Green Lake Community Boathouse

Feasibility Study

December 2017

schacht | aslani architects

Thank you to the following participants who contributed to this feasibility study:

PRIMARY STAKEHOLDERS

David Graves, Seattle Parks - Senior Planner (contracts/scope)
Jason Frisk, Seattle Parks - Program Director (operation: of all programs Rowing/SKCK/sailing)
Mike Stanley, RAC President /Facilities Committee Chair (integration of planning/fundraising/ business case)
Coby Stites, Girls Experienced Coach (Coaches representative)
Ed Maxwell, Boys Experienced Coach (Coaches representative)
Dan Stettler, RAC Boathouse Committee (design oversight)
Steven Wort, SCKC President (SCKC representative)
Bill Keller, ARC Executive Director (oversight of programs)

SCHACHT ASLANI ARCHITECTS

Walter Schacht FAIA, Principal Architect
Evan Bourquard AIA, Project Manager
Kristina Rakestraw
Travis Hauan

LUND OPSAHL - STRUCTURAL

Marjorie Lund, Principal
Rebecca Rumann

SIDER & BYERS ASSOCIATES, INC - MECHANICAL

Nathan Byers , Principal

TRAVIS, FITZMAURICE & ASSOCIATES, INC. - ELECTRICAL

Mike Fitzmaurice, Principal
Rocxy Juan

CASCADE DESIGN COLLABORATIVE - LANDSCAPE

Kas Kinkead, Principal

MIG SVR - CIVIL

Dave Rogers, Principal
Lolly Kunkler

COMPARABLE FACILITIES TOUR

Mount Baker Rowing and Sailing Center
Pocock Rowing Center
Lake Washington Rowing Club
Conibear Rowing Club

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

2 EXISTING CONDITIONS

2.1 Context 9

2.2 Site Development History 12

2.3 Site Analysis 17

2.4 Existing Buildings 19

2.5 Applicable Codes 22

3 NEEDS ANALYSIS

3.1 Program Needs 27

3.2 Program Priorities 30

3.3 Functional Program 31

3.4 Space Allocation Table 35

3.5 Fleet Growth & Storage 37

3.6 Comparable Facilities 39

4 ALTERNATIVES ANALYSIS

4.1 Development Options 45

4.2 Option A - Renovation / Minor Addition 46

4.3 Option B –New Program Building / Split Boat Storage 49

4.4 Option C – New Boathouse & Program Building / Repurpose Shellhouse 51

4.5 Program Comparison 53

5 COST & SCHEDULE

5.1 Project Costs 55

5.2 Project Schedule 58

6 APPENDIX

6.1	Option C Test-To-FIT Drawings	61
6.2	Option C Cost Estimate	72
6.3	Option A and B Estimate	103
6.4	Detailed Project Schedule	113
6.5	Project Budget	114
6.6	Consultant Narratives	116
6.7	Green Lake Rowing Advisory Council	163
6.8	Seattle Historic Sites description	171
6.9	Code Analysis Notes	176
6.10	ADA Assessment	199
6.11	Existing Site Photos	213

1 EXECUTIVE SUMMARY

The over arching goal of the Green Lake Community Boathouse project are:

- To provide a safe place for the rowing and paddling programs through improved accessibility, building and seismic code compliance and by providing basics service to ensure the safe and secure use of the facilities.
- To provide for increased demand for public rowing and paddling programs through more efficient and increased boat storage and improved instructional and meeting spaces.
- To allow the programs to expand to reach underserved populations and continue the legacy for "access for all" though more accessible facilities.
- To better embrace the community as a center of activity at Green Lake and to enhance connections with the park, neighborhood and community.

As the primary public rowing program available on Seattle's north side, the programs at the Green Lake Small Craft Center provide a unique public benefit. They provide access to rowing and paddle sports for both novice and advanced users, create opportunities for youth activities that promote teamwork, health and bonding, and bring more opportunities for the public to interact with and enjoy Green Lake.

The existing facilities are limited and do not adequately serve the current programs in size or quality, which impacts recruitment and retention for all the water-based organizations at the Center. In its current condition, the facility simply cannot provide the level of quality that is present at other similar public and private boathouses. The poor condition and lack of changing facilities discourages adult and youth participation and forces some activities off site. Incremental minor remodeling and filling space to overcapacity to accommodate program growth have simply reached their limit, and a comprehensive approach to renewal is needed as these programs continue to grow.

The center also occupies an important physical position along the lake trail and adjacent to West Green Lake Way, and has the potential to help further connect everyday park users with both activities at the center and the lake itself. The proposed expansion is an opportunity to increase and enhance public access to the lake by improving the park user experience along the path and at the water's edge.

1.0.1 METHODOLOGY

The study team worked closely with representatives from the Rowing Advisory Council (RAC), Seattle Parks and Recreation (SPR), and the other primary stakeholders to develop the study. A list of the primary stakeholder participants and team affliates can be found on the page ii. The study team began by evaluating the existing site, buildings and context. A functional and technical program were developed to define the current program and systems needs and constraints.

The team then visited similar facilities around the Seattle area to ascertain what works well so appropriate ideas could be replicated.

A series of alternatives were developed to test potential site development and program placement. Each alternative was evaluated by the stakeholder group and a preferred site location was selected and Options A, B & C were developed corresponding with a small, medium, and large approach to site development.

A target Maximum Construction Cost was also established based on the anticipated fundraising capacity of the RAC. Costs were estimated and each of the options was adjusted in order to stay below the target value.

Option C was selected by the stakeholder group for further development into a test-to-fit plan. A set of test-to-fit plans and cost estimate for this option can be found in the Appendix.

1.0.2 EXISTING CONDITIONS

The Green Lake Small Craft Center is made up of three existing buildings, from north to south known as the Shellhouse, the Boathouse, and the Aqua Theater. Significant functional and systems deficiencies exist in each of these existing facilities, as described in the Existing Conditions section.

The Boathouse and Shellhouse contain most of the program area used by the various organizations at the Center. Both buildings were primarily constructed in 1980. Each has been

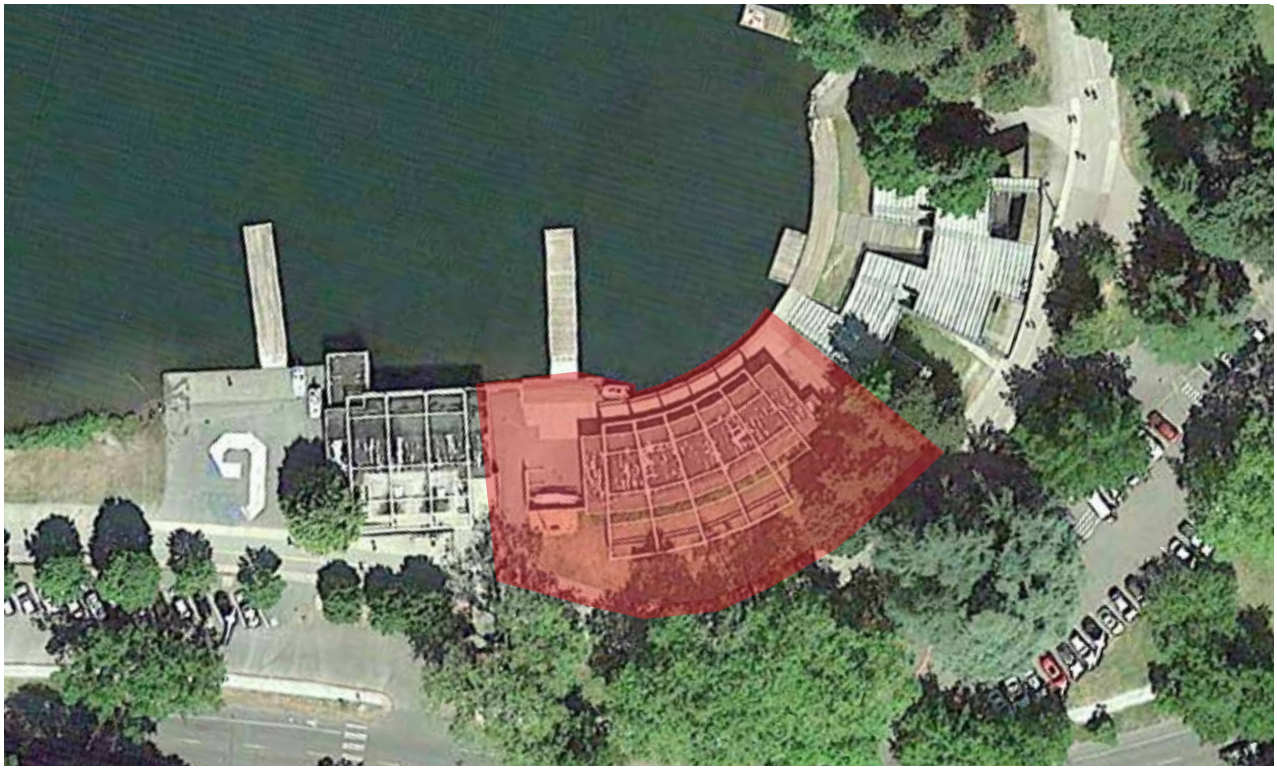


Figure 1 – Existing Site Aerial View

incrementally remodeled over time by Parks staff since their original construction. The existing Aqua Theater grandstand structure is uninsulated, unconditioned, and in very poor condition. The structure is the last remaining remnant of the original Aqua Theater that once occupied the site in the 1950's and 1960's. Significant structural deficiencies exist in this remnant, and the primary structure has little to no seismic load resisting capacity, making it unsuitable for continued regular use.

The site itself also has a number of significant constraints. Soil conditions are poor, which will require the use of pile or mat foundations for new construction. The water table is high which could impact construction costs and complexity. The site slopes approximately seven feet between the path and the water's edge which presents accessibility and access challenges.

The site is also located within the Seattle Shoreline District, which brings additional limitations on uses and development. The expansion qualifies as a "Water-Related Community Center" which is an allowed use under the Shoreline Code. However, care must be taken to minimize the development footprint and impacts to the Lake, and specific restrictions exist within 50 feet of the lake shore. A detailed code summary can be found in the Existing Conditions section and the Appendix.

1.0.3 NEEDS ANALYSIS

Based on projected increased demand, the programs at the center have identified growth targets upwards of 20 percent in terms of users, fleet, and fleet storage space. The current center simply cannot accommodate this growth without expansion. The current facility also does not provide the level of quality that is present at other similar city facilities and private boathouses. The poor quality of workout space and lack of changing facilities discourages adult and youth participation and use.

The existing Assignable Square Footage (ASF) of all the existing program is 10,750 ASF. The estimated amount of program space needed to accommodate growth and provide missing program areas at the center is 17,670 ASF. Not all of this additional program can be accommodated on this site based on budget and site area. However a significant portion of the high priority program spaces (locker rooms and changing facilities, shell and boat storage, and expanded coaches and park office space) can be included.

The scale of development will require upgrades to building systems, including the addition of ventilation, space conditioning and fire alarm. Power and water and sewer services are adequate, and the renovated facility will continue to use a sewage ejector pump system to reach the adjacent city main. Stormwater is a significant challenge given the site elevation and space constraints. Based on conversations with Parks and Seattle Department of Construction and Inspections representatives, a mitigation offset somewhere else in the watershed or around the lake is proposed to meet these requirements.

The existing facilities were previously surveyed for Americans with Disabilities Act (ADA) compliance by the SPR. The resulting report indicted in excess of 150 non compliant issues

with the existing center. The selected development option will need to address these issues and be fully compliant with all regulatory requirements and guidelines. Additionally, with increased demand for adaptive rowing and para-paddling, accessibility beyond code compliance should be considered in the final design.

In the city of Seattle, all new construction and major renovation projects 5,000 square feet or greater must meet LEED Gold, as well as key performance requirements for energy and water efficiency, waste diversion and bicycle facilities. Per the sustainable building + site policy, the Community Boathouse will be required to meet this standard. Additional guidance on site development found in the policy are applicable to the Community Boathouse project. All city departments are also encouraged to follow landscape best management practices. These Best management practices shall consider opportunities encourage buildings to incorporate the community and reduce the consumption of resources.

1.0.4 ALTERNATIVES

OPTION A (RENOVATION/ADDITION)

Option A prioritizes retention of the existing buildings and dock work to the greatest extent possible to minimize cost and site disturbance. A 1,500 sf addition is added onto the existing boathouse building on the north end to provide limited shell storage expansion. Program functions are removed from the Aqua Theater building, leaving only storage functions.

OPTION B (SPLIT SHELLHOUSE AND PROGRAM BUILDING)

Option B includes the demolition of the existing Boathouse building and replacement with a new two-story program and boat storage building. This replacement building is set back from the water's edge providing adequate space for maneuvering to reach the existing pier. The lower level of the new building houses additional shell storage, and parks office space along with the service counter adjacent to the park trail. The upper level contains program space for coaches, locker rooms and multipurpose and workout space. Shell storage is split between the two buildings, depending on boat length. The scope of work at the Shellhouse and storage-only uses in the Aqua Theater are both similar to those in Option A.

OPTION C (NEW SHELLHOUSE AND PROGRAM BUILDING)

Option C proposes replacement of the Boathouse with a new program building. This new program building footprint is large enough to accommodate all boat lengths, including 8's in a dedicated boat storage area on the ground floor. This boat storage area is minimally enclosed and conditioned to reduce cost and consolidate system and envelope to the upper floor. The upper floor contains parks and coaches' offices, a multipurpose room, and dedicated adult and youth locker rooms. A new double pier and apron allows access to the water directly from the boat bays in the new program building.

The new shell storage is large enough to accommodate the entire fleet with proposed expansion. As a result the existing Shellhouse in this scheme can be re-purposed as a workout/erg room

and kayak program boat storage, both of which are more appropriate to the building height and location. Uses in the Aqua Theater are reduced or eliminated depending on the needs of the sailing program and RAC program storage.

PROGRAM COMPARISON TABLE

Program Area	Existing	Proposed Program (from Needs Analysis)	Option A	Option B	Option C
Multipurpose Room & Support	0	2,450	740	1,260	1,480
Parks Office	760	1,070	820	880	1,180
Boat Program Support	2,530	4,550	1,590	2,110	2,390
Boat Storage	6,995	8,500	5,420	7,130	6,970
Shared Support Spaces	465	1,100	495	695	1,080
Aqua Theater (unassigned)	Incl. above	0	0	0	0
Total (ASF)	***10,750**	**17,760**	**9,065**	**12,075**	**13,100**

** 6,605 sf in existing Boathouse and Shellhouse*

1.0.5 CONSTRUCTION COST

A initial construction cost estimate was generated for each of the program options based on the conceptual block diagrams and a narrative description developed by the design team. This initial round of cost estimating involved input from both the consultant team and estimator to identify and assign reasonable cost-per-square-foot values for each of the primary new construction or renovation areas.

Option C was selected for further development by the stakeholder group once this first round of program planning and estimating was completed. A set of test-to-fit plans, elevations, and a massing model were then developed for this option. This expanded set of documents was then re-evaluated and a more detailed cost estimate for option C was developed.

A detailed cost estimate for Options A, B & C can be found in the Appendix.

OPTION A

Option A	Gross Area	$/SF	Cost
Shellhouse Renovation	3,310 sf	$ 80/sf	$264,800
Boathouse Renovation	3,475 sf	$ 241/sf	$837,475
Boathouse Addition	1,535 sf	$ 311/sf	$477,385
Sitework			$200,000
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option A			**$1,778,385**

OPTION B

Option B	Gross Area	$/SF	Cost
Shellhouse Renovation	3,310 sf	$ 80/sf	$264,800
New Boathouse	9,245 sf	$ 298/sf	$2,759,930
Sitework			$200,000
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option B			**$3,224,730**

OPTION C

Option C	Gross Area	$/SF	Cost
Shellhouse Renovation / Restrooms	3,310 sf	$ 40/sf	$131,654
New Boathouse			
Boat Storage (Level 1)	5,313 sf	$173/sf	$920,404
Program Areas (Level 2)	5,448 sf	$393/sf	$2,142,536
Sitework			$279,325
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option C			**$3,529,626**

1.0.6 SCHEDULE

The project schedule was developed in conjunction with the stakeholder group, RAC and Parks department. The project schedule assumes a design-bid-building process, and public bid procurement. It includes a 4-phase design process including Concept Design, Schematic, Design Development and Construction Document phases, a bid period and approximately nine-month construction duration including demolition.

MILESTONE SCHEDULE

	Start	Finish
Feasibility Studies	Jan 2017	Jan 2018
Capital Campaign	Dec 2017	Aug 2019
Major Grant Applications	Sep 2017	Jan 2019
Design / Bidding	Jan 2018	Jul 2019
Permitting	Jul 2018	Sep 2019
Construction	Sep 2019	May 2020
Grand Opening		May 29, 2020

1.0.7 PUBLIC OUTREACH

Because the site occupies a prominent position within one of Seattle's most active and popular park lands, the public outreach process will be critically important to the overall success of the project. Early engagement to specifically interested parties, such as Friend of Green Lake and Friends of Seattle's Olmstead Parks is recommended. Creating opportunities for public comments early enough in the process to influence the design will be an important part of any public outreach plan developed for the project.

2 EXISTING CONDITIONS

This section describes the site context and development history, and summarizes the existing building condition and uses. The applicable code requirements that will impact development at the center are also included.

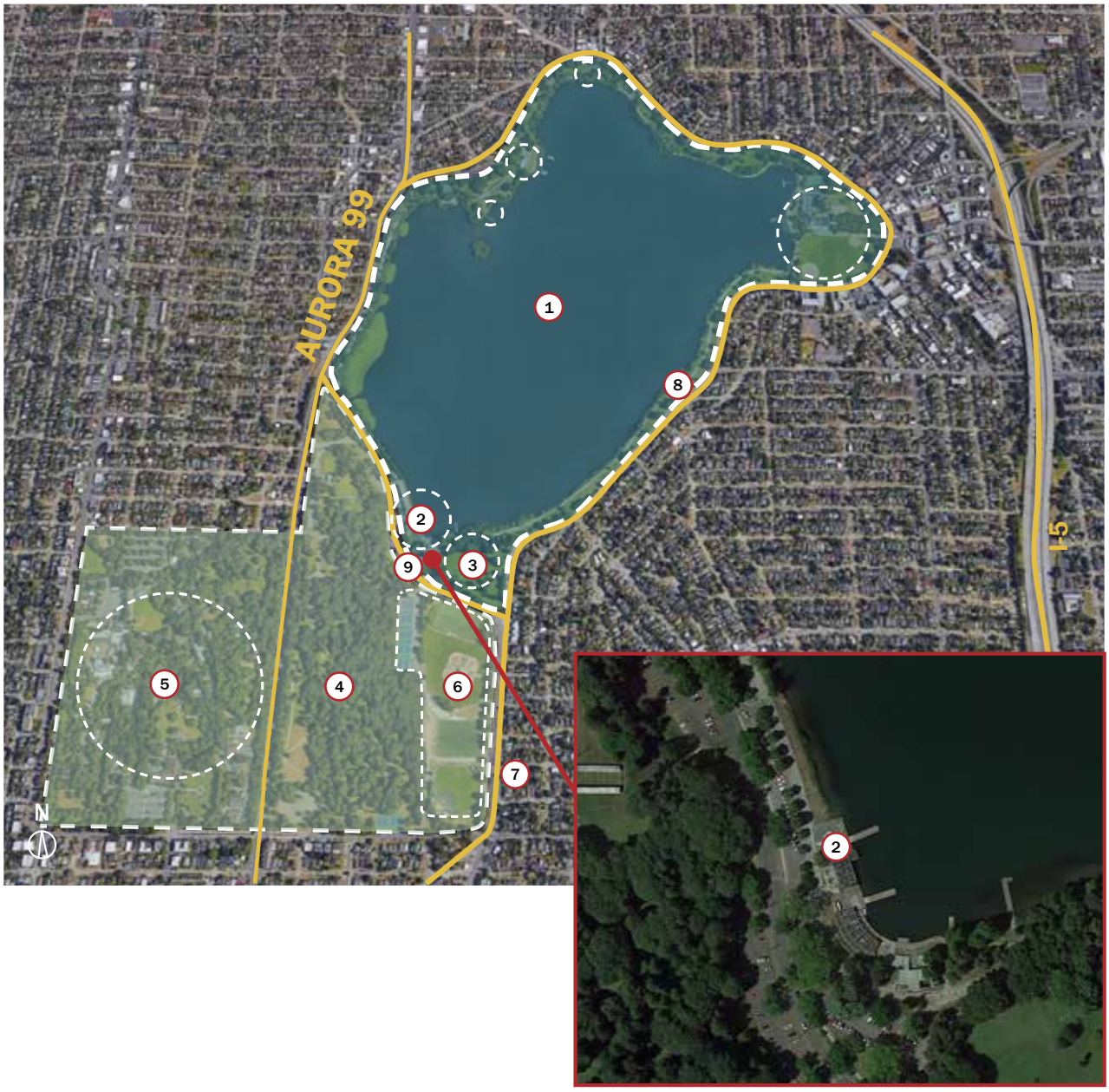
2.1 CONTEXT

2.1.1 VICINITY

The existing Green Lake Small Craft Center is located on the south shore of Green Lake in Seattle, Washington. The center is one of only two public rowing clubs located within the city limits, and the only one located north of the downtown core. It is one of several public amenities located within the park, and is open to the public year-round for program related and general recreational use.

The center is part of a group of activities clustered at the south end of the lake, including a par-three golf course, tennis courts, soccer fields, baseball fields and lawn bowling areas that all share a series of small and mid-sized parking lots along the park roadways.

The project site is bounded on the west side by the existing park loop trail that circles the lake, a shoreline area to the north, and a wooded shoreline area with a designated wetland to the south. The site lies directly on the lakeshore. It occupies a prominent position both in relation to the relatively busy West Green Lake Way and the heavily used park loop trail.



KEY

1 GREEN LAKE PARK
2 SMALL CRAFT CENTER
3 GOLF COURSE
4 WOODLAND PARK
5 WOODLAND PARK ZOO
6 SPORTS FIELDS
7 GREEN LAKE WAY N
8 EAST GREEN LAKE WAY N
9 EAST GREEN LAKE WAY N

Figure 1 – Existing Site Conditions

2.1.2 GREEN LAKE & WOODLAND PARK

Green Lake Park is home to several public amenities and activity areas, including the Green Lake Park Wading Pool, Green Lake Community Center, Green Lake Small Craft Center, and the Green Lake Bath House (currently used by the Seattle Public Theater)

The park itself has long been a destination for formal and informal recreational activities. At the center of the park is Green Lake, a freshwater lake maintained through rainwater and storm drain runoff, with a controlled outflow. A series of green spaces, pathways and park roadways ring the lake, providing exercise, recreational and view amenities.

In 1903, Green Lake Park became part of Seattle's grand Olmsted Plan to create a series of interconnected green spaces around the entire city. The park design still reflects parts of the original Olmsted vision, although the immediate vicinity around the Small Craft Center appears to have been heavily modified through subsequent development.

Woodland Park, which adjoins the Green Lake Park, is a heavily wooded natural area. Some smaller paths and amenities are included here as well.

2.2 SITE DEVELOPMENT HISTORY

2.2.1 EARLY DEVELOPMENT

The first settlements at Green Lake appeared in 1869, and the vicinity was annexed by the City of Seattle in 1891. In 1903, the city hired the Olmsted Brothers landscape firm who recommended the acquisition of Green Lake and the creation of a park and boulevard surrounding the lake. Unfortunately, settlement had reached to the shoreline in some areas, so as a solution the lake level was lowered to fill in the surrounding wetlands to create more usable land. This likely created much of the land south of existing West Green Lake Way, but portions of the shoreline between the roadway and the lake remained swampy until the early 1930's, when spoils from the construction of Aurora Avenue were used as fill to dry out the remaining areas. The proposed project site is likely one of these later filled areas of the shoreline.

In 1949 the first Seafair celebration was being planned, and a feature event was to be the Aqua Follies, which required a large pool, diving towers and stage. This need was fulfilled through the construction of the Aqua Theater along the south shore of the lake at the current site location.

2.2.2 SITE DEVELOPMENT 1950 - 1960

1950'S: AQUA THEATER & SHELLHOUSE

The first intensive use of the Small Craft Center site was a 5,000-seat outdoor theater (dubbed the "Aqua Theater"). The Aqua Theater was designed by George Stoddard & Associates and constructed in 1950 by Strand & Sons. This initial phase included an open air stadium with seven sections of seating, two diving towers and a built up stage. A 180-foot long semicircular pool located between the seating and the stage provided a unique foreground that merged with the background of the larger lake view. Activities at the initial stage included water ballet, comedy, dancers, singers and high diving performances. The stage was also used for plays and musicals.

The original Shellhouse building was constructed by the same contractor and completed shortly after the Aqua Theater. The Shellhouse became the home for the first rowing program on the lake. This building was expanded to include a small concession stand and the two public restrooms to serve the adjacent path in 1958.

2.2.3 SITE DEVELOPMENT 1960 - 1970

AQUA THEATER EXPANSION

In 1960, the Aqua Theater seating area was expanded toward the water's edge to increase overall capacity by approximately 400, primarily in box seats. This brought the total number of occupants to more than 5,500 at full capacity. The early 1960's years following would mark the high point of Aqua Theater use.

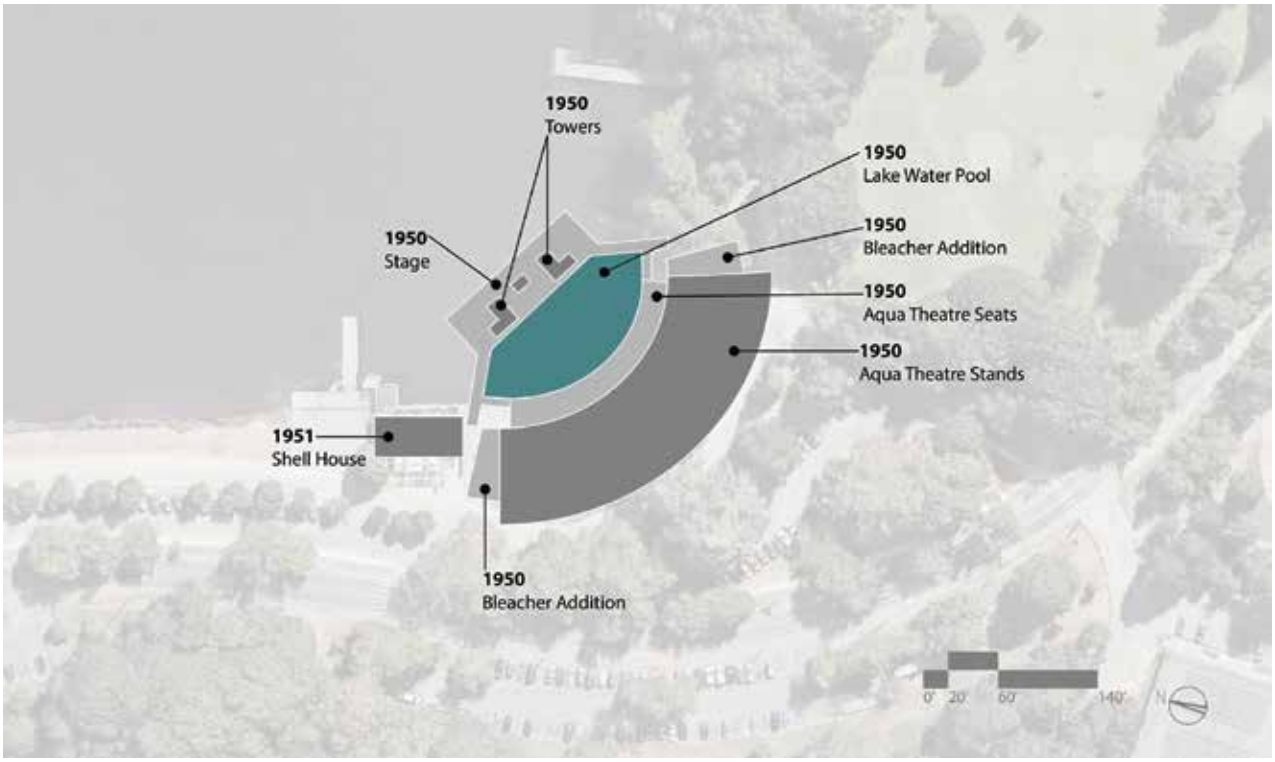


Figure 2 – 1950 to 1960: Early Development of the Aquatheater

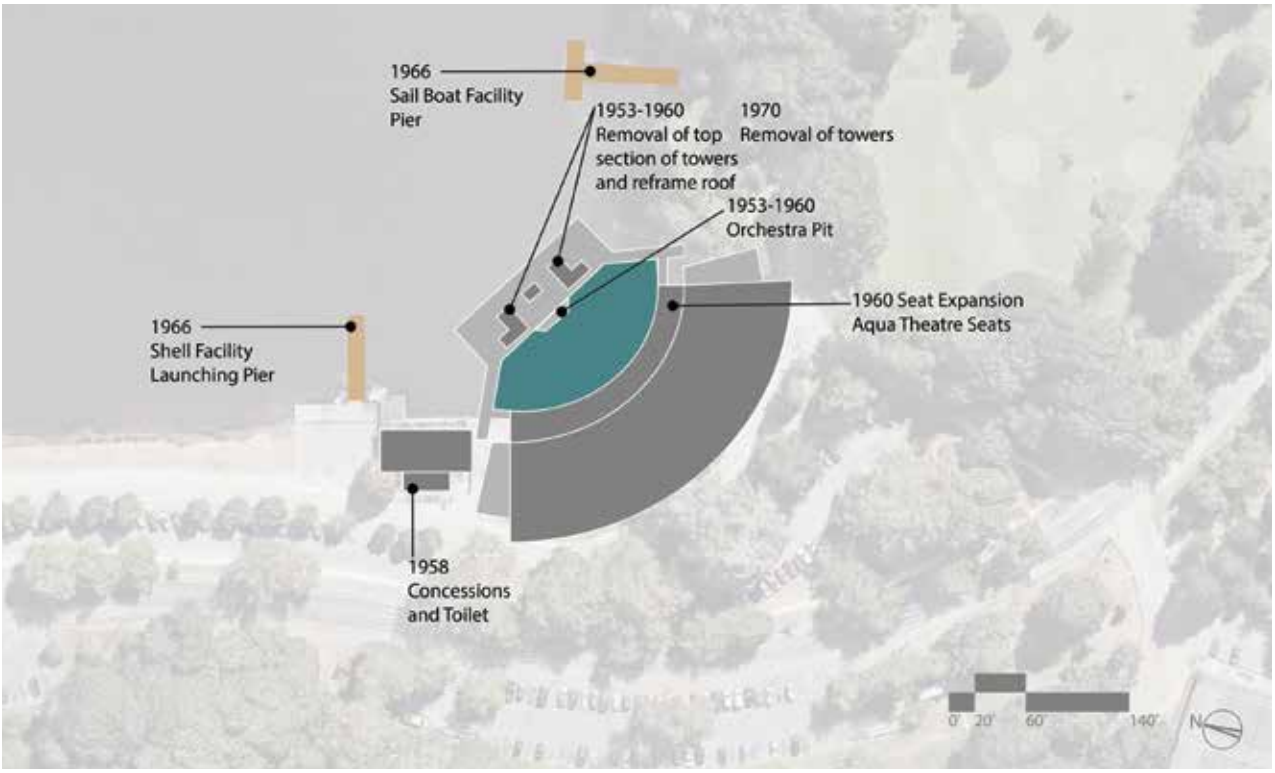


Figure 3 1960 to 1970: Aquatheater modifications, piers, and partial demolition

AQUA THEATER DECLINE AND PARTIAL DEMOLITION

After the 1962 World's Fair, other more contemporary and practical venues eventually outshone the Aqua Theater. The Aqua Follies production ended in 1964, and after that the Aqua Theatre struggled to compete for national productions. The facility was used only rarely, and mostly for local productions. A Grateful Dead appearance in 1969 was one of the final concerts at the lake.

Lack of use led to vandalism, disrepair and eventually condemnation of the facility Funds were allocated through the 1968 Forward Thrust Bond to remove the diving towers, four of the seven original grandstand sections and all fixed seating. This work was completed in the 1970's, leaving the structural remnant that still stands today. The existing timber pilings that supported the original structure were also abandoned in place.

2.2.4 SITE DEVELOPMENT 1980 - PRESENT

BOATING FACILITY CONSTRUCTION

The same 1968 bond measure funded the construction of a new Boathouse building at the site of the demolished portion of the Aqua Theater to accommodate the growing rowing, sailing, and canoeing programs. This work was not completed until 1980. The new Boathouse building was constructed on top of the original timber pilings from the grandstand, and was curved in order to align with these existing points of support. Long span trusses extend outside the building footprint to connect to the timber pile caps, and support the roof structure from above.

The original Shellhouse building also underwent significant repairs and modifications, including the addition of the rescue boathouse slips, and the addition of similar long span truss supports at the roof. The new Green Lake Small Craft Center was dedicated in September of 1980.

GREEN LAKE PARK IMPROVEMENTS

In 1984 the Phase 3 Green Lake Park improvements included modifications to the adjacent parking lots and shoreline restoration at select areas around the lake. Various site related and signage improvements were also completed.

2001: EARTHQUAKE DAMAGE / SHELLHOUSE RETROFIT

After the 2001 Nisqually earthquake, the Shellhouse building was again significantly damaged. Emergency funds were allocated and the structure was retrofitted, including full replacement of the concrete slab which was reinforced with pin-pilings.

This work required vacating the Boathouse building during construction, and a temporary unconditioned enclosure was constructed on the path side the Aqua Theater remnant to house the rowing fleet. This temporary enclosure remains in use as storage today.

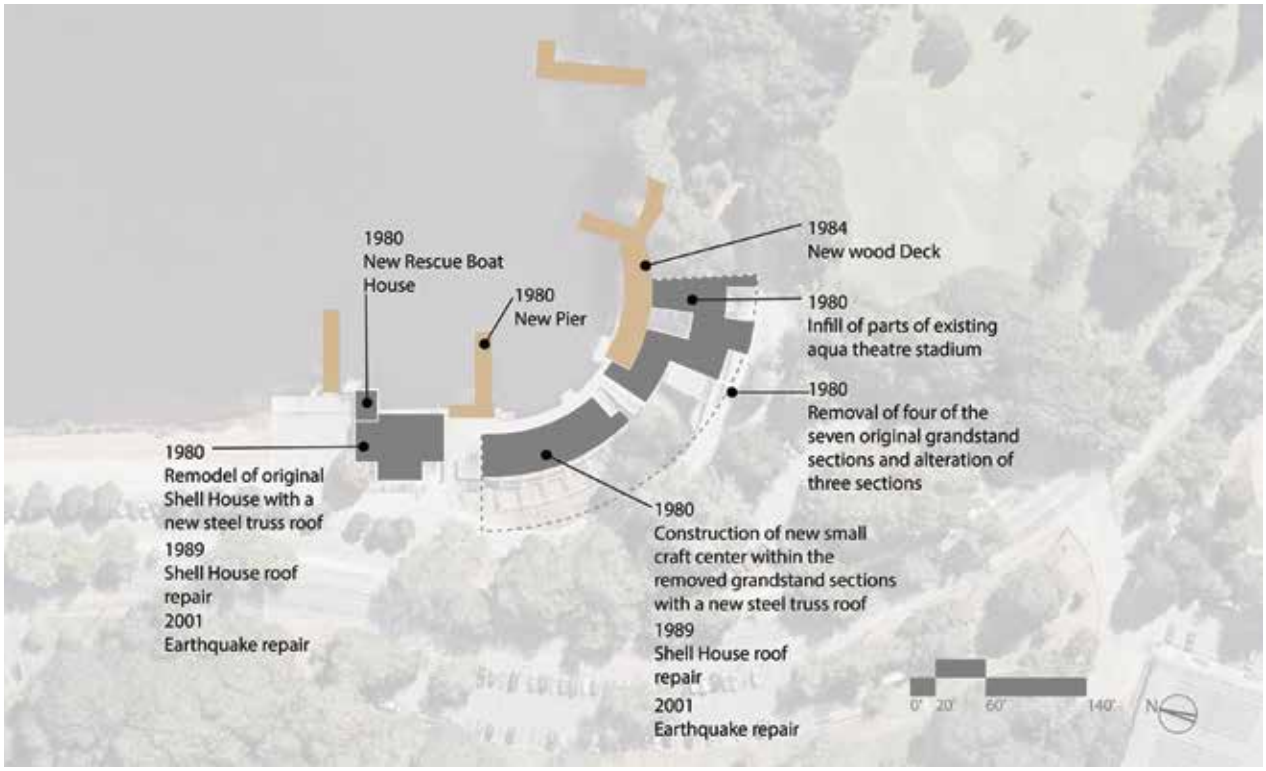


Figure 4 – 1980 to Present: Boathouse and adaptive reuse

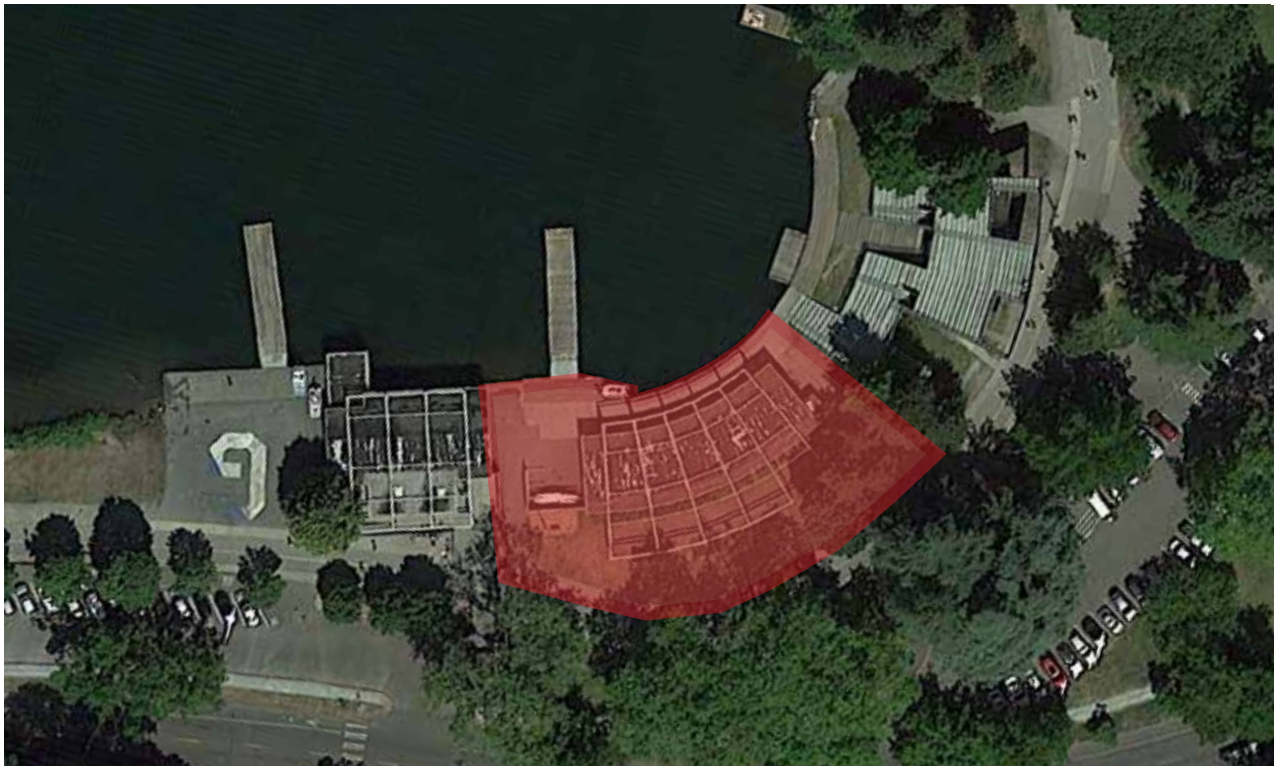


Figure 5 – Existing Site Aerial View

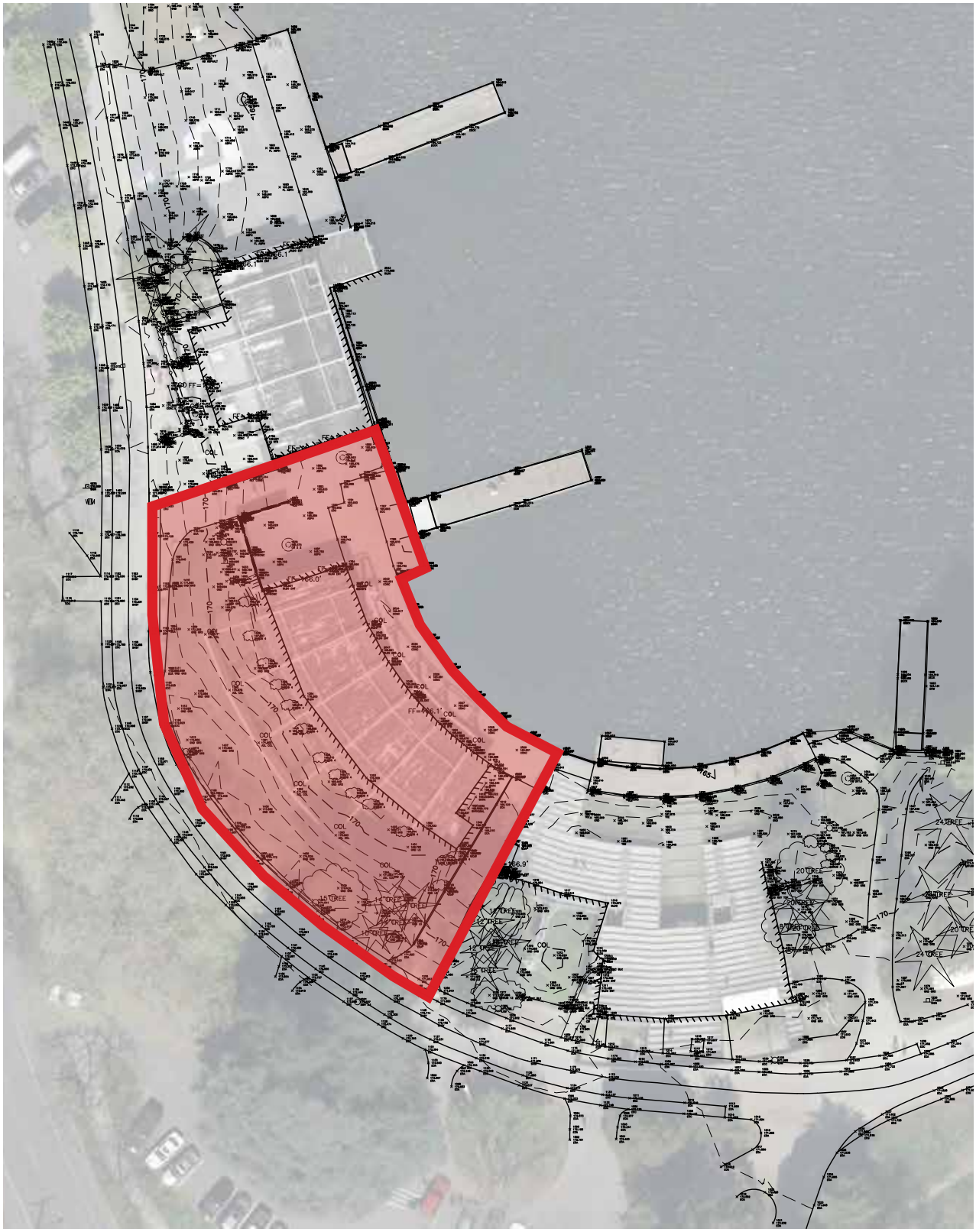


Figure 6 Topographic Survey with Project Site

2.3 SITE ANALYSIS

The Green Lake Community Boathouse (GLCB) site is located adjacent to the shore at the south end of the lake. The selected site area is roughly 30,000 sf, and is bordered by the existing walking path to the west, lakeshore to the east, and open park space to the north and south. Existing parking is located in surface lots along Green Lake Avenue North. Primary access to the site is from West Green Lake Way N. Two wooden floating docks extend into the lake from the center site. A third public launching pier is located along the lakeshore to the south. A bulkhead and boardwalk/paved edge exists at the water's edge and extends in front of the Aqua Theater grandstand remnant.

The site is roughly level from north to south, with a seven foot grade change from east to west between the existing path and waterfront walkway. An additional step down of 12-18 inches exists to reach the lake water's surface under normal conditions. The lake level does not normally fluctuate and is a controlled outflow.

There do not appear to be any significant trees within the proposed project site. Along the parking lot are a series of larger deciduous trees that will need to be protected during any construction activity.

2.3.1 SITE SECURITY & ACCESS

Existing security and access to the site are limited by poor lighting and site hazards caused by aged buildings and deteriorated site conditions. New designs options should incorporate improvements to and the safety of launches, docks and other immediate site hazards.

2.3.2 ACCESSIBILITY

The existing facilities were previously surveyed for ADA compliance by the SPR. The resulting report indicted in excess of 150 issues. The resultant design will need to address these issues and be fully compliant. Additionally, with increased demand for adaptive rowing and para-paddling, accessibility beyond code compliance should be considered in the final design.

2.3.3 STORMWATER SYSTEMS

The existing stormwater control system at the GLCB site is primitive and includes no flow control or water quality treatment. Catch basins collect stormwater runoff from the existing paved areas and are discharged directly to the lake. Existing building downspouts and some floor drains also connect to this system Downspouts along the eastern side of the boathouse are drained via downspouts and splash blocks directly to the lake across the pavement at the water's edge.

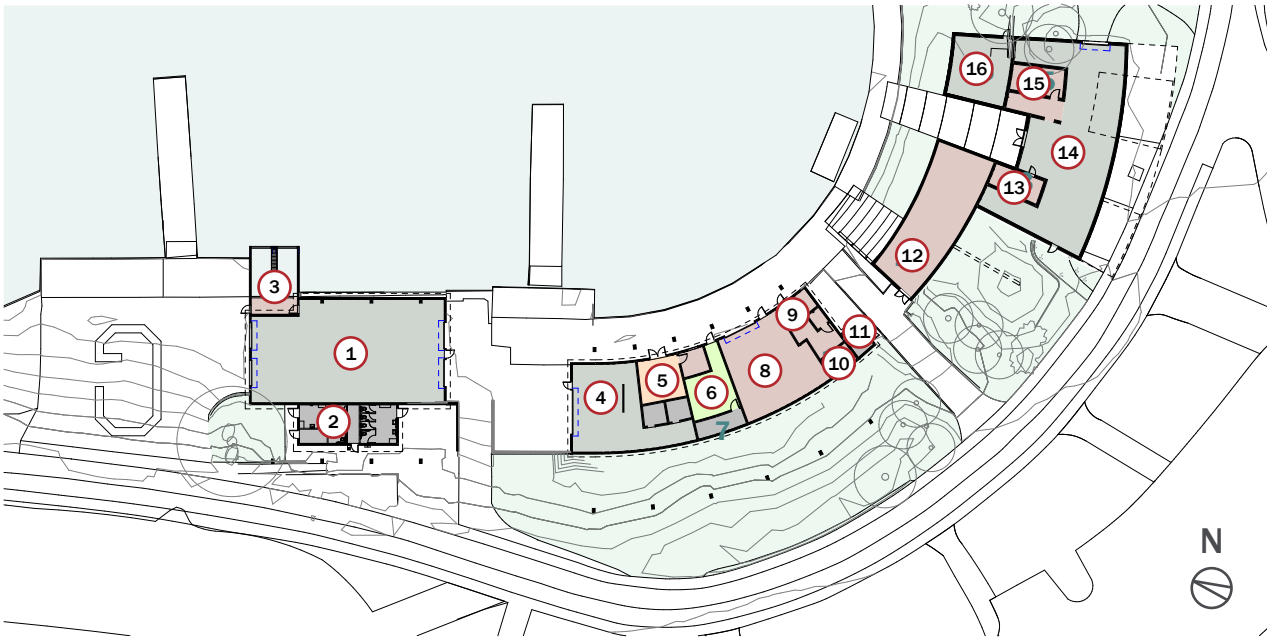
Any new system must comply with the 2016 Seattle Stormwater Code, and must meet on-site stormwater management requirements as well as peak-flow control standards. Meeting these requirements at the site will be extremely challenging given the site constraints and elevations present around the existing buildings and path.

An alternate approach may be to develop a more cost effective and impactful flow control improvement elsewhere along the lakeshore or in the drainage basin, combined with upland mitigation in lieu of flow control for this site. Onsite rainwater harvesting into a cistern or cisterns could also mitigate stormwater runoff. If city code permits, the rainwater could be stored and used to wash shells, flush toilets and serve as a reservoir for fire protection. This would require collaboration with the Parks Department regarding potential sites, and coordination with City Officials regarding the extent of required mitigation.

2.3.4 GEOTECHNICAL CONSIDERATIONS

The entire site lies in an area of liquefiable soils (loose fill over sand and gravel deposits). This makes the existing buildings highly susceptible to settlement and movement during seismic events. After the 2001 Nisqually earthquake, the floor and wall structure of the existing Shellhouse were significantly damaged. Portions of the floor slab experienced settlement in excess of 4-1/2" according to the geotechnical report.

To address this, a new foundation system of driven piles or a mat foundation is recommended to mitigate life safety risk within any new structure during seismic events. If retained the existing Boathouse and Shellhouse structure could also be retrofitted at considerable expense. The cantilevered concrete columns that support the existing roof structure are not adequate to resist seismic



KEY

1 SHELL HOUSE
2 RESTROOMS
3 RESCUE BOAT HOUSE
4 CANOE & KAYAK

Figure 7 – Existing Building Use and Configuration

loads imposed in a major event. If retained these elements would need significant modifications and potential steel jacketing in order to be retrofitted.

The geotech report also identified a very high water table level consistent with the porous soils observed. This will likely require dewatering and pumping activity during construction activities.

2.3.5 HISTORIC RESOURCE STATUS

Both the Shellhouse and the Aqua Theater buildings are identified and described in the Historic Resources Inventory database created and managed by the City of Seattle Department of Neighborhoods. There are no restrictions on properties in the database unless the properties are City of Seattle landmarks or buildings in a local or National Register historic district. Neither structure has achieved such landmark status.

Any property may be eligible for consideration as a landmark during a State Environmental Policy Act (SEPA) review. Information on site and building history will be submitted with the SEPA checklist. A copy of the resource status and known history can be found in the Appendix.

2.4 EXISTING BUILDINGS

The site complex is made up of three existing buildings, from north to south known as the Shellhouse, the Boathouse, and the Aqua Theater.

2.4.1 USES

The Shellhouse contains the primary boat storage space for 8's and 4's, as well as support space for the rowing program. Two enclosed in-water launch bays are located along the water side of the building, with an alcove for fuel and maintenance equipment. Additional launches are stored in the Shellhouse boat bays between the shells and are hand launched from the paved area to the north. Roll-up doors provide access from the south and north. The Shellhouse building also contains the public restrooms, an electrical room and janitor/mechanical space. These spaces are located at a higher level and aligned with the adjacent park trail.

The Boathouse building contains boat storage for the canoe and kayak storage program, a small set of changing rooms and equipment storage associated with that program, the parks administrative office with a small conference room and storage, a multi-use space used for workouts or sailboat storage depending on the season, and a program room. The program room contains limited rower and coaches gear storage, a small kitchen area, and a toilet and shower area used by staff. Attached to the south end of the building is a separate enclosure for the sewage ejector pump (refer to the mechanical section below). All spaces in the Boathouse are accessed from the water side, with a retaining wall along the east (path) side.

The Aqua Theater structure is a remnant of the larger grandstand that was abandoned after the last round of major development on the site. The concrete structure steps up from the water's

edge and contains a series of rooms below the seating that slop upwards toward the path. The underneath portion of the structure houses temporary additional shell storage, kayak and canoe storage overflow, equipment and food storage for the RAC, a room housing the ergometer fleet, and a small workshop space. The enclosure along the path side of the structure was built on an emergency basis after the 2001 earthquake to house shells during renovation of the Shellhouse building.

2.4.2 BUILDING CONDITION

The Shellhouse and Boathouse were both constructed in 1980 as single-story slab-on-grade buildings with little to no interior circulation. The two buildings are clad in corrugated metal siding with Plexiglas clerestory windows in select areas. The buildings are minimally insulated, with exposed structural decking and structural elements visible on most of the interior. Roofing is a membrane system, penetrated regularly with ceiling support from the over-framed steel trusses that make up the primary structure. Soffits and fascia are painted wood.

