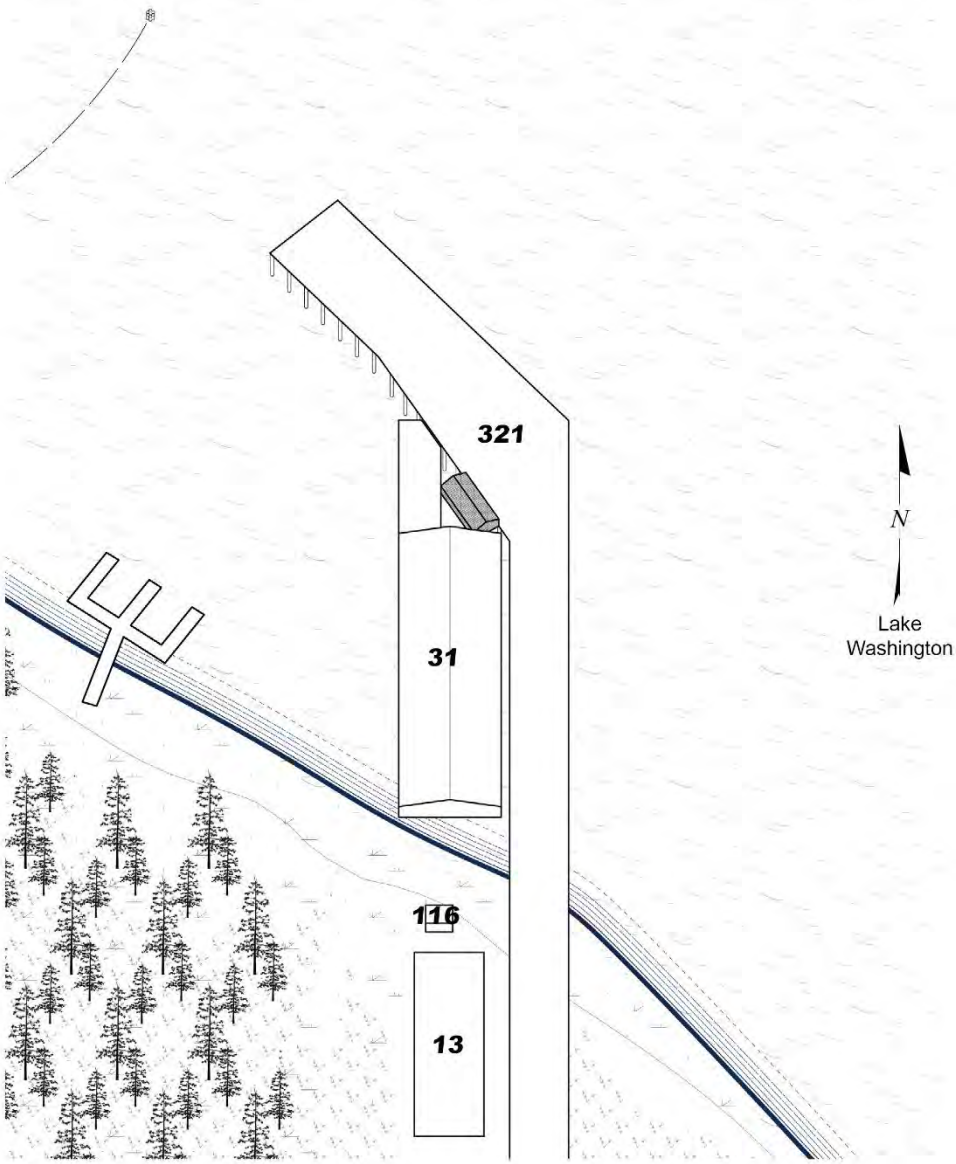

321
31
116
13
N
Lake
Washington
1938
New Construction
Existing Structure
Demolished Structure
Building Legend
ID# - Description
13 - Garage and Storage
31 - Boat House
116 - Sewage Pumping
321 - Pier 1

*Image 6*
Enlargement of aerial photograph showing Building 31 with the C.P.O.'s quarters to the north of the covered moorage bay.[16]

**1939**

The Chief Petty Officer's quarters are added to B31. No complete drawings exist of the original C.P.O.'s quarters, however it can be inferred that the small addition comprised of a quarters and toilet room under a single gable roof.

[16] National Archives photo no. S-135-B.02 1939




**1939**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 13 - Garage and Storage | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

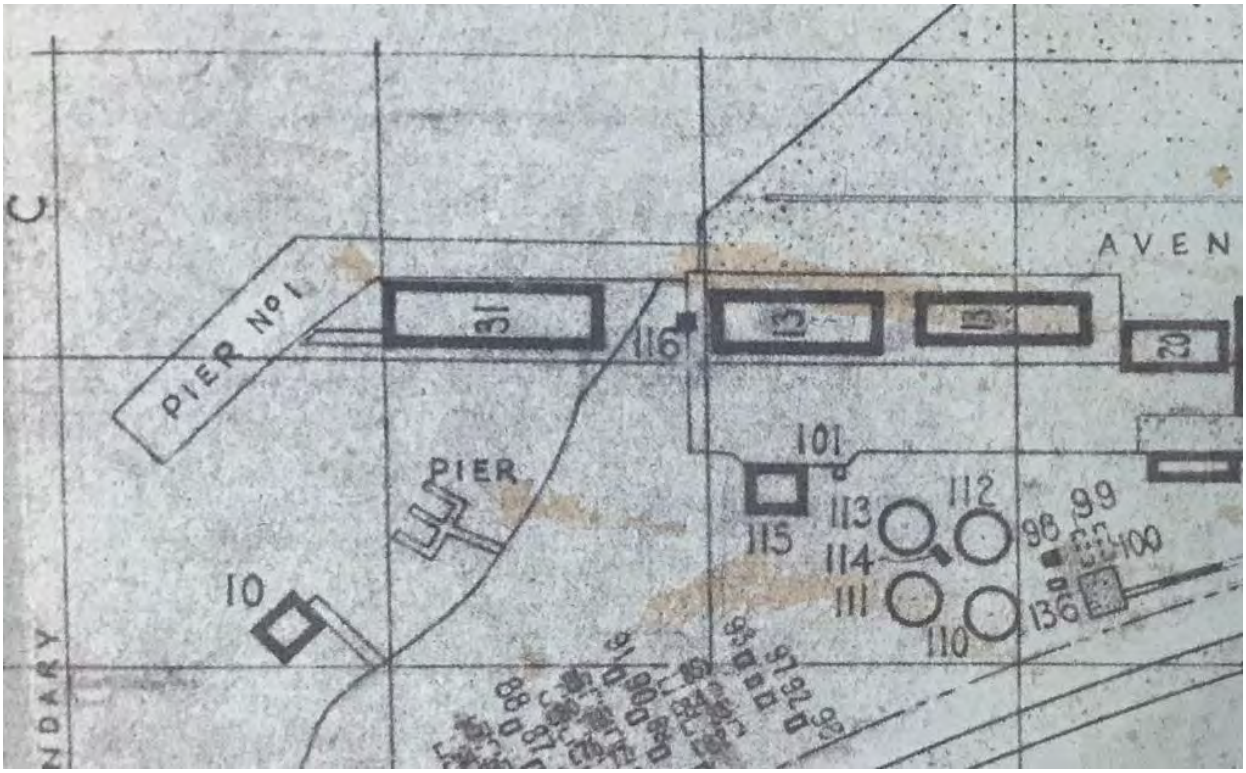
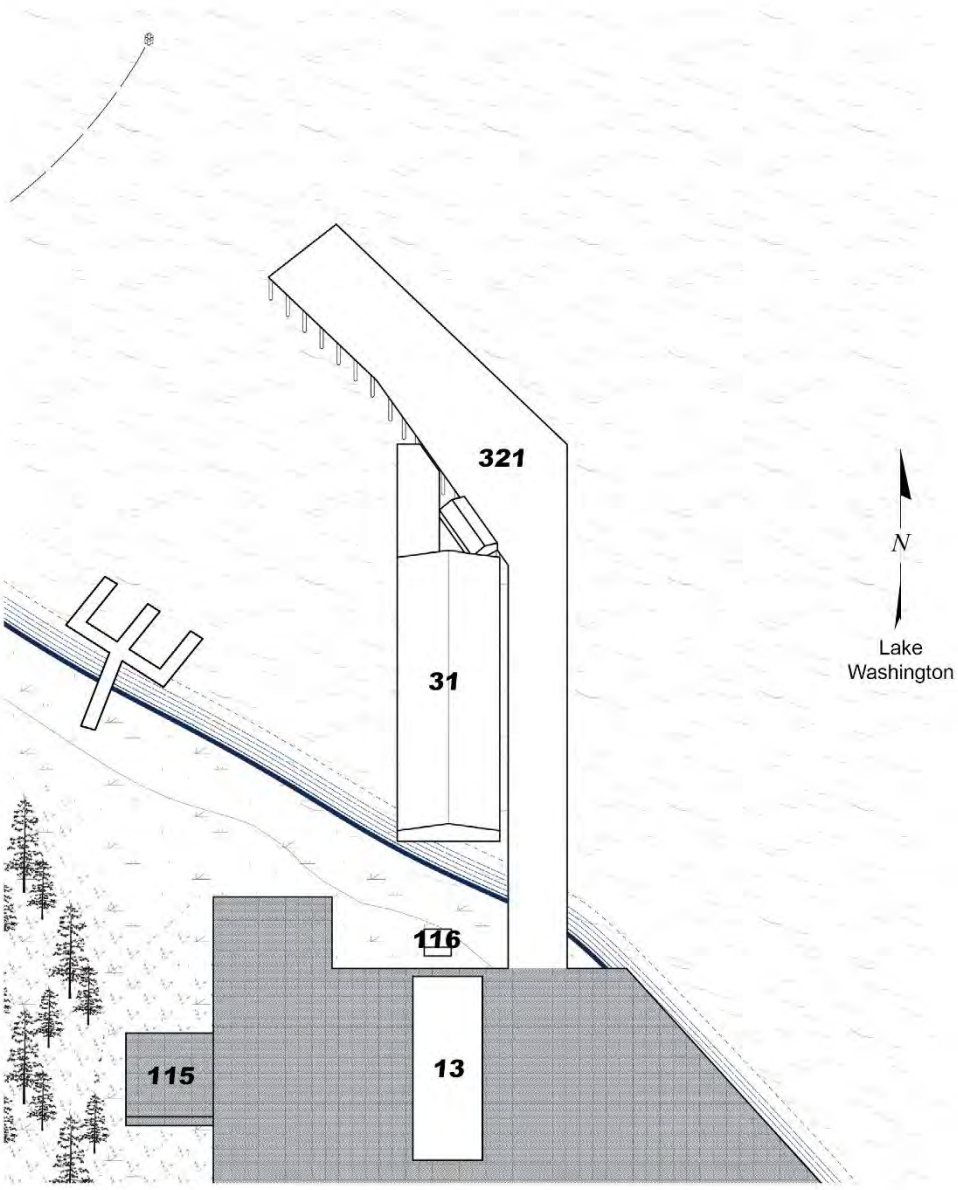



*Image 7*
Enlargement of a photograph showing site conditions in 1942. Building 115 is constructed to the southwest of B31.[17]

**1941**

The same year that the U.S. declared war on Japan, Building 115, whose historic names include "Sewage Sludge Bed Building," or "Tank Farm Repair Storage," or "P.W. Maintenance Shop" was constructed along with an expanded area of tarmac around Building 13. This building was "part of the former sanitary sewer" tank farm on site.[18] The building "was used to house equipment for the repair of pumps and tanks employed at the tank farm located to the west, as well as the storage of related spare parts and equipment."[19] The year before, 1940, the Lake Washington Floating Bridge (I90) is commissioned and the Tacoma Narrows bridge is dedicated, opened, and collapses.

[17] National Archives. Drawing 771. Map of Naval Air Station Seattle Wash. Showing Conditions on April 13, 1942.
[18] Final Radiological Preliminary Assessment Report, Naval Facilities Engineering Command Northwest, 2016.
[19] Nomination Report Appendix B




**1941**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 13 - Garage and Storage | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

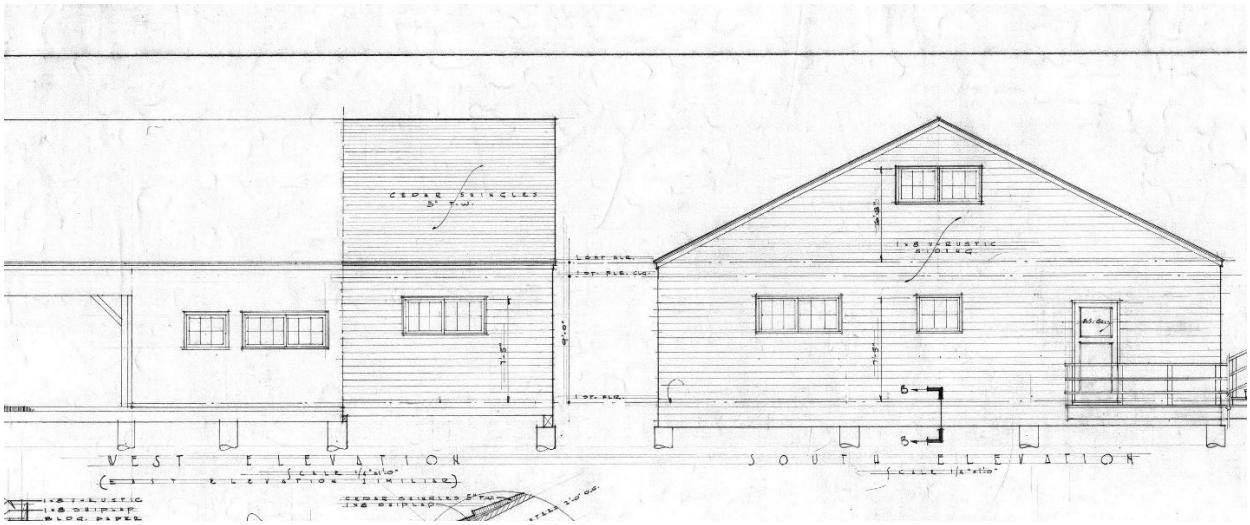
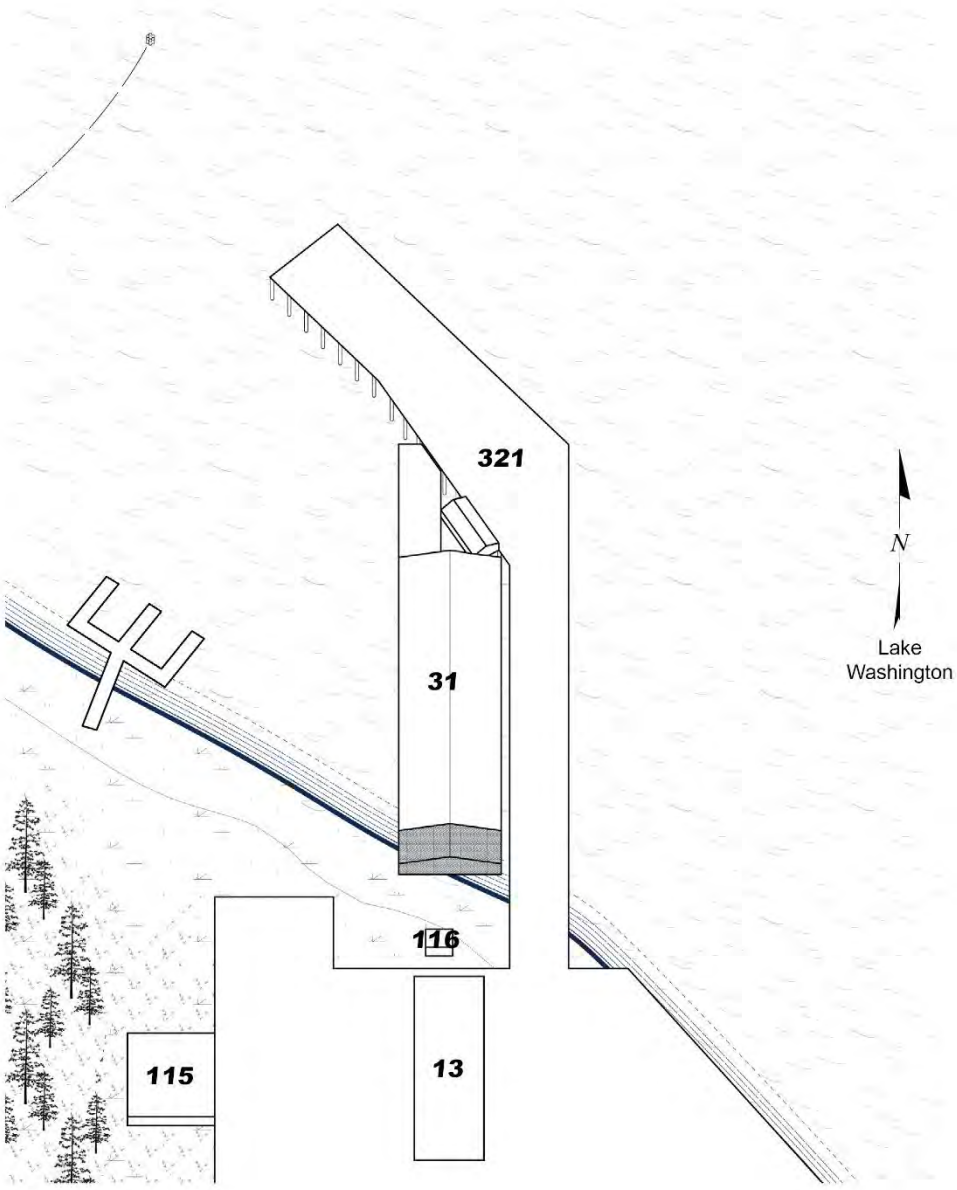



*Image 8*
An enlargement of drawings showing the additional bay added to B31 in 1942.[20]

**1942**

An additional 15’ bay of sixteen bunks is added along with a new, expanded head. The former bunk quarters within the original Boat House are converted to “Office.” The existing shop, head and storage area remains.

[20] Seattle Parks and Recreation, Building 31 Archive Drawing 55206 (NAS Drawing 992)




**1942**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 13 - Garage and Storage | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

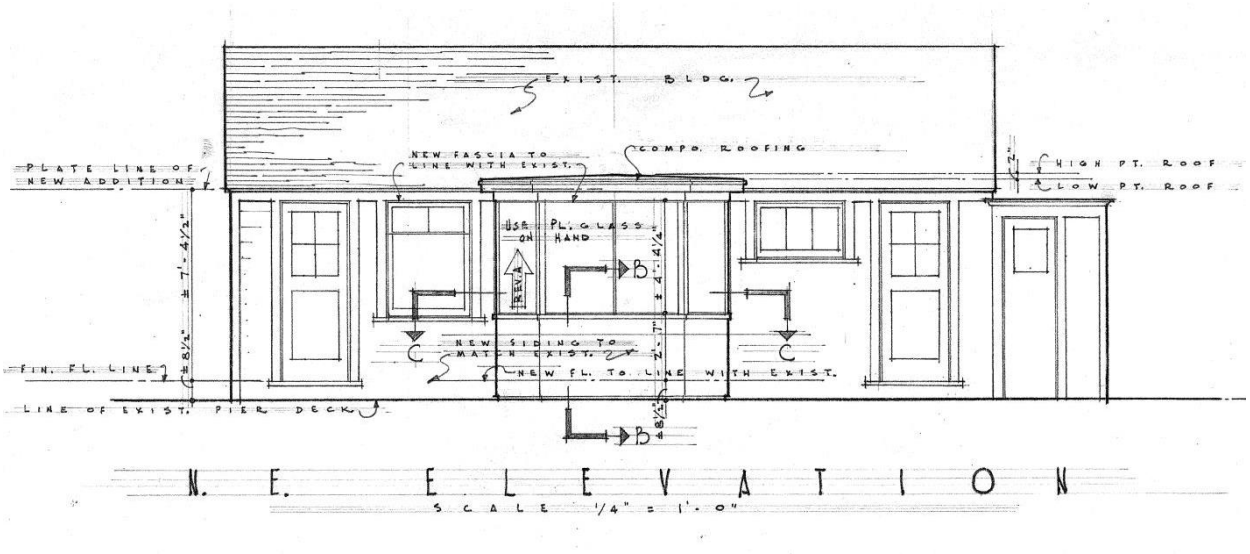
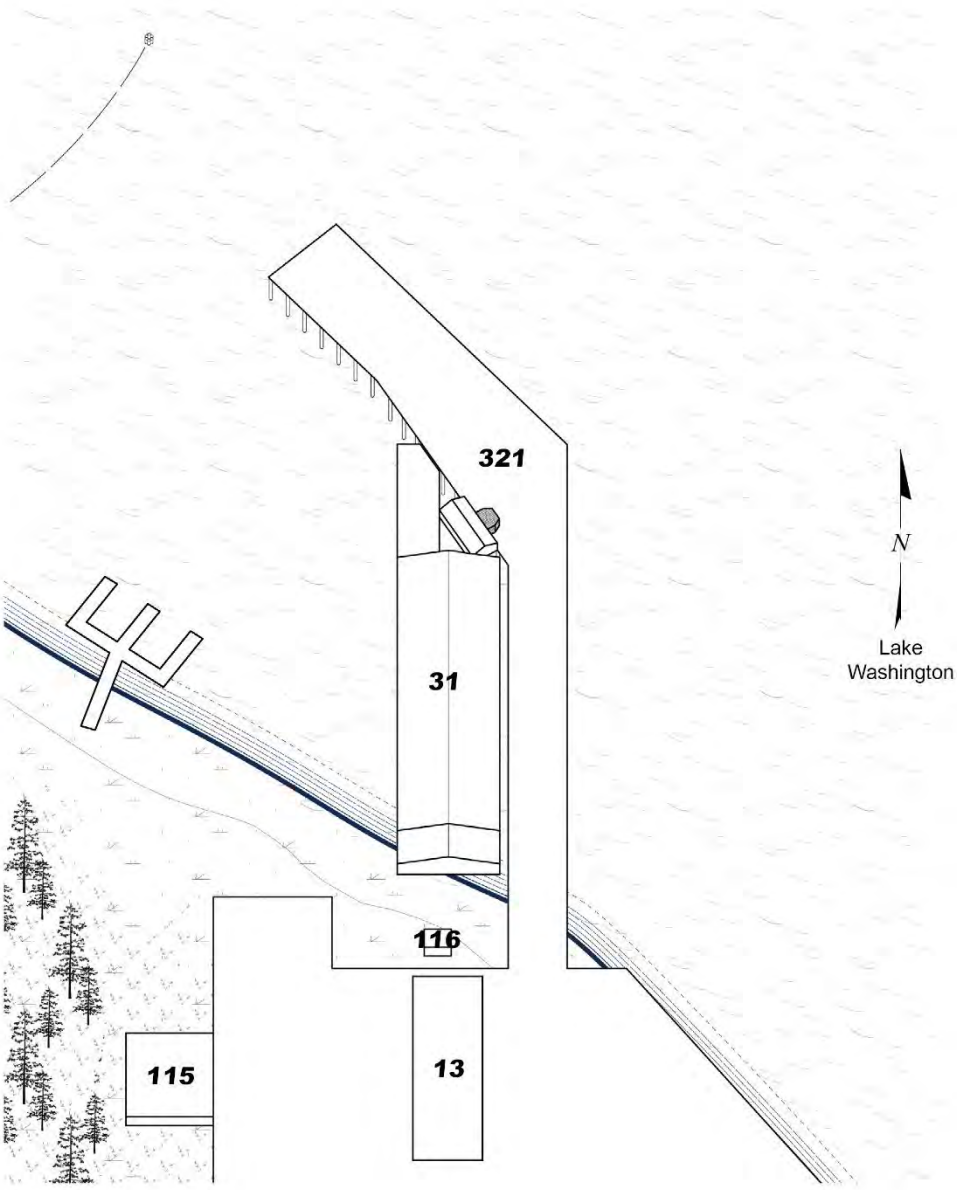



*Image 9*
An enlargement of a drawing showing the "Lookout Room" added to the original C.P.O.'s quarters in 1942. The small portion of the building to the right of the page is a telephone room.[21]

## 1943

In 1943, a lookout room is drawn as an addition to the C.P.O.'s quarters. No photographic evidence exists that proves this addition was ever built. However, the lookout appears on NAS Drawings # 1615 (SPR 55207), 1616 (SPR 55208), 2303 (SPR 55210), 1836 (SPR 46556), and 2455 (SPR 46558). The room as drawn contained a desk and radiator.

[21] Seattle Parks and Recreation, Building 31 Archive Drawing 55207 (NAS Drawing 1615)




**1943**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 13 - Garage and Storage | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

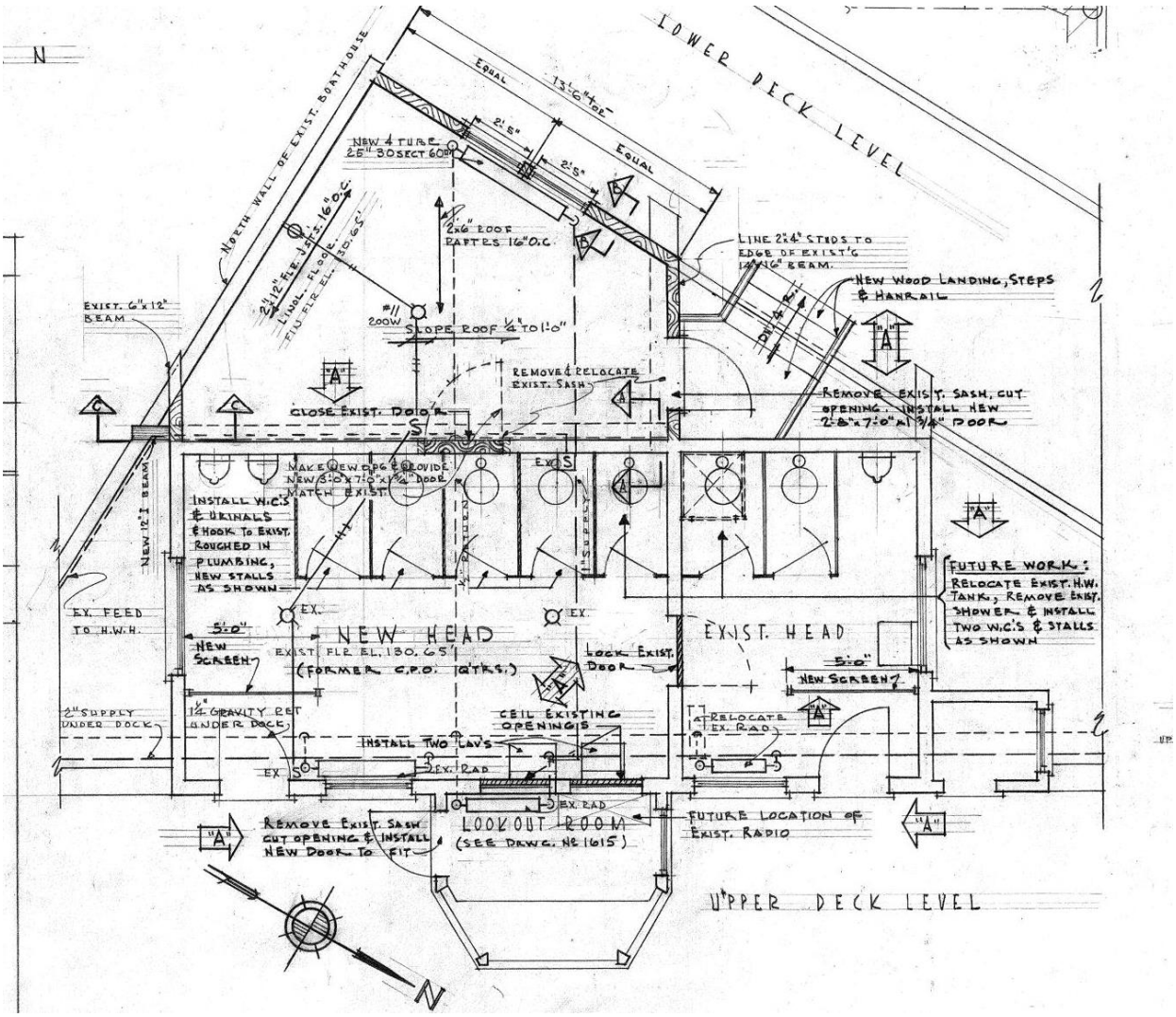
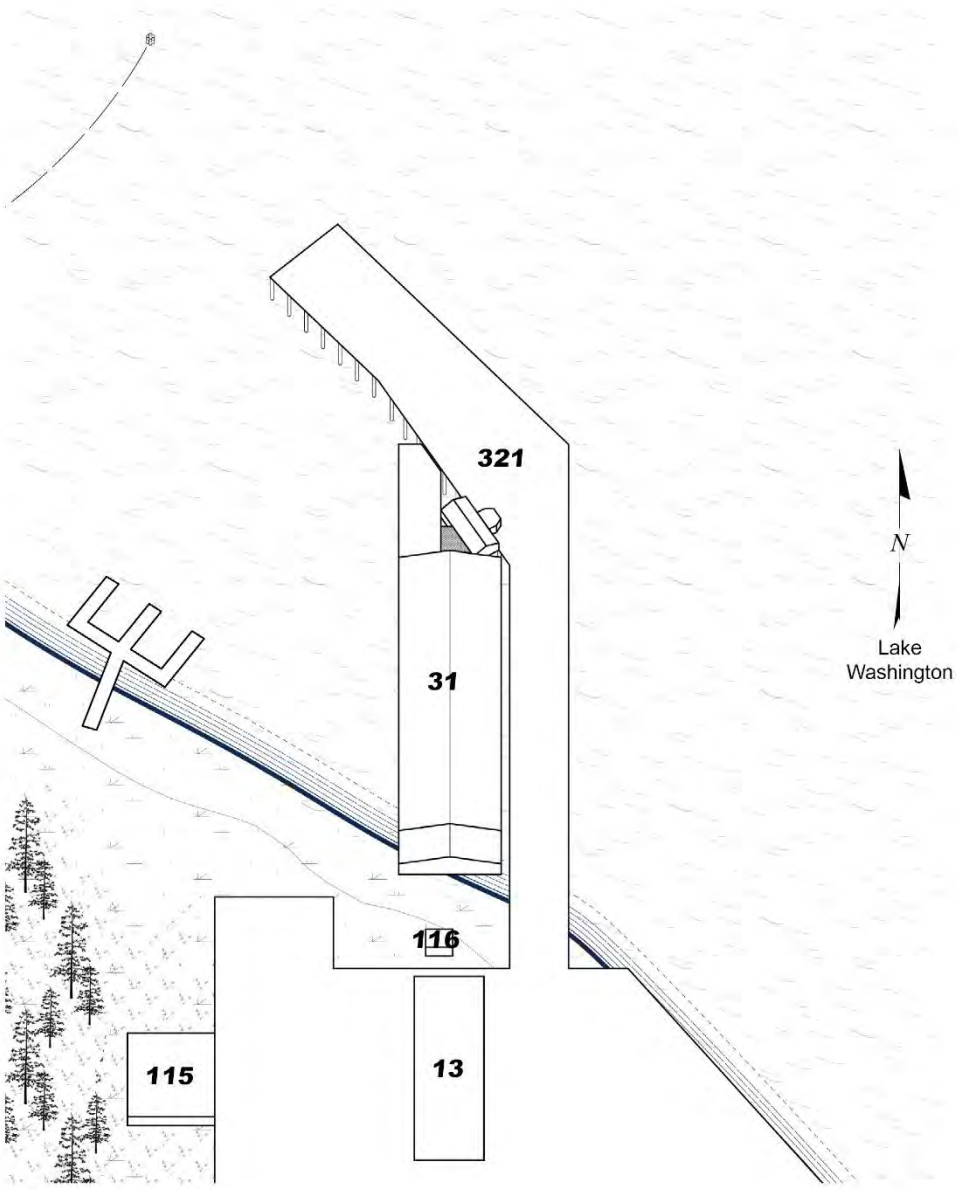



*Image 10*
An enlargement of drawings showing the infill addition to the original C.P.O.'s quarters in 1943. At this point in time, the C.P.O.'s quarters had been converted to a large head.[22]

## 1943

The same year, an addition to the C.P.O.'s quarters is added. This addition infills the space between the original "lower deck level" as identified on the drawings, the north wall of the original 1938 boathouse, and the east wall of the existing C.P.O.'s quarters. No function is identified for this addition on the drawings, however it is isolated from the C.P.O.'s quarters, which are turned into a new expanded head containing three urinals and seven toilets. The addition is only accessed by a set of stairs to the lower deck level of the original 1938 boathouse. A radiator is installed within the addition.

[22] Seattle Parks and Recreation, Building 31 Archive Drawing 55208 (NAS Drawing 1616)




**1943**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 13 - Garage and Storage | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

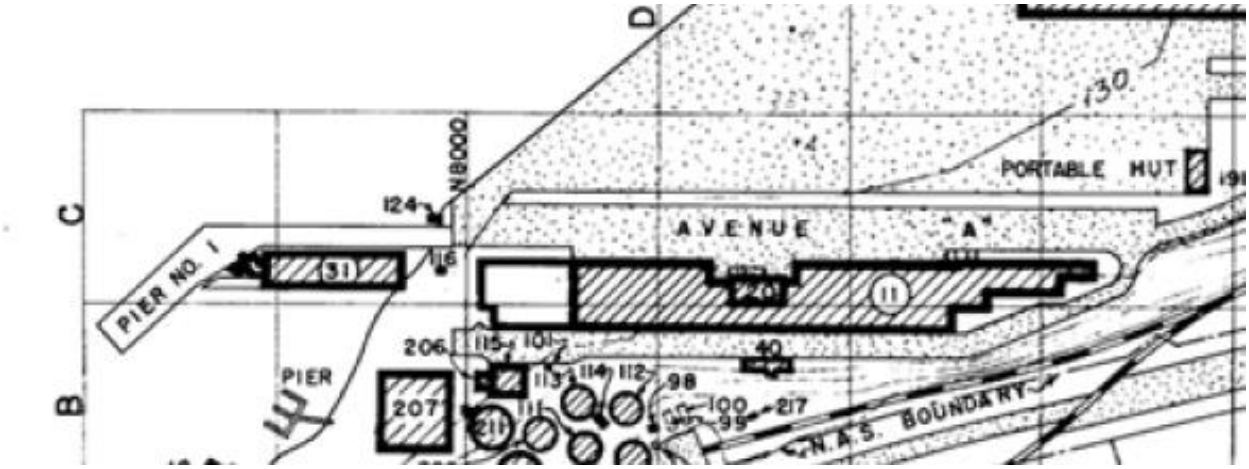



*Image 11*
An enlargement of a site plan drawing showing the complete extents of construction of Building 11 in 1944.[23]

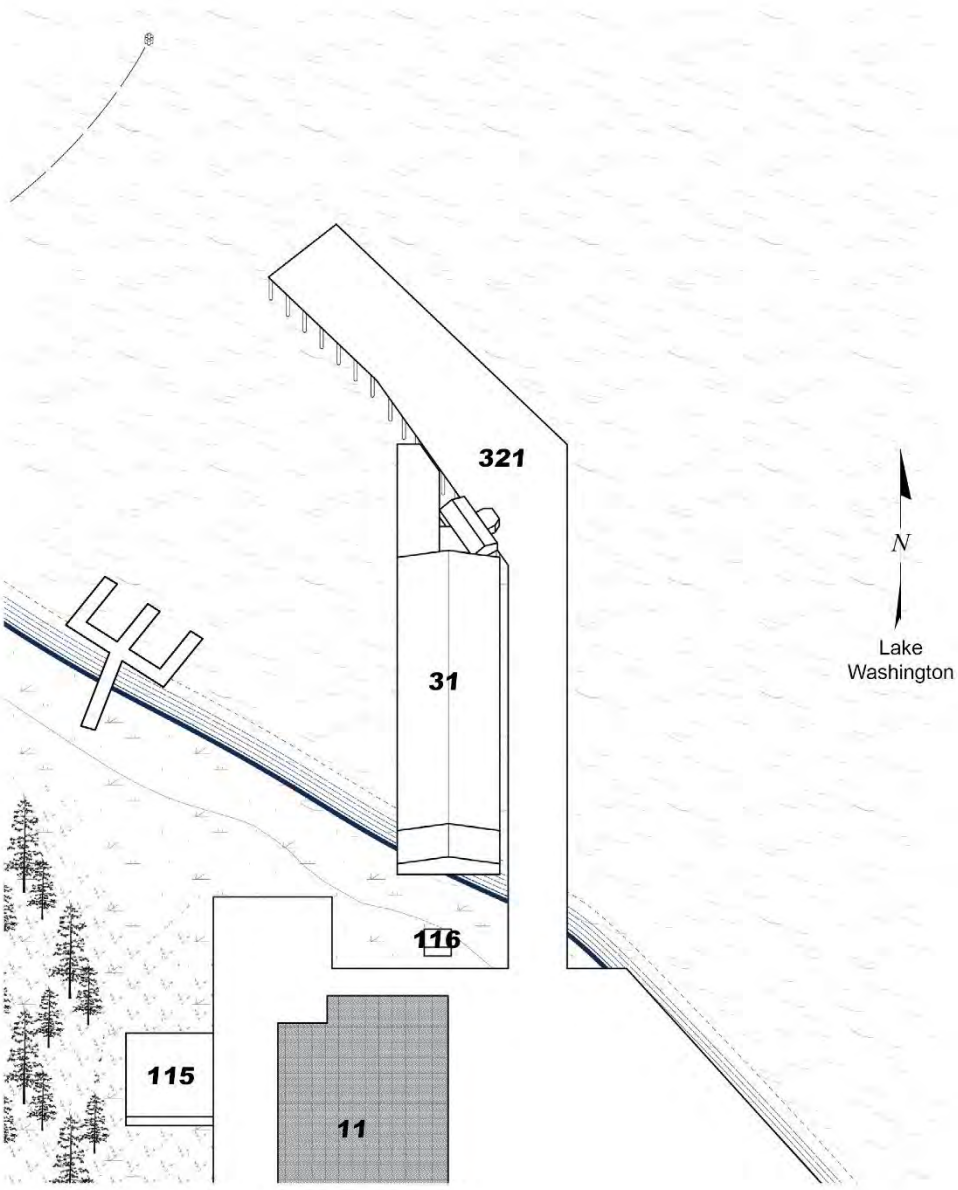
**1944**

Building 11 supplants Building(s) 13.

Building(s) 13 are identified as “Garage, storage shed” in NAVSTA PS Appendix C, In the 1942 site plan showing existing conditions of NAS Seattle, Building(s) 13 are identified as “Storage Sheds – Public Works.” In a 1938 site plan showing proposed condition, Building(s) 13 are split into two identification numbers, Building 11 to the north, called “Shop Building” and a building to the south of this “Shop Building” called Building 13 and assigned “Garage”. Across many site plans, the naming and ID #s of Building 13 are inconsistent, with some site plans labeling multiple buildings with ID 13. Regardless, Buildings 11 and 13 are combined into a single Building 11 in 1944.

Evidence on site suggests that Buildings 13 were demolished and cleared for Building 11.

[23] Seattle Parks and Recreation, Building 31 Archive Drawing 46556 (NAS Drawing 1836)


321
31
116
115
11
N
Lake
Washington
1944
New Construction
Existing Structure
Demolished Structure
Building Legend
ID# - Description
11 - Public Works and Shops
31 - Boat House
115 - Sewage Sludge Bed
116 - Sewage Pumping Station
321 - Pier 1

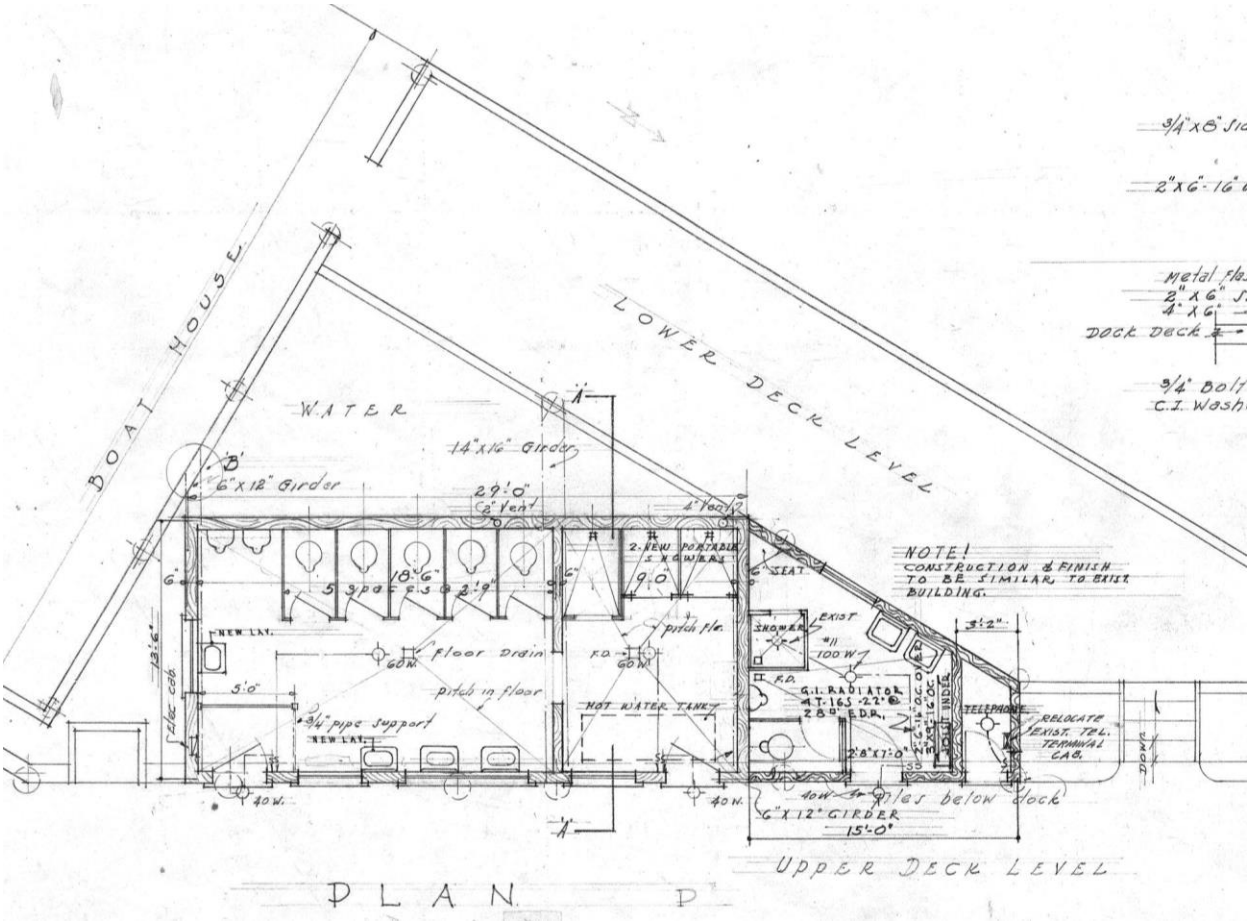
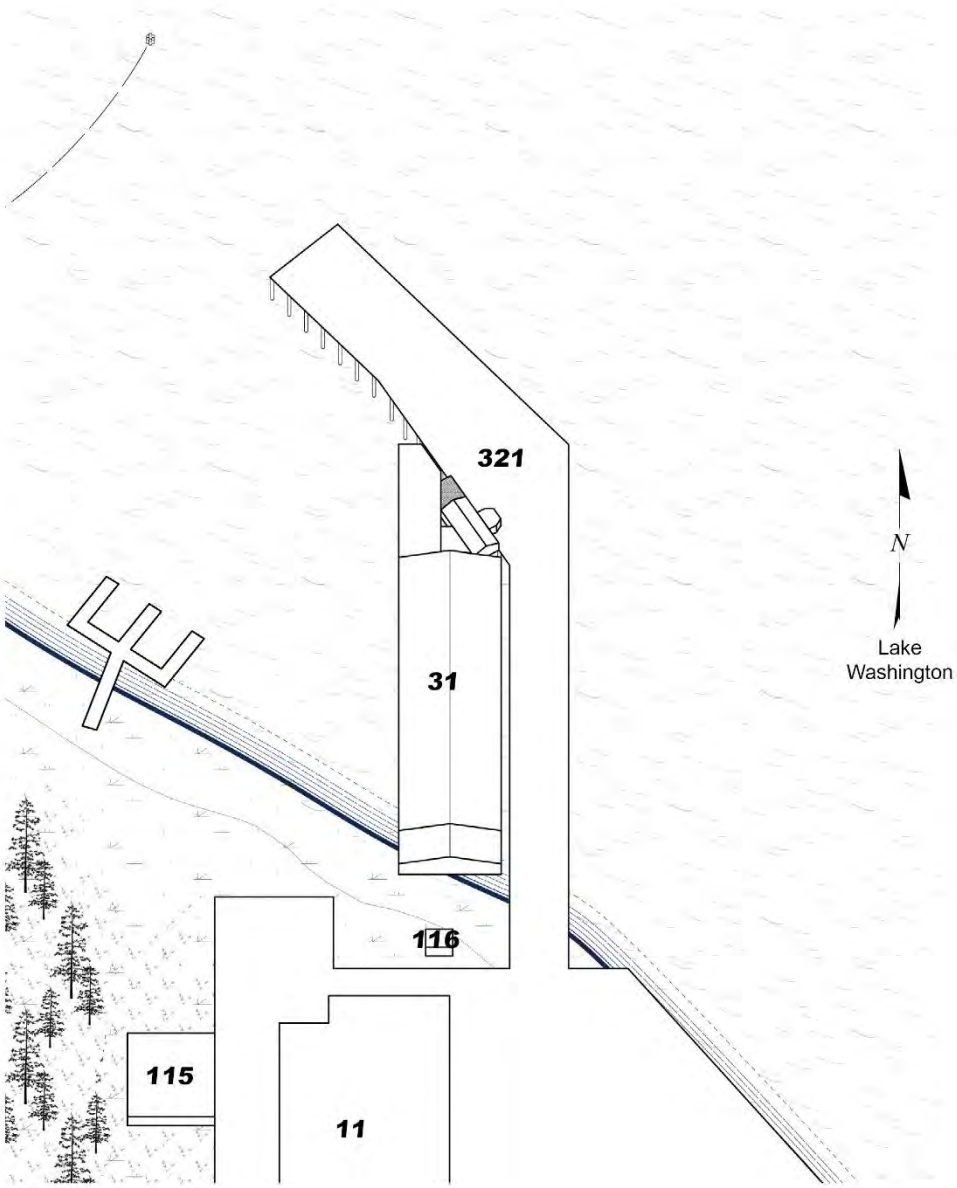



*Image 12*
An enlargement of a drawing showing the extent of addition in 1946 to the existing head, north of the covered moorage.[24]

## 1946

A stand alone, separate addition to the former C.P.O. quarters is made to the north of the existing head expansion that consumed the C.P.O.'s quarters. This addition contains a shower, two lavatories, one urinal, one toilet and a radiator. In conjunction, two toilets and one urinal are removed from the 1943 head expansion and replaced with three showers.

