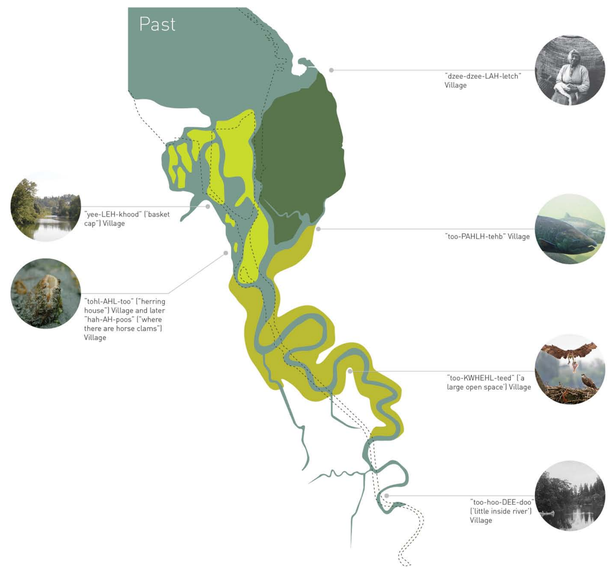
ID: SFB092P

SOUTH PARK FOOD BRIDGE

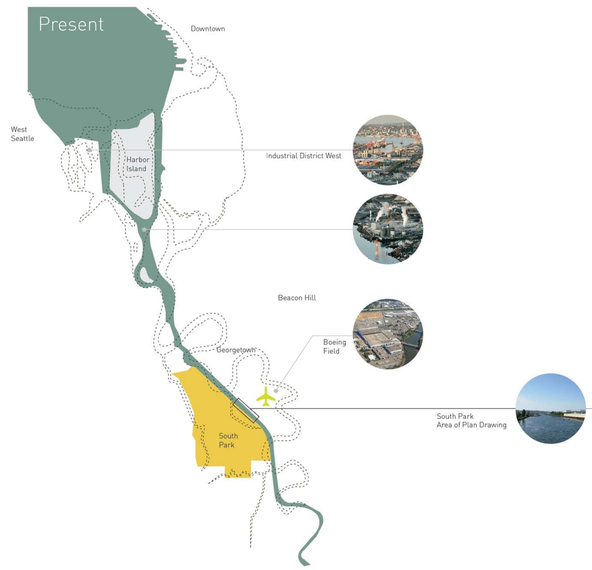
Seattle's South Park neighborhood, located along the southern banks of the Duwamish river faces the triple challenge of a massively polluted waterway, a lack of access to healthy food choices and industrial surroundings that sever connections to the rest of Seattle and the neighborhood's riverfront.

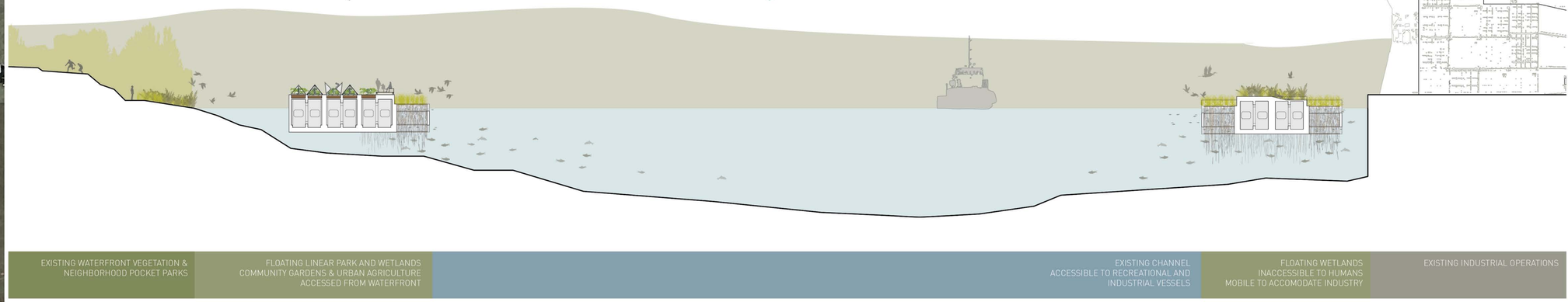
This project REUSES the pontoons from the soon to be demolished 520 bridge to RECLAIM the South Park riverfront as a productive, healing and community-centered landscape. Two types of pontoon modules are deployed to achieve this goal, the first, a chain of linear parks anchored to and accessed by the collection of pocket parks that have infilled the vast industrial landscape that dominates the river. This chain combines community gardening and urban agriculture with floating treatment wetlands bisected by a winding boardwalk that allows for South Park's residents to move freely along the river, circumventing the industrial barriers. The second module creates more porous pontoons, devoted solely to wetlands and creating habitat for wildlife both above and below the water's surface. This second type is not accessible to humans and remains mobile, allowing for a distribution along the shore opposite South Park. This mobility allows for the industrial operations along the riverfront to continue sustaining the industrial and economic heart of the region.

The Duwamish River was once home to an estuary habitat of 5300 acres, made up of intertidal mud, sand flats, estuary marsh, and forested wetlands. The river was the lifeline of the Duwamish people, who had villages all along the waterway. It was a source of food and transport from the 6th century. In 1905, dredging had started in Elliot Bay, by 1911 straightening the once meandering river to the form we know it today. Since then, it has become increasingly industrial and polluted.



After a century of industrial use, it is considered toxic and has been declared a Superfund Site. Despite the contaminated water, people still fish in these waters to supplement their food supply. While the wetland pontoons can't solve these large-scale problems, they can offer a way for communities along the Duwamish River to produce food, as well as provide habitat for wetlands that can counteract the industrial impacts.