The Aqua Theater structure is uninsulated, unconditioned, and in very poor condition. Significant structural deficiencies exist and the primary structure has little to no seismic load resisting capacity, is unventilated, all making it unsuitable for regular use.

2.4.3 BUILDING STRUCTURE - BOATHOUSE / SHELL HOUSE

The Boathouse and Shellhouse structures have similar structural systems. Both buildings are slab on grade single story buildings with cantilevered concrete columns and external steel trusses. Primary roof construction consists of wide flange steel beams with wood decking spanning between external steel trusses. Exterior walls of both buildings are self-supporting and also serve as retaining walls along the path side of the buildings. The Shellhouse slab on grade and the retaining wall along the west side of the boat storage area were partially upgraded after the 2001 Nisqually earthquake, but no improvements to the primary structure were made.

The Boathouse and Shellhouse roof and column structure do not meet current code requirements for seismic (lateral) strength. While it may be possible to renovate the existing structures without disrupting the existing structural elements, any addition to the existing building is likely to trigger a substantial alteration to the existing structure which may require additional structural improvements.

2.4.4 BUILDING STRUCTURE - AQUA THEATER

The remaining portion of the concrete Aqua Theater structure is in overall poor condition. The existing structure has a series of significant structural deficiencies that should discourage any continued use of the underneath portion of the structure. The structure is minimally maintained and is showing signs of structural decay. There is no discernible lateral load resisting system, making it unlikely to withstand a major seismic event.

The original Aqua Theater structure was constructed over a series of timber pilings used to mitigate poor soil conditions. The conditions and method of attachment to these pilings is unknown. Existing concrete columns do not meet current seismic design criteria or code and are susceptible to failure.

Any improvements to the Aqua Theater structure would require significant structural upgrades and modifications to ensure life safety. It was determined early in the study that this building would not be made available for long term program use. A detailed description of the Aqua Theater structure and condition can be found in the Appendix.

2.4.5 MECHANICAL

The Shellhouse and storage in the Aqua Theater building are unheated spaces. The Boathouse has some primitive heating-only equipment, and no active ventilation. The public restrooms are ventilated via an exhaust fan.

Any improvements will require new heating and ventilation systems for all existing and new spaces. Cooling may also be required for workout, changing and toilet spaces.

2.4.6 PLUMBING

The public restroom includes a men's and women's side with four fixtures each, and there is a single-use toilet and shower room located in the Boathouse dedicated to program use. The public restrooms are heavily used because of their proximity to the walking path.

The existing water service is adequate for current and future use. The site is served by Seattle Public Utilities, but no records exist on the exact location or nature of the building water service. This would need to be investigated further during the early design phases to determine the extent of the service line and its condition.

Due to differences in the invert height of the sanitary sewer, all wastewater has to be pumped via an ejector pump up from the Small Craft Center back to the street. All wastewater from the facility, including the public restrooms use this conveyance. When power is interrupted, sewage is released directly into the lake.

Any proposed improvements will face a similar condition. A sewage ejector pump will be required, and emergency power or generator may also be necessary to prevent future sewage overflow. Refer to the Appendix for a detailed description of the existing mechanical and plumbing systems.

2.4.7 FIRE PROTECTION

No automatic fire sprinklers are installed at the existing site, and no risers or water service adequate to serve the facility are currently present. Any future major addition or new building must either add fire protection (and larger water lines adequate to meet the demand) or must stay below the building area thresholds for the building type and use.

Options 2 & 3 in chapter 4 assume Type IV or better construction to avoid triggering this threshold.

2.4.8 ELECTRICAL

The electrical capacity of this service is adequate for the current and future uses, but the service equipment is reaching the end of its useful life, and should be replaced as part of any future major project. This would also provide an opportunity to consolidate the service and eliminate the separate meters currently present. A detailed description of the existing system and panel assignments can be found in the Appendix.

Lighting throughout the existing facility is outdated and there are no daylight controls or occupancy sensors. Several existing rooms appear to be under-lit based upon code minimum requirements for their use. Any major project at the site will include complete replacement of the existing lighting and controls system to reduce energy use and improve efficiency.

2.4.9 SECURITY / ACCESS CONTROL / TELECOM

The site is not served by dedicated data or fiber-optic cabling. Telephone and cable services provide internet and communications access. No security systems, surveillance video, or entry access controls are present at the existing facility.

2.4.10 FIRE ALARM

The current buildings are not protected with a fire alarm system. Fire alarm notification and detecting devices are now code mandated for the facility type and must be added in any future significant renovation.

2.4.11 ACCESSIBILITY

The existing facilities were previously surveyed for ADA compliance by the SPR. The resulting report indicted in excess of 150 issues. The resultant design will need to address these issues and be fully compliant. Additionally, with increased demand for adaptive rowing and para-paddling, accessibility beyond code compliance should be considered in the final design.

2.5 APPLICABLE CODES

2.5.1 SHORELINE CODE

Green Lake is part of the Seattle Shoreline District, and the project is subject to the requirements of the Seattle Shoreline Master Plan Program. This special set of requirements work hand-in-hand with zoning land use requirements to set limits on uses, setbacks and development of shoreline development. This code is required through the State Shoreline Management Act of

1971, which required local governments to establish a program consistent with the Shoreline Master Plan Program Guidelines adopted by the State Department of Ecology (DOE).

DESIGNATION

The GLBC site is designated as a Conservation Management (CM) zone under the Shoreline Code. The proposed project is also considered a "Shoreline Substantial Development" per RCW 90.58.030(3). As such it will require a Shoreline Substantial Development Permit, in addition to the required building and grading permits.

USE CLASSIFICATION

The GLBC is a Public Facility that can be designated (per Table A for 23.60A.224) as an "E.4.b Water-Related Community Center", which is an allowed use in the CM zone. Under this designation, a special use, or conditional use shoreline permit is NOT required.

CM ENVIRONMENT SPECIFIC REQUIREMENTS

Development in the CM zone is subject to the following specific requirements

- Height Limit: 30 feet, (pitched roof 35')
- Lot coverage: 35% of the lot area (for lots greater than 5000 sf)
- Shoreline Setback: 50' (CM zone) from Overall High Water Mark (OHM).
- View corridors must be maintained across 35% of the lot width

GENERAL DEVELOPMENT STANDARDS FOR ALL SHORELINE ZONES

The following Priority Criteria for general development apply to any development within a shoreline zone:

- Project must minimize adverse impact on the existing beneficial shoreline processes, and surrounding land and water uses
- Protect public health and safety
- Minimize disturbance areas to the smallest footprint possible
- Follow best management processed for stormwater management
- Prioritize non-toxic materials for overwater development
- Provide maximum ambient light with new overwater structures

STANDARDS FOR SHORELINE SETBACKS (23.60A.167)

Any use allowed within the CM environment can be developed within the 50' setback. (per 23.60A.167 standards for shoreline setback). More than 20 feet landward of the OHM, other uses (such as the minimum necessary for public access) are allowed.

Designation as a "Water-Related Community Center" qualifies the project as an allowed use. However, development footprint within the setback is still restricted and required to be minimized.

The following relevant items are allowed anywhere within the setback:

- Over-water components of a water-dependent or water-related use
- Piers, Dry docks, Equipment for boat launching
- Structures used to operate or control water-borne equipment or vessel

Constructing and operating the following is allowed:

- B. The minimum necessary for … hand carried boat launches, motorized boat launches, and the minimum necessary to operate them
- D. The minimum necessary for non-motorized boat landing areas

More than 20 feet landward of the OHM, other site uses are permitted. The following specific additional uses are allowed:

- … bath houses, concession stands, pavilions… and the minimum necessary to access them.

New portions of each of the proposed site options reside at least 20 feet back from the OHM, to qualify for the more open set of requirements for that portion of the setback. However the designation of what is "the minimum necessary to operate" is up to interpretation which may provide an avenue for locating portions of the proposed structures closer to the OHM.

STANDARDS FOR USES IN PUBLIC FACILITIES (23.60A.207)

Public facilities are subject to the same development standards as the most similar allowed use designation within the applicable shoreline zone. City Council (with concurrence of Ecology) may also waive or modify applicable development standards for allowed uses for public uses.

The proposed project can be classified as a "major expansion" under section 23.60.207.C.1 and as such must comply with the applicable provisions associated with the proposed use (see above).

2.5.2 LAND USE CODE

Green Lake Park is entirely zoned SF5000. Criteria such as height limits, lot coverage, size and basic setback requirements are drawn from this section of the land use code, if they are more restrictive than the applicable shoreline code. A land use variance or conditional use permit may be required given the SF5000 underlying designation. However because this project is a continuation of the existing use, that is likely not to be a barrier to development.

2.5.3 ENVIRONMENTALLY CRITICAL AREAS

The project site lies within the boundary of two Environmentally Critical Area (ECA) overlays: Wildlife and Liquefaction. ECA review will be required as part of the land use permit application, and specifically identified in the SEPA application. The GLBC site is also adjacent to two other overlay areas, including an identified wetland, and former landfill. Proximity to these overlays will not require additional compliance measures. The site also lies far enough outside of the identified wetland to avoid a setback.

ECA administrative conditional use permits can be used to offset or mitigate requirements of specific ECA overlays. However, because the site also lies within the Shoreline District, an ECA administrative conditional use permit is not required.

2.5.4 BUILDING CODE

All new construction proposed for the site must comply with applicable provisions of the 2015 International Building Code (IBC) or the 2015 Seattle Existing Building Code (SEBC), both with Seattle Amendments. Depending on the scale of renovation, it is likely that the scope of the project will trigger a substantial alteration designation per SEBC 304.1.1, provision 2.

The building can be classified as mixed use building containing A-3, B and S-2 uses per Chapter 3 of the 2015 IBC. While the selected construction type is unknown, the building complies with the maximum area limitations per floor as a non-sprinklered building even as the least restrictive construction type (Type V - 6,000 sf).

A detailed review of the applicable building code provisions can be found in the Appendix.

2.5.5 STATE ENVIRONMENTAL POLICY ACT (SEPA)

Due to the size of the proposed project and presence of ECA overlays, a SEPA checklist and review will be required for the proposed project.

2.5.6 LEED

New construction and major renovations 5,000 square feet or greater must meet LEED Gold, as well as key performance requirements for energy and water efficiency, waste diversion and bicycle facilities. The Community Boathouse will be required to meet this standard.

The Green Lake Small Crafts Center is also interested in going beyond the baseline of LEED Gold which include the following desired performance goals:

- The building must 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;
- The building must 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;
- The building must achieve a 90% waste diversion rate for construction involving demolition and a 75% waste diversion rate for construction not involving demolition;
- Provide bicycle parking and changing/showering facilities appropriate to accommodate expected future demand.

This project will also complete the Ideal Green Parks checklist during the design phase.

3 NEEDS ANALYSIS

3.1 PROGRAM NEEDS

This section includes project goals, descriptions of the active organizations and programs, and analysis of the space types currently present and needed at the Center. Also included is the space allocation table which identifies the existing and proposed program.

3.1.1 PROJECT GOALS

The over arching goal of the Green Lake Community Boathouse project are:

- To provide a safe place for the rowing and paddling programs through improved accessibility, building and seismic code compliance and by providing basics service to ensure the safe and secure use of the facilities.
- To provide for increased demand for public rowing and paddling programs through more efficient and increased boat storage and improved instructional and meeting spaces.
- To allow the programs to expand to reach underserved populations and continue the legacy for "access for all" though more accessible facilities.

As the home of the primary public rowing club available on Seattle's north side, the Green Lake Small Craft Center provides a unique public benefit and access to rowing and paddle sports for both the novice and advanced. The existing facilities are limited and do not adequately serve the current programs in size or quality, which affects recruitment and retention for all the water-based organizations at the center.

Due to the projected demand, the programs at the center have identified growth upwards of 20 percent in terms of users, fleet, and fleet storage space. The current center simply cannot accommodate that growth. Incremental minor remodeling and filling to overcapacity have reached their limit. In its current condition, the facility does not provide the level of quality that is present at other similar city facilities and private boathouses. The poor quality of workout space and lack of changing facilities forces some activities off site, and discourages adult and youth participation and use.

The center also occupies an important physical position along the lake trail and adjacent to West Green Lake Way, and has the potential to help further connect everyday park users with both activities at the center and the lake itself. Increasing and enhancing public access to the lake and improving the park user experience through the renovation is another primary goal.

3.1.2 ORGANIZATIONS AT THE CENTER

There are three primary programs that operate within the Small Craft Center: Green Lake Crew, Seattle Canoe & Kayak Club and the Seattle Sailing Club. All three organizations are overseen

by the Associated Recreation Council (ARC). A Memorandum of Understanding (MOU) operating agreement between Seattle Parks and the ARC provides the structure for center management and operations. Seattle Parks maintains one full time and two part time employees at the site to oversee the coaching program and facility.

3.1.3 ROWING ADVISORY COUNCIL

The Rowing Advisory Council (RAC) is expressly organized to provide means and promote opportunities for the education of the public, with emphasis on youth in the Greater Seattle Area, with respect to the sport and skills of rowing. It does this by providing instruction and training of individuals for the purpose of developing and improving their capabilities and by educating the general community on topics related to rowing. The RAC oversees decisions regarding the budget, equipment purchases, race development and fund-raising.

3.1.4 CURRENT PROGRAMS

There are three active types of programs at the center, rowing, sailing, and canoe and kayaking. Rowing classes and programs include youth and adult programs in both sweep rowing and sculling. Green Lake Crew is the competitive team that operates from the center as part of the rowing program. The sailing programs include children, youth, and adult programs and boat rentals in the summer. The Canoe & Kayak program includes teaching, rental and private boat storage on site.

3.1.5 SPECIAL EVENTS

Annually, the Rowing Advisory Council (RAC) and Green Lake Crew host three major rowing regattas on Green Lake each year:

* Frostbite Regatta in November
* Green Lake Spring Regatta in April
* Summer Rowing Extravaganza in August

The Regattas are major park and community events, with approximately 1,200 active participants and spectators. They typically begin at 7:00 am and go until 6:30 p.m., with races every five minutes throughout the day. These events generate significant revenue generator for the RAC and the programs at the center.

Additionally, the SCKC hosts the annual TED Houk Regetta.

Each August, the Center also hosts the Summer Splash in partnership with the Pocock Rowing Foundation. This event raises funds for rowing youth outreach and scholarships for disadvantaged youth in the Northwest.

Also dDuring the summer, the Center, in partnership with other community centers and Boys and Girls Clubs, onoffers water youth camps.

Periodically, Green Lake has also hosted regional championship rowing regattas. In August 2006, Green Lake RAC hosted the US Rowing Masters National Championship Regatta, which included an estimated 2,000 competitors.

The GLSCC site is in the center of this activity, although most launching, etc. occurs off the pad and pier to the north, food, setup and some launching occurs at the pier between the Boathouse and Shellhouse. It is important for any proposed improvements to accommodate and enhance these and other events.

3.1.6 A TYPICAL DAY

Activity at the center varies by season and time-of-day. The stakeholder group described a typical day in each season:

SPRING & FALL USE

- 7 a.m.: Adult masters rowing with/ 15+ people (stretch, warm up, talk to coach, go out on small boats, leave for work without the ability to shower or change)
- Mid-day: Quiet, occasional use by individual rowers, private boats.
- 3:30 – 6:15 p.m.: Juniors rowing with 140 kids (kids arrive via carpool, bus or bike, stretch, boat, exercise)
- 6:30 – 8:30 p.m.: Masters evening program with 20+ people (stretch, warm up, talk to coach, row)

WINTER USE

- Same as spring and fall except:
- 3:30 – 6:15 p.m.: kids are sent to a local Cross Fit due to inadequate workout facilities at the current center.

SUMMER USE

- Same as spring/fall schedule with the addition of summer camps which add a significant amount of activity.
- Paddling camp activity

3.1.7 PROGRAM GROWTH

Building to accommodate current needs and program growth is a high priority for the RAC. The existing facilities are beyond their maximum capacity in terms of boat storage and amenity space for program support. The stakeholder group determined that all programs at the center should anticipate 20 percent growth in the near and medium term if improvements can be made to the center. This 20 percent metric was used to assign target values to fleet size, locker room needs and boat storage.

The facility should also accommodate potential for new programs not currently possible at the GLSCC. These may include:

- Adaptive Rowing for special populations and disabilities
- A true off-water training programs (e.g., Erg Ed).
- Expanded on-water activities (related to public use or access)
- An integrated outreach program that bring community and school groups out to the facility for learn-to-row programs and introductory training.

3.2 PROGRAM PRIORITIES

The stakeholder group identified the program priorities, i.e., elements of the program or new facilies that were most important to program success and retention of participants. The group identified the following high priority items:

SEPARATED CHANGING FACILITIES

- The current center has virtually no private changing facilities. Those who do change clothes do so in the public toilets or stand behind a screen in the ergometer room in the Aquatheater. Separated changing facilities (adults and youth) are a must for continued offering of youth programs, and to attract more adult masters classes and private boat users.

COACHES LOCKER ROOM / STORAGE

- Several of the comparable facilities included a separate coaches changing area / locker room for equipment storage and preparation prior to coaching on the water. This area is separate from master's program changing areas and locker room, and provides a prep and eating space for the coaching staff.

EXPANDED WORKOUT SPACE

Most rowing programs include a considerable off-water workout program. This is more heavily used in the winter months or during adverse rowing conditions. Providing a workout and locker room space to make GLSCC a true four season facility is a priority.

MORE WAKELESS LAUNCHES / DEDICATED BOATHOUSE SPACE

To support program growth, additional launches (beyond the two already in place) will be required. The current launching method for the coaching/safety boats is unsafe and inadequate (rowers have to manually launch the boats at the beginning of each practice, and they are stored in boat trailers inside the boathouse). Ideally this would be on-water launch storage space.

EXPANDED, MAXIMIZED BOAT STORAGE

Current facility is past capacity for canoes and shell storage. Additional boat storage is needed to grow existing programs and accommodate additional private boat space. The current Shellhouse storage arrangement is compromised somewhat due to the low ceiling heights (boats are stored only four high and oars are not vertical).

3.3 FUNCTIONAL PROGRAM

The following descriptions summarize the anticipated activities and goals for each of the individual program spaces identified by the stakeholder group and included in the feasibility study. The space types are divided into five broader categories based on use: Multipurpose room, Parks Office and Administrative, Boat Program Support, Boat Storage and Support Space.

Refer to the concept plans in the Appendix and block diagrams in the Alternatives section for diagrams showing the relative location and amount of each of the space types in each scheme.

3.3.1 MULTIPURPOSE ROOM PROGRAM

MULTIPURPOSE ROOM

- The Multipurpose Room is intended to be a flexible, multiuse space for public gathering and organized events. At some times, and in some schemes it may also function as additional workout or indoor ergometer space. Ideally the room has capacity for up to 150 people, is located on the first floor, includes AV, lighting and acoustical treatment appropriate to event use. The room may include an operable partition for subdivision.

KITCHEN

- A small catering kitchen off the multipurpose room to serve events. Heavy residential/very light commercial equipment; no grease duct/grills. Light catering use / warming ovens and dish washing capability only.

STORAGE ROOM

Dedicated storage to support multi-purpose room functions, including storage for 10-15 folding tables, 200 chairs.

3.3.2 PARKS ADMINISTRATIVE PROGRAM

PARKS OFFICE

The parks office contains administrative workstations for parks staff that operate the center. It should be centrally located, with good visibility of park activities. Occupants include an enclosed office for the program director, open plan workstations for 2-3 FTE employees, and a public service counter.

CONFERENCE ROOM

The parks office program includes a conference room for general use with seating for up to 12 people. Conference room should have AV, lighting and acoustical treatment appropriate to its use.

STORAGE

Storage room for parks and RAC use, including storage of safety equipment, regatta setup materials, office supplies. Should be collocated with the parks office function.

KITCHENETTE

The office should include a small coffee service kitchenette or counter for preparing food, re-heat and coffee.

3.3.3 BOAT PROGRAM SUPPORT

JUNIOR LOCKER ROOMS, SHOWERS, BATHROOMS

At the heart of the boat program support spaces are new locker rooms to serve the junior rowing program. Currently there is no dedicated changing space. Separate-sex facilities with 80-100 1/3 or 1/4 height lockers or cubbies each; access to private showers; toilets, sinks. Locker rooms should be adjacent to workout space if possible.

ADULT LOCKER ROOMS, SHOWERS, BATHROOMS

Dedicated, separate-sex adult locker rooms with 16-20 half height lockers each; 2 private showers; and access to sinks and toilet facilities. These will provide changing space primarily for the adult/masters program.

COACHES LOCKER/CHANGING ROOMS

A small locker room with 6-8 full height or half-height lockers for coaches use. Ideally would also include access to 1 private shower; toilet and sink.

COACHES OFFICE

Open plan office for use by coaches, assistants and voluenteers. Includes space for up to four touch down workstations and storage. This room can also be used for prep, informal meeting, and gear and food storage.

ERG + WORKOUT ROOM

Ergometers are used for training and off-water workouts and strength/technique training. This room is sized to accommodate up to 16 standard ERG machines and 2 kayak ergometers. Includes space for stretching and prep, circulation and observation by coaching staff. Mirrored walls are preferred, and good ventilation / air flow is needed. This room is ideally located adjacent to usable outdoor space for seasonal indoor-outdoor use.

WEIGHT ROOM

A dedicated weight room sized to accommodate up to 16 at a time with different weight stations and equipment. Room perimeter should include rack storage of free weight and other equipment. Should include a padded floor in lifting and exercise areas.

GLC STORAGE

Dedicated storage room for use by Green Lake Crew for cooking, food and other traveling equipment used when traveling to remote regattas.

3.3.4 BOAT STORAGE PROGRAM

SHELL STORAGE

Dedicated boat storage area for rowing shells. Sizes range from singles to eights, and fleet can be mixed in a single open space. Pre manufactured racks up to 5-high are acceptable to maximize space, with 9'-2" minimum clear between riggers of opposing boats for access. Clear ceiling height of 14' minimum.

Boat storage must be located on the ground floor with a clear path to setup and launching areas/ pier. The space must be secure but can be unconditioned. Contiguous or combined storage space for step stools (for accessing upper boats), oars, and a counter with charging stations for on-boat electronic devices is also required. Oars to be stored blade up on wall mounted racks.

REPAIR SHOP

Boat repair shop; with storage for tools and parts. Should be adjacent to boat storage, ideally this is a conditioned space. Heavy tools are not required.

SAILBOAT STORAGE

Permanent, year round storage space for sailboats, parts and gear. Can be an unconditioned space. Ideally boats can be stored with masts in and on hand-trailers for easy deployment. Currently boats are stored off site during the Winter months and open space becomes indoor workout area.

CANOE AND KAYAK STORAGE

Dedicated storage space for canoes and kayaks on manufactured racks. Length and width of boats varies, so racks should be adjustable. Includes storage for a mix of public (rental) and private boats. Additional space along walls for paddles, personal flotation devices and other gear owned by the Canoe & Kayak program.

LAUNCH HOUSE

Launch house includes in-water covered dock space for wakeless launches used for rowing support and lake safety/response. Must be securable overnight. Includes limited storage space and room for a fuel locker. The current Shellhouse has bays for two wakeless launches. To support the anticipated fleet size this must be expanded to up to six.

3.3.5 SUPPORT SPACES

MECHANICAL / ELECTRICAL ROOM

Dedicated mechanical/electrical room for HVAC equipment, electrical panels and service, fire riser and alarm panels. Requires access to outdoor equipment.

SEWAGE EJECTOR PUMP ROOM

Room to house the sewage ejector pump required to reach the sewer invert at Green Lake Way N.

GLCB RESTROOMS

Shared restroom facilities for use by the multipurpose room, coaches and parks offices, and adult and youth programs depending on proximity. Separate women's and men's facilities. Durable materials designated for moderate public use (tile floor and wet wall).

IDF ROOM / DATA CLOSET

Room to house server, head-end cabling, and IT/AV hardware.

PUBLIC RESTROOMS

Public separated-sex restrooms for public trail users. Designed for heavy public use with highly durable materials, fixtures and finishes. Match existing fixture count. Adjacent to the path and easily accessible and identifiable.

3.3.6 SITE PROGRAM

FLOATING PIER

Floating pier for hand-launching of shells and other boats. 70-feet minimum length for side launching of 8-person shells. Width adequate for launching on both sides simultaneously (approximately 10 feet wide) Ramp to accommodate water to grade difference and any fluctuation in lake levels, launching surface must be flat and level. Direct, easy access to shell storage is critical.

APRON / SETUP AREA

Flat area outside of Shellhouse for boat setup and rigging. Must be capable of accommodating a 8-person shell, and a full 180 degree turn (62 foot diameter minimum). Paved or structured non-slip surface.

FIRST-AID / ACTIVITY AREAS

A space must be identified for first aid and treatment in case of an emergency. This should be proximate to activity areas and the water. Currently this equipment is in the shared locker area, but could be part of the coaches' prep.

PARKING

Parking is managed on a park-wide basis and was not considered or evaluated as a part of this study.

3.4 SPACE ALLOCATION TABLE

The following table provides a summary of the programmatic spaces listed, along with a measured net square footage of each program component from the existing facility plan. A second column shows the proposed program area for that component based on concept layouts of each areas and discussions with the stakeholder group.

The table shows that if all of the desired areas in the program are accommodated, there must be a total of 17,670 assignable square feet (ASF) of program, which is a 64% increase.

3.4.1 SPACE ALLOCATION TABLE

Space Names	Existing Plan		Proposed Program			
			UNIT	ASF/UN	ASF	TOTAL
1. Multipurpose Room & Support						2,450
Meeting/Multi-Purpose Room (Cap 100)	0		1	1,750	1,750	
Kitchen	0		1	300	300	
Chair / Equipment Storage	0		1	400	400	
2. Parks Office		760				1,070
Open Office / Public Service Counter	240		1	390	390	
Office - Program Director	100		1	110	110	
Public Service Counter	0		1	120	120	
Meeting Room	310		1	200	200	
Storage	110		1	200	200	
Kitchenette	0		1	50	50	
3. Boat Program Support		2,530				4,550
Juniors - Locker Rooms, Showers, Bathrooms	410		2	375	750	
Coaches - lockers/changing area	0		2	120	240	
Coaches Offices	0		1	600	600	
Adult Locker Rooms	0		2	225	450	
Erg Room	1,085		1	1,200	1,200	
Weight Room	925		1	1,200	1,200	
GLRC Storage	110		1	110	110	
4. Boat Storage		6,995				8,500
Shell Storage	2,520		1	5,600	5,600	
Shell Storage - Aqua Theater	2,245					
Repair Shop / Tool Storage	235		1	250	250	
Scull Storage (private boats)	0		0	2,000	0	
Sailboat Storage	0		0	900	0	
Canoe and Kayak Storage	1,125		1	1,125	1,125	
Canoe and Kayak Storage - Aqua Theater	470					
Launch House	400		6	200	1,200	
Boat Maintenance/Cleaning	0		1	75	75	
Misc. Equipment Storage	0		1	250	250	
5. Shared Support Spaces		465				1,300
Mechanical (Ejector pump/spk)	85		1	150	150	
Data / IDF / Electrical	0		1	150	150	
ADA Restrooms	0		2	150	300	
Public Bathrooms (separate access)	380		2	250	500	
Total Assignable Area (ASF)	**10,750**					**17,670**
Existing Program in Aqua Theater	4,145					
Building Efficiency Factor (15%)	1,325	12%				2,651
Building Footprint	**12,075**					**20,321**

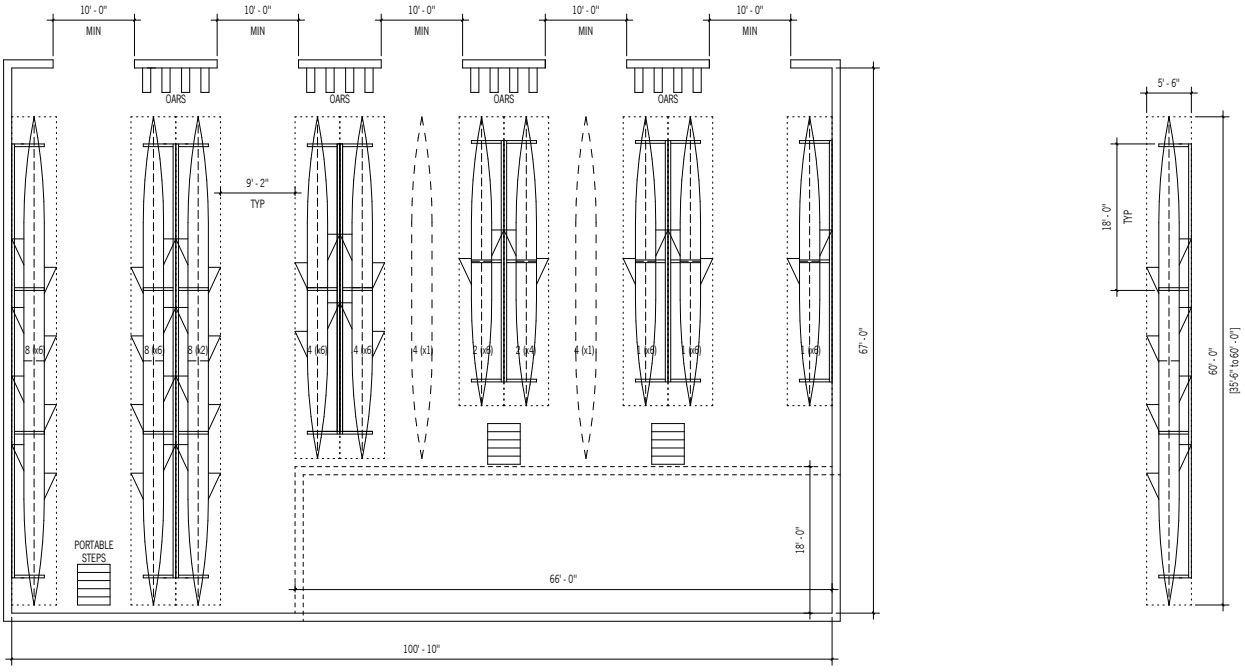


Figure 1 Shell Storage Diagram

3.5 FLEET GROWTH & STORAGE

Boat storage areas represent the largest single area share of the project program. The team visited several other facilities and worked with stakeholders to establish the preferred storage methods and program area required for this component. The following table and concept layout captures the anticipated fleet growth and a potential layout for boat storage areas.

The RAC anticipates up to a a 20% growth in the fleet size over the life of the new center. The group also provided an inventory of the current fleet (as noted below). In order to evaluate storage space need, an area per boat was established, and a circulation factor was applied based on a 9'-2" clear aisleway for accessing the shells. Racks are available as a manufactured product, and typically are used in either a 5-high or 6-high shell configuration. Both stack types were evaluated and the similar approaches were used for the canoe and kayak and sailboat program to estimate the required room footprints. To check the assumptions, a corresponding concept plan was also developed.

3.5.1 FLEET INVENTORY TABLE

Equipment Type	Current Fleet	Growth (20%)	Area per boat (SF)	2.5x Circ/ Stor Factor	6 Stack footprint	5 Stack footprint
8+ Shell	12	14	330	825	1980	2376
4+; 4+/4x; 4x- Shell	12	14	231	578	1386	1663
2x/2- Shell	8	10	195	488	780	936
1x; 1x Shell	15	18	195	488	1463	1755
				Total Shell Storage	**5609**	**6730**
Canoes/Kayaks	100	120		48	96	2304
				Total Canoe/Kayak Storage		**2304**
Sailboats	18	22		84	210	907
				Total Sailboat Storage		**907**
Rescue Boats	6	6		265	incl	1590
				Total Rescue Boat Storage		**1590**

Figure 3 – Conibear Shellhouse program diagram

3.6 COMPARABLE FACILITIES

- The study team and stakeholders toured four local comparable rowing centers:
  - Lake Washington Rowing Club
  - Conibear Shellhouse
  - Pocock Rowing Center
  - Mount Baker Rowing and Sailing Center

The following pages summarize the observations made by the group about each facility:

3.6.1 LAKE WASHINGTON ROWING CLUB

Lake Washington Rowing Club is located on the ship canal in Fremont directly east of the Aurora Bridge. This non-profit club has been part of Seattle since 1957 and the boathouse was completed in 1995. It focuses primarily on masters rowing, but is also open to any rowing level and hosts some student programs. Private boat storage is a major revenue generator.

What Works	What Doesn't Work
Variety of shell storage systems including numerous 6 tier storage racks and 2 tier truss suspended wood frames to maximize storage	Little designated indoor area for workout space, some space in shell storage
Outdoor turning and prep space is adequate	Locker rooms are located on the second floor
A designated boat repair area exists in the shell storage area, with boat building and major repair capability	Upper level finishes are beyond their useful life and dated, limiting rental use
Moveable partitions can divide the multipurpose room into two smaller spaces	Kitchen facilities are limited
	Boat repair area is unconditioned
	Launch requires crossing an active street
	Shared use of boat launch creates use challenges in the summertime with members of the public refusing to give way to boat launching, etc.

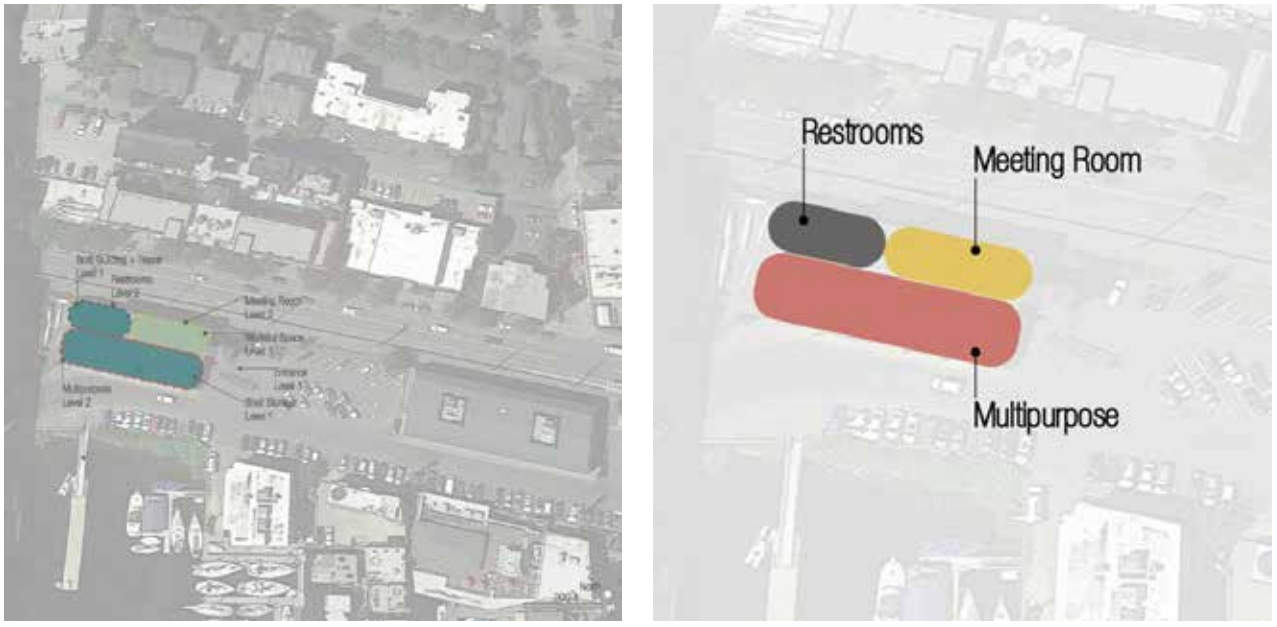


Figure 4 – Lake Washington Rowing and Sailing Center program diagram

3.6.2 CONIBEAR SHELLHOUSE

Conibear Shellhouse is situated on the University of Washington campus, along Union Bay. The original facility opened in 1949 and a new facility opened in 2005. The construction budget was raised by friends and alumni of the University of Washington. The original 1950 Shellhouse was 11,000 SF, and the current Shellhouse is 19,000 SF of total space dedicated to rowing. The shellhouse also includes a full kitchen and large dining area used by student athletes from all sports.

What Works	What Doesn't Work
Compact footprint with efficient flow and circulation	Wakeless launches are stacked or rotated to fit into the launch building
Clearly divided spaces as well as flexible use space between program areas for workout and storage	Individual offices for junior coaches
The building includes several lounge areas with opportunities for artifact display and donor recognition	
Multipurpose space allows for large events	
Rowing program circulation and space	
Efficient boat storage rack system and wall mounted oar storage	
Shell turnaround space (60' deep)	
Ideal sequence of lockers / workout / shell storage / launch on lower level. Windows and views out from the middle workout space make it a pleasant place to be/use	
Touchdown areas for coaches	

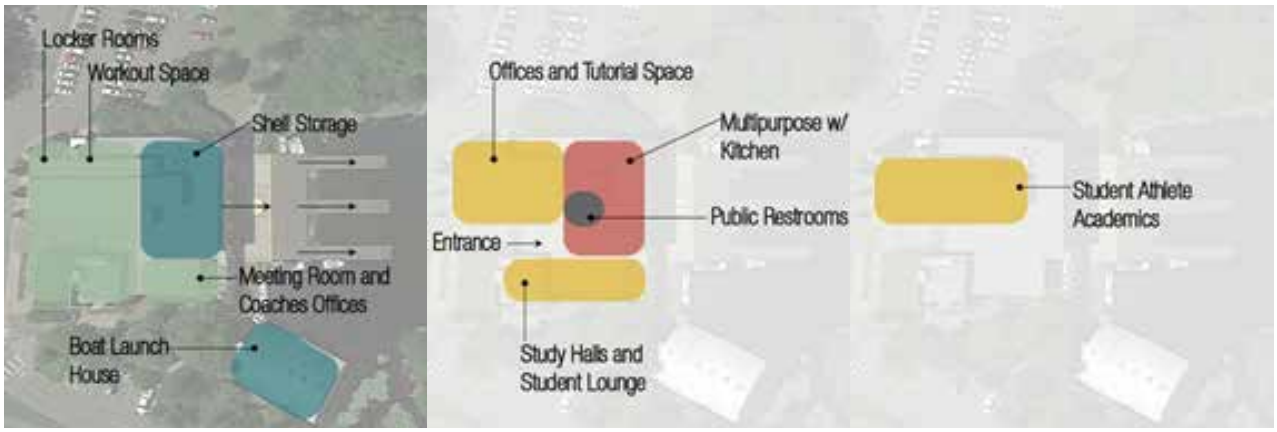


Figure 5 – Conibear Shellhouse program diagram

3.6.3 POCOCK ROWING CENTER

Pocock Rowing Center is located between Eastlake and Portage Bay, near the University Bridge. It focuses solely on rowing, and includes adult, high school, middle school and collegiate programs. The center operates out of the bottom two floors of a three story building. The upper floor is rentable office space.

What Works	What Doesn't Work
Conference room centrally located for group use	Shell turn around space is very constrained by adjacent buildings, which limits the boat length in the eastern portion of the building
Office spaces and prep area for coaching staff with kitchen and gear storage are laid out well	Limited airflow in workout room
Locker rooms have a good number of securable masters lockers	Boat storage is very tight
Lots of space for ergs, including sliding ergs	Not having an enclosed boat house for wakeless boats is a major theft challenge
Shell stacking storage and portable racks	Mixed ages in locker rooms is not acceptable
Numerous wakeless launches available	The event space was converted to a workout room after being unused.
	Coaches areas are not on the same floor as the launching areas

Figure 6 – Pocock Rowing Center program diagram

3.6.4 MOUNT BAKER ROWING AND SAILING CENTER

Mount Baker Rowing and Sailing Center (MBRSC) is located along the southwest edge of Lake Washington. As a Seattle Parks and Recreation facility, MBRSC has been serving the boating community for thirty years. Its programs are co-sponsored by the Mount Baker Boating Advisory Council, a 501(c) 3 nonprofit organization. It facilitates a variety of boating activities such as sailing, paddling, kayaking, and rowing, and includes a multipurpose event space.

What Works	What Doesn't Work
Adequate parking and location	The rental space is too small to host 100+ attendee events which limits use
Multipurpose balcony spill out space allows for larger events	Shell storage is tight and spills into and displaces the workout space
Support kitchen for Multipurpose space is adequate for events	Lack of segregated space for payment workstation per City's PCI standards
Locker rooms and expanded office space additions support the program well	Some security and oversight challenges are created by the multi-building campus
Sailboat storage is easily accessible and allows dome boats to remain rigged	Mixed ages in locker rooms is not acceptable
One-person operated boat launch crane	The event space was converted to a workout room after being unused.
	Coaches areas are not on the same floor as the launching areas

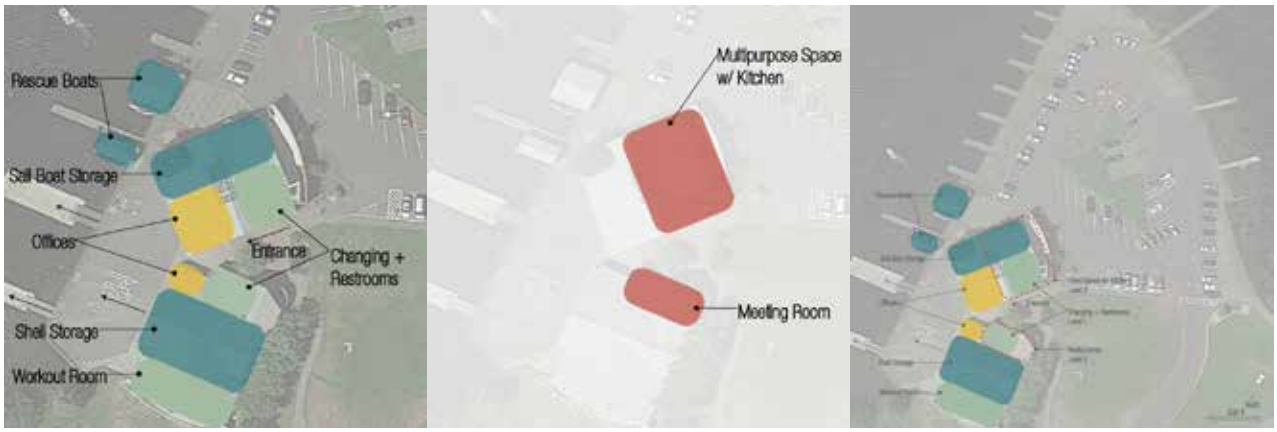


Figure 7 – Mount Baker Rowing Center program diagram

4 ALTERNATIVES ANALYSIS

This section includes concept plans developed with the stakeholders representing three possible approaches to the site improvements onthe selected site. also included is a discussion and analysis of schedule and budget.

4.1 DEVELOPMENT OPTIONS

Several site development options were developed with the stakeholder group to evaluate how much of the desired program could fit on the site. From these options three potential approaches to the site development emerged as described below. Each approach corresponds with a target cost, ranging from small (renovation and minor addition) to large (complete replacement of the boathouse with a new program building).

A maximum construction cost target of $3,700,000 was also established based on the anticipated fundraising capacity of the organization, and total Project Cost. Each of the options was adjusted in order to stay below this target value. As a result, none of the three options achieves all of the desired program area. However, each represents a realistic approach to the site development and budget, in a manner that maximizes the priority program areas.

Each option was evaluated by the consultant team, and an initial cost estimate was developed. Option C was selected by the stakeholder group for further development into a test-to-fit plan. A more detailed set of test-to-fit plans and cost estimate can be found in the Appendix.

COMMON ELEMENTS

Through the course of developing options with the stakeholders, several common themes or requirements emerged that apply to all options.

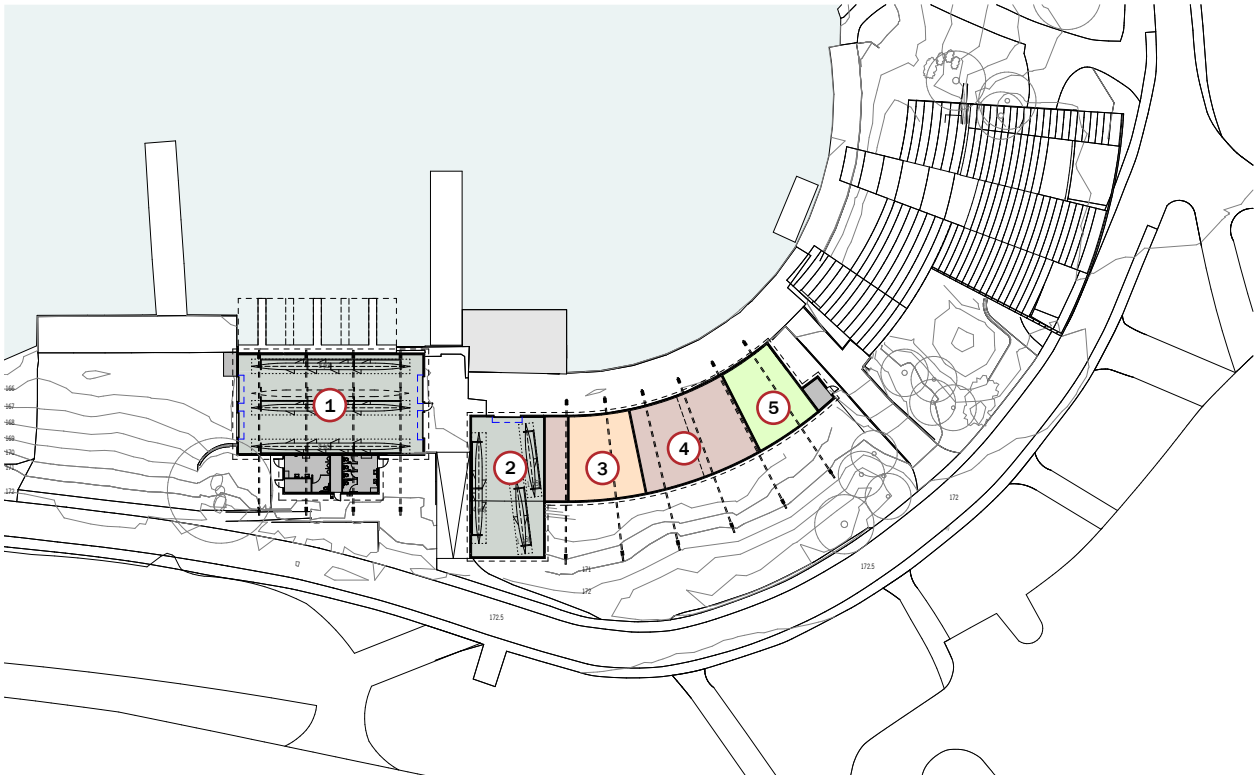
- Aqua Theater must remain but will not be renovated
- The existing park trail must remain in its current configuration and location
- Docks and piers can be modified, and costs for replacement are carried outside of the core project costs.
- Wakeless launch storage will be developed at a later date as a standalone project and costs are carried outside of the core project costs.
- Stormwater mitigation will be accomplished through off-site or equivalent improvements elsewhere in the drainage basin (no pumping or structured detention on-site)
- The Shellhouse building is retained due to the recent investment in seismic upgrades.
- Temporary storage and operations during construction are not included in the construction cost and are handled elsewhere.

4.2 OPTION A - RENOVATION / MINOR ADDITION

Option A prioritizes retention of the existing buildings and dock work to the greatest extent possible to minimize cost and site disturbance. A 1,500 sf addition is added onto the existing boathouse building on the north end to provide limited shell storage expansion. Program functions are removed from the Aqua Theater building, leaving only storage functions.

KEY CONCEPTS

- The entire Boathouse building interior is renovated and reconfigured in this scheme to provide space for a coach's office, parks office, locker rooms and workout space.
- The addition and scale of renovation will trigger a substantial alteration designation, which will require upgrades to the existing structure, envelope and mechanical systems.
- Additional in-water launch bays are added to the existing Shellhouse building and fuel storage is modified to allow storage of 8's along the west wall of the building.
- Existing park restrooms are renovated and exterior finishes of both buildings are improved.
- Aqua Theater and Shellhouse are retained.
- The Shellhouse program remains the same with minimal change.



KEY PRIMARY ADVANTAGES

1 SHELL STORAGE ıtion of the existing Boathouse minimizes cost and site disturbance

Figure 1 Option A – Boathouse Building Renovation and Shell Storage Addition

- Buffer landscaping to Green Lake walking path is maintained
- Re-configuration of building interior provides greater flexibility and efficiency for program use
- Dedicated locker room space is provided (high priority)
- Increase in shell storage / flexible space

PRIMARY DISADVANTAGES

- Substantial Alteration requires upgrade to existing structure and may require assessment and improvements to existing timber pile caps and connections.
- Minimal increase in overall useable square footage
- Minimal room for expansion
- Kayak and canoe storage is located in the Aqua Theater
- Addition footprint limits use of the shared apron space between the Boathouse and Shellhouse for 8's due to space constraints
- Shellhouse height limits shell storage capacity

BUILDING SYSTEMS

- The Shellhouse will remain unconditioned, the Boathouse will require mechanical ventilation and conditioning via a rooftop heat pump.
- No fire sprinklers are proposed. A fire alarm system will be added to all buildings per code.

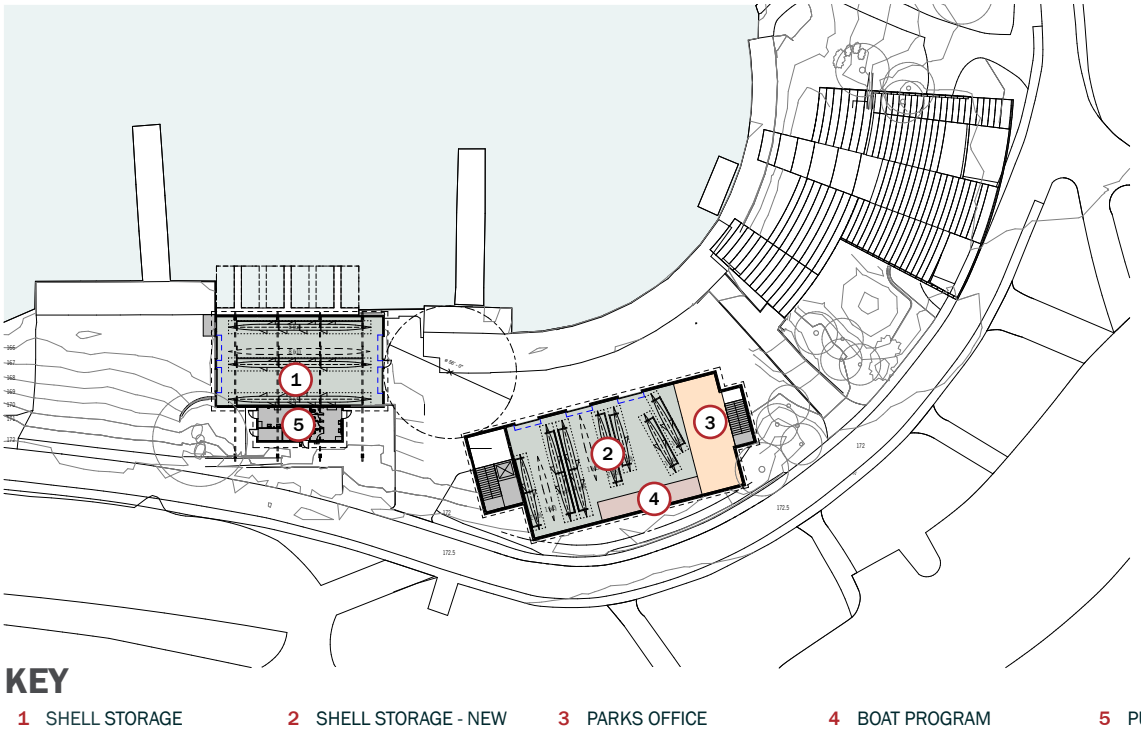


Figure 2 Option B - Split Boat Storage / Program Building – Level 1

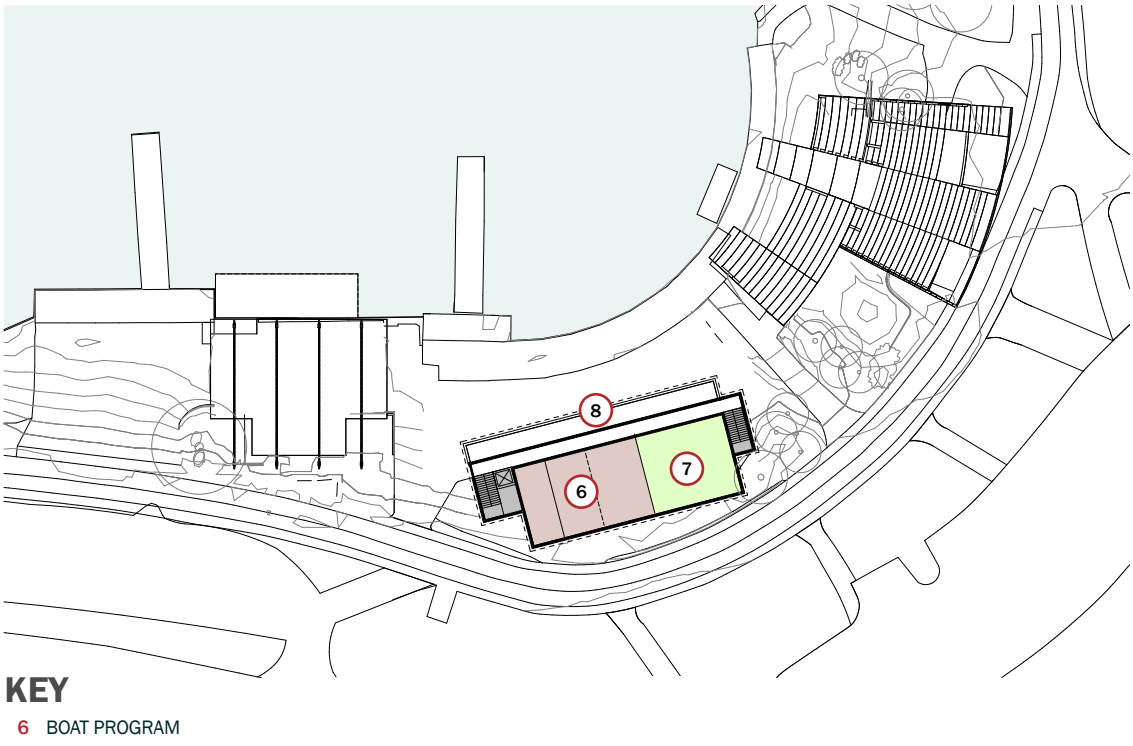


Figure 3 Option B - Split Boat Storage / Program Building – Level 2

4.3 OPTION B –NEW PROGRAM BUILDING / SPLIT BOAT STORAGE

Option B includes the demolition of the existing Boathouse building and replacement with a new two-story program and boat storage building. This replacement building is set back from the water's edge providing adequate space for maneuvering to reach the existing pier. The lower level of the new building houses additional shell storage, and parks office space along with the service counter adjacent to the park trail. The upper level contains program space for coaches, locker rooms and multipurpose and workout space. Shell storage is split between the two buildings, depending on boat length. The scope of work at the Shellhouse and storage-only uses in the Aqua Theater are both similar to those in Option A.