[24] Seattle Parks and Recreation, Building 31 Archive Drawing 55209 (NAS Drawing NAS 110)




**1946**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

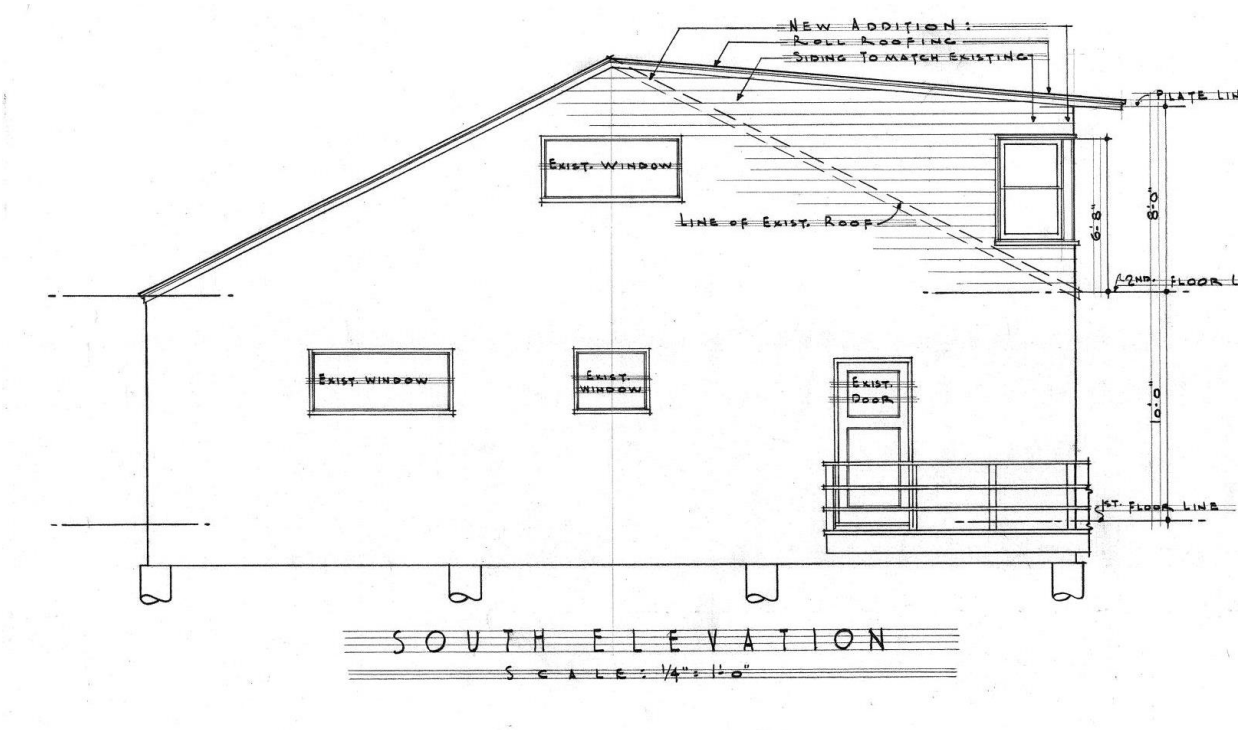
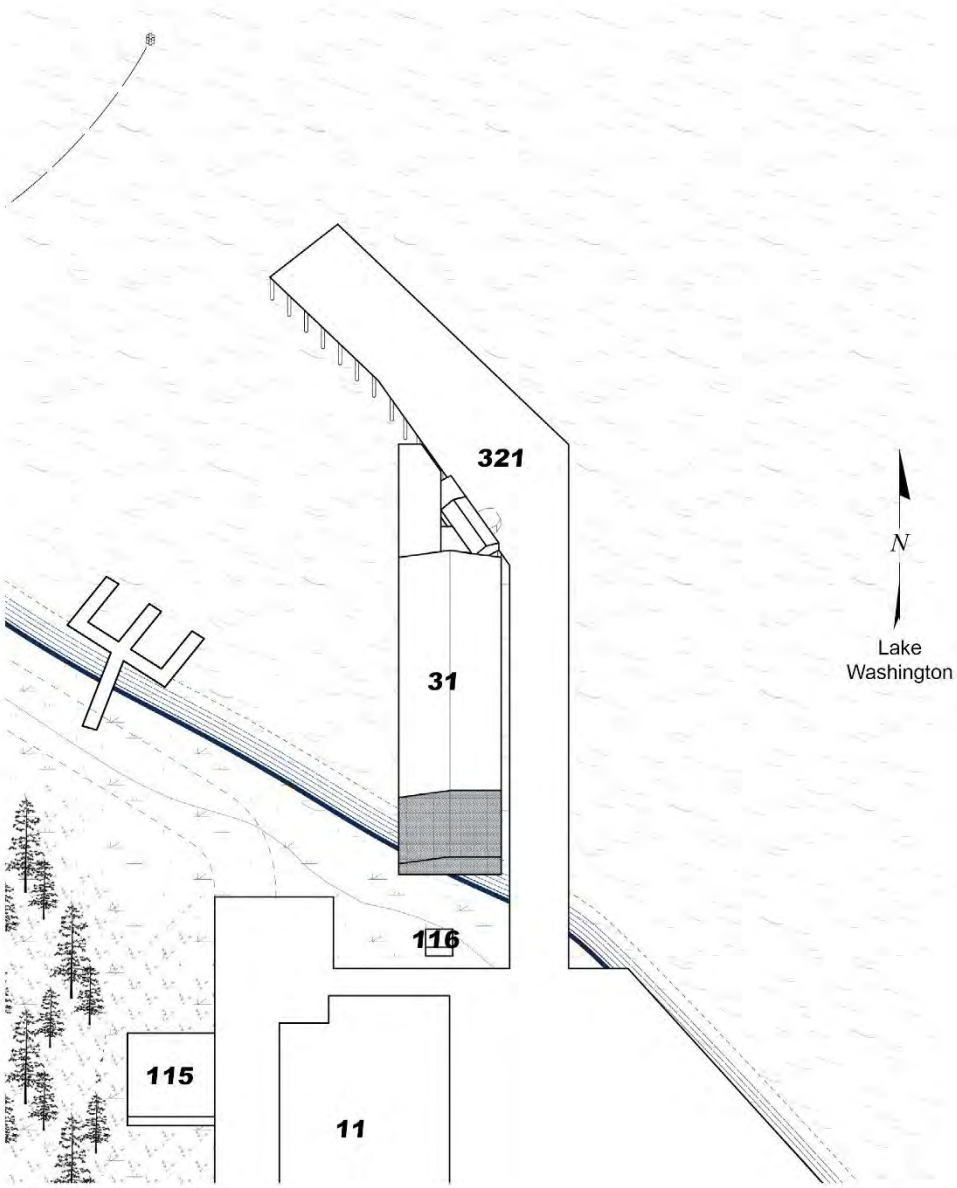



*Image 13*
An enlargement of a drawing showing the second level addition added in 1946 over the two southern-most bays of B31.[25]

## 1946

A second level is added to the southern portion of the boathouse. This addition also changes the roof form, adding a row of ten windows within a flat dormer facing east toward Lake Washington. Within the new level is a, “New Lookout Room,” and a “New Work Space.” In addition, the first level head is relocated to the second level. See drawing 2303 (SPR # 55210).

[25] Seattle Parks and Recreation, Building 31 Archive Drawing 55210 (NAS Drawing 2303)




**1946**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

*Image 14*
A photograph from the early 21st century showing the decayed extents of "Recreational Pier No. 7. The boathouse to the right was added to the site in 1976 and removed in 2005.[26]

**1950**

"Recreational Pier No. 7" (Building 324) is constructed. An adjacent recreational sailing pier is demolished. This demolished pier was used for mooring "Flattie" sailboats. It is guessed that the new recreational pier expanded this functionality. See drawings 2455 (SPR #s 46558 and 46557)

> *The Flattie is a very simple design, a flat-bottom centerboard boat with a fractional sloop rig. Flotation under the decks assures that the boat will not sink. The most unique feature of the class is its centerboard and inboard rudder, both of which can be trimmed fore and aft to optimize the boat's performance under different conditions. The first boats were built by the Blanchard Boat Co, and sold for $150. The Flattie was also built by other local boat companies and by amateurs, so construction varies but is generally very simple, with straight sawn frames and flat sides, bottom, and deck. Later boats were mostly made of plywood, where earlier boats were planked.*[27]

[26] Sail Sand Point. Archive Photos. Date Unknown.
[27] Center for Wooden Boats. https://www.cwb.org/livery-boats/geary

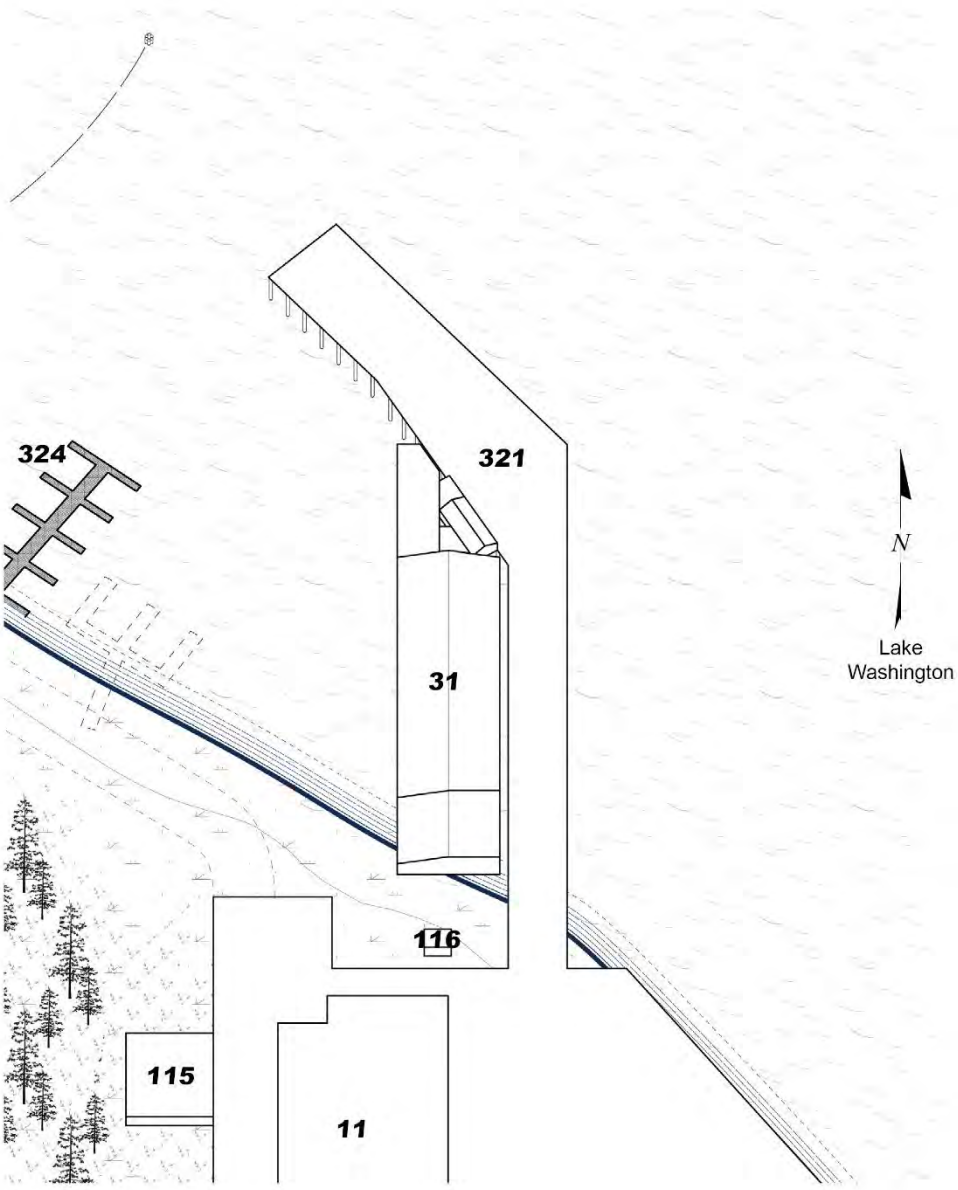
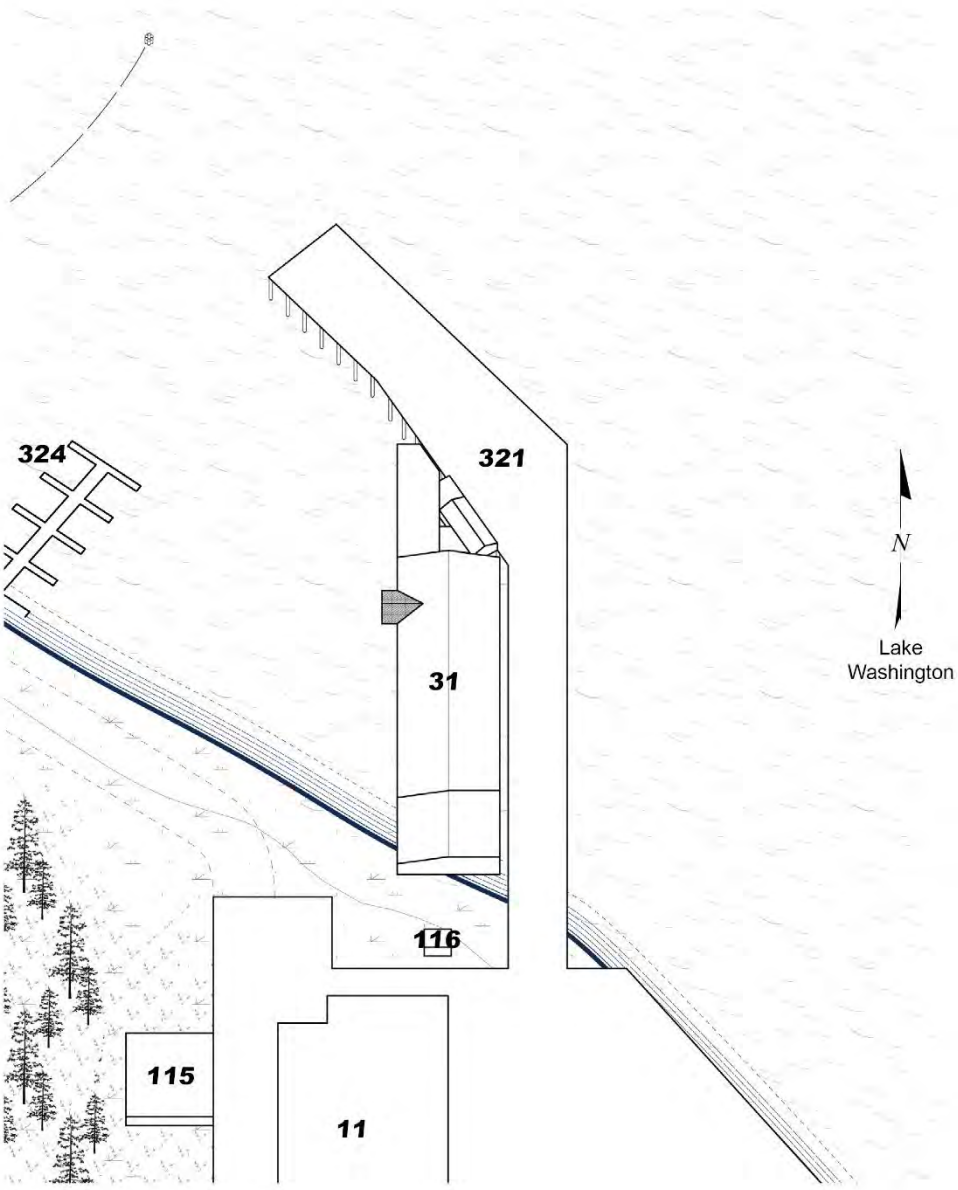

324
321
31
116
115
11
N
Lake
Washington
1950
New Construction
Existing Structure
Demolished Structure
Building Legend
ID# - Description
11 - Public Works and Shops
31 - Boat House
115 - Sewage Sludge Bed
116 - Sewage Pumping Station
321 - Pier 1
324 - Small Boat Dock

*Image 15*
A photograph from the early 21st century showing the extent of the gable dormer addition to the west façade of the covered moorage.[28]

**1956**

A gable roof dormer is added to the west side of the B31 covered moorage within the bay second to the northern end of the covered moorage. This alteration was made to accommodate a "40ft crash and rescue boat". This provided an additional 6' of over water coverage within the covered moorage slip. No additional piles are drawn related to this alteration. See: Drawing 2833 (SPR # 55211)

[28] Sail Sand Point. Photo Archives. Date Unknown.




**1956**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | 324 - Small Boat Dock |

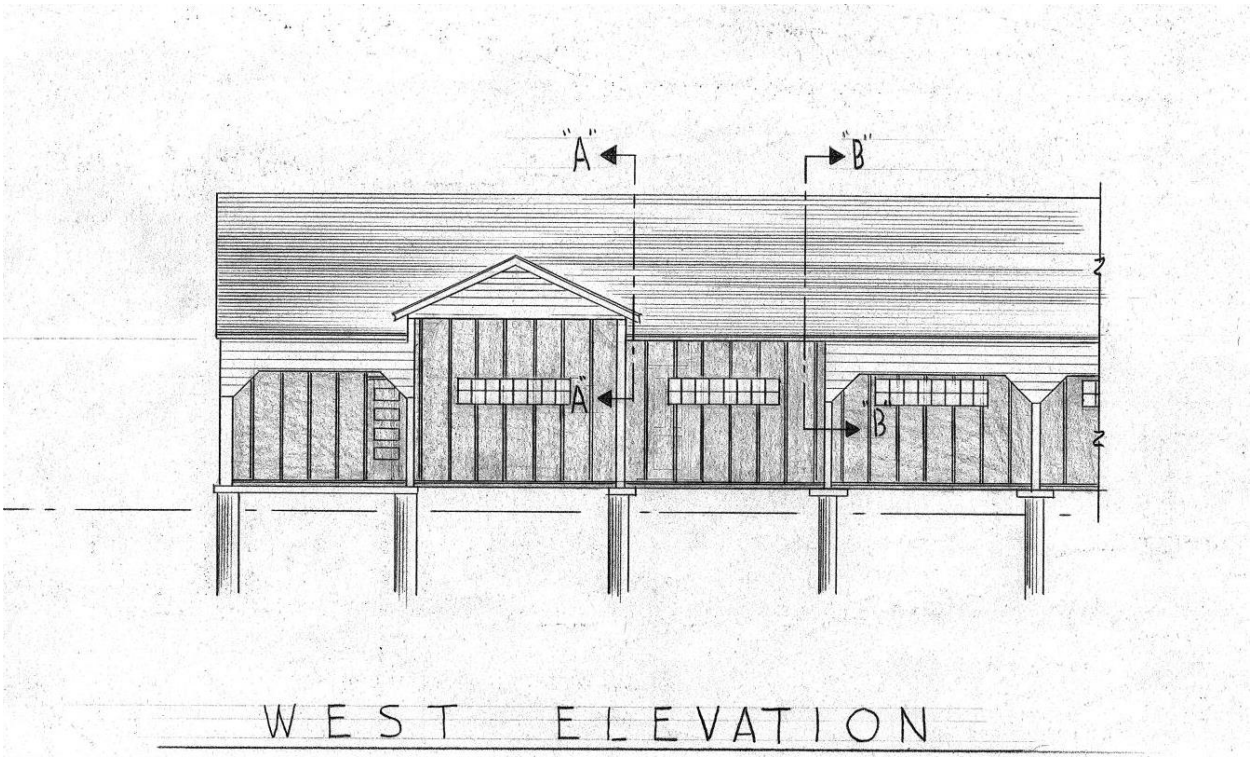



*Image 16*
An enlargement of an architectural drawing showing the extent of alteration to the west facade.[29]

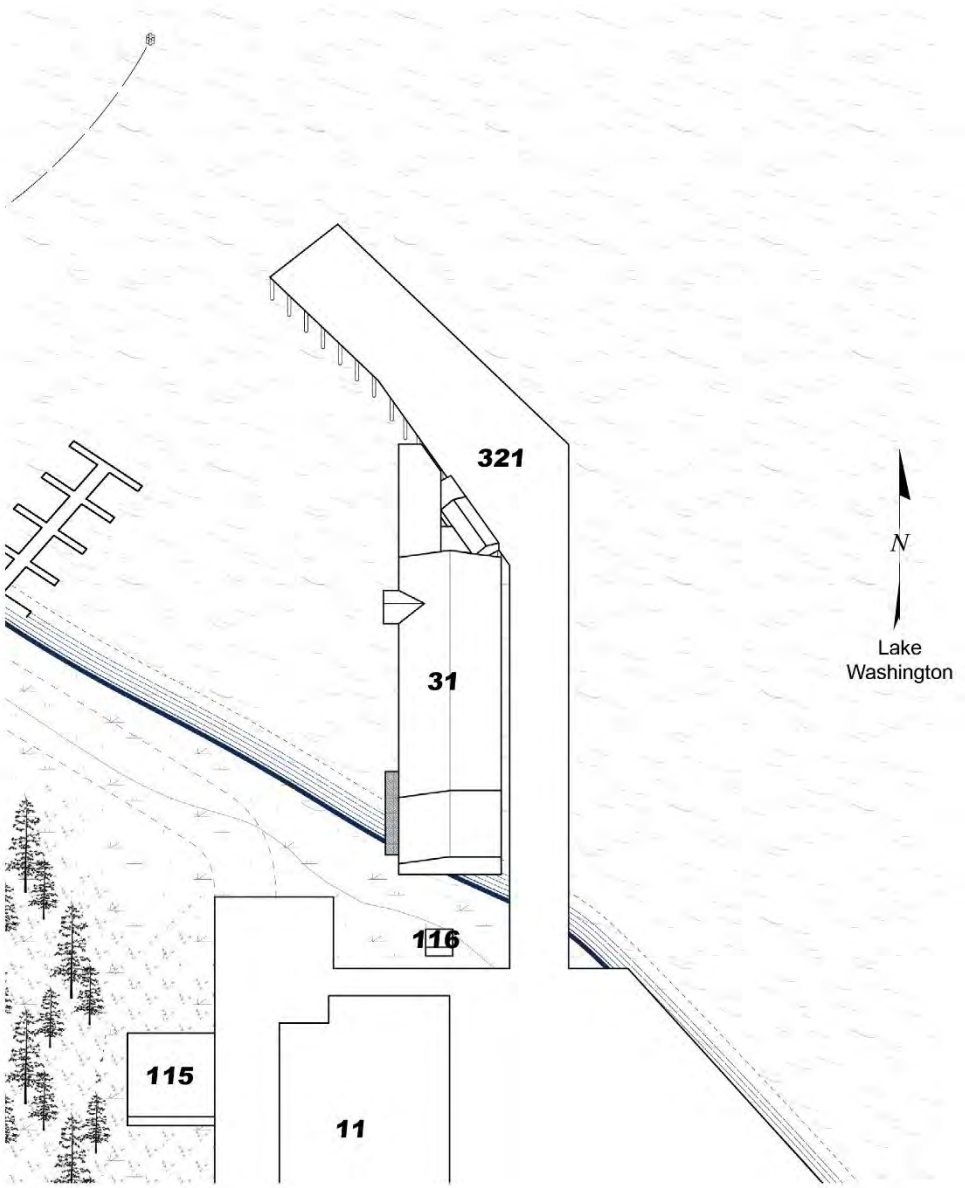
**1965**

An alteration is made to the covered moorage bay opening to the south of the 1956 dormer addition. The opening is maximized and all cladding and structure is removed from the opening to facilitate the accommodation of "No 2 Crash Boat." See: Drawing 2921 (SPR # 55212)

In addition, around this year, an entry platform is added on the west side of the building, that provides access from the shoreline to the covered moorage bay.

See: UW Libraries, Aerial Photographs, 1965 Mylar Enlargements T25N, R4E, S2

[29] Seattle Parks and Recreation, Building 31 Archive, Drawing 55212 (NAS Drawing 2921)




**1965**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

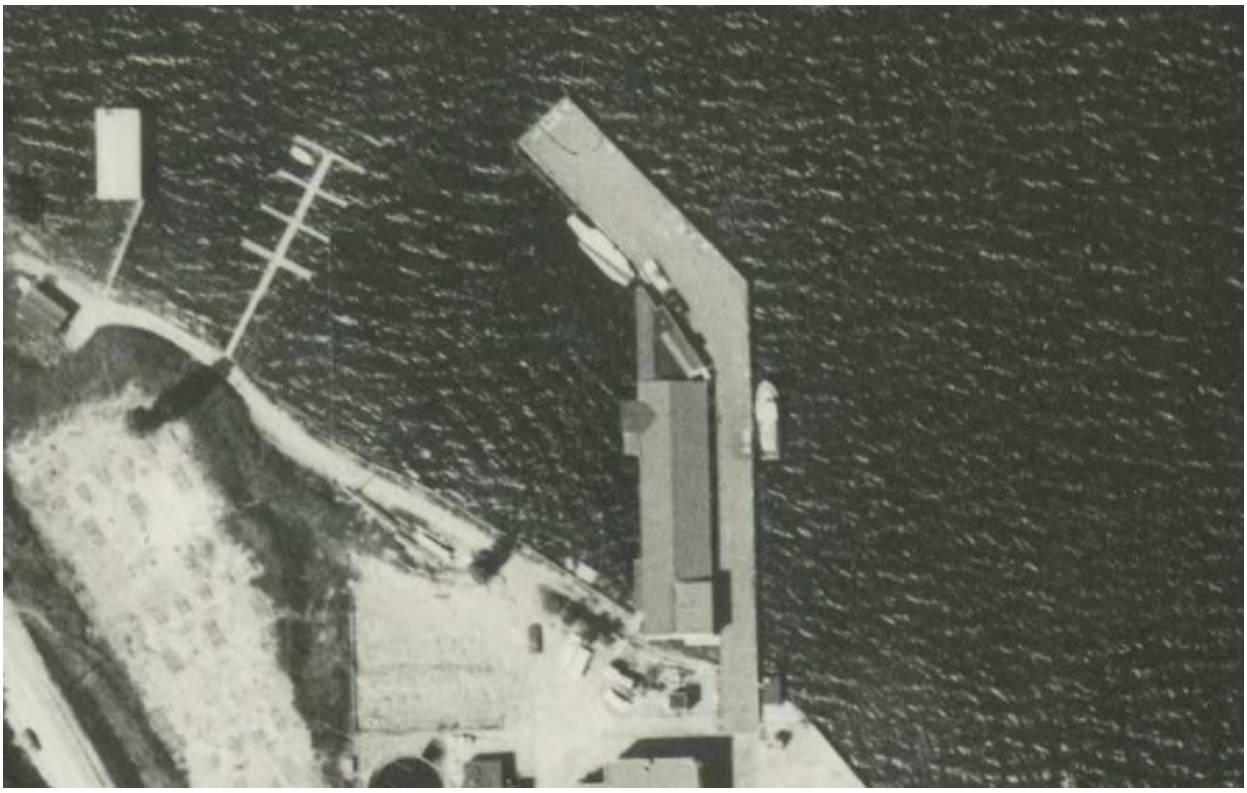
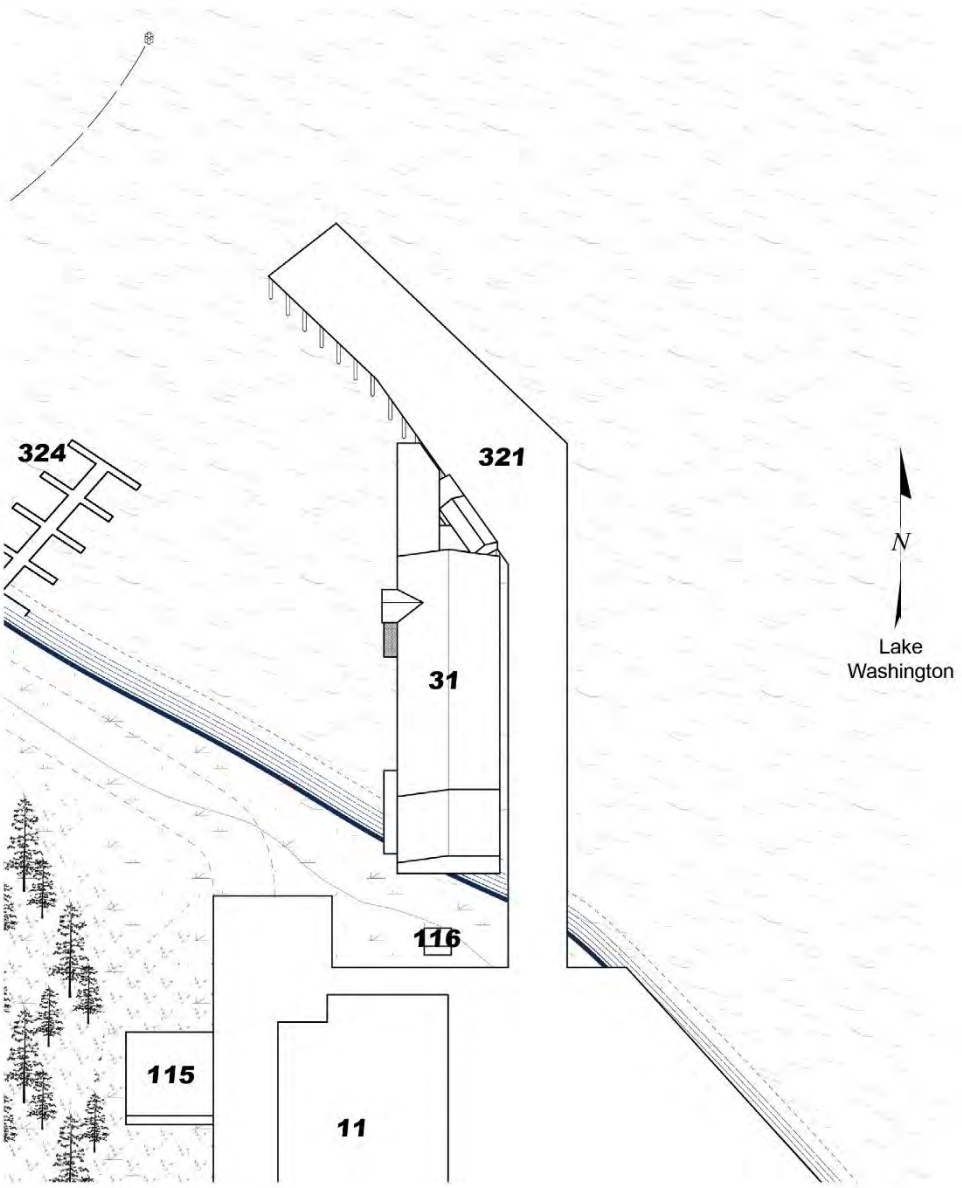


*Image 17*
An enlargement of an aerial photograph taken in 1970, documenting the addition of a shed roof covering to the south of the gable dormer alteration.[30]

**~1970**

A shed roof extension over crash boat no. 2 slip is constructed on the west façade. No drawings of this alteration have been found, however photo-documentation confirms its existence.

[30] UW Libraries, Aerial Photographs, 1970 Enlargements T25N, R4E, S2




**~1970**

| | |
|---|---|
| New Construction | |
| Existing Structure | |
| Demolished Structure | |

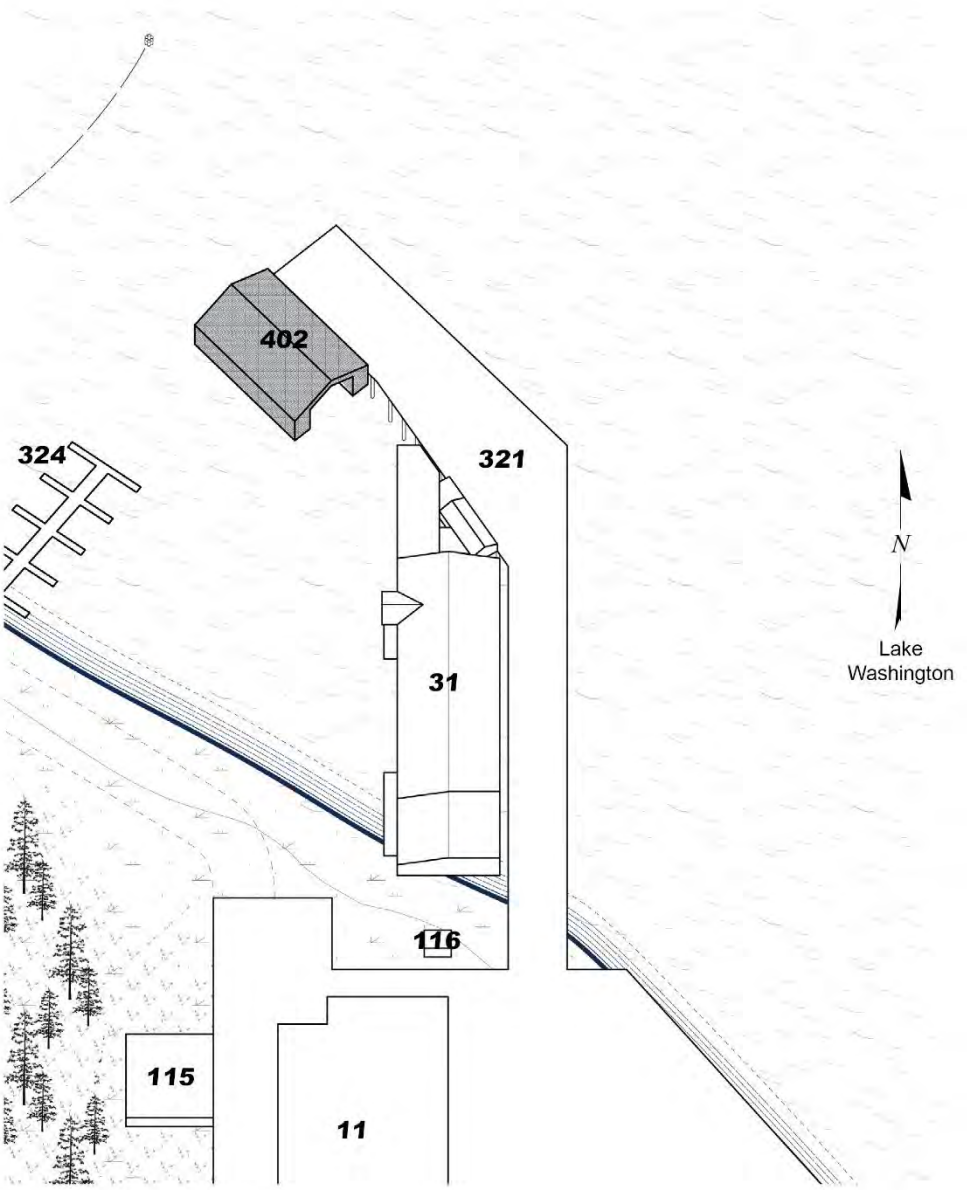
| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | 324 - Small Boat Dock |

*Image 18*
A photograph from the early 21st century showing Building 402, moored to Pier 1.[31]

**~1976**

The “Floating Boat House” (Building 402) is brought into the site. 1976 is the earliest year that photo documentation and site existing conditions drawings show Building 402. The building is named “Admiral’s Floating Boat House” within the Sand Point Historic Properties Reuse and Protection Plan. See: Drawing 3430 (SPR # 46567), UW Libraries Aerial Photographs 1970 KP-70 28-105, 106

[31] Sail Sand Point. Photo Archives. Date Unknown.