EXISTING WATERFRONT VEGETATION & NEIGHBORHOOD POCKET PARKS

FLOATING LINEAR PARK AND WETLANDS COMMUNITY GARDENS & URBAN AGRICULTURE ACCESSED FROM WATERFRONT

EXISTING CHANNEL ACCESSIBLE TO RECREATIONAL AND INDUSTRIAL VESSELS

FLOATING WETLANDS INACCESSIBLE TO HUMANS MOBILE TO ACCOMODATE INDUSTRY

EXISTING INDUSTRIAL OPERATIONS

Plan at South Park | Scale 1/32" = 1'-0"

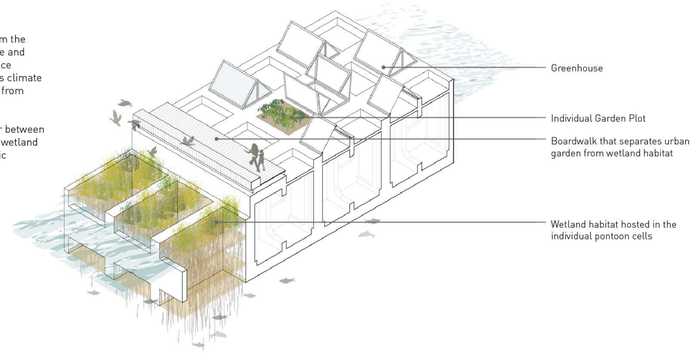
The reused pontoons make up a green chain that spans the length of the Duwamish River, supplying agricultural plots to communities in need, and supporting the wetland habitat that has been mostly displaced.

Relieved of the structural load of a multi-lane highway, the flotation capacity of each pontoon can safely be reduced by selectively excavating flotation cells replacing them with layers of membrane supporting floating wetlands. Plants growing above the surface and the root structure below the surface allow for both water treatment and expanded wildlife habitat.

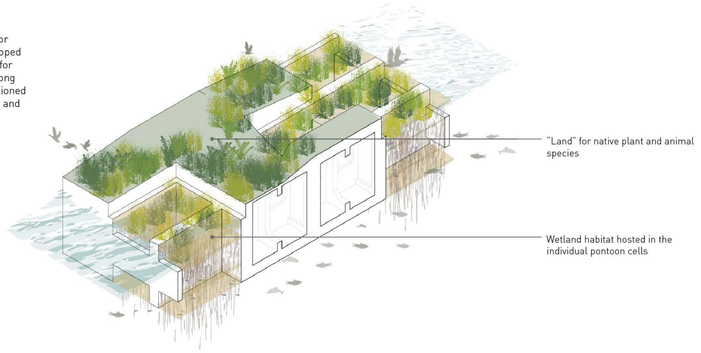
In South Park, the pontoons are mostly focused around the Duwamish Waterway Park, a well-used recreational space, and one of the few that allow access to the water.

Garden plots are excavated from the pontoon's upper layer. Operable and removable greenhouses enhance growing capabilities in Seattle's climate as well as providing protection from nearby wildlife.

The boardwalk creates a buffer between the agricultural plots from the wetland ecosystem, and creates a public promenade along the river.



Isolated wetland pontoons allow for protected habitat in a highly developed location. Lack of tethering allows for them to be deployed as needed along the length of the river, and repositioned as necessary to allow for shipping and industrial exchange.



View from the Food Bridge

View from Duwamish Waterway Park

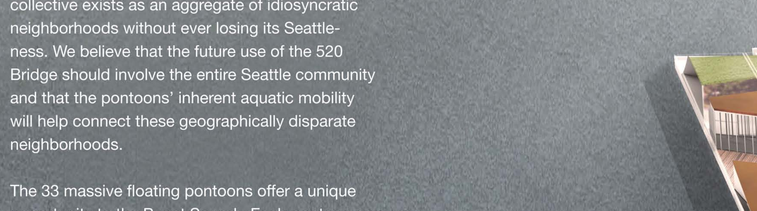
SEA-QUILT

To those living in the Northwest, Seattle gains its unique character by being a community of small cities, towns and neighborhoods. This collective exists as an aggregate of idiosyncratic neighborhoods without ever losing its Seattle-ness. We believe that the future use of the 520 Bridge should involve the entire Seattle community and that the pontoons' inherent aquatic mobility will help connect these geographically disparate neighborhoods.

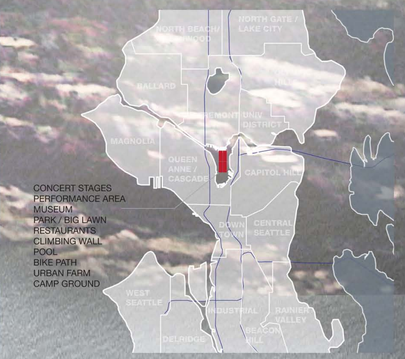
The 33 massive floating pontoons offer a unique opportunity to the Puget Sound. Each pontoon can drift and migrate to each of Seattle's wide-spread neighborhoods, providing a generous amount of new public program for each. Neighborhoods in need of theaters will get floating amphitheaters. Coastlines without public space will get beaches and playgrounds, and so forth. We view adaptive re-use as an opportunity to provide a reciprocal relationship with Seattle's communities—the pontoons provide new program, the locals use it and adapt the spaces to their own individual needs.

Pontoons are very flexible. Not only are they buoyant and mobile, but their regularized dimensions make re-organizing and assembling easy. The pontoons can dock to each other to create bigger spaces as needed. If there is a large event, two pontoons can come together to create a new open ground for that purpose.

We propose that the pontoons not only migrate out to Seattle communities, but also provide an opportunity for them to come together as one. During this time, Seattle can unite as a diverse but singular entity. By merging all of the pontoons together at a central location in Lake Union, we're essentially merging all of the communities into a floating quilt.



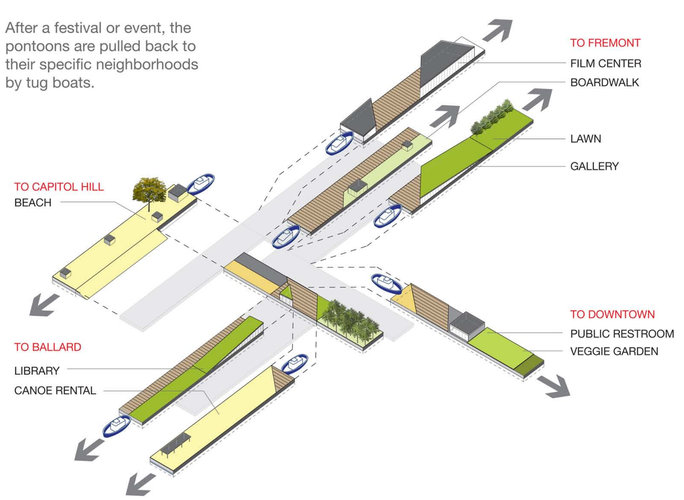
LAKE UNION –
All 33 pontoons coming together from their respective neighborhoods for a city-wide event.