KEY CONCEPTS

- Demolition of the Boathouse building allows for a larger open space adjacent to the water for program and public use
- Program spaces are not limited by existing building floor to floor heights and building geometry
- Interior program spaces are consolidated on the upper floor adjacent to flexible use space
- Existing shell storage is maintained in Shellhouse and fleet growth is accommodated in new building

PRIMARY ADVANTAGES

- New building construction allows for industry standard boat storage and a more efficient floor to floor height
- Multipurpose / workout room is located on the upper level providing views, overflow space to the adjacent balcony to maximize rental potential and uses
- Provides additional shell storage area for future growth and entire existing fleet
- Dedicated locker room space is provided (high priority)
- Compact footprint of the program building provides additional outdoor space for public and program use
- Structure is independent of existing timber pilings of unknown capacity (minimizes risk)

PRIMARY DISADVANTAGES

- Shell storage and program spaces are located on the same floor which requires higher floor-to-floor than needed and building systems/envelope on both levels
- Building is placed immediately adjacent to the walking path

BUILDING SYSTEMS

- Building conditioning and ventilation provided by split system heat pumps with airside economizer
- No fire sprinklers will be provided
- Building structure is heavy timber with glulam primary frame and wood decking
- A mat foundation is proposed to mitigate liquefaction risks

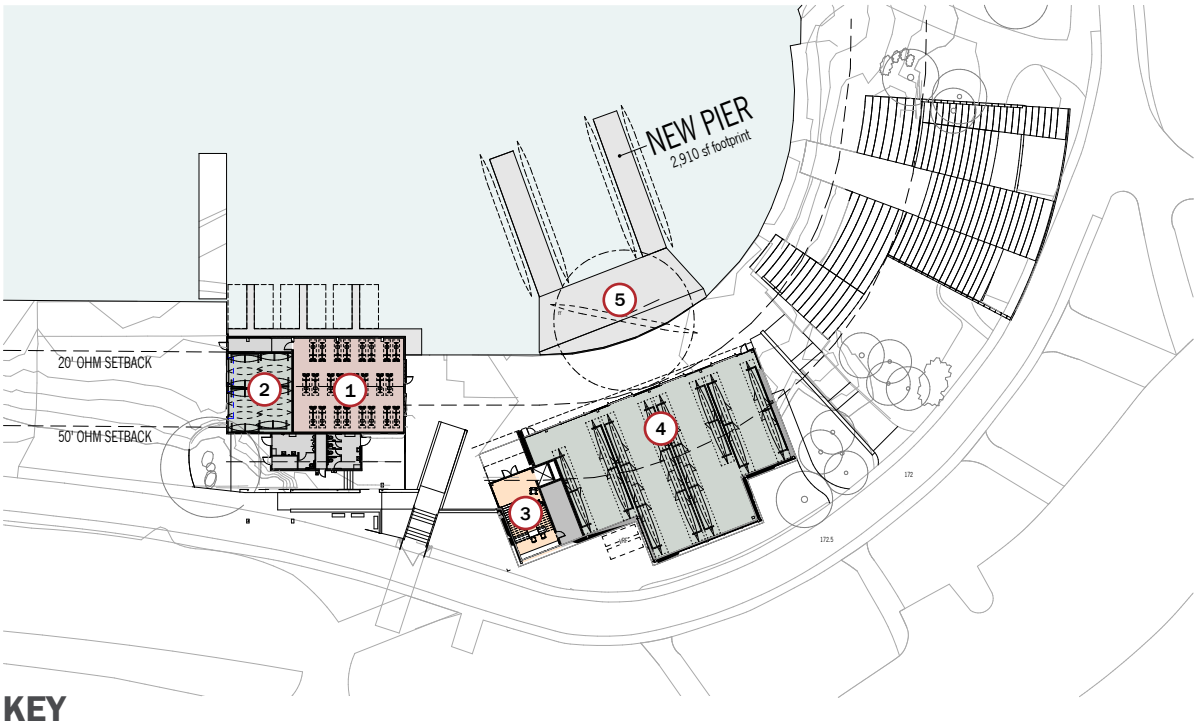


Figure 4 Option C - New Program Building – Level 1

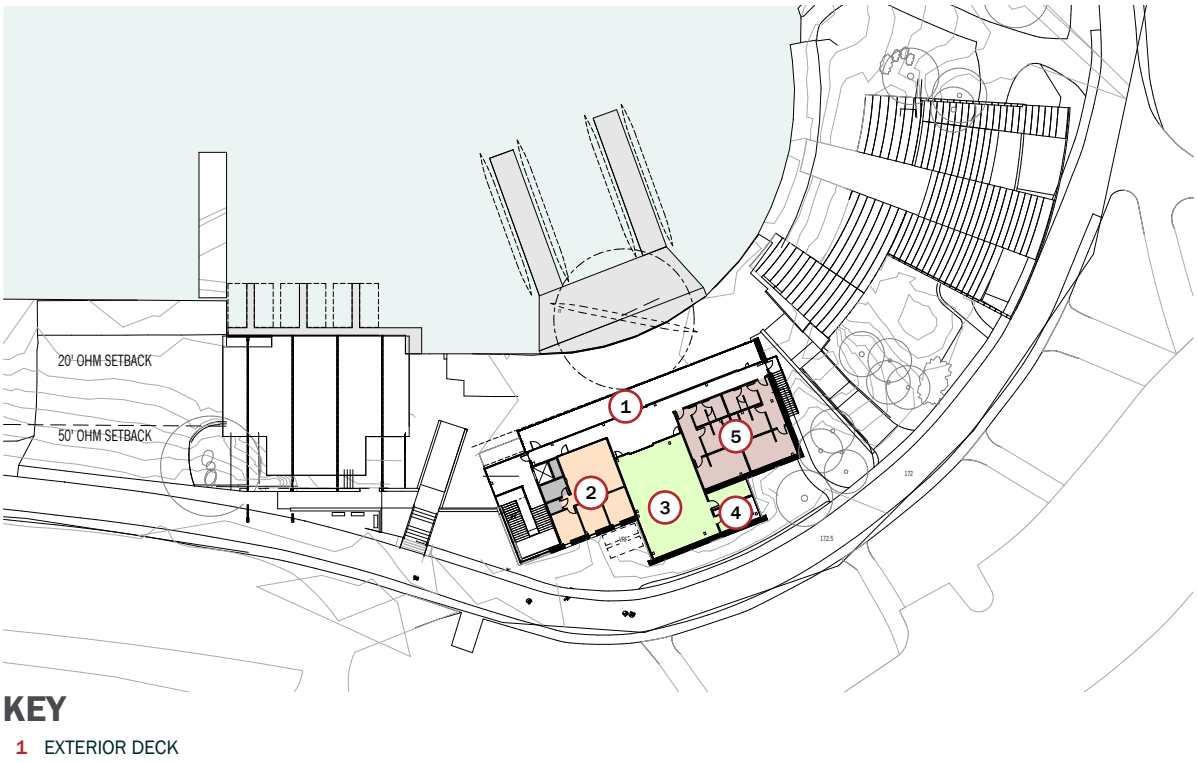


Figure 5 Option C - New Program Building – Level 2

4.4 OPTION C – NEW BOATHOUSE & PROGRAM BUILDING / REPURPOSE SHELLHOUSE

Option C proposes replacement of the Boathouse with a new program building. This new program building footprint is large enough to accommodate all boat lengths, including 8's in a dedicated boat storage area on the ground floor. This boat storage area is minimally enclosed and conditioned to reduce cost and consolidate system and envelope to the upper floor. The upper floor contains parks and coaches' offices, a multipurpose room, and dedicated adult and youth locker rooms. A new double pier and apron allows access to the water directly from the boat bays in the new program building.

The new shell storage is large enough to accommodate the entire fleet with proposed expansion. As a result the existing Shellhouse in this scheme can be repurposed as a workout/erg room and kayak program boat storage, both of which are more appropriate to the building height and location. Uses in the Aqua Theater are reduced or eliminated depending on the needs of the sailing program and RAC program storage.

KEY CONCEPTS

- Consolidation of shell storage entirely to the new building allows for optimization of storage efficiency and shared boat resources.
- Repurposing of Shellhouse as a program building is well located and makes better use of existing building
- Reduces or eliminate program areas in the Aqua Theater
- A new lobby function and public service desk is located on the first floor, and oriented to engage with the park trail
- Lower floor boat storage will be minimally conditioned (exhaust only) and may be open air to reduce envelope costs.

PRIMARY ADVANTAGES

- Shellhouse workout room is ideally located for off-water activities
- Larger pier increases launch capacity for regattas and program use
- Direct access to pier from boathouse is ideal configuration
- Larger footprint provides more program space in upper floor
- Upper floor uses share amenity spaces and views
- Space provided for canoe and kayak program
- Lobby element interfaces visually with the park trail,
- Increased visual and accessible public access to water and pier

PRIMARY DISADVANTAGES

- Parks office is located on the second floor, and separated from the public service counter
- Building is placed immediately adjacent to the walking path

- Cost

BUILDING SYSTEMS

- Building conditioning and ventilation provided by split system heat pumps with airside economizer
- No fire sprinklers will be provided
- Building structure is heavy timber with glulam primary frame and wood decking
- A mat foundation is proposed to mitigate liquefaction risks
- Existing timber pilings will be abandoned in place

4.5 PROGRAM COMPARISON

The following table compares the Assignable Square Footage (ASF) of each option, and the existing and target program from the Needs Analysis. For option A & B, only the program block diagrams were used to develop the assigned areas. For Option C, the test-to-fit plan was used. A detailed program table for Option C can be found in the Appendix.

The Existing program area column includes the 4,145 sf of existing program area currently inside the Aqua Theater as those areas are now in active use. The program areas shown for Option A, B & C do NOT include any available program block area inside the Aqua Theater due to the deteriorated condition of the structure. As a result Options B & C represent significant increases in program area available outside of the Aqua Theater.

PROGRAM COMPARISON TABLE

Program Area	Existing	Proposed Program (from Needs Analysis)	Option A	Option B	Option C
Multipurpose Room & Support	0	2,450	740	1,260	1,480
Parks Office	760	1,070	820	880	1,180
Boat Program Support	2,530	4,550	1,590	2,110	2,390
Boat Storage	6,995	8,500	5,420	7,130	6,970
Shared Support Spaces	465	1,100	495	695	1,080
Aqua Theater (unassigned)	Incl. above	0	0	0	0
Total (ASF)	***10,750**	**17,760**	**9,065**	**12,075**	**13,100**

** 6,605 sf in existing Boathouse and Shellhouse*

5 COST & SCHEDULE

5.1 PROJECT COSTS

5.1.1 CONSTRUCTION COST

A initial construction cost estimate was generated for each of the program options based on the conceptual block diagrams and a narrative description developed by the design team. This initial round of cost estimating involved input from both the consultant team and estimator to identify and assign reasonable cost-per-square-foot values for each of the primary new construction or renovation areas.

Option C was selected for further development by the stakeholder group once this first round of program planning and estimating was completed. A set of test-to-fit plans, elevations, and a massing model were then developed for this option. This expanded set of documents was then re-evaluated and a more detailed cost estimate for Option C was developed.

A detailed cost estimate for Options A, B and C can be found in the Appendix.

5.1.2 CONTINGENCY

Each of the construction cost estimates includes a design contingency based on the level of development of the documentation and to account for unknown conditions that may affect the project scope as the project is developed in the design phase. For Options A and B, which were developed to a lesser extent, the design contingency was set to 20%. The design contingency for Option C, which was developed in greater details, was set to 15%.

In addition to the design contingencies described above, a separate construction contingency is included in the project budget to account for unknown or latent conditions encountered during construction. If desired, an additional project contingency can also be applied to manage fluctuation in soft costs or owner-initiated scope changes.

5.1.3 PROJECT BUDGET

A conceptual project budget was generated by the RAC to begin to establish an overall project cost model. This project budget is based on the Parks Department budget template, and includes soft and hard costs for the project that are in addition to the construction cost. Items include design fees, permitting costs, geotechnical and survey costs, project management, project contingency, and Washington State sales tax. The total estimated project budget for a $3,600,000 construction cost is $6,000,062 A copy of the Project Budget is included in the Appendix.

5.1.4 ESCALATION

Each of the construction cost estimates have been developed using today's construction unit costs. Once a construction start date is established, these costs should have an escalation factor applied to escalate them to the anticipated mid-point of construction to account for market conditions. The anticipated construction duration for a project of this size is 9 months.

5.1.5 COST COMPARISON

OPTON A

Option A	Gross Area	$/SF	Cost
Shellhouse Renovation	3,310 sf	$ 80/sf	$264,800
Boathouse Renovation	3,475 sf	$ 241/sf	$837,475
Boathouse Addition	1,535 sf	$ 311/sf	$477,385
Sitework			$200,000
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option A			**$1,778,385**

OPTION B

Option B	Gross Area	$/SF	Cost
Shellhouse Renovation	3,310 sf	$ 80/sf	$264,800
New Boathouse	9,245 sf	$ 298/sf	$2,759,930
Sitework			$200,000
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option B			**$3,224,730**

OPTION C

Option C	Gross Area	$/SF	Cost
Shellhouse Renovation / Restrooms	3,310 sf	$ 40/sf	$131,654
New Boathouse			
Boat Storage (Level 1)	5,313 sf	$173/sf	$920,404
Program Areas (Level 2)	5,448 sf	$393/sf	$2,142,536
Sitework			$279,325
Launch Enclosure & Piers (Excluded)			0
Total Construction Cost – Option C			**$3,529,626**

Note: Option C was developed further to a test-to-fit level floor plan. A corresponding uniformat estimate was then completed to correspond with the test-to-fit plan and elevation concepts. A copy of the detailed estimate can be found in the Appendix.

Task Name	Duration	Start	Finish
Feasiblity Studies	**265 days**	**Mon 1/16/17**	**Fri 1/19/18**
Feasibilty Design	**215 days**	**Mon 1/16/17**	**Fri 11/10/17**
Capital Campaign Study	**200 days**	**Sat 4/15/17**	**Fri 1/19/18**
Business Plan	**166 days**	**Mon 4/17/17**	**Mon 12/4/17**
Capital Campaign	**440 days**	**Mon 12/25/17**	**Fri 8/30/19**
Quiet Phase	80 days	Mon 12/25/17	Fri 4/13/18
Leadership Gifts Phase	120 days	Mon 4/16/18	Fri 9/28/18
Major Gift Phase	120 days	Mon 10/1/18	Fri 3/15/19
Public Phase	120 days	Mon 3/18/19	Fri 8/30/19
Major Grant Applications	**360 days**	**Fri 9/1/17**	**Thu 1/17/19**
Design	**405 days**	**Mon 1/8/18**	**Fri 7/26/19**
Issue RFQ/RFP	20 days	Mon 1/8/18	Fri 2/2/18
Selection	15 days	Mon 2/5/18	Fri 2/23/18
Contracting	30 days	Mon 2/26/18	Fri 4/6/18
Concept Design	**40 days**	**Mon 4/9/18**	**Fri 6/1/18**
Concept Design	30 days	Mon 4/9/18	Fri 5/18/18
Public Review	0 days	Fri 5/18/18	Fri 5/18/18
Review, Approval and Budget Refinement	10 days	Mon 5/21/18	Fri 6/1/18
Schematic Design	100 days	Mon 6/4/18	Fri 10/19/18
Design Development	80 days	Mon 10/22/18	Fri 2/8/19
Permit Documents	45 days	Mon 2/11/19	Fri 4/12/19
Construction Documents	90 days	Mon 2/11/19	Fri 6/14/19
Bidding	30 days	Mon 6/17/19	Fri 7/26/19
Permits	**305 days**	**Mon 7/30/18**	**Fri 9/27/19**
Shoreline Substantial Development Permit	180 days	Mon 7/30/18	Fri 4/5/19
Demolition Permit	120 days	Mon 4/15/19	Fri 9/27/19
Grading and Drainage Permit	120 days	Mon 4/15/19	Fri 9/27/19
Building Permit	120 days	Mon 4/15/19	Fri 9/27/19
Construction	**175 days**	**Mon 9/30/19**	**Fri 5/29/20**
Mobilize	10 days	Mon 9/30/19	Fri 10/11/19
Demolition	20 days	Mon 10/14/19	Fri 11/8/19
Foundations	30 days	Mon 11/11/19	Fri 12/20/19
Structure	40 days	Mon 12/23/19	Fri 2/14/20
Enclosure	30 days	Mon 2/17/20	Fri 3/27/20
Finishes	45 days	Mon 3/30/20	Fri 5/29/20
Complete	0 days	Fri 5/29/20	Fri 5/29/20

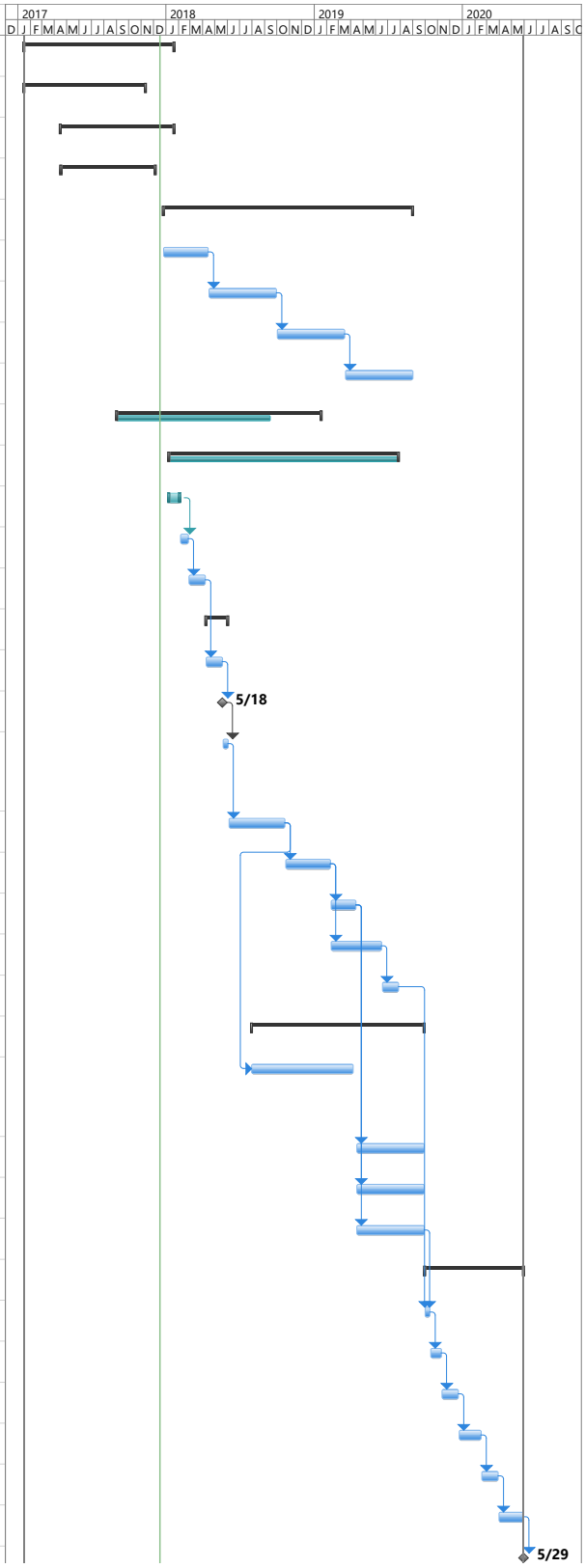


Figure 1 Detailed Project Schedule

5.2 PROJECT SCHEDULE

5.2.1 PROJECT SCHEDULE

The project schedule was developed in conjunction with the stakeholder group, RAC and Parks department. The project schedule assumes a design-bid-building process, and public bid procurement. It includes a four phase design process including Concept Design, Schematic, Design Development and Construction Documents phases, a bid period and approximately nine-month construction duration including demolition.

SCHEDULE MILESTONES

	Start	Finish
Feasibility Studies	Jan 2017	Jan 2018
Capital Campaign	Dec 2017	Aug 2019
Major Grant Applications	Sep 2017	Jan 2019
Design / Bidding	Jan 2018	Jul 2019
Permitting	Jul 2018	Sep 2019
Construction	Sep 2019	May 2020
Grand Opening		May 29, 2020

Permitting for the project includes an initial Shoreline Substantial Development Permit and a SEPA review process, in addition to typical grading, demolition and building permits. Submittals for the Shoreline permit and SEPA submittal would be generated during the Concept and Schematic Design phases. Building permit reviews and intakes are running significantly longer than typical given the volume of applications. As a result the permit documents will be developed during the Construction Documents phase to expedite submittal.

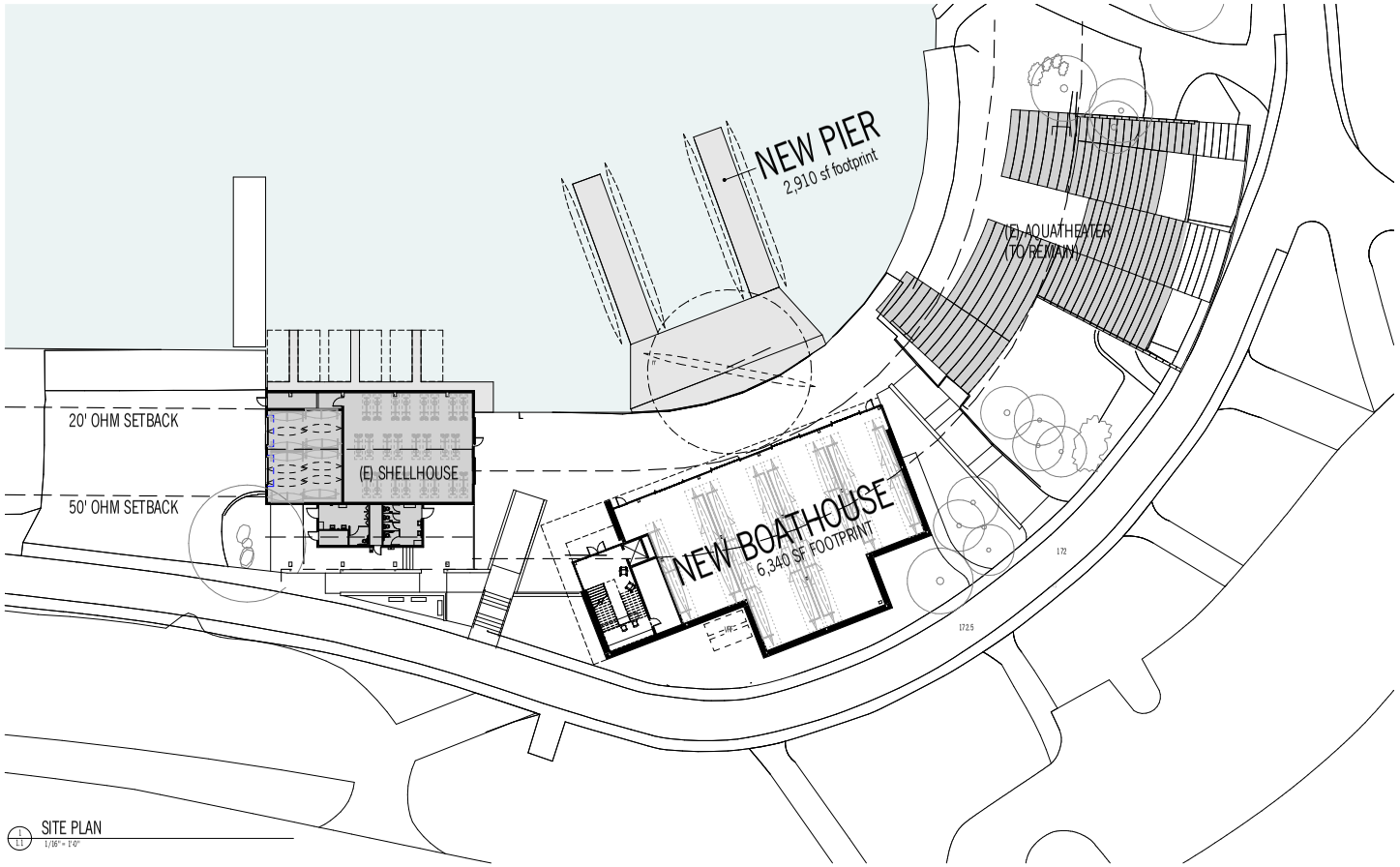
5.2.2 PUBLIC OUTREACH

Because the site occupies a prominent position within one of Seattle's most active and popular park lands, the public outreach process will be critically important to the overall success of the project. Early engagement to specifically interested parties, such as Friend of Green Lake and Friends of Seattle's Olmstead Parks is recommended. Creating opportunities for public comments early in the process to influence the design will be an important part of any public outreach plan developed for the project.

While the center currently provides limited public access to the waterfront, an emphasis on a site and landscape design that improves and enhances that public access is an important part of code compliance and public perception. Other improvements to the restrooms, paths and piers that are outside of the program requirements can also be highlighted. The unique nature of this program at the lake and potential for increased participation with the proposed program improvements is another feature. Finally, the addition of a multipurpose room for public use along the south end of the lake can be presented as a new complimentary amenity to all the other offerings already around the lake.

6 APPENDIX

6.1 OPTION C TEST-TO-FIT DRAWINGS

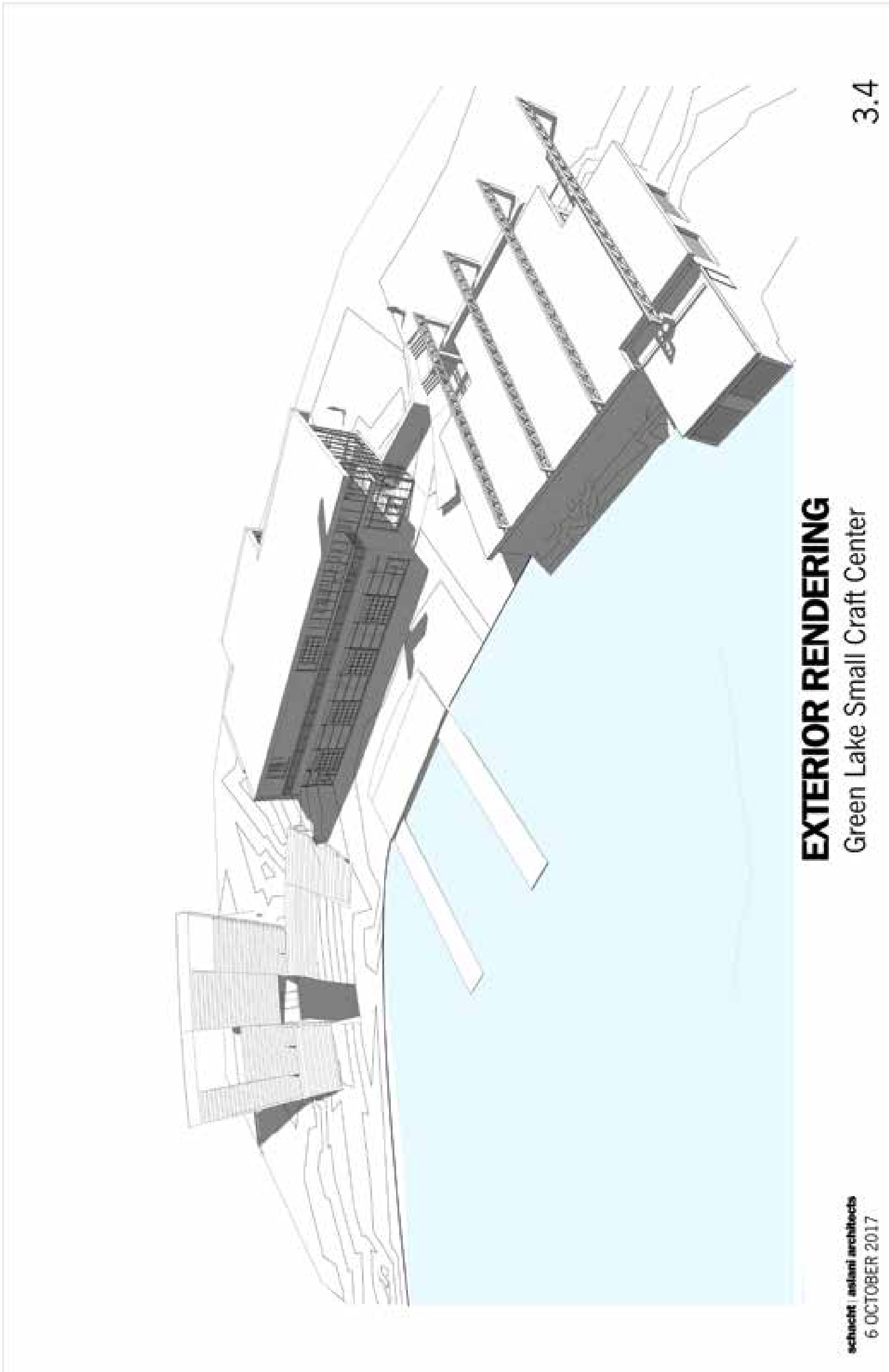


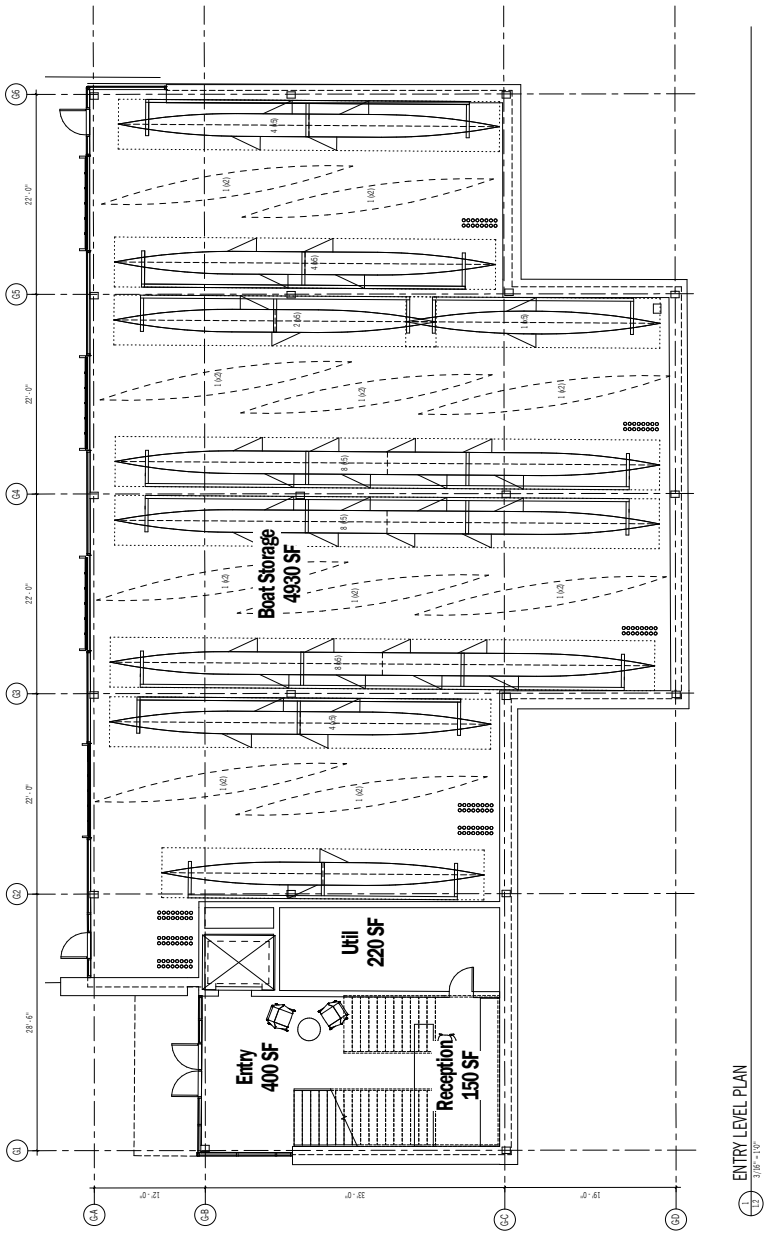
SITE PLAN

Green Lake Small Craft Center

schacht | aslani architects
6 OCTOBER 2017

1.1


3.4
EXTERIOR RENDERING
Green Lake Small Craft Center
schacht | aslani architects
6 OCTOBER 2017

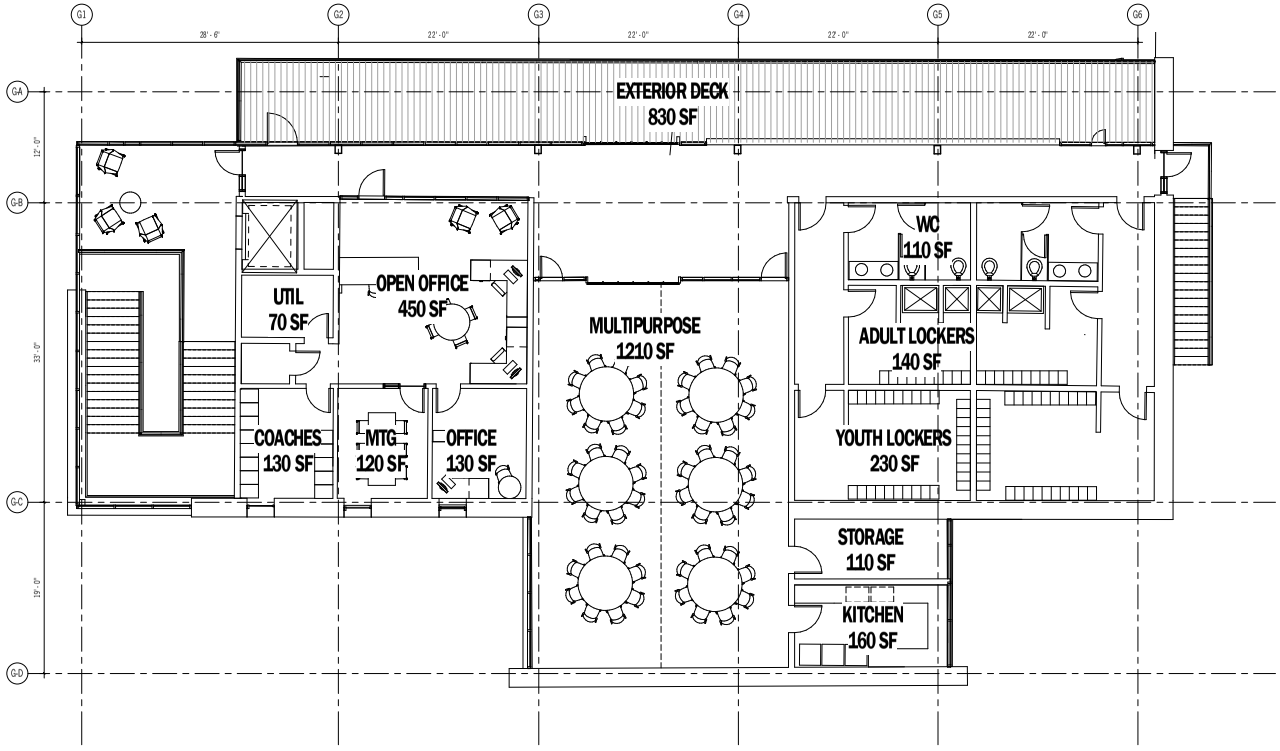


ENTRY LEVEL PLAN

Green Lake Small Craft Center

1.2

schacht | aslani architects
6 OCTOBER 2017

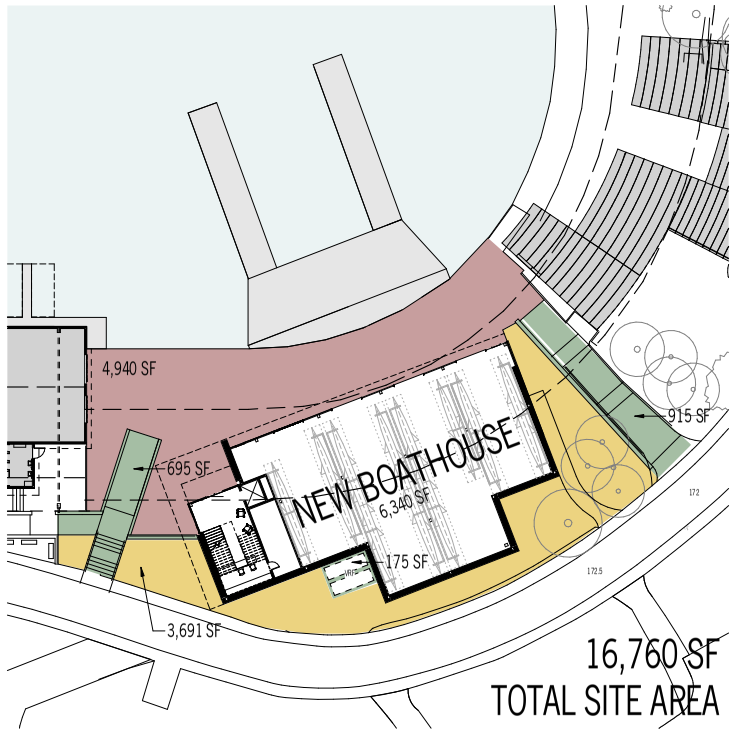


UPPER LEVEL PLAN

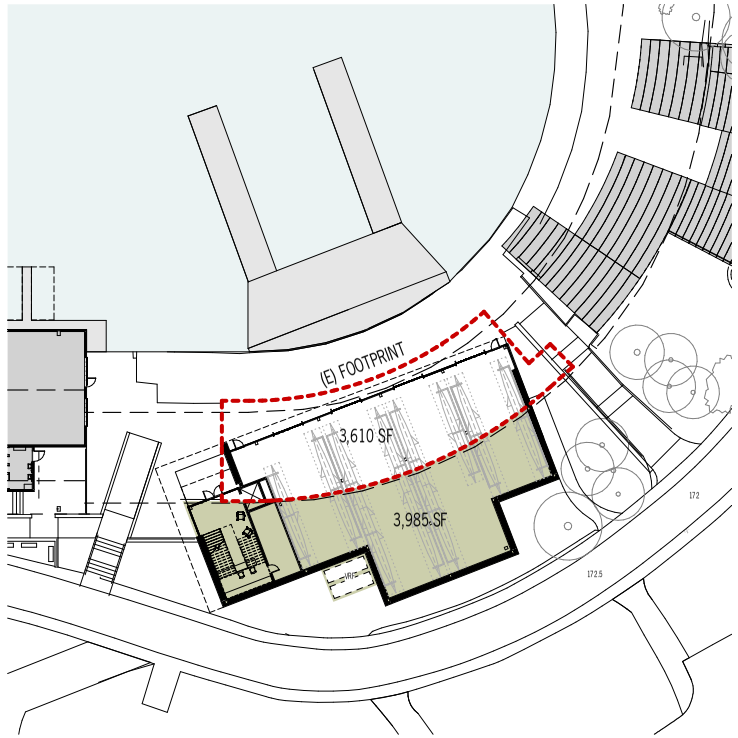
Green Lake Small Craft Center

1.3

schacht | aslani architects
6 OCTOBER 2017



SITE PLAN - SITE AREAS



SITE PLAN - FOOTRINT EXPANSION

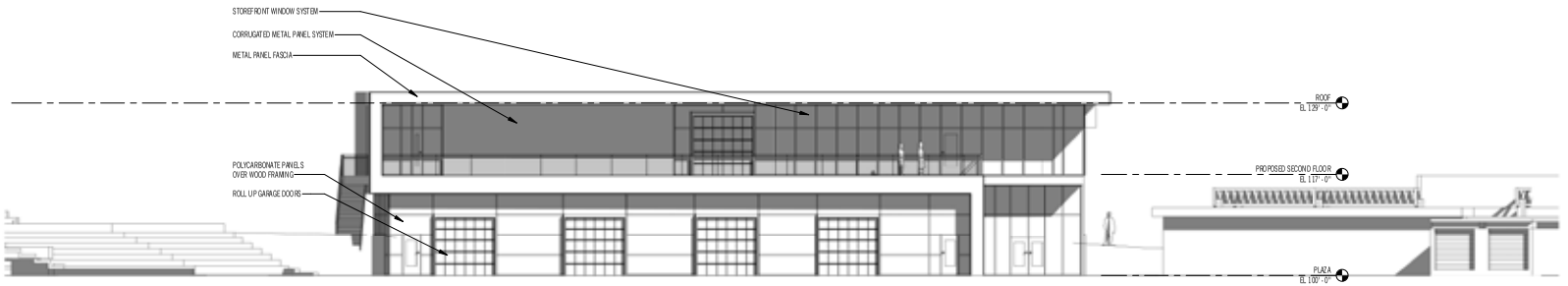
SITE AREA ANALYSIS

Green Lake Small Craft Center

schacht | aslani architects
10/20/17

1.4

2 / 3.1 OPTION C - PATH ELEV
1/8" = 1'-0"



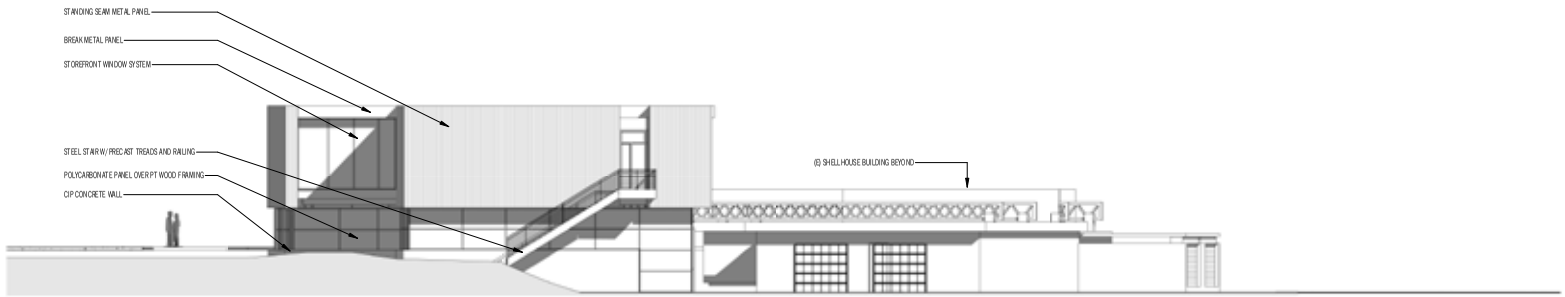
1 / 3.1 OPTION C - WATER ELEVATION
1/8" = 1'-0"

EXTERIOR ELEVATIONS

Green Lake Small Craft Center

schacht | aslani architects
09/21/17

3.1



2 / 3.2 OPTION C - N ELEV
1/8" = 1'-0"

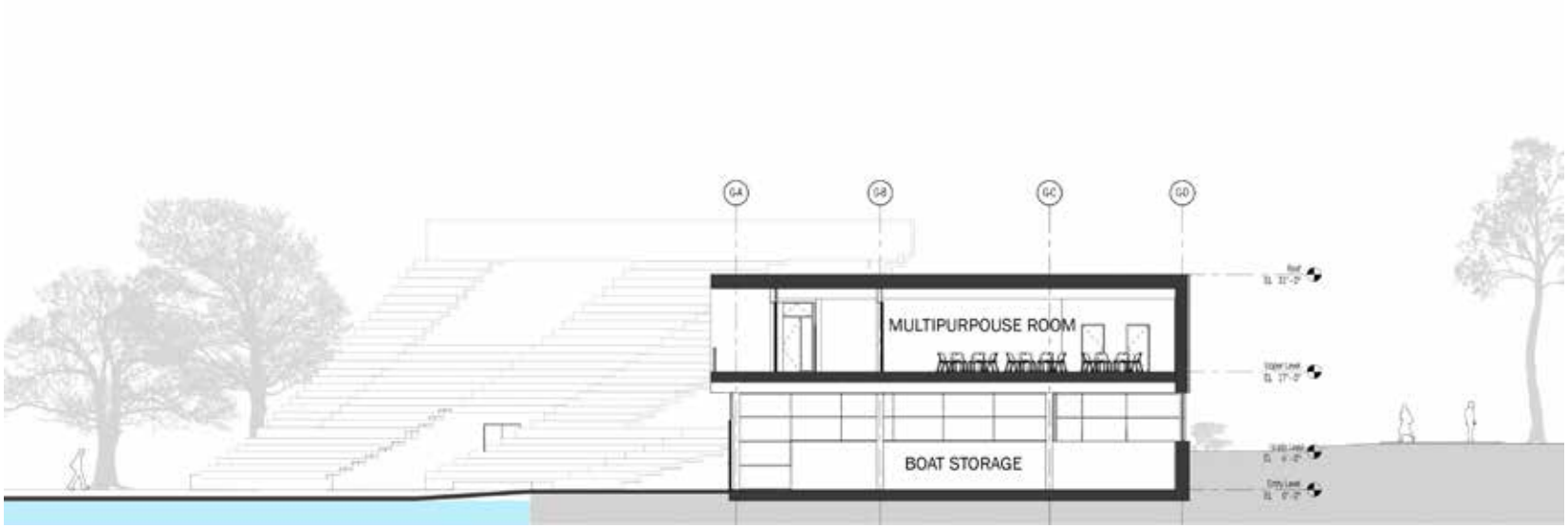
1 / 3.2 OPTION C - S ELEV
1/8" = 1'-0"

EXTERIOR ELEVATIONS

Green Lake Small Craft Center

schacht | aslani architects
09/21/17

3.2

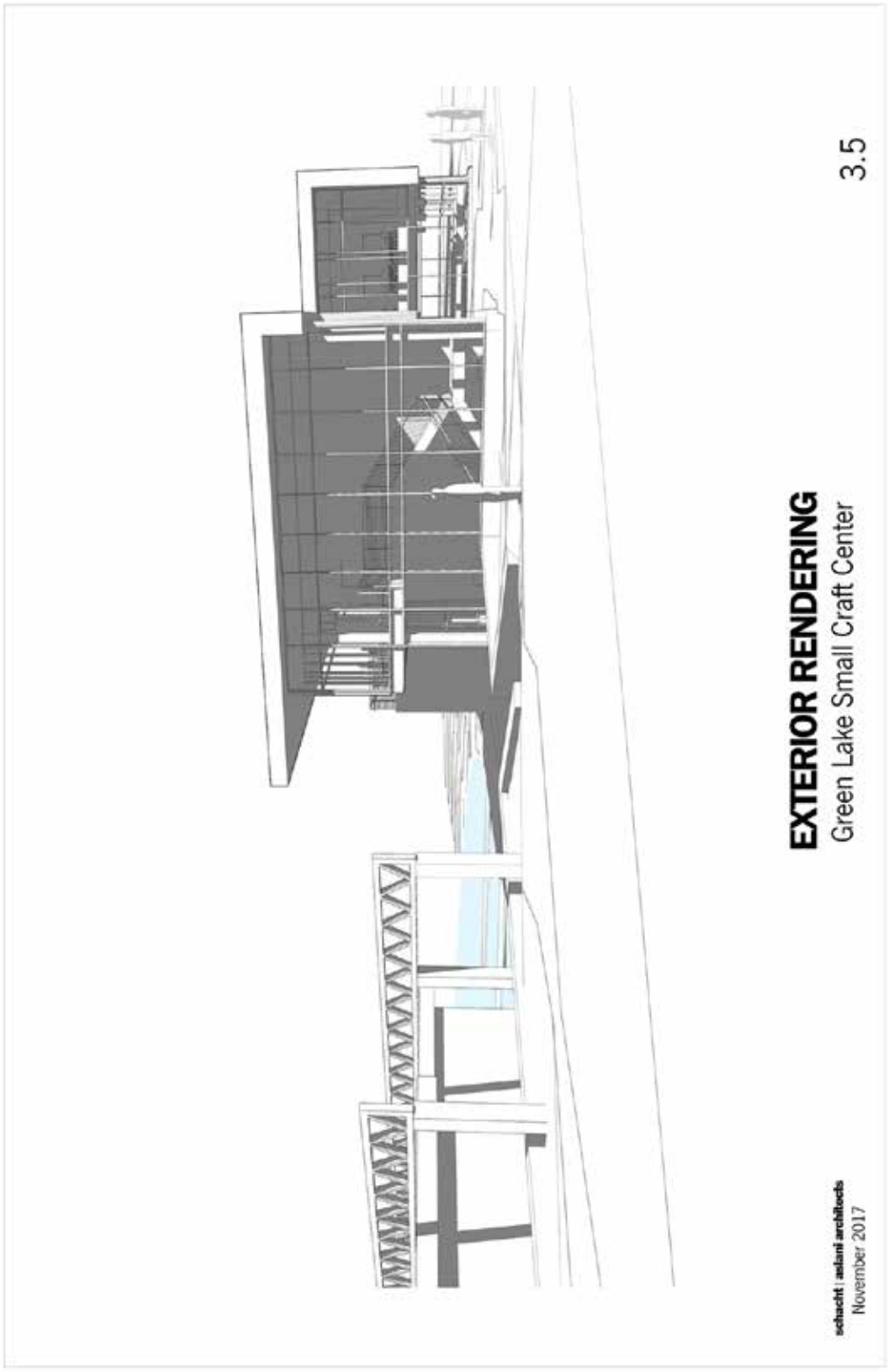


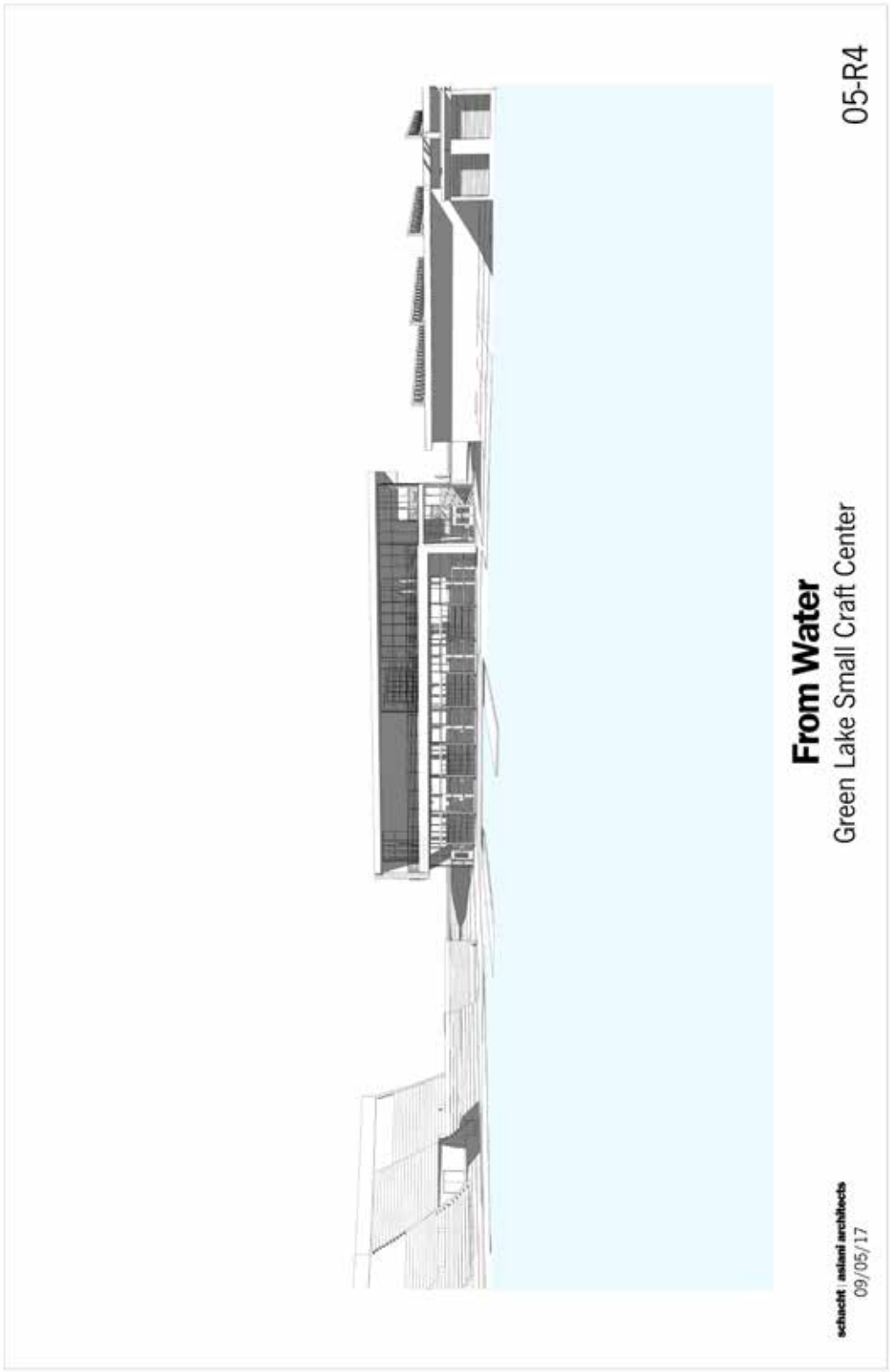
SECTION

Green Lake Small Craft Center

3.3

schacht | aslani architects
09/21/17


EXTERIOR RENDERING
Green Lake Small Craft Center
3.5
schacht | aslani architects
November 2017


From Water
Green Lake Small Craft Center
05-R4
schacht aslani architects
09/05/17

6.2 OPTION C COST ESTIMATE

C & N Consultants, Inc.
Construction Cost Consultants

Green Lake Community Boathouse
Green Lake, WA

Preliminary Design Estimate

Estimate Issue Date: **November 9, 2017**

For: Evan Bourquard
Schacht Aslani Architects
901 5th Ave, Suite 2720
Seattle, WA 98164

Green Lake Community Boathouse
Green Lake, WA
Preliminary Design Estimate
Exclusions and Assumptions

C & N Consultants, Inc.