**~1976**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description | |
|---|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station | 402 - Admiral's Boat House |
| 31 - Boat House | 321 - Pier 1 | |
| 115 - Sewage Sludge Bed | 324 - Small Boat Dock | |

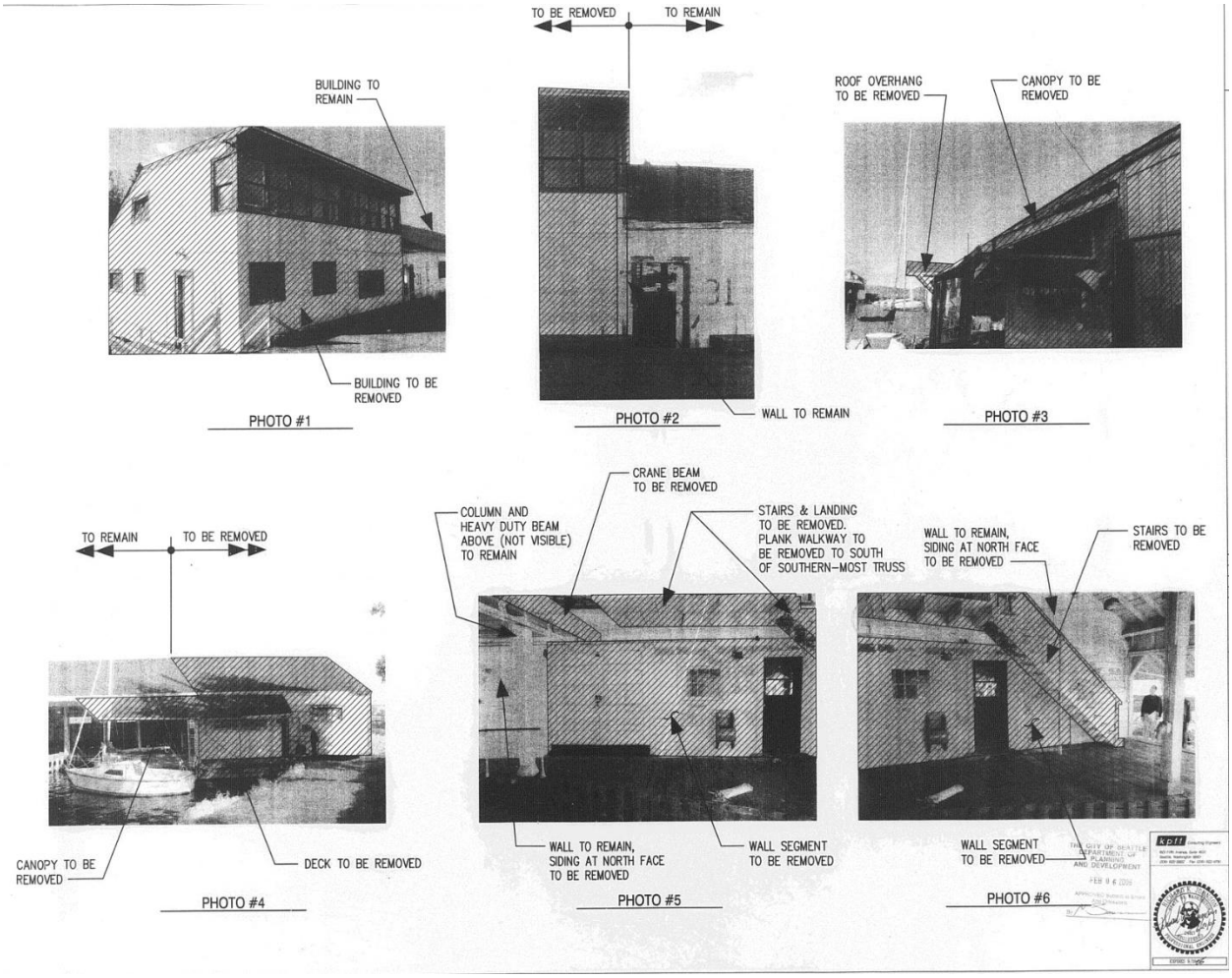
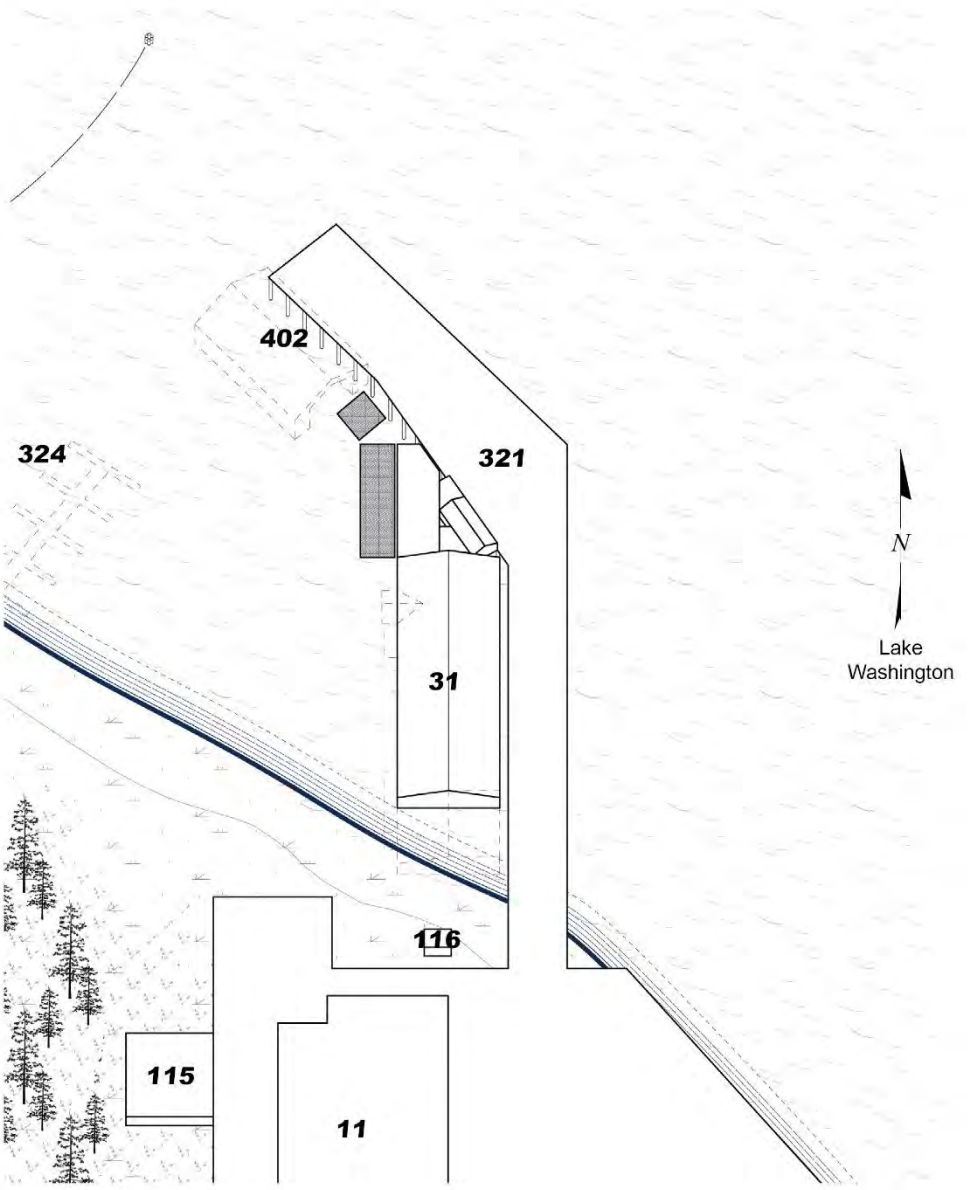



*Image 19*
An enlargement of JARPA permit drawings showing the extent of demolition of B31 as part of the North Shore Recreation Area Phase 1 construction.[32]

## 2005

In 2005, demolition of many portions of B31 was undertaken in an effort to "facilitate restoration of more natural shoreline conditions." This demolition included the southern access platform added in 1965, the shed roof extension added in ~1970, the gable dormer added in 1956, the additional bay added in 1942, the original enclosed bay to the south of the covered moorage build in 1938, and the second story addition from 1946. See: Memorandum of Agreement Between Warren G. Magnuson Park Division of the Seattle Department of Parks and Recreation and the Washington State Historic Preservation Officer Regarding the Partial Demolition of Building 31, Located at Warren G. Magnuson Park.

[32] SDCI Microfilm Archives. North Shore Recreation Area At Magnuson Park: Phase 1 Construction. Sheet BD-2.




**2005**

New Construction
Existing Structure
Demolished Structure

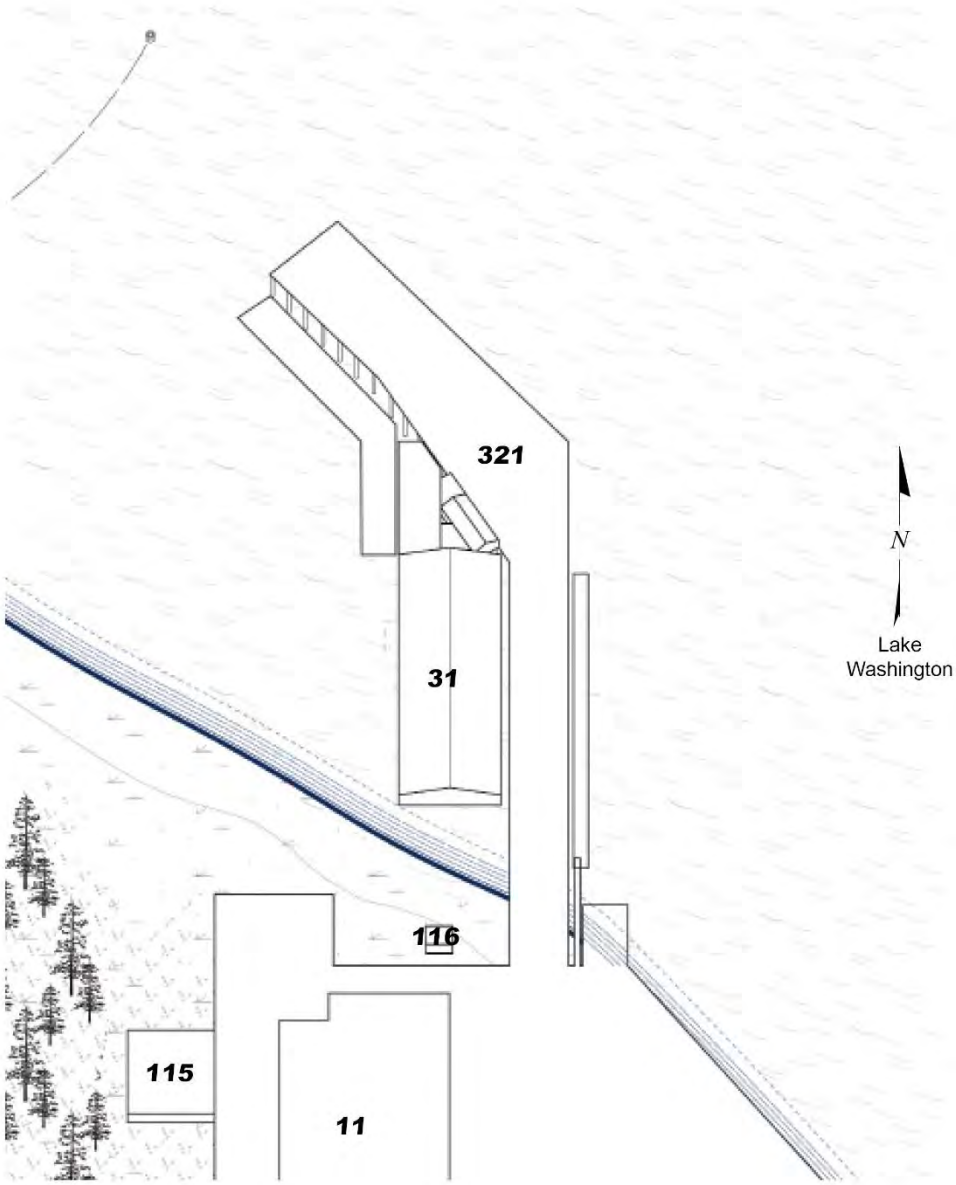
| Building Legend | ID# - Description | |
|---|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station | 402 - Admiral's Boat House |
| 31 - Boat House | 321 - Pier 1 | |
| 115 - Sewage Sludge Bed | 324 - Small Boat Dock | |

*Image 20*
A contemporary photograph showing the extent of boarded windows along the east façade of the covered moorage of B31.[33]

**2016**

Lead and Asbestos abatement within B31 was executed by Grayhawk construction. This included sandblasting and removing lead paints and asbestos materials from B31. In addition to the paint removal, it was found that the windows within the covered moorage area contained lead within each of the divided lites. These windows were encapsulated with plywood on both sides as part of the lead remediation. Since this work in 2016, no further work or alterations have taken place.

[33] Photo: Miller Hull Partnership, Glen Stellmacher, August, 2019.




**2016**

New Construction
Existing Structure
Demolished Structure

| Building Legend | ID# - Description |
|---|---|
| 11 - Public Works and Shops | 116 - Sewage Pumping Station |
| 31 - Boat House | 321 - Pier 1 |
| 115 - Sewage Sludge Bed | |

## The Big Picture of Change

As the navy rapidly constructed its wartime operations, building in haste was very common. This has led to buildings that look disjointed or are a conglomeration of uses. B31 is no exception to this rule. Stepping back and viewing the aggregation of changes to B31 through Navy use and occupation, it becomes clear that the singular constant of the building is the volume of covered moorage. To the north and south of the covered moorage, form and uses of the building have changed consistently over time.

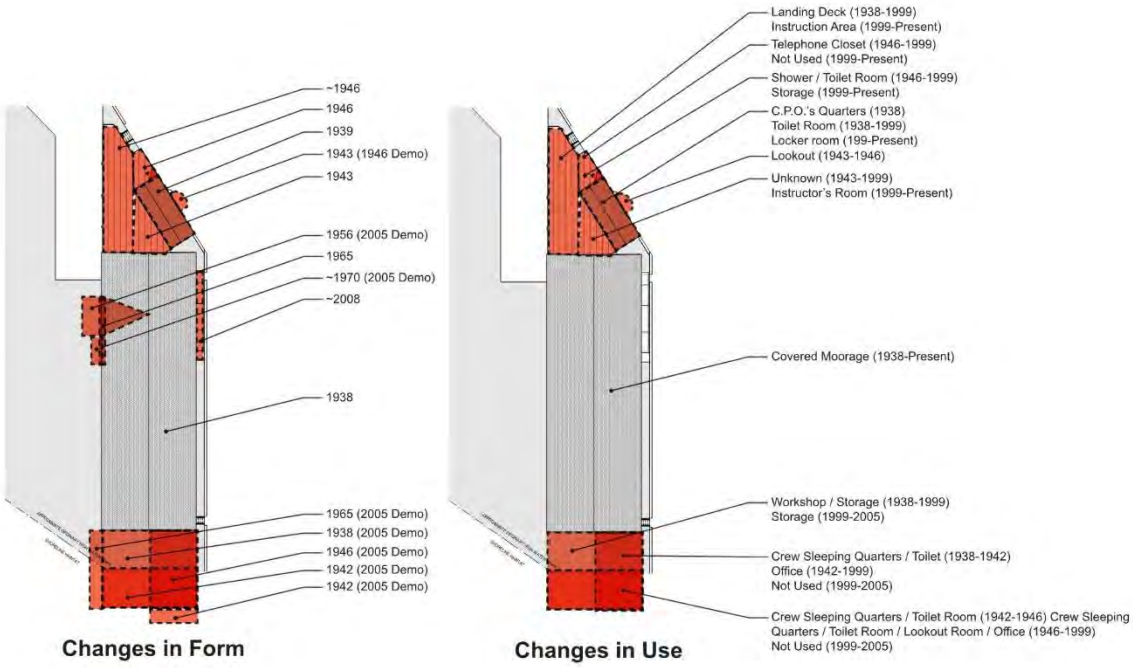



*Image 21*
Diagrams outlining the known changes in form (red) and changes in use (red) of B31 over its entire lifespan since first construction in 1938.

# 5.0 Site Ecology

## Scope of Review

Within this phase of work, Miller Hull met with Washington Department of Ecology (ECY) to review high level ecological issues within the project site. In addition to this discussion, relevant documents were also reviewed for information pertaining to the project site. The following documents are critical within this review:

| Year | Author | Study Title |
|---|---|---|
| 2002 | Anchor Environmental | Biological Evaluation for ESA Species: North Shore Recreation Area, Sand Point Magnuson Park, City of Seattle Department of Parks and Recreation |
| 2003 | Anchor Environmental | Wetland Delineation: North Shore, Sand Point, Magnuson Park |
| 2004 | City of Seattle | Memorandum of Agreement – DPR -WA SHPO – Building 31 |
| 2010 | City of Seattle | Shoreline Characterization Report |
| 2012 | WA Dept of Ecology | Lake Washington Docks and Shoreline Permits Fact Sheet |

*Table 2*
*Documents reviewed by Miller Hull that contain information on project site ecology*

## Findings

*Birds*

On 11/12/19 MHP and Jan Bragg, of the Seattle Audubon Society, walked the site of Building 31 to understand how birds use the area. Barn Swallows are found at Magnuson Park from April – October in some years and at least May – September annually. The earliest log Jan recorded of Barn Swallows on the north shore was April 18th. The latest Jan has recorded Barn swallows on the north shore is September 14th. No evidence of nesting within B31 was found or recorded. A number of regulations exist pertaining to birds, specifically, the Migratory Bird Treaty Act (MBTA) 16 U.S.C. 703-712, and the Urban Bird Treaty signed by Seattle Mayor Edward Murray on May 5, 2017.

Actions this project can pursue in accordance to the Urban Bird Treaty include the following:

- Create habitat within project scope
- Address trash / recycling receptacles on Pier 1.
- Add educational component to all SSP classes on birds / environment of Lake Washington. Add site interpretative elements on birds.
- Manage Invasive species. -Identify those that are invasive. Remove them, plant native species.
- Use bird strike mitigation measures within the building:
- Windows, either include a white vertical frit with pattern every four inches or horizontal frit pattern every 2 inches on the exterior of the glass or include a screen in front of glass. Curtains or shades so the glass does not appear see-through.
- Bird feeders should be placed at least 30ft. from building glass.

- Do not allow plants inside near windows.
- Eliminate indoor and exterior lighting after dark 11pm-sunrise during migratory season.

*Lake Sediment Sampling*

As part of the 2009 North Shore Recreation Area (NSRA), Joint Aquatic Resource Permit Application (JARPA) submittal, "The US Navy and Washington Department of Ecology conducted bioassays on sediment samples in the waters adjacent to the NSRA and found no areas at levels of concern in the western portion of Pontiac Bay, including the non-motorized boating area of the NSRA."[34]

In addition to bioassay analysis, the US Navy, in 2017, as part of the "Final Radiological Site Inspection Report," sampled sediment within the vicinity of storm sewer outfalls within the NSRA. These locations were identified within the November 2, 2016 Final Radiological Preliminary Assessment Report Former Naval Station Puget Sound, Seattle, Washington. The intention of these samples was to determine the concentrations of radiological compounds of concern. No sediment sample exceeded the Project Action Limits for radiological compounds of concern.[35]

*Endangered Species Act*

Through the review of existing documentation, it is understood that one species listed within the Endangered Species Act (ESA) are likely to be found within the project site. This includes Chinook Salmon (Threatened). At the time of analysis in 2002, Coho Salmon were considered a candidate species for listing under the ESA. As of 10/18/19, the Lake Washington /Sammamish Tributaries Coho are not listed under the ESA, however they are listed as a species of concern. Bull trout are likely not to have a sustained population within Lake Washington, Bald Eagle sites, in 2002, have not been found within the project site, however, "Wintering bald eagles may also occur in the project vicinity between October 31 and March 31."[36] Marbled Murrelets, who nest in old growth forests and make daily trips to salt water to forage, do not have access to ocean waters or old growth forest, and thus are not expected to be found on site.

*Existing Site Habitat*

As part of the 2009 NSRA site restoration, a portion of B31 was demolished to facilitate near-shore salmonid habitat.

> *Essential habitat types for chinook salmon consist of the following: (1) juvenile rearing areas; (2) juvenile migration corridors; (3) areas for growth and development to adulthood; (4) adult migration corridors; and (5) spawning areas. Within these areas, essential features of critical habitat include adequate: (1) substrate; (2) water quality; (3) water quantity; (4) water temperature; (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions.*[37]
>
> *Chinook fry enter Lake Washington from mid-January through mid-March. The most important area used by fry while rearing in the lake is the littoral zone (less than 30 feet). Surveys of both the limnetic and littoral zones of Lake Washington have indicated that chinook (0-12 months old) occupy the littoral zone exclusively from early February*

[34] 2002 Biological Evaluation for ESA Species: North Shore Recreation Area, Sand Point Magnuson Park, City of Seattle Department of Parks and Recreation. Page 19
[35] Further information can be found within the 2017 final radiological site inspection report
[36] 2002 Biological Evaluation for ESA Species: North Shore Recreation Area, Sand Point Magnuson Park, City of Seattle Department of Parks and Recreation. Page 29.
[37] Ibid Pg. 23.

> *through late May. Chinook fry prefer areas that have small substrates (sand and small gravel) as well as areas around creek mouths and undeveloped shoreline. Chinook smolts enter the lake from mid-May through July. Smolts spend more time rearing in riverine habitats and use the lake primarily as a migratory corridor to exit the watershed. During this migration period, juveniles can be found using much of the littoral zone of the lake and some limnetic habitats. Observations by WDFW indicate that most juvenile chinook are found in areas between three and six feet deep and adjacent to overhanding vegetation.*[38]

As for Coho Salmon:

> *Coho salmon are only abundant in Lake Washington in April and May where they occur in both littoral and limnetic habitats. These coho are typically yearling smolts migrating from rearing tributaries to Puget Sound. Adult coho salmon return to Lake Washington beginning in late August and continuing through mid-November. If river or tributary flows are low, coho will remain in the lake for several weeks. Spawning activities extend from late October until late February.*[39]

Additionally, the site forms habitat for a number of non-salmonid fish, including longfin smelt, stickleback, and smallmouth bass, turtles, and other birds.

*WRIA 8*


[38] Ibid Pg. 22.
[39] Ibid Pg. 24.

*Image 22*
WRIA 8 watershed map.[40]

B31 and associated project site exist within WRIA 8 tier 1 priority habitat. In terms of ESA listed species, the littoral habitat below B31 is used primarily by wild lake Sammamish Chinook.

*Sockeye Salmon Spawning Habitat*

The project team received information from WA F&W that directly underneath B31 is known sockeye salmon spawning habitat, further constraining the construction work window and sensitivities required on site.

*Natural Heritage*

Washington State Department of Natural Resources, within a search of the Natural Heritage Information System found, "no records for rare plants, select rare animal species, or high-quality ecosystems" in 2001 as part of the NSRA phase 1 construction.[41] This information may have changed over the course of 18 years since the assessment was made, however, it is unlikely.

*Work Window*

July 16 – March 15 is the approved freshwater work windows for ESA-Listed fish species in Lake Washington, north of State Route 520 and south of Arrowhead point. However, due to documented Sockeye spawning area located immediately around and underneath B31, this in water work window is further constrained to July 16 – September 30.

*Near-Shore Coverage*

The near-shore portion of the existing Pier 1 (Building 321) and B31 inhibit the migration corridor of ESA species found in Lake Washington.

> *Over-water structures limit the amount of light available for growth and production of photosynthetic autotrophs important for juvenile salmonids feeding in nearshore environments. Over-water structures may also impact fish migratory behavior by creating sharp underwater light contrasts. Daytime light reduction from pier shading may pose a risk of delaying migration, drive juveniles into deeper waters during daylight hours.*[42]

Over water structures are also expected to benefit predator species like bass, who use the overwater structures to ambush prey. [43] A sizable portion of B31 (~1,875 SF) covers water depths of 3-6' at ordinary low water, thus, a sizable portion of B31 still adversely impacts nearshore migration corridor. Approximately 1,700 SF of Pier 1 overwater coverage exists within this zone as well.

*Creosote Piles*

All piles found in B31 are treated with creosote. These piles are a component of a much larger adverse effect to the lake environment. Creosote itself is an amalgam of chemicals, sometimes with as many as 10,000 unique chemical ingredients. Leaching from creosote-treated piles

[40] https://www.govlink.org/watersheds/8/reports/WRIA8RecoveryTierMap_2016.pdf
[41] Letter, Sandy Swope Moody Environmental Coordinator, Washington Natural Heritage Program, July 13, 2001.
[42] 2002 Biological Evaluation for ESA Species: North Shore Recreation Area, Sand Point Magnuson Park, City of Seattle Department of Parks and Recreation. Page 38.
[43] Ibid Pg. 29.

contributes 98% of all Polycyclic Aromatic Hydrocarbons (PAHs) to the water bodies of Lake Washington.[44] PAHs affect species in a number of ways:

- In general, these chemical compounds vary widely in toxicity. For some organisms, low PAHs are acutely toxic but may be considered non-cancer causing. High PAHs however, are not as toxic, but to many organisms—such as fish, birds, amphibians, mammals—can cause cancer, mutation or malformation of embryo/fetus.
- Exposure of fertilized salmon eggs to low levels (1-10 ppb in water; ~1000 ppb in oiled gravel) of total PAHs from weathered oil is linked to reduced adult returns 2 years after exposure--possibly due to impaired cardiac function.
- Juvenile salmon migrating through urban estuaries show reduced disease resistance and increased PAH exposure, and similar results are seen with PAH exposed animals in lab studies.
- Juvenile salmon migrating through urban estuaries show changes in growth and metabolism, and similar results are seen with PAH exposed animals in lab studies. Fish at higher doses experience delayed mortality several months after exposure ended.[45]

*Mudline Debris*

The nature of humans working and doing things overwater inevitably leads to “Oops!” moments where items are dropped into the water, never to be retrieved again. There is certainly this type of debris underneath B31. The nature and extent of this debris is unknown at this point in time. However, as part of the 1998 underwater pile assessment, a photograph was taken at the mudline showing a marine battery. In 2018, Echelon Engineering dove as part of pile assessment for B31. They were not concerned with debris, and thus, did not document the mudline with a focus on debris in mind.

*Image 23*
Photographs taken in 1998 showing debris at the mudline below B31 and Pier 1.[46]

*Stormwater Runoff*

Both B31 and Pier 1 have no storm water management infrastructure in operation. Currently, stormwater from B31 sheds directly off the asphalt roof, along the edge of the exterior walls, and

[44] Simmonds, Jim. *Past, present, and future water quality in Lake Union/Ship Canal, Elliot Bay, and the Duwamish Estuary and the benefits of combined sewer overflow control and other projects.* Salish Sea Ecosystem Conference. 2018.
[45] Washington State Department of Natural Resources. *Brief Science of Creosote.* 2013.
[46] City of Seattle, Shoreline Characterization Report, 2010.

falls directly into Lake Washington. Stormwater falling on Pier 1, sheets directly off the asphalt surface into Lake Washington. This untreated stormwater contributes to poor water quality. If vehicles are allowed to utilize the Pier 1 deck, it is classified as a pollution generating surface and may require stormwater treatment.[47]

### Potential Positive Ecological Site Mitigation Actions

- Demolish near-shore portion of Pier 1 and replace with translucent gangway/ bridge over restored near-shore environment.
- Manage storm water runoff through green practices/ landscaping on Pier 1 or on shore.
- Remove creosote piles and replace with steel piles.
- Remove obsolete fender piles along Pier 1.
- Remove debris found at lake bottom.
- Remove remnant infrastructure within Pier 1
- Provide overhanging vegetation on Pier 1 within the near-shore environment.
- Provide a dedicated, permanent gangway and float at Optiland.
- Introduce light transmitting roof elements within B31 covered moorage

## 6.0 Site Geotechnical Review

### Existing Documentation Review

Miller Hull has received and identified four geotechnical studies within the vicinity of the project area. These studies and reports are listed below:

| Year | Consultant | Study Title |
|---|---|---|
| 1992 | Shannon & Wilson | Geotechnical Feasibility Studies for Additional NOAA Facilities, Sand Point, Seattle, Washington |
| 2003 | GeoEngineers | Preliminary Geotechnical Engineering Services, North Shore Recreation Area, Sand Point Magnuson Park |
| 2005 | Anchor Environmental | Geotechnical Engineering Design Report, Floating Docks and Approach Structures, North Shore Recreation Area, Magnuson Park |
| 2009 | PanGeo | Geotechnical Report Magnuson Park Building 11 Renovation |

*Table 3*
*Identified geotechnical reports within the project vicinity*

### Findings

Within the identified studies, the closest boring location to Building 31 is *ANS-GT1* from the 2005 Anchor Environmental report. This boring was drilled to a depth of 48 feet below the existing ground surface. Very loose sand with occasional gravels was encountered from the surface to a depth of approximately 20 feet. From a depth of 20 feet to a depth of 35 feet below the surface, medium dense, moist, gray silty (fine) SAND with occasional gravels was found. At 35 feet a very dense, moist, gray, slightly silty, gravely (fine) SAND is encountered. Within the 2005 report, Anchor Environmental recommended that, “steel pipe piles be driven open-ended, to facilitate

[47] Burcar, Joe. Phone call. August 7, 2019.

their penetration into the very dense bearing soils."[48] It is also anticipated that this very dense strata is found at a deeper depth as you move away from the shoreline, thus pile lengths will need to increase in order to connect with this bearing depth as the building moves away from the shoreline. It is anticipated that piles may need to penetrate or bear on this very dense strata to achieve the loading requirements of Building 31 and any associated upgrades or new structures built on site.

According to the City of Seattle, the ground below Building 31 is within an ECA Liquefaction zone. There is the potential within a design seismic event for the top strata of very loose soil to liquefy into a slurry. The lateral forces of a liquefaction event on the bearing pile structure should be considered within any future structural design work for Building 31 or future new construction within the project area. Further information on site geotechnical explorations can be found in Appendix E. Further Geotechnical Soil Explorations are warranted to gain further information within the unique project area of B31. These are outlined in Section 17.

[48] 2005 Geotechnical Engineering Design Report Floating Docks and Approach Structures North Shore Recreation Area Magnuson Park

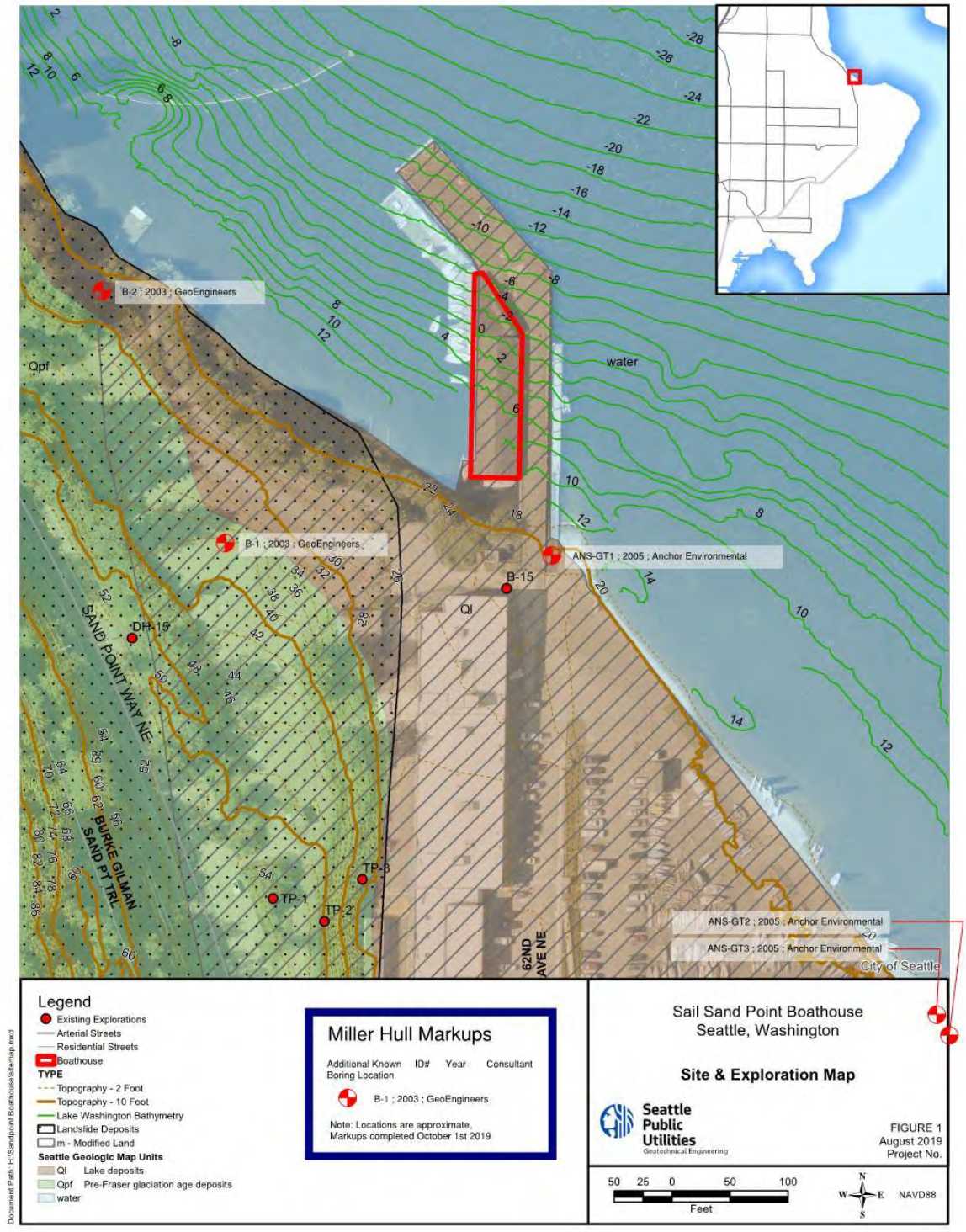



*Image 24*
Seattle Public Utilities Site & Exploration Map, including markups with further boring locations identified through documentation research.

# 7.0 Building 31 Existing Conditions

## Scope of Review

The design team reviewed 18 historic drawings. None accurately reflected the current conditions of B31. With the goal of accurately depicting the site, as it exists today, Light detection and ranging (LiDAR) scanning was completed, documenting the building and site conditions on 8/14/19. This LiDAR scan was used within the design team's 3D BIM model to document the as-built conditions of B31. These drawings can be found in Appendix F. Additional site photographs can be found in Appendix G.

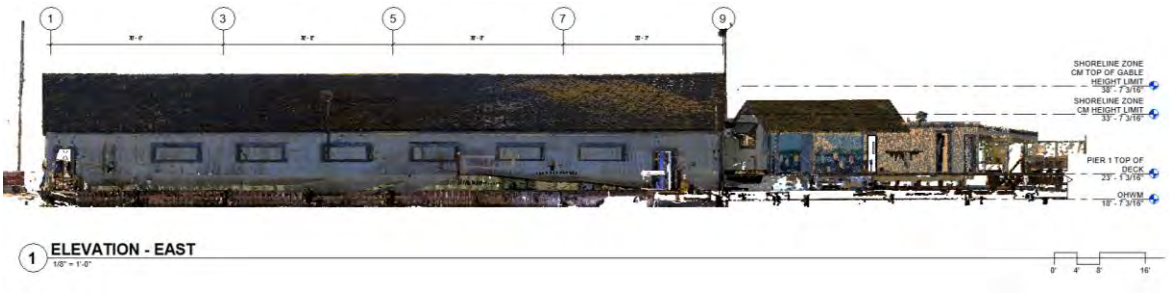



*Image 25*
East Elevation of B31, as documented through LiDAR scanning. Elevations are relative to the NAVD 88 datum.

## Building Structure

Built in 1938, B31 has suffered from over 80 years of wear and tear, deterioration, settlement, and repair. Two assessments completed by Reid Middleton show the extent of deterioration present within the below water pile structure and the adequacy of the existing structure to resist seismic loading. With respect to the above water building structure, "the extent of deficiencies and the lack of an adequate lateral system, extensive damage during a design-level earthquake is possible."[49] In addition, the, "gravity framing members may be overstressed with a demand-capacity-ratio of 1.33."[50] With respect to the below water pile structure, 36 percent of the piles have between 0 and 50 percent of their structural cross section remaining. 52 percent of the pile caps suffer from heavy damage or moderate damage. The extent of damage to the below water pile structure, pile caps, and deficiencies within the above water building structure warrant significant replacement and upgrades. Further structural information can be found within Appendix H.

## Building Functionality

The covered moorage area is spatially inefficient, preventing SSP from storing more safety boats that are needed as operations grow into the future. Pseudo-accessible routes from the pier deck to the boat floats are circuitous and lack code required turning radii. Loft space is combined with sail repair area, creating cramped quarters, in addition to uncomfortably hot conditions during the summertime. Students within the loft classroom space are easily distracted by operations within

[49] Reid Middleton. Magnuson Park Building 31 Seismic Review. September 26, 2019. Pg. 3.
[50] Ibid. Pg. 4.

the covered moorage bay. The outdoor instruction area is spatially inefficient, and students struggle to see concepts drawn on the whiteboard. In addition, this space is susceptible to direct summer sun glare. The staff locker room area is spatially inefficient and lacks appropriate ventilation. The absence of any toilet facility within B31 is not desirable. Additional spaces north of the covered moorage are small, disconnected and spatially constraining. Bird netting within the covered moorage area renders the space within the roof truss plane unusable.

## Building Historic Condition

The existing B31, as it stands today, is analyzed with respect to the seven aspects of integrity codified by the Department of Interior:

*Location*

In 2005 a major portion of the building (~1,200 FT2) was demolished to promote near shore salmon migration habitat. This demolition removed the historic bunk quarters, shop space, toilet, storage area, and crew watch room. The absence of this major portion of the building's function and form from the specific location where the historic property existed is an adverse effect.[51]

*Design*

In 2005 a major portion of the building (~1,200 FT2) was demolished to promote near shore salmon migration habitat. This demolition removed the historic bunk quarters, shop space, toilet, storage area, and crew watch room. The absence of this major portion of the building's function which was designed into the use of the building during the period of significance is an adverse effect with respect to the design of the building. Bird netting within the covered moorage bay has reduced the visual continuity of the large covered moorage space. This non-historic addition is an adverse effect with respect to the design of the space. Divided lite windows within the covered moorage area have been sealed and boarded up as part of lead remediation work. This has affected the exterior visual expression of the façade in addition to the spatial feeling on the interior of the building. The absence of windows does not permit sightlines to the lake from within the covered moorage or daylight to enter into the space from the east façade. This is an adverse effect with respect to the design of the building. Non-original cladding (T1-11 plywood) has replaced the original cladding around the entire perimeter of B31. Asphalt roof tiles have replaced the original cedar shake roof. These changes in colors, textures and surface materials are an adverse effect.

*Setting*

Since 1938, the setting of B31 has changed slightly. The original relationship between B31 and Pier 1 is retained. Flag poles and weather stations on B31 are non-original and thus affect the character of the place, albeit minimally. The addition of non-historic chain-link fence also negatively affects the integrity of setting.

*Materials*

Vinyl window frames have replaced historic windows within the loft area. Non-original cladding (T1-11 plywood) has replaced the original cladding around the entire perimeter of B31. Asphalt roof tiles have replaced the original cedar shake roof. No original exterior materials are retained today. This dearth of original materials negatively affects the integrity of the materials aspect.

[51] Memorandum of Agreement between Warren G. Magnuson Park Division of the Seattle Department of Parks and Recreation and the Washington State Historic Preservation Officer Regarding the Partial Demolition of Building 31, Located at Warren G. Magnuson Park. Dec 13, 2004.

*Workmanship*

Sandblasting off the historic lead paint from the wood structure has left softwood deeply mottled and worn down. The existing building exhibits a particular lack in workmanship evinced in the detailing of the connections between the exterior envelope and the pile structure, leaving significant end grain exposed. The building does not exhibit any evidence of rustic, art deco, craftsman or other stylistic canon of craft culture. No examples of exceptional or notable tooling, carving, painting, graining, turning, or joinery exist within the building. Historic drawings show the exterior materials are comprised of scrap or surplus material, and thus no overt or explicit workmanship was imbued within the exterior expression defining materials of the building.

*Feeling*

B31 housed a crash boat rescue squadron. The presence of these crash rescue boats significantly contributed to the feeling and life of the building during its period of significance. These boats, crews, their tools, implements and accessories are absent from the site today. This diminishes any feeling of life on the pier, and on the north end of the historic air base. The presence of murals and the aging condition of the building do not convey a sense of wartime experience.

*Association*

A majority of B31 still exists within its historic place. With respect to a common observer, with some explaining, it is easy to associate the building and its use with the historic air base. While it is not immediately apparent, the building does retain its association with the war and base activity due to its presence adjacent to the pier and covered moorage volume.

While the national register of historic places conveys that B31 has no exterior or interior character defining features, in the absence of any features, the building has undergone significant changes that have affected its integrity as a contributing resource within the Naval Air Station Seattle Historic District (National Register of Historic Places) and the Sand Point Naval Air Station Landmark District (Seattle Historic District). While B31 was never alone eligible for the National Register of Historic Places, it is a part amongst the whole that was Naval Air Station Seattle. As the 1994 Historic and Archaeological Resources Protection Plan for Naval Station Puget Sound, Sand Point notes:

> *The historic properties at NSPS Sand Point have gained their significance because of their association with the development of Seattle and the participation of the Navy in World War II in the Pacific. The properties are valuable more for their interpretive content and their contribution to a sense of time and place of our history, rather than any unique architectural or engineering features or research value.*

It is understood that the existing building retains a diminished level of integrity and that actions to preserve and sustain the existing form, integrity and materials of the current building would be detrimental to the building's own integrity, the programmatic capacity of the site, life safety, and fiscal responsibility. The current condition of the building warrants major alterations or replacement.

## Mechanical

The majority of B31 is unconditioned, exterior, covered moorage space. The enclosed portions (existing locker rooms, SPYS storage room, instructor room, & changing room) of B31 are unconditioned as well. Heating is accomplished through portable electric space heaters. Beyond a ceiling fan in the existing locker room, no integrated mechanical equipment currently exists within B31.

### Electrical Power
B31 currently receives electrical service from shore. No drawings have been found that outline where the service to B31 originates, or its capacity.

### Plumbing
No water service currently exists to B31. However, during wartime, water was run to B31 to supply showers, toilets and sinks.

### Fire Protection
No fire protection systems exist within B31.

### Telecom
A telephone room existed on the northern end of B31. Since the Navy quit use of the site, this room has not been utilized. The historic telecom infrastructure still exists within the room.

*Image 26*
Existing telephone room service box at the northernmost end of B31. Photo: Glen Stellmacher, Miller Hull Partnership.

### Fire Alarm

Infrastructure for historic fire alarm equipment exists within B31. However, it is unclear if it is functioning. A new code compliant fire alarm system will need to be installed.

*Image 27*
Existing Fire Alarm infrastructure on the exterior of B31. Photo: Glen Stellmacher, Miller Hull Partnership.

### Security

No technical security infrastructure exists within B31. Doors are locked with padlocks.

### Abandoned Infrastructure

As a working and functioning former Naval Air Station, a significant amount of infrastructure was developed and installed to serve the functions and operations on base. Today, a majority of this infrastructure is obsolete and not utilized, however remains in place.

*Image 28*

Example of abandoned piping from Navy use of Pier 1. Photo: Glen Stellmacher, Miller Hull Partnership.

## Accessibility Barriers

First constructed in 1938, B31 includes many barriers to access within the building. In 2010, community members constructed a ramp from Pier 1 to the lower deck of B31. In 2011, a gangway ramp was installed connecting the lower deck level of B31 to the floating boat launch platforms to the west. While these improvements attempted to ameliorate the accessibility deficiencies within B31, many deficiencies still persist today, making the building inaccessible to those with physical challenges. In practice, accessible sailing programs launch from the float east of Pier 1. The ease of access to this float and the clear space allows for a safe exchange of persons onto the sailboat. While a comprehensive ADA compliance survey was not undertaken within this scope of work, an outline of major ADA issues is discussed below:

Stairs to covered moorage lack adequate handrails and extensions. Doors to covered moorage do not contain adequate accessible hardware. Finger piers and walkways within the covered moorage are not an adequate width. No accommodations exist for access to motorboats from finger piers. Almost all door thresholds form barriers to access. Stairs to instructor room lack adequate handrails and extensions. Door to instructor room lacks adequate clear space. Ramp from the pier to covered moorage does not contain adequate landing areas, handrails or handrail extensions. No accessible route is provided from the pier deck level into B31.

Examples of these barriers can be found within Appendix G.

## Regional Access / Links

*Via personal car*

The site is accessed by personal vehicle through the main entry gate to Magnuson Park at the intersection of Sand Point Way NE and NE 74th St. From this gate, parking for B31 is approximately a 0.6-mile drive from the park entrance.

*Via King County Metro Transit Bus*

Two bus routes, 62 and 75, provide access to B31 along Sand Point Way NE. The closest northbound stop is a roughly 1,500 ft (~0.3 miles) walk from Sand Point Way NE, stopping directly across from the Mountaineers building. The closest southbound stop is south of NE 77th St in front of the View Ridge Swim & Tennis Club. The southbound stop requires crossing Sand Point Way NE and is roughly a 1,700 ft (~0.3 miles) walk to B31. The parcel is considered frequently served by transit according to SDCI Director's Rule 15-2018.

*Via bike*

Typical bike access to B31 occurs from the Burke Gillman Trail (BGT). Traveling northbound on the BGT from the University of Washington, cyclists can choose to exit the BGT at NE 65th along a dedicated bike lane, crossing Sand Point Way NE, and intersecting with 62nd Ave NE, a side street which can be taken all the way to B31. Alternatively, northbound and southbound cyclists can access B31 through a dedicated turn-off to Magnuson Park north of Fairway Estates. This turn-off connects the BGT with Sand Point Way NE. Cyclists must cross Sand Point Way NE and connect to a gravel path to the west of Building 11. This gravel path connects to the parking area to the west of Building 11.

A regional access diagram can be found within Appendix I.

# 8.0 SSP Existing Program Documentation

### Scope of review

B31 is the backbone of SSP. Without it, there is no place to keep safety boats, no stinky locker rooms, no place to talk about roll tacks before sailing. While B31 is the backbone, it is connected to a larger body of SSP operations on Magnuson Park's north shore. SSP utilizes a campus of buildings, Optiland (Building 275), the office and equipment bay (Building 11), and Pier 1 to teach sailing, run programs, fix powerboats, cook BBQ, spectate regattas and more. SSP operates a campus, and thus, thinking holistically, campus wide, was needed within a review of the existing program.