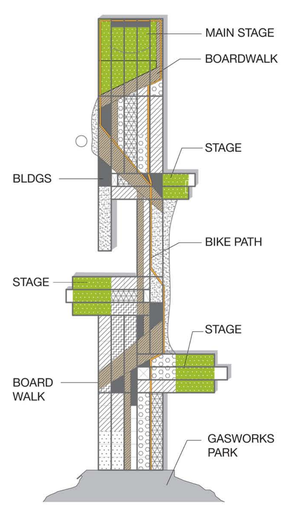
Pontoons are distributed equally among every major community and neighborhood throughout Seattle. Each carries specific community-oriented program that fulfills civic need.

PONTOON DRIFT

After a festival or event, the pontoons are pulled back to their specific neighborhoods by tug boats.



URBAN QUILT



DOWNTOWN

ALKI BEACH

FREMONT

TUGBOAT PUSHING PONTOON TO NEW DESTINATION

spirit pavilion

transforming seattle's 520 floating bridge

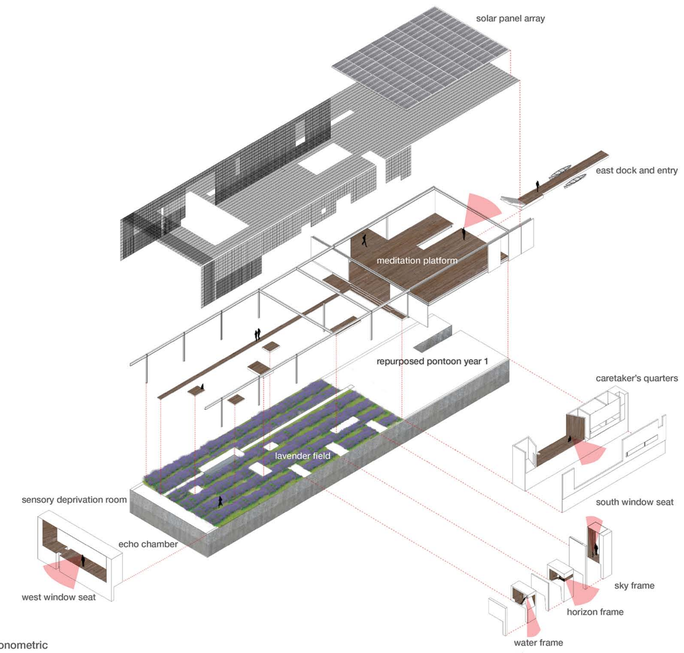
masterplan

In the spring of 2014, a new Seattle tradition will emerge in the heart of Lake Washington. Over a timeframe of 15 years, the 520 floating bridge is systematically dissected and reimagined as a series of site specific island installations; a set of iterative responses grow to form a new connective tissue emerging from Seattle's eastern borders and penetrating deep into Lake Washington. The masterplan sets out a phased pattern of growth, carefully tying together the construction, planting, and displacement of 15 pontoons. These are removed year on year from the 520 bridge, harnessing the power of nature, time and architecture. Each year a designer is chosen to curate a pavilion with an open brief which allows a variety of programmatic responses to the unusual, multi-faceted site. The only constraints are to be the inclusion of natural landscape and the ability to connect to previous and future pontoons.

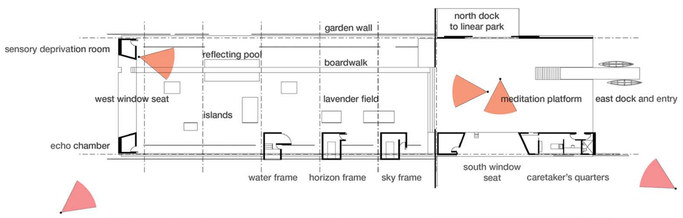
Within the first year several pontoons are removed, creating a disconnect from east to west. A linear park is planted, growing from the eastern side of Seattle, accessed on foot or bicycle from the junction of the old bridge and the new. A kayak and bike rental is nestled within the underbelly of the old 520 bridge, allowing the journey to be experienced by land or water. Repurposed space below the disconnected westernmost section of bridge is used as the staging area for constructing the annual spirit pavilion. Once built, the pavilion is moved to the centre of the lake, to be accessed only by water. After one year in situ, the pavilion is towed to the edge of the park to begin the growth of the archipelago.

Each subsequent year, a new pontoon is chosen and planted ahead of its construction. The cycle of growth and movement continues with each new pavilion spending a year floating in isolation before returning to dock alongside the park.

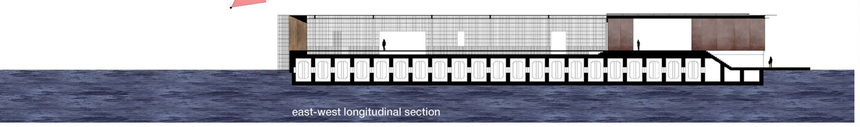
After 15 years, the final pavilion returns to dock alongside the linear park. A series of unexpected programmatic adjacencies have been created with a new typology of urban landscape, inherently tied to the natural beauty of Lake Washington and the infrastructure of the city.