Date: **November 9, 2017**

Exclusions from Construction Cost:

- Design fees
- Owners administration costs
- Building and land acquisition fees
- Legal and accounting fees
- Removal of unforeseen underground obstructions
- Owner's furniture, furnishings and equipment
- Owners supplied materials
- Moving owners equipment and furniture
- Compression of schedule, premium or shift work
- Assessments, finance, legal and development charges
- Builder's risk, project wrap-up and other owner provided insurance program
- Washington State Sales Tax
- Scope associated with Aqua Theater
- AV Equipment
- Escalation

Assumption used in establishing the estimate:

- Construction estimate priced in November 2017 dollars
- Open and competitive bidding among all proportions of the work

Items that may affect the cost estimate:

- Modifications to the scope of work included in this estimate.
- Special phasing requirements other than mentioned above.
- Restrictive technical specifications or excessive contract conditions.
- Any non-competitive bid situations.
- Bids delayed beyond the projected schedule.

Green Lake Community Boathouse
Green Lake, WA
Preliminary Design Estimate

C & N Consultants, Inc.
Construction Cost Consultants

Date: **November 9, 2017**
Prepared By: AC

OVERALL SUMMARY CONSTRUCTION COST

	Gross Area	$/SF	$
Boat Storage	5,313 SF	173.24	920,404
Multi-Purpose	5,448 SF	393.27	2,142,536
Exterior deck / balcony	922 SF	60.42	55,707
Shellhouse Renovation / Restrooms	3,311 SF	39.76	131,654
Sitework			279,325
TOTAL CONSTRUCTION COST			**3,529,626**
Docks			247,350

Page 2

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

C & N Consultants, Inc.

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
A10	FOUNDATIONS			212,060	39.91
A1010	Standard Foundation		63,296		11.91
A1020	Special Foundation				-
A1030	Slab on grade		148,764		28.00
A20	BASEMENT WALL CONSTRUCTION			137,228	25.83
A2010	Basement Excavation		55,098		10.37
A2020	Basement Wall Construction		82,130		15.46
B10	SUPERSTRUCTURE				-
B1010	Floor & Roof Construction				-
B20	EXTERIOR ENCLOSURE			135,750	25.55
B2010	Exterior Walls		100,550		18.93
B2020	Exterior Windows				-
B2030	Exterior Doors		35,200		6.63
B30	ROOFING			3,719	0.70
B3010	Roofing		3,719		0.70
C10	INTERIOR CONSTRUCTION			6,230	1.17
C1010	Partitions		4,672		0.88
C1020	Interior Doors				-
C1030	Fittings		1,558		0.29
C20	STAIRS			-	-
C2010	Stair Construction				-
C30	INTERIOR FINISHES			8,864	1.67
C3010	Wall Finishes		894		0.17
C3020	Floor Finishes		7,970		1.50
C3030	Ceiling Finishes				-
D10	CONVEYING			-	-
D1010	Elevators & Lifts				-
D20	PLUMBING			5,000	0.94
D2010	Plumbing		5,000		0.94
D30	HVAC			10,000	1.88
D3010	HVAC		10,000		1.88
D40	FIRE PROTECTION			25,237	4.75
D4010	Sprinkler System		25,237		4.75
D50	ELECTRICAL			120,795	22.74
D5000	Electrical		120,795		22.74
E10	EQUIPMENT			-	-
E1010	Equipment				-

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

C & N Consultants, Inc.

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
E20	FURNISHINGS			-	-
E2010	Fixed Furnishings				-
F10	SPECIAL CONSTRUCTION			-	-
F1010	Special Structure				
F1020	Special Construction				
	Sub-Total			**664,882**	**125.14**
	Estimating / Design Contingency	15.00%		99,732	18.77
	Sub-Total			**764,614**	**143.91**
	General Conditions	12.50%		95,577	17.99
	Sub-Total			**860,191**	**161.90**
	GC Overhead and Profit	7.00%		60,213	11.33
	Sub-Total			**920,404**	**173.24**
	Escalation, excluded				-
	TOTAL CONSTRUCTION COST			**$920,404**	**173.24**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

Item Description	Quantity	Unit	Unit Cost	Totals
A10 FOUNDATIONS				
A1010 Standard Foundation				
A1011 Foundations				
Reinforced concrete continuous footings at building				
Excavate for continuous footings includes over excavation	154	CY	35.00	5,390
Backfill, assume imported fill	113	CY	40.00	4,527
Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	205	CY	20.50	4,199
Fine grade bottom of footing	1,002	SF	0.90	902
Formwork to foundations - sides	1,002	SF	11.50	11,523
Reinforcing steel in foundations	5,086	LB	1.00	5,086
Concrete, 4,000 psi	41	CY	245.00	10,001
Finish to top of footing	1,002	SF	0.80	802
A1012 Column foundations				
Reinforced concrete spread footings at building				
Excavate for spread footings, includes over excavation	40	CY	35.00	1,400
Backfill, assume imported fill	29	CY	40.00	1,176
Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	53	CY	20.50	1,091
Fine grade bottom of footing	208	SF	0.90	187
Formwork to foundations - sides	260	SF	11.50	2,990
Reinforcing steel in foundations	1,191	LB	1.00	1,191
Concrete, 4,000 psi	11	CY	245.00	2,595
Finish to top of footing	208	SF	0.80	166
A1013 Perimeter drainage and insulation				
Perimeter drain pipe and rock	294	LF	22.00	6,468
Perimeter insulation	735	SF	4.90	3,602
Total For Standard Foundations				**63,296**
A1020 Special Foundation				
No work anticipated				N/A
Total For Special Foundations				
A1030 Slab on Grade				
A1032 Structural slab on grade				
Mat slab, 2'-6" thick	5,313	SF	28.00	148,764
Total For Slab on Grade				**148,764**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	Caulking, sealants and firestopping				
	Caulking, sealants and firestopping	5,313	SF	0.76	4,038
	Total For Exterior Walls				**100,550**
B2020	**Exterior Windows**				
	No work anticipated				N/A
	Total For Exterior Windows				
B2030	**Exterior Doors**				
	B 2030 Exterior Doors				
	Entrance door, including frame and hardware				
	Single	2	EA	2,600.00	5,200
	B2034 Overhead doors				
	Overhead glazed door, 10'-0" x 10'-0"	4	EA	7,500.00	30,000
	Total For Exterior Doors				**35,200**
	ROOFING				
B3010	**Roof Covering**				
	B3011 Roof finishes				
	Roof finishes included in multi purpose estimate				N/A
	B3014 Flashings and trim				
	Sheet metal flashings and trim	1	LS	2,390.85	2,391
	Miscellaneous				
	Rough carpentry	1	LS	1,328.25	1,328
	Total For Roofing				**3,719**
C10	**INTERIOR CONSTRUCTION**				
C1010	**Partitions**				
	C1011 Fixed partitions at demising wall				
	Metal stud framing	344	SF	4.38	1,507
	Batt insulation	344	SF	1.15	396
	Gypsum board, 5/8", underlayment	258	SF	2.60	671
	Gypsum board, 5/8"	688	SF	3.05	2,098
	Total For Interior Partitions				**4,672**
C1020	**Interior Doors**				
	No work anticipated				N/A
	Total For Interior Doors				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
C1030	**Specialties**				
	C1035 Identifying devices				
	Interior signage	5,313	SF	0.25	1,328
	Exterior building signage, assumed FF&E				N/A
	C1037 General fittings and misc. metals				
	Fire extinguishers	2	EA	115.00	230
	Total For Fittings and Specialty Items				**1,558**
C20	**STAIRS**				
C2010	**Stair Construction**				
	No work anticipated				N/A
	Total For Stair Construction				
	INTERIOR FINISHES				
C3010	**Wall Finishes**				
	C3012 Wall finishes to interior walls				
	Paint to walls	688	SF	1.30	894
	Total For Wall Finishes				**894**
C3020	**Floor Finishes**				
	C3024 Flooring including base				
	Sealed concrete	5,313	SF	1.50	7,970
	C3026 Bases, curbs and trim				
	Rubber base, assumed not required				N/A
	Total For Floor Finishes				**7,970**
C3030	**Ceiling Finishes**				
	C3031 Ceiling finishes				
	Open to structure, no finish anticipated				N/A
	Total For Ceiling Finishes				
D10	**CONVEYING**				
D1010	**Elevator & Lift**				
	No work anticipated				N/A
	Total For Elevator & Lifts				
D20	**PLUMBING**				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
C1030	**Specialties**				
	C1035 Identifying devices				
	Interior signage	5,313	SF	0.25	1,328
	Exterior building signage, assumed FF&E				N/A
	C1037 General fittings and misc. metals				
	Fire extinguishers	2	EA	115.00	230
	Total For Fittings and Specialty Items				**1,558**
C20	**STAIRS**				
C2010	**Stair Construction**				
	No work anticipated				N/A
	Total For Stair Construction				
	INTERIOR FINISHES				
C3010	**Wall Finishes**				
	C3012 Wall finishes to interior walls				
	Paint to walls	688	SF	1.30	894
	Total For Wall Finishes				**894**
C3020	**Floor Finishes**				
	C3024 Flooring including base				
	Sealed concrete	5,313	SF	1.50	7,970
	C3026 Bases, curbs and trim				
	Rubber base, assumed not required				N/A
	Total For Floor Finishes				**7,970**
C3030	**Ceiling Finishes**				
	C3031 Ceiling finishes				
	Open to structure, no finish anticipated				N/A
	Total For Ceiling Finishes				
D10	**CONVEYING**				
D1010	**Elevator & Lift**				
	No work anticipated				N/A
	Total For Elevator & Lifts				
D20	**PLUMBING**				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
D2010	**Plumbing**				
	Plumbing estimate prepared by Engineer				
	Plumbing , Option C	1	LS	5,000.00	5,000
	Total For Plumbing				**5,000**
D30	**HVAC**				
D3010	**HVAC**				
	HVAC estimate prepared by Engineer				
	HVAC, Option C	1	LS	10,000.00	10,000
	Total For HVAC				**10,000**
D40	**FIRE PROTECTION**				
D4010	**Fire Protection**				
	Fire sprinkler estimate prepared by Engineer				
	Fire sprinkler system	5,313	SF	4.75	25,237
	Total For Fire Sprinkler System				**25,237**
D50	**ELECTRICAL**				
D5000	**Electrical**				
	Electrical estimate completed by Engineer				
	Electrical, Option C	5,313	SF	22.74	120,795
	Total For Electrical				**120,795**
E10	**EQUIPMENT**				
E1010	**Equipment**				
	No work anticipated				N/A
	Total For Equipment				
E20	**FURNISHINGS**				
E2010	**Fixed Furnishing**				
	No work anticipated				N/A
	Total For Furniture				
F10	**SPECIAL STRUCTURES**				
F1010	**Special Structure**				
	No work anticipated				N/A
	Total For Special Structure				
F1020	**Special Construction**				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Boat Storage

Gross Floor Area: **5,313 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

Item Description	Quantity	Unit	Unit Cost	Totals	
No work anticipated				N/A	
Total For Special Construction					

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

C & N Consultants, Inc.

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
A10	FOUNDATIONS			69,022	12.67
A1010	Standard Foundation		41,190		7.56
A1020	Special Foundation				-
A1030	Slab on grade		27,832		5.11
A20	BASEMENT WALL CONSTRUCTION			34,413	6.32
A2010	Basement Excavation		10,296		1.89
A2020	Basement Wall Construction		24,116		4.43
B10	SUPERSTRUCTURE			137,088	25.16
B1010	Floor & Roof Construction		137,088		25.16
B20	EXTERIOR ENCLOSURE			322,708	59.23
B2010	Exterior Walls		149,328		27.41
B2020	Exterior Windows		152,880		28.06
B2030	Exterior Doors		20,500		3.76
B30	ROOFING			143,907	26.41
B3010	Roofing		143,907		26.41
C10	INTERIOR CONSTRUCTION			152,198	27.94
C1010	Partitions		78,123		14.34
C1020	Interior Doors		31,040		5.70
C1030	Fittings		43,035		7.90
C20	STAIRS			46,000	8.44
C2010	Stair Construction		46,000		8.44
C30	INTERIOR FINISHES			68,885	12.64
C3010	Wall Finishes		16,395		3.01
C3020	Floor Finishes		36,593		6.72
C3030	Ceiling Finishes		15,897		2.92
D10	CONVEYING			110,000	20.19
D1010	Elevators & Lifts		110,000		20.19
D20	PLUMBING			86,500	15.88
D2010	Plumbing		86,500		15.88
D30	HVAC			168,000	30.84
D3010	HVAC		168,000		30.84
D40	FIRE PROTECTION			-	-
D4010	Sprinkler System				-
D50	ELECTRICAL			190,680	35.00
D5000	Electrical		190,680		35.00
E10	EQUIPMENT			6,200	1.14
E1010	Equipment		6,200		1.14

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
E20	FURNISHINGS			12,125	2.23
E2010	Fixed Furnishings		12,125		2.23
F10	SPECIAL CONSTRUCTION			-	-
F1010	Special Structure				
F1020	Special Construction				
	Sub-Total			**1,547,726**	**284.09**
	Estimating / Design Contingency	15.00%		232,159	42.61
	Sub-Total			**1,779,884**	**326.70**
	General Conditions	12.50%		222,486	40.84
	Sub-Total			**2,002,370**	**367.54**
	GC Overhead and Profit	7.00%		140,166	25.73
	Sub-Total			**2,142,536**	**393.27**
	Escalation, excluded				-
	TOTAL CONSTRUCTION COST			**$2,142,536**	**393.27**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
A10	**FOUNDATIONS**				
A1010	**Standard Foundation**				
	A1011 Foundations				
	Reinforced concrete continuous footings at building				
	Excavate for continuous footings includes over excavation	154	CY	35.00	5,390
	Backfill, assume imported fill	145	CY	40.00	5,785
	Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	205	CY	20.50	4,199
	Fine grade bottom of footing	230	SF	0.90	207
	Formwork to foundations - sides	230	SF	11.50	2,645
	Reinforcing steel in foundations	1,167	LB	1.00	1,167
	Concrete, 4,000 psi	9	CY	245.00	2,296
	Finish to top of footing	230	SF	0.80	184
	A1012 Column foundations				
	Reinforced concrete spread footings at building				
	Excavate for spread footings, includes over excavation	40	CY	35.00	1,400
	Backfill, assume imported fill	38	CY	40.00	1,502
	Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	53	CY	20.50	1,091
	Fine grade bottom of footing	48	SF	0.90	43
	Formwork to foundations - sides	60	SF	11.50	690
	Reinforcing steel in foundations	275	LB	1.00	275
	Concrete, 4,000 psi	2	CY	245.00	599
	Finish to top of footing	48	SF	0.80	38
	A1013 Perimeter drainage and insulation				
	Perimeter drain pipe and rock	82	LF	22.00	1,804
	Perimeter insulation	205	SF	4.90	1,005
	Miscellaneous				
	Elevator pit	1	EA	10,870.00	10,870
	Total For Standard Foundations				**41,190**
A1020	**Special Foundation**				
	No work anticipated				N/A
	Total For Special Foundations				
A1030	**Slab on Grade**				
	A1032 Structural slab on grade				
	Mat slab, 2'-6" thick	994	SF	28.00	27,832
	Total For Slab on Grade				**27,832**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
A20	**BASEMENT CONSTRUCTION**				
A2010	**Basement Excavation**				
	A 2010 Basement Excavation				
	Excavate and remove off-site	147	CY	45.00	6,615
	A2012 Structure backfill and compaction				
	Imported structural fill	92	CY	40.00	3,681
	Total For Basement Excavation				**10,296**
A2010	**Basement Walls**				
	A2021 Basement wall construction				
	Over excavation at retaining walls	41	CY	35.00	1,443
	Backfill at retaining walls	25	CY	42.50	1,063
	Reinforced concrete retaining walls	371	SF	44.00	16,324
	A2022 Moisture protection				
	Waterproofing system	371	SF	8.20	3,042
	A2023 Basement wall insulation				
	Rigid insulation	371	SF	2.70	1,002
	A2024 Interior skin				
	Gypsum board, painted	371	SF	3.35	1,243
	Total For Basement Walls				**24,116**
B1010	**Floor & Roof Construction**				
	B 1010 Floor Construction				
	Floor structure	5,448	SF	30.00	163,440
	B 1020 Roof Construction				
	Roof structure	6,528	SF	21.00	137,088
	Total For Floor & Roof Construction				**137,088**
B20	**EXTERIOR CLOSURE**				
B2010	**Exterior Walls**				
	B2011 Exterior wall construction				
	Metal panel siding at Level 1	120	SF	25.00	3,000
	Metal panel siding at Level 2	3,150	SF	25.00	78,750
	Stud framing, 2 x 6	3,270	SF	7.00	22,890
	Batt insulation	3,270	SF	0.70	2,289
	Plywood sheathing 1/2"	3,270	SF	3.10	10,137
	Air / water barrier	3,270	SF	4.50	14,715
	Vapor retarder	3,270	SF	0.85	2,780
	Gypsum board	3,270	SF	3.25	10,628

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	Caulking, sealants and firestopping				
	Caulking, sealants and firestopping	5,448	SF	0.76	4,140
	Total For Exterior Walls				**149,328**
B2020	**Exterior Windows**				
	B2023 Storefronts				
	Storefront glazing, 35%	1,820	SF	84.00	152,880
	Total For Exterior Windows				**152,880**
B2030	**Exterior Doors**				
	B 2030 Exterior Doors				
	Entrance door including frame and hardware				
	Double at Level 1	1	EA	5,200.00	5,200
	Single at Level 2	3	EA	2,600.00	7,800
	B3012 Traffic toppings and paving membranes				
	Overhead glazed door, 10'-0" x 10'-0"	1	EA	7,500.00	7,500
	Total For Exterior Doors				**20,500**
	ROOFING				
B3010	**Roof Covering**				
	B3011 Roof finishes				
	Single ply membrane roofing system	6,528	SF	19.90	129,907
	B3014 Flashings and trim				
	Sheet metal flashings and trim	1	LS	7,500.00	7,500
	Miscellaneous				
	Rough carpentry	1	LS	6,500.00	6,500
	Total For Roofing				**143,907**
C10	**INTERIOR CONSTRUCTION**				
C1010	**Partitions**				
	C1011 Fixed partitions				
	Level 1				
	Metal stud framing	1,094	SF	4.38	4,792
	Batt insulation	1,094	SF	1.15	1,258
	Gypsum board, 5/8", underlayment	821	SF	2.60	2,133
	Gypsum board, 5/8"	2,188	SF	3.05	6,673
	Level 2				
	Metal stud framing	5,120	SF	3.75	19,200
	Batt insulation	5,120	SF	1.15	5,888
	Gypsum board, 5/8" underlayment	2,048	SF	3.05	6,246

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	Ceramic tile	196	SF	15.00	2,940
	Entry wall, by owner				N/A
	Total For Wall Finishes				**16,395**
C3020	**Floor Finishes**				
	C3024 Flooring including base				
	Level 1				
	Entry reception - carpet	909	SF	4.65	4,227
	Level 2				
	Multi-purpose room / storage floor finishes - resilient	1,321	SF	6.85	9,049
	Office / admin floor finishes - carpet	941	SF	4.65	4,376
	Locker room / shower room / restrooms floor finishes - tile / resilient	1,303	SF	8.00	10,424
	Break room floor finishes - resilient	155	SF	6.85	1,062
	Hallway floor finishes - carpet	838	SF	4.65	3,897
	Stair alcove floor finishes - carpet	265	SF	4.65	1,232
	C3026 Bases, curbs and trim				
	Rubber base	738	LF	2.85	2,103
	Ceramic tile	28	LF	8.00	224
	Total For Floor Finishes				**36,593**
C3030	**Ceiling Finishes**				
	C3031 Ceiling finishes				
	Gypsum board, painted	1,303	SF	12.20	15,897
	Total For Ceiling Finishes				**15,897**
D10	**CONVEYING**				
D1010	**Elevator & Lift**				
	D1011 Passenger elevators				
	Passenger elevator, 2 stops including cab finish	1	EA	110,000.00	110,000
	Total For Elevator & Lifts				**110,000**
D20	**PLUMBING**				
D2010	**Plumbing**				
	Plumbing estimate prepared by Engineer				
	Plumbing - Option C	5,448	SF	15.88	86,500
	Total For Plumbing				**86,500**
D30	**HVAC**				
D3010	**HVAC**				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Multi-Purpose

Gross Floor Area: **5,448 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	HVAC estimate prepared by Engineer				
	HVAC- Option C	5,448	SF	30.84	168,000
	Total For HVAC				**168,000**
D40	**FIRE PROTECTION**				
D4010	**Fire Protection**				
	Fire sprinkler estimate				
	Fire sprinkler system, not required				N/A
	Total For Fire Sprinkler System				
D50	**ELECTRICAL**				
D5000	**Electrical**				
	Electrical estimate completed by Engineer				
	Electrical- Option C	5,448	SF	35.00	190,680
	Total For Electrical				**190,680**
E10	**EQUIPMENT**				
E1010	**Equipment**				
	E1094 Residential equipment				
	Residential appliances	1	LS	6,200.00	6,200
	Total For Equipment				**6,200**
E20	**FURNISHINGS**				
E2010	**Fixed Furnishing**				
	E2012 Fixed casework				
	Restroom vanity	11	LF	175.00	1,925
	Base cabinetry	30	LF	235.00	7,050
	Countertop	30	LF	105.00	3,150
	E2013 Blinds and other window treatments				
	Window treatments, assumed not required				N/A
	Total For Furniture				**12,125**
F10	**SPECIAL STRUCTURES**				
F1010	**Special Structure**				
	No work anticipated				N/A
	Total For Special Structure				
F1020	**Special Construction**				
	No work anticipated				N/A
	Total For Special Construction				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
A10	FOUNDATIONS				-
A1010	Standard Foundation				-
A1020	Special Foundation				-
A1030	Slab on grade				-
A20	BASEMENT WALL CONSTRUCTION				-
A2010	Basement Excavation				-
A2020	Basement Wall Construction				-
B10	SUPERSTRUCTURE				-
B1010	Floor & Roof Construction				-
B20	EXTERIOR ENCLOSURE			16,500	17.90
B2010	Exterior Walls		16,500		17.90
B2020	Exterior Windows				-
B2030	Exterior Doors				-
B30	ROOFING			17,241	18.70
B3010	Roofing		17,241		18.70
C10	INTERIOR CONSTRUCTION				-
C1010	Partitions				-
C1020	Interior Doors				-
C1030	Fittings				-
C20	STAIRS			-	-
C2010	Stair Construction				-
C30	INTERIOR FINISHES				-
C3010	Wall Finishes				-
C3020	Floor Finishes				-
C3030	Ceiling Finishes				-
D10	CONVEYING			-	-
D1010	Elevators & Lifts				-
D20	PLUMBING				-
D2010	Plumbing				-
D30	HVAC			-	-
D3010	HVAC				-
D40	FIRE PROTECTION			-	-
D4010	Sprinkler System				-
D50	ELECTRICAL			6,500	7.05
D5000	Electrical		6,500		7.05
E10	EQUIPMENT			-	-
E1010	Equipment				-

Page 19

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

C & N Consultants, Inc.

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
E20	FURNISHINGS			-	-
E2010	Fixed Furnishings				-
F10	SPECIAL CONSTRUCTION			-	-
F1010	Special Structure				
F1020	Special Construction				
	Sub-Total			**40,241**	**43.65**
	Estimating / Design Contingency	15.00%		6,036	6.55
	Sub-Total			**46,278**	**50.19**
	General Conditions	12.50%		5,785	6.27
	Sub-Total			**52,062**	**56.47**
	GC Overhead and Profit	7.00%		3,644	3.95
	Sub-Total			**55,707**	**60.42**
	Escalation, excluded				-
	TOTAL CONSTRUCTION COST			**$55,707**	**60.42**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
A10	**FOUNDATIONS**				
A1010	**Standard Foundation**				
	No work anticipated				N/A
	Total For Standard Foundations				
A1020	**Special Foundation**				
	No work anticipated				N/A
	Total For Special Foundations				
A1030	**Slab on Grade**				
	No work anticipated				N/A
	Total For Slab on Grade				
A20	**BASEMENT CONSTRUCTION**				
A2010	**Basement Excavation**				
	No work anticipated				N/A
	Total For Basement Excavation				
A2010	**Basement Walls**				
	No work anticipated				N/A
	Total For Basement Walls				
B1010	**Floor & Roof Construction**				
	B1013 Balcony floors construction				
	Floor structure	922	SF	28.00	25,816
	Total For Floor & Roof Construction				
B20	**EXTERIOR CLOSURE**				
B2010	**Exterior Walls**				
	B2015 Balcony walls and handrails				
	Guardrails	110	LF	150.00	16,500
	Total For Exterior Walls				**16,500**
B2020	**Exterior Windows**				
	No work anticipated				N/A

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals	
	Total For Exterior Windows					
B2030	**Exterior Doors**					
	No work anticipated				N/A	
	Total For Exterior Doors					
	ROOFING					
B3010	**Roof Covering**					
	Roofing	922	SF	18.70	17,241	
	Total For Roofing				**17,241**	
C10	**INTERIOR CONSTRUCTION**					
C1010	**Partitions**					
	No work anticipated				N/A	
	Total For Interior Partitions					
C1020	**Interior Doors**					
	No work anticipated				N/A	
	Total For Interior Doors					
C1030	**Specialties**					
	No work anticipated				N/A	
	Total For Fittings and Specialty Items					
C20	**STAIRS**					
C2010	**Stair Construction**					
	No work anticipated				N/A	
	Total For Stair Construction					
	INTERIOR FINISHES					
C3010	**Wall Finishes**					
	No work anticipated				N/A	
	Total For Wall Finishes					
C3020	**Floor Finishes**					
	No work anticipated				N/A	

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals	
	Total For Floor Finishes					
C3030	**Ceiling Finishes**					
	No work anticipated				N/A	
	Total For Ceiling Finishes					
D10	**CONVEYING**					
D1010	**Elevator & Lift**					
	No work anticipated				N/A	
	Total For Elevator & Lifts					
D20	**PLUMBING**					
D2010	**Plumbing**					
	No work anticipated				N/A	
	Total For Plumbing					
D30	**HVAC**					
D3010	**HVAC**					
	No work anticipated				N/A	
	Total For HVAC					
D40	**FIRE PROTECTION**					
D4010	**Fire Protection**					
	No work anticipated				N/A	
	Total For Fire Sprinkler System					
D50	**ELECTRICAL**					
D5000	**Electrical**					
	Electrical estimate completed by Engineer					
	Electrical, allow	1	LS	6,500.00	6,500	
	Total For Electrical				**6,500**	
E10	**EQUIPMENT**					
E1010	**Equipment**					
	No work anticipated				N/A	
	Total For Equipment					

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Exterior Deck

Gross Floor Area: **922 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals	
E20	**FURNISHINGS**					
E2010	**Fixed Furnishing**					
	No work anticipated				N/A	
	Total For Furniture					
F10	**SPECIAL STRUCTURES**					
F1010	**Special Structure**					
	No work anticipated				N/A	
	Total For Special Structure					
F1020	**Special Construction**					
	No work anticipated				N/A	
	Total For Special Construction					

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Shell House Renovation / Restrooms

Gross Floor Area: **3,311 SF**
Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	Cost Per SF
A10	FOUNDATIONS				-
A1010	Standard Foundation				-
A1020	Special Foundation				-
A1030	Slab on grade				-
A20	BASEMENT WALL CONSTRUCTION				-
A2010	Basement Excavation				-
A2020	Basement Wall Construction				-
B10	SUPERSTRUCTURE				-
B1010	Floor & Roof Construction				-
B20	EXTERIOR ENCLOSURE			6,500	1.96
B2010	Exterior Walls		6,500		1.96
B2020	Exterior Windows				-
B2030	Exterior Doors				-
B30	ROOFING				-
B3010	Roofing				-
C10	INTERIOR CONSTRUCTION			10,672	3.22
C1010	Partitions		2,200		0.66
C1020	Interior Doors		5,000		1.51
C1030	Fittings		3,472		1.05
C20	STAIRS			-	-
C2010	Stair Construction				-
C30	INTERIOR FINISHES			23,000	6.95
C3010	Wall Finishes		7,500		2.27
C3020	Floor Finishes		8,500		2.57
C3030	Ceiling Finishes		7,000		2.11
D10	CONVEYING			-	-
D1010	Elevators & Lifts				-
D20	PLUMBING			30,000	9.06
D2010	Plumbing		30,000		9.06
D30	HVAC			-	-
D3010	HVAC				-
D40	FIRE PROTECTION			-	-
D4010	Sprinkler System				-
D50	ELECTRICAL			15,000	4.53
D5000	Electrical		15,000		4.53
E10	EQUIPMENT			-	-
E1010	Equipment				-

Page 25

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Shell House Renovation / Restrooms

Gross Floor Area: **3,311 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
A10	**FOUNDATIONS**				
A1010	**Standard Foundation**				
	No work anticipated				N/A
	Total For Standard Foundations				
A1020	**Special Foundation**				
	No work anticipated				N/A
	Total For Special Foundations				
A1030	**Slab on Grade**				
	No work anticipated				N/A
	Total For Slab on Grade				
A20	**BASEMENT CONSTRUCTION**				
A2010	**Basement Excavation**				
	No work anticipated				N/A
	Total For Basement Excavation				
A2010	**Basement Walls**				
	No work anticipated				N/A
	Total For Basement Walls				
B1010	**Floor & Roof Construction**				
	No work anticipated				N/A
	Total For Floor & Roof Construction				
B20	**EXTERIOR CLOSURE**				
B2010	**Exterior Walls**				
	B2011 Exterior wall construction Paint to exterior closure	1	LS	6,500.00	6,500
	Total For Exterior Walls				**6,500**
B2020	**Exterior Windows**				
	No work anticipated				N/A

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Shell House Renovation / Restrooms

Gross Floor Area: **3,311 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	Total For Exterior Windows				
B2030	**Exterior Doors**				
	No work anticipated				N/A
	Total For Exterior Doors				
	ROOFING				
B3010	**Roof Covering**				
	No work anticipated				N/A
	Total For Roofing				
C10	**INTERIOR CONSTRUCTION**				
C1010	**Partitions**				
	C1011 Fixed partitions				
	Partition modifications, allow	1	LS	2,200.00	2,200
	Total For Interior Partitions				**2,200**
C1020	**Interior Doors**				
	C1021 Interior doors				
	Interior doors, frames and hardware	1	LS	5,000.00	5,000
	Total For Interior Doors				**5,000**
C1030	**Specialties**				
	C1035 Identifying devices				
	Signage	1	LS	450.00	450
	Exterior building signage, assumed FF&E				N/A
	C1037 General fittings and misc. metals				
	Fire extinguisher cabinets	2	EA	234.00	468
	Grab bars at restrooms	2	EA	216.75	434
	Mirrors	2	EA	160.00	320
	Restroom accessories	1	LS	1,800.00	1,800
	Total For Fittings and Specialty Items				**3,472**
C20	**STAIRS**				
C2010	**Stair Construction**				
	No work anticipated				N/A
	Total For Stair Construction				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Shell House Renovation / Restrooms

Gross Floor Area: **3,311 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	INTERIOR FINISHES				
C3010	**Wall Finishes**				
	C3012 Wall finishes				
	Wall finishes	1	LS	7,500.00	7,500
	Total For Wall Finishes				**7,500**
C3020	**Floor Finishes**				
	C3024 Flooring including base				
	Floor finishes	1	LS	8,500.00	8,500
	Total For Floor Finishes				**8,500**
C3030	**Ceiling Finishes**				
	C3031 Ceiling finishes				
	Ceiling finishes	1	LS	7,000.00	7,000
	Total For Ceiling Finishes				**7,000**
D10	**CONVEYING**				
D1010	**Elevator & Lift**				
	No work anticipated				N/A
	Total For Elevator & Lifts				
D20	**PLUMBING**				
D2010	**Plumbing**				
	Plumbing estimate prepared by Engineer				
	Plumbing, Option C	1	LS	30,000.00	30,000
	Total For Plumbing				**30,000**
D30	**HVAC**				
D3010	**HVAC**				
	HVAC estimate prepared by Engineer				
	HVAC, not required, Option C				N/A
	Total For HVAC				
D40	**FIRE PROTECTION**				
D4010	**Fire Protection**				

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Shell House Renovation / Restrooms

Gross Floor Area: **3,311 SF**
Date: **November 9, 2017**
Prepared By: AC

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
	Fire sprinkler estimate				
	Fire sprinkler system, not required, Option C				N/A
	Total For Fire Sprinkler System				
D50	**ELECTRICAL**				
D5000	**Electrical**				
	Electrical estimate prepared by Engineer				
	Electrical, Option C	1	LS	15,000.00	15,000
	Total For Electrical				**15,000**
E10	**EQUIPMENT**				
E1010	**Equipment**				
	No work anticipated				N/A
	Total For Equipment				
E20	**FURNISHINGS**				
E2010	**Fixed Furnishing**				
	No work anticipated				N/A
	Total For Furniture				
F10	**SPECIAL STRUCTURES**				
F1010	**Special Structure**				
	No work anticipated				N/A
	Total For Special Structure				
F1020	**Special Construction**				
	No work anticipated				N/A
	Total For Special Construction				
F20	**SELECTIVE BUILDING DEMOLITION**				
F2010	**Building Element Demolition**				
	F 2010 Building Elements Demolition				
	Selective interior demolition	3,311	SF	3.00	9,933
	Total For Selected Demolition				**9,933**

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Sitework

C & N Consultants, Inc.

Date: **November 9, 2017**
Prepared By: AC

Summary of Estimate

No.	Element Description		Element Totals	Group Totals	
G	BUILDING SITEWORK			201,779	
G10	Site Preparation		30,137		
G20	Site Improvement		41,230		
G30	Site Mechanical Utilities		130,412		
G40	Site Electrical Utilities				
	Sub-Total			**201,779**	
	Estimating / Design Contingency	15.00%		30,267	
	Sub-Total			**232,045**	
	General Conditions	12.50%		29,006	
	Sub-Total			**261,051**	
	GC Overhead and Profit	7.00%		18,274	
	Sub-Total			**279,325**	
	Escalation, excluded				
	TOTAL CONSTRUCTION COST			**$279,325**	

Green Lake Small Craft Center
Green Lake, WA
Preliminary Design Estimate
Sitework

C & N Consultants, Inc.

Date: **November 9, 2017**
Prepared By: **AC**

DETAIL OF ESTIMATE

	Item Description	Quantity	Unit	Unit Cost	Totals
G	**BUILDING SITE WORK ESTIMATE COMPLETED BY ENGINEERS**				
G10	**Site Preparation**				
	Site Preparation and Demolition estimate prepared by Civil Engineer Dated November 3rd, 2017				
	Mobilization	1	LS	14,946.56	14,947
	Demolition	1	LS	9,000.00	9,000
	Erosion Control estimate prepared by Civil Engineer Dated November 3rd, 2017				
	Erosion control	1	LS	6,190.00	6,190
	Total For Site Preparation				**30,137**
G20	**Site Improvements**				
	Site paving estimate prepared by Civil Engineer Dated November 3rd, 2017				
	Paving restoration	1	LS	41,230.00	41,230
	Total For Site Improvement				**41,230**
G30	**Site Mechanical Utilities**				
	Storm drainage estimate prepared by Civil Engineer Dated November 3rd, 2017				
	Mechanical utilities	1	LS	130,412.00	130,412
	Total For Site Mechanical Utilities				**130,412**
G40	**Site Electrical Utilities & Site Lighting**				
	No work anticipated				N/A
	Total For Site Electrical Utilities				

6.3 OPTION A AND B ESTIMATE

C & N Consultants, Inc.
Construction Cost Consultants

GLSCC

Options

Preliminary ROM Estimate

Estimate Issue Date: **August 18, 2017**

For: Scacht Aslani Architects

GLSCC
Options
Preliminary ROM Estimate
Exclusions and Assumptions

C & N Consultants, Inc.

Date: August 18, 2017

Exclusions from Construction Cost:

- Design fees
- Owners administration costs
- Building and land acquisition fees
- Legal and accounting fees
- Removal of unforeseen underground obstructions
- Owner's furniture, furnishings and equipment
- Owners supplied materials
- Moving owners equipment and furniture
- Compression of schedule, premium or shift work
- Assessments, finance, legal and development charges
- Builder's risk, project wrap-up and other owner provided insurance program
- Washington State Sales Tax
- AV Equipment

Assumption used in establishing the estimate:

- Open and competitive bidding among all proportions of the work
- Escalation has been included at 5% per annum

Items that may affect the cost estimate:

- Modifications to the scope of work included in this estimate.
- Special phasing requirements other than mentioned above.
- Restrictive technical specifications or excessive contract conditions.
- Any non-competitive bid situations.
- Bids delayed beyond the projected schedule.

Page 1

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.
Construction Cost Consultants

Date: **August 18, 2017**
Prepared By: AC

OVERALL SUMMARY CONSTRUCTION COST

	Gross Area	$/SF	$
Scheme A			
Scheme A - Shellhouse Renovation	3,310 SF	80.00	264,800
Scheme A - Renovation of Boathouse Building	3,475 SF	241.00	837,475
Scheme A: Boathouse Addition	1,535 SF	311.00	477,385
Scheme A - Launch boat docks			250,000
Scheme A - Sitework			200,000
TOTAL CONSTRUCTION COST - SCHEME A			**2,029,661**
Scheme B			
Scheme B - Shellhouse Renovation	3,310 SF	80.00	264,800
Scheme B: New Boathouse	9,245 SF	298.53	2,759,930
Scheme B - Launch boat docks			250,000
Scheme B - Sitework			200,000
TOTAL CONSTRUCTION COST - SCHEME B			**3,474,730**

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: **August 18, 2017**
Prepared By: AC

Item Description	Quantity	Unit	Unit Cost	Totals
Scheme A - Renovation of Boathouse Building				
A1011 Foundations				
No work anticipated				N/A
A1031 Standard slab on grade				
No work anticipated				N/A
Roof Construction				
No work anticipated				N/A
B2011 Exterior wall construction				
Infill cladding at OHC door locations, complete	350	SF	45.00	15,750
Glazing improvements / Cladding enhancements	1	LS	25,000.00	25,000
Paint to exterior closure	1	LS	6,500.00	6,500
Caulking, sealants and firestopping				
Caulking, sealants and firestopping	3,475	SF	0.55	1,911
B 2030 Exterior Doors				
Exterior door revisions	1	LS	5,500.00	5,500
B3011 Roof finishes				
No work anticipated				N/A
Miscellaneous				
Rough carpentry	1	LS	1,000.00	1,000
C1011 Fixed partitions				
Stud framing	1,690	SF	3.75	6,338
Batt insulation	1,690	SF	1.15	1,944
Gypsum board, 5/8", underlayment	845	SF	2.60	2,197
Gypsum board, 5/8"	3,380	SF	3.05	10,309
Miscellaneous				
Blocking and backing	1	LS	500.00	500
C1021 Interior doors				
Interior doors, frames and hardware	1	LS	6,000.00	6,000
C1035 Identifying devices				
Code signage	3,475	SF	0.15	521
Wayfinding and room identification signage	3,475	SF	0.30	1,043
C1037 General fittings and misc. metals				
Miscellaneous metals, allow 0.4#/SF	1,390	LB	3.00	4,170
Fire extinguisher cabinets	2	EA	234.00	468
Restroom accessories	1	LS	2,200.00	2,200
Whiteboards	1	LS	1,250.00	1,250

Page 3

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: August 18, 2017
Prepared By: AC

Item Description	Quantity	Unit	Unit Cost	Totals
Lockers	1	LS	10,500.00	10,500
C3012 Wall finishes to interior walls				
Wall finishes	1	LS	19,500.00	19,500
C3024 Flooring including base				
Floor finishes	1	LS	29,750.00	29,750
C3031 Ceiling finishes				
Ceiling finishes	1	LS	31,500.00	31,500
Plumbing				
Plumbing	1	LS	44,975.00	44,975
HVAC				
HVAC	1	LS	113,000.00	113,000
Fire sprinkler estimate				
Fire sprinkler system	1	LS	19,250.00	19,250
Electrical				
Electrical	1	LS	122,000.00	122,000
E2012 Fixed casework				
Casework	1	LS	9,700.00	9,700
E2013 Blinds and other window treatments				
Window treatments	1	LS	1,624.50	1,625
F 2010 Building Elements Demolition				
Selective demolition	3,475	SF	9.00	31,275
Sub-Total				**525,675**
Estimating / Design Contingency	20.00%		525,674.50	105,135
Sub-Total				**630,809**
General Conditions	16.00%		630,809.40	100,930
Sub-Total				**731,739**
GC Fee	9.00%		731,738.90	65,857
Escalation - August 2018	5.00%		797,595.41	39,880
TOTAL CONSTRUCTION COST				**837,475**

Scheme A: Boathouse Addition

A1011 Foundations

Page 4

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: **August 18, 2017**
Prepared By: **AC**

Item Description	Quantity	Unit	Unit Cost	Totals
Reinforced concrete continuous footings at building				
Excavate for continuous footings includes over excavation	32	CY	30.00	960
Backfill, assume imported fill	24	CY	42.00	1,010
Disposal of excavated material off-site within 8 miles, assumed a 33% swell factor	43	CY	22.00	936
Fine grade bottom of footing	195	SF	0.70	137
Formwork to foundations - sides	260	SF	9.00	2,340
Reinforcing steel in foundations	990	LB	1.00	990
Concrete, 4,000 psi	8	CY	245.00	1,946
Finish to top of footing	195	SF	0.80	156
A1013 Perimeter drainage and insulation				
Perimeter drain pipe and rock	132	LF	22.00	2,904
Perimeter insulation	330	SF	4.90	1,617
A1031 Standard slab on grade				
Mat slab	1,535	SF	22.00	33,770
A 2020 Basement Walls				
Reinforced concrete stem walls and plinths	5	CY	1,280.00	6,289
B 1020 Roof Construction				
Roof Construction	1,535	SF	24.50	37,608
Seismic joint	1	LS	7,500.00	7,500
B2011 Exterior wall construction				
Cladding	1,980	SF	20.00	39,600
Stud framing	1,980	SF	8.50	16,830
Batt insulation	1,980	SF	0.70	1,386
Wall sheathing 1/2"	1,980	SF	2.35	4,653
Vapor retarder	1,980	SF	0.85	1,683
Gypsum board	1,980	SF	2.10	4,158
Fascia	1	LS	2,400.00	2,400
Caulking, sealants and firestopping				
Caulking, sealants and firestopping	1,535	SF	0.95	1,458
B2021 Windows				
Windows	260	SF	65.00	16,900
B 2030 Exterior Doors				
Aluminum glazed entrance door, types F&G including frame and hardware				
Single	1	EA	2,150.00	2,150
OHC door	1	EA	8,500.00	8,500
B3011 Roof finishes				
Roofing system, complete	1,535	SF	17.50	26,863
B3014 Flashings and trim				
Sheet metal flashings and trim	1	LS	850.00	850

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: **August 18, 2017**
Prepared By: AC

Item Description	Quantity	Unit	Unit Cost	Totals
B3016 Gutters and downspouts				
Guttering and downspouts	1	LS	1,850.00	1,850
Miscellaneous				
Rough carpentry	1	LS	950.00	950
C1011 Fixed partitions				
Stud framing	528	SF	3.75	1,980
Batt insulation	528	SF	1.15	607
Gypsum board, 5/8", underlayment	264	SF	2.60	686
Gypsum board, 5/8"	1,056	SF	3.05	3,221
C1035 Identifying devices				
Code signage	1,535	SF	0.15	230
Wayfinding and room identification signage	1,535	SF	0.30	461
C1037 General fittings and misc. metals				
Miscellaneous metals, allow 0.4#/SF	600	LB	3.00	1,800
C3012 Wall finishes to interior walls				
Wall finishes	1	LS	3,760.50	3,761
C3024 Flooring including base				
Floor finishes	1,535	SF	1.75	2,686
C3031 Ceiling finishes				
Ceiling finishes	1,535	SF	1.84	2,824
Plumbing				
Plumbing	1	LS	3,000.00	3,000
HVAC				
HVAC	1	LS	12,500.00	12,500
Fire sprinkler estimate				
Fire sprinkler system	1	LS	7,500.00	7,500
Electrical				
Electrical	1	LS	30,000.00	30,000
Sub-Total				**299,650**
Estimating / Design Contingency	20.00%		299,649.86	59,930
Sub-Total				**359,580**
General Conditions	16.00%		359,579.83	57,533
Sub-Total				**417,113**

Page 6

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: August 18, 2017
Prepared By: AC

Item Description	Quantity	Unit	Unit Cost	Totals
GC Fee	9.00%		417,112.61	37,540
Escalation - August 2018	5.00%		454,652.74	22,733
TOTAL CONSTRUCTION COST				**477,385**
Scheme A - Launch boat docks				
Launch boat docks, covered	1	LS	156,922.50	156,923
Sub-Total				**156,923**
Estimating / Design Contingency	20.00%		156,922.50	31,385
Sub-Total				**188,307**
General Conditions	16.00%		188,307.00	30,129
Sub-Total				**218,436**
GC Fee	9.00%		218,436.12	19,659
Escalation - August 2018	5.00%		238,095.37	11,905
TOTAL CONSTRUCTION COST				**250,000**
Scheme B: New Boathouse				
A1013 Perimeter drainage and insulation				
Perimeter drain pipe and rock	321	LF	22.00	7,062
Perimeter insulation	803	SF	4.90	3,932
A1031 Standard slab on grade				
Mat slab	5,224	SF	26.50	138,436
B 1010 Floor Construction				
Floor construction	4,021	SF	28.50	114,599
B 1020 Roof Construction				
Roof Construction	5,224	SF	24.50	127,988
B2011 Exterior wall construction				
Cladding	4,800	SF	20.00	96,000
Stud framing	4,800	SF	8.50	40,800
Batt insulation	4,800	SF	0.70	3,360
Wall sheathing 1/2"	4,800	SF	2.35	11,280
Vapor retarder	4,800	SF	0.85	4,080
Gypsum board	4,800	SF	2.10	10,080
Fascia	1	LS	5,500.00	5,500
Caulking, sealants and firestopping				
Caulking, sealants and firestopping	1	LS	8,500.00	8,500

Page 7

GLSCC
Options
Preliminary ROM Estimate

C & N Consultants, Inc.