### Findings

24 program spaces were analyzed and cataloged as part of this study. Individual program data sheets for each program space are available within Appendix J. Comments from multiple sessions of meetings with SSP staff and executive director are cataloged within each program data sheet. A summary of the gross square footage (GSF) within each campus unit is provided below:

| Program Space | Unit | GSF | Total |
|---|---|---|---|
| **Building 31** | | | **6,545** |
| Motorboat Bay | 1 | 3,825 | |
| Motorboat Bay Storage | 1 | 375 | |
| Instructor Room | 1 | 175 | |
| Loft Storage | 1 | 525 | |
| Locker Rooms | 1 | 250 | |
| Changing Room | 1 | 120 | |
| Sailboat Gear Storage | 1 | 525 | |
| SPYS Room | 1 | 140 | |
| Old Telephone Room | 1 | 22 | |
| Covered Instruction Deck | 1 | 588 | |
| **Floats** | | | **5,260** |
| North Float | 1 | 2,200 | |
| South Float | 1 | 1,350 | |
| Optiland Floats | 1 | 510 | |
| East Dock Float | 1 | 1,200 | |
| **Building 11** | | | **3,083** |
| Equipment Bay | 1 | 980 | |
| Dockmaster Bay | 1 | 790 | |
| Office | 1 | 608 | |
| Boardroom, Kitchen and Toilet | 1 | 705 | |
| **Boat Yard** | | | **71,840** |
| Windsurf Storage Shed | 1 | 290 | |
| Paddlesport Storage Shed | 1 | 250 | |

| | | | |
|---|---|---|---|
| Boat Yard (Inc sheds) | 1 | 71,840 | |
| **Pier 1** | | | **12,135** |
| Pier 1 | 1 | 12,090 | |
| BBQ Storage | 1 | 45 | |
| **Optiland (Building 275)** | | | **313** |
| Optiland Building | 1 | 313 | |
| | | **Total** | **99,176** |

*Table 4*
Existing program utilized by Sail Sand Point.

# 9.0 SSP Growth Program Documentation

## Summary

Following the same logic outlined within the SSP Existing Program Documentation, the design team cataloged the growth needs for SSP operations at a campus level. While B31 is the focus of this study, growth program is forecasted to expand into B11, and at Optiland, B275, as well. Work within B11 will need to be accomplished simultaneously to work on B31. In all, 17 new space types are proposed, driven by the growth and trajectory of SSP operations since taking over the site in 1999. Many spaces replace poorly functioning existing space, (i.e. Locke rooms). Documentation of growth program data can be found within Appendix J.

| New Program Space | Unit | GSF | Total |
|---|---|---|---|
| **Building 31** | | | **2,574** |
| New Multipurpose Space | 1 | 1,200 | |
| New Small Classroom | 1 | 150 | |
| New Accessible, All-Gender, Single Restroom | 1 | 75 | |
| New SPYS Classroom Space | 1 | 300 | |
| New Equipment Storage | 1 | 232 | |
| Reconfigured Covered Moorage Space | 1 | 600 | |
| New Dockmaster Lookout | 1 | 22 | |
| New Kitchenette | 1 | 20 | |
| **Floats** | | | **2,540** |
| Additional North Float Space | 1 | 650 | |
| Boat Yard Launch Float | 1 | 1,890 | |
| **Building 11** | | | **4,425** |
| Locker Rooms | 1 | 1,330 | |
| Break Room | 1 | 250 | |
| Covered Boat Storage | 1 | 2,325 | |

| | | | |
|---|---|---|---|
| Medium Classroom | 2 | 520 | |
| **Boat Yard** | | | **16,200** |
| Healthy Beach | 1 | 16,200 | |
| **Optiland (Building 275)** | | | **785** |
| Accessible, All Gender, Kid specific, single restroom | 1 | 75 | |
| Additional Opti Storage | 1 | 560 | |
| Small Classroom | 2 | 150 | |
| | | **Total** | **26,524** |

*Table 5*
New growth program need identified by Sail Sand Point and Seattle Parks.

# 10.0 Code Review

## Overview

The complex nature of this project brings multiple overlapping codes, zones, and regulatory overlays. While not complete and exhaustive, the following review outlines pertinent information in relation to each applicable code.

## Seattle Code

*Use*

The contemporary site was not within the City of Seattle's jurisdiction until 1999 when the U.S. government signed a quit claim deed, granting ownership of the property to the City of Seattle. In 1938, when B31 was constructed, the property was owned by the U.S. Government. No construction or use permits were issued by the City of Seattle at that time for work completed within the Naval Air Station. Within the quit deed claim, the allowed uses of the site are outlined within the 1996 *Application By the City of Seattle for the Acquisition of a Portion of the Naval Station Puget Sound at Public Benefit Allowance For Public Park or Recreation Purposes*. This plan outlines the acceptable use of B31 as a "Small Craft Center." Further, "Building 31 would be renovated for use as support office and meeting space."[52] As the City took ownership of the property, a concession agreement was signed between the City and SSP on October 5th, 1999. This concession agreement ordained the use of the site:

> *In the absence of prior written approval by the City and to the extent not required for City purposes, the Premises shall be used solely for non-motorized boating programs including boat usage, storage, education, racing and community outreach related to general operations of and events produced by Sail Sand Point and only as described in Exhibit C.*[53]

Exhibit C outlines covered moorage for safety boats in Building 31.

*Base Zone – Single Family Residential (SMC 23.44)*

[52] City of Seattle. Application By the City of Seattle for the Acquisition of a Portion of the Naval Station Puget Sound at Public Benefit Allowance For Public Park or Recreation Purposes. December 1996. Pg. 26.
[53] City of Seattle. Concession Agreement Between The City of Seattle and Sail Sand Point. October 5, 1999.

The building has received a Seattle Department of Construction and Inspections (SDCI) building ID # 0000010008. The building exists on parcel # 0225049062. The base zone of the project is SF 7200. This is Residential Single Family 7200. This base zone does not significantly constrain the project. Documentation of the project site and parcel can be found within Appendix K.

*Sand Point Overlay District (SMC 23.70.010)*

The purpose of the Sand Point Overlay District (SPOD) is to "Expanded opportunity for recreation, education, arts, cultural and community activities" and "Increased public access to the shoreline and enhanced open space and natural areas." B31 is within Subarea B of the SPOD.

> 23.72.010.D -*Demolition of existing structures and construction of new structures in the Sand Point Overlay District are permitted if in compliance with the following provisions and if consistent with the Sand Point Historic Properties Reuse and Protection Plan, dated April 1998, as documented by a letter from the State Historic Preservation Officer certifying that the proposal is consistent with the Plan. Any new structure shall be located on and limited to the footprint of a structure that existed on the site as of July 18, 1997.*

*Shoreline Master Program (SMC 23.60A)*

The site is within the Conservatory Management (CM) zone.

> 23.60A.220 - *The purpose of the CM Environment is to provide for water-dependent infrastructure, such as navigational locks, that provide a substantial public benefit, and recreational facilities, such as marinas and parks. Development allowed in the CM Environment can be managed to preserve ecological functions and typically provide public access.*
>
> *23.60A.030 – Shoreline development must conform to RCW 90.58.020, meet LR3 zone requirements*
>
> 23.60A.152.A - *All shoreline developments, shoreline modifications, and uses shall be located, designed, constructed and managed to achieve no net loss of ecological functions.*
>
> 23.60A.152.J - *All in-water and over-water structures shall be designed, located, constructed, and managed to avoid adverse impacts to aquatic habitat, such as increased salmonid predator habitat and adverse impacts due to shading, to the maximum extent feasible and to limit construction to the times of the year when construction will have the least impact on migrating salmonids as set by WDFW and the U.S. Army Corps of Engineers.*
>
> 23.60A.152.L.3 -*Creosote treated piles in need of repair must be replaced if under a structure that is being replaced and 50 percent or more of the number of piles are proposed to be repaired, if reasonable.*
>
> 23.60A.152.M -*Replaced covered moorage and new and replaced boat sheds shall be designed to provide the maximum ambient light to reach the water. Designs shall Minimize sides of the structures and Provide light transmitting roofing and side material to the maximum extent feasible.*
>
> 23.60A.228.A. -*Maximum Height in the CM Environment is 15'*

23.60A.228.C - *Pitched roofs. The ridge of a pitched roof on a principal structure, including projections to accommodate windows, may extend 5 feet above the maximum height allowed, as provided in the underlying zone or special district.*

23.60A.952 - *In the case of structures to be built over water, average grade level shall be the elevation of ordinary high water.*

*Environmentally Critical Areas (SMC 25.09)*

The project is within a liquefaction zone and archeological buffer zone.

*State Environmental Policy Act (SEPA) Requirements (SMC 25.05)*

A SEPA checklist and review will be required for the project.

*Sand Point Naval Air Station Landmark District (SMC 25.30)*

25.30.050 – *The design review guidelines are intended to fulfill the preservation goals as established by the Sand Point Historic Properties Reuse and Protection Plan (Resolution 29725) and adhere to The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Properties (and associated National Park Service guidelines & technical briefs)*

25.30.60 -*Jurisdiction over changes and improvements to the District is vested in the Seattle Landmarks Preservation Board*

*Master Use Permit Issuance (SMC 23.76)*

A Master Use Permit (MUP) with a type II decision is required for the project.

*2015 Seattle Fire Code (SFC)*

At this stage, further code interpretation is necessary. Automatic sprinklers may be required within the covered moorage.

*2015 Seattle Building Code (SBC)*

Note: City of Seattle will likely adopt IBC 2018 in July 2020 after Washington State adopts IBC 2018. (Confirmed by inquiry to SDCI 9/23/2019)

This code applies to this project. Further code review is required with respect to the rehabilitation design of Building 31 explored within Task 3 of this report.

Chapter 4 – Special Detailed Requirements based on Use and Occupancy, Section 427 – Waterfront Structures applies to this project.

*2015 Seattle Existing Building Code (SEBC)*

SEBC applies to this project as an existing building, however it largely points to compliance with International Building Code and International Fire code when working within existing buildings.

## Federal Code

*1855 Treaty of Point Elliot*

Signed in 1855, the Treaty of Point Elliot is the land settlement agreement between the United States Government and the Native American tribes of historic Washington territory. With regards

to the project site occupying land completely over water, the project will need to comply with Article 5 of the treaty.

> Article 5 - *The right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands. Provided, however, that they shall not take shell-fish from any beds staked or cultivated by citizens.*

*2017 Secretary of the Interior's Standards for the Treatment of Historic Properties*

As a "Historic Contributing" building to the nationally registered historic place of Naval Air Station Seattle, alterations to B31 are required to follow The Secretary's Standards. The 10 Standards for Rehabilitation are defined as follows:

> *1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.*
>
> *2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.*
>
> *3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*
>
> *4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.*
>
> *5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*
>
> *6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*
>
> *7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*
>
> *8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*
>
> *9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*
>
> *10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

# 11.0 Pile Treatment Solutions: Options and Assessment

## 11.1 Summary

### Methodology

At the onset of the project, many variables, problems, options, approaches, and opportunities arose that will act to shape the preferred path to rehabilitating B31. It became clear that a more analytical approach to decision making was required beyond verbal discussion and presentation of the options. Each option has distinct advantages and disadvantages. These would need to be cataloged and assessed as a whole in order to move forward within the process.

The design team has engaged in a similar approach to assessment while working with the U.S. Forest Service. Within their work, a decision-making methodology called, “Choosing by Advantages” is utilized within the value analysis process. This process begins by identifying the most important criteria within a project. These criteria for the rehabilitation of B31 were identified through conversations with SPR and SSP staff, WDAHP, SDN, contractors and building users. They include considerations of health and safety, programming and space use, life cycle cost, site impacts, sustainability, construction feasibility, and historical impacts. Each identified solution is than analyzed based on each of these criteria. At the culmination of analysis, the project team is able to select a preferred option based on the identified advantages and disadvantages of each approach. Within the process presented herein, the project team has utilized a streamlined “Choosing by Advantages” approach, by ranking each option according to a semi-quantitative matrix of values assigned to each criteria. In the end, an option is advanced based on its cumulative advantages within each of the criteria. The work descriptions outlined herein may not be completely accurate. A contractor may provide alternate means and methods to accomplish a similar approach to the project.

### Secretary’s Standards

When touching a nationally registered historic place, project teams are governed by the Secretary of the Interior’s Standards for the Treatment of Historic Properties (Secretary’s Standards). The Secretary’s Standards outlines the methodologies of four distinct and legally differentiated treatment standards including, Preservation, Rehabilitation, Restoration and Reconstruction. It is asserted that the project team will utilize the Rehabilitation treatment under the Secretary’s Standards. This is the most common treatment standard when working with historic properties. Rehabilitation is the only treatment standard that allows for the addition or alteration of a historic building to facilitate its continued use. In addition, The City of Seattle Sand Point Naval Air Station Landmark District identifies the selection of “Rehabilitation” as the preferred treatment method to historic resources within the district.

### Findings

At the culmination of the herein analysis, the project team advocates for the selection of the pile replacement strategy:

**Option 11: Rehabilitate / Reconstruct Hybrid Historic & New**

This strategy acts to retain the integrity of the historic character on site, in addition to increasing programmatic capacity for SSP operations, making improvements to safety and accessibility, minimizing risk within the construction process, designing in an efficient and sustainable way, positively giving back to the site’s natural environment and ecosystem services, as well as adding historic value back into the project through the inclusion of site interpretative elements and historic cladding materials.

## 11.2 Assessment Criteria Rubric:

The following rubric outlines the criteria selected within this analysis:

| | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| **Health and Safety (HS)** | Highly unsafe conditions | Unsafe conditions | Somewhat unsafe conditions | No Change | Above average safety conditions | Very safe conditions | Extremely safe conditions |
| **Programming Success (PS)** | No programming capacity | Significantly decreased programming capacity | Less programming capacity | No change in current programming capacity | More programming capacity | Significantly increased programming capacity | Highly flexible and significantly expanded programming capacity |
| **Life Cycle Cost (LCC)** | Far above average LCC | Above average LCC | Slightly above average LCC | Average LCC | Slightly below average LCC | Below average LCC | Well below average LCC |
| **Site Impacts (SI)** | Significant negative site effects | Above average negative site effects | Slightly negative site effects | Average effect to site | Slightly positive site effects | Above average positive site effects | Significant positive site effects |
| **Sustainability (S)** | Well below average sustainable design | Below average sustainable design | Slightly less sustainable design | Code required sustainability | Slightly better sustainability than code | Above average sustainable design | Well above average sustainable design |
| **Construction Feasibility (CF)** | Highly infeasible | Significant construction challenge | Some challenges in construction | Standard construction methods apply | Slightly simplified construction methods | Significantly simplified construction methods | Highly simplified construction methods |
| **Historical Impact (HI)** | High adverse effects | Above average adverse effects | Slight adverse effects | No Historical Adverse Effects | Effects and mitigation provide slight benefit | Effects and mitigation provide above average benefit | Effects and mitigation provide high benefit |

*Table 6*
Pile replacement critical criteria and scoring rubric

**Note:**
Within the analysis of each potential pile replacement option, it is asserted that a score of -3 within any category may disqualify an option from being pursued further. Scores of -3 include highly unsafe conditions, no programming capacity, far above average life cycle capital cost, significant negative site impacts, well below average sustainable design, highly infeasibly construction process and high adverse effects on a site's historical character.

## 11.3 Pile Replacement Options Assessment

Through the conduct of meetings on site at B31 and further correspondence with the following pile contractors; Ted Franco (Quigg Bros., Inc.), Niclas Arvberger (American Construction Co., Inc.), and John

Ogorsolka (Mcclure and Sons, Inc.), there has been determined the following options for the treatment of the below water structure of B31:

| | | HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|---|---|
| 0 | Do-Nothing | -2 | -2 | 3 | -2 | -1 | 2 | -3 |
| 1 | Pile Posting Repair | -1 | -1 | -3 | -1 | -1 | -1 | -1 |
| 2 | Outboard Pile Replacement | 1 | -1 | -1 | -1 | 0 | -1 | -1 |
| 3 | Batter Pile Replacement | 1 | 0 | -1 | -1 | 0 | -1 | -1 |
| 4 | Through the Roof Pile Replacement | 1 | -1 | -2 | -1 | 0 | -2 | -2 |
| 5 | Barge Lift Pile Replacement | 1 | 0 | -3 | -2 | 0 | -3 | -1 |
| 6 | Roll Off Pile Replacement | 1 | 0 | -3 | -3 | 0 | -3 | -1 |
| 7 | Deconstruct and Reconstruct | 1 | 0 | -2 | -1 | 0 | -1 | -1 |
| 8 | Demolish and Rebuild - In Kind | 1 | 0 | 0 | 0 | 0 | 1 | -3 |
| 9 | Demolish and Rebuild - Hybrid Historic & New | 2 | 2 | 0 | 1 | 2 | 1 | -3 |
| 10 | Demolish and Rebuild - New facility | 2 | 3 | 0 | 1 | 2 | 1 | -3 |
| 11 | Rehabilitate / Reconstruct Hybrid Historic & New | 2 | 3 | 0 | 2 | 2 | 1 | 1 |

*Table 7*
*Pile replacement options and associated scoring*

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

In supplement to the options, an infrastructure matrix is also compiled below, outlining how many barges are required for each option, the pile removal method, the size of crane required, and if the proposed replacement method affects the adjacent pier.

| | | Barges | Pile Removal | Crane | Affects Pier |
|---|---|---|---|---|---|
| 0 | Do-Nothing | 0 | N/A | N/A | No |
| 1 | Pile Posting Repair | 1 | N/A | N/A | No |
| 2 | Outboard Pile Replacement | 1 | Chainsaw | 125 ton | Yes |
| 3 | Batter Pile Replacement | 1 | Chainsaw | 125 ton | Yes |
| 4 | Through the Roof Pile Replacement | 1 | Chainsaw | 125 ton | No |
| 5 | Barge Lift Pile Replacement | 3 | Vibration | 300 ton | No |
| 6 | Roll Off Pile Replacement | 1 | Vibration | 125 ton | No |
| 7 | Deconstruct and Reconstruct | 2 | Vibration | 125 ton | No |
| 8 | Demolish and Rebuild - In Kind | 2 | Vibration | 125 ton | No |
| 9 | Demolish and Rebuild - Hybrid Historic & New | 2 | Vibration | 125 ton | No |
| 10 | Demolish and Rebuild - New facility | 2 | Vibration | 125 ton | No |
| 11 | Rehabilitate / Reconstruct Hybrid Historic & New | 1 | Vibration | 125 ton | No |

*Table 8*
*Pile replacement options and associated infrastructure and impacts*

The following assessment outlines the effects each replacement option would incur on the above identified criteria. A semi-quantitative score is given for each criteria, in addition to a written explanation for the determination.

## Option 0: Do-Nothing

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| -2 | -2 | 3 | -2 | -1 | 2 | -3 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

Within this option, nothing is done to the building. Its lifespan plays out and it is eventually condemned by Seattle Department of Construction and Inspections and demolished.

### Health and Safety:

As structural engineer Reid Middleton has reported, the "facility is entering [a] phase of accelerated deterioration, especially for the piles."[54] 36 percent of the below water pile structure will need to be replaced within 1 to 3 years. 100 percent of the below water pile structure will need to be replaced within 10-15 years. With respect to the pile caps, 52 percent are considered to be heavily damaged or moderately damaged, necessitating their replacement in 1 to 3 years. The reduced capacity and structural integrity of the pile and pile cap structure leave the building in a structurally compromised state. Independent from the present scope of deterioration, the size of structural members within Building are considered to be significantly overstressed, receiving 33 percent more load than what they are designed to accommodate.[55] In addition, the absence of a lateral structural system leaves the building susceptible to heavy damage during a seismic event. As part of this scope of work, Reid Middleton found that, "due to the extent of deficiencies and the lack of an adequate lateral system, extensive damage during a design-level earthquake is possible."[56] Access to boats within the covered moorage area is precarious. The interior finger piers are high off the water, and spaced too far apart, leaving SSP staff at risk of falling or injury when accessing motorboats. Access to the boat floats is accomplished through stairs that do not contain code compliant handrails or guards.

### Programming Success:

The covered moorage area is spatially inefficient, preventing SSP from storing more safety boats that are needed as operations grow into the future. Accessible routes from the pier deck to the boat floats are circuitous and lack code required turning radii. Loft classroom space is combined with sail repair area, creating cramped quarters, in addition to uncomfortably hot conditions during the summertime. Students within the loft classroom space are easily distracted by operations within the covered moorage bay. The outdoor instruction area is spatially inefficient, and students struggle to see concepts drawn on the whiteboard. In addition, this space is susceptible to direct summer sun glare. The staff locker room area is spatially inefficient and lacks appropriate ventilation. The absence of any toilet facility within B31 is not desirable. Additional spaces north of the covered moorage are small, disconnected and spatial constraining. Bird netting within the covered moorage area renders the space within the roof truss plane unusable.

### Life Cycle Cost:

Design of the original structure, allowing for the exposed end grain of pile tops, accelerated the decay of the below water pile structure. In comparison to the adjacent Pier 1 piles, the piles within B31 have decayed at an accelerated rate. This has necessitated the replacement of the pile structure. Ad-hock fixes and repairs to the structure and pile caps over the years have resulted in a convoluted aggregation of structural parts and pieces, some decayed, others repaired. Demolition of the structure is considered straightforward. No required construction after demolition substantially reduces capital costs.

### Site Impacts:

Creosote piles are the number one source, contributing 98 percent, of polyaromatic hydrocarbons (PAHs) into Lake Washington.[57] Piles within B31 are treated with creosote and actively leech PAHs into the aquatic environment. These and over 300 other chemicals within the creosote treatment, are particularly toxic within the water column.

> *Studies show that herring eggs exposed to creosote have a high mortality rate. PAHs can increase disease and alter growth and reproductive function in English sole. These chemicals affect juvenile salmonids that migrate through contaminated estuaries by reducing their growth*

[54] Reid Middleton, Magnuson Park Bld. 31 & Covered Moorage Condition Assessment Results, March 21, 2019

[55] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

[56] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 3.

[57] Simmonds, Jim. Past, present, and future water quality in Lake Union/Ship Canal, Elliot Bay, and the Duwamish Estuary and the benefits of combined sewer overflow control and other projects. Salish Sea Ecosystem Conference. 2018.

> *and altering immune function. Herring and other affected species are important parts of the food web for salmon, Orca whales, and birds. Creosote can also pose a threat to human health through exposure to creosote vapors on a hot day or through direct contact when playing around, sitting on, or burning the treated wood.* [58]

In addition, no storm water management has been enacted on site, leaving runoff from both B31 and Pier 1 to flow directly into Lake Washington below, washing any contaminants or debris with it into the lake. The opaque surfaces of the pier and of B31 form a barrier to migrating Sammamish river salmonids, forcing them to swim around the Pier into deeper water where they are susceptible to attack by predators. In addition, shade from the structure prevents marine flora and fauna from accessing sunlight.

> *Over-water structures limit the amount of light available for growth and production of photosynthetic autotrophs important for juvenile salmonids feeding in nearshore environments. Over-water structures may also impact fish migratory behavior by creating sharp underwater light contrasts. Daytime light reduction from pier shading may pose a risk of delaying migration, drive juveniles into deeper waters during daylight hours.*[59]

Current asphalt roof shingles are deteriorating and falling into the lake, adding contaminants and debris. Asbestos and lead paints installed by the Navy, used within B31, have been mitigated. However, lead pane windows still remain within the building and have been boarded up. Black asphalt shingles on B31 increase solar energy absorption onto the site, reducing the site albedo. Black asphalt surface on Pier 1 is not currently required due to restrictions on vehicle use on the Pier. This large surface area of asphalt additionally negatively affects the site albedo and contributes further to solar energy absorption on-site.

### Sustainability:

The absence of heating, cooling, ventilation and thermal enclosure results in a building that does not currently consume a lot of energy. The absence of any plumbing fixtures results in low water usage as well. Some lead paints have been mitigated, however creosote piles remain within the project. Air quality within the covered moorage is affected by stagnant outboard engine idle. Air quality within the enclosed spaces north of the covered moorage is affected by inadequate ventilation coupled with drying neoprene and sailing gear. The occupied spaces within B31 are uninsulated. The later C.P.O. Quarters addition was clad using surplus materials.

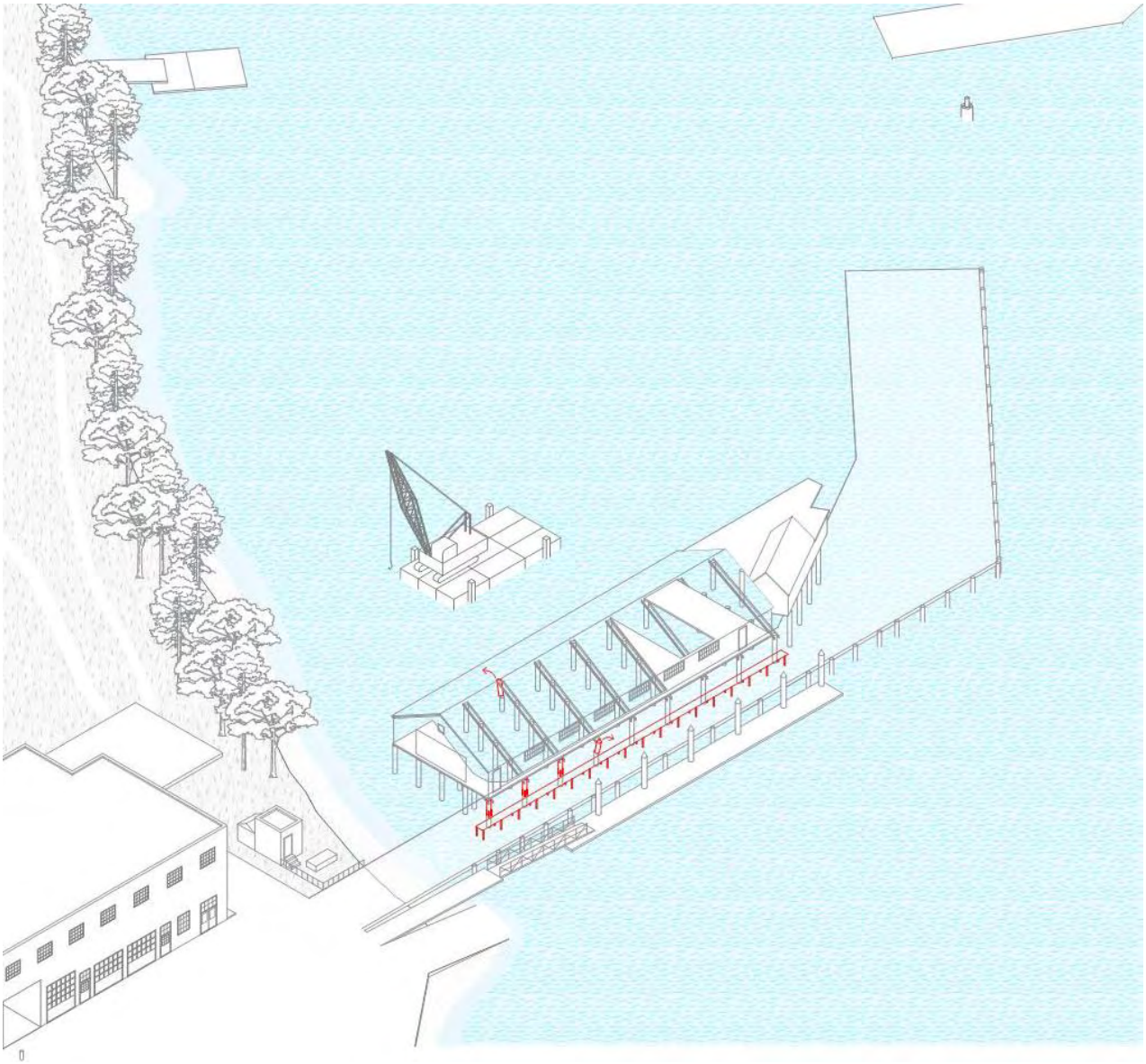
### Construction Feasibility:

Demolition of the structure is straightforward.

### Historical Impacts:

As an absence from the site, the demolition of B31 is an adverse effect on the Landmark District.

[58] Washington State Department of Natural Resources, Removing Creosote-Treated Materials from Puget Sound and its Beaches. 1/8/14. Pg. 1.
[59] Anchor Environmental. Biological Evaluation for ESA Species: North Shore Recreation Area, Sand Point Magnuson Park, City of Seattle Department of Parks and Recreation. 2002. Pg. 38.



## Option 1: Pile Posting Repair

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| -1 | -1 | -3 | -1 | -1 | -1 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

This rehabilitation option is a temporary repair, not a replacement strategy. Of the piles that are 0, 25, and 50 percent remaining cross section, a pile posting repair is made. This entails cutting and removing the destroyed section and replacing it with a new piece of wood. The building is temporarily shored by fixing strongback steel beams to the existing piles within regions of relative structural soundness. This fixing is

problematic, as new, drilled bolt holes form pathways for water to seep into the unprotected core of creosote treated wood piles. The building is then fully supported on each new steel strongback beam. The rotten top section of the pile is removed, and a new wood section is spliced to the top. This new wood section is affixed using steel strapping and bolted to the existing pile below. These new, drilled bolt holes also allow a pathway for moisture to seep into the center of the existing and new wood pile tops. The structure is then settled down onto the repaired pile tops and temporary shoring beams are floated out and removed. Existing damaged pile caps are repaired. Seismic and gravity upgrades are made to the existing structure. These include significant installation of steel moment frames in the longitudinal and transverse direction of the structure. Re-sheathing the walls and roof, increasing the nailing, adding strapping and hold-downs, and upgrading connections to the new steel moment frame system. A concept outline of these upgrades is addressed by Reid Middleton.[60]

### Health and Safety:

Applying a pile posting repair along an entire line of structure significantly weakens the ability of the structure to resist lateral forces within a seismic event. With respect to a maintenance and operations safety perspective, this creates required yearly inspection of the pile repairs. No significant improvements are made to building user safety. While the above water structure is upgraded, it rests on a pile structure compromised by the number of posting repairs.

### Programming Success:

This method of repair does not address or ameliorate any existing programming deficiencies within B31 Within this repair method, the existing spaces are retained as is. The necessity to mobilize two major operations within 10 years may diminish the ability for SSP to program and utilize B31 within the ecological work window. Multiple events and regattas are held during the fall and spring months that support high school and collegiate programming. These events would be impacted.

### Life Cycle Cost:

The temporary nature of this repair method delays the full capital cost of replacement by possibly 10 years or so. It is financially advantageous to commission work in today's dollars, rather than waiting for labor rates, taxes, and inflation to rise over the course of 10 years. The temporary pile posting mobilization costs and repairs are not able to be integrated into fully rehabilitated building structural system, and thus, will be thrown out in 10 years' time. With this option, you pay for two large construction and mobilization efforts within the span of 10 years. It is understood that existing creosoted piles will not be able to be replaced with new creosoted wood. The use of creosote is prohibited within pile structures under SMC 23.60A.187.E.5. The use of untreated wood will only allow a short service life of the repair (5-10 years).

### Site Impacts:

No piles are fully replaced within this option, and thus below water site impacts are minimized. There is the potential, if not mitigated, for debris from cutting and drilling into the existing wood piles to fall into the lake. Site mobilization requirements are comparatively small due to the absence of any pile driving needs. The retention of the exact existing structure eliminates the possibility for new architecture to remediate or mitigate any existing present site impacts such as the dearth of green storm water management infrastructure and existing creosote piles that continue to leech PAHs into the water column. Existing overwater coverage is retained.

### Sustainability:

[60] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

The result does not address energy performance, water usage, storm water management, or healthy materials. In addition, the doubling of mobilization efforts increases the amount of emissions and embodied carbon consumed in support of the project. In 10 years', time, one of the next 10 replacement options will need to be chosen and implemented.

### Construction Feasibility:

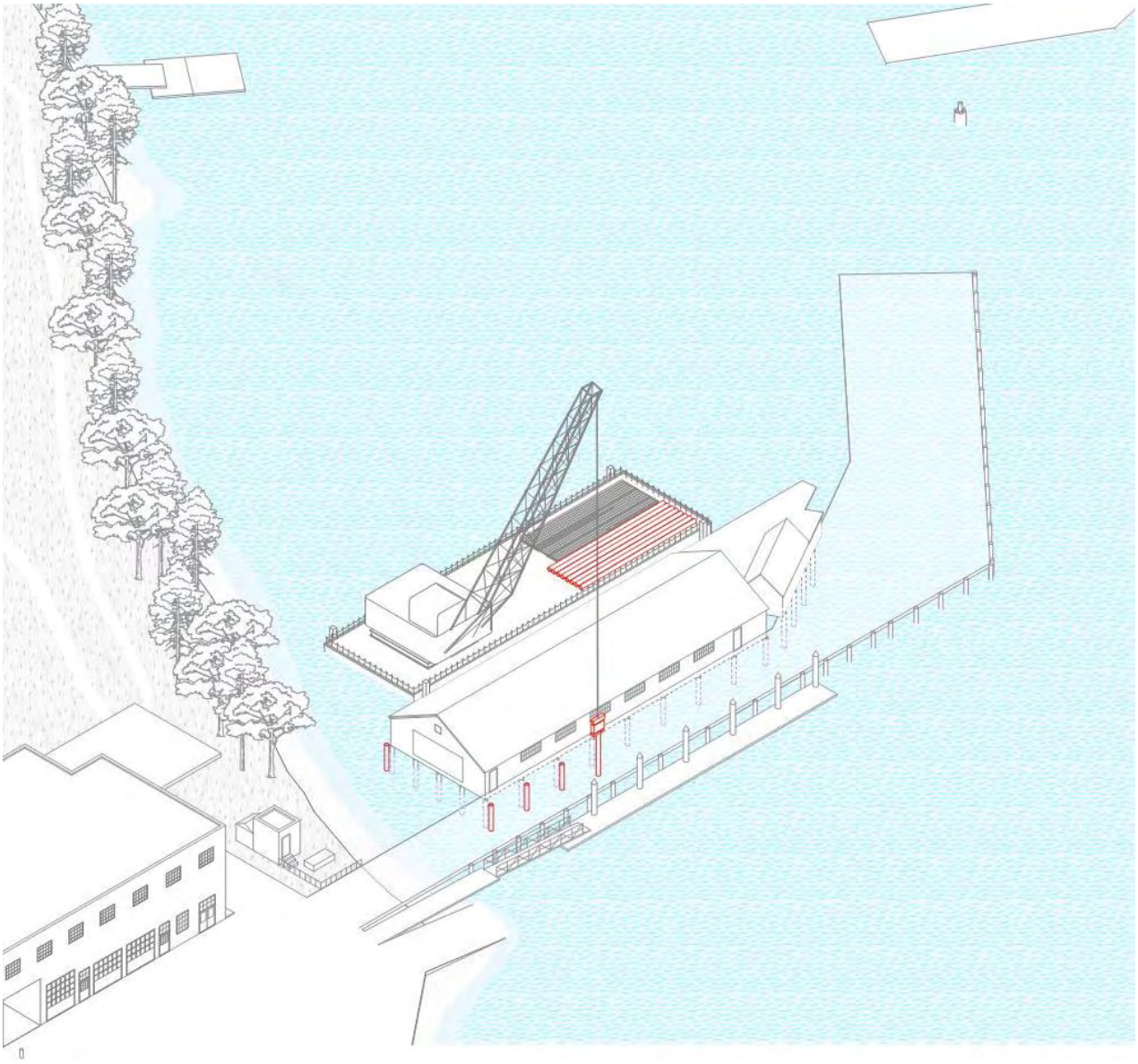
Complications include finding adequate structurally stable section depth to affix temporary steel pile cap beams. This may need to be done under the water line. Jacking and transferring the load from the existing building onto temporary pile caps will present some challenges within the construction process. Supporting work crews over water may require scaffolding or floating platforms.

### Historical Impacts:

The work affects the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling.

### Additional Considerations:

It is unclear if this option is even legally viable, as per SMC 23.60A.152.L.3., "Creosote treated piles in need of repair must be replaced if under a structure that is being replaced and 50 percent or more of the number of piles are proposed to be repaired, if reasonable."



## Option 2: Outboard Pile Replacement

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | -1 | -1 | -1 | 0 | -1 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

A large barge is mobilized within the inner harbor of the site, necessitating the opening of the existing log boom. Existing boat floats to the West of B31 will need to be removed and temporarily anchored during the work window. Once positioned, new steel plies are driven between the Pier and B31, and to the west of B31 within the inner harbor. The interior, non-load bearing, finger piers within the covered moorage are demolished for access. New steel pile caps are floated underneath the building into position and are

connected to the new steel piles. Once secured, the building is re-settled onto the new steel pile caps. Seismic and gravity upgrades are made to the existing structure. These include significant installation of steel moment frames in the longitudinal and transverse direction of the structure. Re-sheathing the walls and roof, increasing the nailing, adding strapping and hold-downs, and upgrading connections to the new steel moment frame system. A concept outline of these upgrades is addressed by Reid Middleton.[61] At this time, the existing wood piles and pile caps are removed by excavating 2 feet below mudline at the lake bottom, using a pneumatic chainsaw to cut them underwater. If this replacement methodology is utilized for the northern additions to the covered moorage portion of B31, 5-foot square access holes will need to be coordinated with the existing piles within Pier 1 and then cut through the deck of Pier 1 to drive outboard piles to support the additions north of the covered moorage. This would require further consultation with WDAHP and Seattle LPB, as Pier 1 is a nationally registered contributing historic resource.

### Health and Safety:

The full replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof.

### Programming Success:

The addition of piles outboard of the structure will expand overwater coverage on the site and trigger mitigation measures through the JARPA process. If total overwater coverage is to be retained on the site, program area comparable to the expanded pile area will need to be removed from the site. This may necessitate the removal of small boat float area or other program area to be determined. SSP requires as much program area as is feasible on site. The necessity to remove SSP program area from the site would be a net detriment to SSP's operational capacity.

### Life Cycle Cost:

Completely replacing the below water pile structure adds over 50 years, likely longer, of service free life to the structure. The yearly rise and fall of Lake Washington also facilitates a longer design life within the new piles than a completely stagnant water body. The long design life embodied within a full pile replacement reduces total life cycle capital costs. Leaving the above water building envelop in its existing position without any manipulations also eliminates any costs in moving or working through the existing structure. The demolition of existing piles through underwater excavation and pneumatic chainsaw adds significant cost in the removal of the existing creosote piles.

### Site Impacts:

This option will increase overwater coverage on the site if the existing program area is retained. The pile driving barge deploys and utilizes spuds into the lake bottom to hold the barge in place. In addition, new pile driving operations affect the lake bottom ecosystem and environment. Removal of piles through excavation and cutting is cited as a "last resort" within the Army Corps best management practices for removing piles.[62] This method disrupts the lake bottom area around each existing pile. In addition, piles that are cut and remain buried under ground become a potential hinderance to future development or rehabilitation efforts on site. A reduction in total pile area is made through the use of steel piles.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

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[61] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

[62] U.S. Army Corps of Engineers, EPA Region 10, Best Management Practices For Piling Removal and Placement in Washington State. February 18, 2016. Pg. 4.

### Construction Feasibility:

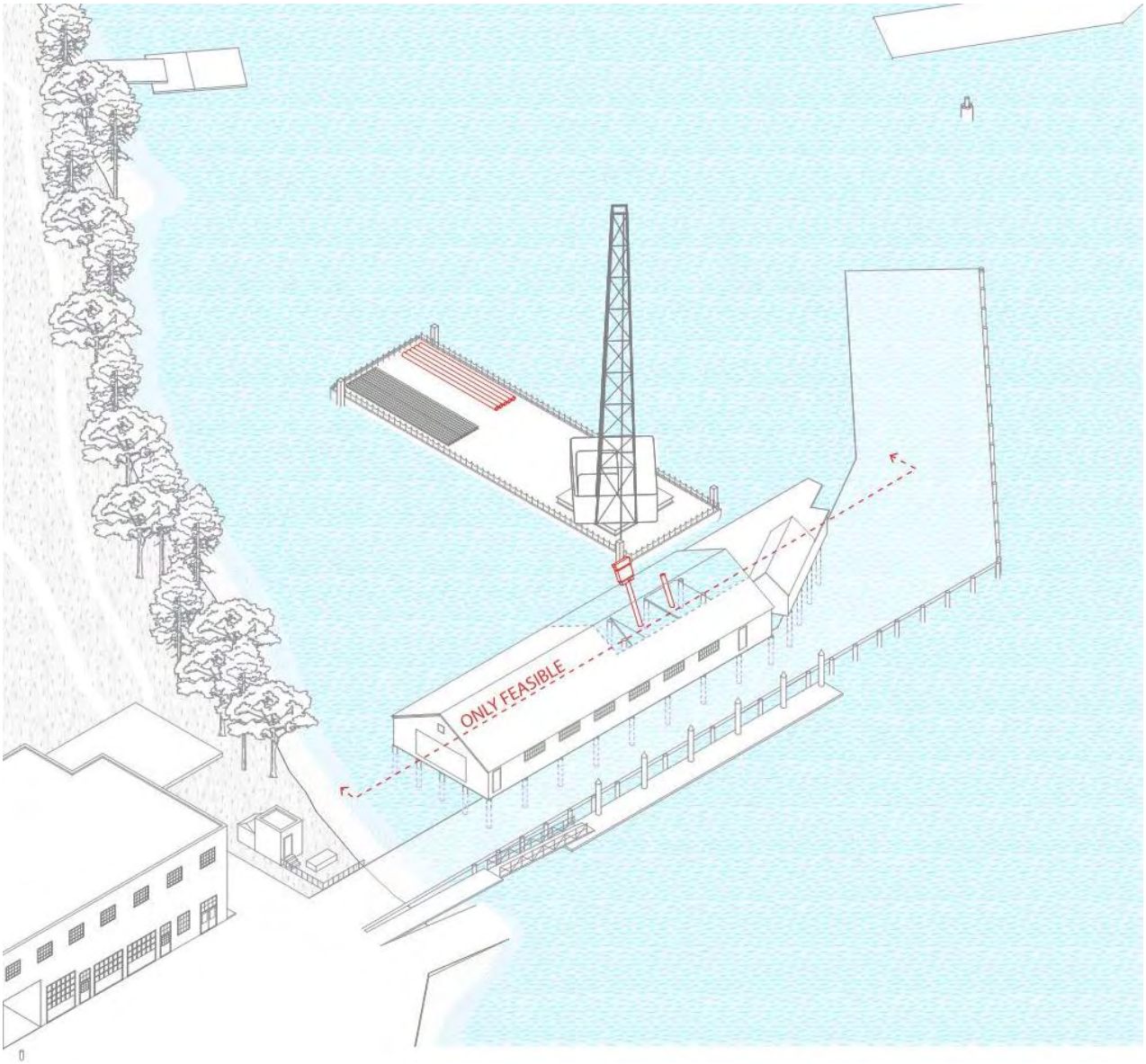
It is important to note that this solution is not feasible for the portions of B31 north of the covered moorage. These portions abut Pier 1 directly, leaving no free space to drive a pile outboard of the existing structure. If this replacement methodology is desired for these northern portions, access holes and repairs will need to be made within Pier 1. This will require coordination with the existing Pier 1 piles and battered pile bracing. Due to the density of piles within Pier 1, this may not be a feasible approach. Negotiating the existing B31 pile caps and piles with new steel pile caps is a challenge. Additionally, many challenges occur within the planes of existing and new piles and pile caps. Excavating and cutting the piles underwater is time consuming, cumbersome and expensive.