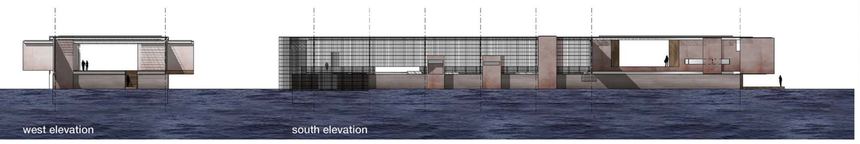
exploded axonometric



spirit pavilion plan

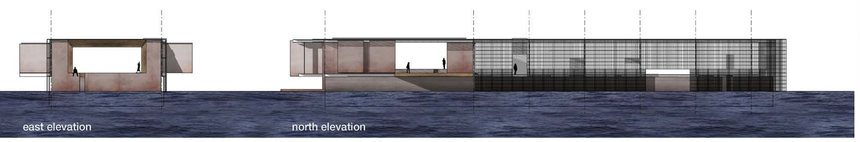


east-west longitudinal section



west elevation

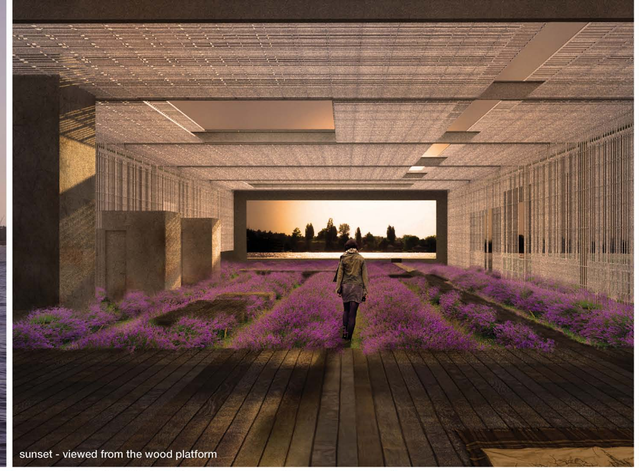
south elevation



east elevation

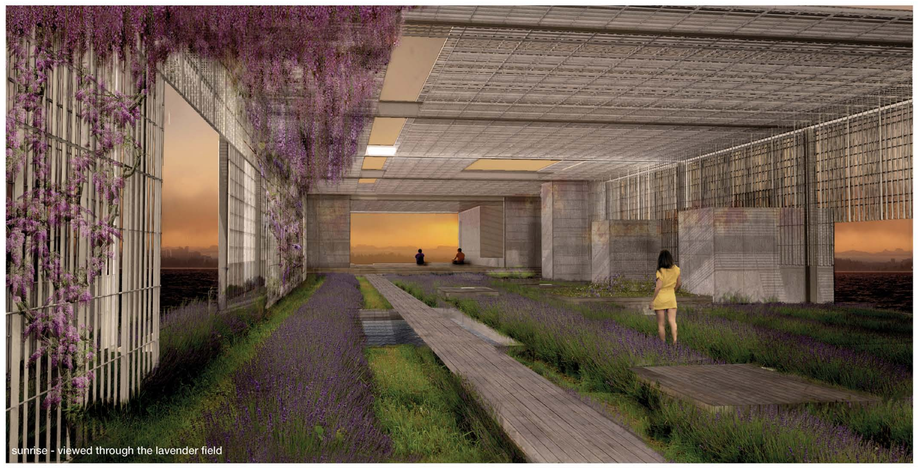
north elevation

east entry dock and compressed entry to the elevated wood platform



sunset - viewed from the wood platform

west window seat at dusk



sunrise - viewed through the lavender field

spirit pavilion

The first floating pavilion to be constructed aims to harness the power of journey and discovery to create a place of quiet contemplation within the city. Floating in isolation, the pavilion is positioned to frame views and immersive natural experiences. Primarily, the program is broken into two elements: the platform and the field. The platform provides a space for collective meditation and an elevated refuge to absorb the surrounding landscape.

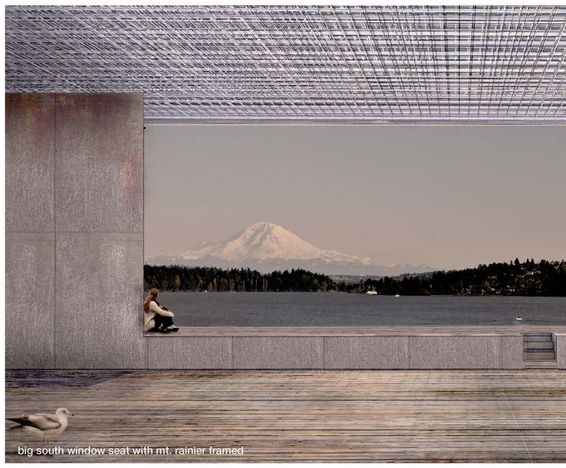
The lavender field creates a sensory experience providing a natural sense of calm and solitude; an open landscape for discovery and contemplation.

Time is an integral element of the spirit pavilion's evolution. The course of nature is evident through the weathering of materials, the growth of the field, and expansion of the garden wall over the years.

The journey to the pavilion creates a physical and metaphorical separation from the surrounding urban landscape, requiring visitors to actively engage in their displacement from the city and arrival to this new spirit.

"The goal of life is to make your heartbeat match the beat of the universe to match your nature with Nature."

Joseph Campbell



big south window seat with mt. rainier framed

linear park - year 2

approach from the south

master plan - year 7

ceiling and garden walls glow in the night

lantern in the night


#1 entry dock


#2 ash pool

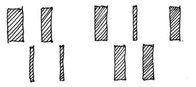

#3 lawn and park

CEMETERY [520]

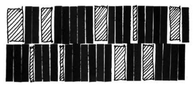

existing pontoons


rearranged

+


floating gardens

=


cemetery [520]

With land shortages facing crowded urban cemeteries and a growing demand for ecologically-sensitive burial grounds, Cemetery [520] reuses the thirty-three pontoons of the State Route 520 bridge to create a floating cemetery and park in Lake Washington. This eleven-acre artificial island acts as both a traditional cemetery and a modern civic space by providing recreational and commemorative functions that can transform and grow over time. Cemetery [520] is a living cemetery where loved ones can celebrate life in memory of the dead.

The solution is meant to be simple: move the floating pontoons south of their current location and rearrange them into an island. In plan, this system creates a rhythm of island and inlet that can continue to expand as demand for burial space increases.

The cemetery is sited near the west shore of Lake Washington, adjacent to Seattle's Madrona Park. Located away from nearby residences, the park provides a sheltered space that visually and programmatically links the floating cemetery to land. The site also allows for future growth of necessary public infrastructure such as a water taxi terminal, parking, and small boat rentals.

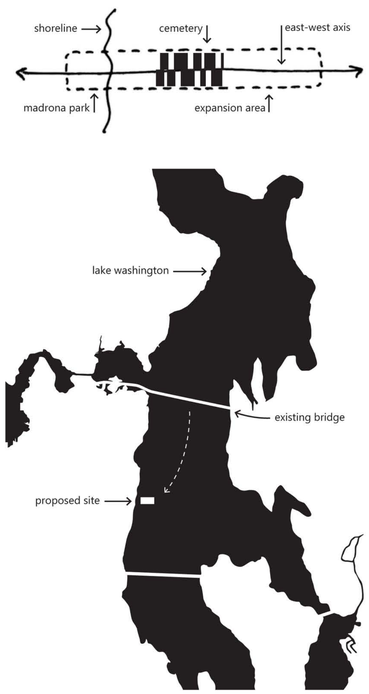
On the island, a village of light-framed structures housing a visitor center, gathering hall, sacred space, administrative offices, caretaker workshop, and storage facility greet visitors as they arrive by water taxi or personal watercraft.