Date: **August 18, 2017**
Prepared By: AC

Item Description	Quantity	Unit	Unit Cost	Totals
B2021 Windows				
Windows	1,600	SF	70.00	112,000
B 2030 Exterior Doors				
Aluminum glazed entrance door, types F&G including frame and hardware				
Single	1	EA	2,150.00	2,150
OHC door	4	EA	8,500.00	34,000
B3011 Roof finishes				
Roofing system, complete	5,224	SF	17.50	91,420
B3014 Flashings and trim				
Sheet metal flashings and trim	1	LS	5,200.00	5,200
B3016 Gutters and downspouts				
Guttering and downspouts	1	LS	4,800.00	4,800
Miscellaneous				
Rough carpentry	1	LS	6,000.00	6,000
C1011 Fixed partitions				
Stud framing	3,740	SF	3.75	14,025
Batt insulation	3,740	SF	1.15	4,301
Gypsum board, 5/8", underlayment	1,870	SF	2.60	4,862
Gypsum board, 5/8"	7,480	SF	3.05	22,814
C1035 Identifying devices				
Code signage	9,517	SF	0.15	1,428
Wayfinding and room identification signage	9,517	SF	0.30	2,855
C1037 General fittings and misc. metals				
Miscellaneous metals, allow 0.4#/SF	3,807	LB	3.00	11,420
C 2010 Stair Construction including railings and finish				
Stairs	2	FLT	22,500.00	45,000
C3012 Wall finishes to interior walls				
Wall finishes	1	LS	18,500.00	18,500
C3024 Flooring including base				
Floor finishes	9,517	SF	4.85	46,157
C3031 Ceiling finishes				
Ceiling finishes	9,517	SF	4.85	46,157
D1011 Passenger elevators				
Passenger elevator, 2 stop including cab finish	1	EA	125,000.00	125,000
Plumbing				
Plumbing	1	LS	30,108.00	30,108

Page 8

GLSCC
Options
Preliminary ROM Estimate

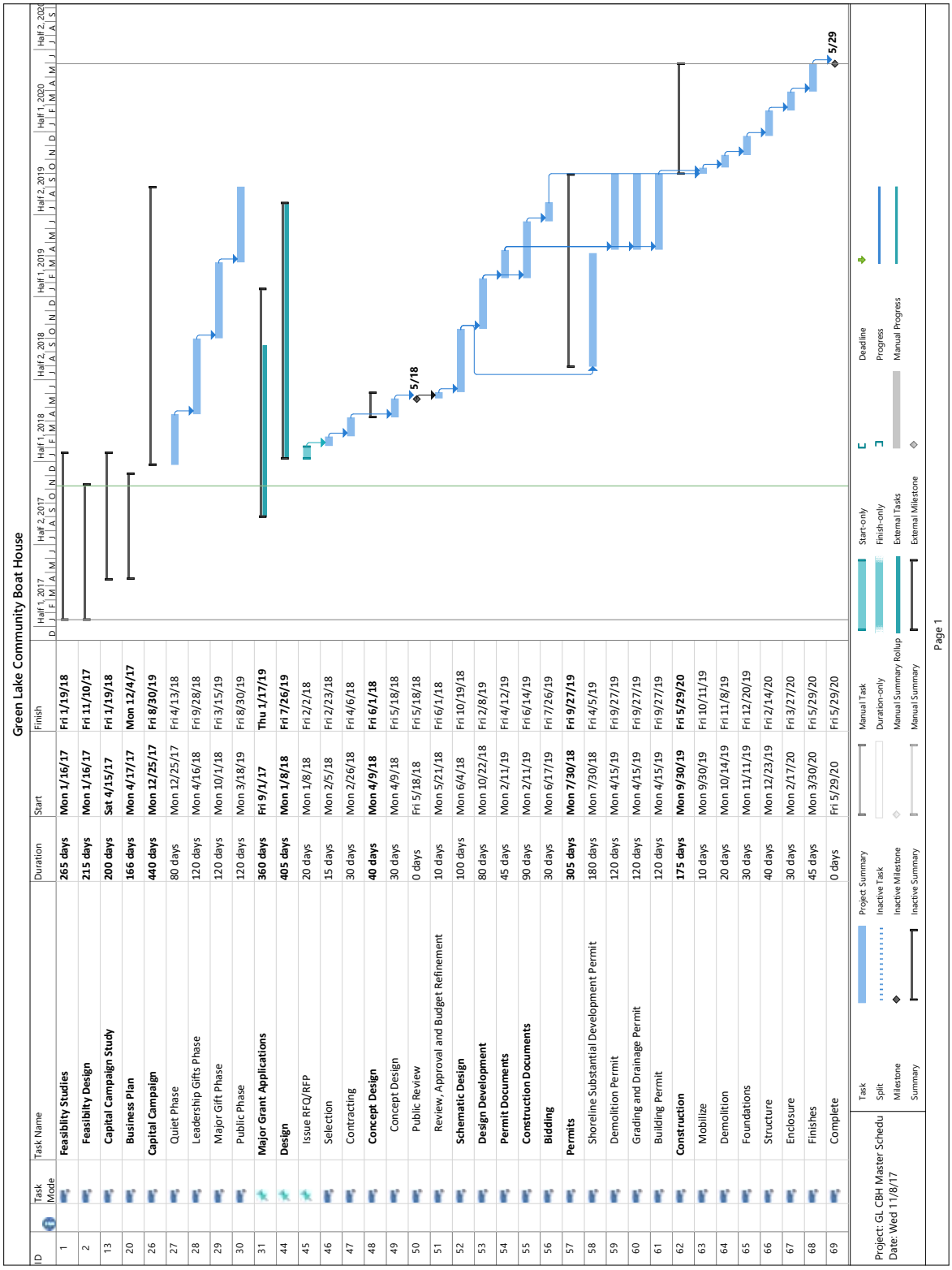
C & N Consultants, Inc.

Date: **August 18, 2017**
Prepared By: AC

Item Description		Quantity	Unit	Unit Cost	Totals
HVAC					
HVAC		1	LS	247,000.00	247,000
Fire sprinkler estimate					
Fire sprinkler system		1	LS	46,225.00	46,225
Electrical					
Electrical		1	LS	203,390.00	203,390
E2012 Fixed casework					
Casework		1	LS	6,200.00	6,200
Demolish existing boathouse building		3,500	SF	8.50	29,750
	Sub-Total				**1,732,380**
Estimating / Design Contingency		20.00%		1,732,379.70	346,476
	Sub-Total				**2,078,856**
General Conditions		16.00%		2,078,855.64	332,617
	Sub-Total				**2,411,473**
GC Fee		9.00%		2,411,472.54	217,033
Escalation - August 2018		5.00%		2,628,505.07	131,425
	TOTAL CONSTRUCTION COST				**2,759,930**
Scheme B - Launch boat docks					
Launch boat docks, covered		1	LS	156,922.50	156,923
	Sub-Total				**156,923**
Estimating / Design Contingency		20.00%		156,922.50	31,385
	Sub-Total				**188,307**
General Conditions		16.00%		188,307.00	30,129
	Sub-Total				**218,436**
GC Fee		9.00%		218,436.12	19,659
Escalation - August 2018		5.00%		238,095.37	11,905
	TOTAL CONSTRUCTION COST				**250,000**

Page 9

6.4 DETAILED PROJECT SCHEDULE



ID	Task Mode	Task Name	Duration	Start	Finish
1		**Feasibilty Studies**	**265 days**	**Mon 1/16/17**	**Fri 1/19/18**
2		**Feasibilty Design**	**215 days**	**Mon 1/16/17**	**Fri 11/10/17**
13		**Capital Campaign Study**	**200 days**	**Sat 4/15/17**	**Fri 1/19/18**
20		**Business Plan**	**166 days**	**Mon 4/17/17**	**Mon 12/4/17**
26		**Capital Campaign**	**440 days**	**Mon 12/25/17**	**Fri 8/30/19**
27		Quiet Phase	80 days	Mon 12/25/17	Fri 4/13/18
28		Leadership Gifts Phase	120 days	Mon 4/16/18	Fri 9/28/18
29		Major Gift Phase	120 days	Mon 10/1/18	Fri 3/15/19
30		Public Phase	120 days	Mon 3/18/19	Fri 8/30/19
31		**Major Grant Applications**	**360 days**	**Fri 9/1/17**	**Thu 1/17/19**
44		**Design**	**405 days**	**Mon 1/8/18**	**Fri 7/26/19**
45		Issue RFQ/RFP	20 days	Mon 1/8/18	Fri 2/2/18
46		Selection	15 days	Mon 2/5/18	Fri 2/23/18
47		Contracting	30 days	Mon 2/26/18	Fri 4/6/18
48		**Concept Design**	**40 days**	**Mon 4/9/18**	**Fri 6/1/18**
49		Concept Design	30 days	Mon 4/9/18	Fri 5/18/18
50		Public Review	0 days	Fri 5/18/18	Fri 5/18/18
51		Review, Approval and Budget Refinement	10 days	Mon 5/21/18	Fri 6/1/18
52		**Schematic Design**	100 days	Mon 6/4/18	Fri 10/19/18
53		**Design Development**	80 days	Mon 10/22/18	Fri 2/8/19
54		**Permit Documents**	45 days	Mon 2/11/19	Fri 4/12/19
55		**Construction Documents**	90 days	Mon 2/11/19	Fri 6/14/19
56		**Bidding**	30 days	Mon 6/17/19	Fri 7/26/19
57		**Permits**	**305 days**	**Mon 7/30/18**	**Fri 9/27/19**
58		Shoreline Substantial Development Permit	180 days	Mon 7/30/18	Fri 4/5/19
59		Demolition Permit	120 days	Mon 4/15/19	Fri 9/27/19
60		Grading and Drainage Permit	120 days	Mon 4/15/19	Fri 9/27/19
61		Building Permit	120 days	Mon 4/15/19	Fri 9/27/19
62		**Construction**	**175 days**	**Mon 9/30/19**	**Fri 5/29/20**
63		Mobilize	10 days	Mon 9/30/19	Fri 10/11/19
64		Demolition	20 days	Mon 10/14/19	Fri 11/8/19
65		Foundations	30 days	Mon 11/11/19	Fri 12/20/19
66		Structure	40 days	Mon 12/23/19	Fri 2/14/20
67		Enclosure	30 days	Mon 2/17/20	Fri 3/27/20
68		Finishes	45 days	Mon 3/30/20	Fri 5/29/20
69		Complete	0 days	Fri 5/29/20	Fri 5/29/20

6.5 PROJECT BUDGET

PROJECT ESTIMATE NUMBER 1

PROJECT TITLE			Activity (WC) Number
Program (K72) Number	**Project (K73) Number**	**Const. Contract Amount (CCA)**	**Applicable Sales Tax**
		$ 3,700,000	10.10%
Total Appropriation to Date	**CIP Budget Amount**	**Estimate Submitted By**	**Date**
	$ 5,972,583		16-Mar-16
Project Manager Signature	**Date**	**Review (Karen Haslam) Signature**	**Date**

	PROJECT ACTIVITY DESCRIPTION	% of CCA Standard %	% of CCA Adjusted %	Estimate	Comments
PLANNING					
A30	Conservation Corps Demolition/Clean-up Agreements	0.00%		$ -	
A50	Acquisition Legal Costs	0.00%		$ -	
P40	Proj Initiation/Pre-Design Program Study	0.20%		$ 7,400.00	
P41	Design Program Development/Approval	0.50%		$ 18,500.00	
P42	Consultant Selection	0.20%		$ 7,400.00	
P43	Environ & Permit Planning	0.20%		$ 7,400.00	
P70	Development Public Process	1.00%		$ 37,000.00	
P71	Other Public Involvement Costs	0.20%		$ 7,400.00	
P79	Other Planning Costs	0.20%		$ 7,400.00	
	PLANNING: PROJECT MANAGEMENT				
P80	Project Management Start-up	0.20%		$ 7,400.00	
P81	Design Program Development/Approval	0.20%		$ 7,400.00	
P82	Consultant Selection	0.20%		$ 7,400.00	
P83	Design Contract Negotiation/Approval	0.50%		$ 18,500.00	
	Planning Subtotal	**3.60%**		**$ 133,200.00**	
DESIGN					
D51	Design Contract	15.00%		$ 555,000.00	
D52	Design Contract Amendments	1.00%		$ 37,000.00	
D53	Design Commission	0.33%		$ 12,333.33	
D54	Design Surveys	2.40%		$ 88,800.00	
D55	In-house Design	0.00%		$ -	
D56	In-house Design Review (Core Team etc.)	1.45%		$ 53,786.90	
D57	Design IDWOs	0.00%		$ -	
D58	Property/ROW Services	0.00%		$ -	
D59	Other Design Costs	0.50%		$ 18,500.00	
D73	Permit Fees	0.50%		$ 18,500.00	
D74	Program Management	0.05%		$ 1,850.00	
D78	Art Allocation (if any)	1.61%		$ 59,722.83	
	DESIGN: PROJECT MANAGEMENT				
D84	Schematic Design	1.00%		$ 37,000.00	
D85	Design Development	0.00%		$ -	
D86	Construction Documents	1.30%		$ 48,100.00	
D87	Permit Processing	0.30%		$ 11,100.00	
	Design Subtotal	**25.45%**		**$ 941,693.06**	
CONSTRUCTION					
C60	Conservation Corps Construction Agreements	0.00%		$ -	
C61	Site Preparation	0.00%		$ -	
C62	Construction Contract, including 10.10% WSST	110.10%		$ 4,073,700.00	
C63	Construction Contingency @ 10% of C62 (incl. WSST)	11.01%		$ 407,370.00	
C64	Construction Materials	0.00%		$ -	
C66	In-House Construction Activities	0.00%		$ -	
C67	Construction IDWOs	0.00%		$ -	

	PROJECT ACTIVITY DESCRIPTION	% of CCA		Estimate	Comments
		Standard %	Adjusted %		
C68	Equipment and Furnishings	0.00%		$ -	
C69	Other Construction Costs	3.20%		$ 118,400.00	
C80	In-house Construction Inspection	3.20%		$ 118,400.00	
C81	Hazardous Materials Abatement	0.00%		$ -	
C82	Construction Inspection. Contracts	0.50%		$ 18,500.00	
C83	Construction Surveys	0.50%		$ 18,500.00	
	CONSTRUCTION: PROJECT MANAGEMENT				
C90	Bidding	0.50%		$ 18,500.00	
C91	Construction Administration	3.00%		$ 111,000.00	
	Construction Subtotal	**132.01%**		**$ 4,884,370.00**	
CLOSEOUT:	**PROJECT MANAGEMENT**				
F92	Project Closeout	0.36%		$ 13,320.00	
F93	Warranty	0.00%		$ -	
F94	Targeted Surplus	0.00%		$ -	
	Closeout Subtotal	**0.36%**		**$ 13,320.00**	
	OVERALL PROJECT TOTAL	**161.42%**		**$ 5,972,583.06**	CCA is 61.95% of Total Est.

APPROVAL SIGNATURES

Program Manager	**Date**
CIP Manager	**Date**
Director (PDD or Delegated Division)	**Date**

DISTRIBUTION

Original: **Project File**

Copies: **Accounting**
CIP Manager
Division Director (for Project site)
Program Manager
Project Manager
Director, Planning & Development Division
PDD CIP Finance Analyst (Karen Haslam)

6.6 CONSULTANT NARRATIVES

6.6.1 STRUCTURAL

November 14, 2017

Greenlake Small Craft Center
Initial Structural Assessment

This narrative summarizes structural observations of the existing buildings currently housing the Greenlake Small Craft Center programs. The programs occupy three buildings: the Boathouse, the Shell house, and portions of the remaining Greenlake Aqua Theater. The structural deficiencies and feasibility of future alternation to each of these buildings are discussed following. These observations are based on a site visit and the study of existing building drawings and reports.

This report also describes the structural system for a replacement structure for the Boat House.

Aqua Theater:

The remains of the original 1950's aqua theater structure is in overall poor condition. The lack of seismic resistance can lead to a collapse of all or portions of the structure in a major earthquake. It is our opinion that this, coupled with other life-safety issues, should discourage any continued use of the underneath portion of the structure without upgrades.

Following is a list of structural deficiencies:

- The 1950's original concrete is showing signs of decay and spalling in several places throughout the structure.
- Steel reinforcement is exposed at locations where the structure has been demolished and where concrete has spalled. The exposed reinforcement is rusted, and it is unknown how far the rust has propagated into the internal concrete structure.
- There is no discernable lateral load system. Existing masonry walls may take seismic loads, but are likely not detailed to withstand a major seismic event.
- Concrete columns supporting the grandstand have inadequate reinforcing to meet current building code requirements for seismic strength. They would be heavily damaged in a major earthquake and could collapse.
- The condition of the original 1950's timber pilings is unknown.
- Existing drawings do not indicate a positive connection between the timber pilings and concrete pile caps.

Structural Challenges of Future Construction:

The remaining Aqua Theater structure retains stability and strength for gravity loads, however, it is seismically deficient according to current building codes and would perform poorly in a seismic event. Upgrades to the structure would include improving the connection between the masonry walls and concrete structure, and adding more masonry walls supported by new pile foundations. All exposed rebar needs cleaning and covering to prevent further rust decay.

Boathouse:

The Boathouse structure appears to be in good condition. Three structural deficiencies are given below. It is worth noting that these deficiencies do not pose a significant life safety risk in a seismic event due to the fact the boathouse is a relatively lightweight structure, and has multiple exits.

- The cantilevered concrete columns supporting the roof trusses do not have adequate reinforcement to meet current building codes.
- The slab on grade rests on liquefiable soils, and lacks grade beam support.
- The construction drawings do not indicate any positive connections of the pile caps to the original 1950 timber piles below.

Structural Challenges of Future Construction:

While these deficiencies do not pose a significant life safety risk, they do present challenges to future building modifications. The Boathouse roof is fully supported by external roof trusses that span to and bear on cantilevered concrete columns. These cantilevered concrete columns in turn bear on top of 1950's era timber pilings that supported the original aqua theater. The walls of the Boathouse support their own self weight, and retain a few feet of soil on the southwest side of the building. Due to this roof system, any modification to the concrete columns will involve either removing or shoring all roof structure. Another complicating factor is the presence of liquefiable soils throughout the site.

Renovation:

Renovation of the existing boathouse without disrupting structural elements would possibly avoid triggering substantial upgrade requirements. A substantial upgrade relative to renovations/additions is defined in the 2015 Seattle Existing Building Code section 304.1.1 (2) as '*Remodeling or an addition that substantially extends the useful physical or economic life of the building, or a significant portion of the building, other than typical tenant remodeling*'. The Seattle Department of Construction and Inspections' client assistance memo #314 provides further clarification on how this designation is triggered. Avoiding a substantial alteration designation would avoid the requirement to update all structural systems to comply with current building code.

Addition:

An addition tied to the existing boathouse will trigger a substantial alteration designation. A substantial alteration designation requires the entire structure to be strengthened to comply with current building codes. For the boathouse, this would entail either retrofitting the cantilevered concrete columns with steel or polymer jackets, or possibly re-building the column and pile cap/grade beam connection. It would also entail installing out of plane bracing to walls, and installing grade beams to support the slab on grade.

The possibility of adding a second story to the existing boathouse is structurally not a feasible option. A second story would nearly double the weight bearing on the original 1950's timber pilings. It is unknown what condition the original pilings are in, and if any additional capacity can be obtained. Furthermore, adding a second story to the existing boathouse would introduce much higher seismic loads to the original pilings. In the case that the original pilings were shown to have adequate capacity for new loading, adding a story to the existing boathouse would trigger a substantial alteration designation. This would require the existing cantilevered columns and their pile cap connections to be extensively modified,

or removed and replaced. The existing roof trusses would have to be substantially modified to support a second story. Taking the challenges of unknown pile capacity and existing structural systems into account, it would be more feasible to construct new structure that is not bearing on the existing boathouse structure.

Replacement Building:

The replacement building scheme shown in the conceptual plans will be a Type IV heavy timber structure.

FOUNDATIONS: Due to potential liquefaction issues, we are assuming that the foundation for the building will be a solid thick mat that is also the floor slab of the Ground Level. This reinforced mat is estimated to be 30" thick for the entire building footprint. Soil supporting the mat may require over-excavation and replacement with imported fill. No geotechnical investigation has been performed and these recommendations are just preliminary assumptions based on similar sites. Pile foundations may be considered as an alternative to the mat foundation.

FLOOR FRAMING: The upper floor framing consists of deep glulam beams on the numbered grids supporting glulam joists at 5'-0"oc spanning between them. The floor system is 2x decking with plywood sheathing.

ROOF FRAMING: Roof framing consists of deep glulam beams on the grid lines and 2x6 decking (laid vertical) spanning 22'-0". The decking is covered with plywood sheathing. On the water side of the building, the glulam beams and decking extend as cantilevers over the exterior deck. Panelized decking systems will be considered for the decking of the floor and roof.

VERTICAL FRAMING: The conceptual design plan for the building shows columns centered on the shell storage racks and 20'-0" oc. These columns need to be 8"x8" timbers for the Type IV (HT) rating. Columns extend through the upper level to support the roof. The solid exterior walls will be plywood sheathing on 2x6 studs acting as shear walls. Interior walls around the elevator would also need structural sheathing for shear wall. On the water side of the structure there will be diagonal braces made from glulams bolted to knife plates at the floor and tops of columns. This helps resist lateral forces from wind and earthquakes.

Shell house:

The roof structure of the existing Shell house is similar to the boathouse. The main difference being that the slab-on-grade and walls of the shell house have undergone extensive repairs following the 2001 Nisqually earthquake. Because the roof structure is supported by cantilevered columns on existing pilings, the challenges to renovating, expanding, or replacing structure at the shell house are the same as those listed for the boat house.

6.6.2 ELECTRICAL

Electrical Report

Introduction

Green Lake Small Craft Center was visited on April 13 & 20, 2017 to investigate the existing facility and provide assessment to the existing electrical installations and systems. The purpose of this assessment is to observe the existing electrical installations and develop recommendations to facilitate future planning for improvements and modifications.

EXISTING CONDITIONS:

Existing Utility Services

Electrical power to the facility is served by Seattle City Light (SCL) and is delivered from an existing utility pole across West Green Lake Avenue North. The underground SCL secondary service feeder to the building is in existing 4" conduit serving a utilization power of 240/120 volts, high leg delta, 3-phase, 4-wire, 60 hertz system. The facility's main service equipment is located at Shell House building Main Electrical Room. Power is distributed through (4) SCL utility service meters utilizing meter-main circuit breaker service equipment configurations. The power is distributed to various panels in the facility. The SCL electrical service appears adequate to serve the building. However, the existing service equipment is aging and coming to the end of their useful life. As the building continues to age, it will become costly to maintain as the systems fail. It is also ideal to consolidate the utility service to a single utility meter to simplify billing.

The telephone service is served from the same utility pole as power. There is a 3" underground conduit with (1) 25-pair telephone service cable from the existing utility pole terminating at main communication (demarcation) board located at Main Electrical Room. Telephone signal is distributed throughout the facility utilizing Cat 3 cables. The telephone service cable should be adequate to serve the entire facility. Upgrade and modification to the main communication board will be required to accommodate future improvements to the facility.

No fiber optic cable infrastructure for data/internet system services going to the facility.

The cable television (CATV) service to the facility is delivered from the same utility pole as power. There is a 1" underground conduit with service coax cables terminating at existing communication backboard to serve the facility.

Power Distribution

The existing Panel P located at Shell House building main electrical room is serving the site lighting system, public restrooms, mechanical/electrical room and the sewer pump room located at the south

`

side of Boat House building. Panel P is rated 100 amps, 120/240 volts, 3-phase, 4-wire with 24 circuits and is manufactured by Westinghouse. The panel is aging but still in fair and operable condition. Consider replacing this panel in the near future as to prevent costly maintenance due to circuit breakers are failing.

Existing Panel A at Shell House building is serving the Shell House Storage area and the Rescue Boat House power and lighting systems. This panel is manufactured by Westinghouse rated 100 amps, 120/240 volts, single phase, 3-wire with 24 branch circuits. The panel is aging but appears in good operable condition and have ample spare circuits for future use. There is evidence of early corrosion to the enclosure. Replacing this panel should be considered in the future.

The existing Panel B at Boat House canoe/kayak storage area is rated 100 amps, 120/240 volts, single phase, 3-wire with 24 branch circuits. It is serving the space power and lighting system. Due to age and signs of corrosion to the panel, replacement would be desirable in future work.

Existing Panel C is serving mostly the administration offices and meeting room areas power and lighting circuitries. The Panel is manufactured by Westinghouse rated 200 amps, 120/240 volts, single phase, 3-wire with 42 circuits. There are enough available spare circuits for future use. The panel is in fair condition. Consider replacing this panel in the future due to its age and to prevent costly maintenance due to circuit breakers are failing.

There is an existing 6-circuit load center Panel LS located at Sewer Pump Room serving the lights and receptacles within room. The panel is manufactured by Westinghouse and is fed from Panel P. It appears in good condition and have available spare circuits for future use.

Interior Building Wiring

The branch circuit wiring system is a mixture of conduit and metal-clad (MC) cable for connection to light fixtures, receptacles and equipment. Majority of the wiring are exposed.

Power receptacles are installed in majority of the spaces. Some receptacles are rated 15 amps, 120V. This type of facility, it is recommended to use 20 amps rated duplex outlets. Receptacles that shows signs of corrosion need to be replaced for reliability and safety purposes.

In Administration Offices, Meeting Room and some Storage areas, additional receptacles would be desirable for general use and convenience.

Lighting

The facility's lighting system mostly comprises of surface mounted fluorescent strip fixture with T8 lamps. Some areas have incandescent lamp fixtures and HID type fixtures. Replacing these fixtures

with LED lamp source fixtures would reduce energy consumption and require less maintenance due to longer lamp life.

No occupancy sensors and daylight harvesting photocell devices are installed to all spaces in the facility. Providing automatic controls for these areas will enhance energy savings and will meet the requirements of the current Seattle Energy Code.

There is no emergency power generating equipment to the facility. It is not required in this type of establishment. The Code required emergency means of egress lighting and illuminated exit signage are accomplished utilizing battery backup integrated to the light fixtures. Additional emergency egress light fixture units will be required in Storage areas, Electrical Room, Administration Offices and Meeting Room to meet the requirements of current Code. Some illuminated exit signage fixtures have defective lamps that requires replacement to meet Code.

The Canoe/Kayak Storage, The Rat Room, Chuck's Room, ERG Room and Shell Storage at existing Boat Storage Building appear to be under illuminated to meet the light level criteria required by Code. Additional lighting fixtures and replacing all the fixtures in these areas with LED type fixtures will meet Seattle Energy Code and will reduce energy consumptions.

The existing building mounted exterior light fixtures are weatherproof wall pack type of fixtures with HID lamp. Replacing these fixtures with LED type fixtures will provide energy savings and reduce cost of maintenance due to less frequent lamp replacement.

There are no pole lights serving all the parking lots. The parking lots are just relying on over spill lights from existing poles lights serving the trail path and street lights. Providing pole lights to the parking lots will improve security in the area.

Telephone/Data System

Telephone and data outlets are in Administration offices and Meeting Room. The cables are run exposed and goes aerial from Boat House building to Shell House building then terminating at main communication board. These cables need to be installed in a conduit system to maintain reliability of telephone and data signals.

Surveillance Close Circuit Television (CCTV)

There is no CCTV monitoring system in the facility. Providing site monitoring CCTV camera will improve security to the facility.

Security/Access Control

No security access control system installed.

Cable Television (CATV)

There is a CATV outlet at Boat House building Meeting Room. CATV coax cable run exposed and goes aerial from Boat House building to Shell House building then terminating at main communication board.

Fire Alarm System

There is no fire alarm system in the facility. Fire alarm notification and detecting devices are required in this type of facility as required by current Seattle Fire Code.

Conclusion

In general, the existing facility is aging and the electrical installations are starting to deteriorate over the years of its use. The electrical systems, equipment and other components are coming to the end of their useful life and are in need of replacement. As the building continues to age, it will become costly to maintain as the systems fail.

PROPOSED IMPROVEMENTS:

The project is about the improvement and modification of the existing Green Lake Small Craft Center. The purpose of this report is to established electrical design criteria required in rehabilitation of the Center. The improvements to the facility will comprise of three (3) options. It will be broken down into small, medium and large scales modifications. All the three improvement options will utilize the following general electrical design criteria unless noted otherwise:

GENERAL ELECTRICAL DESIGN CRITERIA:

The electrical design criteria will be based on the following Codes and Standards:

2015 International Building Code
2015 Seattle Building Code
2014 National Electrical Code
2015 Seattle Energy Code
2015 International Fire Code
2015 Seattle Fire Code Ordinance

INTERIOR WIRING

All existing receptacle devices and branch circuit wiring will be removed and will be replaced with new as per program requirements. All interior and exterior branch circuit wiring will utilize conduit system.

`

Receptacles will be distributed throughout the facility for convenience, computer use, appliances and equipment use. All general convenience outlets will be rated 20 Amps, 125 volts grounding type. Receptacles will predominantly be located on walls and will be provided per program requirements.

Branch circuitry will be provided as required for lighting, receptacles, mechanical units, equipment, and appliances connections. All branch circuit wiring will be in raceways.

Convenience outlets will be provided in Hallways and Lobby per Code requirements.

Small Craft Storage areas will be provided with 20 Amps general use duplex outlets per program requirements.

Receptacles GFCI type with weatherproof cover will be provided at Launch House for general purpose use.

Multipurpose Room, Meeting Rooms and Offices will be provided with receptacles per program requirements.

Toilets and Locker Rooms will be provided with GFCI type receptacles for general purposes use.

Workout/EGR area will be provided with duplex outlets per program requirements.

Outdoor receptacles shall be provided for maintenance purposes and shall be GFI type. It will have a weatherproof cover while in use and provision for padlock.

EMERGENCY POWER

Emergency power generating equipment is not required in this type of facility. The Code required emergency means of egress lighting and illuminated exit signage will be accomplished utilizing battery backup integrated to the light fixtures. The fire alarm control panel will also utilize battery back-up system as required by Code. Provision for padlocking covers will be provided.

LIGHTING

All existing lighting fixtures and respective control system will be removed and will be replaced with new. New lighting system both interior and exterior will be provided with high efficiency low energy consumption fixtures utilizing LED technology. Lighting will be high energy efficient and meet Seattle Energy Code requirements. Fixtures will be surface mounted, pendant mounted, or recessed per ceiling conditions, room usages, and architectural considerations.

Fixture types, in general, to be as follows:

Offices……..Recessed LED
Meeting Room and Multipurpose Room……..Linear Pendant LED
Lobby……..Surface or pendant LED
Hallways ……Surface or Recessed LED
Locker Rooms, Mechanical/Electrical, Toilets, Misc……..Wraparound LED
Shell House and Boat House Storages……Surface LED
Launch House……..Surface LED

Workout/EGR area……..Surface LED
Exterior…….. Weatherproof Wall Surface LED

Lighting control system will be provided to meet the requirements of Seattle Energy Code. Localized switching will be accomplished with digital type wall switches. Automatic controls will be provided with occupancy sensors in most spaces and daylight sensors in all spaces with daylight zone areas per Seattle Energy Code requirements.

Exterior lighting fixtures will be LED, weatherproof type with sharp cutoff optics. Exterior lighting systems will be provided per facility's program requirements with safety and area pathway way illumination as priorities. Wall mounted sconces and recessed fixtures in soffits will be provided on building exterior to illuminate entry areas and pathways around the building. Control will be combination of photocell sensor and timeclock system.

Lighting systems shall be designed to provide illumination levels in accordance with the recommendations of the Illuminating Engineering Society (IES). Generally, as follows:

Offices and Meeting Rooms……30-40 footcandles
Multipurpose Room……30 footcandles
Kitchen……50 footcandles
Lobby……30 footcandles
Hallways ……10 to 15 footcandles
Locker Rooms……20 to 25 footcandles
Workout/EGR ……30 footcandles
Storage, Toilets, Misc……20 footcandles
Mechanical/Electrical/Pump Rooms……..20 footcandles
Exterior Perimeter Surroundings……2 footcandles

COMMUNICATIONS SYSTEMS

Data and Voice cabling and termination system will be provided consisting of all wiring, jacks, raceways, punch-down terminal blocks, patch cords, patch panel and wall mounted rack. System will be based on EIA/TIA 568, Category 6 twisted pair. Data and Voice cabling will be Category 6 and will be routed open above accessible ceilings and in raceway where in walls, exposed and above non-accessible ceilings. No exposed cable homeruns will be allowed. RJ45 Cat6 jacks will be used for data and voice outlets. Quantity of data and voice outlets will be determined by program requirements. All cables will homerun to Data Room. All computers, network switches and routers by owner.

Data outlet will be provided to support wireless access point (WAP). WAP devices will be placed throughout per program requirements to provide Wi-Fi access coverages.

Cable Television (CATV) will be provided per program requirements. Coax cable will be used for signal transmission at RG-6 CATV outlets

FIRE ALARM AND DETECTION SYSTEM

Fire Detection and Alarm System: A fire alarm system will be provided in compliance with the International Fire Code and Seattle Fire Code requirements. The system will be completely addressable. Smoke detection to be provided for egress pathways, Storage Rooms, Meeting Rooms, Multipurpose Room, Office, Kitchen, Data Room, lobby, Mechanical/Electrical Room. Notification

horn/strobes and strobes to be provided throughout as required for Code prescribed audibility and visibility levels. LCD annunciator to be provided at main entry.

Fire alarm panel to provide interface connection with sprinkler system's tamper switch, flow switch and alarm switch for supervision and monitoring. Post Indicator Valve (PIV) will be supervised and monitored by the Fire Alarm Panel per Code compliance.

ACCESS CONTROL AND SECURITY SYSTEMS

Access Control and Security Systems will be provided in the facility. Card readers will be provided at selected exterior entry doors. As required by program some interior rooms will be provided with card reader access such as Data Room, etc. Card readers and associated devices will be terminated at the Access Control Panel located at Data Room. A data outlet will be provided at the panel for remote data gathering, monitoring and programming purposes.

PROPOSED OPTION A (SMALL) IMPROVEMENTS:

UTILITY SERVICES

Existing electrical service equipment will remain to serve Option A improvements. Existing electrical service is adequate to support the small improvement option.

The existing (1) 25-pair telephone service cable to remain to serve Option A improvements. No service upgrade is required for the small improvement option.

Fiber optic cable and infrastructure support will be provided for data/internet system as desired per program required. There will be a new 4" underground conduit to be provided from existing communication board to existing utility pole in support of fiber optic cable.

The existing 1" underground conduit with service coax cables terminating at existing communication backboard will remain to serve the facility.

Power Distribution

The existing Panel P at Main Electrical Room will be removed and will be replaced with a new panel. The new Panel P will be rated 125 amps, 120/240 volts, 3-phase, 4-wire with 42 circuits to accommodate new loads. New feeder will also be provided for the new panel. This new panel will serve exterior site lighting, new lighting and receptacle circuitries at public toilets, mechanical exhaust fans and other equipment. This panel will also feed the existing panel at the Pump Room.

Existing Panel A at Shell House Storage building will be replaced with a new panel with adequate circuit capacity to support new load requirements. The new Panel A is rated 100 Amps, 120/240 volts,

single phase with 36 circuit capacity. The existing feeder will be replaced with new. This panel will serve lighting and receptacle circuitries at Shell House Storage and Launch House.

The existing Panel B at Boat House canoe/kayak storage area will be removed and will be replaced with a new Panel B. The new panel is rated 100 amps, 120/240 volts, single phase, 3-wire with 30 branch circuits. It will serve lighting and receptacle power at the new Boat House Storage and Coaches Office areas. Existing feeder wiring will be removed and will be provided with new.

Existing Panel C will be removed and will be replace with new. The new Panel is rated 200 amps, 120/240 volts, single phase, 3-wire with 42 circuits. This panel will serve receptacles and lighting circuitries at Parks offices, Locker Rooms and Workout/EGR areas. The existing feeder will be replaced with new.

The existing 6-circuit load center Panel LS located at Sewer Pump Room will remain. The existing feeder will be reconnected to the new Panel P located at the main Electrical Room.

PROPOSED OPTION B (MEDIUM) IMPROVEMENTS:

UTILITY SERVICES

Existing electrical service equipment will be upgraded to accommodate the loads for the new Option B improvements. The new service equipment will be consolidated to a single utility meter. A new main distribution panel will be provided to serve all the sub-panels in the facility and will be located at the existing Electrical Room. The new service voltage will be 208Y/120 volts, 3-phase, 4 wire system. Amperage is anticipated to be 400 amps. Amperage will be further evaluated and adjusted as necessary as design progresses. New 4" underground conduit will be provided from the new service equipment to the existing utility pole for Seattle City Light secondary service feeder. Service work will be coordinated with the utility company.

The existing (1) 25-pair telephone service cable will remain to serve Option B improvements. No telephone service upgrade is required for the medium improvement option.

Fiber optic cable and infrastructure support will be provided for data/internet system as desired per program required. There will be a new 4" underground conduit to be provided from existing communication board to existing utility pole in support of fiber optic cable. Service work will be coordinated with the utility service provider.

The existing 1" underground conduit with service coax cables terminating at existing communication backboard will remain to serve the facility.

Power Distribution

The existing Panel P at Main Electrical Room will be removed and will be replaced with a new panel. The new Panel P will be rated 125 amps, 208/120 volts, 3-phase, 4-wire with 42 circuits to accommodate new loads. New feeder will be provided for the new panel and will terminate to the new Main Distribution Panel. This new panel will serve exterior site lighting, new lighting and receptacle circuitries at public toilets, mechanical exhaust fans and other equipment. This panel will also feed the existing panel at the Pump Room.

Existing Panel A at Shell House Storage building will be replaced with a new panel with adequate circuit capacity to support new load requirements. The new Panel A will be rated 100 Amps, 208/120 volts, 3-phase, 4-wire with 36 circuit capacity. New feeder will be provided and will terminate at the new Main Distribution Panel. This panel will serve lighting and receptacle circuitries at Shell House Storage and Launch House.

The existing Panel B at Boat House Storage area will be removed and will be replaced with a new Panel B. The new panel will be rated 125 amps, 208/120 volts, 3-phase, 4-wire with 42 branch circuits. It will serve Lower Level lighting, receptacle and other equipment at the new Boat House Storage and Park Office areas. It will also provide power at the Pump Room. New feeder will be provided and will terminate at the new Main Distribution Panel.

Existing Panel C will be removed and will be replace with new. The new Panel will be rated 200 amps, 208/120 volts, 3-phase, 4-wire with 42 circuits. This panel will serve receptacles, lighting and other equipment at the Upper Level (Coaches office, Locker Rooms and Workout/EGR). New feeder will be provided and will terminate at the new Main Distribution Panel.

PROPOSED OPTION C (LARGE) IMPROVEMENTS:

UTILITY SERVICES

Existing electrical service equipment will be upgraded to accommodate the loads for the new Option C improvements. The new service equipment will be consolidated to a single utility meter. A new main distribution panel will be provided to serve all the sub-panels in the facility including the new two-story Multipurpose building and will be located at the existing Electrical Room. The new service voltage will be 208Y/120 volts, 3-phase, 4 wire system. Amperage is anticipated to be 600 amps. Amperage will be further evaluated and adjusted as necessary as design progresses. New (2) 4" underground conduit will be provided from the new service equipment to the existing utility pole for Seattle City Light secondary service feeder. Service work will be coordinated with the utility company.

New telephone service will be delivered to the building via underground conduit installed per applicable utility requirements. Telephone service cabling will be in a new 4" conduit and will be terminated to the same utility pole for power. New telephone service demarcation will terminate at

Data Room located at Upper Level Multipurpose Balcony building. Work to be coordinated with utility service provider.

Fiber optic cable and infrastructure support will be provided for data/internet system as desired per program required. There will be a new 4" underground conduit to be provided from existing communication board to existing utility pole in support of fiber optic cable. New fiber optic service will terminate at Data Room. Service work will be coordinated with the utility.

New Cable Television (CATV) service will be delivered to the building via underground conduit installed per applicable utility requirements. New CATV service cabling will be in a new 2" conduit and will be served to the same utility pole for power and will terminate at Data Room. Work to be coordinated with utility service provider.

Power Distribution

The existing Panel P at Main Electrical Room will be removed and will be replaced with a new panel. The new Panel P will be rated 125 amps, 208/120 volts, 3-phase, 4-wire with 42 circuits to accommodate new loads. New feeder will be provided for the new panel and will terminate to the new Main Distribution Panel. This new panel will serve exterior site lighting, new lighting and receptacle circuitries at public toilets, mechanical exhaust fans and other equipment. This panel will also feed the existing panel at the Pump Room.

Existing Panel A at Boat House Storage building will be replaced with a new panel with adequate circuit capacity to support new load requirements. The new Panel A will be rated 100 Amps, 208/120 volts, 3-phase, 4-wire with 36 circuit capacity. New feeder will be provided and will terminate at the new Main Distribution Panel. This panel will serve lighting, receptacle and other equipment circuitries at Boat House Storage and Launch House.

The existing Panel B at Boat House Storage area will be removed and will be replaced with a new Panel B. The new panel is rated 125 amps, 208/120 volts, 3-phase, 4-wire with 42 branch circuits and will be located at the new Boathouse/Multipurpose Level 1 building. It will serve Lower Level lighting, receptacle and other equipment at the new Boat House Storage. It will also provide power at the Pump Room. New feeder will be provided and will terminate at the new Main Distribution Panel.

Existing Panel C will be removed and will be replace with new. The new Panel will be rated 200 amps, 208/120 volts, 3-phase, 4-wire with 42 circuits and will be located at the new Multipurpose/Balcony Level 2 building. This panel will serve receptacles, lighting and other equipment at Upper Level (Coaches office, Meeting Room, Open Office, Multipurpose, Locker Rooms and Kitchen). New feeder will be provided and will terminate at the new Main Distribution Panel.

6.6.3 LANDSCAPE

CASCADE DESIGN COLLABORATIVE

Memo

To:	Schact Aslani	**Project:**	GLSCC – Green Lake Small Craft Center
Attn:	Evan Bourquard	**Date:**	Oct 25, 2017
From:	Kas Kinkead	**Pages:**	1
Cc:			
Subject:	GLSCC Feasibility report – Landscape Narrative		

Landscape narrative for Preferred Alternative

The intent for the Landscape design around the proposed project is to be simple, easily maintainable and in keeping with the character of this end of Green Lake and the Green Lake Trail. The proposed building will change views of this edge of the trail but the character of the south side of the trail will not change – the existing large trees will be protected and retained. The Pines at the southeastern corner may be able to be retained dependent on the level of control over construction impacts that is cost effective. The façade to the south facing the trail would include 4-6 deciduous trees that would screen the building's blank facades while letting light and views into and through the building. A planting of low native shrubs is proposed between the building and the trail that would allow light into the windows, but screen views into the building by passers by.

Entries and exits from the building – the associated ramps and stairs and paths as shown are necessarily diagrammatic and will be refined as details are developed.
The entries and exits of the building are constrained by the existing buildings that will remain; ramps providing ADA pedestrian access and ease of moving the rowing shells will be rebuilt to improve access to the water's edge and the Boathouse. The access points will require stairs, handrails and guardrails. The eastern most access is a wide ADA ramp, the western side will have stairs down to the main entry of the Boathouse – adjacent to the current restrooms.

The access to the existing restrooms will be reconstructed – replacing the three existing benches and making the sitting area more intimate, though smaller. The sitting area will be redefined but still support the same number of benches.

The path to the lake between the restrooms and the new Boathouse will be substantially changed, improving access from the trail with a reconstructed ramp and stairs that provides access to the water's edge and the new entrance to the proposed Boathouse. Landscaping in this area will be low plantings and limited trees to keep visibility as open as possible to the lake.

Views from the entry points and views along the trail of the building will be important to the public and will require additional public review and comment. .

The Preferred alternative does not require the removal of any Exceptional Trees per the City of Seattle standard defintions. (Director's Rule 16-2009 - link: http://www.seattle.gov/dpd/codes/dr/DR2008-16x.pdf).

LANDSCAPE ARCHITECTURE + URBAN DESIGN
1402 3rd Avenue, Suite 415, Seattle, WA 98101 206.628.9133 www.cascadedesigncollab.com

6.6.4 GEOTECHNICAL REPORT

615 Second Avenue, Suite 280
Seattle, WA 98104
206.223.0326
www.svrdesign.com

Greenlake Small Crafts Center Improvements – Existing Conditions Site Civil
The Greenlake Small Crafts Center is located along the water's edge at the southwest side of Greenlake. The roughly 30,000sf site is within an ECA wildlife setback and an ECA liquefaction zone. It is bordered by the Greenlake multi-use trail on the west, the Greenlake Aqua Theater on the south and open park space to the north. Two 50ft long wooden docks extend from the water's edge along the east side of the site into the lake.

The site includes an existing shell house which provides boat storage and maintenance area for the Greenlake rowing teams and the Seattle Canoe and Kayak Club. The building also includes a public restroom for users of the park and multi-use trail. The existing boathouse to the south of the shell house, provides office space for coaching and park staff, a restroom, a changing area and work-out space for users of the facility. The remaining site area is primarily asphalt and concrete-paved with some landscaping and existing trees between the boathouse and multi-use trail.

The site is level from north to south, and slopes from the western edge along the multi-use trail to the shoreline along the eastern edge at between 12-16%. Asphalt pathways connect the multi-use trail paving to the water's edge to the north and south of the site and between the existing buildings. Catch basins collect surface water in the paved areas and provide conveyance connections from building floor drains and building downspouts. This stormwater is discharged directly into the lake. The downspouts along the eastern face of the existing boathouse are splash-blocked to the pavement and surface flow across the pavement to the lake.

Stormwater Controls and Compliance
In compliance with the 2016 Seattle Stormwater Code, the project storm drain design will include facilities to meet On-Site Stormwater Management requirements and the Peak Flow Control Standard. The On-site Stormwater Management minimum, requires that the project reduce the discharge of run-off from the site through the installation of infiltration and flow attenuation facilities. The Peak Flow Control Standard requires that the project limit the total run-off from the site such that the post-development peak flow of the 25-year storm event not exceed 0.4 cubic feet per second per acre. Additionally, the peak flow for the 2-year storm event not exceed 0.15 cubic feet per second per acre.

On-site stormwater management controls are triggered at 1,500sf of replaced or new hard surface. On-site stormwater management designs include project elements such as green (planted) roofs or non-infiltrating bioretention.

The flow control requirement, which limits discharge from the site, is triggered at 2,000sf of replaced or new hard surface. The feasibility of infiltration will need to be determined through geotechnical investigation, but due to the fill nature of the site, it is likely that infiltration is not feasible. With this assumption, the site development would need to meet the peak flow control standard (if triggered) through detention which would require shallow, or below water collection facilities and pumped systems. As the development will not increase the existing stormwater flow rates from the site, and because pollution generating impervious surface is not included in

the design (water quality is not required), the design team and Parks proposes that a more cost effective and impactful flow control design could occur elsewhere in the basin. The design team and Parks proposes to provide upland mitigation design in lieu of flow control at the site. Parks staff is discussing with SDCI a potential waiver for this project.

See below for reference to the guidance documents identifying the minimum requirements.

> **SMC 22.805.050. B.2** - Parcel-based projects shall meet the Minimum Requirements for On-site Stormwater Management contained in Section 22.805.070, to the extent allowed by law, if either the total new plus replaced hard surface is 1,500 square feet or more or the land disturbing activity is 7,000 square feet or more
>
> **SMC 22.805.050.C.4** - Parcel-based projects discharging into Bitter Lake, Green Lake, or Haller Lake, or to the drainage basin of such lake, shall comply with subsection 22.805.080.B.4 (Peak Control Standard) if the total new plus replaced hard surface is 2,000 square feet or more.
>
> **Director's Rule 21-2015 Appendix A Definitions** - "Replaced impervious surface" or "replacement of impervious surface" means, for structures, the removal and replacement of impervious surfaces down to the foundation and, for other impervious surfaces, the removal down to existing subgrade or base course and replacement."

Other Site Utility and Restoration Considerations
The proposed building will require sanitary side sewer connection. If the intent is to reuse the existing connection, the service must to be videotaped and pressure tested to verify condition and may require repair interventions such as slip lining. Sizing of fire and domestic services for the new construction will determine whether existing meters can be reused of whether new fire and domestic meters will be installed.

6.6.5 MECHANICAL

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

We visited the Green Lake Small Craft Center on April 13 and April 20 to evaluate mechanical systems and issues relevant to the possible renovation and long-term use of the building by the City of Seattle Parks Department and Green Lake Crew.

The City is studying three options. Option A is a limited renovation. Option B is a replacement of the existing Boathouse, and Option C is an all new boathouse larger than in Option B.

There are three separate buildings at the Center: The Shell House; the Boat House; and the Boat Storage facility (previously the Aqua Theater). No work is intended in the Aqua Theater structure in any of the three options.

Existing Fire Protection
None of the three buildings are currently equipped with fire sprinklers. They are all used for boat storage, so the opportunity for a fire that results in a large amount of property damage is possible.

We anticipate that none of the Options will include fire sprinklers as part of those programs. The new buildings in Option 2 and Option 3 will be built of heavy timber construction that eliminates the Code requirements for fire sprinklers.

Existing Plumbing
Plumbing services at the GLSCC are limited. There are public Men's and Women's Rooms on the south side of the Shell House. They were built with robust materials, but they date from the 1980's and are very heavily used. Parks counts this pair of toilet rooms as among the most used toilet rooms in the state.

There is also an exterior drinking fountain and a toilet room in the Boat House. That room includes a shower, toilet, and hand sink.

The existing building domestic water service is 2", and enters in the wet wall between the Men's and Women's rooms in the Shell House. It has sufficient flow and pressure to operate eight flush valve fixtures, four lavatories and water service for boat washing in the Shell House. Site pressure is approximately 87 psi per Seattle Public Utilities, although SPU is not sure where

these buildings are connected to SPU's system and there does not appear to be documentation that shows the source of the incoming water utilities.

There is an existing 50 gallon electric water heater with integral storage tank in the Boat House. The water heater has completed a significant portion of its service life and we anticipate replacement with a high-efficiency type.

Piping materials are Type L brazed copper for hot and cold water, and cast iron no-hub for waste and vent piping throughout. None of the water piping is insulated and/or labeled.

There are currently two ADA water closets in the existing public Men's and Women's rooms.

Due to the difference in pipe invert between the Shell House and the sewer piping in the street, sewage is currently pumped from the Small Craft Center to the street. When power in interrupted, sewage flows directly into the lake.

Existing HVAC

The Shell House and Boat Storage are unheated spaces. The Boat House has some existing heated spaces, but the existing heating systems are primitive and ventilation largely consists of opening doors. The existing public restrooms are adequately ventilated with a dedicated fan.

We anticipate full demolition of the existing heating and ventilation systems in the Boathouse, and new HVAC to support the architectural program whether Option A, Option B, or Option C.

It is important that the new HVAC systems be relatively simple, with modest maintenance requirements, and relatively robust, for long life.

The new locker rooms will include weight training, toilet facilities, lockers, and changing rooms, all of which will require ventilation and air conditioning.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Three

OPTION A

Option A includes complete internal renovations in the existing Boat House; a 1500 square foot unheated addition for boat storage; and refreshing the existing public restrooms in the Shell House.

Fire Protection
No fire sprinkler systems will be included in this scope.

Plumbing
We anticipate a new sewage pumping system as part of the site work, to be installed in the same location as the existing pumps. There will be one 4 inch sewer connection from the new building into this pumping system.

Storm drainage from all roof and deck drains will be piped (gravity flow) to a new storm drain site connection.

Storm drainage and waste piping: Below grade storm drainage and waste piping will be ABS or PVC plastic with solvent cement fittings, as will all vent piping; above grade storm drainage and waste piping will be cast iron with no-hub fittings.

The building's domestic water systems will be served by a new two inch domestic water service.

All domestic water piping will be Type L copper with ProPress style fittings, or cross-linked PEX with Uponor or Rehau fittings.

Hot water will be provided by a 95% efficiency gas fired water heater with integral 120 gallon storage tank, located in the Storage Room.

Fixtures for Small Craft Center:

- Water Closets: Wall mount, vitreous china, manual dual flush valves (1.1gpf/1.6gpf), with open seats. No infrared sensors.
- Lavatories: Counter-top or wall hung units as indicated on architect's drawings, vitreous china, with 1.5 gpm single handle mixing faucets which comply with ADA. No infrared sensors.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Four

Option A Plumbing Fixtures (cont.)

- Tile shower stalls with heavy duty shower valves.
- Service sink: 24" x 24" floor mount with wall mount service type faucet, pail hook, edge guards, backsplash and hose.
- Kitchen Sink: Eighteen gauge stainless steel, double bowl unit with 2.0 gpm single lever swing spout faucet, hose spray, 3/4 HP disposal and "Insta-hot" water dispenser Service valve box at refrigerator.
- Laundry box at clothes washer.
- Freeze proof hose bibbs with flush mount locking boxes on each face of building.

Fixtures for existing public toilets:

- Public Water Closets: Wall mount, stainless steel, with concealed flush valves and push button operation.
- Public Lavatories: Wall mount, stainless steel.
- Faucets: Commercial quality, polished chrome plated, cast brass.
- Freeze proof hose bibb with flush mount locking box and key handle.

HVAC
There will be no HVAC work in the Shell House.

The Boat House will have all new systems. There will be a rooftop heat pump unit for the Office and Boat Program areas, with exposed galvanized steel ductwork in the spaces. The Locker Room areas will be served by a rooftop heat recovery ventilator with an internal heating section (no cooling in the locker areas). The Workout/Erg space will have operable windows and doors for ventilation, but also overhead radiant electric heat and a large switched exhaust fan.

OPTION B

Option B includes a new two story Boat House, smaller than in Option C, with boat storage and Parks offices on the lower floor and lockers, office, and workout space on the upper floor. The Shell House toilet rooms will be remodeled, but otherwise the Shell House will remain the same.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Five

Option B (cont.)

Fire Protection
No fire sprinkler systems will be included in this scope.

Plumbing
There will be new ADA compliant locker rooms, including toilet facilities, lockers, and changing rooms. We anticipate six to eight additional water closets for both men and women, associated lavatories, and two showers each.

We anticipate a new sewage pumping system, installed as part of the site work. There will be one 4 inch sewer connection from the new building into this pumping system.

Storm drainage from all roof and deck drains will be piped (gravity flow) to a new storm drain site connection.

Storm drainage and waste piping: Below grade storm drainage and waste piping will be ABS or PVC plastic with solvent cement fittings, as will all vent piping; above grade storm drainage and waste piping will be cast iron with no-hub fittings.

The building's domestic water systems will be served by a new two inch domestic water service.

All domestic water piping will be Type L copper with ProPress style fittings, or cross-linked PEX with Uponor or Rehau fittings.