### Historical Impacts:

The addition of new materials (piles and pile caps) in a new position underneath the existing resource is an adverse effect on the historic integrity of the building. Through seismic and gravity loading upgrades, the work will affect the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

### Additional Considerations:

None identified at this time.




## Option 3: Batter Pile Replacement

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | 0 | -1 | -1 | 0 | -1 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

If using a wood pile, it is possible to batter the pile alongside, and then pull the pile into place underneath a pile cap. If using a steel pile, it is not possible to elastically deform it into place. When using a steel pile, to transfer the vertical load, a steel corbel is welded to the pile and steel pile cap. Wood piles treated with creosote, CCA, or other comparably toxic compounds are prohibited by SMC 23.60A.186. The use of

untreated wood piles is not advised; thus, steel piles are envisioned within this option, using the welded corbel technique.

A large barge is mobilized to site with a crane and pile driving heads. The existing small boat float will need to be disconnected and temporarily anchored out of the work area. The barge is secured using spuds down to the lake bottom. Demolition work of all building parts that are within the work area is commenced. This includes skirting and existing, non-load-bearing, finger pier decks. Once cleared, new temporary steel pile caps are floated into position and secured to the above water structure. Existing pile caps are removed and new steel pile caps are installed. New steel piles are driven at a batter alongside the existing piles. Steel corbel is welded to the top of the pile, connecting the new steel pile cap and steel pile together. The existing pile is then dug out at the lake bottom by hand and cut using a pneumatic chainsaw underwater. The above water structure is then settled onto a new pile and pile cap structure. Seismic and gravity upgrades are made to the existing structure. These include significant installation of steel moment frames in the longitudinal and transverse direction of the structure. Re-sheathing the walls and roof, increasing the nailing, adding strapping and hold-downs, and upgrading connections to the new steel moment frame system. A concept outline of these upgrades is addressed by Reid Middleton.[63]

If this replacement methodology is utilized for the northern additions to the covered moorage portion of B31, 5-foot square access holes will need to be coordinated with the existing piles within Pier 1 and then cut through the deck of Pier 1 to drive battered piles to support the additions north of the covered moorage. This would require further consultation with WDAHP and Seattle LPB, as Pier 1 is a nationally registered contributing historic resource.

### Health and Safety:

The replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof. Seismic and gravity upgrades are made to the existing structure.

### Programming Success:

This rehabilitation option retains the existing programming capacity of the above water structure. This structure is currently limiting to SSP's operational capacity.

### Life Cycle Cost:

The method increases building longevity by replacing wood piles with steel piles. Leaving the above water building envelop in its existing position without any manipulations also eliminates any costs in moving or working through the existing structure. The demolition of existing piles through underwater excavation and pneumatic chainsaw adds significant cost in the removal of the existing creosote piles. Battering piles and welding corbel steel to the pile tops adds complexity and cost to the process.

### Site Impacts:

The pile driving barge deploys and utilizes spuds into the lake bottom to hold the barge in place. Removal of piles through excavation and cutting is cited as a "last resort" within the Army Corps best management practices for removing piles. This method disrupts the lake bottom area around each existing pile. In addition, piles that are cut and remain buried under ground become a potential hinderance to future development or rehabilitation efforts on site. A reduction in total pile area is made through the use of steel piles. Existing overwater coverage is retained.

[63] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

### Construction Feasibility:

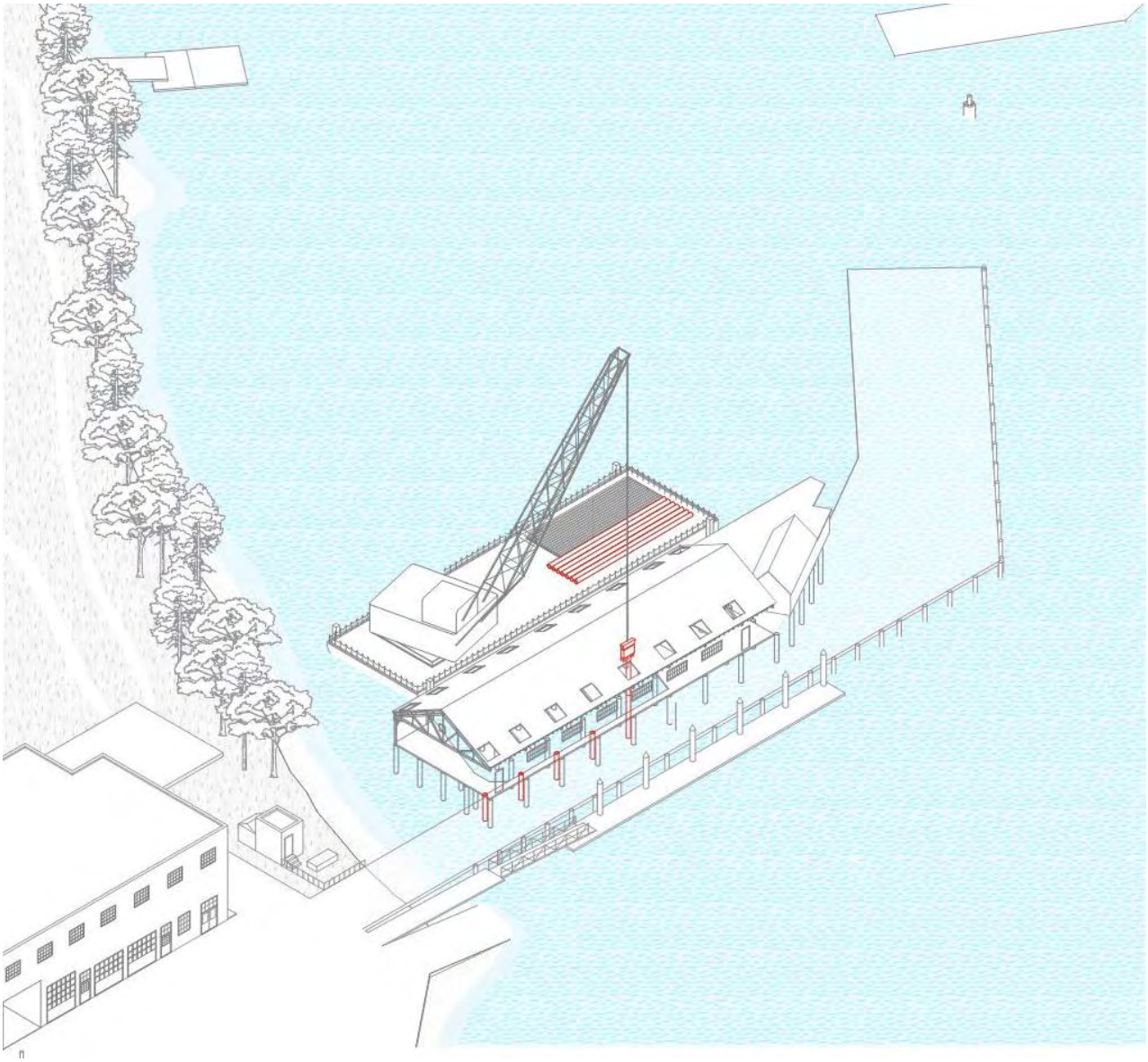
Battering piles is a typical construction process with precedent. Welding, corbeling and connecting piles adds complexity to the process.

### Historical Impacts:

The addition of new materials (piles and pile caps) in a new position underneath the existing resource is an adverse effect on the historic integrity of the building. Through seismic and gravity loading upgrades, the work will affect the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

### Additional Considerations:

It is unclear if this method alone is adequate to replace the existing pile structure of B31. Battered piles alone may not be adequate to receive the gravity loads or respond adequately within a seismic event. Further consultation is needed for this replacement option.



## Option 4: Through the Roof Pile Replacement

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | -1 | -2 | -1 | 0 | -2 | -2 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

**Work Description:**

A large crane barge is mobilized to site, necessitating the opening of the existing log boom, and the temporary removal and anchorage of the small boat floats to the west of B31. 5'x5' holes are cut through the roof of B31. New steel piles are driven through each consecutive hole. Once driven to bearing capacity, the pile is cut at the desired height, lifted off and the remaining stub welded to the next pile along the line. The weld area is touched up with galvanizing and then the new composite pile is used as the next new pile in the structure. Once all of the new piles are driven, steel pile cap beams are floated

into place underneath the structure. The barge crane is then utilized to lift each pile cap into place through the holes within the roof. The building is re-settled onto the new steel pile caps. New internal structural transfer members are added to bring the gravity load of the project onto the new pile locations. The existing piles are then excavated to 2' below mud line and cut underwater using a pneumatic chainsaw. The roof holes are repaired, and the entire roof of the project is re-done. Seismic and gravity upgrades are made to the existing structure. These include significant installation of steel moment frames in the longitudinal and transverse direction of the structure. Re-sheathing the walls and roof, increasing the nailing, adding strapping and hold-downs, and upgrading connections to the new steel moment frame system. A concept outline of these upgrades is addressed by Reid Middleton.[64]

The implementation of this repair method within the additions north of the covered moorage within B31 would require further study, as there are ceiling, roof, floor, substructure, pile caps and piles to negotiate the placement of a new pile and pile cap system for this region of the building.

### Health and Safety:

Cutting holes within the roof of B31 creates safety hazards for work crews on the roof. In addition, the vibration installation of piles through the roof holes adds movement to the site itself which translates to movement of the structure. This may self-compromise the structure. Further study is required.

### Programming Success:

This method of repair does not address or ameliorate any existing programming deficiencies within B31. Within this repair method, the existing piles are not able to be replaced within their exact location, necessitating a shift in the pile caps, transfer beams, and pile structure. This shift in structure will create spatial inefficiencies within the existing, already constrained B31 envelope.

### Life Cycle Cost:

The method increases building longevity by replacing wood piles with steel piles. However, working through an existing building requires careful coordination. Opening, closing, repairing and patching large structural holes within the roof diaphragm adds cost to the process. Holding, cutting square and cleanly a driven pile, grinding and prep for structural welding and certified structural welding of composite piles throughout the entire project adds time, complexity and cost to the process. The addition of gravity and lateral transfer structure to the new pile locations, driven through the roof, adds cost and complexity to the design and construction of the project. The demolition of existing piles through underwater excavation and pneumatic chainsaw adds significant cost in the removal of the existing creosote piles.

### Site Impacts:

The pile driving barge deploys and utilizes spuds into the lake bottom to hold the barge in place. Removal of piles through excavation and cutting is cited as a "last resort" within the Army Corps best management practices for removing piles. This method disrupts the lake bottom area around each existing pile. In addition, piles that are cut and remain buried under ground become a potential hinderance to future development or rehabilitation efforts on site. A reduction in total pile area is made through the use of steel piles. Existing overwater coverage is retained.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

[64] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

### Construction Feasibility:

Roof holes and new pile locations must be coordinated with the existing roof truss structure. New piles cannot be driven in the same location as existing piles. New piles will need to be driven inboard of existing line of exterior piles, necessitating additional structural systems to transfer gravity load from the exterior wall to the pile system. The existing finger piers are in the way when floating in new pile caps into the structure. They will need to be demolished. Cutting holes in the roof diaphragm of the structure reduces its capacity to resist lateral forces. It is unclear if these holes in conjunction with the heavy vibration and driving action of the pile hammer could result in damage to the building. Driving piles through the roof of the portions of B31 north of the covered moorage would also necessitate coordination with the floor structure, walls, ceilings and pile cap structure within these additions. It is unclear at this time if the clear area needed around a working pile to drive it would structurally impair these small spaces during the pile driving process. Cutting and welding piles necessitates clean, square cutting, grinding and prep for structural welding, and certified in field structural welding. The required cutting and welding of pile adds further work to the project and increases interaction between people and large piles, creating the potential for hazardous situations. Pneumatic chainsaw cutting underwater adds human risk of injury to the pile removal process. Repairing and re-roofing the project adds human risk of working at height.

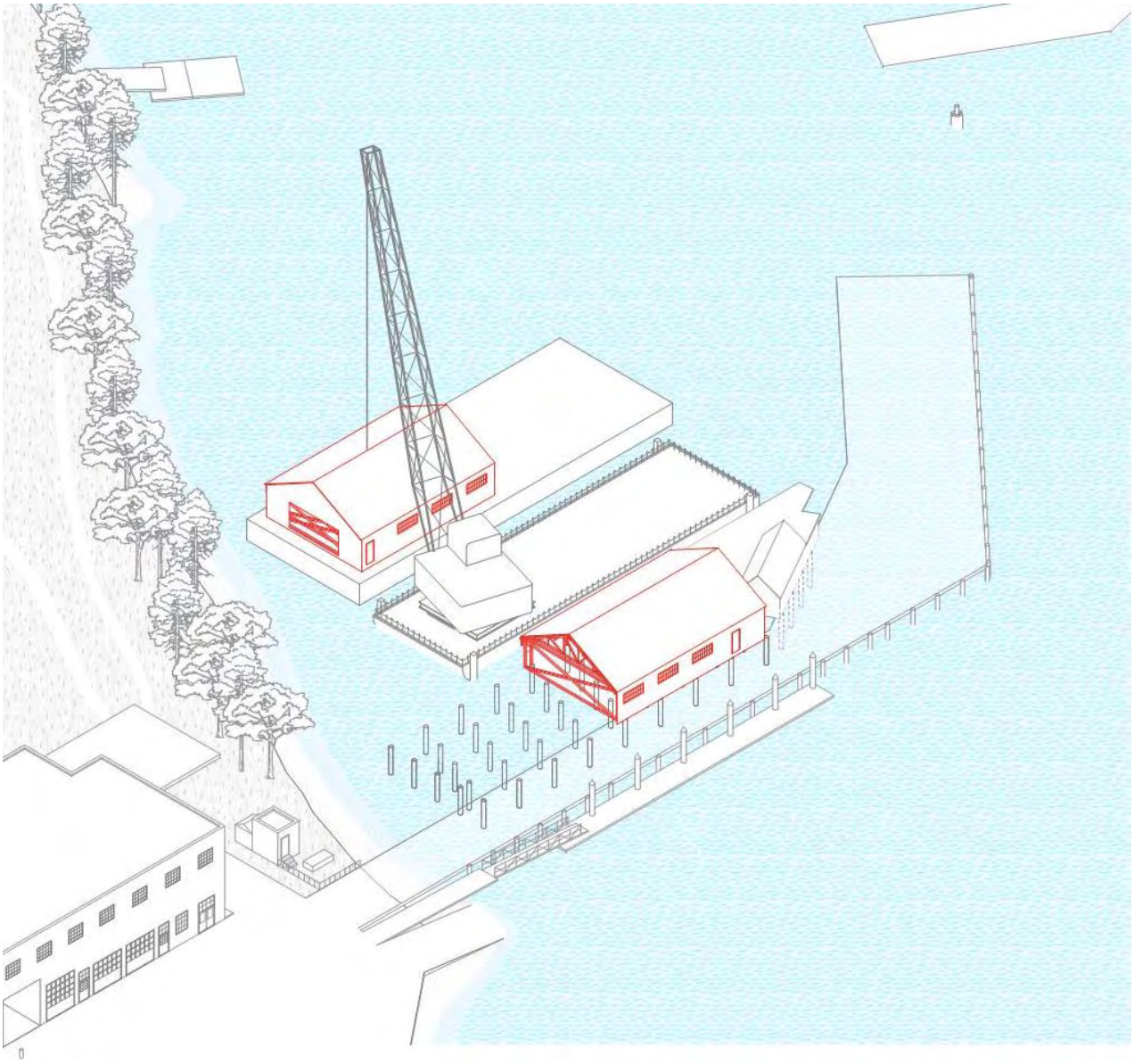
### Historical Impacts:

The addition of new materials (piles and pile caps) in a new position underneath the existing resource is an adverse effect on the historic integrity of the building. New structural members are added to transfer the wall shear and gravity loads from the external walls to the inboard pile cap system. These members conflict with the existing structural system and conflict with the original feeling and design of the building. Through seismic and gravity loading upgrades, the work will affect the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

The removal and repair of a large percentage of the roof structure may affect the integrity of the roof volume from a historical perspective.

### Additional Considerations:

It is unclear if B31 will need to be temporarily braced while the holes in the roof are cut while pile vibration work is done on-site. It is unclear if this method of replacement is even feasible within the additions north of the covered moorage within B31.



# Option 5: Barge Lift Pile Replacement

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | 0 | -3 | -2 | 0 | -3 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

**Work Description**

Three large barges are mobilized into the inner harbor of Sand Point, necessitating the opening of the existing log boom and temporary removal and anchorage of the small boat floats to the west of B31. Depending on the scale of structure to remain, a barge with a clear area of 5,500 $FT^2$ to hold the covered moorage or 7,000 $FT^2$ to hold the covered moorage and the northern additions of B31. Due to the unstable nature of the existing structure, temporary steel interior bracing is developed and installed within B31. The large nature of the building necessitates cutting it into multiple pieces for the lift operation. A team uses a saw to cut the covered moorage section of the building in half. The sections are rigged and

prepared for lifting. Using the crane barge, each section of the building is lifted off and staged onto an additional floating barge adjacent to the crane. The existing deck and pile caps are removed and the existing wood piles are vibrated out using the crane barge vibration head. New piles are driven within the clear work area and new pile caps are installed. New deck is installed. One by one, the historic sections of the building are lifted back onto the new deck structure. Siding and roofing are repaired around the cut seams. Seismic and gravity upgrades are made to the existing structure. These include significant installation of steel moment frames in the longitudinal and transverse direction of the structure. Re-sheathing the walls and roof, increasing the nailing, adding strapping and hold-downs, and upgrading connections to the new steel moment frame system. A concept outline of these upgrades is addressed by Reid Middleton.[65]

### Health and Safety:

The replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof. Seismic and gravity upgrades are made to the existing structure.

### Programming Success:

This rehabilitation option retains the existing programming capacity of the above water structure. This structure is currently limiting to SSP's operational capacity.

### Life Cycle Cost:

The mobilization of three larger barges to the site adds significant cost to the project. The capacity of a crane barge to lift B31 is much larger than the capacity needed to drive and pull piles. Cutting and securing the covered moorage sections adds significant time and cost. Designing, developing and constructing temporary bracing structure within B31 for the crane lift is required. This adds time, cost (~$50,000) and complexity to the project. Lifting the portions of B31 north of the covered moorage becomes difficult and complex with the hodge-podge conglomerate of structures. Once the building is off, work is accomplished much faster and easier. Old piles are removed using a vibratory attachment. This expedites the removal process and reduces complexity, saving cost. The building is then lifted back into position onto new piles. The method increases building longevity by replacing wood piles with steel piles.

### Site Impacts:

The use of three barges on site adds more spud interaction with the lake bottom. However, removal of existing creosote piles is done through Army Corps best management practices using a crane and vibration driver. This is low impact compared to excavating by hand and removing piles with diver and chainsaw. It is more likely through vibration that an entire, intact, creosote pile can be removed from the site. A reduction in total pile area is accomplished through the use of steel piles. Existing overwater coverage is retained.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

### Construction Feasibility:

At this point, we do not know how robust the temporary bracing structure will need to be in order to prevent the building, as it is cut in half, from falling apart during the lift operation. This may necessitate

[65] Reid Middleton, Magnuson Park B31 Seismic Review, Letter, September 26, 2019. Pg. 4.

solid structural steel moment frames. There may be opportunity to design the temporary lift bracing and the final gravity and seismic structure upgrades to be the same structural system, installed once, and utilized for two separate purposes. Mobilizing three large barges will crowd significantly the inner harbor. It is unclear if there will be enough space available to coordinate the lift and set down of the building pieces. The complexity of this option lies within the initial cutting, securing, bracing and lifting of the above water structure onto a site barge. Afterwards, the work on site is straightforward and simplified, with crews able to use Army Corps best management practices for removing piles and vibrating in new piles without any obstructions to the work. Once new piles, pile caps, and deck are built, the building is lifted back onto its new foundation. There may be tolerance problems when placing, aligning, and connecting the old structures back onto a new deck.

Cutting the roof of B31 creates safety hazards for work crews on the roof. Lifting the building additionally creates more hazards within the rigging process and lift.

### Historical Impacts:

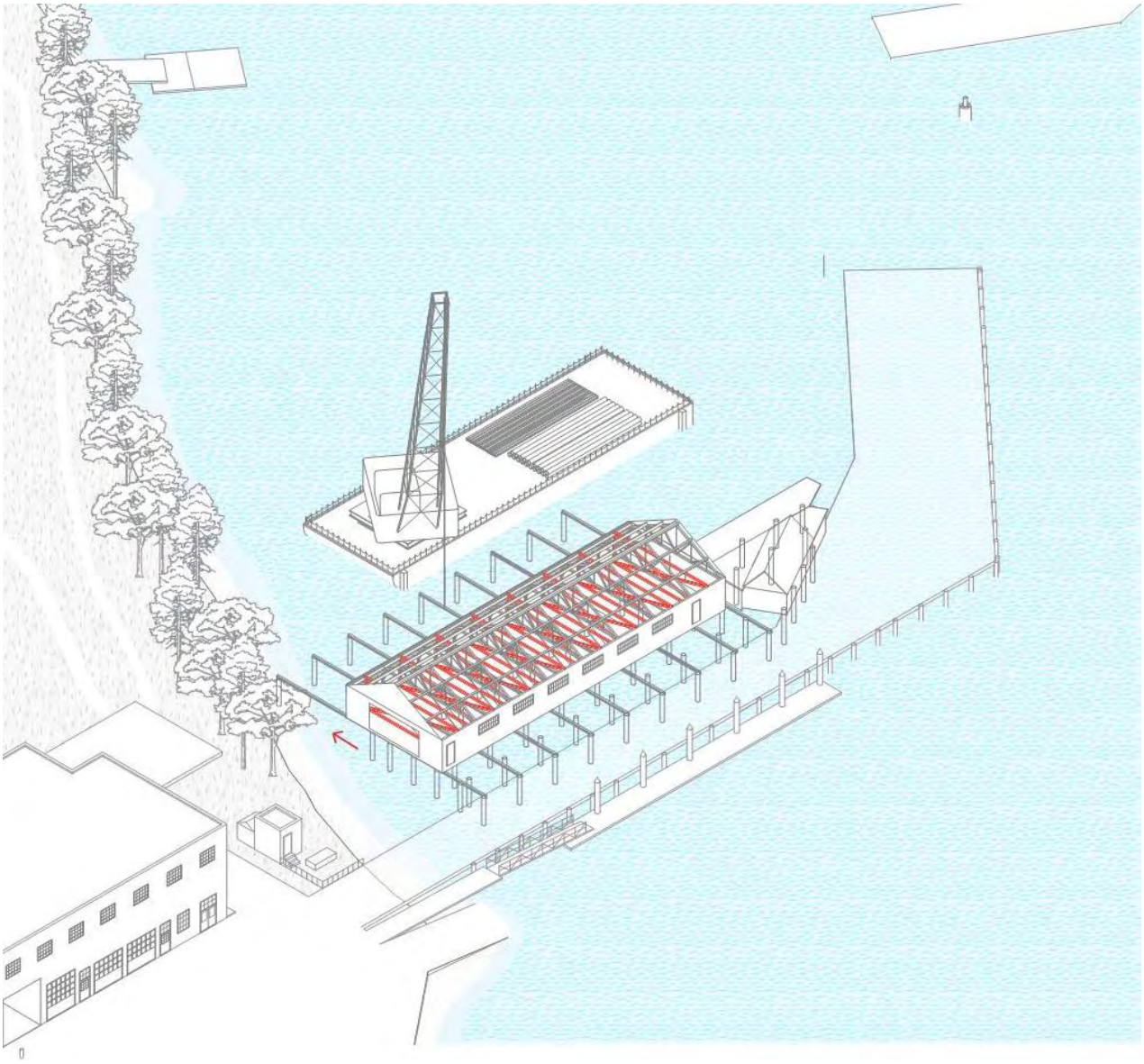
Cutting apart, moving and then reinstalling a resource affects its historic integrity. According to the Secretary of the Interior, with respect to the location aspect of integrity, “The relationship between a property and its historic associations is destroyed if the property is moved.” However, within this strategy, the building is moved and then placed back onto the same position. It does not appear that the addition of removing, then placing back, a historic feature is an adverse effect.

The addition of new materials (piles and pile caps) underneath the existing resource is an adverse effect on the historic integrity of the building. Through seismic and gravity loading upgrades, the work will affect the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

### Additional Considerations:

When lifting the existing building off of the existing pile foundation structure, there is significant uncertainty on the extent of the building structure that will be able to remain once placed back onto the new foundations. We may find that the existing columns and structural shear system need to be completely retrofitted, necessitating large scale changes in the building structure, eliminating existing building structure and replacing with code required upgrades. This may mean that once portions of the building are lifted off, only a fraction of that matter is retained and utilized within the final building structure.

There is significant risk within this method. If the building is destroyed within the lift process, an alternate method will need to be designed and executed. The contractor team will need to determine if barges larger than the size of the Ballard locks are needed for this work.



## Option 6: Roll Off Pile Replacement

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | 0 | -3 | -3 | 0 | -3 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

First, a crane barge is mobilized to site, necessitating the opening of the existing log boom, moving, and temporarily anchoring the existing small boat float West of B31 to an alternate location. 2 new lines of temporary steel piles are driven to the west of B31. A temporary pile cap is connected between the two temporary piles, and spans underneath B31. This temporary pile cap is connected to the existing piles underneath B31. Temporary interior structural steel bracing is designed and installed on the interior of

B31. B31 is then jacked up and off its existing pile caps and onto the temporary steel pile cap. A series of wheels along the temporary pile caps allow the Building to be rolled off of its existing pile structure onto the new temporary pile structure to the west. The temporary steel pile cap section affixed to the existing piles is removed. The existing deck and pile caps are removed. The existing piles are vibrated out. The crane barge is moved to the East of Pier 1. New steel piles are driven on site and new steel pile caps installed. The building is then rolled back onto the new steel pile cap structure.

### Health and Safety:

The replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof. Seismic and gravity upgrades are made to the existing structure.

### Programming Success:

This method of repair does not address or ameliorate any existing programming deficiencies within B31. Within this repair method, the existing spaces are retained as is.

### Life Cycle Cost:

The mobilization of additional equipment, piles, pile caps, deck, bracing and other equipment needed to construct the temporary pile deck adds significant cost to the project. The construction of the temporary pile deck to the west of B31, temporarily supporting B31, necessitates moving the pile driving crane barge to the east of Pier 1, requiring a larger and longer boom crane barge, adding cost to the project. The complexity of installing temporary bracing, jacking the existing building up, rigging it for the move, and then rolling it evenly along newly constructed pile caps adds significant complexity and cost to the project.

### Site Impacts:

The introduction of an entirely new pile structure to the west of B31 adds significant environmental impact to the below water habitat. While these piles are temporary, the act of driving and removing them is disruptive. Removal of the existing wood piles is done through vibration attachment, in accordance with Army Corps best management practice. Total pile area on the site is eventually reduced through the replacement of wood piles with steel piles. Barge access and use of the inner harbor and east of Pier 1 is required. This increases below water impacts from barge spud deployment. Existing overwater coverage is retained.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

### Construction Feasibility:

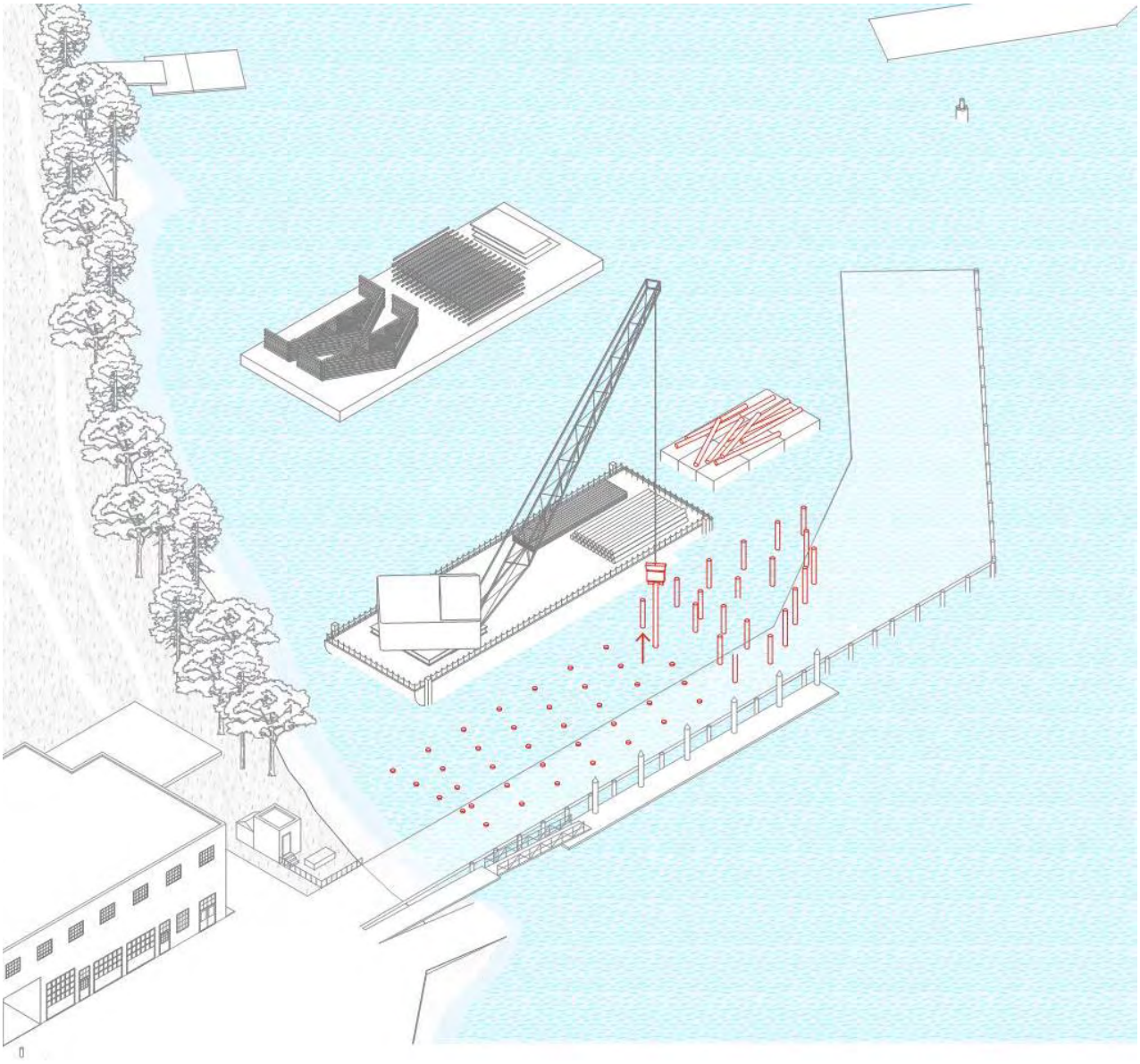
Significant challenges are presented within this rehabilitation option. The driving of two new sets of pile lines creates further risk in hitting a below water obstruction, causing significant delays to the project. The splicing, connecting and supporting of new temporary pile caps for the roll-off operation adds complexity within the existing structural system and orientation of the existing structural pile caps. These orientations may not directly allow a single directional rolling movement. Once installed, lifting and securing the building onto the new temporary pile caps adds complexity to the process. The integration of temporary internal structural bracing for the move also introduces complexity of working within the existing building structure and systems. The actual rolling and movement operation has its complexities as well, with many unanswered questions. This option has a high risk for unforeseen problems.

### Historical Impacts:

The addition of new materials (piles and pile caps) underneath the existing resource is an adverse effect on the historic integrity of the building. Through seismic and gravity loading upgrades, the work will affect the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

### Additional Considerations:

When rolling the existing building off of the existing pile foundation structure, there is significant uncertainty on the extent of the building structure that will be able to remain once rolled back onto the new foundations. We may find that the existing columns and structural shear system need to be completely retrofitted, necessitating large scale changes in the building structure, eliminating existing building structure and replacing with code required upgrades. This may mean that once portions of the building are rolled off, only a fraction of that matter is retained and utilized within the final building structure. The construction and removal of a temporary pile deck may not be feasible within the ecological work window granted to the project.



# Option 7: Deconstruct and Reconstruct

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | 0 | -2 | -1 | 0 | -1 | -1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

Two barges are mobilized to site, necessitating the opening of the existing log boom and temporary removal and anchorage of the small boat floats to the west of B31. The building is sectioned into discrete wall and roof panels. These regions are cut apart by hand, craned off of the building structure, and stored on an additional mobilized barge, or stored on land within a site staging area. If building components are stored on land, adequate calculations will need to be made to ensure that trailer trucks and loads are able

to be driven onto the existing Pier 1 to receive loads of building panels. Once the exterior roof and wall structure is removed, the structure of the building is removed and stored on a barge or shoreside. Old structure, roof and wall panels are structurally upgraded with blocking, strapping, nailing, sheathing, and sistering while laying flat within a work area on site (barge or shoreside). The existing deck, caps, and piles are then accessible without overhead obstruction. The existing deck and pile caps are removed and placed on a demo barge. Existing piles are removed using a vibration attachment and placed on the demo barge. Once the site is cleared, new steel piles are driven using a vibration attachment. New steel pile caps are installed. New deck is installed. New steel moment frame structure is installed. Old structure is then lifted back into position and affixed to new steel moment frame structure. Improved roof and wall panels are then lifted into position and attached to the new hybrid structure.

### Health and Safety:

The replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof. Seismic and gravity upgrades are made to the existing structure.

### Programming Success:

This method of repair does not address or ameliorate any existing programming deficiencies within B31. Within this repair method, the existing spaces are retained as is.

### Life Cycle Cost:

The mobilization of a storage barge, and crane barge to site adds cost to the project. Partitioning, cutting, rigging and lifting multiple pieces of building, in addition to each structural truss and column adds significant time and cost to the process. Coordinating these structural pieces and working within the confines of existing cobbled together structure adds time and cost to the process. Once the site is clear of above water obstructions, the demolition process of the existing piles, caps, and deck is quick and straightforward.

### Site Impacts:

Mobilizing two barges (potentially three if demo materials cannot be stored on the crane barge) to site increases the site impacts below water with the deployment of more spuds. If trucks are used to haul building panels to a staging area on site at Magnuson, this creates congestion, exhaust, and runoff problems while utilizing the Pier as an access road. Otherwise, further site impacts are mitigated through the use of Army Corps best management practices for removing piles using a vibration attachment. The reduction of pile area on site additionally is a site benefit. Existing overwater coverage is retained.

### Sustainability:

The result does not address energy performance, water usage, storm water management, or healthy materials.

### Construction Feasibility:

The sectioning and removal of panels of building requires stabilizing the building while removing each panel. In addition, each panel removed may not be laterally stable, and will require bracing or strapping to retain its original shape.

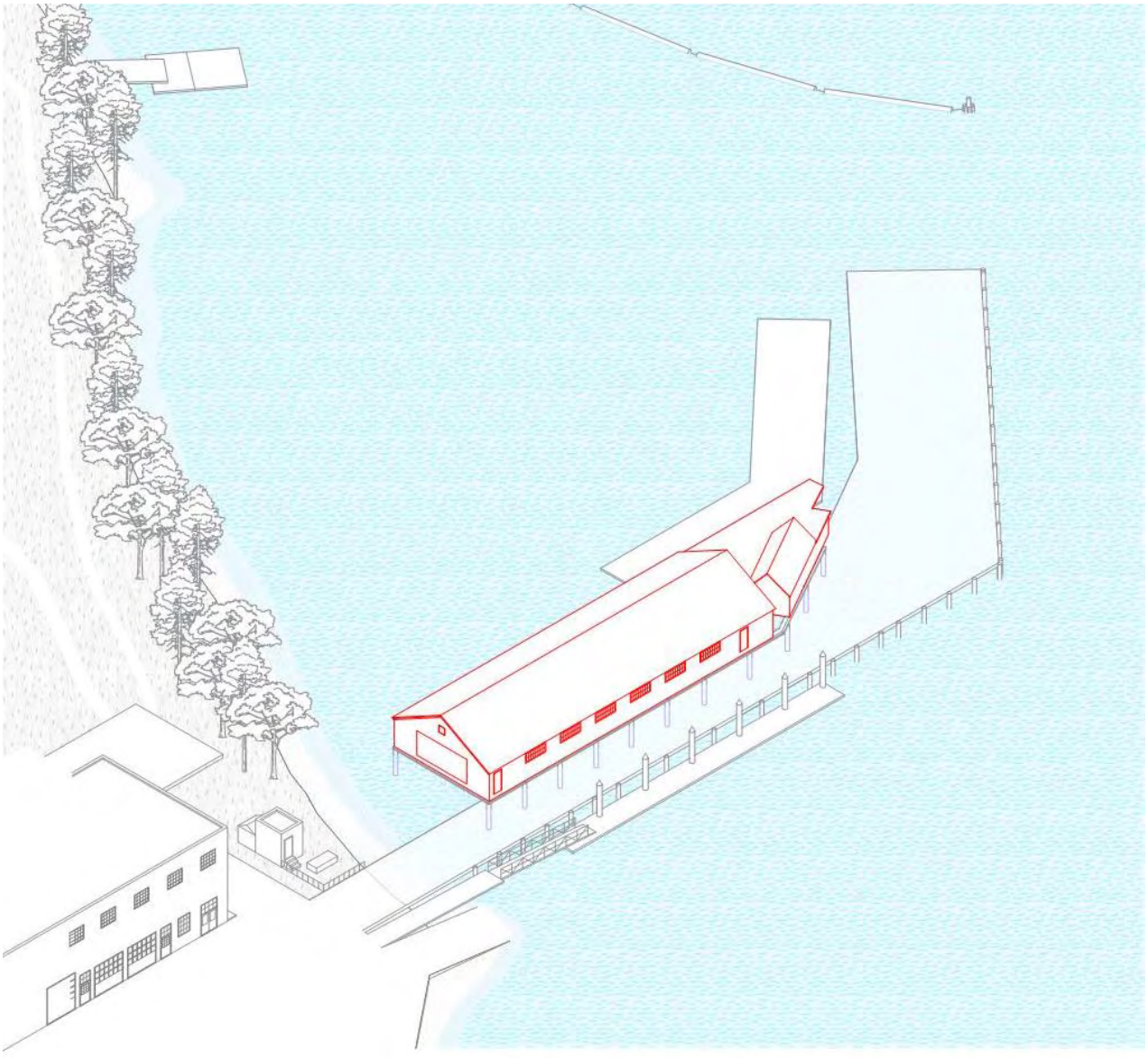
### Historical Impacts:

The addition of new materials (piles and pile caps) underneath the existing resource is an adverse effect on the historic integrity of the building. Through seismic and gravity loading upgrades, the work will affect

the historical integrity of the existing resource by altering the structure and adding elements that visually conflict with the historic structure. These added elements include steel strapping, bolts, and new pile post tops. Structural impacts include the addition of steel moment frames on the interior of the building, sistering existing wood structural elements with new timbers, adding numerous bolt head locations, etc. New blocking, nailing, and sheathing added onto the interior of the building alters its design, materials and feeling. All these affects would need to be mitigated.

### Additional Considerations:

While portions of B31 such as piles, pile caps, and pressure treated materials are demolished and disposed as waste material, the reclamation of historic building materials and intact wood members can be made integral to the project. The project may repurpose these materials as fitting and appropriate within the new hybrid design approach.



## Option 8: Demolish and Reconstruct In-Kind

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 1 | -3 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

Two barges (demo and crane) are mobilized to site, necessitating the opening of the existing log boom and temporary removal and anchorage of the small boat floats to the west of B31. A containment boom is placed around the work area. Tarps and nets are slung underneath with floats to catch any falling debris from the demolition. Using the crane mobilized to site, the building is demolished and placed on the demo barge. Once the above water structure is demolished, pile caps, and deck are removed as well. The slung

tarps are removed and piles are vibrated out using the crane barge with a vibration attachment. Once the existing wood piles are removed and placed on the demo barge, the demo barge is towed and offloaded. The crane barge on site, then is used to install and drive new steel piles. New steel pile caps are installed as well as new deck installed. New wood framing and wood structural elements are installed, upgraded to meet modern seismic code. New wood sheathing and exterior cladding is installed. The exterior form and volume of the original building is replicated exactly with new materials from the water up.

### Health and Safety:

The replacement of the below water pile structure significantly improves the structural performance of the building. Operational safety is not changed due to the retention of the existing B31 envelope and roof. Seismic and gravity upgrades are made to the existing structure.

### Programming Success:

This method of repair does not address or ameliorate any existing programming deficiencies within B31. Within this repair method, the existing spaces are retained as is.

### Life Cycle Cost:

The simplification of approach reduces the initial capital cost of the project significantly compared to other more complex proposals. The use of steel piles and pile caps increases the longevity of the structure.

### Site Impacts:

Aside from the initial use of two barges and the demolition mitigation, the site impacts are minimal. The reduction of pile area on site additionally is a site benefit. Existing overwater coverage is retained. Removal and reconstruction of lead pane windows is accomplished.

### Sustainability:

The result conforms to code required sustainability standards.

### Construction Feasibility:

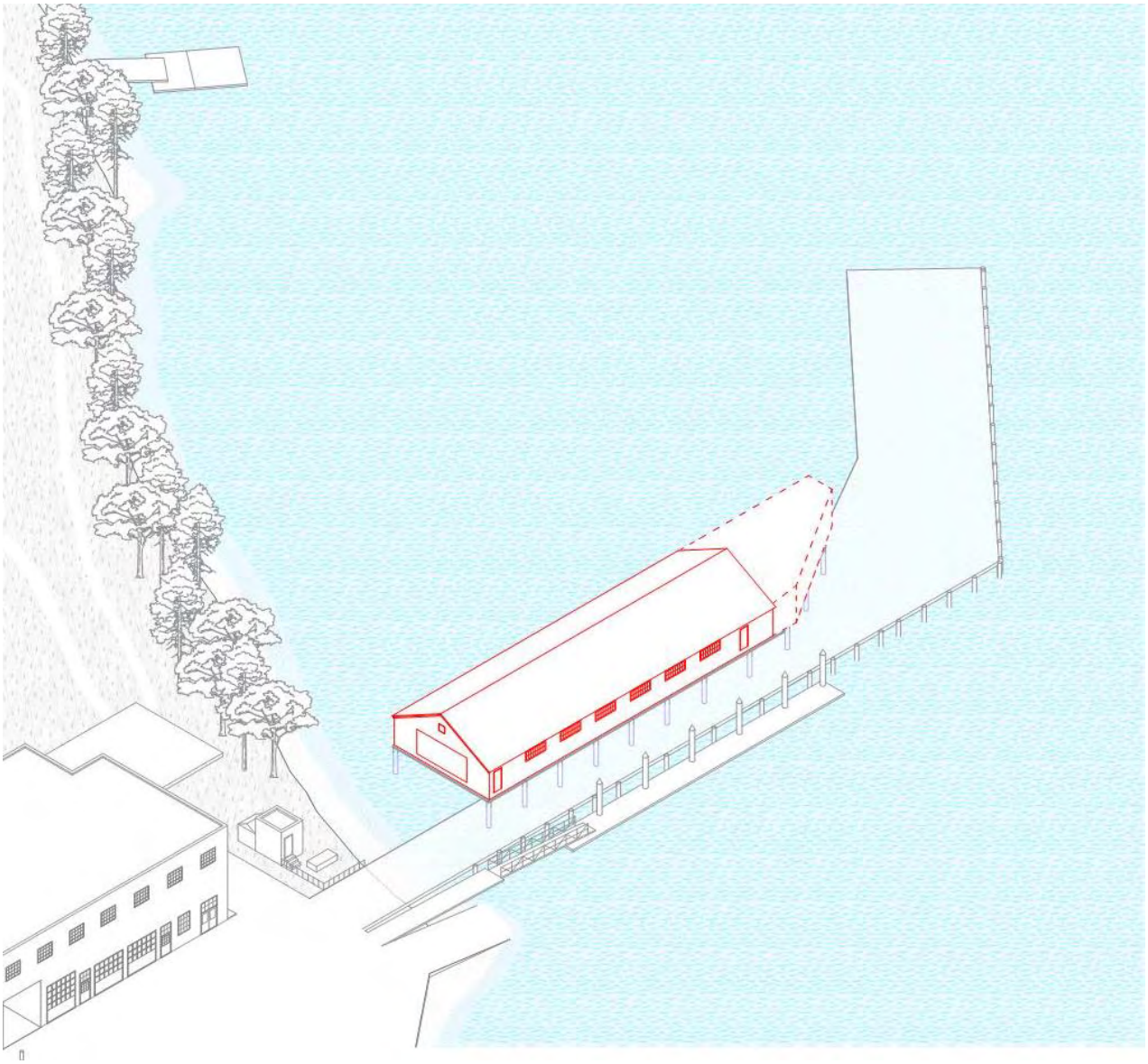
Minimal challenges present themselves within this option. It is straightforward.