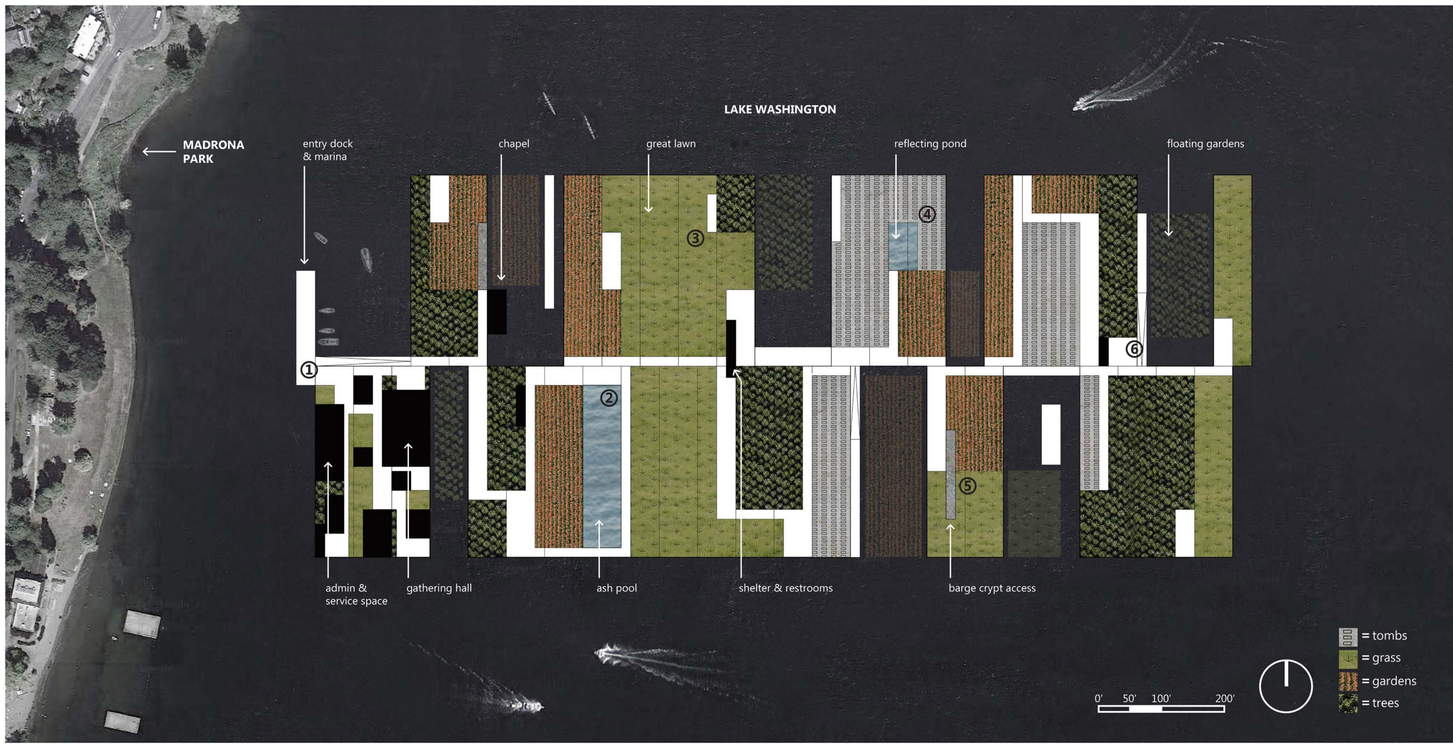
In accordance with public health regulations, the spreading of ashes is allowed in designated gardens throughout the cemetery and in a special barge pool that filters and recycles the water. In the pool and throughout the island, these ashes fertilize both floating and planted commemorative gardens.

The pontoons are arranged to create small, tranquil inlets where aquatic gardens can flourish and filter the lakewater. As a burial space, these floating gardens provide a place for biodegradable urns to float until they descend to the bottom of the lake where they nourish the local ecosystem.

Traditional burial options are also available in the above-ground vaults. A field of stone-encased tombs create a series of intimate paths and private courtyards for reflection and remembrance.

Crypts within the pontoons offer yet another possibility for resting places. Access from above is provided by removing some of the pontoons' inner cavities. Once inside the pontoon, the walls are marked with the name plaques of those buried in the surrounding urn and coffin vaults.






#4 reflecting pool


#5 barge crypt


#6 floating gardens

88 MILLION

19 MW = 19,000,000 W
1 MWh / 24 hr = 1/24 MW
1/24 MW = 41,666.67 W
= 456 TURBINES = 2 DAMS
33 PONTOONS x 2/3 = 21.78
= 2,112 TURBINES
= 88,002,119 W (≈ 88 MILLION)
= 4.63 x MORE THAN DAMS.

Shortly after hanging up the phone with Archie Allen,

the superintendent of the Governor Albert D. Rosellini 520 bridge, he sent over construction drawings for all 33 concrete pontoons. Slightly startled that we were able to obtain the bridge construction drawings so easily, we went straight to work modeling every last detail, down to the ladders and doors in each pontoon. The exploded diagram to the right, is a depiction of one the most commonly found pontoons supporting the Bridge.

This project is not just addressing the problems brought up by demolishing a floating bridge super-structure on Lake Washington, but also helping to remediate our growing concerns for the world's energy crisis. Just across the Puget Sound on the Olympic Peninsula, there is a whole different set of problems that have arisen in recent years. For nearly a century, the 105 ft Elwha Dam (built in 1913), and 210 ft Glines Canyon dam (built in 1927), have provided an annual average of 19 million watts of power to the Olympic Peninsula.1 In an effort to restore the Elwha River to its natural state (hoping to see salmon runs grow from the current 3,000 to the 380,000 recorded before the dams construction), the dams started a three-year demolition process in 2011.2 No plan of action is currently underway to recover the energy lost created by the dams. Why not use the displaced elements of one "problem" to create a solution for another? This project proposes the reuse of the 520 bridge pontoons to house a whole new center for tidal power creation and observation. Not only is this restoring energy creation for the peninsula, but also eliminating wasted materials, helping promote the tidal energy business, and providing an interaction between people and an otherwise unobserved process.