Hot water will be provided by a 95% efficiency gas fired water heater with integral 120 gallon storage tank, located in the Boat Shop on the lower level.

Fixtures for Small Craft Center:

- Water Closets: Wall mount, vitreous china, manual dual flush valves (1.1gpf/1.6gpf), with open seats. No infrared sensors.
- Lavatories: Counter-top or wall hung units as indicated on architect's drawings, vitreous china, with 1.5 gpm single handle mixing faucets which comply with ADA. No infrared sensors.
- Tile shower stalls with heavy duty shower valves.
- Service sink: 24" x 24" floor mount with wall mount service type faucet, pail hook, edge guards, backsplash and hose.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Six

Option B Plumbing Fixtures (cont.)

- Kitchen Sink: Eighteen gauge stainless steel, double bowl unit with 2.0 gpm single lever swing spout faucet, hose spray, 3/4 HP disposal and “Insta-hot” water dispenser Service valve box at refrigerator.
- Laundry box at clothes washer.
- Freeze proof hose bibbs with flush mount locking boxes on each face of building.

Fixtures for existing public toilets:

- Public Water Closets: Wall mount, stainless steel, with concealed flush valves and push button operation.
- Public Lavatories: Wall mount, stainless steel.
- Faucets: Commercial quality, polished chrome plated, cast brass.
- Freeze proof hose bibb with flush mount locking box and key handle.

HVAC

Although the public toilets will be renovated as set forth in “plumbing”, above, we anticipate no heating or ventilation work for the Shell House. It will be an unheated space.

The lower level Boat House boat storage area will be equipped with a manually switched exhaust fan for ventilation.

We anticipate two new split system heat pumps for space heating and cooling. One unit will serve the lower level offices, and one will serve the second floor office spaces. Both units will be high efficiency type with airside economizer.

An energy recovery ventilator with heating capability will bring fresh air into the locker spaces and exhaust air through the toilet and shower areas (no cooling in the locker rooms). Minimum airflow rate is twelve air changes per hour.

The workout area on the second floor will have overhead radiant heating and a switched exhaust fan. The intention for this area is for it to be largely unconditioned.

Exhaust ductwork serving the locker rooms will be aluminum or stainless steel to resist corrosion.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Seven

OPTION C (Preferred)

Option C includes a new two story Boat House with boat storage on the lower floor and lockers, office, and multipurpose space on the upper floor. The Shell House is also remodeled to be an indoor/outdoor workout space and kayak storage space.

Fire Protection
No fire sprinkler systems will be included in this scope.

Plumbing
There will be new ADA compliant locker rooms, including toilet facilities, lockers, and changing rooms. We anticipate six to eight additional water closets for both men and women, associated lavatories, and two showers each.

We anticipate a new sewage pumping system, to be installed as part of the site work. There will be one 4 inch sewer connection from the new building into this pumping system.

Storm drainage from all roof and deck drains will be piped (gravity flow) to a new storm drain site connection.

Storm drainage and waste piping: Below grade storm drainage and waste piping will be ABS or PVC plastic with solvent cement fittings, as will all vent piping; above grade storm drainage and waste piping will be cast iron with no-hub fittings.

The building's domestic water systems will be served by a new two inch domestic water service.

All domestic water piping will be Type L copper with ProPress style fittings, or cross-linked PEX with Uponor or Rehau fittings.

Hot water will be provided by a 95% efficiency gas fired water heater with integral 120 gallon storage tank, located in the Storage Room.

Fixtures for Small Craft Center:

- Water Closets: Wall mount, vitreous china, manual dual flush valves (1.1gpf/1.6gpf), with open seats. No infrared sensors.

Green Lake Small Craft Center
Mechanical Predesign Report
Existing Systems and Three Options
November, 2017

Page Eight

Option C Plumbing Fixtures (cont.)

- Lavatories: Counter-top or wall hung units as indicated on architect's drawings, vitreous china, with 1.5 gpm single handle mixing faucets which comply with ADA. No infrared sensors.
- Tile shower stalls with heavy duty shower valves.
- Service sink: 24" x 24" floor mount with wall mount service type faucet, pail hook, edge guards, backsplash and hose.
- Kitchen Sink: Eighteen gauge stainless steel, double bowl unit with 2.0 gpm single lever swing spout faucet, hose spray, 3/4 HP disposal and "Insta-hot" water dispenser Service valve box at refrigerator.
- Laundry box at clothes washer.
- Freeze proof hose bibbs with flush mount locking boxes on each face of building.

Fixtures for existing public toilets:

- Public Water Closets: Wall mount, stainless steel, with concealed flush valves and push button operation.
- Public Lavatories: Wall mount, stainless steel.
- Faucets: Commercial quality, polished chrome plated, cast brass.
- Freeze proof hose bibb with flush mount locking box and key handle.

HVAC

Although the public toilets will be renovated as set forth in "plumbing", above, we anticipate no heating or ventilation work for the Shell House. It will be an unheated space.

The lower level Boat Storage area will be equipped with a manually switched exhaust fan for ventilation.

We anticipate two new split system heat pumps for space heating and cooling. One unit will serve the Multipurpose Room, and one will serve the Entry/Coaches/Office spaces. Both units will be high efficiency type with airside economizer.

An energy recovery ventilator with heating and cooling capability will bring fresh air into the locker spaces and exhaust air through the toilet and shower areas. Minimum airflow rate is twelve air changes per hour.

Exhaust ductwork serving the locker rooms will be aluminum or stainless steel to resist corrosion.

6.6.6 GEOTECHNICAL REPORT

Zipper Zeman Associates, Inc.

Geotechnical and Environmental Consulting

J-1104
July 16, 2001

JRP Engineering, Inc.
2150 North 107th Street, Suite 375
Seattle, Washington 98133

Attention: Mr. Jim Perrault

Subject: Geotechnical Engineering Evaluation
South Green Lake Shell-house Facility
5900 West Green Lake Way North
Seattle, Washington

Dear Mr. Perrault:

Zipper Zeman Associates, Inc. (ZZA) is pleased to present herein a copy of the above-referenced report. This report presents the results of our subsurface exploration and geotechnical engineering study relative to post-earthquake soil conditions and foundation repair recommendations to the damaged shell-house facility. We understand damage to the subject shell-house facility occurred due to the Nisqually earthquake on February 28, 2001. Authorization to proceed with this study was provided by you by acceptance of our June 8, 2001 proposal. Our work was completed in general accordance with the scope of services described in the referenced proposal letter.

The purpose of the study was to establish general surface and subsurface conditions at the site from which conclusions and recommendations in support of design phase efforts could be formulated for the repair of the foundation and reconstruction considerations for the South Green Lake Shell-house Facility in Seattle, Washington. The scope of our work consisted of field explorations, laboratory testing, geotechnical engineering analysis, and preparation of this report. Our scope of services did not include sampling or testing of soil or water for regulated environmental contaminants.

In the event of any changes in the nature, design, or location of the proposed improvements, the conclusions and recommendations presented in this report should be reviewed and modified, if necessary, to reflect the changes. This report is an instrument of service and has been prepared in accordance with generally accepted geotechnical engineering practices for the exclusive use of JRP Engineering, Inc., Seattle Parks Department and their agents, for specific application to this project and the stated purpose.

SITE AND PROJECT DESCRIPTION

The project site includes an existing shell-house building north of the small craft center at the south end of Green Lake at 5900 West Green Lake Way North in Seattle, Washington. The Green Lake Path traverses around the west side of the shell-house and restroom facility.

18905 33rd Avenue West, Suite 117 Lynnwood, Washington 98036 (425) 771 - 3304

The shell-house facility is surrounded with the asphalt surfaced Green Lake Path and concrete sidewalk and entry to the west, an asphalt drive to the south, an asphalt ramped access area to a dock to the north and Green Lake to the east. The asphalt areas to the north and south of the building access boat storage and docks along the lakefront. The shell-house facility building consists of upper restrooms to the west and lower boat storage which daylights to the east. In addition, a rescue boathouse is attached to the northeast corner of the building and extends over the lake. The site slopes down to the east with the lower daylight area approximately 5 to 6 feet lower in elevation than the surface of the Green Lake Path.

We understand the shell-house facility at the south end of Green Lake experienced up to 4 inches of settlement with severe distress to the interior floors caused by the Nisqually earthquake on February 28, 2001. The building has been closed by the City of Seattle Department of Construction and Land Use (DCLU) due to the earthquake damage. The shell-house building has a steel truss roof which is structurally supported by 8 columns, with 4 columns east and 4 columns west of the exterior walls. The roof support columns are reportedly supported by vertical timber piling which were advanced to a depth of approximately 30 to 32 feet, but the floors were not structurally supported. The severity of damage to the floors due to liquefaction of the subgrade soils requires repairs including structurally supporting the new floors. In addition, we were informed that the pile supported columns moved laterally up to 2 inches and will require remedial repairs or replacement. Current conceptual reconstruction plans include using the existing columns and steel truss roof and replacing the remainder of the building including the floors and walls.

SITE CONDITIONS

The site conditions were evaluated in June 2001 for the current study. The surface and subsurface conditions are described below, while the exploration procedures and interpretive logs of the explorations are presented in Appendix A. Laboratory testing procedures and results are presented in Appendix A. The existing site features and approximate exploration locations are shown on the Site and Exploration Plan, Figure 1.

Surface Conditions

The project site includes an existing shell-house building north of the small craft center at the south end of Green Lake at 5900 West Green Lake Way North in Seattle, Washington. The Green Lake Path traverses around the west side of the shell-house and restroom facility. The shell-house facility is surrounded with the asphalt surfaced Green Lake Path and concrete sidewalk and entry to the west, an asphalt drive to the south, an asphalt ramped access area to a dock to the north and Green Lake to the east. The asphalt areas to the north and south of the building access boat storage and docks along the lakefront. The shell-house facility building consists of upper restrooms to the west and lower boat storage which daylights to the east. In addition, a rescue boathouse is attached to the northeast corner of the building and extends over the lake. The site slopes down to the east with the lower daylight area approximately 5 to 6 feet lower in elevation than the surface of the Green Lake Path.

Subsurface Conditions

The subsurface exploration consisted of advancing one boring (B-1) for the study at the approximate location shown on Figure 1. Soil descriptions presented in this report are based on the subsurface conditions encountered at the specific exploration location. Variations in subsurface conditions may exist across the site and the nature and extent of variations may not become evident until construction. If variations then appear, it may be necessary to reevaluate the recommendations of this report.

The geologic map, *Preliminary Geologic Map of Seattle and Vicinity* (USGS Map I-354, 1962) mapped the soils surrounding the lake as Qvt- Vashon glacial till, with the exception of an approximately one-half mile segment at the south end of the lake which is mapped as Qsc- Lacustrine or lake-bottom sediments which consists of unconsolidated sand, silt and clay. The shell-house area is within the mapped Lacustrine sediments.

The test boring (B-1), advanced for this study disclosed very loose to loose sand to a depth of approximately 18.5 feet, atop very loose sand with some interbedded silt to approximately 26.5 feet in depth. From 26.5 feet to approximately 33 feet in depth a loose to medium dense sand with some silt was encountered. Medium dense sand with interbedded sandy silt was disclosed below 33 feet to a depth of approximately 38 feet. Below 38 feet in depth, dense sand with some gravel and interbedded sandy silt was encountered, to approximately 48.5 feet in depth. Hard sandy silt with interbedded fine sand was encountered below approximately 48.5 feet in depth and extended to the bottom of the boring at 56.5 feet. We would interpret the upper sands and interbedded silts to be lacustrine sediments and alluvium to a depth of approximately 38 feet. The lower dense sands and hard sandy silts below approximately 38 feet in depth are interpreted as glacio-lacustrine deposits or glacially overridden lake-bottom deposits.

Groundwater

Groundwater was observed in boring B-1 at a depth of approximately 2.0 feet. It should be noted that groundwater conditions and soil moisture contents are expected to vary with changes in lake level, season, precipitation, site utilization, and other on- and off-site factors. The groundwater observed in boring B-1 correlates approximately with the surface water level of Green Lake.

Seismic Considerations

The project site lies within Seismic Zone 3 based on the 1997 Uniform Building Code as presented in Figure 16-2. Based on the soil conditions encountered at the site and published geologic literature, the soils correspond to a seismic soil profile type S_F. Soil profile type S_F applies to a profile consisting of predominantly loose sand or other soil that requires site specific evaluation due to high liquefaction potential.

Liquefaction occurs when loose, saturated and relatively cohesionless deposits temporarily lose strength as a result of earthquake shaking. Primary factors controlling the development of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, in-situ stress conditions and the depth to groundwater. Effects of soil liquefaction include settlement and lateral spreading, which reportedly occurred to the structure on the subject site during the February 28, 2001 Nisqually earthquake.

The subject site is included within a designated liquefaction prone area as classified by the Seattle Department of Construction and Land Use (DCLU) in the Critical Areas Folio. The southern portion of the Green Lake shoreline area was mapped as highly susceptible to liquefaction under a moderate to severe earthquake in a study titled, *Evaluation of Liquefaction Potential, Seattle, Washington* (Grant, and others, 1992). In addition to the ground movement observed in the February 28, 2001 earthquake (Richter Magnitude 6.8), lateral spreading near the shoreline reportedly also occurred during the 1949 and 1965 Puget Sound earthquakes (Richter Magnitudes 7.1 and 6.5, respectively).

CONCLUSIONS AND RECOMMENDATIONS

The shell-house facility at the south end of Green Lake experienced severe settlement and distress to the building and interior floors during the earthquake on February 28, 2001. The severity of damage to the building and floors due to liquefaction of the subgrade soils requires extensive repairs including structurally supporting the new floors. In addition, the roof support columns moved laterally and will require remedial repairs or replacement.

Based upon the subsurface exploration program, the project appears feasible from a geotechnical perspective utilizing piles for building and floor support, adequate drainage provisions and limited site grading. Our explorations revealed upper very loose to loose sand to a depth of approximately 33 feet. Below the upper loose sand, medium dense grading to dense sand with interbedded silt was noted to approximately 48.5 feet. Hard sandy silt was encountered below approximately 48.5 to the bottom at 56.5 feet. Due to the liquefaction potential of the upper very loose to loose sand, all structural components and settlement sensitive features should be supported by piling advanced into the dense sand or hard silt.

Site Preparation and Structural Fill

Adequate temporary and permanent control of surface water runoff and subsurface seepage will be required in order to allow any grading and construction of underground utilities to proceed. Excavation, filling, subgrade and grade preparation should be performed in a manner and sequence that will provide drainage at all times and proper control of erosion.

Site preparation is recommended to include removal of all portions of the existing structure, including foundations, floor slabs, other underground structures and utility conduits that will not be reused for the reconstruction. Any remaining voids should be filled with structural fill, controlled density fill or grout.

Based on our boring, adjacent to the existing building, the surface is generally surfaced with asphalt or concrete atop silty sand fill. Below the approximate one foot of fill, we encountered a very loose sand which became saturated at a depth of approximately two feet. We would expect limited grading associated with the demolition and removal of the existing building and construction of a new structure. In being the site improvement grades have not been established we would expect limited cuts and fills.

The new shell house facility, including the walls and floors, will be pile supported. Limited filling would be expected on the site and may include utility trench and wall backfill. The loose silty sand and sand materials encountered in our exploration appear suitable for use as compacted "structural fill", as discussed subsequently. However, because of the variable silt content, moisture conditioning by aeration, mixing, and drying may be necessary before the silty site soils can be properly placed and compacted. After stripping, the exposed ground surface should be compacted such that an in-place soil density of at least 95 percent is achieved, using the ASTM:D-1557 modified Proctor maximum dry density standard.

Structural fill should be placed over a properly prepared subgrade, as discussed above. Structural fill should be placed in 8-inch maximum loose lifts. Each lift should be compacted to at least 95 percent of the laboratory maximum dry density, using ASTM:D-1557 as the standard. All fill placed on existing slopes, which are steeper than 5H:1V (Horizontal to Vertical) should be properly keyed into the existing slope.

Pile Foundations

Our subsurface exploration program revealed the presence of about 30 feet of very loose to loose sand atop medium dense grading to dense sand with interbedded silt to a depth of approximately 48.5 feet. Below approximately 48.5 feet in depth a hard sandy silt was encountered to the termination depth of 56.5 feet. Based on the upper very loose soils encountered, the reconstructed shell-house structure should be supported by pile foundations bearing in the underlying dense sands and hard silts below approximately 40 feet in depth. In addition, to reduce possible differential floor slab settlements, it appears necessary to also transfer the floor slab support loads to pile foundations. The types of possible piling would include timber, steel pipe, steel H, and augercast. The most cost effective choices would be limited to the timber and augercast piling. For a proposed pile depth of up to 55 feet, the quality and quantity of timber piles would be limited. In addition, the possibility of pile driving vibration induced damage to nearby buildings would lead us to recommend against driven piling, except for pin piles driven with relatively small hammers as discussed below. Considering the site access conditions, soil conditions, and nature of the project, we recommend considering either augercast piles or 4-inch diameter pin piles for support of the walls and floors.

Augercast Pile Considerations

An augercast pile is formed by drilling to an appropriate predetermined depth with a continuous flight, hollow stem auger. Cement grout is then pumped down the stem of the auger under high pressure as the auger is withdrawn. The final result is a cast in-place concrete pile.

Reinforcing can be installed in the un-set concrete column to provide lateral and tension capabilities.

Pressure grouting typically results in a grout column diameter in excess of the nominal diameter of the drilled hole. We anticipate grout volumes may be on the order of 1.5 to 2 times the nominal volume of the drilled holes, due to the very loose to loose site soils. The contractor should be required to stagger the pile grouting and drilling operations, such that all piles within 10 feet of a pile being drilled have "set" for at least 24 hours.

Based on the explorations advanced for this study, the recommended depths of augercast piling at the specific boring locations have been estimated. The recommended pile lengths in this report assume 15 feet of penetration into the dense sands or hard silts. However, the elevation and nature of the bearing layer may vary. For this reason, we strongly recommend that the installation of all piles be observed by ZZA. Our representative would observe the contractors operation, collect and interpret the installation data and determine the required pile penetration depth.

Augercast piles would gain their vertical compressive capacity mainly from end bearing, with minimal contribution by side friction between the pile and the medium dense granular native soils. Vertical uplift pile capacity will develop as a result of side friction between the pile and the adjacent soil, along with the weight of the pile. Based on the conditions encountered in Boring B-1, augercast piles should extend into suitable dense to very dense native soils, and have a tip depth of 45 feet or deeper below the exiting ground surface grade. Properly installed 12-inch and 16-inch diameter augercast piles can be designed for a vertical compressive capacity of 30 and 40 tons, respectively. An ultimate uplift capacity equivalent to one-third of the allowable compressive capacity, plus the submerged dead weight of the pile, can be assumed.

We estimate that the settlement of augercast pile foundations, designed and installed as recommended, will be on the order of ½ inch or less. Most of this settlement is expected to occur rapidly as loads are applied. Post construction differential settlements should be minor.

Lateral resistance to foundation loads can be provided by augercast piles, as noted in the "Pile Fixity and Lateral Capacity" section of this report. If additional lateral resistance is required, passive earth pressure on the buried portions of the pile caps and/or grade beams can be incorporated into the design. We recommend a passive earth pressure as an equivalent fluid weight of 250 pounds per cubic foot for buried foundation members under static loading. The upper 18 inches of soil at exterior areas should be neglected for passive pressure calculations. Passive earth pressure assumes that the backfill is compacted to at least 90% of modified Proctor maximum dry density, and consists of predominantly granular soil. Under seismic loading, we recommend that passive earth pressures not be considered for lateral resistance, due to the liquefaction susceptibility of the site. Lateral pile capacity considerations are presented in the "Pile Fixity and Lateral Capacity" section of this report.

Because augercast piles are drilled, obstacles such as logs or rocks in the subsurface can cause difficult installation conditions. It is possible that obstacles encountered during drilling the piles would require relocation of piles at the time of construction if impenetrable obstacles are encountered at planned pile locations. It may be necessary to periodically remove the pile auger

from the holes during drilling in order to verify depths of the various soil types, and penetration into the bearing soil layer.

The adequacy of augercast piles is highly dependent on the drilling and grouting procedures, and on the specific soil conditions encountered at each pile location. Due to the variability of soils at the building location, we recommend that an experienced geotechnical representative monitor all pile installations. It may be necessary to increase the depth of some piles based on field conditions. We recommend that the contractor use equipment capable of extending piles to at least 10 feet below the design pile tip depth.

Pin Pile Considerations

Pin piles comprise relatively small diameter steel pipe which are driven into the ground with a pneumatic or hydraulic jackhammer or percussion driver to a designated "refusal" criteria. Pipe section lengths of 5 or 10 feet are commonly used. Successive pile lengths are either compression coupled or welded. Once the piles are installed, they are cut off to a pre-determined elevation, and lengths of reinforcing steel or top plates are generally welded to the top. The tops of the piles are then incorporated into a cast-in-place grade beam or pile cap that supports the structure.

The axial load capacity of pin piles is based on the diameter of the pile and resistance from the soils over the embedded portion of the pile. We recommend that pin piles consist of 4-inch (I.D.) Schedule 40, galvanized steel pipe as a minimum. The 4-inch piles should be driven to refusal criteria of less than 1-inch of penetration in 20 seconds (for 3 consecutive intervals) using a hydraulic hammer with a hammer weight of 650 pounds (TB 225 hydraulic hammer or equivalent). Each pile should be driven closed-end and subsequently filled with structural concrete after driving is complete. We recommend an allowable vertical axial capacity of 16 kips per pile for 4-inch pin piles installed to refusal criteria.

Determination of the depth to suitable bearing soils and the resultant pile capacities and depths will require field engineering decisions. We recommend that the pile installation and refusal criteria be observed by a representative of our firm. We estimate that pile lengths may vary from 45 to 55 feet below floor grade based on the conditions encountered in the boring. The pin pile capacity presented above is based on a minimum center-to-center pile spacing of 3 pile diameters, and includes a factor of safety of about 2.5. At least two pile load tests should be specified, assuming that less than 40 piles will be required. If more than 40 piles are required, additional load tests should be specified to provide for at least 5 percent of the total number of piles.

Larger diameter piles could be used to obtain higher capacities, if needed. Batter piles are not recommended, due to the liquefaction risk on the site and possible damage to batter piles. Lateral pile fixity and capacity considerations are presented in the "Pile Fixity and Lateral Capacity" section of this report.

We estimate that the settlement of pin pile foundations, designed and installed as recommended, will be on the order of ½ inch or less. Most of this settlement is expected to occur rapidly as loads are applied. Post construction differential settlements should be minor.

It is possible that obstructions such as buried wood and other debris could be encountered during pin pile installation. The allowable capacity of pin piles which meet refusal on obstructions at depths shallower than anticipated should be evaluated by a representative from our firm to determine if replacement piles will be required .

Pile Fixity and Lateral Capacity

The site is underlain by approximately 30 feet of liquefaction susceptible soil. The effects of liquefaction during future large-magnitude seismic events are likely to include ground settlements, reduction of soil strength adjacent to pile foundations, and lateral spreading of soils. Settlement and soil strength reduction can be mitigated by construction of pile foundations as recommended d in this report. Lateral spreading, however, is likely to induce lateral loads to the piles and cause lateral movement and excessive bending moments in pile foundations. The interconnection of pile tops as recommended below is intended to provide structural redundancy in the foundation system, to mitigate the risk of building collapse during lateral spreading caused by liquefaction. Mitigation of the lateral spreading risk, to allow the piles and structure to resist the loads caused by lateral spreading, would very likely exceed the cost of the structure itself.

Lateral resistance and bending moments of vertical pile foundations are governed primarily by the strength of near-surface soils and the strength of the pile itself. The design lateral capacity of the piles will depend, to a large extent, on the allowable lateral deflection and the degree of fixity of the pile top. Considering the liquefaction susceptibility of the site soils, we recommend that the tops of all piles (including the existing pile foundations supporting the roof) be structurally connected with grade beams or a structural slab. The pile top connection should be designed and constructed to fix the top of pile against rotation and develop a fixed-end moment. Our lateral pile analyses, described below, have assumed that the tops of all piles are restrained and fixed-headed.

For the very loose to loose granular soils, a horizontal modulus of subgrade reaction (n_h) equal to 7 pounds per cubic inch has been estimated for static loading conditions. Under cyclic loading, a decrease of n_h to 25 percent of the static value has been assumed. Using this value, and an assumed value for the stiffness and properties of the piles, the relative stiffness factor "T", was calculated as the fifth root of (EI/n_h). The moment and deflection coefficients presented in Tables 1 and 2 below were calculated using methods outlined in NAVFAC DM 7.2 "Foundations and Earth Structures". We recommend that the structural engineer calculate deflections and bending moments in the piles, using this methodology, and the strength of the pile to resist lateral loads, and provide an appropriate factor of safety.

For purposes of determining pile fixity to analyze column action referenced in UBC Chapter 1807, we recommend that the piles be considered fixed at the depth of zero deflection noted in Tables 1 and 2 below.

Lateral design parameters are represented below for 4-inch diameter steel pin piles. We recommend that pin piles subjected to lateral loads be fully fixed at the top, and that individual pipe connections be structurally designed to provide continuity. Field welds may be required to provide lateral capacities for pin piles.

Table 1: Lateral Pile Design Parameters (Static Loading)

Pile Type and Size	Assumed EI ($lb\text{-}in^2 \times 10^9$)	Relative Stiffness factor "T", (feet)	Depth to Point of Zero Deflection (feet)	Deflection per 1000 pound applied lateral load (inches)
8-inch tip diameter timber	1.1	3.6	11.2	0.07
12-inch diameter augercast	3.1	4.5	14.0	.0.05
16-inch diameter augercast	5.7	5.0	15.5	0.04
4-inch schedule 40 steel pin pile	0.2	2.6	8	0.15

Table 2: Lateral Pile Design Parameters (Cyclic Loading)

Pile Type and Size	Assumed EI ($lb\text{-}in^2 \times 10^9$)	Relative Stiffness factor "T", (feet)	Depth to Point of Zero Deflection (feet)	Deflection per 1000 pound applied lateral load (inches)
8-inch tip diameter timber	1.1	4.8	14.9	0.17
12-inch diameter augercast	3.1	5.9	18.3	0.11
16-inch diameter augercast	5.7	6.7	20.6	0.09
4-inch schedule 40 steel pin pile	0.2	3.4	10.6	0.34

The above values represent idealized performance of individual piles subjected to lateral loading, and do not contain a safety factor. If piles are spaced closer than about 8 times the diameter, reductions of lateral capacity are recommended to account for group effects. If piles are not fixed at the top, reduced lateral capacities and increased deflections would occur. If piles are not fixed at the ground surface, or if alternate pile types or sizes are proposed, we can provide additional analyses.

Floor Considerations

Due to the settlement sensitive nature of the very loose to loose sand in the upper 30 feet, structural floors are recommended. Structural floors could rest upon grade beams supported by the pile foundations. We recommend that the floor slab be underlain by at least 6 inches of pea gravel or crushed rock to function as a capillary break and working surface. The fines content of the capillary break material should be limited to 3 percent or less, when based on that soil fraction passing the U.S. No. 4 sieve. The floor slab thickness and reinforcing should be designed by the project structural engineer.

It may be necessary to install a drainage blanket and collector drains beneath the on-grade floor slab. We recommend that the possible need for underslab drainage be evaluated, based on the subsurface conditions encountered during construction.

An impervious moisture barrier (Visqueen) should also be utilized to provide protection against dampness. Two inches of clean, moist, sand should be placed both above and below the Visqueen.

Retaining Walls

All backfill placed behind subgrade walls should be placed in accordance with the recommendations presented in the Site Preparation and Drainage sections of this report, and as described below. The following recommended earth pressures are presented as an equivalent fluid unit weight and are based on the assumption that the wall backfill will consist of granular material without the buildup of hydrostatic pressures behind the wall.

All wall backfill should consist of free-draining granular material with drainage provisions as discussed in the subsequent Drainage section of this report. We recommend that at least two feet of free-draining backfill be provided against the back of the retaining wall, extending up to within 12 inches of the ground surface. The free-draining backfill should contain less than 3 percent fines (minus U.S. No. 200 sieve fraction) based on that soil fraction passing the U.S. No.4 sieve fraction. A relatively impermeable silty soil should be used to cap the upper 12 inches to provide a barrier to minimize surface water infiltration.

For a horizontal backfill surface, backfilled cantilevered walls may be designed for a triangular active earth pressure distribution using an equivalent fluid weight of 35 pcf. If the retaining wall has an inclined backslope no steeper than 2H:1V, an equivalent fluid weight of 50 pcf is recommended. The above equivalent fluid pressures assume that the backfill is compacted to about 90 to 92 percent of the modified Proctor maximum dry density (ASTM:D-1557). Additional lateral pressure should be added to this value to model surcharges such as traffic or construction loads, or seismic loads.

A surcharge is recommended for walls subject to traffic loading. A uniform pressure of 100 psf (pounds per square foot) is recommended for traffic loads, distributed uniformly over the wall. In the event that construction loads on the backfill adjacent to the wall exceed 250 psf, a higher surcharge may be required. Additionally, we calculated a uniform seismic surcharge

equivalent to 10 times H, where H is the height of the wall backfill, for seismic loads on a non-yielding wall.

The retaining wall design information presented above is applicable to backfilled walls constructed as a part of the shell house building. The bulkhead wall along the waterfront, if replaced, may require different soil parameters. We are available to provide design recommendations for the bulkhead wall if requested.

Drainage Considerations

Site grades should be set so that water does not collect adjacent to the structure or adjacent improvements. Instead, the ground should be sloped downward away from the structure so that run-off may be carried to a suitable discharge facility. As part of the site improvements, subsurface and surface drainage installations should be checked for leakage and repaired as necessary. We recommend all drainage be routed to a suitable discharge facility.

Positive drainage should be provided behind retaining walls or stem walls where the floor level is at or below adjacent grade by placing a zone of free-draining sand and gravel containing less than 5 percent fines (material passing No. 200 sieve) against the wall. The drainage zone should be at least 24 inches thick (measured horizontally) and extend from the base of the wall to within 1 foot of the finished ground surface behind the wall. The upper foot of wall backfill should consist of fine-grained structural fill compacted and graded to drain surface water away from the wall backfill zone. Rigid perforated drainpipe having a minimum diameter of 4 inches should be embedded within the free-draining material at the base of the wall along its entire length. This drainpipe should discharge into a tightline leading to an appropriate collection and disposal system. Roof and surface runoff should not discharge into the footing drain system. Instead, a separate tightline drain system should be used.

Temporary Excavation Considerations

The stability of temporary cut slopes made during site work is a function of many factors, including, but not limited to, the following considerations: 1) the presence and abundance of groundwater; 2) type and density of the various soil strata; 3) the depth of the cut; 4) surcharge loadings adjacent to the excavations; and 5) the length of time the excavation remains open. Consequently, it is exceedingly difficult to establish a safe and maintenance-free cut slope angle in advance of construction. Cut slope stability should, therefore, be the responsibility of the contractor, since he is continuously at the job site, able to observe the nature and condition of the subsurface materials encountered, monitor the cut performance, and control the scheduling of site activities.

We recommend that excavations greater than 4 feet in vertical height be adequately sloped or braced to prevent injury to workmen from localized sloughing and spalling. All excavations should be accomplished in accordance with applicable local, State or Federal safety provisions. As recommended in OSHA/WISHA guidelines, cuts in the loose granular soils should be no steeper than 2H:1V. Under adverse weather conditions, temporary slopes should be

draped with Visqueen or other means to protect them from the elements and minimize sloughing and erosion.

Pavement Design Considerations

It must be recognized that pavement design is a compromise between high initial cost and little maintenance on one side and low initial cost coupled with the need for periodic repairs. As a result, the owner will need to take part in the development of an appropriate pavement section. Critical features which govern the durability of the surface include the level of compaction of the subgrade, the stability of the subgrade, the presence or absence of moisture, free water and organics, the fines content of the subgrade soils, the traffic volume, and the frequency of use by heavy vehicles.

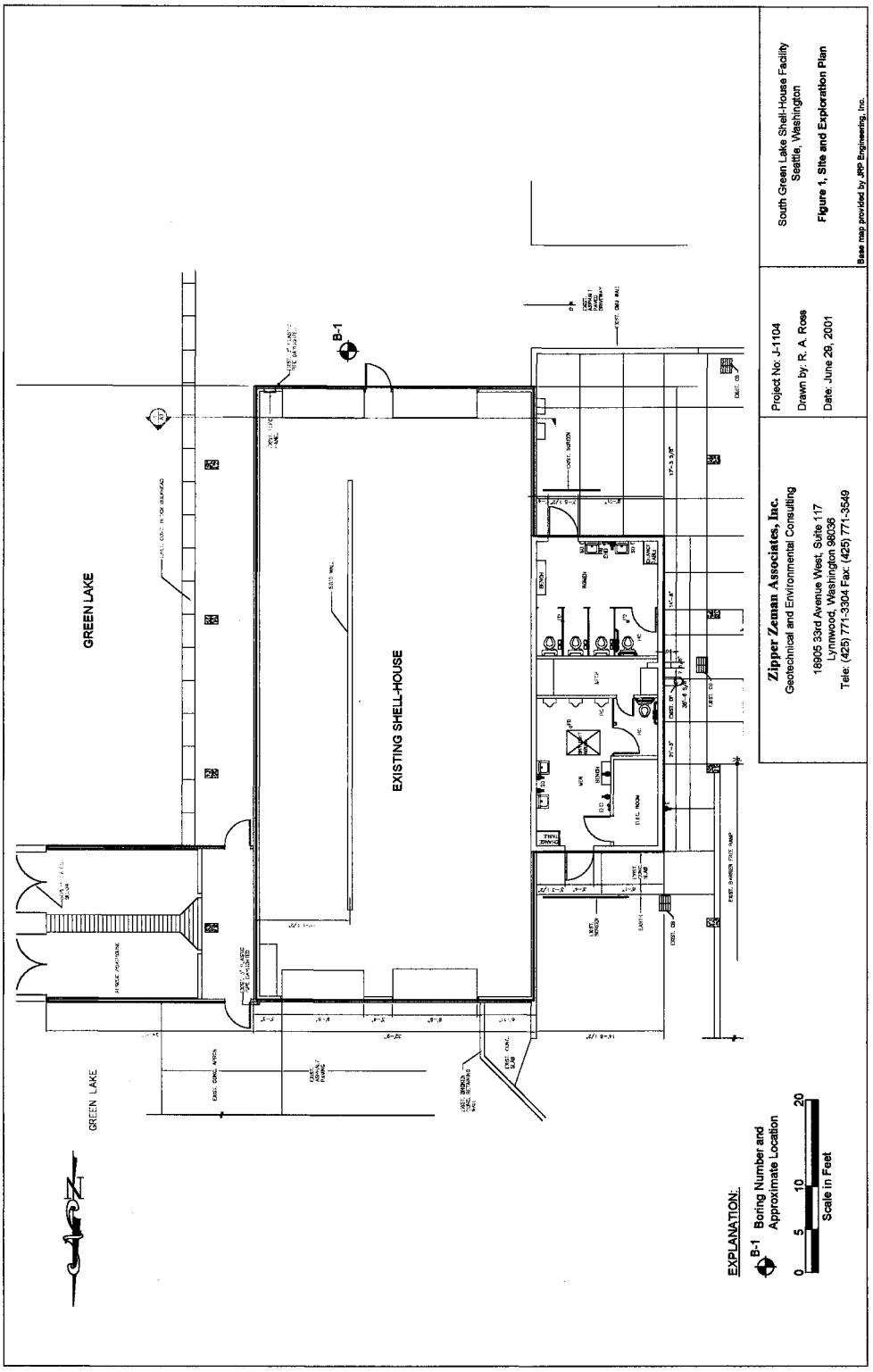
The pavement design recommendations assume that the subgrade and any structural fill will be prepared in accordance with the recommendations presented in this report. We recommend that all structural fill beneath the pavement surface be compacted to a minimum of 95 percent relative compaction, using AASHTO T-180 (ASTM: D1557) as a standard. In cut areas, we recommend that the subgrade be proofrolled to obtain a compaction level of at least 95 percent within the upper foot. For pavement sections founded in such a manner, we recommend the following pavement sections for this project:

1. Auto Parking Areas: Three inches Class B asphaltic concrete over four inches crushed aggregate base course.

2. Driveways, Fire Lanes, and Heavy Equipment Parking Areas: Three inches Class B asphaltic concrete over six inches of crushed aggregate base course.

Although a variety of less costly pavement sections are available, we recommend these sections in consideration of the anticipated subgrade soils, usage, and design life. A minimum three inch thickness of asphaltic concrete is recommended by the Asphalt Institute, even for car parking areas. We can provide alternative pavement sections, if required, considering reduced design life and more frequent maintenance. For example, asphalt treated base (ATB) could be considered in lieu of crushed rock if protection of the subgrade is required due to scheduling of earthwork.

Specifications for pavements and crushed top course should conform to specifications presented in the 2000 WSDOT *Standard Specifications for Road, Bridge, and Highway Construction* or applicable local standards. We recommend that the subbase course material conform to Sections 9-03.9(1), Ballast, 9-03.10, Aggregate for Gravel Base, 9-03.14, Gravel Borrow, or 9-01.14(2), Select Borrow and have a minimum CBR value of 40 percent. The crushed aggregate base course material should conform to Section 9-03.9(3), Crushed Surfacing Base Course.


GREEN LAKE
EXISTING SHELL-HOUSE
B-1
GREEN LAKE
EXPLANATION:
B-1 Boring Number and Approximate Location
0 5 10 20
Scale in Feet
Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting
18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549
Project No: J-1104
Drawn by: R. A. Ross
Date: June 29, 2001
South Green Lake Shell-House Facility
Seattle, Washington
Figure 1, Site and Exploration Plan
Base map provided by JRP Engineering, Inc.

CLOSURE

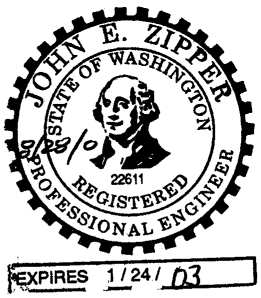
The conclusions and recommendations presented in this report are based on the explorations accomplished for this study. The number, location, and depth of the explorations for this study were completed within the site and scope constraints of the project so as to yield the information necessary to formulate our conclusions and recommendations.

The integrity and performance of the pile foundation system at this site depend greatly on proper design, site preparation and construction procedures. Field judgement by a qualified engineer will be necessary in order to determine the adequacy of the site drainage and pile foundation support systems. Therefore, because of our familiarity with the site soils, we recommend that Zipper Zeman Associates, Inc. be retained to provide geotechnical services during the design, earthwork and pile foundation construction phases of the project. If variations in the subsurface conditions are observed at the time of construction, we would be able to provide additional geotechnical engineering recommendations to the contractor and design team in a timely manner as the project construction progresses. We appreciate this opportunity to be of service to you, and would be pleased to discuss the contents of this report or other aspects of the project with you at your convenience.

Respectfully Submitted,
ZIPPER ZEMAN ASSOCIATES, INC.

Curt R. Thompson P.G.
Project Geologist

John E. Zipper P.E.
President



Enclosures: Figure 1 – Site and Exploration Plan
Appendix A- Field Exploration Procedures and Logs
Laboratory Testing Procedures and Results

APPENDIX A
FIELD EXPLORATION PROCEDURES AND LOGS
LABORATORY TESTING PROCEDURES AND RESULTS

Our field exploration for this project included one borings advanced on June 20, 2001. The approximate exploration location is shown on the Site and Exploration Plan, Figure 1. The exploration location was determined by measuring distances from existing site features with a fiberglass tape relative to a site plan, referenced on Figure 1. As such, the exploration location should be considered accurate to the degree implied by the measurement method. The following sections describe our procedures associated with the exploration. A descriptive log of the exploration is enclosed in this appendix.

Soil Boring Procedures

Our exploratory boring was advanced with a hollow stem auger, using a smaller, rubber-tracked drill rig operated by an independent drilling firm working under subcontract to our firm. An experienced engineering geologist from our firm continuously observed the boring, logged the subsurface conditions encountered, and obtained representative soil samples. All samples were stored in moisture-tight containers and transported to our laboratory for further visual classification and testing. After the boring was completed, the borehole was backfilled with bentonite and soil cuttings, and the surface was patched with concrete.

Throughout the drilling operation, soil samples were obtained at 2.5- to 5-foot depth intervals by means of the Standard Penetration Test (ASTM: D-1586). This testing and sampling procedure consists of driving a standard 2-inch outside diameter steel split spoon sampler 18 inches into the soil with a 140-pound hammer free falling 30 inches. The number of blows required to drive the sampler through each 6-inch interval is recorded, and the total number of blows struck during the final 12 inches is recorded as the Standard Penetration Resistance, or "blow count" (N value). If a total of 50 blows is struck within any 6-inch interval, the driving is stopped and the blow count is recorded as 50 blows for the actual penetration distance. The resulting Standard Penetration Resistance values indicate the relative density of granular soils and the relative consistency of cohesive soils.

The enclosed boring log describes the vertical sequence of soils and materials encountered, based primarily upon our field classifications and supported by our subsequent laboratory examination and testing. Where a soil contact was observed to be gradational, our log indicates the average contact depth. Where a soil type changed between sample intervals, we inferred the contact depth. Our log also graphically indicates the blow count, sample type, sample number, and approximate depth of each soil sample obtained from the boring, as well as any laboratory tests performed on these soil samples. If groundwater was encountered in a borehole, the approximate groundwater depth, and date of observation, are depicted on the log. Groundwater depth estimates are typically based on the moisture content of soil samples, the wetted portion of the drilling rods, the water level measured in the borehole after the auger has been extracted, or through the use of an observation well.

The boring log presented in this appendix is based upon the drilling action, observation of the samples secured, laboratory test results, and field log. The various types of soils are indicated as well as the depth where the soils or characteristics of the soils changed.

LABORATORY TESTING PROCEDURES

A series of laboratory tests were performed during the course of this study to evaluate the index and geotechnical engineering properties of the subsurface soils. Descriptions of the types of tests performed are given below.

Visual Classification

Samples recovered from the exploration locations were visually classified in the field during the exploration program. Representative portions of the samples were carefully packaged in moisture tight containers and transported to our laboratory where the field classifications were verified or modified as required. Visual classification was generally done in accordance with the Unified Soil Classification system. Visual soil classification includes evaluation of color, relative moisture content, soil type based upon grain size, and accessory soil types included in the sample. Soil classifications are presented on the exploration logs in Appendix A.

Moisture Content Determinations

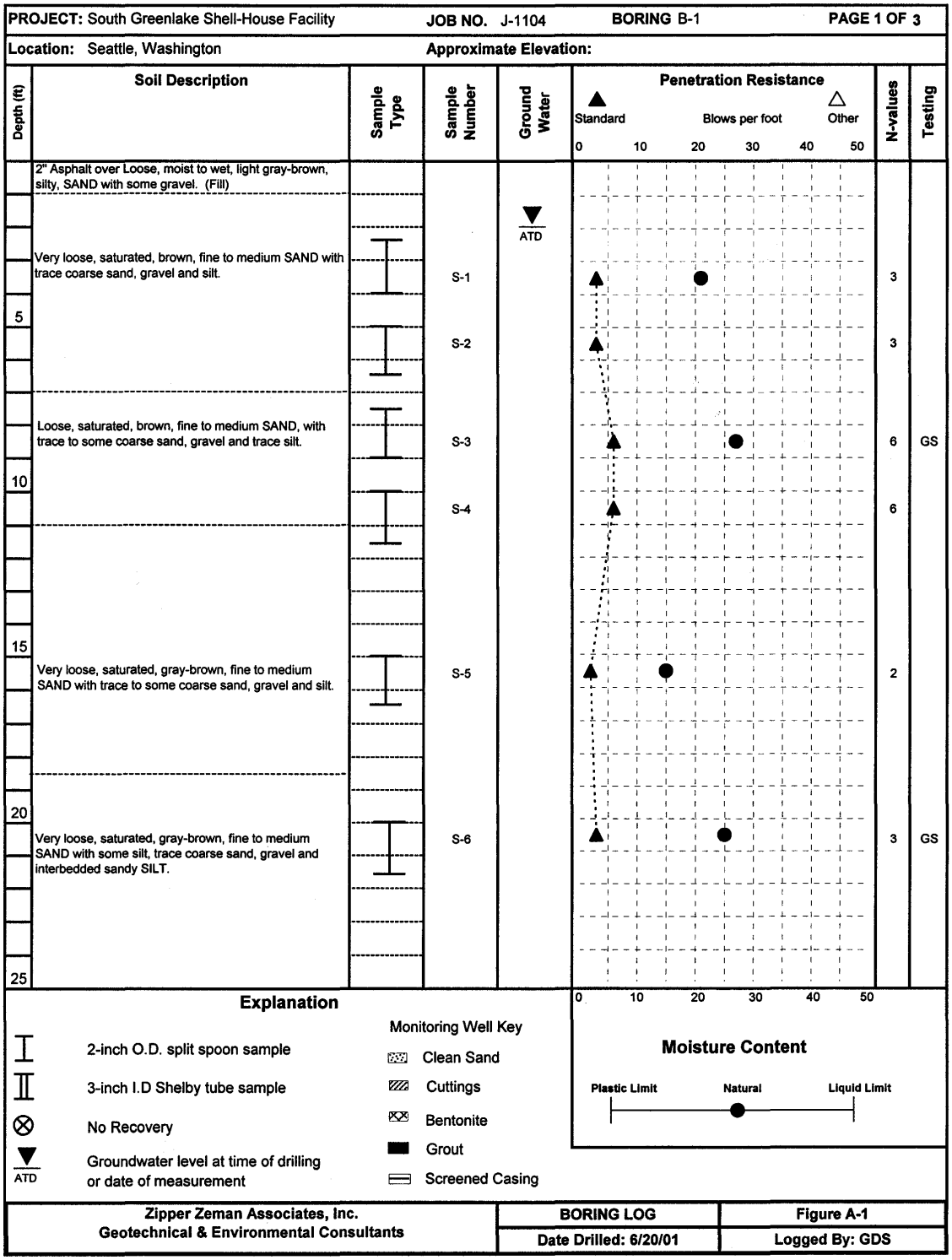
Moisture content determinations were performed on representative samples obtained from the exploration in order to aid in identification and correlation of soil types. The determinations were made in general accordance with the test procedures described in ASTM: D-2216. The results are shown on the exploration logs in Appendix A.

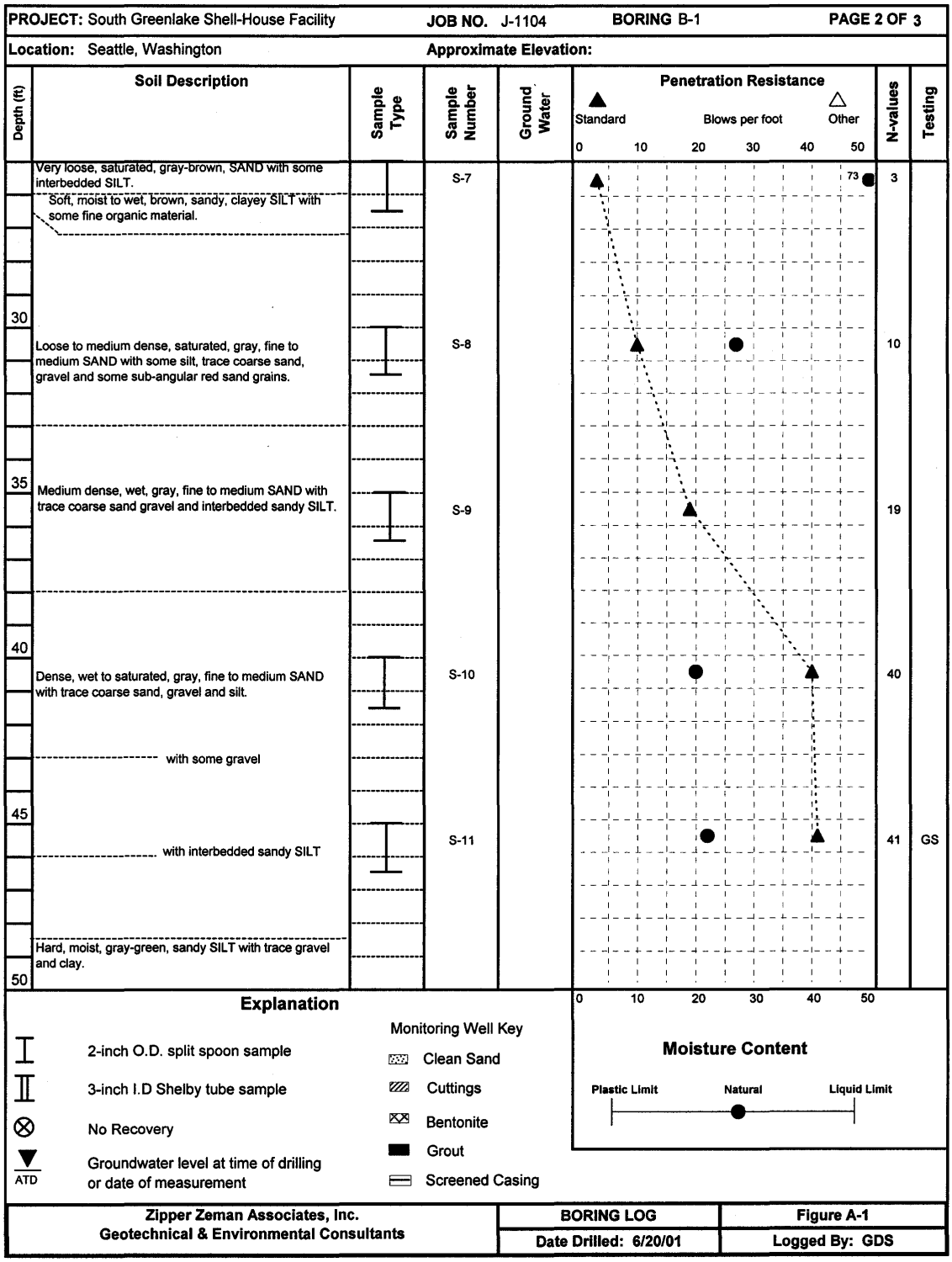
Grain Size Analysis Procedures

A grain size analysis indicates the range of soil particle diameters greater than the U.S. No. 200 mesh sieve size included in a particular sample. Grain size analyses were performed on representative samples in general accordance with ASTM:D-422. The results of these tests are presented on the enclosed grain-size distribution graphs and were used in soil classifications shown on the exploration logs contained in Appendix A.

200- Wash Analysis

A 200-wash is a procedure in which the fine-grained soil fraction is separated from the sand and gravel by washing the soil on a U.S. No. 200 sieve. A 200-wash was performed on selected soil samples obtained from our borings in general accordance with ASTM:D-1140. The results of these analyses were used in soil classifications shown on the boring logs in Appendix A and are presented in this appendix.