### Historical Impacts:

The demolition of the existing historic resource is an adverse effect on the resource. This will need to be mitigated, potentially through work done somewhere else on the Magnuson Park site.

### Additional Considerations:

While portions of B31 such as piles, pile caps, and pressure treated materials are demolished and disposed as waste material, the reclamation of historic building materials and intact wood members can be made integral to the project. The project may repurpose these materials as fitting and appropriate within the new hybrid design approach.



## Option 9: Demolish and Reconstruct Hybrid

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 2 | 2 | 0 | 1 | 2 | 1 | -3 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

**Work Description:**
Two barges (demo and crane) are mobilized to site, necessitating the opening of the existing log boom and temporary removal and anchorage of the small boat floats to the west of B31. A containment boom is placed around the work area. Tarps and nets are slung underneath with floats to catch any falling debris from the demolition. Using the crane mobilized to site, the building is demolished and placed on the demo barge. Once the above water structure is demolished, pile caps, and deck are removed as well. The slung

tarps are removed and piles are vibrated out using the crane barge with a vibration attachment. Once the existing wood piles are removed and placed on the demo barge, the demo barge is towed and offloaded. The crane barge on site, then is used to install and drive new steel piles. New steel pile caps are installed as well as new deck installed. New framing and structural elements are installed, upgraded to meet modern seismic code. New sheathing and exterior cladding are installed. The exterior form and volume of the covered moorage is replicated exactly with new materials from the ground up. The northern additions, CPO quarters and storage areas are replaced with a newly designed structure.

### Health and Safety:

The newly designed northern addition to the covered moorage greatly improves the level transition from the Pier deck to the small boat floats through the use of gangways and elimination of stairs. Building maintenance and operations specialists are brought in to advise on the new design, improving the safety of building maintenance staff and users.

### Programming Success:

Within this rehabilitation method, the inefficiencies of the northern additions to the covered moorage are eliminated. This footprint area is significantly improved through new design resulting in a more usable, useful and performative building for SSP and SPR.

### Life Cycle Cost:

The simplification of approach reduces the initial capital cost of the project significantly compared to other more complex proposals. The use of steel piles and pile caps increases the longevity of the structure.

### Site Impacts:

Aside from the initial use of two barges and the demolition mitigation, the site impacts are minimal. The reduction of pile area on site additionally is a site benefit. Existing overwater coverage is retained. The new building is forced to improve stormwater management on site through code compliant construction.

### Sustainability:

The result conforms to code required sustainability standards.

### Construction Feasibility:

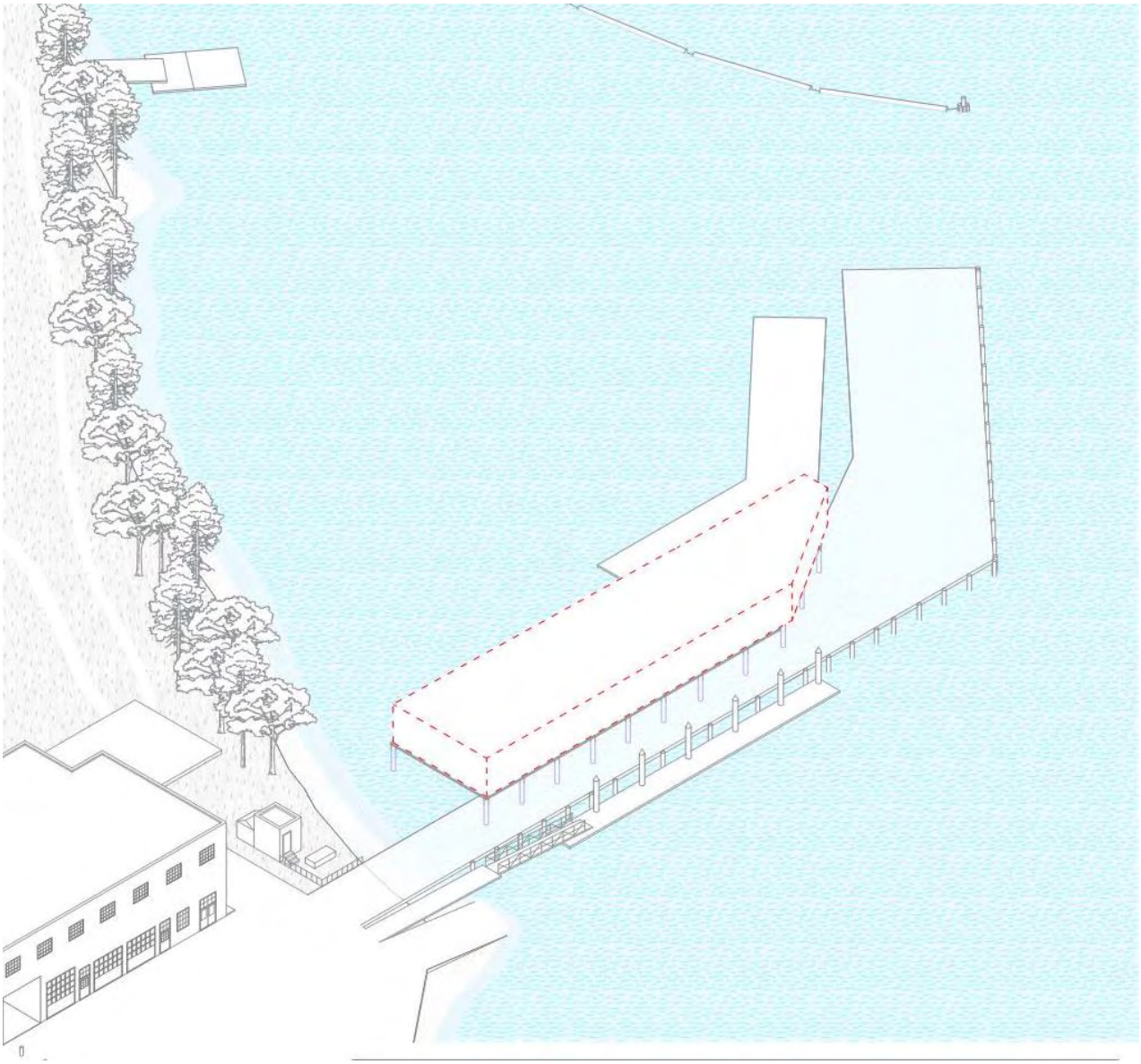
Minimal challenges present themselves within this option. It is straightforward.

### Historical Impacts:

The demolition of the existing historic resource is an adverse effect on the resource. This will need to be mitigated, potentially through work done somewhere else on the Magnuson Park site.

### Additional Considerations:

While portions of B31 such as piles, pile caps, and pressure treated materials are demolished and disposed as waste material, the reclamation of historic building materials and intact wood members can be made integral to the project. The project may repurpose these materials as fitting and appropriate within the new hybrid design approach.



## Option 10: Demolish and Reconstruct New Facility

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 2 | 3 | 0 | 1 | 2 | 1 | -3 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

**Work Description:**
Two barges (demo and crane) are mobilized to site, necessitating the opening of the existing log boom and temporary removal and anchorage of the small boat floats to the west of B31. A containment boom is placed around the work area. Tarps and nets are slung underneath with floats to catch any falling debris from the demolition. Using the crane mobilized to site, the building is demolished and placed on the demo barge. Once the above water structure is demolished, pile caps, and deck are removed as well. The slung

tarps are removed and piles are vibrated out using the crane barge with a vibration attachment. Once the existing wood piles are removed and placed on the demo barge, the demo barge is towed and offloaded. The crane barge on site, then is used to install and drive new steel piles. A newly designed structure is installed and constructed on site. New steel pile caps are installed as well as new deck installed. New framing and structural elements are installed, upgraded to meet modern seismic code. New sheathing and exterior cladding are installed.

### Health and Safety:

The newly designed building greatly improves the level transition from the Pier deck to the small boat floats through the use of gangways and elimination of stairs. Building maintenance and operations specialists are brought in to advise on the new design, improving the safety of building maintenance staff and users.

### Programming Success:

A new building is designed in a way that rethinks in new and practical ways how the space can perform currently and adapt to future growth needs for SSP and SPR.

### Life Cycle Cost:

The simplification of approach reduces the initial capital cost of the project significantly compared to other more complex proposals. The use of steel piles and pile caps increases the longevity of the structure.

### Site Impacts:

Aside from the initial use of two barges and the demolition mitigation, the site impacts are minimal. The reduction of pile area on site additionally is a site benefit. Existing overwater coverage is retained. The new building is forced to improve stormwater management on site through code compliant construction.

### Sustainability:

The result conforms to code required sustainability standards.

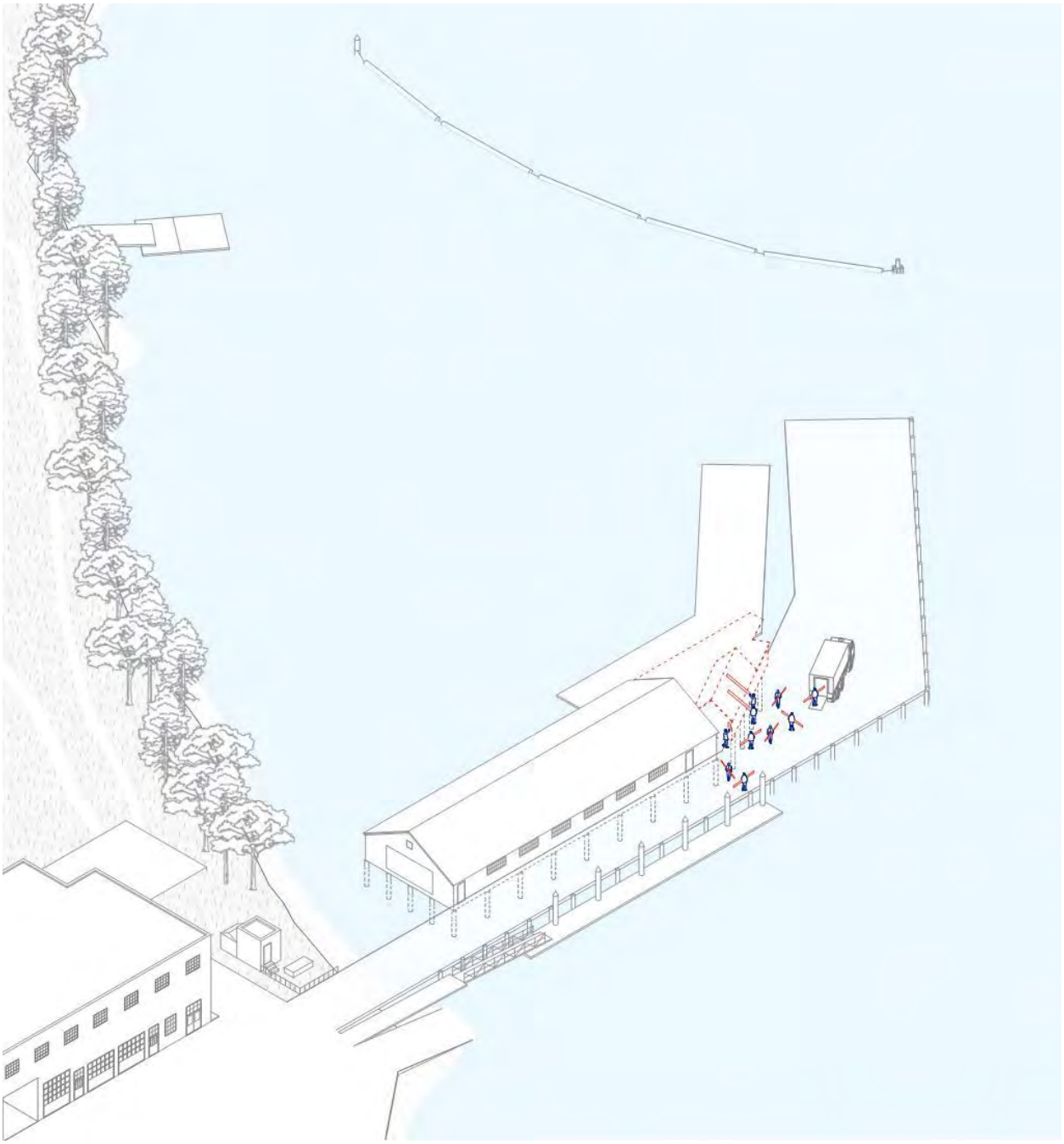
### Construction Feasibility:

Minimal challenges present themselves within this option. It is straightforward.

### Historical Impacts:

The demolition of the existing historic resource is an adverse effect on the resource. This will need to be mitigated, potentially through work done somewhere else on the Magnuson Park site.

### Additional Considerations:



## Option 11: Rehabilitate / Reconstruct Hybrid Historic & New

| HS | PS | LCC | SI | S | CF | HI |
|---|---|---|---|---|---|---|
| 2 | 3 | 0 | 2 | 2 | 1 | 1 |

| | |
|---|---|
| **HS** | Health & Safety |
| **PS** | Programming Success |
| **LCC** | Life Cycle Cost |
| **SI** | Site Impacts |
| **S** | Sustainability |
| **CF** | Construction Feasibility |
| **HI** | Historic Impacts |

### Work Description:

A containment trap is deployed underneath B31. Community members through multiple work parties disassemble the northern additions to B31, north of the covered moorage. Materials worthy of salvage are saved and stored offsite within a covered warehouse space. Other portions of the additions are demolished and taken to waste treatment. A large crane barge is mobilized to site, necessitating the opening of the existing log boom, and the temporary removal and anchorage of the small boat floats to the west of B31. Systematically, the historic walls and roof section of the existing covered moorage are disassembled and removed from the building. These stud walls, and original shiplap sheathing are retained through the rehabilitation effort. The stud walls and roof are either placed on a barge or loaded onto trucks where they are transported to a dry staging area. Existing wood structure and trusses are picked from the building and placed onto the existing pier, where they are deconstructed and materials salvaged.

At this point, the site is clear of obstructions, pile caps are removed by crane and salvaged where feasible. A vibration head is used to vibrate existing wood piles out of the ground. These piles are waste and taken to waste treatment. New steel piles are driven using a vibration head. New steel pile caps are installed, and new steel moment frames are erected within the covered moorage bay. The historic wall framing is lifted onto the new steel moment frame system within the covered moorage bay and clad with historic V-bead clapboard, as the covered moorage appeared in 1938.

A new addition is constructed north of the covered moorage volume. This addition utilizes the same footprint of the former northern additions. Construction waste is removed from the site on the mobilized barge.

### Health and Safety:

The newly rehabilitated building greatly improves the level transition from the Pier deck to the small boat floats through the use of gangways and elimination of stairs. Building maintenance and operations specialists are brought in to advise on the new design, improving the safety of building maintenance staff and users.

### Programming Success:

The rehabilitated building is designed in a way that improves efficiency for SSP operations, in addition to expanding the potentials for SSP to adapt to future growth and needs.

### Life Cycle Cost:

The use of community volunteer work sessions in deconstructing portions of the existing structure reduces initial capital labor costs. In addition, the focus on salvaging as much reusable material as feasible minimizes the amount of material conveyed to waste management, reducing costs. In addition, a reduction in waste materials reduces the size of barge infrastructure mobilization to site. Reused material within B31 reduces material costs. A clear working space with no obstructions for pile removal and driving streamlines the pile process, reducing costs. Erecting a new moment frame structure within the covered moorage minimizes the uncertainty and complications of retrofitting an existing structure, reducing capital costs.

### Site Impacts:

The reduction of pile area on site additionally is a site benefit. Existing overwater coverage is retained. Positive site impacts may be pursued through International Living Futures Institute (ILFI) certifications such as petal or full Living Building Challenge (LBC) certification. The maximization of light transmissive materials within the covered moorage roof allows for greater light penetration into the aquatic habitat

below, facilitating an increase in food, photosynthesis and oxygen within the water column, as well as reducing dark shaded areas for piscivorous fish to congregate.

### Sustainability:

The design team targets higher level sustainability metrics beyond LEED Gold, approaching ILFI petal certification and net zero energy. This leads to net positive water and energy use on site. Salmon safe certification is also pursued.

### Construction Feasibility:

Construction methods are simplified through the disassembly of the existing covered moorage volume, allowing ease of access to the pile cap and pile structure. Deconstructing, moving, and rehabilitating historic wall and roof framing adds complexity to the project.

### Historical Impacts:

See Section 14.11.

### Additional Considerations:

Considerations for engaging communities and adding further public benefit to the park will be considered. At the culmination of the project, B31 is ADA accessible.

# 12.0 Design Options

## 12.1 Introduction / Project Goals

On 11/06/19, a Kick-Off meeting attended by SPR, SSP, and MHP was held for Task 3 of this study. The intent of this meeting was to collectively vision what the project could and should be moving forward. Through the development of these many discussions with SSP, SPR, and stakeholders, the following goals for the rehabilitation of B31 have emerged, in no order of importance:

- Provide a safe, structurally sound building
- Expand the programmatic capacity of the site for SSP and SPR
- Demonstrate environmental stewardship
- Respect and acknowledge the history of the site
- Expand opportunities for access
- Provide public benefit

Consistent with these goals, the project team developed the definition of three project design options to draw and price within Task 3. The options were defined in basic terms as follows:

## 12.2 Option 1 – Bare Bones Baseline

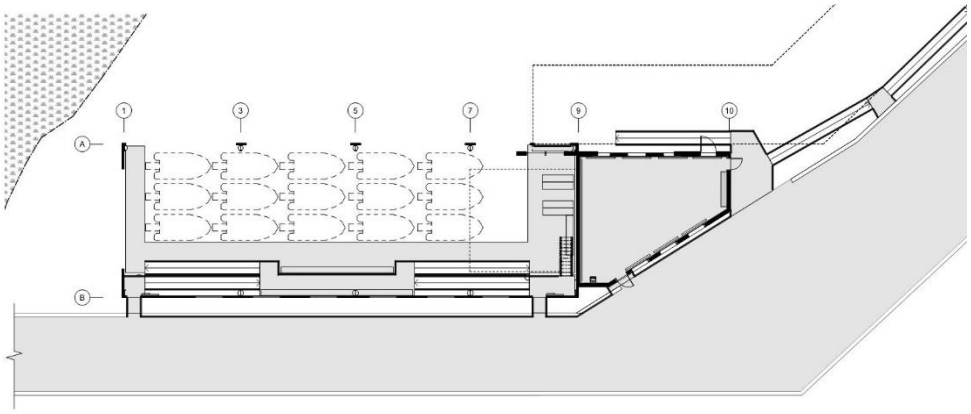



*Image 29*
Option 1- B31 conceptual floor plan
*Not to scale

*Building 31*

*Historic*

Covered moorage is rehabilitated to achieve structural integrity and making the building safe. New steel moment frame structure is installed. Steel piles replace wood piles. The Covered Moorage volume will be placed “as-is” back in place onto the new steel moment frame structure. Minimal effort will be put into historic mitigation/improvements. Building façade to remain as is. Only existing windows are replaced for visibility/safety.

*Program*

Arrangement of covered moorage is improved. Finger piers are demolished and not replaced. Total building footprint/ overwater coverage is retained. Northern additions (C.P.O.'s quarters/ toilets) are demolished, and a new addition is built as one multipurpose space. This new added space is conditioned and supplied with electricity. New addition is stud framed walls with punched openings. An equipment storage space is added. All parts of Building 31 are accessible.

*Sustainability*

B31 will achieve LEED gold.

*Building 11 T.I.*

New ventilated gender-neutral locker room is placed in Building 11 to replace existing lost locker room space in Building 31. Building 11 T.I. is accessible. Option B – Program Improvements Conditioned space, inviting, practical, possible to partition between SSP and Parks space. LEED Gold certification is pursued.

## 12.3 Option 2 – Functionally Successful

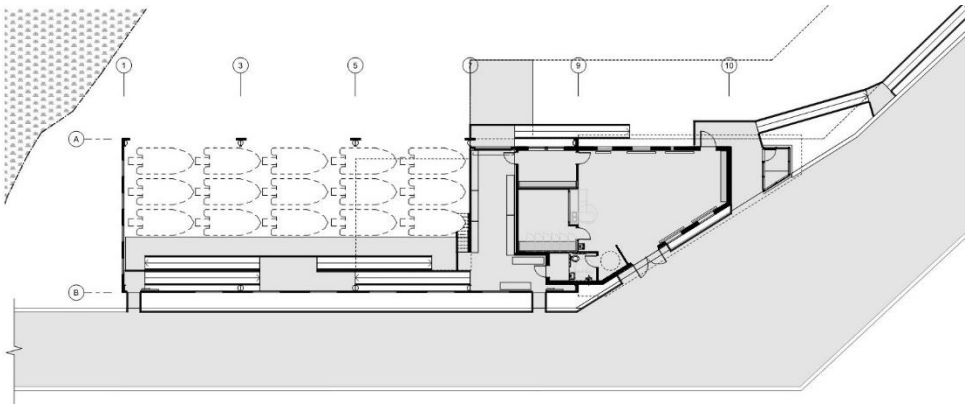


*Image 30*
Option 2- B31 conceptual floor plan
*Not to scale

Inclusive and in addition to features within Option 1.

*Building 31*

*Historic*

Rehabilitate West covered moorage façade to match 1938 as-built conditions. Representative historic materials are used to re-clad the building façade to match original conditions/materials.

*Program*

SSP program is improved, new addition contains multipurpose space, classroom/SPYS room, toilet, kitchenette, dockmaster space. New addition uses large punched openings. Transparency and improved program also make Building 31 more public. Access zoning is built in which makes dual function (SSP + renting out space) possible.

*Sustainability*

Full photovoltaic array on Building 11 sized to be net-zero demand. Add stormwater treatment on site.

*Building 11 T.I.*

Add staff kitchen and breakroom T.I. drying room and changing room scope is added to Building 11 Locker Room T.I..

## 12.4 Option 3 – Outstanding Performance

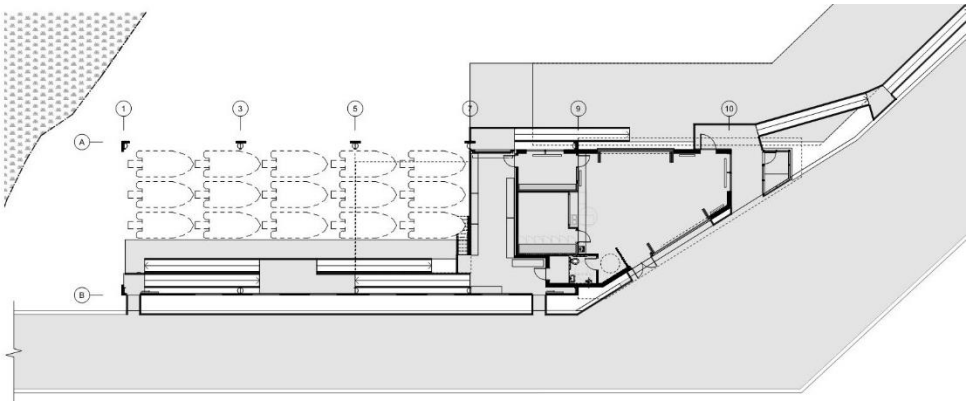


*Image 31*
Option 3- B31 conceptual floor plan
*Not to scale

Inclusive and in addition to features within Options 1 and 2.

*Building 31*

*Historic*

Re-cladding façade with representative historic materials. Site historical interpretive signage added.

*Program*

Deepened connection to surroundings, operable glazing system (Nana Wall) in addition to Structural Silicone Glazing (SSG) curtain wall at the dockmaster space. Spatially optimized, integrated storage solutions. Built in furniture in classrooms which improves flexible use of the space. Addition of more FJ sailboat float space.

*Sustainability*

ILFI Petal certification. Treatment, capture and reuse of stormwater on site. Composting toilet infrastructure included. (Update: Later it was determined that a composting toilet in B31 may add further complications and spatial constraints. Low flow fixtures are proposed in B31.)

*Building 11 T.I.*

Add new showers and toilets to Building 11 locker room T.I..

# 13.0 Preferred Approach – Building 31 – Option 3

## 13.1 Outreach


*Image 32*
Pictured above, the project team engaged in various outreach events over the course of this phase of work.

*Summary*

Various public outreach events were attended and developed by the project team over the course of this phase of work. They included and are not limited to:

- 09/11/19 Magnuson Park Advisory Council Meeting
- 09/12/19 Solid Ground Outreach BBQ
- 09/28/19 SSP High School Sailing Outreach
- 10/08/19 Friends of Sand Point Magnuson Park Historic District Meeting
- 10/19/19 SSP High School/ UW Sailing Outreach
- 10/19/19 Friends of Sand Point Magnuson Park Historic District Meeting
- 10/25/19 Magnuson Community Center Haunted House Outreach
- 12/10/19 Sand Point Application Review Committee Meeting
- 12/11/19 Magnuson Park Advisory Council Meeting
- 01/31/20 Landmarks Preservation Board ARC Meeting

At many events, the public was asked to provide comments on sticky notes and apply them to the project boards located at the event. In general, some fundamental themes emerged from various

community groups. Those from the Magnuson community wanted the opportunity to go in and engage with the new building, potentially linking community center programs with new spaces within B31. Those in the sailing community wanted dry space, more room, better locker rooms and shower facilities, and more glass to see the water and racecourse from inside. Everyone wanted a safe and inviting building.

## 13.2 Design Narrative / Concept

*Concept*

The rehabilitation concept aims to restore the aquatic habitat underneath the building, while providing major life safety, accessibility, and functionality improvements. These significant improvements are done in a manner conscious of the historic value the building contributes to the SP-NAS-LD.

As we zoom out to a larger scale, B31 is sited directly over critical Tier 1 habitat and migration corridor for Chinook salmon, a keystone species for our entire region responsible for transiting nutrients and minerals from the ocean to our forests, rivers and lakes, while serving as food for humans and endangered mammals like the southern resident killer whale in addition to hundreds of other animals and organisms. In addition, B31 is sited directly on top of known Sockeye salmonspawning habitat, as determined by WA F&W. The proposed design of B31 uses restorative measures by including light transmissible roof materials over critical nearshore littoral habitat minimizing pile area, eliminating toxic materials and using light transmissive gangways and floats where feasible.

Functionally, B31 serves as a critical component to a growing small boat recreational center known as Sail Sand Point. Within the building, moorage for rescue boats, equipment storage and instruction space is found. Accessibility to all launch floats and instructional areas is provided. A large multipurpose space connects the building to the Pier and provides large classroom and event space.

The building complements the existing public space on the Pier by moving private functions like changing and locker rooms to the shore and replacing them with a new multipurpose room allowing further opportunities for access and enjoyment of Lake Washington to the public at large. The increase in classroom space and safety boat infrastructure allows Sail Sand Point and SPR to expand water-related recreational programming for the community within Magnuson Park and at large.

The rehabilitation is accomplished in a way that retains major historic character defining features, such as the restoration of historic windows and the retention of the original major covered moorage volume on site. A new addition north of the original covered moorage volume is differentiated from the historic building.

*Major Program Elements*

*Covered Moorage*
By reducing the pile area and count, and providing light transmissive materials to the building, gangways and floats, we believe the rehabilitation of the covered moorage will be a net improvement to the ecological functionality of the shoreline area. In addition, the reconfiguration and improvements made to the covered moorage area allow for the additional storage of at least three new rescue boats, allowing for the expansion of SSP programming and further opportunities for the public to access classes and safety infrastructure on the water.

*Multipurpose Room (MPR)*

By replacing the existing locker room area with a single multipurpose room, the project aims to move private inward focused program to the shore and create public instructional program on the water. The MPR is intended to support the instruction of large group classes, allowing visibility to the lake and sailing equipment while instructing. In addition, the MPR serves as a briefing area and covered spectating location for large high school and collegiate regattas as well as open boating and community racing nights, allowing direct visibility to the racing area and access to equipment. A MPR space allows SSP to further expand programming activities into the shoulder seasons and winter.

As forest fire and poor air quality become a more regular summertime occurrence, interior, conditioned space is increasingly becoming a priority, allowing for the instruction of large groups with visibility to the water and equipment on days with hazardous air quality. King County identifies children as a sensitive health group with respect to wildfire smoke.[66] This MPR space provides the potential for interior conditioned summertime space.

*Small Classroom*
As an educational institution, classroom space is required as an essential space for learning. Locating classroom space adjacent and with visibility to the equipment and lake conditions is essential for the communication of concepts and knowledge students will use as they gain skills in sailing and seamanship.

*SPYS (Sand Point Youth Sailing) Classroom*
As an educational institution, classroom space is required as an essential space for learning. Locating classroom space adjacent and with visibility to the equipment and lake conditions is essential for the communication of concepts and knowledge students will use as they gain skills in sailing and seamanship. The SPYS room serves as a space of instruction for race team sailors, and a quiet, private briefing and debriefing room for SSP instructors and staff with immediate access to other program spaces on the pier.

*Equipment Storage*
As a small boat sailing center, equipment for sailing including rudders, tillers, spars, sails, lines, foils, and other parts need to be located adjacent to sailboat launch floats. In addition, it is desired to provide space for hanging sails to dry. The space is organized in a way to reduce clutter, visual and physical. Items are stored within locker systems and are easily identifiable. Egress and ingress into equipment area needs to be large to allow for large equipment.

*Dockmaster Space*
The intention with this space is to provide a functional lookout where a SSP dockmaster/ staff member has visibility to the Pier, Lake Washington and the Small Boat Floats. The space should be functional with checkout and information connectivity and the ability to access a powerboat quickly.

## 13.3 Program Comparison

[66] King, Kitsap, Pierce and Snohomish Counties. Wildfire Smoke Guide.

## Existing B31 Program Space

| | Unit | GSF | Total |
|---|---|---|---|
| **Building 31** | | | **6,525** |
| Motorboat Bay | 1 | 4,200 | |
| Instructor Room | 1 | 175 | |
| Loft Storage | 1 | 525 | |
| Locker Rooms | 1 | 250 | |
| Changing Room | 1 | 120 | |
| Sailboat Gear Storage | 1 | 505 | |
| SPYS Storage Room | 1 | 140 | |
| Old Telephone Room | 1 | 22 | |
| Covered Instruction Deck | 1 | 588 | |

## Proposed B31 Program Space

| | Unit | GSF | Total |
|---|---|---|---|
| **Building 31** | | | **6,506** |
| Motorboat Bay | 1 | 3,560 | |
| ~~Instructor Room~~ (Moved to SPYS Classroom) | ~~1~~ | ~~175~~ | |
| Loft Storage | 1 | 870 | |
| ~~Locker Rooms~~ (Moved to Building 11) | ~~1~~ | ~~250~~ | |
| ~~Changing Room~~ (Moved to Building 11) | ~~1~~ | ~~120~~ | |
| Equipment Storage | 1 | 500 | |
| SPYS Classroom | 1 | 224 | |
| ~~Old Telephone Room (Not Functional)~~ | ~~1~~ | ~~22~~ | |
| ~~Covered Instruction Deck (Not Functional)~~ | ~~1~~ | ~~588~~ | |
| Multipurpose Support Space | 1 | 970 | |
| Small Classroom | 1 | 147 | |
| Accessible, All-Gender, Single Restroom | 1 | 46 | |
| Dockmaster Lookout | 1 | 52 | |
| Kitchenette | 1 | 20 | |
| Circulation | | 117 | |

| | Unit | GSF | Total |
|---|---|---|---|
| **Program Relocated to Building 11** | | | **1,320** |
| Expanded Locker Rooms / Changing Rooms | 1 | 1,320 | |

*Table 9*
*Table showing existing and proposed program within B31.*

## 13.4 Accessibility


*Image 33*
*Proposed accessibility improvements between existing and proposed building.*

*Summary*

Major accessibility improvements are proposed. It is intended that the proposed building be ADA accessible, where anyone, regardless of physical limitations can access and egress from a powerboat within the covered moorage, attend a class, rig a sailboat and use a restroom.

## 13.5 Structure

*Piles*

Existing wood piles are replaced by steel piles. Steel piles are generally anticipated to be 18" diameter with a ½" wall thickness. Further information on the environmental impacts of pile materials can be found in Section 14.16.

*Superstructure*

Above the steel piles, steel moment frames form the gravity and lateral resistance systems within the covered moorage bay. Steel roof purlins support a single membrane ETFE roofing material with wood cladding caps. Existing walls within the covered moorage bay are supported by the steel moment frame system and act as a cladding system, with major building forces being transmitted through the steel moment frame system.

Within the new addition to the north of the covered moorage, precast concrete pile deck/cap system is used to support the occupied over water spaces. These spaces are envisioned framed out using wood framing and heavy timber scissor trusses with punched window openings.

## 13.6 Mechanical

In order to fulfill the project's requirement for LEED Gold, passive cooling, operable windows and natural ventilation measures will be utilized within the project. Minisplit units may be used as a backup or for spaces without exterior windows. In the wintertime, a tight envelope, electric resistance heating and energy recovery ventilators will be used for heating in conditioned space. For a more in-depth summary of mechanical systems see Appendix Q produced by PAE.

## 13.7 Electrical

Power outlets within B31 will be provided. Power for AV equipment and kitchenette equipment will be provided. Code required lighting with occupancy sensors will be provided within B31. Rooftop PV is not proposed on B31. Instead, rooftop, ballasted, PV system is to be provided on B11, out of view, and connected to B31 to meet LEED Gold. Provisions for marine outboard engine battery charging stations should be made within the covered moorage.

For a more in-depth summary of electrical systems see Appendix Q produced by PAE.

## 13.8 Plumbing

Given the size of B31, the project team does not recommend pursuing the Living Building Challenge Water Petal. The extent of infrastructure required to support one water closet and a couple sinks, at this stage, do not appear to be the best use of financial resources. Low-flow fixtures and point-of-use electric water heaters will provide water and energy savings. For a more in-depth summary of plumbing systems see Appendix Q produced by PAE.

*Code required fixture count*

SBC Table 2902.1 outlines the code required number of plumbing fixtures for each given occupancy of a building. Due to the limitations in over water coverage area
In the instance that the code required fixtures were included within the proposed rehabilitation, the area of restroom required (~400SF) would replace the SPYS and classroom space within B31. As an overwater structure, the classroom and SPYS space, both sailing instruction spaces, are seen as serving the intent of the Seattle Shoreline Master Program (SMC 23.60A.002) as encouraging water-dependent uses and providing maximum public access to and enjoyment of the shorelines of the City. Sailing instruction spaces appear to meet this criteria more than toilet facilities. In addition, the replacement of classroom space with restroom space would directly suppress SSP's mission and potential for growth and expansion of programs.

Therefore, a single gender-neutral restroom is proposed within the rehabilitation plan for B31.This restroom is seen as a private, inward facing restroom for "emergencies" on the pier and is seen as an improvement over the current conditions of no restroom. Primary restrooms in B11 are meant to serve the large demand for restrooms during events, class time and regular summer use. A single restroom allows an individual who is recreating in a sailboat or human powered craft the ability to quickly relieve themselves and return to teaching or learning, reducing time spent by students or instructors traveling back to B11, and then back out to the pier to return to class.

The deviation from a preliminary code analysis is presented as follows:

| | Water Closets | | Lavatories | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Code Required | 2 | 3 | 2 | 2 |
| Existing | 0 | | 0 | |
| **Proposed** | **1** | | **1** | |

*Table 10*
*Analysis of SBC required fixture count within proposed B31 rehabilitation, existing count and proposed fixture count for B31 rehabilitation. This analysis does not include exterior Pier 1 deck area.*

## 13.9 Fire Protection

A wet/dry sprinkler system will be needed within B31, inclusive of space for a nitrogen generator for system air pressure. Dedicated 6-inch water service will be provided to the building in concert with a detector double check assembly for cross connection control. Tamper, flow and pressure switches will be coordinated with the fire alarm system. Fire department test drains will terminate outside the building. For a more in-depth summary of fire protection systems see Appendix Q produced by PAE.

## 13.10 Lighting

Code required lighting with occupancy sensors will be provided within B31. Site lighting, inclusive of motion sensors, is proposed on Pier 1. Further study of the ecological aspects of site lighting on migratory birds and fish are needed within the next phase of work. Further study of light trespass and pollution to the surrounding neighborhood is needed within the next phase of work. For a more in-depth summary of lighting systems see Appendix Q produced by PAE.

## 13.11 Materials

*Exterior*

Wall cladding on the exterior of the covered moorage is envisioned to be an in-kind replacement of the original V-bead tongue and groove wood siding. Wall cladding on the exterior of the new addition to the north of the covered moorage is meant to be differentiated from the in-kind replaced historic material and is envisioned as metal panel. In addition, large punched openings are glazed with double pane, operable windows systems. Roof materials over the covered moorage area is envisioned as a single layer of ETFE membrane, sprung between keder rails of even frequency over the length of the covered moorage. Keder rails are then capped with either a wood or metal finish cap. The ETFE membrane will require a secondary screen printing as a measure to reduce solar heat gain and bird-strike. Roof materials over the new addition, to the north of the covered moorage are envisioned to be aluminum metal panel.

*Interior Finishes*

Interior finishes include magnetic marker board surfaces for teaching and lectures, acoustic treatments on walls and ceiling, exposed structure and mechanical systems. Casework is integrated into the architecture, with storage opportunities throughout. Opportunities for mosaic or inlay within the polished concrete floor as an educational component of the building are to be explored within the next phase of the project.

## 13.12 Waste Diversion

Per SDCI/ SPU, a waste diversion plan is required for work on B31, as the project scope exceeds 750 square feet. Per correspondence with SPU, creosote-treated wood is not recyclable. Waste originating in Seattle must be disposed of in Seattle. Piles are likely too big to go to one of the three Seattle transfer stations, so disposing in an intermodal container is likely the project's only option.[67]

## 13.14 SPR Standards

*Proview*

The Proview (Project Review) and Proview Tech (Technical Project Review) process will be required for work proposed to B31. Proview will be required at each subsequent stage of Schematic Design, Design Development, 60-65% Construction Documents, 90-95% Construction Documents, Near 100% Construction Documents, and Bid Set Construction Documents. If an alternate project delivery method is proposed, the established Proview process may require revision or alteration. At this feasibility stage, the project has not formally been reviewed through the Proview process, however an internal SPR project review meeting was held on 11/20/19 including Oliver Bazinet, Brian Judd, David Graves, Garrett Farrell, Mike Plympton, and Redi Karameto of SPR.

*Design Standards*

SPR's existing design standards were analyzed for their applicability to the rehabilitation of B31. These standards provide design guidelines for SPR facilities. Deviations from the approved standards may be acceptable if approved by the Parks Engineer and/or Construction Manager during the design review process. SPR standards were accessed and analyzed from SPR's web page on 11/11/2019. At this point in time, 15 of the 87 SPR design standards apply to this project.

## 13.15 Secretary's Standards

*Summary*

As a contributing historic resource to a nationally registered historic property and a local landmark district, the Secretary's Standards apply to any work proposed on this project. Through the course of evaluation, with respect to the Secretary's Standards, no explicit character defining features of B31 were identified by a collaborative group including, "representatives of the Washington State Office of Archeology and Historic Preservation, the Navy and the City of Seattle during site inspections conducted in September 1996, and in March, June, July, and August of 1997."[68] The City of Seattle SP-NAS-LD identifies the selection of "Rehabilitation" as the preferred treatment method to historic resources within the district.

The first step within the rehabilitation process is to identify, retain, and preserve historic materials and features. Through the course of evaluation, with respect to the Secretary's Standards, no explicit character defining features exist within B31. One explicit site wide character defining feature exists within the site of B31. This feature regards the North / South view corridor down Avenue A (Now 62th Ave NE) from overpass at 1st Street (Now NE NOAA Dr.) to Lake Washington as a specific site feature of character. Guidance from the Secretary indicates that components of a property fall within a "continuum of importance." While there are no explicitly identified character defining features, the Quit Deed for the site outlines a number of general site wide features to be considered:

[67] Personal correspondence, Katie Kennedy, Seattle Public Utilities. 12/27/19.

[68] Office of Sand Point Operations, City of Seattle, Sand Point Historic Properties Reuse and Protection Plan. (Prepared by EDAW), April 1998. Pg. 2-7.

*In general the character defining exterior features of contributing buildings are wall surfaces, rooflines, window openings and divided light windows, specialized doors, art deco architectural ornamentation and lighting fixtures.*[69]

*There is sufficient integrity in the floor plans, space volumes, exposed structural elements, and industrial finishes in the hangars and other shop spaces to make these interior features contributing elements. In the case of the other types of buildings most have been substantially modified during numerous renovations and use changes and exhibit a limited amount of details or fabric worthy of retention.*[70]

The Sand Point Historic Properties Reuse and Protection Plan further identifies that, "The northern half of the district has an industrial character, with buildings related to the former aircraft operations, while the southern half has a campus-like character, with administration buildings, support buildings, and housing."[71] B31 occupies this area of "industrial character." This is further called the, "maintenance and operational facilities" area within the Sand Point Design Guidelines.[72] In relation to these more ambiguous and implicit site-wide character features, the design team has proactively identified an additional five implicit character features that have relevance to the history of the project. These features are as follows:

| No. | Feature | Description of Importance |
|---|---|---|
| 1 | Wall Surfaces | The surface texture and wood materials of the original 1938 exterior walls. |
| 2 | Roof Lines and Form | The roof lines and gable form of the original covered moorage volume built in 1938. |
| 3 | Windows | The distribution, size, quantity and divided lite character of windows within the 1938 covered moorage volume. |
| 4 | Use | The use of Building 31 as a hub for safety boat infrastructure. |
| 5 | Location | The location of the 1938 volume of Building 31 as it exists currently, its adjacency and connectivity to Pier No. 1. |

*Table 11*
Implicit character defining features of B31, defined by design team.