WHY TIDAL POWER?

Tidal power is non-polluting, predictable, more reliable than solar or wind, and is one of the oldest forms of energy used by humans. All coastal areas consistently experience two high and two low tides over a period slightly greater than 24 hours.For those tidal variations to be harnessed into electricity, the differences between high and low tides should be at least five meters, or more than 16 feet in order to be effective and economically beneficial. There are only about 40 sites on Earth with tidal ranges of this magnitude, with the Pacific Northwest containing several. 3 One of the most promising sites, and one that has been researched exhaustively by tidal energy professionals, is Admiralty Inlet located in the northwest corner of the Puget Sound.

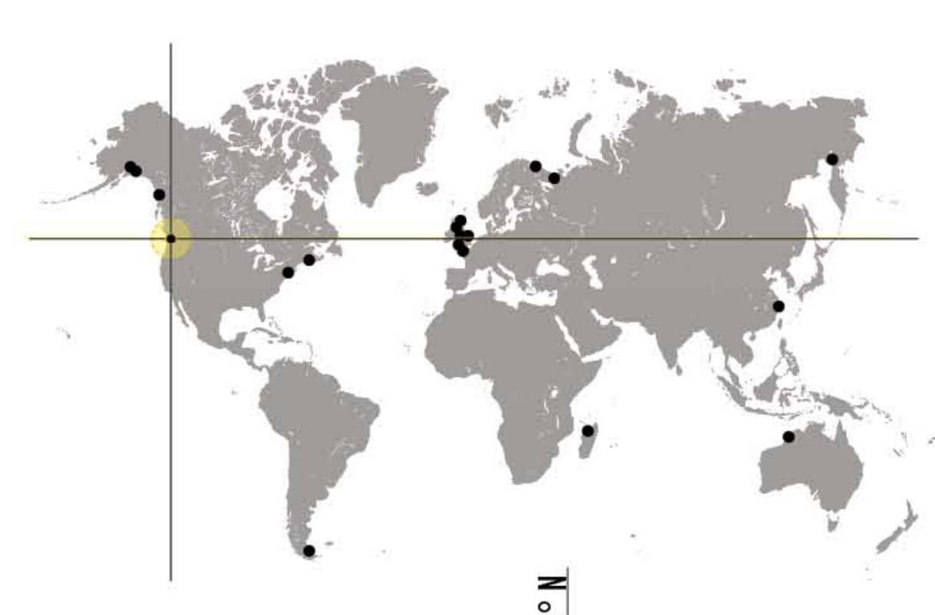
WHY ADMIRALTY INLET?

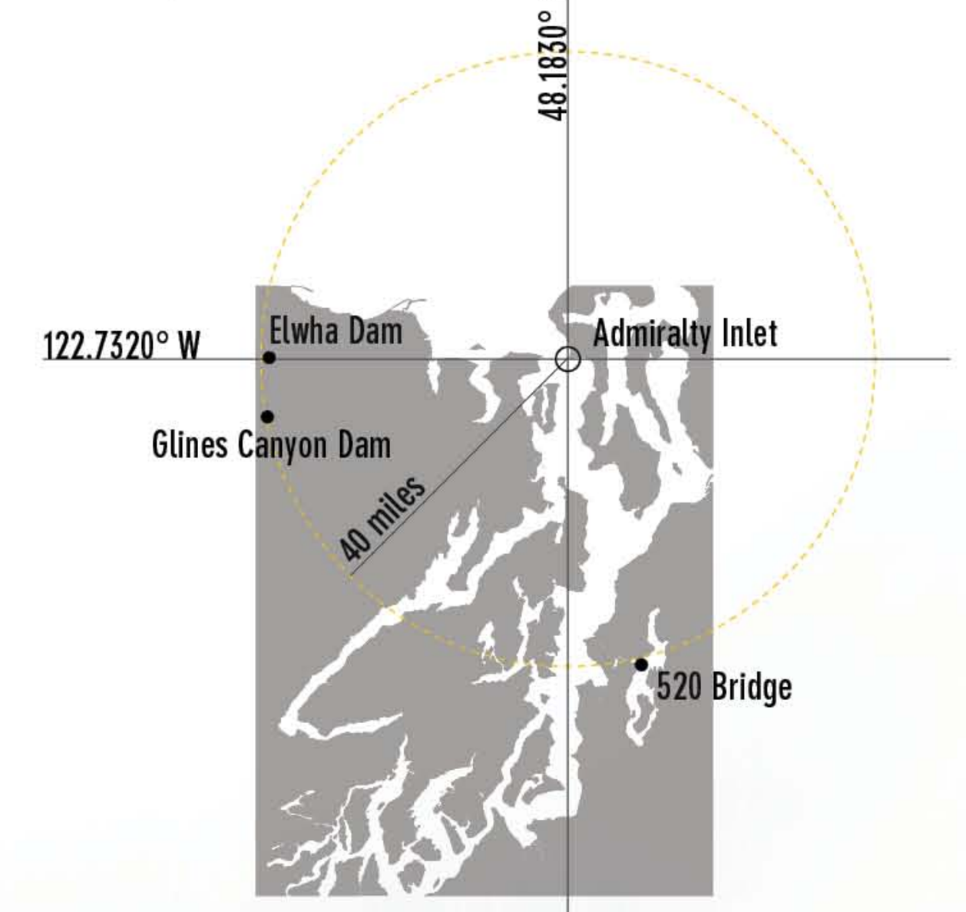
Testing has been occurring here for years with the intentions that in the near future they will be placing turbines nearby. Located on the shore of the inlet is Fort Casey, a military base built in 1897 which operated in tandem with two other Puget Sound bases forming the "Triangle of Fire".4 This inlet was a key location in the Pacific Northwest's history and is still a major passageway into the rest of the Puget Sound. In addition, the recently demolished Elwha dams were located only 40 miles away. Placing this design in Admiralty Inlet allows the opportunity to utilize the Fort Casey National Park as a pedestrian departure point, as well as harness some of the most prime tidal conditions in the world to replace energy production lost due to the demolition of the Elwha dams.