PROJECT: South Greenlake Shell-House Facility
JOB NO. J-1104
BORING B-1
PAGE 1 OF 3
Location: Seattle, Washington
Approximate Elevation:
Depth (ft)
Soil Description
Sample Type
Sample Number
Ground Water
Penetration Resistance
Standard
Blows per foot
Other
0 10 20 30 40 50
N-values
Testing
2" Asphalt over Loose, moist to wet, light gray-brown, silty, SAND with some gravel. (Fill)
ATD
Very loose, saturated, brown, fine to medium SAND with trace coarse sand, gravel and silt.
S-1
3
5
S-2
3
Loose, saturated, brown, fine to medium SAND, with trace to some coarse sand, gravel and trace silt.
S-3
6
GS
10
S-4
6
15
Very loose, saturated, gray-brown, fine to medium SAND with trace to some coarse sand, gravel and silt.
S-5
2
20
Very loose, saturated, gray-brown, fine to medium SAND with some silt, trace coarse sand, gravel and interbedded sandy SILT.
S-6
3
GS
25
Explanation
2-inch O.D. split spoon sample
3-inch I.D Shelby tube sample
No Recovery
Groundwater level at time of drilling or date of measurement
ATD
Monitoring Well Key
Clean Sand
Cuttings
Bentonite
Grout
Screened Casing
Moisture Content
Plastic Limit
Natural
Liquid Limit
Zipper Zeman Associates, Inc.
Geotechnical & Environmental Consultants
BORING LOG
Figure A-1
Date Drilled: 6/20/01
Logged By: GDS


PROJECT: South Greenlake Shell-House Facility
JOB NO. J-1104
BORING B-1
PAGE 2 OF 3
Location: Seattle, Washington
Approximate Elevation:
Depth (ft)
Soil Description
Sample Type
Sample Number
Ground Water
Penetration Resistance
Standard
Blows per foot
Other
0 10 20 30 40 50
N-values
Testing
Very loose, saturated, gray-brown, SAND with some interbedded SILT.
Soft, moist to wet, brown, sandy, clayey SILT with some fine organic material.
S-7
73
3
30
Loose to medium dense, saturated, gray, fine to medium SAND with some silt, trace coarse sand, gravel and some sub-angular red sand grains.
S-8
10
35
Medium dense, wet, gray, fine to medium SAND with trace coarse sand gravel and interbedded sandy SILT.
S-9
19
40
Dense, wet to saturated, gray, fine to medium SAND with trace coarse sand, gravel and silt.
S-10
40
with some gravel
45
with interbedded sandy SILT
S-11
41
GS
Hard, moist, gray-green, sandy SILT with trace gravel and clay.
50
Explanation
2-inch O.D. split spoon sample
3-inch I.D Shelby tube sample
No Recovery
Groundwater level at time of drilling or date of measurement
ATD
Monitoring Well Key
Clean Sand
Cuttings
Bentonite
Grout
Screened Casing
Moisture Content
Plastic Limit
Natural
Liquid Limit
Zipper Zeman Associates, Inc.
Geotechnical & Environmental Consultants
BORING LOG
Figure A-1
Date Drilled: 6/20/01
Logged By: GDS

PROJECT: South Greenlake Shell-House Facility | **JOB NO.** J-1104 | **BORING** B-1 | **PAGE 3 OF 3**

Location: Seattle, Washington | **Approximate Elevation:**

Depth (ft)	Soil Description	Sample Type	Sample Number	Ground Water	Penetration Resistance (▲ Standard, △ Other; Blows per foot: 0 10 20 30 40 50)	N-values	Testing
	Hard, moist, gray-green, sandy SILT with trace gravel and clay.		S-12			40	
55	with interbedded fine SAND and trace organics		S-13			48	200 Wash
	Boring completed at 56.5 feet on 6/20/01. Groundwater seepage observed at 2.0 feet at time of drilling (Greenlake Level).						
60							
65							
70							
75							

Explanation

- 2-inch O.D. split spoon sample
- 3-inch I.D Shelby tube sample
- No Recovery
- ATD — Groundwater level at time of drilling or date of measurement

Monitoring Well Key

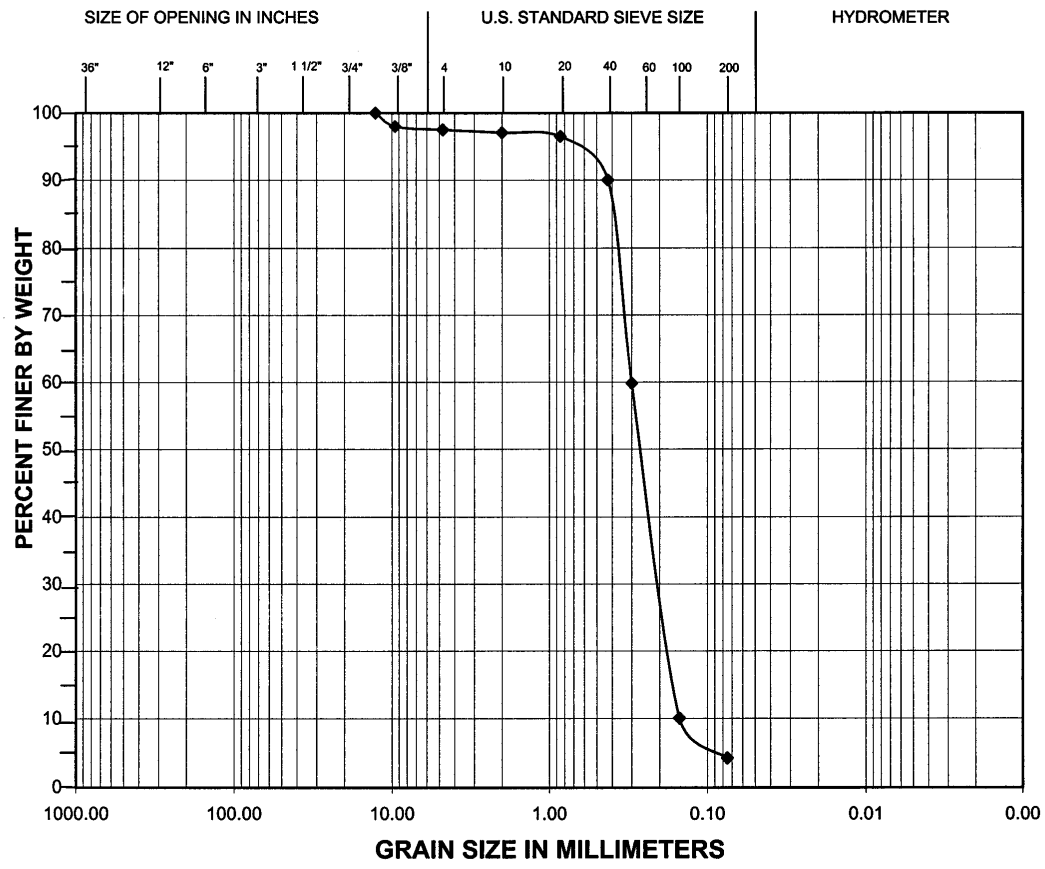
- Clean Sand
- Cuttings
- Bentonite
- Grout
- Screened Casing

Moisture Content

Plastic Limit — Natural — Liquid Limit

Zipper Zeman Associates, Inc. Geotechnical & Environmental Consultants	BORING LOG	Figure A-1
	Date Drilled: 6/20/01	Logged By: GDS

GRAIN SIZE DISTRIBUTION ASTM D422

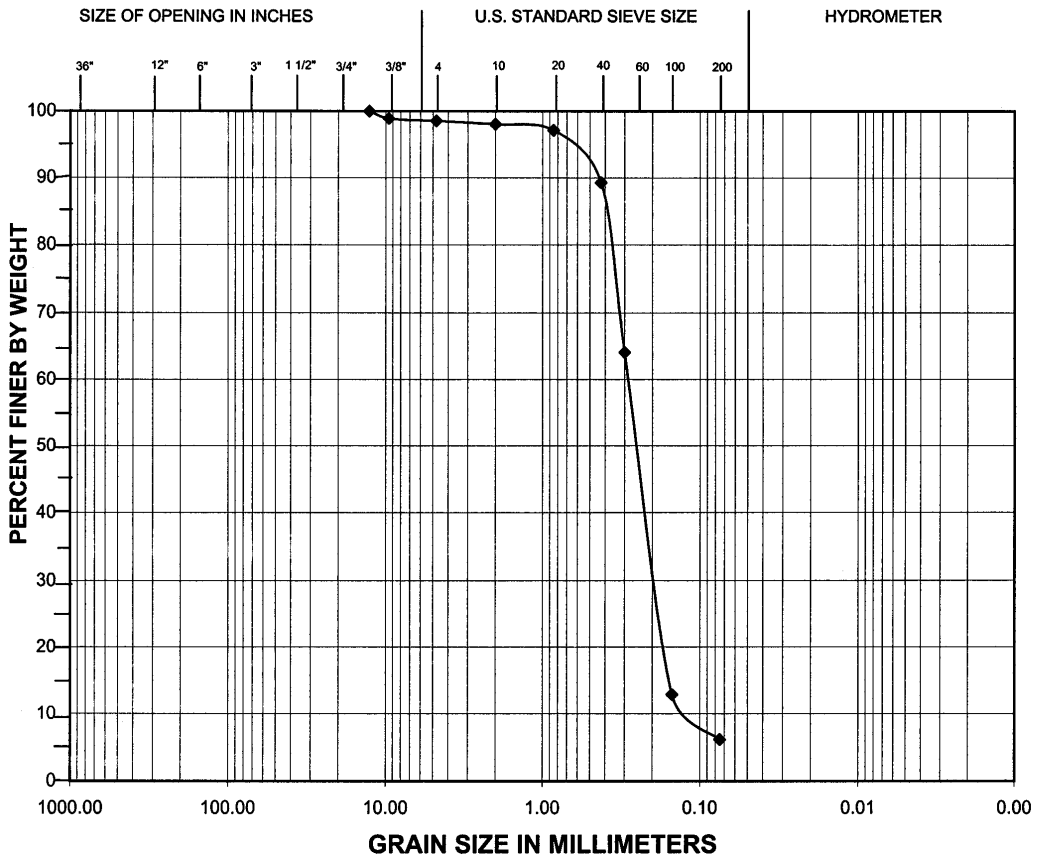


		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
BOULDERS	COBBLES	GRAVEL		SAND			FINE GRAINED	

Exploration	Sample	Depth (feet)	Moisture (%)	Fines (%)	Description
B-1	S-3	7.5'	27	4	SAND w/trace gravel and silt

ZIPPER ZEMAN ASSOCIATES, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTING	PROJECT NO: J-1104 DATE OF TESTING: 6/21/01	PROJECT NAME: South Green Lake Shell-House Facility

GRAIN SIZE DISTRIBUTION ASTM D422

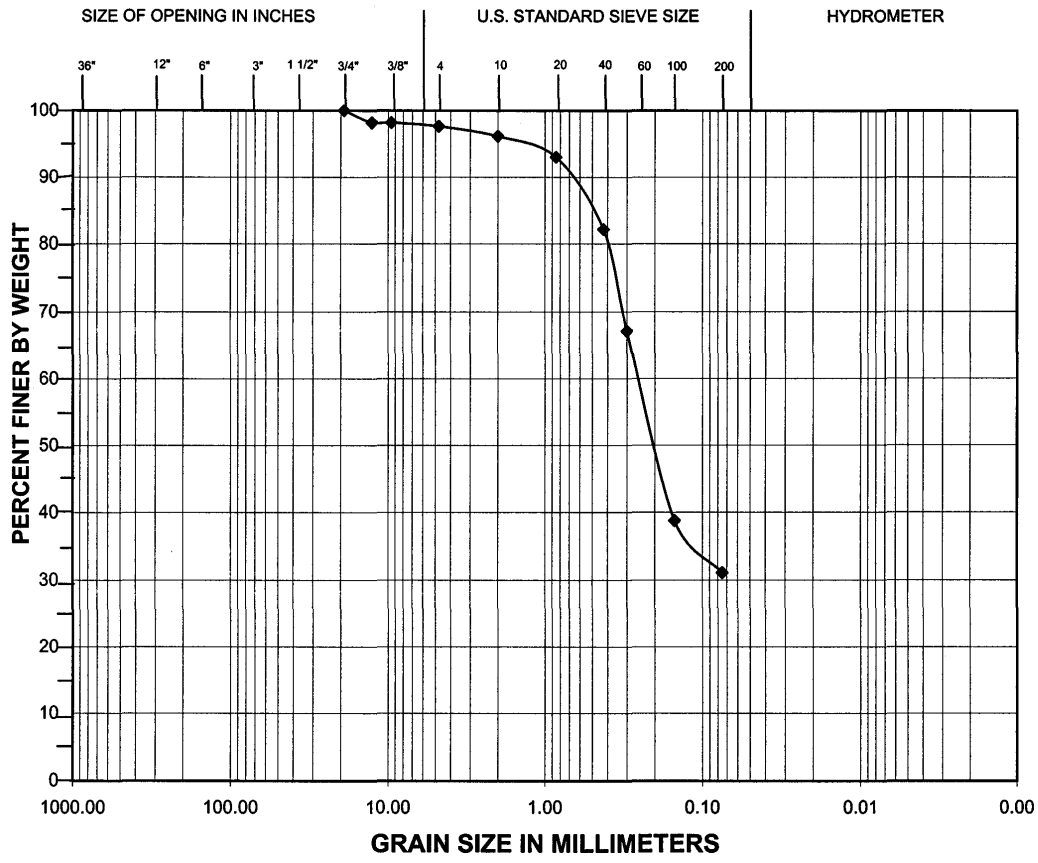


		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
BOULDERS	COBBLES	GRAVEL		SAND			FINE GRAINED	

Exploration	Sample	Depth (feet)	Moisture (%)	Fines (%)	Description
B-1	S-6	20'	25	6	SAND w/some silt and trace gravel

ZIPPER ZEMAN ASSOCIATES, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTING	PROJECT NO: J-1104 DATE OF TESTING: 6/21/01	PROJECT NAME: South Green Lake Shell-House Facility

GRAIN SIZE DISTRIBUTION ASTM D422



		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
BOULDERS	COBBLES	GRAVEL		SAND			FINE GRAINED	

Exploration	Sample	Depth (feet)	Moisture (%)	Fines (%)	Description
B-1	S-11	45'	22	31	Silty SAND with trace gravel

ZIPPER ZEMAN ASSOCIATES, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTING	PROJECT NO: J-1104 DATE OF TESTING: 6/21/01	PROJECT NAME: South Green Lake Shell-House Facility

PERCENT FINES - 200 WASH ONLY

		Job No:	J-1104
Project Name:	South Green Lake Shell-House Facility	***Boring No:***	B-1
Location of Project:		***Sample No:***	S-13
Description of Soil:	Sandy SILT	***Depth of Sample:***	55'
Tested By:	Jake Young	***Date of Testing:***	6/25/01

Moisture Content Determination			**200 Wash**	
Can No.	KAY		Can No.	T11
Weight wet + tare	105.6		Weight wet + tare	457.6
Weight dry + tare	78.7		Weight dry + tare	340.8
Weight tare	3.6		Weight tare	14.7
Weight of dry sample	75.1		Wt. washed sample + tare	66.1
% Moisture Content	36		Weight washed fines	275
			% Percent Fines	84

6.7 GREEN LAKE ROWING ADVISORY COUNCIL

BYLAWS of the GREEN LAKE ROWING ADVISORY COUNCIL

I. GENERAL

The business and affairs of this Advisory Council shall be conducted solely by its board of Council Members.

A. Purpose and Mission

This Council is organized to provide means and promote opportunities for the education of the public, with emphasis on youth in the Greater Seattle Area, with respect to the sport and skills of rowing and the lifetime enjoyment thereof, through organizational support of the Green Lake Crew rowing programs, by providing instruction and training of individuals for the purpose of developing and improving their capabilities and by educating the general community on topics related to rowing. It is this Council 's further purpose to otherwise support Green Lake rowing programs and activities, including promotion of the rowing programs and special events, finance and budget management, fundraising, rowing equipment purchasing and maintenance, race organization, and facilities maintenance; where appropriate, to make recommendations to the staff of the Seattle Department of Parks and Recreation and the Board of Park Commissioners, the Seattle City Council concerning any of the foregoing activities, and, in general, to carry on any other lawful business whatsoever in connection with the foregoing. The Council functions under an Operating Agreement with the Associated Recreation Council (ARC), and part of its mission is to fulfill its obligations thereunder.

II. BOARD OF COUNCIL MEMBERS

A. Membership.

The Board shall be comprised of three types of members: Council Members; Ex Officio Members; and Associate Members. The Board shall be composed of individuals of varied interests to ensure that the diverse aspects of the Green Lake Crew programs are represented. Council Members shall, in appointing or recommending candidates for appointment to the Board, take into account the following as a desirable background for a Board member:

- Involvement with a rowing program;
- Desire to support the Green lake Crew and/or other City of Seattle rowing programs; and
- Dedication to furthering the sport of rowing

Nomination and appointment of Board members shall be without regard to sex race, creed or color.

B. Council Members.

1. Number. There shall be not less than seven (7) nor more than twenty-one (21) Council Members. Within this range, the number of Council Members may be changed by the Council Members at any regular meeting or at a special meeting called for that purpose.

2. Appointment. New Council Members shall be selected by the existing Council Members and approved by the Associated Recreation Council (ARC).
3. Elections and Term. The regular, full term of a Council Member shall be three years. There shall be no limit on the number of terms which a Council Member may serve. Upon the recommendation of the Council Members, one-third (or as close thereto as possible, if the number of Council Members is not divisible by three) of the Council Members shall be (re)appointed each year on or before the Annual Meeting of the Board of Council Members.
4. Resignation. Failure of a Council Member to attend two of any three consecutive regular (including the annual) or special meetings of the Board of Council Members without submission in advance of the second absence of an excuse acceptable to the Executive Committee shall automatically constitute a resignation from the Board of Council Members. In other respects, a Council Member is free to resign at any time without consent of the remaining Council Members or the appointing official.
5. Vacancies. Any vacancies occurring on the Board of Council Members shall be filled by the same appointment process as above. A Council Member so appointed shall serve for the unexpired term of his/her predecessor.

C. Ex Officio Members.

1. Number. There shall be two ex officio members of the Board. They are the Green Lake Small Craft Center Recreation Programmer, and the Parks and Recreation Department Aquatics Manager.
2. Rights and Duties. Ex officio members may attend meetings of the Board (including Closed Sessions, as specified in V.H.I), and those of any Standing Committee thereof.

Ex officio members may be appointed by the Council Members to serve on any Standing Committee (with the exception of the Executive Committee). Any Ex Officio member appointed to a Standing Committee may vote in the same capacity as a Council Member serving on that same Standing Committee.

D. Associate Members.

1. Application. At any time, an individual may petition the Board to be appointed an Associate member of the Board.
2. Number. Council Members of the Board shall determine the number of Associate Members of the Board.
3. Term. The term of an Associate Member shall automatically lapse annually, ending at the time of the Board's Annual Meeting. Council Members shall, at the Annual Meeting of the Board, review the contributions of Associate Members and, upon indication of continuing interest by a current Associate Member, may renew said Member's term for an additional year. There shall be no limit on the number of terms which an Associate Member may serve.
4. Rights and Duties. Associate members may attend meetings of the Board, and those of any Standing Committee thereof.

Associate Members may be appointed by the Council Members to serve on any Standing Committee (with the exception of the Executive Committee). Any Associate Member appointed to a Standing Committee may vote in the same capacity as a Council Member serving on that same Standing Committee.

III. OFFICERS

A. Number.

The Officers of the Council shall be a President, Secretary, Treasurer, and Boatperson. In addition to the foregoing, the Board of Council Members may elect such assistant or other Officers as the Board, from time to time, deems appropriate.

B. Terms/Qualifications.

Officers must be Council Members, and shall be elected by the Board of Council Members at the Annual Board Meeting, and shall serve for a term of one year, commencing on their election, or until such time as their successors are selected.

C. Vacancies.

A vacancy in any office may be filled by the Board of Council Members for the unexpired portion of the term.

D. President.

The President shall be the Chief Executive Officer of the Rowing Advisory Council and shall, subject to the ultimate authority of the Board of Council Members and/or any Executive or other Committees appointed by it, have general charge of the business of the Council.

The President shall, together with the Secretary, execute all documents and instruments which are required in the ordinary course of the Council 's business, or which are required by law to be executed by the Council.

E. Vice-President.

If elected, the Vice-President shall, in the absence of the President, or his/her inability or refusal to act, perform the duties of the President, and, when so acting, shall have all of the powers of and be subject to all of the restrictions upon the President.

F. Secretary.

The Secretary shall, in person or through any Assistant Secretary or other designee of the Board

(a) keep the minutes of all Council Members' meetings;

(b) give all notices which must be given under these Bylaws or by statute;

(c) be custodian of the corporate records and seal; and

(d) in general, perform all duties as from time to time may be assigned to him/her by the President or the Board of Council Members.

G. Treasurer.

The Treasurer shall, in person or through any Assistant Secretary or designee of the Board:

(a) Have charge and custody of all funds and securities of the Council;

(b) give receipts for money due and payable to the Council, and deposit all such monies in the name of the Council in such banks as shall be selected by the Board of Council Members; and

(c) in general, perform all duties as from time to time may be assigned to him/her by the President or the Board of Council Members.

H. Assistant Secretary and Assistant Treasurer.

The Assistant Secretary and Assistant Treasurer, if and when elected, may act in the absence, death, inability or refusal to act of the Secretary or Treasurer to perform such duties as shall from time to time be assigned to him/her by the Board of Council Members of the Secretary or Treasurer.

I. Boatperson.

The Boatperson shall oversee the maintenance of the equipment; prepare quarterly recommendations on program equipment needs; and shall be Chairman of the Equipment Committee.

IV. ORGANIZATION

A. Authority to Create Committees.

The Board of Council Members may designate and appoint an Executive and/or other Committees, each of which shall consist of two or more Council Members, and which Committees shall have the authority of the Board of Council Members in the management of the Council, to the extent provided by law.

Notwithstanding the foregoing, no such Committee shall have the authority to change the Bylaws of the Council; to amend, alter or repeal any previous action by the Board of Council Members; or do any act prohibited by law or statute.

The appointment of any such Committee and the delegation thereto of authority shall not operate to relieve the Board of Council Members, or any individual Council Member, of any responsibility imposed upon it or him/her by law.

B. Standing Committees.

1. Identity, Membership, and Voting.

Unless and until changed by the Board of Council Members, the following Standing Committees shall be appointed annually and each Committee shall be chaired by a Council Member of the Board:

Executive
Budget and Finance
Equipment
Fundraising
Parent Liaison
Regatta

In lieu of appointment of such Committees, the Board of Council Members may act as a Committee of the whole responsible for that Committee's function.

Each Council Member shall serve on a minimum of two Standing Committees. Any Council Member may attend the meetings of any Standing Committee. Only those Council Members appointed to a Standing Committee by the Board shall have the vote at meetings of that Standing Committee.

Ex officio and Associate Members shall have the vote on those Standing Committees to which they have been appointed by the Council Members (as provided in II.C.2 and II.D.4).

2. Organization and Responsibilities.

The organization of each Standing Committee, including any subcommittee structures, shall be determined by the respective Standing Committee members and approved by the full Board.

Responsibilities of each Standing Committee shall be determined and assigned by the Board. General areas of responsibility shall include:

a. The Executive Committee shall consist of all of the elected officers of the Board. The Executive Committee shall consider and propose changes to the Board's Bylaws; oversee the development of the Board's Outreach Programs; make decisions on any and all financial aid applications to the Board.

    i. Outreach Programs are defined as those programs designed to reach out to youth, groups and individuals not historically participating in the mix of programs (rowing and otherwise) offered through the Green Lake Small Craft Center. The purposes of such programs are (1) to ensure that children and youth survive, thrive, and succeed, by expanding, where appropriate, programs for at-risk children and youth, and (2) that Seattle's capacity to support its diverse array of families and individuals be strengthened.

b. The Budget and Finance Committee shall draft the Board's annual operating budget; consider and recommend changes to the Council 's employee wage schedule; develop and recommend long-range plans to achieve the purposes of the Council.

c. The Equipment Committee shall maintain a current, prioritized equipment acquisition plan; anticipate, address, and resolve equipment scheduling conflicts among various components of the Council's programs, including equipment scheduling for regattas; develop appropriate equipment-use standards and policies in consultation with the facility Recreation Programmer; exercise Board oversight of equipment and facilities maintenance programs in consultation with the facility Recreation Programmer.

d. The Fundraising Committee shall engage in such activities as are approved by the Board in order to meet the Council's fiscal goals as identified in the annual operating budget.

e. The Parent Liaison Committee shall actively promote the involvement of parents/guardians in all phases of the Council's junior programs; recruit parents/guardians as volunteer staff for events such as regattas on Green Lake and as chaperones for juniors traveling to Board-sanctioned events; organize annually a junior awards ceremony (and any and all fund-raising activity associated with such an event).

f. The Regatta Committee shall plan and organize staffing for all regattas held on Green Lake. Such responsibility will include planning and organizing concession sales associated with such regattas.

C. Ad Hoc Committees.

1. Any Ad Hoc Committee created by the Board shall be automatically dissolved at the time of the Board's Annual Meeting unless its continuation is explicitly reauthorized by the Board at that time.

V. GOVERNANCE

A. Robert's Rules of Order.

Robert's Rules of Order are to be used as the standard for conducting all meetings [Robert's Rules of Order, Newly Revised, 1990 Edition, Scott, Foresman and Company, 1990, being the standard at this time].

B. Quorum.

A majority of the Council Members shall constitute a quorum for the transaction of business at any meeting.

C. Voting.

Each Council Member shall have the vote at all meetings of the Board (and at committees thereof, as specified in IV.B.1, above). Absentee/proxy votes shall not be accepted. Ex officio and Associate Members shall not have the vote in meetings of the Board.

1. As a member of the Board, the presiding officer can vote as any other member when the vote is by ballot. In all other cases (e.g., voice votes), the presiding officer can (but is not obliged to) vote whenever his/her vote will affect the result – that is s/he can vote either to break or to cause a tie. The presiding officer cannot vote twice, once as a member, then again in his/her capacity as presiding officer.

D. Regular Meetings.

Regular meetings of the Board of Council Members shall be held monthly, unless a majority of the Board elects to skip a particular month.

E. Annual Meeting.

The Annual Meeting of the Board of Council Members shall be the regular meeting held in the month of November of each year.

F. Special Meeting.

Special meetings of the Board of Council Members may be called at any time by or at the request of the President and any three Council Members. The persons calling the special meeting shall give notice of the purpose thereof to the Council. The Secretary shall then fix the date, place, and time of the meeting and give notice thereof, and of its purpose, to all the Council Members at least three days in advance of the meeting.

G. Informal Action.

Any action which must or might be taken at a meeting of the Board of Council Members, or any Committee thereof, may be taken without a meeting if a consent in writing, setting forth the action

so taken, shall be signed by all of the Council Members or Committee members as the case may be.

H. Closed Sessions of the Council.

Personnel matters and Board membership discussions shall be in Closed Session of the Board.

1. In accord with the "Agreement between the City of Seattle Department of Parks and Recreation and Recreation Advisory Councils," and as members of the Board, ex officio members of the Board may attend Closed Sessions of the Board, except for those Closed Sessions at which the President judges such attendance to be inappropriate.

2. Associate members of the Board shall not attend Closed Sessions of the Council.

I. Remote Electronic Participation in Meetings and Special Meetings.

Board members may participate in scheduled board meetings via telephone if arranged with a member of the Executive Committee at least one week in advance of the meeting. Special meetings of the members may be called by the president or by the Board of Council Members. Special meetings of the members may also be called by other officers or persons or number or proportion of members as provided in the articles of incorporation or the bylaws. In the absence of a provision fixing the number or proportion of members entitled to call a meeting, a special meeting of members may be called by members having one-twentieth of the votes entitled to be cast at the meeting. Except as otherwise restricted by the bylaws, members and any committee of members of the Council may participate in a meeting by conference telephone or similar communications equipment so that all persons participating in the meeting can hear each other at the same time. Participation by that method constitutes presence in person at a meeting.

J. Number System.

A numbering system will be implemented to record and mark all Board resolutions which address policy, governance, and purpose.

K. Dissolution.

No member or officer shall be entitled to share in the distribution of the Council's assets, if any, upon dissolution of the Council or the winding up of its affairs. Upon the winding up or dissolution of the Council, the assets of the Council remaining after payment of, or provision for payment of, all debts and liabilities of the Council, shall be distributed to an successor organization. To the extent required by law to fulfill any financial obligation, proceed may be distributed to ARC, provided that ARC continues to be described in Section 501(c)(3) of the Code. If ARC has dissolved or is no longer described in Section 501(c)(3) of the Code, such assets may be distributed for one or more exempt purposes within the meaning of Section 501(c)(3) of the Code or the corresponding provision of any future federal tax law to the Department or another government unit within the meaning of Sections 170(b)(1)(A)(v) and 170(c)(1) or the corresponding provision of any future federal tax law.

VI. COUNCIL FUNDS

A. Deposits.

All funds of the Council, other than a reasonable amount of petty cash shall be deposited, in the name of the Council, in such banks or depositories as the Board of Council Members may select.

B. Checks.

All disbursements by the Council, other than small amounts from petty cash, shall be by check, drawn direct to the ultimate payee, and signed by one or more Council Members.

C. Budget.

By September of each year, or as soon thereafter as is possible, the Board of Council Members shall approve a budget of estimated income and expenses of the Council for the coming fiscal year (October-September). Said budget may be prepared initially by the Executive Committee, the Board itself, or such other Committee or Officer(s) as the Board shall designate. The budget will be done in accordance with the requirements of ARC.

VII. AMENDMENTS

The Board of Council Members have the exclusive authority to amend the Bylaws, and to adopt rules and regulations governing the Council.

VIII. CONTRACTS AND LOANS

A. Contracts.

The Board of Council Members may authorize any Officer or Officers, agent or agents, to enter into any contract or execute and deliver any instrument in the name of and on behalf of the Council, and such authority may be general or confined to specific instances.

B. Loans.

No loans shall be contracted on behalf of the Council and no evidence or indebtedness shall be issued in its name unless authorized by a Resolution of the Board of Council Members or the Executive Committee, if such authority is delegated to it by the Board of Council Members. Such authority may be general or confined to specific circumstances.

IX. SEAL

The corporate seal shall be circular in form and have inscribed thereon the name of the Council and the words “State of Washington” and “Corporate Seal.” Said seal shall be approved by the Board of Council Members.

Adopted this 17th day of September, 2008, by unanimous vote of the Board of Council Members.

6.8 SEATTLE HISTORIC SITES DESCRIPTION

Seattle Historical Sites

New Search

Summary for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR033

Historic Name:	Green Lake Park Shellhouse/Concession & Comfort Station	**Common Name:**	
Style:	Modern	**Neighborhood:**	Green Lake
Built By:		**Year Built:**	1951

Significance
In 1950, the contractor of the adjacent Aqua Theater built this reinforced concrete shellhouse without cost to city while constructing the larger structure. In 1959, the building was enlarged with the addition of a concession and comfort station. Within thirty years of the first settlement at Green Lake in 1869, the area had been transformed from dense forests to an attractive residential neighborhood served by a streetcar line, which connected it with downtown Seattle. In the late 1880s, entrepreneur William D. Wood acquired more than 600 acres of real estate around Green Lake and then platted and promoted his holdings. In order to stimulate development, Wood convinced Dr. Edward C. Kilbourne, one of the founders of Fremont, to extend his streetcar line from Fremont to Green Lake in 1891. Together, they organized the Green Lake Electric Railway, which Wood managed, and developed a ten-acre amusement park at its terminus on the northwestern corner of Green Lake. The same year, the City of Seattle annexed the Green Lake area along with other northern suburbs. In 1903, the city hired the Olmsted Brothers landscape firm to prepare plans for a comprehensive park and boulevard system, including suggestions for improvements to existing parks. This move was largely brought on by the public interest generated for the planned Alaska-Yukon-Pacific Exposition and through the purchase of Woodland Park and the acquisition of Washington Park, two large tracts of mostly undeveloped land. The Olmsted Brothers recommended the acquisition of Green Lake and the creation of a park and boulevard surrounding the lake. Unfortunately, settlement had reached to the shoreline by this time, providing little opportunity to create the park economically. As a solution, the Olmsted Brothers recommended lowering the level of the lake and filling in the wetlands to create more usable parkland. In 1905, the State of Washington deeded ownership of the lake bottom to the city, which proceeded to acquire the remainder of the shoreline through purchase and condemnation, including the former amusement park site. Beginning in 1911, the level of the lake was lowered seven feet, which added 100 acres of dry land once it had been graded and filled. Before the lake was lowered, the shoreline extended south to North 54th Street. Much of this marshy area was filled to create additional space for athletic fields at Lower Woodland. A swampy area north of the boulevard remained largely under water until the early 1930s. The next great physical change came in 1932 with the construction of Aurora Avenue, a six-lane north-south highway, through the center of Woodland Park. Additional land at the south end of Green Lake was filled with material excavated from the trench through Woodland Park. Up until this time, the Parks Department had made extensive improvements to Green Lake Park. However, the financial difficulties of the depression in the 1930s and the shortages of labor and materials during the Second World War halted the construction of most park buildings until the later 1940s with the exception of those built by state and federal relief agencies. One of the first major improvements after the war was the construction of the Aqua Theater in 1950 to serve as an open-air venue for summertime entertainment productions, including Seafair's Aqua Follies. In addition to the 5200-seat fan shaped grandstand, the contractors, Strand & Sons, built a smaller concrete building to house the Junior Crew Program. The following year, the Parks Department made improvements to the existing structure. After the failure of several earlier efforts, a youth rowing program was organized by a group of community leaders and neighborhood supporters in 1947, with the first crew beginning rowing in the summer of 1948. Before the construction of the small shellhouse in 1950, the rowing program used an older boathouse located on the eastern shoreline of Green Lake near the field house. Guided by the Seattle Junior Crew Rowing Commission under the leadership of Alex L. Shults, the crew received equipment, and travel and operational support. By the mid-1950s, the involvement of the Parks Department had increased, and the program was able to grow and develop continuity between seasons. The facility was improved in 1959 with the addition of a comfort station and concession. After his election to the City Council in 1950, Clarence F. Massart was instrumental in garnering support for the program during its early years. Upon his retirement in 1967, the shellhouse was named in his honor. In the Seattle earthquake of 1965, the shellhouse received extensive damage. Rather than just conduct repairs, the Parks Department decided to expand the boathouse to accommodate additional shell storage and improve the launching areas. At the same time, a new building for the Green Lake Small Craft Center was constructed after a large portion of the Aqua Theater was demolished. Canoeing and sailing had come to the lake in the late 1960s with the introduction of two public clubs, the Seattle Canoe Club and the Seattle Sailing Association. Both of these groups allowed for the expansion of small craft program opportunities without impacting the Department budget. The 1968 Forward Thrust Bond Issue allowed for the construction of a new small craft center to accommodate rowing, sailing, and canoeing on Green Lake. This facility was completed in 1980 and included the remodeling of the Massart Shellhouse, the partial demolition of the Aqua Theater, and the addition of a building to house sailing and canoeing. The Green Lake Small Craft Center was dedicated on September 27, 1980. Although extensively altered, this building is significant for its association with the growth of the Parks Department rowing program and with the development of Green Lake Park.

Appearance
Located at the southwest corner of Green Lake, this mostly rectangular one-story building features a shellhouse and boathouse at the lake level on the east and a combination concession and comfort station at the path level on the west. Four concrete columns along both the east and west elevations of the shellhouse support four metal roof trusses connected to each other by diagonal bracing. The flat overhanging roof suspended from these trusses allows for uninterrupted interior storage spaces. Large overhead doors on the north and south elevations provide access to the shellhouse interior. Bands of plexiglass windows below the roof light the spacious interior. Two overhead doors on the east elevation of the boathouse open onto the lake. The concrete block comfort station on the west exhibits a T-plan with entrances to the bathrooms in the recessed corners. Contractors for the adjacent Aqua Theater constructed the earliest portion in 1950. The following year, the Parks Department made improvements to the existing structure used as a shellhouse by the Junior Crew Program. In 1959, the combination concession and comfort station was added to the west elevation to improve the amenities available in the southwest corner of the lake. After the 1965 earthquake extensively damaged the building,

substantial repairs were delayed until the later 1970s when the shellhouse was remodeled with Forward Thrust funds. The current appearance is largely the result of that project, which also included the partial demolition of the Aqua Theater and the construction of the adjacent Small Craft Center.

Detail for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR033

Status:	Yes - Inventory		
Classication:	Building	**District Status:**	
Cladding(s):	Concrete, Concrete - Block, Metal	**Foundation(s):**	Concrete - Poured
Roof Type(s):	Flat	**Roof Material(s):**	Other
Building Type:	Other	**Plan:**	Irregular
Structural System:	Concrete - Block	**No. of Stories:**	one
Unit Theme(s):	Architecture/Landscape Architecture, Community Planning/Development, Entertainment/Recreation		

Integrity

Changes to Original Cladding:	Slight
Changes to Windows:	Slight
Changes to Plan:	Moderate

Major Bibliographic References

Sherwood, Don. Seattle Parks Histories, c. 1970-1981, unpublished.

Fiset, Louis. "Green Lake -- Thumbnail History," The Green Lake News, July-August 2000, p. 4-5.

"$50,000 Orchid Gift Accepted By Park Dept." Seattle Times, May 24, 1951, p. 21.

Photo collection for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR033

Photo taken Jul 18, 2000

Seattle Historical Sites

New Search

Summary for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR003

Historic Name: Aqua Theater (Green Lake Park)
Common Name:
Style: Modern
Neighborhood: Green Lake
Built By:
Year Built: 1950

Significance
This reinforced concrete structure constitutes less than half of the original Aqua Theater, which was completed in 1950 as an open-air stadium for outdoor performances. Much of the fan-shaped grandstand was demolished in the late 1970s to accommodate construction of a new building for the Green Lake Small Craft Center. Within thirty years of the first settlement at Green Lake in 1869, the area had been transformed from dense forests to an attractive residential neighborhood served by a streetcar line, which connected it with downtown Seattle. In the late 1880s, entrepreneur William D. Wood acquired more than 600 acres of real estate around Green Lake and then platted and promoted his holdings. In order to stimulate development, Wood convinced Dr. Edward C. Kilbourne, one of the founders of Fremont, to extend his streetcar line from Fremont to Green Lake in 1891. Together, they organized the Green Lake Electric Railway, which Wood managed, and developed a ten-acre amusement park at its terminus on the northwestern corner of Green Lake. The same year, the City of Seattle annexed the Green Lake area along with other northern suburbs. In 1903, the city hired the Olmsted Brothers landscape firm to prepare plans for a comprehensive park and boulevard system, including suggestions for improvements to existing parks. This move was largely brought on by the public interest generated for the planned Alaska-Yukon-Pacific Exposition and through the purchase of Woodland Park and the acquisition of Washington Park, two large tracts of mostly undeveloped land. The Olmsted Brothers recommended the acquisition of Green Lake and the creation of a park and boulevard surrounding the lake. Unfortunately, settlement had reached to the shoreline by this time, providing little opportunity to create the park economically. As a solution, the Olmsted Brothers recommended lowering the level of the lake and filling in the wetlands to create more usable parkland. In 1905, the State of Washington deeded ownership of the lake bottom to the city, which proceeded to acquire the remainder of the shoreline through purchase and condemnation, including the former amusement park site. Beginning in 1911, the level of the lake was lowered seven feet, which added 100 acres of dry land once it had been graded and filled. Before the lake was lowered, the shoreline extended south to North 54th Street. Much of this marshy area was filled to create additional space for athletic fields at Lower Woodland. A swampy area north of the boulevard remained largely under water until the early 1930s. The next great physical change came in 1932 with the construction of Aurora Avenue, a six-lane north-south highway, through the center of Woodland Park. Additional land at the south end of Green Lake was filled with material excavated from the trench through Woodland Park. Up until this time, the Parks Department had made extensive improvements to Green Lake Park. However, the financial difficulties of the depression in the 1930s and the shortages of labor and materials during the Second World War halted the construction of most park buildings until the later 1940s with the exception of those built by state and federal relief agencies. In 1949, a group of Seattle businessmen developed the idea for "Seafair" as a summer festival with a maritime theme in the spirit of the earlier "Golden Potlatch" celebrations. By March of 1950, the organizers, Greater Seattle Inc., had set the dates for the first Seafair for August 11-20, 1950. The centerpiece of the event would be the Aqua Follies, a "swimusical revue" with performers from St. Paul, Minnesota performing water ballet in a large pool, trick and comic dives from two towers, and a stage show with singing and dancing. However, a water theater complete with a stage, swimming pool, and two forty-foot diving towers was required. On May 15, 1950, after considering many locations, Greater Seattle, Inc. decided to lobby the Seattle City Council to build a 5,000-seat concrete "Aqua Theater" on the south shore of Green Lake. Three days later, they successfully lobbied the Seattle Park Board to approve its construction in a city park. On June 1, the Seattle City Council agreed to finance it and approved the plan unanimously. Over the summer of 1950, the Aqua Theater was designed by George Stoddard & Associates and constructed by Strand & Sons in less than 75 days from the date of its conception. The contractors also built a small shellhouse to house the Junior Crew Program of the Parks Department at no additional cost to the city. The 5200-seat facility was completed four days before the grand opening on August 11, 1950 for the first showing of the Aqua Follies. During Seafair, nearly every Aqua Follies show sold out. By the time of the twelfth and final performance on August 20, more than 59,000 people had attended. For most of his career, George W. Stoddard practiced alone, and designed large homes, clinics, banks, and apartment houses. Stoddard also designed a number of public structures, including the 1947 Memorial Stadium, and the 1950 south stands at the University of Washington's Husky Stadium. In 1955, Stoddard went into practice with Francis Huggard, a partnership, which lasted into the early 1960s. Stoddard & Huggard designed the 1961 south stands at the West Seattle Stadium. Over the next fifteen years, the Aqua Follies as well as other annual summertime productions played to sold-out crowds at the Aqua Theater, which reached the zenith of its popularity in the summer of 1962. That year, the Seattle World's Fair Century 21 Exposition helped to draw large crowds from throughout the country to five separate productions, occurring during the summer season. However, the creation of the Seattle Center proved to be the demise of the Aqua Theater, which could not compete for national productions with the superior indoor and outdoor facilities at the new civic center. Declining use by the end of the 1960s led to the demolition of the diving towers in 1970 and of most of the remaining portion of the facility ten years later. The 1968 Forward Thrust Bond Issue had allowed for the construction of a new small craft center to accommodate rowing, sailing, and canoeing on Green Lake. Construction of a new building for this facility on the southwest corner of the lake required the demolition of much of the Aqua Theater. The new Green Lake Small Craft Center was dedicated on September 27, 1980. Although only a portion of the Aqua Theater remains, the structure is significant for its associations with the creation of the summertime Seafair celebration and other outdoor entertainment productions and with the development of Green Lake Park.

Appearance
Completed in 1950, this reinforced concrete structure occupies a site at the southwest corner of Green Lake adjacent to the Green Lake Small Craft Center. Originally, the fan-shaped open-air stadium featured an enclosed pool area in front of a stage, two forty-foot diving towers, and seven sections of seats with a capacity of 5,200. The semicircular pool measured approximately 180 feet by 67 feet with depths varying between four feet and fifteen feet. The rectangular plan stage at the rear of the pool measured 130 feet by 40 feet with angled walkways at either end, connecting it to the shoreline. The diving towers at the north and south ends of the stage had three platform levels. In 1960, a new box seat section was added between

the pool and the stands, which increased the capacity by almost 400 to 5,582. In order to limit access, a chain link fence surrounded the site, which extended as far north as the shellhouse. Despite declining use over the 1960s, the structure remained largely intact until the diving towers were removed in 1970 and much of the grandstand was demolished in the later 1970s to accommodate construction of the new small craft center. Facing northeast, the present structure constitutes nearly three full sections as well as the lower portion of the center section. The upper portion of the center section was removed as well as the three northern sections. As part of the demolition, the seats were removed, some openings were enlarged, and new railings were added within the remaining sections for safety purposes. At the rear of the poured concrete structure, the upper portion of the grandstand cantilevers over the tapered concrete piers supporting each section. The exposed underside of the grandstand reveals the terraced seating levels lined with concrete walls on the east and south. Concrete block walls enclose the lower rear portion of the grandstand and contain two tunnels with stairways, which lead up into the stands. A number of entrance doors line the concrete block walls between the tunnels, which provide access to rooms and storage areas beneath the structure. A portion of one of the support piers remains extant at the rear of the center section and serves as the base for a sculpture entitled "Stroke." Dedicated in March 1981, this sculpture by R. Allen Jensen features a crew oar, which waves in the wind. In addition to the extensive alterations, the concrete displays signs of deterioration in places, including spalling and rust jacking. As a result, this structure retains very little physical integrity.

Detail for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR003

Status:	Yes - Inventory		
Classication:	Building	**District Status:**	
Cladding(s):	Concrete	**Foundation(s):**	Concrete - Poured
Roof Type(s):	None	**Roof Material(s):**	None
Building Type:	Recreation and Culture - Music facility	**Plan:**	Other
Structural System:	Concrete - Poured	**No. of Stories:**	
Unit Theme(s):	Architecture/Landscape Architecture, Arts, Community Planning/Development, Entertainment/Recreation		

Integrity

Changes to Original Cladding:	Slight
Changes to Plan:	Extensive

Major Bibliographic References

Ochsner, Jeffrey Karl, ed. Shaping Seattle Architecture, A Historical Guide to the Architects. Seattle: University of Washington Press, 1994.

Sherwood, Don. Seattle Parks Histories, c. 1970-1981, unpublished.

Seattle Department of Parks. Annual report/Department of Parks. Seattle, WA: 1909-1955.

HistoryLink Website (www.historylink.org).

Fiset, Louis. "Green Lake – Thumbnail History," The Green Lake News, July-August 2000, p. 4-5.

Photo collection for 5900 W Green Lake WAY W / Parcel ID 0725049002 / Inv # DPR003

Photo taken Jul 18, 2000

Photo taken Jul 18, 2000

App v2.0.1.0

6.9 CODE ANALYSIS NOTES

schacht | aslani architects

GLSCC BUILDING CODE REVIEW

Reference/Code	Topic	Relevant Information	Note
2001 Earthquake Damage Partial Replacement 1980 Renovation	Existing Occupancy Type	Shell House • Restrooms: B • Shell Storage: S1 • Rescue Boat House: S3 Boat House • Boat House: F-1	
	Existing Occupancy Load		
	Existing Buildings Construction Type	Shell House: V-N Boat House: V-N	V-N = V-B = 5B (Unprotected Combustible)
2001 Earthquake Damage Partial Replacement 1980 Renovation	Existing Base allowed area	Shell House • Restrooms / B = 8,000 SF • Shell Storage / S1 = 8,000 SF • Rescue Boat House / S3 = 8,000 SF Boat House • Boat House / F-1= 9,000 SF	
	Existing area	Shell House • Restrooms / B = 537 SF • Shell Storage / S1 = 2,662 SF • Rescue Boat House / S3 = 443 SF Boat House • Boat House / F-1 = 3,612 SF	
	Allowed area increase		
1980 Renovation	Existing Allowed # of stories	2 Stories	
SBC Section 302	Occupancy Type	• A-3 (Community Hall, gymnasium)	

901 Fifth Avenue
Suite 2720
Seattle, WA 98164
tel 206•443•3448
fax 206•443•3471
saarch@saarch.com

		• B (Training, office, services) • F-1 (Athletic equipment, boats, canvas) • S-1 (Dry boat storage, Repair garage) • S-2 (New rescue boat house?)	
	Occupancy Load		
	Construction Type	V-B to math existing	Potential different occupancy if replacement
SBC 504.3 Table 504.3	Base Allowed Height	For Occupancy Classification A, B, E, F, M, S, U, Type V B Construction, the allowable height in feet above grade plane is 40 feet	
SBC 504.4 Table 504.4	Base # of stories	A-3, Type VB Construction = 2 stories (S) or 1 story (NS) B, Type VB Construction = 3 stories (S) or 2 stories (NS) F-1, Type VB Construction = 2 stories (S) or 1 story (NS) S-1, Type VB Construction = 2 stories (S) or 1 story (NS) S-2, Type VB Construction = 3 stories (S) or 2 stories (NS)	S= Sprinkler system NS = No sprinkler system
SBC Section 506 Table 506.2	Base allowed area	A-3, Type VB Construction, the allowable area factor = 6,000 SF w/out sprinkler system (NS), 24,000 SF w/ sprinkler and 1 floor max above grade (S1), 18,000	

2

		SF w/ sprinkler system and 2+ stories above grade (SM) B, Type VB Construction, the allowable area factor = 9,000 SF (NS), 36,000 SF (S1), 27,000 SF (SM) F-1, Type VB Construction, the allowable area factor = 8,500 SF (NS), 34,000 SF (S1), 25,500 SF (SM) S-1, Type VB Construction, the allowable area factor = 9,000 SF (NS), 36,000 SF (S1), 27,000 SF (SM)system and 2+ stories above grade (SM) S-2, Type VB Construction, the allowable area factor = 13,500 SF (NS), 54,000 SF (S1), 40,500 SF (SM)	
SBC Section 903	Sprinklers	Required	
SBC Section 1004 Occupant Load	Occupancy Load factors	Accessory storage areas, mechanical equipment= 300 gross Assembly without fixed seats = • Concentrated (chairs only – not fixed) = 7net • Standard space = 5 net • Unconcentrated (tables and chairs) = 15 net Business areas (with sprinkler protection) = 130 gross	

		Exercise Rooms = 50 gross Kitchens, commercial = 200 gross Warehouses =500 gross	
SBC Section 2901 Table 2902.1	Restrooms Required	*Group A-3 (Total # = ½# Male, ½# Female)* • Male Water Closets: 1 per 125 = # • Female Water Closets: 1 per 65 = # • Male Lavatories: 1 per 200 = # • Female Lavatories: 1 per 200 = # *Group B (Total # = ½# Male, ½# Female)* • Male Water Closets: 1 per 25 for the first 50 = 1 • Female Water Closets: 1 per 25 for the first 50 = 1 • Male Lavatories: 1 per 40 for the first 80 = 1 • Female Lavatories: 1 per 40 for the first 80 = 1 *Group F-1 (Total # = ½# Male, ½# Female)* • Male Water Closets: 1 per 100 = # • Female Water Closets: 1 per 100 = # *Group S-1 & S-2 (Total # = ½# Male, ½# Female)*	

4

		• Male Water Closets: 1 per 100 = # • Female Water Closets: 1 per 100 = #	

2015 SEATTLE EXISTING BUILDING CODE

CHAPTER 3 PROVISIONS FOR ALL COMPLIANCE METHODS

SECTION 301 COMPLIANCE METHODS

- Must comply with one of the compliance methods outline in the SEBC 301.1.1 through 301.1.3
- Portions of the building considered in compliance with previous codes shall be considered in compliance with this code unless the building is classified as a substantial alteration.

Compliance methods:

- 301.1.1 Prescriptive compliance method: comply with fire code and chapter 4 of the SEBC
- 301.1.2 Work Area compliance method: comply with chapters 5-7 and 13 of the SEBC
- 301.1.3 Performance compliance method: comply with chapter 14 of the SEBC

SECTION 302 ADDITIONAL REQUIREMENTS FOR ALL COMPLIANCE METHODS

302.2 ADDITIONAL CODES

- Must comply with requirements of IECC, IFC, IFGC, IMC, UPC and NFPA 70.
- Elevators must comply with current version of the IBC

302.3 EXISTING MATERIALS

- Materials already in use that complied with the requirements or approvals in effect at time of installation shall be permitted to remain in use unless the materials are deemed unsafe.

302.4 NEW AND REPLACEMENT MATERIALS

- Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used.

302.5 OCCUPANCY AND USE

- The occupancy and use of a building shall be determined in accordance with Chapter 3 of the *International Building Code.*

SECTION 303 REPAIRS

SECTION 304 SUBSTANTIAL ALTERATION REQUIREMENTS FOR ALL COMPLIANCE METHODS

- Regardless of compliance method, a building or structure to which substantial alterations or repairs are made shall conform to the requirements of this section and the following IBC sections:
    - Section 403 when applicable

- Special requirements of the Fire District found in chapter 4 when applicable
- Section 717
- Chapter 8
- Section 903 and 905
- Sections 909.20.5, 909.20.6, 909.21
- Chapter 10
- Fire alarms shall be provided as required by the international Fire Code

304.1.1 DEFINITIONS

- Substantial Alteration if any one of the following 5 conditions are met:
  1. Repair of a building with a damage ratio of 60 percent or more
  2. Remodeling or addition that substantially extends the life of the building over a significant portion of the building, other than typical tenant remodeling.
  3. A change of a significant portion of a building to an occupancy that is more hazardous than the existing occupancy per table 304.1
  4. Re-occupancy of a building that has been vacant for more than 24 months
  5. A significant increase in the occupant load of an unreinforced masonry building.

*GLSCC Interpretation: The proposed project **might** meet the definition of a Substantial Alteration based on item 2 or 3.*

SECTION 305 STRUCTURAL REQUIREMENTS FOR ALL COMPLIANCE METHODS

305.1.1 NEW STRUCTURAL ELEMENTS

- New structural elements must comply with current IBC

305.1.3 EXISTING STRUCTURAL ELEMENTS CARRYING GRAVITY LOAD

- Existing elements that are affected by the proposed alteration shall be strengthened supplemented or replaced to carry the increased gravity load unless the newly applied load is less than 5% increase over the design loading.

305.1.4 EXISTING STRUCTURAL ELEMENTS CARRYING LATERAL LOAD

- If the proposed alteration increases the design lateral load or decreases the lateral load carrying capacity of any existing lateral load carrying element, the structure must meet relevant IBC requirements
- Exception: if the demand-capacity ratio of existing lateral load carrying element is increased by less than 10% by the proposed alteration, it may remain unaltered.