The following outlines how this project and scope comply specifically to each of the Secretary's Standards:

*Standard*
*1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.*

*Response*
B31 was historically used to house a "crash boat rescue squadron."[73] Rehabilitation work would sustain SSP's use of the building as covered moorage for their fleet of safety boats that support sailing and recreational programming within the NSRA. The new use of B31 will not negatively impact any explicit or implicit distinctive materials, features, spaces or spatial relationships. A new addition, north of the covered moorage replaces a series of

[69] 1999 Quid Deed Claim Page 20
[70] 1999 Quid Deed Claim Page 20
[71] Office of Sand Point Operations, City of Seattle, Sand Point Historic Properties Reuse and Protection Plan. (Prepared by EDAW), April 1998. Pg. 2-2.
[72] Sand Point Naval Air Station Landmark District. Design Guidelines. Pg. 2.
[73] 2010 National Register Nomination Report

historic toilets. The historic toilet spaces are, at this point, not considered character defining features to the building, thus their removal does not change any distinctive spaces or features.

*Standard*
*2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.*

*Response*

*The amount of change to features and spaces that can be accommodated within the Standards will vary according to the roles they play in establishing the character of the property. The Standards use language such as "distinctive feature" and "spaces that characterize a property," suggesting that all features and spaces do not carry equal weight in determining the character of an historic property. This does not mean that features and spaces fit into absolute categories of either "character-defining" or not. Rather, the components of a property can be seen as falling into a continuum of importance.*[74]

*The more important a feature or space is to the historic character of a property, the less it can be changed without damaging the character as a whole. On the other hand, aspects less critical to the historic character may be altered more substantially with less effect on the character of the building as a whole. However, even when the features being changed are minor, changes that are too numerous or radical can in some instances alter the overall character of the building.*[75]

The design team has identified both explicit and implicit features present within B31. There are no explicit interior or exterior character defining features of B31. A single explicit character defining feature of the district affects B31. This feature regards the North / South view corridor down Avenue A (Now 62th Ave NE) from overpass at 1st Street (Now NE NOAA Dr.) to Lake Washington as a specific site feature of character. Our work respects this corridor and does not intrude into this view corridor lane. No work is proposed that diminishes this feature.

Additionally, the identification of implicit character features was proactively initiated by the design team. Through the review of the history of the site, an additional five criteria were identified as important to the historic story of the site. These are the wall surfaces, roof lines and form, windows and openings, use, and location. The proposed work affects the wall surfaces in a positive manner through exposing, preserving, repairing and restoring original wood siding and in-kind replacing where it is currently missing on the covered moorage volume. The proposed work does not affect the roof lines or form of the covered moorage volume. This volume and its external expression are retained through the rehabilitation work. Windows and openings are affected by rehabilitation work. Larger steel pile and steel moment frame structure on the West façade of the covered moorage will increase the size of columns and piles within the covered moorage openings. This will be a minimal impact, and the façade will largely remain intact and rehabilitated to its visual composition in 1938. It is noted that the proposed design envisions to eliminate every other column bay of structure on the west façade of the covered moorage to improve motor boat access to the covered moorage, decrease marine pile costs, and increase benthic habitat. These changes are done on a "secondary façade" and the consistent use of the original style of opening with the diagonal bracing is retained,

[74] https://www.nps.gov/Tps/standards/applying-rehabilitation/cumulative-effect.htm
[75] https://www.nps.gov/Tps/standards/applying-rehabilitation/cumulative-effect.htm

providing the overall character of the historic façade. Through the rehabilitation work and to facilitate ADA compliance, the two door openings on the East façade of B31 will be raised to the level of the Pier 1 deck. These doors will remain in their current position, however will be raised to meet the Pier 1 deck level. This will slightly alter the façade of B31, however it is a minimal impact. The currently boarded up divided lite windows will be repaired and restored, retaining the original character of the façade. Through the rehabilitation work, the use and location of the covered moorage volume is retained. The new addition is located in a space where it is extremely inconspicuous from the Avenue A view corridor, and from the Pier 1 approach to B31. The new addition is smaller in height than the existing covered moorage volume and thus, does not compete visually with the historic character of the site.

At the culmination of the rehabilitation work, the identified historic character defining features are preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property is not undertaken through the rehabilitation work proposed.

*Standard*
*3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*

*Response*
Through the rehabilitation work proposed, no additions will be added to the property that create a false sense of historical development. No historic conjectural features are proposed.

*Standard*
*4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.*

*Response*
Since construction in 1938, B31 has had over 12 additions or demolitions to its structure recognized at this point in time (2/7/2020 9:44:28 AM).

They are as follows:

| | |
|---|---|
| 1938 | Original Covered Moorage volume constructed |
| 1939 | C.P.O. quarters added north of the covered moorage |
| 1942 | One bay of additional bunk quarters added to the south |
| 1943 | Lookout station added to the C.P.O. quarters (No photographs confirm the existence of this addition, however it is seen on multiple drawings produced in 1943. |
| 1943 | C.P.O quarters addition is added (Somewhere around this time, the C.P.O. quarters is converted to a large room of toilets.) |
| ~1943 | A covered roof was added over the landing platform to the north of the covered moorage. |
| 1946 | Former C.P.O. quarters head expanded to the north (This addition is external to the period of significance outlined within the national register nomination report.) |
| 1946 | A second level is added above the bunk rooms to the south, forming a crew watch space (This addition is external to the period of significance outlined within the national register nomination report.) |
| 1946 | An entry platform to the south providing access to the shore from the double height portion of B31 is built, inclusive of an overhead canopy. (Estimated year, no drawings exist, however photo documentation confirms its existence) (This addition |

is external to the period of significance outlined within the national register nomination report.)

1956 A dormer is added on the west façade to provide a larger area of coverage for a larger boat within B31(This addition is external to the period of significance outlined within the national register nomination report.)

1970 An expansion of this dormer addition is made, in addition to a new shed roof canopy extension on the West façade of B31. (Estimated year, no drawings exist, however photo documentation confirms its existence) (This addition is external to the period of significance outlined within the national register nomination report.)

2005 The double height addition of B31 is demolished. At this time, the dormer addition is also demolished.

2016 Lead paint abatement, sandblasting, repainting. Plywood used to encapsulate lead found within historic divided lite windows. Windows are boarded up.

The original construction in 1938 was a boat house. Since this construction it is the design team's feeling that the extensive ad-hoc additions to the north of the covered moorage have failed to gain any historical significance, due to the changing nature of their use, the temporality of their use and change, and the low quality of construction utilized. These changes are seen, in the eyes of the National Park Service as follows: *In the case of the other types of buildings most have been substantially modified during numerous renovations and use changes and exhibit a limited amount of details or fabric worthy of retention.*[76] Thus, the design team argues that demolition of these additions does not diminish the original historic integrity of the 1938 covered moorage volume.

*Standard*
*5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

*Response*
Very few existing materials, features, finishes or construction techniques or examples of craftsmanship exist within the property. Those distinctive materials such as V-joint siding that contributed to the character of the building in 1983 have been removed over time and do not exist currently on site. It is the intention of the design team to reintroduce these character defining materials through the rehabilitation work.

*Standard*
*6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

*Response*
Replacement of historic V-bead wood cladding material is supported by photographic and technical drawing evidence retained by the project team. These missing materials, proposed to be replaced are not done so in a conjectural way, they replace materials that were known to exist on the resource.

*Standard*
*7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

[76] 1999 Quid Deed Claim Page 20

*Response*
No historic character defining materials, per Sand Point Historic Properties Reuse and Protection Plan, exist on the site currently. A very small area (~150 SF) of original historic V-bead wood siding exists on the west façade of the covered moorage. This will be repaired and restored.

*Standard*
*8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

*Response*
To date (As of 2/7/2020 9:44:28 AM) no significant archeological resources have been identified on site. The site has undergone extensive modifications since pre-historic times, and the potential to find significant archeological resources on-site remains a possibility. Section 3-20 within the 1994 HARP Plan for Naval Station Puget Sound, Sand Point identifies:

> *Because local Native American groups have raised particular concerns that archaeological resources may be present at NSPS Sand Point, the Navy shall have subsurface construction activities at NSPS Sand Point monitored by a professional archaeologist to ensure that any archaeological remains are identified and evaluated. This monitoring will apply to excavation in undisturbed areas or when the depth of the construction penetrates below the previously disturbed surface. If substantial areas of subsurface activities are proposed, the Navy may choose to conduct additional archaeological studies to identify areas that have a higher probability of cultural resources and then limit the monitoring of construction work to those high probability areas.*

Within the rehabilitation work plan, the possibility of discovering significant archeological resources is understood and a monitoring plan should be enacted during all new pile driving operations. As of 2/7/2020 9:44:28 AM the project team has not been able to consult with any tribal entities on the proposed scope of work.

*Standard*
*9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*

*Response*
The rehabilitation work will contain a new addition to the north of the covered moorage. This addition will not destroy character defining historic materials, features, or special relationships. No character defining materials exist on the current portion proposed to be replaced. The new work will be differentiated from the historic rehabilitation of the covered moorage and will be clearly differentiated. The massing of the new addition will be subservient to the covered moorage and will be a sensitive architectural intervention.

*Standard*
*10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic*

*property and its environment would be unimpaired.*

*Response*
The rehabilitation work will contain a new addition. This new addition will be visually and volumetrically differentiated from the old historic structure in a manner that if removed, the essential form and integrity of the 1938 covered moorage volume can be retained.

## 13.16 Landmark District Ordinance (SMC 25.30)

*Code Language*
*25.30.010 B. - The purposes of this chapter are: (1) to designate, preserve, protect, enhance, and perpetuate those sites, improvements, and objects that reflect significant elements of the City's cultural, aesthetic, social, economic, political, architectural, engineering, historic, or other heritage, consistent with the established long-term goals and policies of the City; (2) to foster civic pride in the beauty and accomplishments of the past; (3) to stabilize or improve the aesthetic and economic vitality and values of such sites, improvements, and objects; (4) to protect and enhance the City's attraction to tourists and visitors; and (5) to promote the use of outstanding sites, improvements, and objects for the education, stimulation, and welfare of the people of the City.*

*Response*
1) We preserve the existence and function of a historic structure by intervening to provide critical life safety and accessibility upgrades. We enhance the project by providing significant upgrades in functionality for the local community and non-profit recreation partners, consistent with the vision for the Magnuson Park NSRA.
2) We improve the aesthetic and economic vitality of the property through addition of new materials, functional upgrades and improved habitat
3) Right now people do not want to engage with the building, they do not want to engage because they do not feel safe with it. We are proposing to make the building inviting and safe and to introduce site interpretive elements that allow visitors to connect with the history of the project.
4) This is the largest section of dedicated launch area for human powered vessels on all of Lake Washington. Improvements in the assets of the site allow the continued and improved functionality and service to the public.
5) The inclusion of site interpretative elements allows for education about the building's past. The expansion of programming capacity within B31 directly benefits the welfare of the people of the city by providing more programs and more access to the water.

*Code Language*
*25.30.040 B. – Criteria for district Designation - Architectural characteristics. The landmark district includes notable examples of Art Deco, Art Moderne, and Colonial Revival buildings as well as utilitarian buildings and structures that typify industrial vernacular and military architecture. The district also retains an important collection of Public Works Administration and Works Progress Administration funded projects that date from the pre-World War II era of station expansion. The buildings and structures within the landmark district remain generally intact and exhibit moderate to high levels of physical integrity. The organizational relationships among buildings remain*

*evident, with maintenance and operational facilities situated to the north; residences and recreation facilities to the south; offices, training, and administration facilities centrally located to transition between these; and munitions and other aviation related facilities situated a distance away to the east, in close proximity to the operation of aircraft to be serviced. Primary building and structure types include aircraft hangars, office and administration buildings, a steam plant, officer housing and barracks, munitions magazines and storehouses, and aircraft maintenance shops. The use of brick, concrete, and steel as structural materials, as well as cladding elements, is a dominant design feature throughout the district. The scale and massing of facilities, in particular the hangars, reflect the magnitude of the aircraft that constituted the primary operational mission of the air station, as described in Appendix B of the Landmark Nomination Application.*

*Response*
Building 31 is a utilitarian building. Building 31 does not exhibit any of the dominant design features of brick, concrete, and steel found within the SP-NAS-LD.

*Code Language*
*25.30.050 B. The design review guidelines shall identify the unique values of the District, include a statement of purpose and intent, and remain consistent with the purposes of this Chapter 25.30. The guidelines shall identify design characteristics that have either a positive or negative effect upon the unique values of the District. The guidelines shall also specify design-related considerations that will be allowed, encouraged, limited or excluded from the District when certificate of approval applications are reviewed.*

*Response*
See responses to SP-NAS-LD Design Guidelines below.

*Code Language*
*25.30.050 C. – The design review guidelines are intended to fulfill the preservation goals as established by the Sand Point Historic Properties Reuse and Protection Plan (Resolution 29725) and adhere to The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Properties (and associated National Park Service guidelines & technical briefs)*

*Response*
See responses to Secretary's Standards herein. With respect to Resolution 29725, the proposed work intends to fulfill the purposes of the Sand Point Historic Properties Reuse and Protection Plan.

## 13.17 SP-NAS-LD Design Guidelines:

*Introduction*
Apart from the Secretary's Standards and Seattle Municipal Code, the Sand Point Naval Air Station Landmark District (SP-NAS-LD) provides its own guidelines for changes made within the district. The following outlines specific guideline language and associated responses.

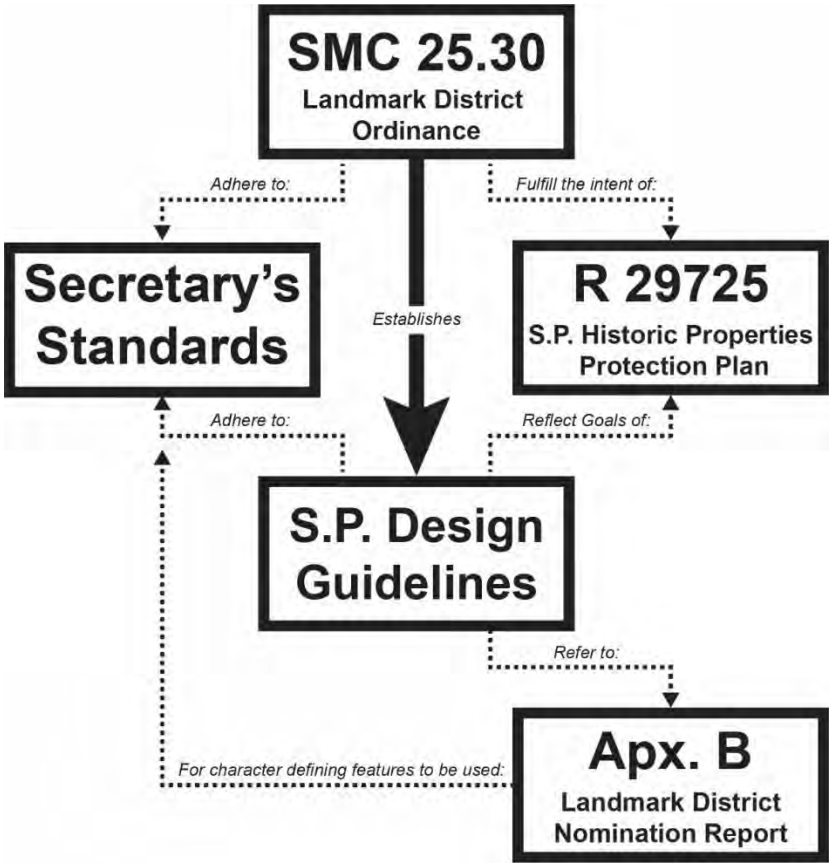



*Image 34*
*Interconnectivity between Municipal Code, Secretary's Standards and SP-NAS-LD guidelines.*

*Guide Language*
*For specific architectural descriptions and identification of character defining features and finishes of individual buildings and structures, please refer to the individual Historic Resource descriptions and photographs included in Appendix B of the Landmark Nomination Report.*

*Response*
No specific character defining features are identified within Appendix B of the Landmark Nomination Report.

*Guide Language*
*The Sand Point NAS Landmark District design guidelines are intended to:*

- *Fulfill the preservation goals as established by the Sand Point Historic Properties Reuse and Protection Plan*
- *Adhere to The Secretary of the Interior's Standards for Rehabilitation (and associated National Park Service guidelines & technical briefs).*

*Response*

The project aims to return the building to a state of utility through repair and alteration which makes possible an efficient use while preserving those portions and features of the building which are significant to its historic architectural and cultural values as determined by the secretary, per 36 CFR § 67.2. See responses to Secretary's Standards herein within this report.

*Guide Language*
*Protect and Maintain Historic Materials and Features Wherever feasible, every effort should be made to identify, protect and maintain intact original and/or historic building materials, architectural features and design details. All cladding materials and features should only be cleaned when necessary using the gentlest methods possible and no abrasive methods of cleaning.*

*Response*
Only a very small portion of original cladding remains on the building. This material will be salvaged and reapplied. The remaining cladding will be replaced in kind with materials milled to the same historic section and shape established through photo documentation and historic architectural drawings.

*Guide Language*
*Repair Historic Materials and Features When the physical condition of character-defining materials or features requires work the preferred approach is to repair or undertake limited in-kind replacement rather than replace the materials or entire feature.*

*Response*
A majority of the existing façade does not include original wood siding materials. The intention of the project team is to replace-in kind, consistent with the historic fabric, the historic wood siding materials that are currently missing from the project.

*Guide Language*
*Replace Deteriorated Historic Materials and Features If the level of deterioration or damage to character-defining materials or features is very extensive and precludes making appropriate repairs then an entire feature may be replaced in-kind if its essential form and detailing is replicated. Consideration may be given to the use of substitute materials based on technical and economic feasibility and visual impacts.*

*Response*
The existing roof is an asphalt shingle roof. The original roof in 1938 was a cedar shingle roof. This type of roof deteriorated quickly and was not replaced in kind when repairs were needed before the formulation of the NAS-SP-LD. The design team proposes the use of an ETFE roof on the covered moorage of the building. The use of light transmissive materials to the maximum extent feasible is mandated by the shoreline master program SMC23.60A.152.M and required through directive from WA F&W. The need for a fully light transmissive roof is driven by the requirements for restoring critical near shore ESA-listed species fish habitat.

*Guide Language*
*Design for the Replacement of Missing Historic Features If an important exterior feature is missing its replacement may be necessary or desired. If feasible and appropriate, such replacement should be based on available historical, pictorial or physical documentation. In some cases, it may be feasible to replace a missing feature with a new design that is compatible in size, scale and material selection with the*

*remaining character-defining features of the building.*

*Response*
Only a very small portion of original cladding remains on the building. This material will be salvaged and reapplied. The remaining cladding will be replaced in kind with materials milled to the same historic section and shape, consistent with the historic fabric. The missing historic south façade is proposed re-designed in a compatible character to the remaining historic fabric.

*Guide Language*
*Wood*

- *Every effort should be made to repair wood cladding features by patching, piecing-in, consolidating or otherwise reinforcing the wood using methods recommended by the NPS.*
- *If required, all replacement wood cladding and trim should be an in-kind match that will not alter the essential form and detailing of the historic cladding.*

*Response*
Only a very small portion of original cladding remains on the building. This material will be salvaged and reapplied. The remaining cladding will be replaced in kind with materials milled to the same historic section and shape as documented through architectural drawings and photographs.

*Guide Language*
*Windows*

- *Retaining, preserving and in some cases restoring the original historic fenestration pattern (window placement pattern) should be a priority.*

*Response*
Restoration of the existing divided lite windows will be prioritized.

*Guide Language*
*Architectural Features & Details*

- *Retaining, preserving and restoring original architectural and decorative features including historic signage and building identification numbers, building ornament and functional elements and historic light fixtures should be of the highest priority.*
- *All original architectural and decorative (or functional) features should be preserved and/or repaired as needed with careful attention given to the proper treatment of the specific construction materials and details.*
- *If required, any replacement elements should be an in-kind match that will not alter the essential form and detailing of the feature. Every effort should be made to ensure that the feature continues to convey the same visual appearance; however, consideration may be given to the use of substitute materials based on technical and economic feasibility and visual impacts.*

*Response*
No historic building signage, identification numbers or building ornament exists. A determination should be made if rebuilding historic building identification numbers would be a faux-historic addition to the site or contribute as a positive historic benefit.
Exterior historic light fixtures do not exist on site, however, were well documented. A determination should be made if rebuilding these historic fixtures and re-installing them would be a faux-historic addition to the site or contribute as a positive historic benefit.

*Guide Language*
*Roofs/Roof Features*

- *Retaining and preserving historic roof forms and their functional and decorative features should be a priority.*
- *Roof features including roofing materials should be repaired by reinforcing the historic materials. Extensively deteriorated or missing materials or features should be replaced in-kind. If it can be demonstrated that using the same material is not technically or economically feasible, a compatible substitute material may be considered.*
- *An entire roof feature (i.e. soffit, dormer, chimney) may be partially reconstructed or replaced in-kind if it can be demonstrated that it is too deteriorated to repair. The replacement feature should closely replicate the essential form, design and character of the original feature.*

*Response*

The proposed work acts to preserve the historic covered moorage roof form and volume. Roof materials are required to change per SMC23.60A.152.M –"Replaced covered moorage and new and replaced boat sheds shall be designed to provide the maximum ambient light to reach the water. Designs shall Minimize sides of the structures and Provide light transmitting roofing and side material to the maximum extent feasible," in addition to Washington State Department of Fish and Wildlife directives received on 01/13/20. Operable skylights are proposed within the covered moorage roof on the west face (secondary elevation) in order to facilitate natural ventilation. The existing roof material of asphalt shingle is not original to the 1938 construction.

*Guide Language*
*Wood Structural Elements*

- *Every effort should be made to repair and reuse wooden structural members by patching, piecing-in, consolidating or otherwise reinforcing the wood using methods recommended by the NPS.*
- *If required, any replacement of wooden structural members should be an in-kind match that will not alter the essential form and character of the structure.*

*Response*

Wooden structural members are overstressed by a demand to capacity ratio of 1.33. In addition, wood structural members do not provide any lateral seismic stability within the structure. Transverse moment connections are required over the covered moorage bay, necessitating the replacement of existing wood structure with steel structure. Creosote treated wood piles are not permitted per SMC 23.60A.187.E.5.

*Guide Language*
*New Additions/Exterior Alterations*

- *Additions or alterations may be necessary or desired in order to adapt a building to a new or an expanded use.*
- *Such alterations should be considered only after full evaluation has been given to adapting functional changes within the existing interior spaces.*
- *Exterior additions or alterations should not radically change, obscure or destroy primary elevations, character-defining features, materials or finishes.*
- *New construction should be clearly differentiated from the historic building such that a false sense of historic appearance is not created and should not diminish the historic property or its character-defining features.*
- *Design for new construction may be contemporary in character or may directly reference design motifs or proportions drawn from the historic building.*
- *Design of new construction should be compatible in terms of mass, materials,*

*relationships of solids and voids, and color.*

- *Any new building addition should be constructed in a manner that, if removed in the future, the essential form and integrity of the historic building will be intact.*
- *New windows may be installed and new window openings on a rear or secondary elevation in order to accommodate a new or expanded use. Window size and proportion should be compatible with the overall design and character of the building but it should not duplicate historic features or create a false historic appearance.*
- *Rooftop additions when required for a new use (and allowable by code) should be set back from the wall plane and parapet and must be as inconspicuous as possible when viewed from adjacent streets and sidewalks.*
- *Rooftop mechanical equipment does not necessarily need to be screened, unless required by code. The screening of rooftop mechanical equipment shall be reviewed on a case-by-case basis.*

*Response*

Additions and alteration to B31 are necessary to adapt the building to expanded use. A study of adapting the existing footprint to expanded use was completed and determined to be an insufficient solution resulting in a continuation of accessibility barriers, extremely low ceiling heights, existing doors and openings at uncoordinated locations, reduced connectivity between the pier and program, isolated and disconnected program locations. It has been determined that a new constructed addition to the covered moorage is the only solution to provide the expanded programming capacity required by SSP and SPR. The design of this new addition will be contemporary in character. The proposed new addition will be clearly differentiated from the historic moorage volume, as well as being architecturally subservient through the use of lower, humble roof lines. The expansion of structural openings on the west (secondary) façade of the covered moorage is required due to expansion in use and a need to reduce benthic habitat disruption. The openings retain their original character through the careful use of knee bracing, chamfered corners.

*Guide Language*

*Accessibility*

- *Every effort should be made to comply with barrier-free accessibility requirements with design solutions that do not radically change, obscure or alter primary elevations, character-defining features or materials.*
- *If it is technically infeasible to meet accessibility code requirements and adhere to the above guideline, alternative design solutions are allowed by code.*
- *The design of new or additional means of access should be compatible with the design of the individual historic building and its building site.*
- *New ramps, guardrails and handrails should be clearly differentiated from the historic building such that character-defining features are not diminished or a false historic appearance created. However, it is important that new work be designed with characteristics sympathetic to the historic building and be based on the established palette of design elements and construction materials.*

*Response*

The project aims to be ADA compliant, providing access to anyone, regardless of physical ability to recreational opportunities on the water. Major accessibility improvements are proposed. It is intended that the proposed building be ADA accessible, where anyone, regardless of physical limitations can access and egress from a powerboat within the covered moorage, attend a class, rig a sailboat and use a restroom. New ramps are proposed on the interior of the covered moorage and for access to the launch floats to the west of B31 and Pier 1.

## 13.18 Environmental Considerations


*Image 35*
*Magnuson Park forms a peninsula within the WRIA 8 Lake Washington / Cedar Sammamish watershed. This watershed is critical aquatic habitat to ESA listed species and non-ESA listed species.*

*Introduction*
B31 occupies a unique site directly over and within Tier 1 priority habitat of the Cedar River/Sammamish River/ Lake Washington (WRIA 8) watershed. This habitat is used by migrating, ESA listed, Chinook salmon of the Puget sound evolutionary significant unit (ESU). This ESU of chinook is listed as the number 1 priority chinook population for the endangered southern resident killer whale.[77] At this point in time, B31 is actively degrading this critical habitat. A number of existing adverse environmental effects are identified previously within this report in Section 5. The following outlines design considerations from an environmental perspective for the proposed project.

*Materials*
Marine piles are left in direct contact with the water column for the duration of their lifespan. The materiality and finish of these piles can leech into the water column, affecting the surrounding

[77] U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Southern Resident Killer Whales and West Coast Chinook Salmon.* Factsheet. 2018.

habitat. Steel piles installed as part of the North Shore Recreation Area JARPA permitting in 2005 are galvanized steel pile.

Piles within B31 could be galvanized, use a specific type of steel (ASTM A690) and left untreated or coated to achieve longevity in use. Each option has potential benefits and adverse effects that need to be assessed in the next phase of work.

*Light Transmission*

Our complete existence on planet earth is made possible by the conversion of solar energy from the sun into chemical work on our planet's surface. Within the aquatic environment, this holds true as well. A key component of the aquatic photosynthetic process is the release of oxygen into the water column. The amount of light within a water body is directly correlated to the amount of food, temperature, oxygen availability, within the water column. In addition, the "absorption of solar energy and its dissipation as heat have profound effects on the thermal structure, stratification of water masses, and circulation patterns of lakes. Nutrient cycling, distribution of dissolved gasses and biota, and behavioral adaptations of organisms are all markedly influenced by the thermal structure and stratification matters."[78]

In a natural state, light transmission through a water column is a function of the turbidity of the water. The turbidity of Lake Washington has varied over the years, from a period of extreme sewage dumping in the 1960s to a cleanup and remediation effort in the 1970s, to today. Visibility through the lake has seen a low point of around 30 inches in the 1960s at the height of sewage dumping into the lake to today's visibility of about 18 feet of depth. As a trend, water turbidity in Lake Washington has decreased gradually over the last decade. An average of 22 Secchi Depth observations from station 0826 during the year 2019 yields a result of 6.04m.[79] This value can be used to correlate and calculate the depth of light penetration within the NSRA project site.

Light transmission within the littoral zone of the shoreline is imperative to nearshore habitat, flora and fauna. Thus, it is critical to design any rehabilitation or new construction inclusive of light transmissive elements through an overwater structure. Light transmissible materials are mandated by the Seattle shoreline master program SMC 23.60A.152.M and through directives received by WA F&W. The inclusion of an ETFE, translucent roof over the covered moorage volume is meant to satisfy these requirements in addition to grated and translucent gangways, decks and floats.

[78] Wetzel, Robert. Limnology: Lake and River Ecosystems. Academic Press. San Diego, CA. 2001. Pg. 49.
[79] King County Water and Land Resources Division. Secchi Data. Station 0826 Lake Washington.

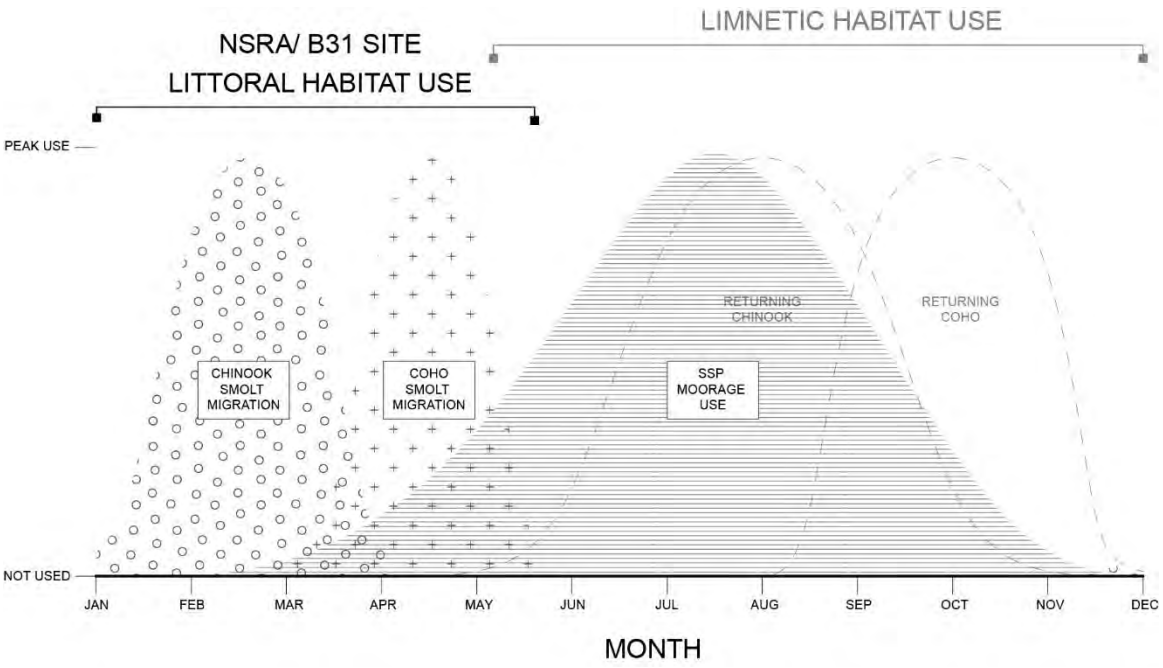



*Image 36*
*Use of littoral habitat below B31 by ESA listed and considered species overlaid with SSP use intensity of the covered moorage volume. Information based on 2002 NSRA Biological Evaluation by Anchor Environmental.*

*Artificial Lighting*
Further study of the ecological aspects of site lighting on migratory birds and fish are needed within the next phase of work. Further study of light trespass and pollution to the surrounding neighborhood is needed within the next phase of work. At a preliminary level, “Juvenile Chinook appear to be attracted to artificial lighting which may increase predation risk”[76]

*Pile Area*
A reduction in pile area from 51 creosote treated wood piles to 27 steel piles represents a net gain in 28.5 SF of benthic habitat area.

*Work Window*
July 16 – March 15 is the approved freshwater work window for ESA-Listed fish species in Lake Washington, north of State Route 520 and south of Arrowhead point. However, due to documented Sockeye spawning area located immediately around and underneath B31, this in water work window is further constrained to July 16 – September 30.

*Construction*
Certain construction practices, means and methods can lead to adverse effects within the littoral habitat zone. A preliminary assessment of these effects are made within Section 11, Pile Treatment Solutions: Options and Assessment. The design team advocates and intends to use the best management practices for construction and marine pile work over and within the littoral zone.

*Operations*

As a recreational facility operating within Tier 1 critical habitat which include, "the highest priority habitats for protection/ restoration, and include primary spawning areas, as well as migratory and rearing corridors."[80] As a working facility, the operations within the facility can lead to adverse effects to the littoral habitat. The following measures are proposed to mitigate any adverse environmental effects:

- Eliminate the use of gasoline outboard engines within the safety boat fleet and develop a transition plan to 100% electric outboard engines.
- Brief each cohort of SSP summer staff on the basic principles of the aquatic habitat they operate within around B31. Knowledge and awareness of the big picture is key. We each have a part to play, and each small action can lead to systematic improvements.
- Ensure and enforce a no wake zone within the harbor. Motorboat wake and traffic are known to negatively impact aquatic plan community, diversity, and biomass.[71]
- When covered moorage area is not completely full, make it policy to moor boats starting at the northern edge, working to the south. This allows for less disruption of nearshore habitat.
- Determine a more suitable location for the existing lift / storage of E-scow sailboat out of the nearshore habitat.
- Design, permit, and build a dedicated gangway and float at Optiland.

## 13.19 Race and Social Justice Initiative Standards

*Summary*

It is the responsibility of SPR to complete the Racial Equity Toolkit Assessment Worksheet as the lead department for the project. It is the project team's understanding that a diverse group of stakeholders have been engaged throughout the MPCF feasibility phase of this project. It is the project team's understanding that the proposed rehabilitation of B31 and potential site work improvements will be a net benefit to communities of color in the following ways:

- Expansion of SSP programming capacity will result in more opportunities to fund scholarships to SSP programs to local community members
- Expansion of SSP programming capacity and the integration of a multipurpose space will result in more opportunities for local community to engage in keynote public events located directly within their community, reducing barriers and travel time to access
- Integration of a dockmaster space adds a layer of psychological safety for those who feel scared or intimidated by the swimming, sailing, paddling, or boating process.
- Removal of existing environmental adverse effects allows further access to a restored aquatic habitat within the local community.
- Expansion of SSP programming allows for further opportunities to access education in various aquatic recreational activities directly within the community
- An increase in SSP programming will result in an increase in SSP staffing demand, creating more seasonal work opportunities for high schoolers directly within the community
- The communal nature of the MPR space could allow for collaborative engagements between the Magnuson Community Center, Mercy Housing, Solid Ground Housing, SSP and B31, creating new programming opportunities and venues.
- By improving critical fish habitat, the project aims to repair and restore the vitality of WRIA 8 fish resources, a critical resource protected by the 1855 Treaty of Point Elliot between the United States of America and the "Dwamish, Suquamish, Sk-kahl-mish, Sam-ahmish, Smalh-kamish, Skope-ahmish, St-kah-mish, Snoqualmoo, Skai-wha-mish, N'Quentl-ma-mish, Sk-tah-le-jum, Stoluck-wha-mish, Sno-ho-mish, Skagit, Kik-i-allus,

[80] Lake Washington/ Cedar/ Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan. 10 year update. Lake Washington / Cedar/Sammamish Watershed Salmon Recovery Council. 2017.

Swin-a-mish, Squin-ah-mish, Sah-ku-mehu, Noo-wha-ha, Nook-wa-chah-mish, Mee-see-qua-guilch, Cho-bah-ah-bish, and other allied and subordinate tribes and bands of Indians occupying certain lands situated in said Territory of Washington."[81] According to a report by the Treaty Indian Tribes in Western Washington, "stopping habitat degradation is the cornerstone of salmon recovery."[82] According to this report, the federal government is not fully implementing its obligation to protect treaty rights.

Potential adverse effects to local communities of color could include:

- Increase in noise during the day within the construction work window
- Increase in heavy equipment on site within the construction work window
- Increase in vehicular traffic due to expanded SSP and public programming capacity

## 13.20 Sustainable Buildings Policy

*Summary*

It is the design team's understanding that the proposed project will fulfill all requirements within the DPD (now SDCI) Sustainable Building Policy. As New Construction / Major Renovation, the project will at a minimum achieve LEED Gold in addition to:

- Achieve a modeled energy use intensity performance that is a minimum of 15% more efficient than a baseline building meeting the 2009 Seattle Energy Code;
- Achieve projected water use performance that is a minimum of 30% more efficient (not including irrigation) than a baseline building meeting the 2009 Uniform Plumbing Code;
- Achieve a 90% waste diversion rate for construction involving demolition and a 75% waste diversion rate for construction not involving demolition; and
- Provide bicycle parking and changing/showering facilities appropriate to accommodate expected future demand.

*Ideal Green Parks Checklist*

A checklist will need to be completed within the next phase of work.

[81] Treaty of Point Elliot, 1855.

[82] Treaty Indian Tribes in Western Washington. Treaty Rights at Risk: Ongoing Habitat Loss, the Decline of Salmon Resource, and Recommendations for Change. July 14, 2011. Pg. 2.

## 13.21 LEED


*Image 37*
*LEED point distribution across all credit categories to achieve LEED certification. The graph visually conveys the weight of each credit category, with Energy and Atmosphere representing the largest potential for points credit category. Solid color areas represent points achieved, shaded areas represent potentially achievable points, and white fill indicates points that are impossible to achieve for this project.*


*Image 38*
*LEED point distribution across all credit categories to achieve LEED Gold certification. By pursuing net zero energy, the project is able to meet LEED Gold. Solid color areas represent points achieved, shaded areas represent potentially achievable points, and white fill indicates points that are impossible to achieve for this project.*

*Summary*

A preliminary assessment of the project with respect to LEED results in 44 points “in the bag” with a high degree of confidence in achieving and 19 points completely out of reach to the project due to project location, transit, and other factors. This preliminary assessment leaves 47 points in play. To achieve LEED gold certification, a minimum of 60 points are required. To achieve these points, the largest credit category with point potential is Energy and Atmosphere (orange area above). The pursuit of a net-zero energy building will garner a significant number of points in this category, pushing the project to the LEED Gold level. It is advised to pursue a net zero energy B31 in order to achieve LEED Gold. As a historic resource with a visible roof, it is not advised to place PV panels on the roof of B31. The proposed location for PV panels is on the roof of B11.

*Alternative and Additional Certification Systems*

Salmon Safe Certification: As a building located directly over critical Tier 1 salmon aquatic habitat, the Salmon Safe Certification process would certify that the design team has used the

best possible development practices in this sensitive location. There are seven categories of standards. A further assessment of these criteria and a decision to pursue Salmon Safe Certification is required within the next phase of work.

ILFI Petal and Living Building Certification: In achieving net zero energy operations, the design project achieves a significant challenge in pursuit of the ILFI Living Building Challenge (LBC). To achieve LBC certification, a project must meet the 20 imperatives of the LBC which are further grouped into seven performance areas called “Petals”. The Petals include Beauty, Energy, Health & Happiness, Materials, Place, & Water. While the achievement of all petals is a possibility for the proposed project, there are significant complications and questions if the water petal is worth pursuing, as the project includes only a single restroom.

## 13.22 Crime Prevention Through Environmental Design (CPTED)

*Summary*

Seattle Police CPED standards include three priority areas, Natural Surveillance, Natural Access Control and Territoriality / Defensible Space.

The following outlines considerations made for each area:

Natural Surveillance

- Lighting – The use of sensors for lighting at night provides a well-lit pier space
- Landscaping – No plants are currently planned for higher than 3 feet tall within B31
- Fencing – No fencing is currently planned
- Windows – Windows are planned within the covered moorage bay and within the new addition to the north of the covered moorage

Natural Access Control

- Visibility to the end of Pier 1 is obstructed by B31.
- Restroom is located within the building in a highly visible location
- Accessing any space attached to Pier 1, there is only one way in and out on solid ground

Territoriality / Defensible Space

- The architecture retains the existing scale of historic building
- Clear transitions between public, private and semi-private are made through architectural/ spatial thresholds through B31 in addition to signage
- SSP imaging, signage, activity and community involvement create a clear presence and care for the site

## 13.23 Artwork

As a major capital improvement project, the rehabilitation of B31 at Magnuson Park will trigger the need for public art. As stated by the City of Seattle:

> “The program specifies that 1% of eligible city capital improvement project funds be set aside for the commission, purchase and installation of artworks in a variety of settings. By providing opportunities for individuals to encounter art in parks, libraries, community centers, on roadways, bridges and other public venues, we simultaneously enrich citizens' daily lives and give voice to artists.”

A few potential locations for public artwork are identified below:

- End of Pier 1 large sculptural clock for people on the water to tell the time
- Floor inlay of new B 31 Multipurpose Room conveying environmental and social history of the site
- Light transmissive material installation within Pier 1 paving
- Screen-printed patterning design on new ETFE roof of B31 to prevent bird strike

## 13.24 Building Cost

A preliminary rough order of magnitude (ROM) construction cost estimate was generated for each design option developed within Task 3 of this feasibility phase. In addition to a ROM cost for B31, ROM construction cost estimates were completed for the anticipated and desired site work items. Further information and description of site work items is provided within Section 15 below.