IS IT ALL WORTH IT?

Together, the Elwha Dams were capable of producing 28 Megawatts of power, but due to their less than perfect efficiency, they would produce on average 19 Megawatts of usable power annually.5 19 Megawatts is the equivalent of 19 thousand Kilowatts or 19 million Watts. Verdant Power Ltd. Is a world leader in marine renewable energy, and has produced numerous models of hydro turbines being used around the world today. One such model is the 4.68 meter diameter Free Flow Turbine which is capable of producing 1 Megawatt of power over a 24 hour period, or 1/24 of a Megawatt.6 1/24 of a Megawatt is equal to 41,666.67 Watts. Since both of the Elwha Dams combined were producing 19,000,000 Watts of power and one Free Flow Turbine is capable of producing 41,666.67 Watts, we would need to have 456 turbines in place to restore the energy lost due to the demolition of the dams. On average, this design has 2/3 of all the 33 pontoons underwater at all times, and therefore are capable of contributing to harnessing the inlet's currents. With each pontoon containing 96 "cubbies", there would be enough room to house 2,112 energy harvesting turbines. This large amount of devices could be expected to generate approximately 88,002,119 Watts of power which is over 4.5 times as much as the two Elwha Dams combined.

1 - Gottlieb, Paul. "Power down: Elwha dams' turbines silenced after decades." Peninsula Daily News [Olympic Peninsula] 02 June 2011, 1. Web. 16 Aug. 2012.
2 - Coaster, Lefty. "The Re-Birth of the Elwha River - dam removal gets underway." Daily KOS 17 Sep 2011, 1. Web. 16 Aug. 2012. <http://www.dailykos.com/story/2011/09
3 - United States Department of Energy, . "Ocean Tidal Power." Energy Efficiency and Renewable Energy. U.S. Department of Energy, February 9th, 2011. Web. 16 Aug 2012
4 - McClary, Daryl C. "Triangle of Fire - The Harbor Defenses of Puget Sound (1897-1953)." 2005. Web. 16 Aug 2012. <http://www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=7524>.
5 - Cohn, Lisa. "Feds Poised to Remove Northwest Dam." Energy Biz Magazine. Oct 2011: 1. Web. 16 Aug. 2012. <http://www.energybiz.com/magazine/article/235205/feds-poised-remove-northwest-dam>.
6 - O'Rourke, Fergal, Fergal Boyle, and Anthony Reynolds. "Tidal Energy Update 2009." School of Mechanical and Transport Engineering - Articles. Dublin Institute of Technology, February 1st, 2012. Web. 16 Aug 2012. <http://arrow.dit.ie/cgi/viewcontent.cgi?article=1015&context=engschmecart&sei-redir=1&referer=http://www.google.com/url?sa=t&rct=j&q=solon%20tidal%20turbines&source=web&cd=5&ved=0CFYQFjAE&url=http%3A%2F%2Farrow.dit.ie%2Fcgi%2Fviewcontent.cgi%3Farticle%3D1015%26context%3Dengschmecart&ei=8UIrUMnSIcjxiQK04YD4DA&usg=AFQjCNFuYiwHjhNStLL_YoyMp7lYLvFWjw





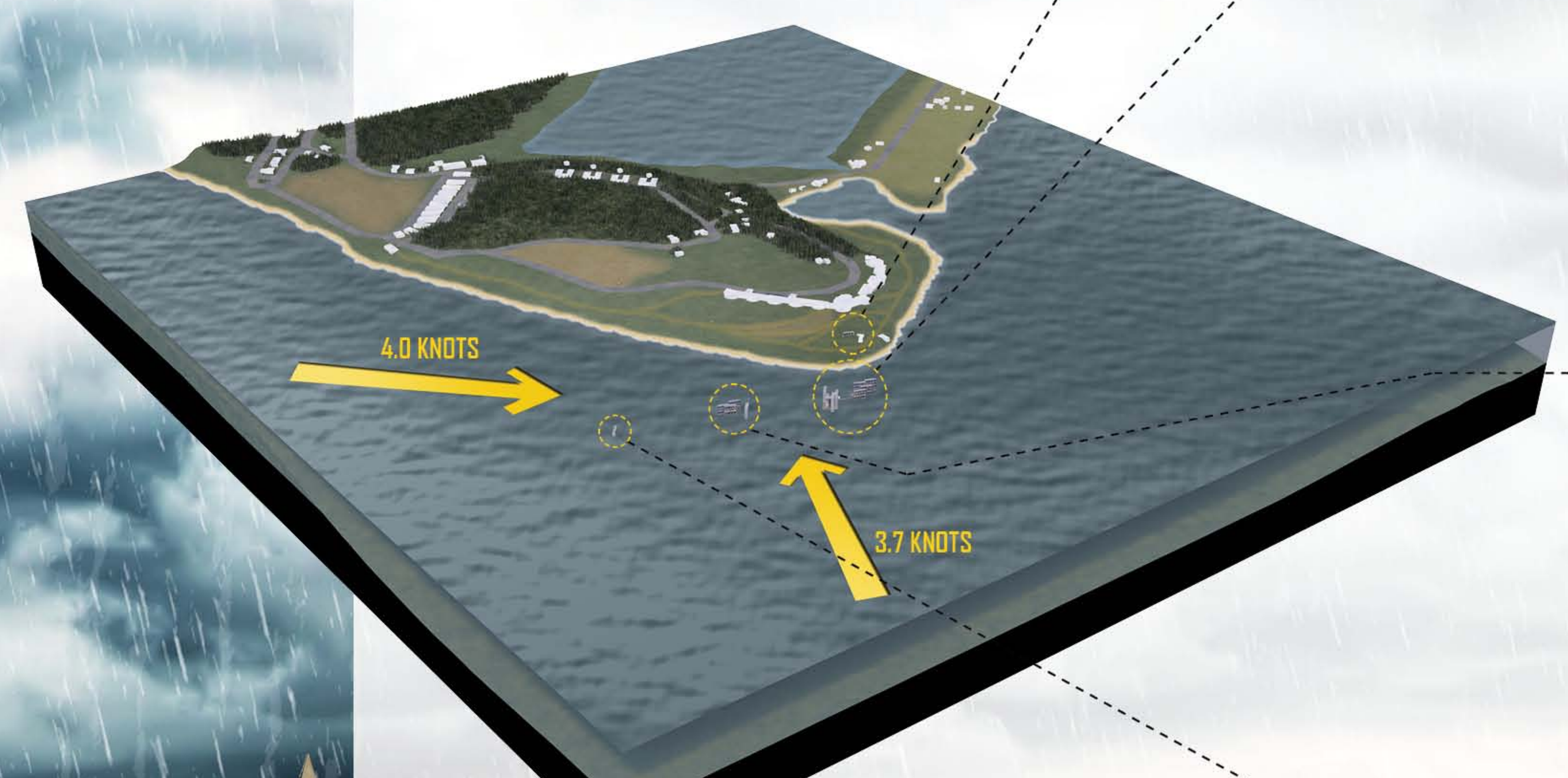
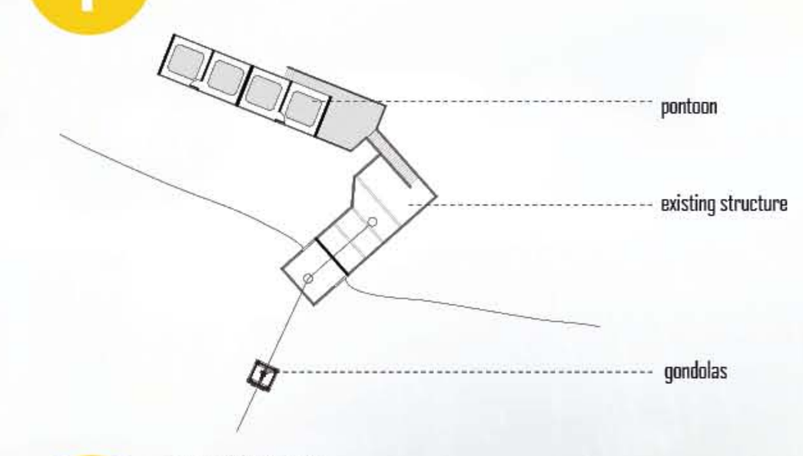