GLSCC Interpretation: Modifications to the gravity elements must remain below 5% of capacity, and lateral elements must remain below 10% of design loading to remain practical. Specific elements such as proposed new openings will need to be specifically evaluated to avoid hitting this threshold.

SECTION 306 LANDMARKS

306.1 LANDMARKS

- Compliance with provisions of this code can be waived on a case by case basis by the building official where preservation of historic elements precludes complete compliance and a reasonable degree of safety can be achieved.

GLSCC Interpretation: If any portion of the site becomes landmarked, it is possible for the building official to waive compliance provisions due to impossible historic conditions.

SECTION 307 ACCESIBILITY FOR EXISTING BUILDINGS

307.1 SCOPE

- Accessibility requirements apply to the existing structure, including historic buildings.

GLSCC Interpretation: Any new work and restrooms will need to comply with all accessibility requirements.

307.4 CHANGE OF OCCUPANCY

- *Existing buildings* that undergo a change in occupancy shall comply with this section.

307.4.1 PARTIAL CHANGE IN OCCUPANCY

- Where a portion of the building is changed to a new occupancy classification, any *alterations* shall comply with Section 307.6, 307.7, and 307.8, as applicable.

307.4.2 COMPLETE CHANGE OF OCCUPANCY

- Where an entire building undergoes a *change of occupancy*, it shall comply with Section 307.4.2 and shall have all the following accessible features:
    - At least one accessible building entrance
    - At least one accessible route from an accessible building entrance to *primary function* areas.
    - Signage complying with Section 1111 of the *International Building Code*.
    - Accessible parking, where parking is being provided.
    - At least one accessible passenger loading zone, when loading zones are provided.
    - At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.
- Where it is *technically infeasible* to comply with the new construction standards of any of these requirements for a change of occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

307.5 ADDITIONS

- Provisions for new construction shall apply to *additions*. An *addition* that affects the accessibility to, or contains an area of, a *primary function* shall comply with the requirements in Section 307.7.

307.6 ALTERATIONS

- A *facility* that is altered shall comply with the applicable provisions of Chapter 11 of the *International Building Code*, unless *technically infeasible.* Where compliance with this section is *technically infeasible,* the *alteration* shall provide access to the maximum extent technically feasible.

307.7 ALTERATIONS AFFECTING AN AREA CONTAINING A PRIMARY FUNCTION

- When an *alteration* effects the accessibility to, or contains an area of *primary function*, the route to the *primary functions* area shall be *accessible.* The accessible route to the *primary function* area shall include toilet facilities, telephones and drinking fountains serving the area of *primary function*.

    Exceptions:
    - The costs of providing the accessible route are not required to exceed 20% of the costs of *alterations* affecting the area of *primary function*.

- This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
- This provision does not apply to *alterations* undertaken for the primary purpose of increasing the accessibility of a *facility*.

307.8. SCOPING FOR ALTERATIONS

307.8.1 ENTRANCES

- *Accessible* entrances shall be provided in accordance with Section 1105 of the *International Building Code*.
  - Exception: Where an *alteration* includes alterations to an entrance, and the *facility* had an *accessible* entrance, the altered entrance is not required to be *accessible*, unless required by Section 307.7. Signs complying with Section 1111 of the *International Building Code* shall be provided.

307.8.5 RAMPS

- Where slopes steeper than allowed by Section 1012.2. of the *International Building Code* are necessitated by space limitations, the slope of the ramps in or providing access to existing facilities shall comply with Table 307.8.5
  - Steeper than 1:10 but not steep than 1:8
  - Steeper than 1:12 but not steeper than 1:10

307.9 LANDMARKS

GLSCC Interpretation: Currently none of the buildings have been landmarked.

CHAPTER 4 PRESCRIPTIVE COMPLIANCE METHOD

SECTION 402 ADDITIONS

402.1 GENERAL

- *Additions* to any building or structure shall comply with the requirements of the *International Building Code* for new construction. *Alterations* to the *existing building* or structure shall be made to ensure that the *existing building* or structure together with the *addition* are no less conforming to the provisions of the *International Building Code* than the *existing building* or structure was prior to the *addition.* An *existing building* together with its *additions* shall comply with the height and area provisions of Chapter 5 of the *International Building Code.*

402.1.1 FIRE WALLS

- An existing nonconforming building to which an *addition* is made is permitted to exceed the height, number of stories and area specified for new buildings if a fire wall is provided, the *existing building* is not made more conforming, and the *addition* conforms to this code.

402.3 SMOKE ALARMS IN EXISTING PORTIONS OF A BUILDING

- When an *addition* is made to a building or structure of a Group R or I-1 occupancy, the *existing building* shall be provided with smoke alarms in accordance with Section 1103.8 of the *International Fire Code.*

SECTION 403 ALTERATIONS

- *Alterations* to any building shall comply with the requirements of the IBC for new construction

- *Alterations* shall be made such that the existing building is no less conforming that prior to the *alteration*

SECTION 407 CHANGE OF OCCUPANCY

- Change of occupancy shall be such that the existing building is no less complying with the provisions of the IBC than prior to the occupancy change.
- Changes of occupancy shall be permitted without conforming to all the provisions of this code for the new occupancy, provided that the new use is no more hazardous.

407.1.1 CHANGE IN THE GROUP OR USE

- A change in occupancy with no *change of occupancy* classification shall not be made to any structure that will subject the structure to any special provisions of the applicable *International Codes* without the approval of the code official. Compliance shall be only as necessary to meet the specific provisions and is not intended to require the entire building be brought into compliance.

407.5 SUBSTANTIAL ALTERATIONS

- *Change of occupancy* that are *substantial alterations* shall comply with Section 304.

CHAPTER 5 CLASSIFICATION OF WORK

- This chapter provides direction on classification of work under the SEBC.
- *Alterations* that include a change of occupancy must also comply with Section 302

SECTION 504 ALTERATION LEVEL 2

- Level 2 *alterations* include reconfiguration of and door or window, reconfiguration of any system, or installation of any additional equipment.
- Level 2 *alterations* must comply with the provisions of Chapter 7 and 8 of the SEBC

GLSCC Interpretation: The proposed project can be classified as a Level 2 alteration per the SEBC.

SECTION 505 ALTERATION LEVEL 3

- Level 3 *alterations* apply where the work area exceeds 50 percent of the *building area.*
- Level 3 *alterations* shall comply with the provisions of Chapter 7 and 8 for Level 1 and 2 alterations, respectively, as well as the provisions of Chapter 9.

GLSCC Interpretation: The proposed project **might** be classified as a Level 2 alteration per the SEBC.

SECTION 507 ADDITIONS

- *Additions* to existing buildings shall comply with the provisions of Chapter 11.

SECTION 508 LANDMARKS

- Landmarks shall comply with section 306

CHAPTER 7 – ALTERATIONS - LEVEL 1

701.2 CONFORMANCE

- An existing building or portion thereof shall not be altered such that the building becomes less safe that its existing condition.

SECTION 702 BUILDING ELEMENTS AND MATERIALS

- Interior finished, materials and methods, etc. shall conform to the IBC requirements.

SECTION 703 FIRE PROTECTION

703.1 GENERAL

- Alterations shall be done in a manner that maintains the level of protection provided.

SECTION 704 MEANS OF EGRESS

704.1 GENERAL

- Alterations shall be done in a manner that maintains the level of protection provided for the means of egress.

SECTION 705 ACCESSIBILITY

705.1 GENERAL

- A facility that is altered must comply with the applicable provisions of Section 307.

CHAPTER 8 ALTERATIONS - LEVEL 2

801.3 COMPLIANCE

- All new construction elements, components, systems and spaces shall comply with the requirements of the International Building Code.

SECTION 802 SPECIAL USE AND OCCUPANCY

802.1 GENERAL

- *Alteration* of buildings classified as special use and occupancy as described in the International Building Code shall comply with the requirements of section 901.1 an the scoping provisions of chapter 1 where applicable.

SECTION 803 BUILDING ELEMENTS AND MATERIALS

803.1 SCOPE

- The requirements of this section are limited to work areas in which Level 2 alteration are being performed and shall apply beyond the *work area* where specified.

SECTION 804 FIRE PROTECTION

804.1 SCOPE

- The requirements of this section shall be limited to work areas in which Level 2 *alternations* are being performed, and where specified they shall apply thorough the floor on which the work areas are located or otherwise beyond the work area.
    - Exception (Seattle only): The fire code official may modify or waive the fire protection requirements for level 2 alteration projects in which the fire protection requirements constitute an excessive burden.

804.2 AUTOMATIC SPRINKLER SYSTEMS

- Automatic Sprinklers shall be provided in accordance with the requirements of section 804.2.1 through 804.2.5. Installation requirements shall be in accordance with the IBC.

804.2.2 GROUPS A, B, F-1, S-1 AND S-2...ETC

- In buildings with occupancies in Groups B, F-1, S-1 and S-2 (and others), work areas that have exits or corridors shared by more than one tenant or that have exist or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where all the following occur:
    - The work area is required to be provided with automatic sprinklers in accordance with IBC as applicable for new construction.
    - The work area exceeds 50% of the floor area

804.4 FIRE ALARM AND DETECTION

- An approved FA system complying with sections 804.4.1 through 804.4.3is required. Where automatic sprinklers are also provided in accordance with section 804.2 and is connected to the building fire alarm system, automatic heat detection shall not be required.

804.4.1 OCCUPANCY REQUIREMENTS

- Must tie in with the existing system building wide, OR if not required building wide must activate all alarms within the work area.
- Exceptions: Occupancies with an existing previously approved FA system.

SECTION 805 MEANS OF EGRESS

805.2 GENERAL

- The means of egress shall comply with the requirements of this section.
- Exception 2: Means of Egress conforming to the requirements of the building code under which the building was considered compliant means of egress if, in the opinion of the code official, they do not constitute a distinct hazard to life.

805.3 NUMBER OF EXITS

- Must meet IBC requirements

805.3.3 MAIN ENTRANCE – GROUP A

- All buildings of group A with an occupant load of 300 or more shall be provided with a main entrance capable of serving as the main exit with an egress capacity of at least one-half of the total occupant load. The remaining exists shall be capable of providing one-half of the total required exit capacity.
- Exception: Where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

805.4 EGRESS DOORWAYS

- Must comply with 805.4.1 & 805.4.2

805.4.1 TWO EGRESS DOORWAYS REQUIRED

- Work areas shall have two egress doorways in accordance with 805.4.1.1 and 805.4.1.2

SECTION 810 PLUMBING

810.1 MINIMUM FIXTURES

- Where the occupant load of the story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified on the IBC based in increased occupant load.

CHAPTER 9 ALTERATIONS – LEVEL 3

- In Addition to the provisions of this chapter, work shall comply with all of the requirements of Chapter 7 and 8. The requirements of Section 803, 804, and 805 shall apply within all *work areas* whether or not they include exits and corridors share by more than one tenant and regardless of the occupant load.

904.1 AUTOMATIC SPRINKLER SYSTEMS

- An automatic sprinkler system shall be provided in a work area where required by Section 804.2 or this section.

904.2 FIRE ALARM AND DETECTION SYSTEMS

- Fire alarm and detection shall be provided in accordance with Section 907 of the *International Building Code* as required for new construction

905 MEANS OF EGRESS

CHAPTER 10 CHANGE OF OCCUPANCY

1001.2 CHANGE OF OCCUPANCY

- A change of occupancy or a change of occupancy within a space where there is a different fire protection system threshold requirement in Chapter 9 of the *International Building Code* shall not be made to any structure without the approval of the code official.

1001.2.1 CHANGE OF USE

- Any work undertaken in connection with a change in use that does not involve a *change of occupancy* classification or a change to another group within an occupancy classification shall conform to the applicable requirements for the work as classified in Chapter 5 and the requirements of Section 1002 through 1011.
    - Exception: As modified in Section 1205 for *historic buildings*.

1001.2.2 CHANGE OF OCCUPANCY CLASSIFICATION OR GROUP

- Where the occupancy classification of a building changes, the provisions of Section 1002 through 1012 shall apply. This includes a *change of occupancy* classification and a change to another group within an occupancy classification.

1001.2.2.1 PARTIAL CHANGE OF OCCUPANCY

- Where the occupancy classification or group of a portion of an occupancy classification or group of a portion of an *existing building* is changed, Section 1012 shall apply.

SECTION 1004 FIRE PROTECTION

SECTION 1005 MEANS OF EGREES

SECTION 1006 ACCESSIBILITY

SECTION 1012 CHANGE OF OCCUPANCY CLASSIFICATION

- A change in occupancy within a group as well as a change of occupancy classification from one group to a different group or where there is a change of occupancy within a space where there is a different fire protection system threshold requirement in Chapter 9 of the IBC. Such buildings shall comply with Section 1002 through 1011.

1012.1.1.1 CHANGE OF OCCUPANCY CLASSIFICATION WITHOUT SEPERATION

- Where a portion of an existing building is changed to a new occupancy classification or where there is a change of occupancy within a space where there is a different fire protection system threshold requirement in Chapter 9 of the *International Building Code*, and that portion is not separated from the remainder of the building with fire barriers having a fire-resistance rating as required in the IBC for the separate occupancy, the entire building shall comply with all the requirements of Chapter 9 applied for the most restrictive occupancy classification and with the requirements of this chapter.

1012.1.1.2 CHANGE OF OCCUPANCY CLASSIFICATION WITH SEPERATION

- Where a portion of an existing building is changed to a new occupancy classification or where there is a change of occupancy within a space where there is a different fire protection system threshold requirement in Chapter 9 of the *International Building Code*, and that portion is separated from the remainder of the building with fire barriers having a fire-resistance rating as required in the IBC for the separate occupancy, that portion shall comply with all the requirements of Chapter 9 for the new occupancy classification and with the requirements of this chapter.

1012.1.1.3 CHANGE OF OCCUPANCY CLASSIFICATION BASED ON HAZARD CATEGORY

- The relative degree of hazard between different occupancy classifications shall be determined in accordance with the categories specified in Tables 1012.4, 1012.5 and 1012.6. Such a determination shall be the basis for the application of Sections 1012.4 – 1012.7.

1012.4 MEANS OF EGRESS, GENERAL

- Hazard Categories for Egress
    - 1 (Highest Hazard)
        - H
    - 2
        - I-2, I-3, I-4
    - 3
        - A, E, I-1, M, R-1, R-2, R-4
    - 4
        - B, F-1, R-3, S-1
    - 5 (Lowest Hazard)
        - F-2, S-2, U

1012.4.1 MEANS OF EGRESS FOR CHANGE TO HIGHER HAZARD CATEGORY

- When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 1012.4, the means of egress shall comply with the requirements of Chapter 10 of the IBC.

1012.4.2 MEANS OF EGRESS FOR CHANGE OF USE TO EQUAL OR LOWER HAZARD CATEGORY

- When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 1012.4, existing elements of the means of egress shall comply with the requirements of Section 905 for the new occupancy classification.

1012.5 HEIGHTS AND AREAS

- Hazard categories in regard to the height and area shall be in accordance with Table 1012.5.
- Hazard Categories for Heights and Areas
    - 1 (Highest Hazard)
        - H
    - 2
        - A-1, A-2, A-3, A-4, I, R-1, R-2, R-4
    - 3
        - E, F-1, S-1, M
    - 4 (Lowest Hazard)
        - B, F-2, S-2, A-5, R-3, U

1012.5.1 HEIGHT AND AREA FOR CHANGE TO HIGHER HAZARD CATEGORY

- When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 1012.5, heights and areas of buildings and structures shall comply with the requirements of Chapter 5 of the IBC.

1012.5.2 HEIGHT AND AREA FOR CHANGE TO EQUAL OR LESSER HAZARD CATEGORY

- When a change of occupancy classification is made to an equal or lesser hazard as shown in Table 1012.5, the height and area of the *existing building* shall be deemed acceptable.

CHAPTER 11 ADDITIONS

1101.1 SCOPE

- An addition to a building or structure shall comply with the *International Codes* as adopted for new construction without requiring the existing building or structure to comply with any requirements of those codes or these provisions, except as required by this chapter.

1101.1 CREATION OR EXTENSION OF NONCOMFORMITY

- An addition shall not create or extend any nonconformity in the existing building to which the addition is being made with regard to accessibility, structural strength, fire safety, means of egress of the capacity of mechanical, plumbing, or electrical systems.

1102.1 HEIGHT LIMITATIONS

- No addition shall increase the height of an existing building beyond that permitted in IBC Chapter 5

1102.2 AREA LIMITATIONS

- No addition shall increase the area limitations of an existing building beyond that permitted in IBC Chapter 5

CHAPTER 12 HISTORIC

- Not adopted in The City of Seattle. See Section 306 for provisions for landmark buildings.

2015 SEATTLE BUILDING CODE

CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION

SECTION 302 CLASSIFICATION

- Assembly: Groups A-1, A-2, A-3, A-4 and A-5
- Business: Group B
- Educational: Group E
- Factory and Industrial: Groups F-1 and F-2
- Institutional: Groups I-1, I-2, I-3 and I-4
- Storage: Groups S-1 and S-2
- Utility : Group U

303.1 ASSEMBLY GROUP A

- Gathering of persons for purposes such as civic, social or religious functions
    - Recreation
    - food or drink consumption

303.1.1 SMALL BUILDINGS AND TENANT SPACES

- A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.

303.1.2 SMALL ASSEMBLY SPACES

- The following rooms and spaces shall not be classified as Assembly occupancies:
    1. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
    2. A room or space used for assembly purposes that is less than 750 square feet in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

303.1.3 ASSOCIATED WITH GROUP E OCCUPANCIES

- A room or space used for assembly purposes that is associated with a Group E occupancy is not considered a separate occupancy.

303.4 ASSEMBLY GROUP A-3

- Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

- Community halls
- Gymnasiums

304.1 BUSINESS GROUP B

- Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include…
  - Educational occupancies for students above the 12th grade
  - Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities, and not more than 2,500 SF in area
  - Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy.)

306.1 FACTORY INDUSTRIAL GROUP F

- Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

306.2 MODERATE-HAZARD FACTORY INDUSTRIAL, GROUP F-1

- Factory industrial uses that are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:
  - Athletic equipment
  - Bicycles
  - Boats
  - Canvas or similar fabric
- Food processing establishments and commercial kitchens not associated with restaurants, cafeteria and similar dining facilities, and more than 2,500 square feet in area

311.1 STORAGE GROUP S

- Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

311.2 MODERATE-HAZARD STORAGE, GROUP S-1

- Storage Group S-1 occupancies are *buildings* occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:
  - Dry boat storage (indoor)
  - Motor vehicle and marine *repair garages* complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)

311.3 LOW-HAZARD STORAGE, GROUP S-2

- Storage Group S-2 occupancies include, among others, *buildings* used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

- Covered boat moorage not classified as Group U

CHAPTER 4 SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS

SECTION 503 GENERAL BUILDING HEIGHT AND AREA LIMITATIONS

- Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. Each portion of the *building* separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate *building*.

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES

504.2 MIXED OCCUPANCY

In a building containing mixed occupancies in accordance with Section 508, no individual occupancy shall exceed the height and number of *story* limits specified in this section for the applicable occupancies.

504.3 HEIGHT IN FEET

The maximum height, in feet, of a *building* shall not exceed the limits specified in Table 504.3.

- For Occupancy Classification A, B, E, F, M, S, U, Type V B Construction, the allowable height in feet above grade plane is 40 feet

504.4 ALLOWABLE NUMBER OF STORIES

The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.

- For Occupancy Classification A-3, Type VB Construction, the allowable number of stories above grade = 2 stories w/ sprinklers (S) or 1 story w/ out sprinklers (NS)
- For Occupancy Classification B, Type VB Construction, the allowable number of stories above grade = 3 stories (S) or 2 stories (NS)
- For Occupancy Classification F-1, Type VB Construction, the allowable number of stories above grade = 2 stories (S) or 1 story (NS)
- For Occupancy Classification S-1, Type VB Construction, the allowable number of stories above grade = 2 stories (S) or 1 story (NS)
- For Occupancy Classification S-2, Type VB Construction, the allowable number of stories above grade = 3 stories (S) or 2 stories (NS)

SECTION 506 BUILDING AREA

506.1 GENERAL

- The allowable floor area of a *building* shall be determined based on the type of construction, occupancy classification, whether there is an *automatic sprinkler system* installed throughout the building and the amount of building frontage on public way or open space.

506.2.2 MIXED-OCCUPANCY, ONE-STORY BUILDINGS

- The allowable area of a mixed-occupancy building with no more than one *story above grade plane* shall be determined in accordance with the applicable provisions of Section 508.1 based on Equation 5-1 for each applicable occupancy.
    - Allowable area (SF) = Tabular allowable area factor per Table 506.2 + [Tabular allowable area factor for NS per Table 506.2 * Area factor increase due to frontage percent per Section 506.3]

506.2.4 MIXED-OCCUPANCY, MULTI-STORY BUILDINGS

- Each story of a mixed-occupancy building with more than one story above grade plane shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three *stories above grade plane,* the total building area shall be such that the aggregate sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories*
    - Allowable area (SF) = [Tabular allowable area factor per Table 506.2 + (Tabular allowable area factor for NS per Table 506.2 * Area factor increase due to frontage percent per Section 506.3)]
    - Exception: For buildings designed as separated occupancies under Section 508.4 and equipped throughout with an *automatic sprinkler system* installed in accordance with Section 508.1, shall not exceed four.

- For Occupancy Classification A-3, Type VB Construction, the allowable area factor = 6,000 SF w/out sprinkler system (NS), 24,000 SF w/ sprinkler and 1 floor max above grade (S1), 18,000 SF w/ sprinkler system and 2+ stories above grade (SM)
- For Occupancy Classification B, Type VB Construction, the allowable area factor = 9,000 SF (NS), 36,000 SF (S1), 27,000 SF (SM)
- For Occupancy Classification F-1, Type VB Construction, the allowable area factor = 8,500 SF (NS), 34,000 SF (S1), 25,500 SF (SM)
- For Occupancy Classification S-1, Type VB Construction, the allowable area factor = 9,000 SF (NS), 36,000 SF (S1), 27,000 SF (SM)system and 2+ stories above grade (SM)
- For Occupancy Classification S-2, Type VB Construction, the allowable area factor = 13,500 SF (NS), 54,000 SF (S1), 40,500 SF (SM)

506.3 FRONTAGE INCREASE

- Every building shall adjoin or have access to a public way to receive an area factor increase based on frontage. Area factor increase shall be determined in accordance with Section 506.3.1 through 506.3.3.

SECTION 508 MIXED USE OCCUPANCY

508.1 GENERAL

- Each portion of a *building* shall be individually classified in accordance with Section 302.1. Where a *building* contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3, 508.4, or a combination of these section.

508.2 ACCESSORY OCCUPANCIES

- Accessory occupancies are those occupancies that are ancillary to the main occupancy of the *building* or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4.

508.2.1 OCCUPANCY CLASSIFICATION

508.2.2 ALLOWABLE BUILDING HEIGHT

508.2.3 ALLOWABLE BUILDING AREA

- Based on the provisions for the main occupancy of the *building*. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the *story* in which they are located and shall not exceed the tabular values per Table 506.2.

508.2.4 SEPERATION OF ACCESSORY OCCUPANCIES

- No separation is required between accessory occupancies and the main occupancy.

508.3 NONSEPERATED OCCUPANCIES

- *Buildings* or portions of *buildings* that comply with the provisions of this section shall be considered as nonseparated occupancies.

508.3.1 OCCUPANCY CLASSIFICATION

- Nonseperated occupancies shall be individually classified per Section 302.1… In addition, the most restrictive provisions of Chapter 9 that apply to the nonseparated occupancies shall apply to the total nonseperated occupancy area.

508.3.2 ALLOWABLE BUILDING AREA AND HEIGHT

- The allowable *building area*, number of *stories* and *height* of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.3 SEPERATION

CHAPTER 6 TYPES OF CONSTRUCTION

SECTION 602 CONSTRUCTION CLASSIFICATION

- Table 601: Fire-Resistance requirements for VB = 0 hours

602.5 TYPE V

- Type V construction is that type of construction in which the structural elements, *exterior walls* and interior walls are of any materials permitted by this code.

CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES

CHAPTER 8 INTERIOR FINISHES

- The project must meet all IBC requirements for flame spread and flammability.

CHAPTER 9 FIRE PROTECTION SYSTEMS

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS

903.2.1.3 GROUP A-3

- An *automatic sprinkler system* shall be provided for *fire areas* containing Group A-3 occupancies and intervening floors of the building where one of the following conditions exists:
    - The *fire area* exceeds 12,000 SF
    - The *fire area* has an *occupant load* of 300 or more
    - The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.4 GROUP F-1

- An *automatic sprinkler system* shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:
    - The F-1 *fire area* exceeds 12,000 SF
    - The F-1 *fire area* is located more than three *stories above the grade plane.*
    - The F-1 combined *fire area* on all floors, including any mezzanines, exceeds 24,000 SF

903.2.9 GROUP S-1

- An *automatic sprinkler system* shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists
    - The S-1 *fire area* exceeds 12,000 SF
    - The S-1 *fire area* is located more than *three stories above the grade plane.*
    - The S-1 combined *fire area* on all floors, including any mezzanines, exceeds 24,000 SF
    - The S-1 *fire area* used for the storage of a commercial motor vehicles where the *fire area* exceeds 5,000 SF.

903.2.10 GROUP S-2 ENCLOSED PARKING GARAGES

- An *automatic sprinkler system* shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.6 where wither of the following condition exists:
    - The enclosed parking garage *fire area* exceeds 12,000 SF
    - The enclosed parking garage is located beneath other groups

903.3 INSTALLATION REQUIREMENTS

- *Automatic sprinkler systems* shall be designed and installed in accordance with Sections 903.3.1 through 903.3.8.

CHAPTER 10 MEANS OF EGRESS

SECTION 1004 OCCUPANT LOAD

Function of Space	Occupancy Load Factor
Accessory storage areas, mechanical equipment	300 gross
Assembly without fixed seats	Concentrated (chairs only – not fixed) = 7net Standard space = 5 net Unconcentrated (tables and chairs) = 15 net
Business areas (with sprinkler protection)	130 gross
Exercise Rooms	50 gross
Kitchens, commerical	200 gross
Warehouses	500 gross

SECTION 1005 MEANS OF EGRESS SIZING

1005.2 MINIMUM WIDTH BASED ON OCCUPANCY

- Minimum width in inches of any means of egress components shall not be less that that specified for such component. Width cannot be less that width required for doors in section 1010.

1005.3.1 STAIRWAYS

- 0.2 inches per occupant (sprinkler building, exception 1)

1005.3.2 OTHER EGRESS COMPONENTS

- 0.15 inches per occupant (sprinkler building, exception 1)

1005.5 DISTRIBUTION OF MAXIMUM WIDTH AND REQUIRED CAPACITY

- Where more than 1 exit are required, or access to more than 1 exit, must be configured so that loss of one exit does not reduce the available capacity by width to less than 50 percent of the required capacity width

1005.6 EGRESS CONVERGENCE

- Where combining means of egress from upper levels, means of egress at point of convergence shall not be less than the required width for both combined.

1005.7 ENCROACHMENT

SECTION 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

Table 1006.2.1

- A, B & F occupancies with over 49 occupants require 2 exits
- S occupancies with over 29 occupants require 2 exits
- Common Path of Egress Travel Distance Limits:
    - A Occupancy (with sprinkler) max dead end = 75'
    - B Occupancy (with sprinkler) max dead end = 100'
    - F Occupancy (with sprinkler) max dead end = 100'

- S Occupancy (with sprinkler) max dead end = 100’

1006.3.1 EGRESS BASED ON OCCUPANT LOAD

- Each Story shall have the minimum number of exits or access to exits as specified in table 1006.3.1

Table 1006.3.1 Occupant load per story

- 1-500: requires 2 exits

SECTION 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

- Where 2 exits are required, separation distance shall not be less than one-third the maximum overall diagonal dimension of the area served.
- This applies to all portions of exit access stairways (first riser or doorway)

SECTION 1010 DOORS, GATES AND TURNSTILES

- Means of egress doors shall be sized according to this section

1010.1.1 SIZE OF DOORS

- Sufficient for occupant load, not less than 32 inches

SECTION 1016 EXIT ACCESS

1016.2 EGRESS THROUGH INTERVENING SPACES

- Item 2: Egress from a room or space shall not pass through adjoining or intervening rooms or areas except:
  - Where such rooms are accessory to one or the other and provide a discernable path of egress travel to an exit.
- Item 6: Unless approved by the building official, where two or more exits are required, exit travel shall not pass through an interior exit stairway as the only way to reach another exit.

SECTION 1017 EXIT ACCESS TRAVEL DISTANCE

- Applies to the exit access portion of the means of egress system
- Exit access travel distances shall not exceed the values in Table 1017.2

TABLE 1017.2 EXIT ACCESS TRAVEL DISTANCE

- Maximum Exit Access Travel Distance
  - A Occupancy (sprinkler) = 250’
  - B Occupancy (sprinkler) = 300’
  - F-1 Occupancy (sprinkler) = 250’
  - S-1 Occupancy (sprinkler)= 250’
  - S-2 Occupancy (sprinkler)= 400’

1017.3 MEASUREMENT

- Exist access distance shall be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit.
- 1017.3.1 Travel Distance on exit access stairways shall be made on a plane parallel to and tangent to the tread nosing in the center of the stair.

SECTION 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.3 OCCUPANCIES OTHER THAN I-2 AND I-3

- Floor openings containing exist access stairways that do not comply with one of the conditions listed shall be enclosed with a shaft enclosure:
  - Item 1: Exit access stairways that serve or atmospherically communicate between only two stories. Such interconnected stories shall not be open to other stories.
  - Item 4: Exit access stairways that are designed exclusively for circulation in buildings equipped with an automatic sprinkler system where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway and the opening is protected by a draft curtain and closely spaced sprinklers. (limited to 4 stories)

SECTION 1020 CORRIDORS

- Corridors to be fire resistance rated per table 1020.1

TABLE 1020.1 CORRIDOR FIRE RESISTANCE RATING

- Required rating:
  - Occupancy A, B, S, & F, occupant load greater than 30 = 0 (sprinkler)

1020.4 DEAD ENDS

- Where more than 1 exit is required, exit access shall be arranged such that there are no dead ends in corridors more than 25 feet.
- Exceptions
  - Item 2: In B occupancies, with sprinklers, the length of the dead end corridor shall not exceed 50 feet
  - Item 3: A dead end corridor shall not be limited in length where the length of the dead end corridor is less than 2.5 times the least width.

CHAPTER 11 ACCESSIBILITY

CHAPTER 15 ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

CHAPTER 29 PLUMBING SYSTEMS

TABLE 2902.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

Group A-3 (Total # = ½# Male, ½# Female)

- Male Water Closets: 1 per 125 = #
- Female Water Closets: 1 per 65 = #
- Male Lavatories: 1 per 200 = #
- Female Lavatories: 1 per 200 = #

Group B (Total # = ½# Male, ½# Female)

- Male Water Closets: 1 per 25 for the first 50 = 1
- Female Water Closets: 1 per 25 for the first 50 = 1
- Male Lavatories: 1 per 40 for the first 80 = 1

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

Record Number	Facility	Facility Description	Owned Leased	Area	Room/Space	Room/Space Description	Room/Space Type	Element	Element Description	Attribute	Attribute Description	On-Site Value	Compliant	Finding	Priority
1647	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate		Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	1-Entry
1654	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	Into cubby room	Closing speed		4	NO	Too fast.	3-Restrooms
1655	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	Into cubby room	Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	3-Restrooms
1658	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	Into cubby room	Opening force		6	NO	Too high.	3-Restrooms
1659	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Other Element	Lockers	Z-Other attribute		8 lockers none accessible	NO	No lockers between 15" and 48" are provided	3-Restrooms
1664	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Signage, Designation		Signage location?		Door	NO	Signage located on door	2-Services
1669	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate		Closing speed		3	NO	Too fast.	3-Restrooms
1670	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate		Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	3-Restrooms
1673	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate		Opening force		7	NO	Too high.	3-Restrooms
1675	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Water Closet		Clearance, perpendicular	To door that swings in	52.5	NO	Too shallow.	3-Restrooms
1676	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Water Closet		Dim, height of seat		15.5	NO	Too low.	3-Restrooms
1677	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Water Closet		Dim, sidewall to centerline		26.5	NO	Too far.	3-Restrooms
1678	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Water Closet		Location of flush control?		Narrow	NO	On narrow side of toilet	3-Restrooms
1680	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Dispenser, T.P.		Dim, from water closet seat		6	NO	Wrong location.	3-Restrooms
1681	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Coat Hook		Dim, height		68	NO	Too high.	3-Restrooms
1682	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Other Element	Lockers in bathroom	Z-Other attribute		Locker hardware not accessible	NO	Hardware requires twisting of wrist	3-Restrooms
1685	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Lavatory Sink		Pipes protected?		No	NO	Not wrapped.	3-Restrooms

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

1686	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Dispenser, Soap		Dim, height of operable part		49.5	NO	Too high.	3-Restrooms
1688	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Mirror		Dim, height to bottom		47.5	NO	Too high.	3-Restrooms
1690	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Operable Part	Fire extinguisher near sink	Dim, height		69	NO	Too high.	3-Restrooms
1691	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Dispenser, P.T.		Dim, height of operable part		64	NO	Too high.	3-Restrooms
1692	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Dispenser, P.T.		Hardware operable?		No	NO	Hardware requires twisting of wrist.	3-Restrooms
1696	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	To shower	Closing speed		3	NO	Too fast.	3-Restrooms
1697	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	To shower	Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	3-Restrooms
1700	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Door/Gate	To shower	Opening force		8	NO	Too high.	3-Restrooms
1707	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Shower Compartment, Roll-In		Dim, height of vertical threshold		2.5	NO	Too high.	3-Restrooms
1715	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Shower Compartment, Roll-In		Z-Other attribute	Curtain rod	72	NO	Too low.	3-Restrooms
1724	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Operable Part	Fan switch in shower	Control accessible?		No	NO	Hardware requires twisting of wrist	3-Restrooms
1725	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Operable Part	Fan switch in shower	Dim, height		55	NO	Too high.	3-Restrooms
1726	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Operable Part	Fire extinguisher in cubby room	Dim, height		69	NO	Too high.	3-Restrooms
1727	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Restroom Unisex		3-Employee Common	Coat Hook	In cubby room	Dim, height		65	NO	Too high.	3-Restrooms
1732	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To fitness room	1-Public Unsupervised	Door/Gate		Dim, height of vertical threshold		1.5	NO	Too high.	1-Entry
1733	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To fitness room	1-Public Unsupervised	Door/Gate		Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	1-Entry
1737	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Exercise Room	Fitness room	1-Public Unsupervised	Signage, Designation		Signage location?		No signage	NO	No designation signage provided	2-Services

1739	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Exercise Room	Fitness room	1-Public Unsupervised	Exercise Equipment	Bike	Clear space provided?		No	NO	No cleat space provided.	2-Services
1745	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate	The Meeting Room	Dim, height of vertical threshold		1.75	NO	Too high.	1-Entry
1746	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate	The Meeting Room	Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	1-Entry
1750	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Other Room	Meeting Room	1-Public Unsupervised	Operable Part	Fire extinguisher	Dim, height		72	NO	Too high.	2-Services
1754	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	Boat storage under bleachers	1-Public Unsupervised	Door/Gate		Closing speed		4	NO	Too fast.	1-Entry
1755	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	Boat storage under bleachers	1-Public Unsupervised	Door/Gate		Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	1-Entry
1759	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	Boat storage under bleachers	1-Public Unsupervised	Door/Gate		Slope, cross		2.9	NO	Excessive slope.	1-Entry
1763	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate	Boat storage near office	Closing speed		4	NO	Too fast.	1-Entry
1764	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate	Boat storage near office	Dim, height of vertical threshold		1	NO	Too high.	1-Entry
1768	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Door/Gate	Boat storage near office	Opening force		15	NO	Too high.	1-Entry
1769	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Signage, Designation		Signage location?		No signage	NO	No designation signage provided	1-Entry
1770	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	Boat storage under bleachers	1-Public Unsupervised	Signage, Designation		Signage location?		No signage	NO	No designation signage provided	1-Entry
1771	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Walkway	Boat storage near office	1-Public Unsupervised	Walking Surface		Dim, width		27	NO	Too narrow.	1-Entry
1773	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Walkway	Boat storage near office	1-Public Unsupervised	Operable Part	Fire extinguisher	Dim, height		71	NO	Too high.	2-Services
1776	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Door/Gate	Left	Clearance, door opening height		79	NO	Too low.	2-Services
1777	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Door/Gate	Left	Clearance, door opening width		29	NO	Too narrow.	2-Services

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

1780	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Coat Hook	Left	Dim, height		60	NO	Too high.	2-Services
1783	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Door/Gate	Right	Clearance, door opening height		79	NO	Too low.	2-Services
1784	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Door/Gate	Right	Clearance, door opening width		31.5	NO	Too narrow.	2-Services
1785	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Door/Gate	Right	Hardware operable?	Pocket door	No	NO	Hardware requires tight grasping.	2-Services
1786	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Dressing Room	Boat storage near office	1-Public Unsupervised	Coat Hook	Right	Dim, height		62	NO	Too high.	2-Services
1790	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To large boat storage	1-Public Unsupervised	Door/Gate		Closing speed		4	NO	Too fast.	1-Entry
1795	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To large boat storage	1-Public Unsupervised	Door/Gate		Slope, running		6.2	NO	Excessive slope.	1-Entry
1799	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To office	1-Public Unsupervised	Door/Gate		Dim, height of vertical threshold		1.5	NO	Too high.	1-Entry
1800	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To office	1-Public Unsupervised	Door/Gate		Dim, height to bottom of vision window		45.75	NO	Too high.	1-Entry
1801	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To office	1-Public Unsupervised	Door/Gate		Fixed door stop provided?		Yes	NO	Door stop is located in smooth surface of door.	1-Entry
1807	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Interior	Lobby		1-Public Unsupervised	Counter		Z-Other attribute		33" width to lowered section, remove black box to get to lowered section	NO	Too narrow.	2-Services
1813	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	1	Dim, height of sign		55	NO	Too low.	1-Entry
1821	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	1	Van sign provided?		No	NO	None provided	1-Entry
1826	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Access Aisle	1&2	Surface marking?		No	NO	No surface marking is provided.	1-Entry
1827	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Curb Ramp	1&2	Slope, left flare		16.7	NO	Excessive slope.	1-Entry
1828	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Curb Ramp	1&2	Slope, right flare		15.4	NO	Excessive slope.	1-Entry

1831	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	2	Dim, height of sign		51.75	NO	Too low.	1-Entry
1838	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	3	Dim, height of sign		47	NO	Too low.	1-Entry
1842	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	3	Slope, running		4.2	NO	Excessive slope.	1-Entry
1846	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Access Aisle	3&4	Dim, width		48	NO	Too narrow.	1-Entry
1847	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Access Aisle	3&4	Full length of parking space?		No	NO	Not full length of parking space.	1-Entry
1848	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Access Aisle	3&4	Slope, running		3.6	NO	Excessive slope.	1-Entry
1850	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Curb Ramp	3&4	Slope, landing maximum		4.5	NO	Excessive slope.	1-Entry
1851	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Curb Ramp	3&4	Slope, left flare		13.6	NO	Excessive slope.	1-Entry
1852	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Curb Ramp	3&4	Slope, right flare		18.1	NO	Excessive slope.	1-Entry
1855	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	4	Dim, height of sign		55.25	NO	Too low.	1-Entry
1859	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	4	Slope, running		3.1	NO	Excessive slope.	1-Entry
1862	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	5	Access aisle provided?		No	NO	Not provided.	1-Entry
1863	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	5	Dim, height of sign		58.5	NO	Too low.	1-Entry
1867	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Parking Facility		1-Public Unsupervised	Parking Space	5	Slope, cross		4.5	NO	Excessive slope.	1-Entry
1870	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From 1&2 accessible spaces to sidewalk	1-Public Unsupervised	Walking Surface		Slope, cross		3.6	NO	Excessive slope.	1-Entry
1873	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface	From parking to right walkway of bleachers	Slope, cross		6	NO	Excessive slope.	1-Entry

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

1874	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface	From parking to right walkway of bleachers	Slope, running		6.3	NO	Excessive slope.	1-Entry
1875	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface	To right dock	Dim, height of vertical level change		1	NO	Too high.	1-Entry
1876	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface	To right dock	Slope, running		11.9	NO	Excessive slope.	1-Entry
1877	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface	To right dock	Slope, running	At wood deck	14.1	NO	Excessive slope.	1-Entry
1878	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway		1-Public Unsupervised	Walking Surface		Slope, cross	On wood deck	3.3	NO	Excessive slope.	1-Entry
1879	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to walkway between bleachers and locker room	1-Public Unsupervised	Walking Surface		Dim, height of vertical level change		1.25	NO	Too high.	1-Entry
1880	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to walkway between bleachers and locker room	1-Public Unsupervised	Walking Surface		Slope, running		14.1	NO	Excessive slope.	1-Entry
1881	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To center dock	1-Public Unsupervised	Walking Surface		Dim, width of gap	Ramp to deck	.75	NO	Too wide.	1-Entry
1882	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	To center dock	1-Public Unsupervised	Walking Surface		Slope, running		14.5	NO	Excessive slope.	1-Entry
1884	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to boat house	1-Public Unsupervised	Drinking Fountain Exterior	Next to locker room	High-low fountain?		No	NO	No high-low fountains provided.	4-Other

1885	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to boat house	1-Public Unsupervised	Walking Surface		Slope, running		13.1	NO	Excessive slope.	1-Entry
1886	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to far left dock	1-Public Unsupervised	Walking Surface		Slope, running		18.8	NO	Excessive slope.	1-Entry
1887	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to far left dock	1-Public Unsupervised	Walking Surface	To left dock	Dim, width of gap		.75	NO	Too wide.	1-Entry
1888	Green Lake Small Crafts Center	Green Lake Small Crafts Center	Owned	Exterior	Walkway	From parking to far left dock	1-Public Unsupervised	Walking Surface	To left dock	Slope, running		11.3	NO	Excessive slope.	1-Entry

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

Recommendation	Recomm Value	Photo Reference Number	Citation	Mitigation Difficulty	Resolution Status	Resolution Comment
Remove door stop.		4242522	404, 402	3-Low		
Adjust the door closer to the correct closing speed.	5 seconds minimum	4242522	213, 603, 404, 402	3-Low		
Remove door stop.		4242528	213, 603, 404, 402	3-Low		
Adjust the door closer to the required amount of force allowed.	5 lbs. maximum	4242527	213, 603, 404, 402	3-Low		
Provide lockers between 15" and 48".	5% of lockers shall be compliant	4242531, 4242530	213, 603, 222	3-Low		
Instal compliant signage that has tactile letters and Braille. Mount the signage on the latch side of the door.	48" minimum and 60" maximum	4242532	213, 603, 216.2, 703	3-Low		
Adjust the door closer to the correct closing speed.	5 seconds minimum	4242532	213, 603, 404, 402	3-Low		
Remove door stop.		4242533	213, 603, 404, 402	3-Low		
Adjust the door closer to the required amount of force allowed.	5 lbs. maximum	4242532	213, 603, 404, 402	3-Low		
Remodel the restroom to provide at least the minimum required depth.	59" minimum	4242538, 4242539	213, 603, 604	1-High		
Adjust or modify the toilet so the seat height is at the required accessible height.	17" to 19" AFF	4242537	213, 603, 604	3-Low		
Relocate the toilet so that it is within the required distance from the side wall.	16" to 18"	4242535	213, 603, 604	2-Moderate		
Move the flush control to the open/wide side of the toilet.		4242535	213, 603, 604	3-Low		
Move the dispenser to the correct distance from the front of the toilet seat.	7" to 9" from water closet seat	4242540, 4242541	213, 603, 309.4, 604.7	3-Low		
Lower coat hook.	48" maximum	4242542	213, 603, 604.8.3	3-Low		
Install hardware that does not require tight grasping, pinching, or twisting of the wrist.		4242531	213, 603, 803	3-Low		
Wrap or insulate the drain and supply lines to protect against contact.		4242546	213, 603, 606	3-Low		

Relocate the dispenser to the correct height.	48" maximum	4242547	213, 603, 205, 308, 309	3-Low		
Lower bottom edge of reflective surface.	40" maximum AFF	4242548	213, 603, 603.3	3-Low		
Lower the operable part.	48" maximum	4242549	213, 603, 309	3-Low		
Relocate the dispenser to the correct height.	48" maximum	4242550	213, 603, 205, 308, 309	3-Low		
Install hardware that does not require tight grasping, pinching, or twisting of the wrist.		4242550	213, 603, 205, 308, 309	3-Low		
Adjust the door closer to the correct closing speed.	5 seconds minimum	4242551	213, 603, 404, 402	3-Low		
Remove door stop.		4242551	213, 603, 404, 402	3-Low		
Adjust the door closer to the required amount of force allowed.	5 lbs. maximum	4242551	213, 603, 404, 402	3-Low		
Provide a threshold which is 0.25 inch maximum, or a beveled threshold which is 0.5 inch maximum, at the door entrance.	0.5 inch maximum	4242556	213, 603,	1-High		
Raise the curtain rod.	80" minimum	4242559	213, 603,	3-Low		
Replace hardware that does not require pinching or twisting of the wrist.		4242566	213, 603, 309	3-Low		
Lower the operable part.	48" maximum	4242566	213, 603, 309	3-Low		
Lower the operable part.	48" maximum	4242567	213, 603, 309	3-Low		
Lower coat hook.	48" maximum	4242568	213, 603, 604.8.3	3-Low		
Provide a threshold which is 0.25 inch maximum, or a beveled threshold which is 0.5 inch maximum, at the door entrance.	0.25" maximum	4242571	404, 402	3-Low		
Remove door stop.		4242572	404, 402	3-Low		
Instal compliant signage that has tactile letters and Braille. Mount the signage on the latch side of the door.	48" to 60" AFF	4242570	216.2, 703	3-Low		

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

Provide a 30 by 48 inch clear floor space beside the exercise equipment.		4242574	236, 1004	3-Low		
Provide a threshold which is 0.25 inch maximum, or a beveled threshold which is 0.5 inch maximum, at the door entrance.	0.25" maximum	4242578	404, 402	3-Low		
Remove door stop.		4242577	404, 402	3-Low		
Lower the operable part.	48" maximum	4242579	309	3-Low		
Adjust the door closer to the correct closing speed.	5 seconds minimum	42542582	404, 402	3-Low		
Remove door stop.		4242582	404, 402	3-Low		
Regrade surface to reduce slope.	2.08% maximum	4242583, 4242585	404, 402	1-High		
Adjust the door closer to the correct closing speed.	5 seconds minimum	4242586	404, 402	3-Low		
Provide a threshold which is 0.25 inch maximum, or a beveled threshold which is 0.5 inch maximum, at the door entrance.	0.25" maximum	4242589, 4242590	404, 402	3-Low		
Adjust the door closer to the required amount of force allowed.	10 lbs maximum per City of Seattle building code.	4242586	404, 402	3-Low		
Instal compliant signage that has tactile letters and Braille. Mount the signage on the latch side of the door.	48" to 60" AFF	4242586	216.2, 703	3-Low		
Instal compliant signage that has tactile letters and Braille. Mount the signage on the latch side of the door.	48" to 60" AFF	4242580	216.2, 703	3-Low		
Increase width of walking surface.	48" minimum	4242591	403	1-High		
Lower the operable part.	48" maximum	4242593	309	3-Low		
Replace the doorway with a compliant vertical clearance.	80" minimum	4242596	222, 803, 404, 402	2-Moderate		
Reframe the doorway to provide a compliant clear opening width. Offset hinges may be used to facilitate the process.	32" minimum	4242595	222, 803, 404, 402	2-Moderate		

Lower coat hook.	48" maximum	4242597	222, 803, 604.8.3	3-Low		
Replace the doorway with a compliant vertical clearance.	80" minimum	4242600	222, 803, 404, 402	2-Moderate		
Reframe the doorway to provide a compliant clear opening width. Offset hinges may be used to facilitate the process.	32" minimum	4242599	222, 803, 404, 402	2-Moderate		
Install hardware that does not require tight grasping, pinching, or twisting of the wrist.		4242602	222, 803, 404, 402	3-Low		
Lower coat hook.	48" maximum	4242603	222, 803, 604.8.3	3-Low		
Adjust the door closer to the correct closing speed.	5 seconds minimum	4242604	404, 402	3-Low		
Regrade surface to reduce slope.	2.08% maximum	4242607, 4242608	404, 402	1-High		
Provide a threshold which is 0.25 inch maximum, or a beveled threshold which is 0.5 inch maximum, at the door entrance.	0.25" maximum	4242616	404, 402	3-Low		
Lower vision window or replace with a new door. (Safe harbor if built before 3/15/12.)	43" maximum	4242617	404, 402	3-Low		
Remove door stop.		4242609	404, 402	3-Low		
Remove black cabinet.	36" minimum	4242611	902, 904	2-Moderate		
Raise the height of the sign.	60" minimum	4242622	502	3-Low		
Install van accessible signage.	60" minimum	No photo	502	3-Low		
Paint the parking lot.		4242619	502.3	3-Low		
Rebuild the curb ramp with compliant side flares.	10% maximum	4242623, 4242624	406, 405.2 - 405.5, 405.10	1-High		
Rebuild the curb ramp with compliant side flares.	10% maximum	4242625, 4242626	406, 405.2 - 405.5, 405.10	1-High		

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

Raise the height of the sign.	60" minimum	4242628	502	3-Low		
Raise the height of the sign.	60" minimum	4242632	502	3-Low		
Regrade/replace paved surface.	2.08" maximum	4242630, 4242631	502	1-High		
Restripe the parking space and aisle to provide a compliant sized access aisle.	60" minimum	4242633, 4242634	502.3	3-Low		
Restripe the parking space and aisle to provide a compliant sized access aisle.		4242633	502.3	3-Low		
Regrade access aisle or relocate accessible parking to a level area of the parking facility.	2.08% maximum	4242635, 4242636	502.3	1-High		
Resurface or replace curb ramp landing.	2.08% maximum	4242641, 4242642	406, 405.2 - 405.5, 405.10	1-High		
Rebuild the curb ramp with compliant side flares.	10% maximum	4242637, 4242638	406, 405.2 - 405.5, 405.10	1-High		
Rebuild the curb ramp with compliant side flares.	10% maximum	4242639, 4242640	406, 405.2 - 405.5, 405.10	1-High		
Raise the height of the sign.	60" minimum	4242645	502	3-Low		
Regrade/replace paved surface.	2.08" maximum	4242643, 4242644	502	1-High		
Provide a marked access aisle adjacent to the parking space.	60" minimum	4242646	502	3-Low		
Raise the height of the sign.	60" minimum	4242650	502	3-Low		
Regrade/replace paved surface.	2.08" maximum	4242646, 4242649	502	1-High		
Rebuild the walking surface with compliant running and cross slopes.	2.08" maximum	4242651, 4242652	403	1-High		
Rebuild the walking surface with compliant running and cross slopes.	2.08" maximum	4242657, 4242658	403	1-High		

Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242655, 4242656	403	1-High		
Grind or bevel the surface to provide a change in level no higher than 1/2 inch (beveled), with a slope not > 1:2.	0.5" maximum	4242662	403	2-Moderate		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242660, 4242661	403	1-High		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242663, 4242664	403	1-High		
Rebuild the walking surface with compliant running and cross slopes.	2.08" maximum	4242665, 4242666	403	1-High		
Grind or bevel the surface to provide a change in level no higher than 1/2 inch (beveled), with a slope not > 1:2.	0.5" maximum	4242672	403	2-Moderate		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242669, 4242670	403	1-High		
Fill/patch the gaps in the walking surface.	0.5" maximum	4242676	403	3-Low		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242674, 4242675	403	1-High		
For drinking fountains installed before March 15, 2012, and complying with the previous standards (high-low fountains were not required in the old standard), no action is required.		4242677	211, 602	2-Moderate		

MEETING THE CHALLENGE

Transition Plan Database
Facilities

Entity Name
Department/Division
City, State

Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242684, 4242685	403	1-High		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242686, 4242688	403	1-High		
Fill/patch the gaps in the walking surface.	0.5" maximum	4242692	403	3-Low		
Rebuild the walking surface with compliant running and cross slopes, or install handrails, edge protection, and landings required for ramps.	5.0% maximum	4242690, 4242691	403	1-High		

6.11 EXISTING SITE PHOTOS