As a construction cost ROM estimate, it is inclusive of design and estimating contingency of 20%. In addition to the construction cost contingency, a 162% multiplier is made to the final ROM construction cost which incorporates soft costs, project management, design, engineering, planning and close-out. A 120.88% multiplier is then made as a contingency for escalation to an anticipated project start date of September 2023. A detailed summary of the cost estimate is provided in Appendix O. A summary of the total project costs for each design option is presented below:

| Option | Description | Construction ROM Cost ($x1,000) | Total ROM Cost ($x1,000) | **Total Escalated ROM Cost ($x1,000)** |
|---|---|---|---|---|
| 1 | Bare Bones Baseline | $5,792 | $9,383 | $11,342.22 |
| 2 | Functionally Successful | $6,860 | $11,113 | $13,433.64 |
| 3 | Outstanding Performance | $6,860 | $11,113 | $13,433.64 |

*Table 12*
*ROM total project cost for each option studied. ROM total project cost includes a 162% construction cost multiplier for soft costs, design and administration, as well as an additional 120.88% escalation multiplier, resulting in the ROM total project cost.*

## 13.25 Concept Diagrams

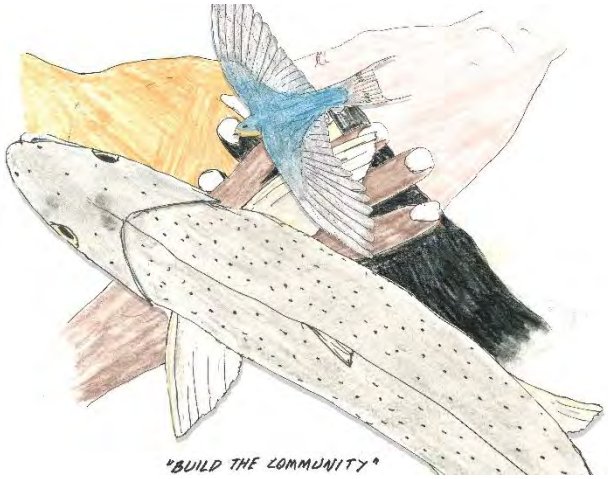




*Image 39*

*At a project level, the team aims to build community at every level of the project, inclusive of ESA listed and non-ESA listed wildlife that actively use the site. In addition, a primary concept within the covered moorage area is to filter the light through the roof to the littoral zone below.*

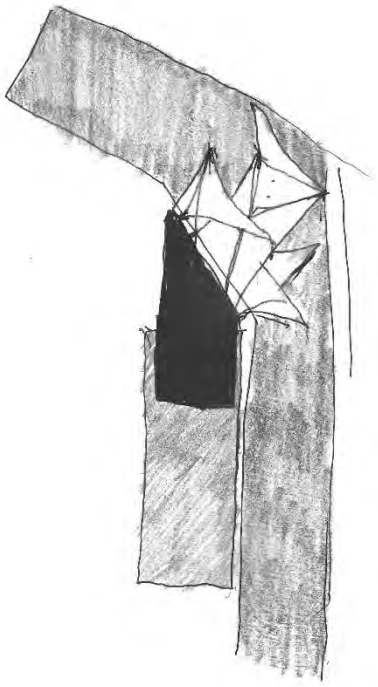


*Image 40*

*A conceptual diagram of the new addition in black emerging from the historic covered moorage volume. The addition of temporary site tents adds life and vibrancy to the site during events throughout the year.*

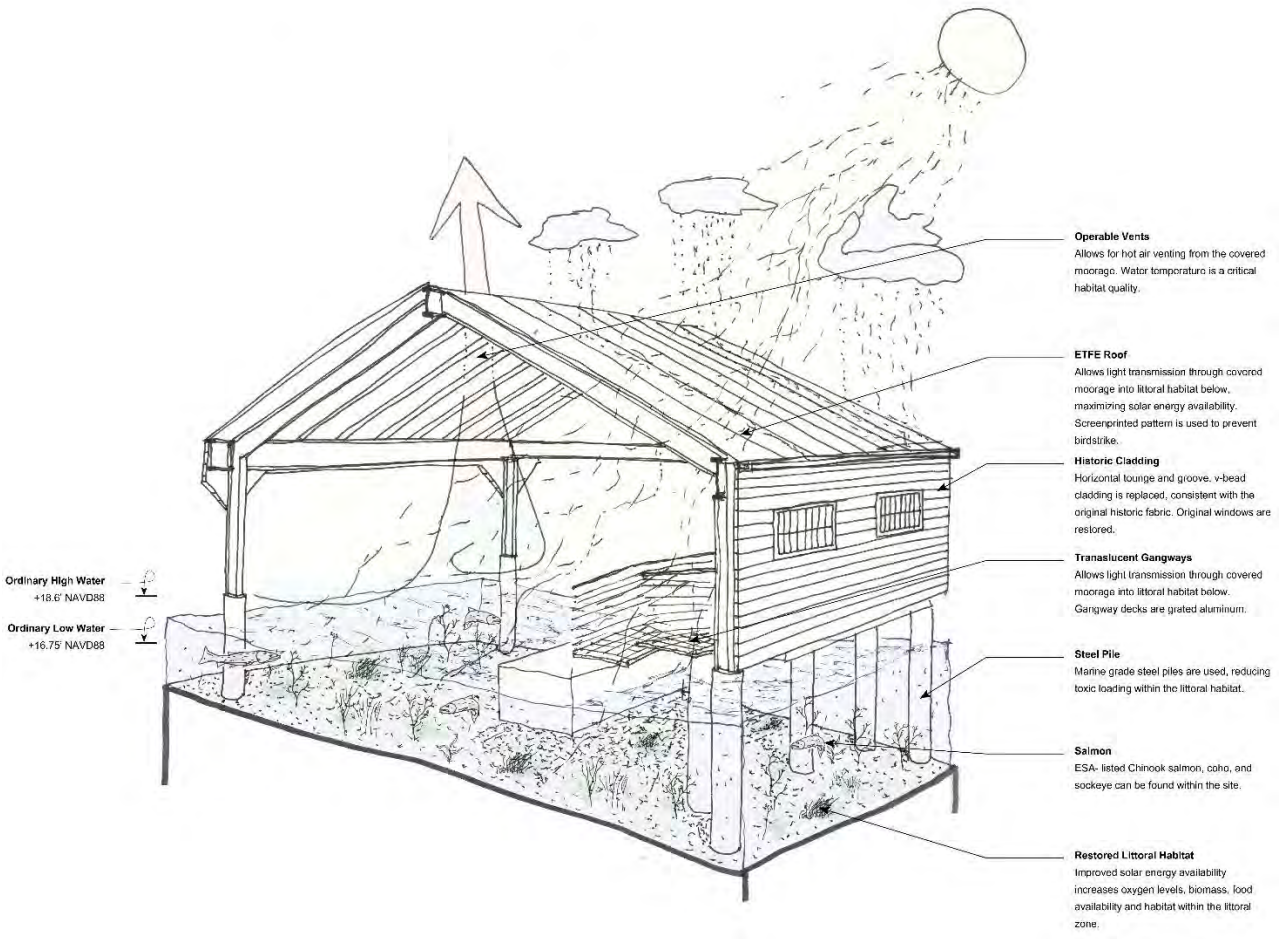



*Image 41*
*A conceptual section within the covered moorage volume of the proposed B31 rehabilitation.*

## 13.26 3D Visualization

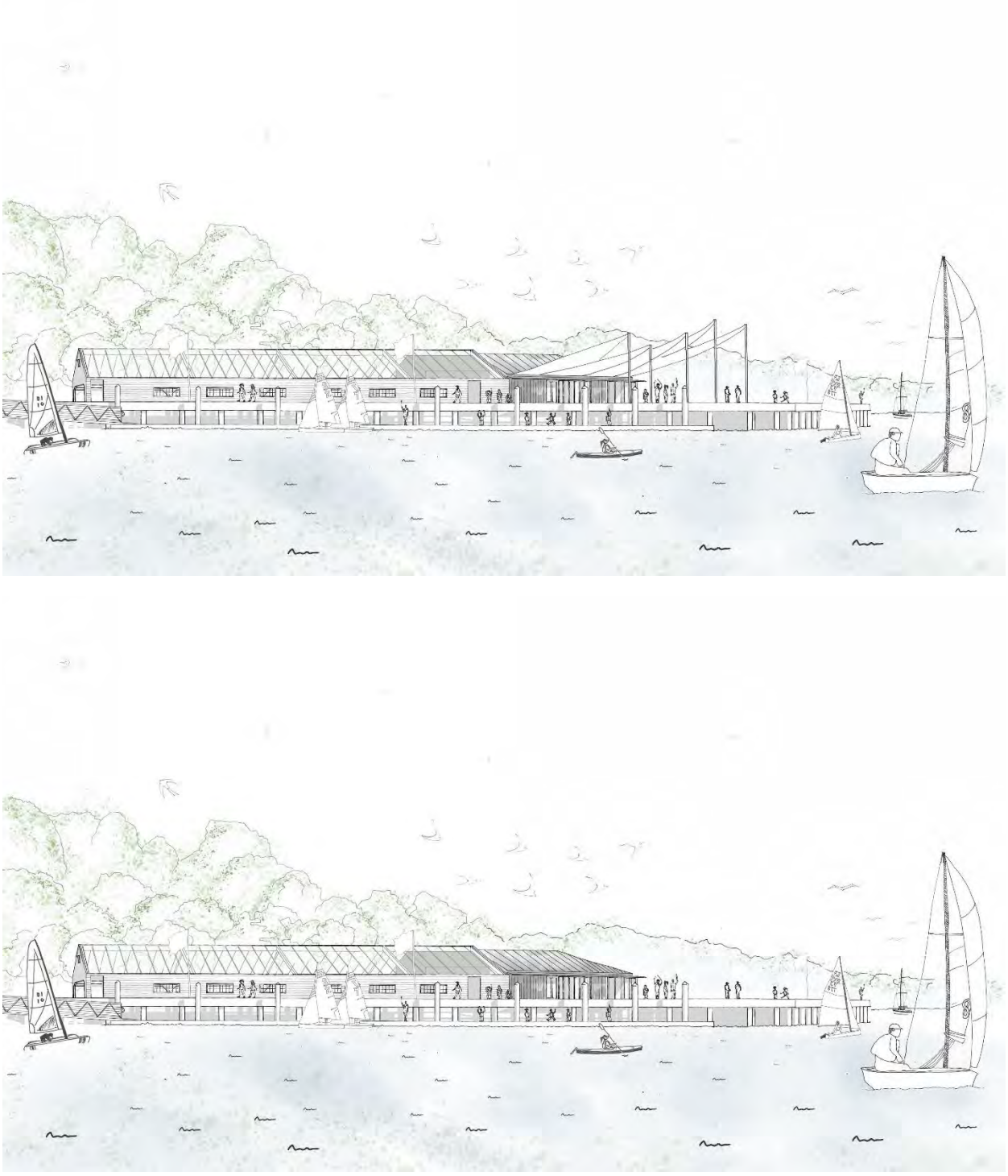


*Image 42*
*View from Lake Washington of proposed boathouse rehabilitation, with and without temporary canopies.*
**Not to scale.*

## 13.27 Plans, Sections and Elevations

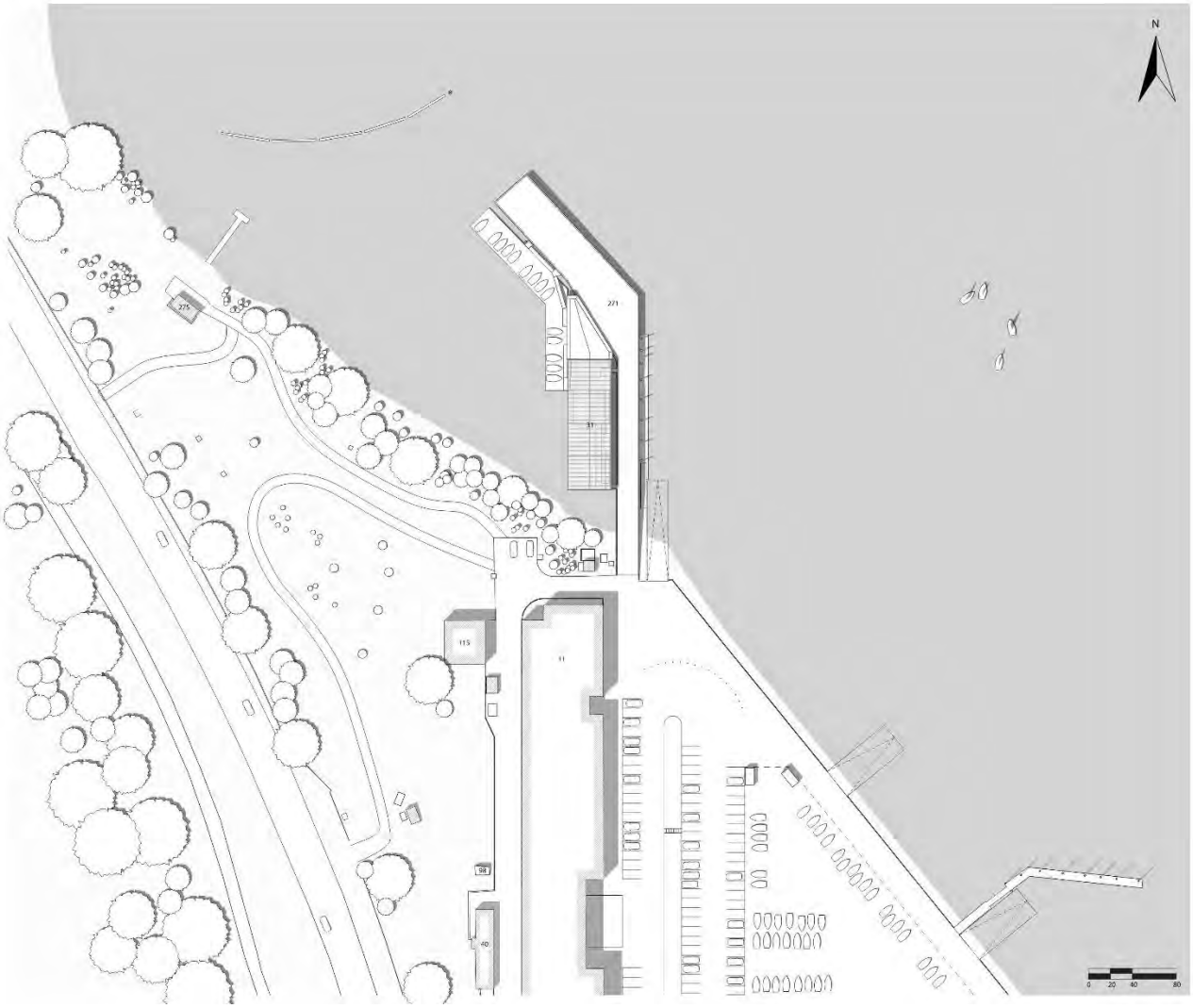



*Image 43*
*Site plan of proposed B31 rehabilitation work.*
**Not to scale*

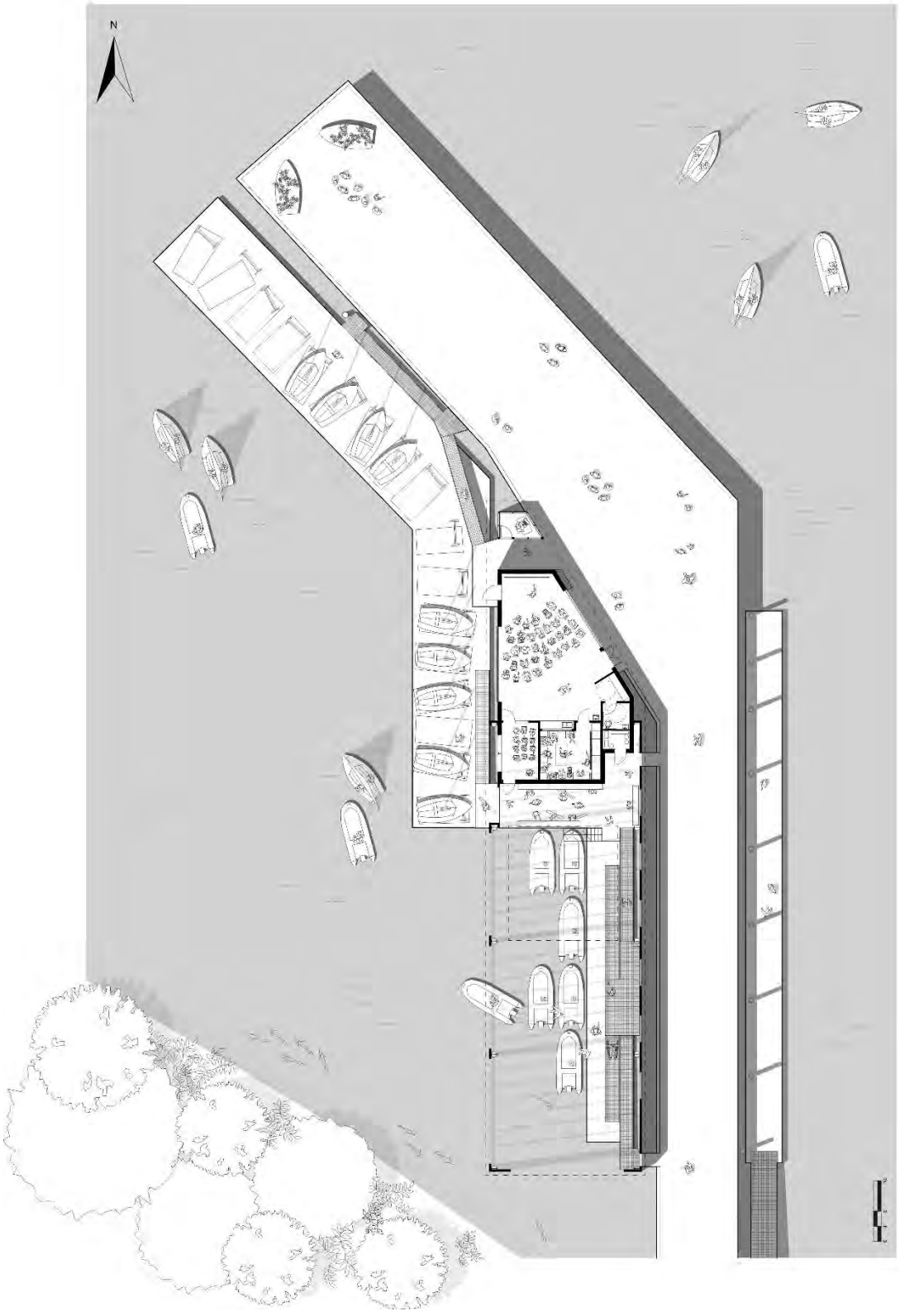



*Image 44*
*Plan view of proposed B31 rehabilitation. *Not to scale.*

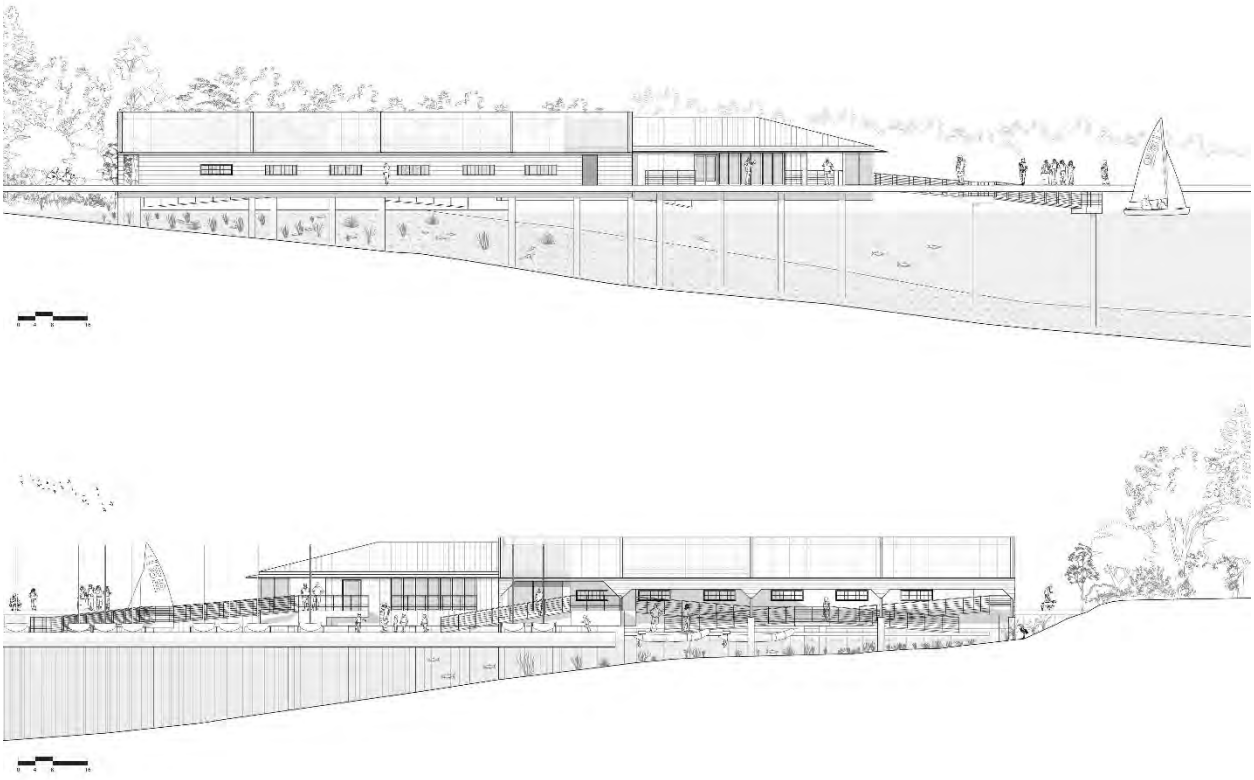


*Image 45*
*East (Top) and West (Bottom) elevations of the proposed B31 rehabilitation.*
**Not to scale.*

# 14.0 Site Work

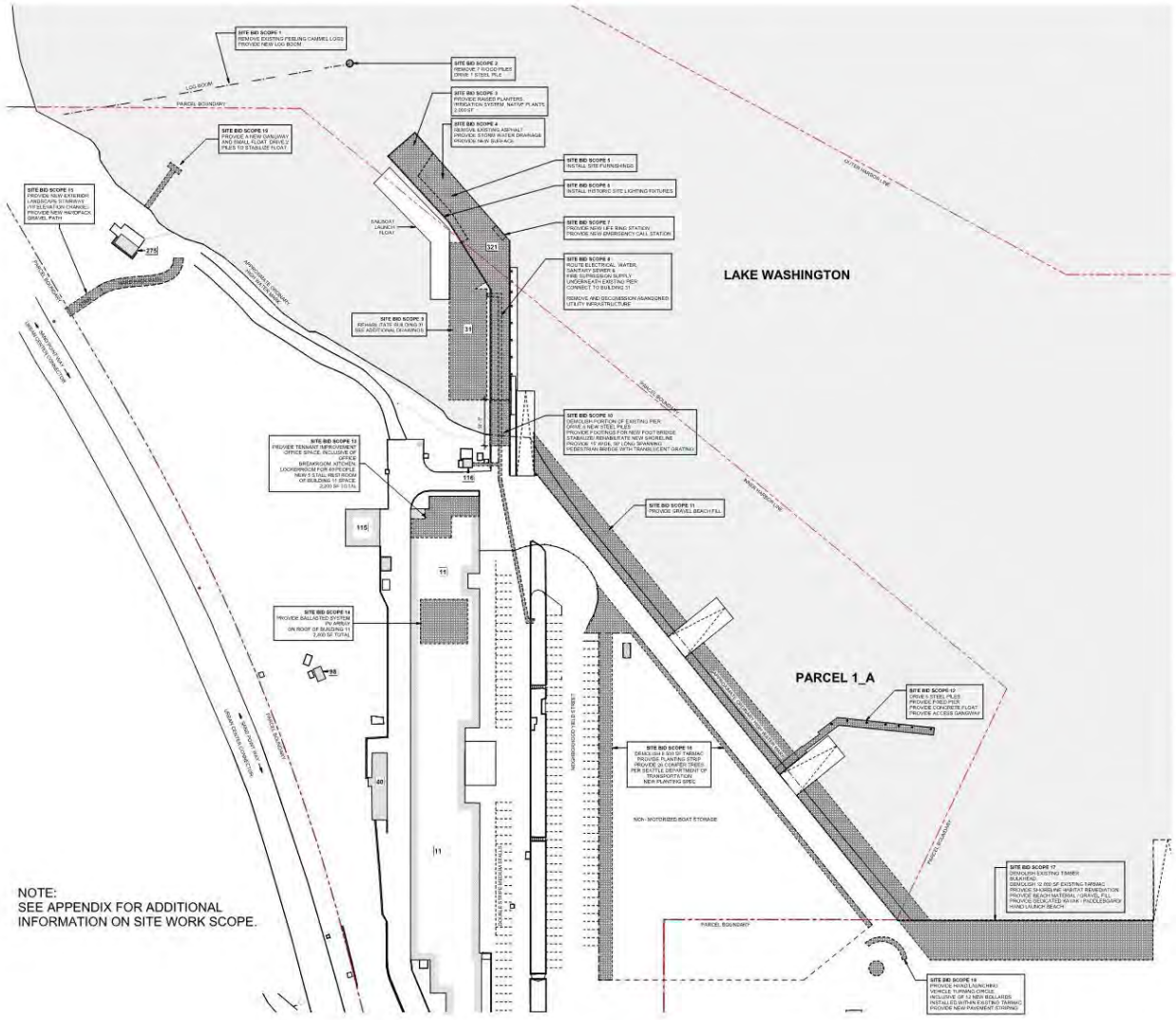



*Image 46*
*Preliminary evaluation of proposed site work at North Shore Recreation Area, Magnuson Park, inclusive of B31.*
**Not to scale.*

*Summary*

Through the course of study of B31, multiple site scale improvements were identified as important to the overall success of the Magnuson Park NSRA. A more detailed description of each site work scope item is further provided within Appendix R. A brief description and preliminary ranking of priority is provided within the table below:

# Site Work Scope Ranking

| ID | Scope Description | Rough Priority SSP E | SSP FA | SPR OB | SPR BJ | AVG RANK | Construction ROM Cost* ($ x 1,000) |
|---|---|---|---|---|---|---|---|
| I | B31 rehabilitation | 1 | 1 | 1 | 1 | 1 | $ 8,291 |
| M | B11 T.I. work (New office/locker rooms, break room, etc.) | 3 | 2 | NR | 4 | 3 | $ 847 |
| K | Provide beach fill / gravel along concrete bulkhead at boat yard | 4 | 7 | 2 | 2 | 4 | $ 89 |
| H | Provide new utility connections to B31 rehabilitation | 2 | 4 | 6 | NR | 4 | $ 167 |
| U | Provide additional FJ launch float area attached to existing launch float | 6 | 8 | NR | NR | 7 | $ 198 |
| V | Provide land improvements at Opti land (Increased boat storage, restroom, classroom space) | 11 | 5 | NR | 7 | 8 | † |
| G | Provide life ring and emergency call station on pier | 8 | 12 | 8 | 3 | 8 | $ 20 |
| L | Provide permitted pier and float at boatyard | 5 | 7 | 12 | NR | 8 | $ 473 |
| S | Provide a gangway and dock at Optiland | 10 | 6 | NR | NR | 8 | † |
| T | Provide B31 / pier integrated temporary event tent covering | 9 | 6 | 10 | NR | 8 | $ 261 |
| A | Log boom replacement (provide new logs that do not peel) | 18 | 17 | 3 | 5 | 11 | $ 29 |
| E | Pier site furnishings (Provide site furnishings on the pier, incl art, benches, drinking fountains) | 12 | 12 | 9 | NR | 11 | $ 42 |
| N | B11 PV Array (The intent is it will be included/ required within ITM I - B31 rehabilitation) | 7 | 16 | NR | NR | 11 | ‡ |
| P | Demolish existing timber bulkhead between boat yard and boat ramp north of Arena sports, replace with natural shoreline habitat | 21 | 17 | 5 | 6 | 12 | $ 723 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| B | Dolphin replacement (replace dolphin with steel pile or buoy) | 17 | 17 | 4 | NR | 13 | $ | 28 |
| R | Provide landscaping/ trees between boat yard and shore | 20 | 18 | 2 | NR | 13 | $ | 356 |
| D | Pier Storm water management (Resurface pier and add drains, collect storm water) | 15 | 13 | 15 | NR | 14 | $ | 118 |
| C | Pier Planting (add further landscaping onto the pier) | 14 | 16 | 14 | NR | 15 | $ | 217 |
| J | Pier nearshore demolition and replacement with pedestrian bridge | 16 | 19 | 11 | NR | 15 | $ | 524 |
| F | Provide historic pier exterior light fixtures | 13 | 17 | 16 | NR | 15 | $ | 100 |
| Q | Provide a new turning circle striping and bollards north of arena sports and south/east of boat yard | 22 | 18 | 7 | NR | 16 | $ | 50 |
| O | New stair and path connecting sand point way to Opti land | 19 | 18 | 13 | NR | 17 | $ | 96 |
| W | Provide Large Clock on Pier | | 21 | | | | † | |

Table Notes:
General cost note: An additional $200,000 should be budgeted total for temporary protection and construction.
* ROM cost includes markup for contingencies, general requirements and conditions, liability insurance, bong and B&O. Washington State Sales Tax is omitted. This cost is for construction only and does not include a 162% markup for soft costs, design, and administration of the project.
† ROM cost value not estimated within this phase of work.
‡ ROM cost is included within Building 31 rehabilitation (ID I) ROM cost.
NR Site work item was not rated by party or individual.

*Table 13*
*Site work priority tabulations.*
*As independent but interconnected organizations, SSP and SPR have similar and differing priorities within the entire scope of the project. This table is meant to assess the priority of site work items from each organization's perspective, highlighting potential common goals and alignments.*

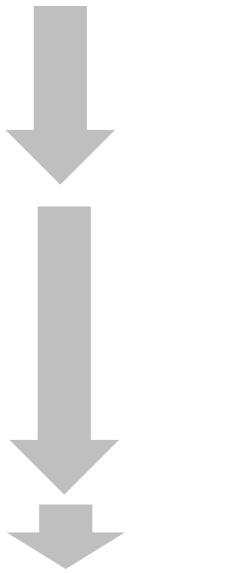
# 15.0 Next Steps

## 15.1 Permitting Schedule

The sequential nature of the permitting process from Master Use Permit to Joint Aquatic Resource Permit (JARPA) to SDCI building permit necessitates almost three years of permitting time allocated. This extended time frame is anticipated due to the complexity of the project, the multiple regulatory overlays and code constraints. This is a preliminary review.

The following table outlines the anticipated permits:

| | |
|---|---|
| **SDCI Master Use Permit (MUP) Type II** | 12 Months |
| SEPA Compliance Determination | |
| ECA Compliance | |
| Shoreline Substantial Development Permit | |
| Landmarks Preservation Board Certificate of Approval | |
| **Joint Aquatic Resource Permit Application (JARPA)** | 12 Months |
| Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval (HPA) | |
| U.S. Army Corps of Engineers Section 10 and Section 404 Permits | |
| Department of Ecology 401 Water Quality Certification | |
| Department of Natural Resources (DNR) Aquatic Use Authorization | |
| **SDCI Building Permit** | 8 Months |
| SDCI Building Permit | |



***July 16 – September 30***

*Table 14*
*Anticipated permits and review required for B31 rehabilitation. Estimated review and completion period includes time for multiple corrections cycles.*

Table Note:

*July 16 – March 15 is the approved freshwater work windows for ESA-Listed fish species in Lake Washington, north of State Route 520 and south of Arrowhead point. However, due to documented Sockeye spawning area located immediately around and underneath B31, this in water work window is further constrained to July 16 – September 30. A more detailed project schedule is to be developed within the next phase of work.

## 15.2 Project Urgency

As noted within the structural surveys completed by Reid Middleton in Appendix H, the "accelerated state of decay" of the structure necessitates an urgency from the project management team to address the inadequacies of the existing B31 structural system.

## 15.3 Scope Determination / Project Definition

At the termination of this feasibility study, in addition to B31 work, the project team identified the need for additional site work scope items. Following this feasibility study, the project team should

work to identify the scope to be included within Magnuson Park NSRA Phase 3 development, inclusive of B31 work. With the mobilization of heavy marine pile and crane barge equipment, the project team should work to identify efficiencies gained in the use of mobilized equipment for site work across the entire NSRA. In addition, the project team should work to identify synergies with other resource agencies (WRIA 8) and funding streams to coordinate efforts where goals align.

## 15.4 Project Delivery Method

*Summary*

As the owner and client, SPR must make a determination on the project delivery method. At this phase, the project team has not extensively assessed SPR delivery standards, however, the delivery of this project and associated NSRA site work using a Design-Bid-Build delivery model presents many specific challenges. The consideration of an alternative delivery model such as progressive-design-build is warranted.

A number of specific constraints with B31 present themselves:

- As a cooperative fiscal investment between SPR and SSP, both entities are constrained financially, and have significant need for financial resource allocation in other programs and capital projects.
- The lifespan of the pile structural elements is in critical condition, necessitating replacement within 1-3 years.
- The complex nature of working over-water with specialized equipment requires specialized knowledge of building methods and best practices
- The regulatory “In Water” window for working on the project, is constrained to three months, necessitating a highly organized and coordinated sequencing and mobilization
- The regulatory “In Water” window for working on the project directly coincides with the busiest and most economically critical time of year for the tenant of the project, SSP.

Section 39.10.300 RCW, which limits the use of the design-build for public works to projects with a total project cost over $2 million, provides three reasons for using the procedure:

- design-build is critical to developing a methodology for highly specialized construction, or
- there are opportunities for greater innovation or efficiencies between the designer and the builder, or
- there will be significant savings in project delivery time.[83]

Each of these three criteria are evident within the singular scope of B31 work, in addition to proposed site work within the NSRA. In addition to the project specific constraints, the City of Seattle Sustainable Building Site Policy outlines the use of an integrated process:

> *Integrated Design Process: a collaborative method for designing buildings which emphasizes the development of a holistic design. Integrated design processes require multidisciplinary collaboration, including key stakeholders and design professionals, from conception to completion and involve a “whole building design” approach in which a building is viewed as an interdependent system, as opposed to an accumulation of its separate components (site, structure, systems and use). The goal of looking at all the systems together to is make sure they work in harmony rather than in conflict with each other. Projects utilizing an integrated design process approach undertake systems*

[83] Capital Projects Advisory Review Board (CPARB), Design-Build Best Practices Guidelines. Nov. 2017.

*analysis during early design phases and integrated design workshop(s) at multiple stages of the project's development.*[84]

Further considerations include that the City of Seattle may not be authorized by the State of Washington to perform alternative project delivery. Thus, approval from the State Capital Projects Advisory Review Board (CPARB) Project Review Committee may be required. CPARB will likely agree with the assessment that the B31 work is a good candidate for alternative project delivery, however they will ask SPR for a project manager or owner's representative with experience in alternative project delivery. If SPR does not currently have someone on staff who fulfills this need, they may be required to retain an owner's representative for the duration of the project, adding further cost to the project. Project delivery methods like GC / CM include a contingency fund that additionally adds up front cost to the project. Arguments could be made if this contingency would have been spent regardless on change orders.

If SPR desires to deliver the project using the Design – Bid – Build delivery method, SPR could incur significant costs in change order for marine work or delays in schedule. Minor delays in schedule within the marine pile work window could set the project back into the next year's work window cycle. Thus, it is strongly encouraged that the project team survey and discuss the benefits and drawbacks of alternative delivery methods within the next phase of work. In the end, an alternative project delivery may not be desired by SPR, however its consideration is warranted.

### 15.5 Site Survey

Existing site survey information is incomplete and outdated. A complete site survey inclusive of current utilities, topographic and vegetation information, hardscape location, pier and building positioning is warranted for the next phase of the project.

### 15.6 MEP Site Verification

- A flow test will be required to determine available incoming water pressure.
- Electrical service size confirmation, determine if existing service equipment is able to support PV system
- Confirm which electrical panels are serving B11 and B31
- Confirm how much load capacity is available from the existing electrical panels. If the existing panels do not have capacity for new loads, a new panel will need to be added.
- Obtain access to all electrical panels serving scope areas in B11 and B31.
- Confirm amount of space of the roof of B11 that is usable for PV

### 15.7 Pier 1 Assessment

A contemporary structural assessment of Pier 1 is required to assess the potential bearing capacity of the pier deck. This survey is needed to determine the size of vehicles permitted and prohibited from driving on the pier deck while work is undertaken on B31. In addition, an assessment should be made for the capacity of the Pier to resist uplift forces due to temporary event tent anchorage to the pier deck structure.

### 15.8 Underwater Debris Assessment

Concurrently with the Pier 1 structural assessment, the dive team should perform a preliminary survey for debris found at the mudline underneath B31. Video documentation should be made, and any major debris identified under B31.

[84] City of Seattle Sustainable Building Site Policy

## 15.9 Geotech Soil Exploration – Over water

Existing geotechnical soil explorations do not form an adequate picture of the below grade soil conditions along the length of B31. It is anticipated that a minimum of two explorations will be needed. These are to be located at the southwest edge of B31 (P3-A below), and at the south edge of the existing launch float to the west of B31 (P3-B below). A 3rd boring near the existing dolphin (P3-C below) would be desirable to get the holistic scale of the site and lake bottom conditions, if desired by SPR. This 3rd boring would likely not be needed for B31 work, however, would provide information for SPR to replace the dolphin piles, or any future work on Pier 1. An additional boring, P3-D, may be desired at Opti Land with the intent of assessing conditions around a future pile and dock location. At the time of mobilization, with a barge, it may not be that much more to take a 3rd or 4th boring. Doing the boring now, would be cost advantageous due to future escalation as well. All soil explorations will be done from a barge over the water. It is advocated for these explorations to be coordinated within September of 2020.

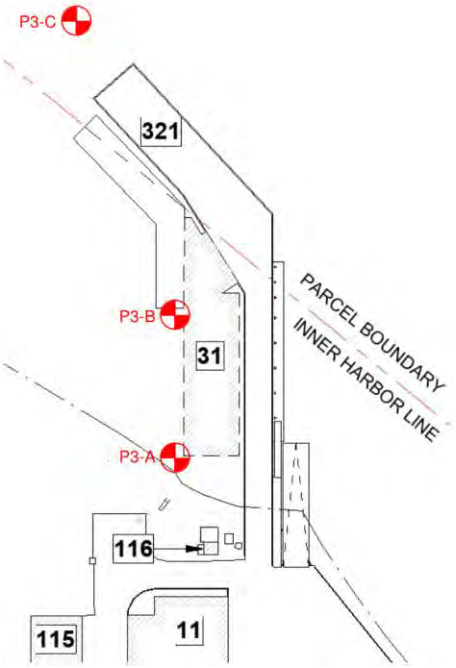
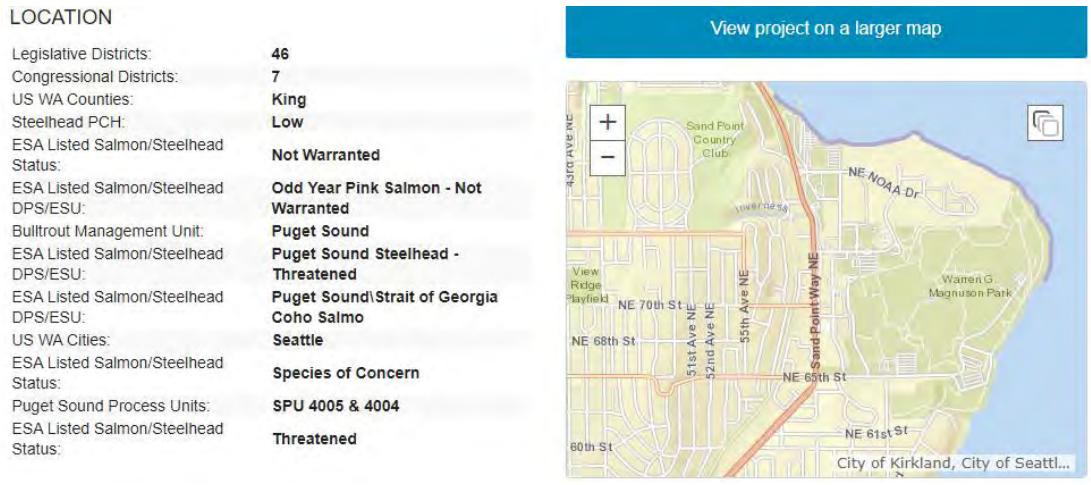



*Image 47*
*Proposed locations for further geotechnical soil exploration are indicated by the following symbol:* . *An additional boring, P3-D, may be desired at Opti Land (not shown).*

## 15.10 Coordinate Project Actions with WIRA 8 Habitat Restoration Plan



LOCATION

| | |
|---|---|
| Legislative Districts: | 46 |
| Congressional Districts: | 7 |
| US WA Counties: | King |
| Steelhead PCH: | Low |
| ESA Listed Salmon/Steelhead Status: | Not Warranted |
| ESA Listed Salmon/Steelhead DPS/ESU: | Odd Year Pink Salmon - Not Warranted |
| Bulltrout Management Unit: | Puget Sound |
| ESA Listed Salmon/Steelhead DPS/ESU: | Puget Sound Steelhead - Threatened |
| ESA Listed Salmon/Steelhead DPS/ESU: | Puget Sound\Strait of Georgia Coho Salmo |
| US WA Cities: | Seattle |
| ESA Listed Salmon/Steelhead Status: | Species of Concern |
| Puget Sound Process Units: | SPU 4005 & 4004 |
| ESA Listed Salmon/Steelhead Status: | Threatened |



*Image 48*
*Proposed conceptual location for lakeshore habitat restoration project (LW-S6-1) proposed by Seattle Public Utilities.*

A conceptual shoreline restoration project (LW-S6-1) has been proposed by Seattle Public Utilities as part of the WRIA 8 habitat work schedule. This project includes, “Remove dumped material, concrete, and other shoreline armoring; regrade the shoreline, install appropriate beach gravels, and plant with native trees and shrubs in the north end of the park.” There is significant potential to coordinate shoreline work with the required barge mobilization to the B31 site. The integration of B31 rehabilitation work within this habitat restoration project should be considered.

## 15.11 Clean Air Compliance

Asbestos Surveys for renovations and demolitions must be performed by an AHERA Building Inspector as defined under 40 CFR 763. This is consistent with the Puget Sound Clean Air Agency’s guidelines. An existing asbestos survey by the U.S. Navy was completed in 1993. While many asbestos containing materials appear to have been removed, there is not clear documentation through the process. In future work, further investigation will be needed to determine if there is adequate documentation of asbestos removal, or if further asbestos survey is required.

## 15.12 Execute a Window Survey of existing windows

Per Sand Point Design Guidelines “An in-depth survey identifying the condition of the existing window frames and sash should be undertaken prior to any consideration of projects involving the

replacement or alteration of window sash or window units." The project team should incorporate an assessment within the next phase of work.

## 15.13 SSP Operational Recommendations

As a recreational facility operating within Tier 1 critical habitat which include, "the highest priority habitats for protection/ restoration, and include primary spawning areas, as well as migratory and rearing corridors."[85] As a working facility, the operations within the facility can lead to adverse effects to the littoral habitat. The following measures are proposed to mitigate any adverse environmental effects:

- Eliminate the use of gasoline outboard engines within the safety boat fleet and develop a transition plan to 100% electric outboard engines.
- Brief each cohort of SSP summer staff on the basic principles of the aquatic habitat they operate within around B31. Knowledge and awareness of the big picture is key. We each have a part to play, and each small action can lead to systematic improvements.
- Ensure and enforce a no wake zone within the harbor. Motorboat wake and traffic are known to negatively impact aquatic plan community, diversity, and biomass.[71]
- When covered moorage area is not completely full, make it policy to moor boats starting at the northern edge, working to the south. This allows for less disruption of nearshore habitat.
- Determine a more suitable location for the existing lift / storage of E-scow sailboat out of the nearshore habitat.
- Design, permit, and build a dedicated gangway and float at Optiland.

## 15.14 Report Disclaimer

The work presented within this document has not been approved by any community, city, county, district, federal or tribal agency, service or organization. All work presented within this report and appendices is not final and is based on the project team's best judgement. The project team regrets any errors or omissions present within this report.

[85] Lake Washington/ Cedar/ Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan. 10 year update. Lake Washington / Cedar/Sammamish Watershed Salmon Recovery Council. 2017.

# Appendices

A. Historical Research Sources
B. Building Community Plan
C. LiDAR Scan Process and Graphics
D. Lushootseed Pronunciation Guide
E. Relevant Geotech Information
F. As-Built LiDAR Drawings
G. Site Photographs
    a. Accessibility Barriers
    b. Historic Markups
    c. General Site Photos/ Annotations
H. Building 31 Structural Assessments
I. Regional Access and Links Diagram
J. Program Data Sheets
K. Parcel Information
L. Preliminary LEED Scorecard
M. Physical Site Model Photographs
N. Pile Replacement Options Process Diagrams
O. Preliminary ROM Cost Estimate & Cost Drawings
P. Salmon Safe Metals Hand Out
Q. MEP Feasibility Narrative
R. Site Work Scope Items Summary
S. B31 Graphics Package

**END OF REPORT**

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