DIAGRAM OF ADMIRALTY INLET, FORT CASEY, CURRENT VELOCITIES, AND PONTOON LOCATIONS.

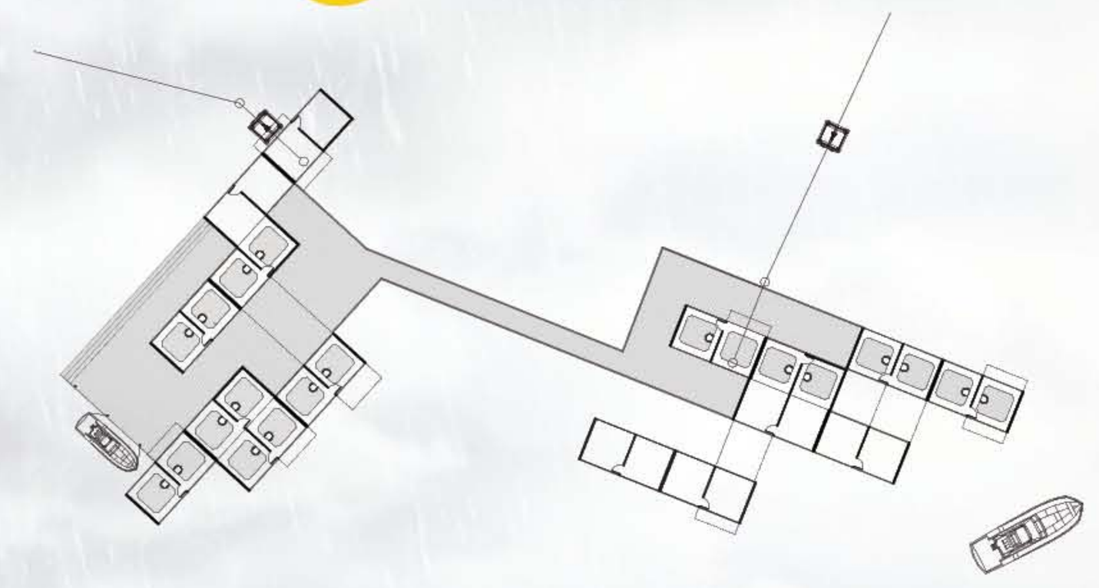
1 VISITORS CENTER

THIS CLUSTER IS THE ONLY STRUCTURE ON LAND. IT IS WHERE THE GONDOLA BEGINS AND HOUSES GENERAL INFORMATION ABOUT THE TURBINE FARM.



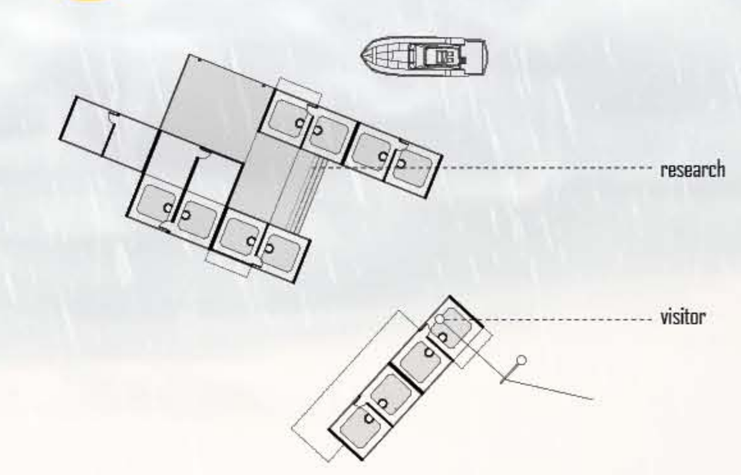
2 COMMUNITY HUB

WHERE VISITORS CAN STAY OVERNIGHT, RENT OUT CONFERENCE SPACES AND CLASS-ROOMS. THIS CLUSTER COULD ALSO HOUSE AMENITIES SUCH AS A MUSEUM, LIBRARY AND AQUARIUM.



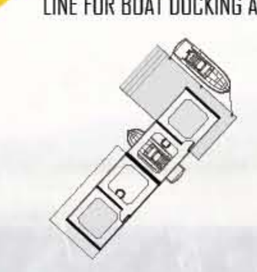
3 OBSERVATION CLUSTER

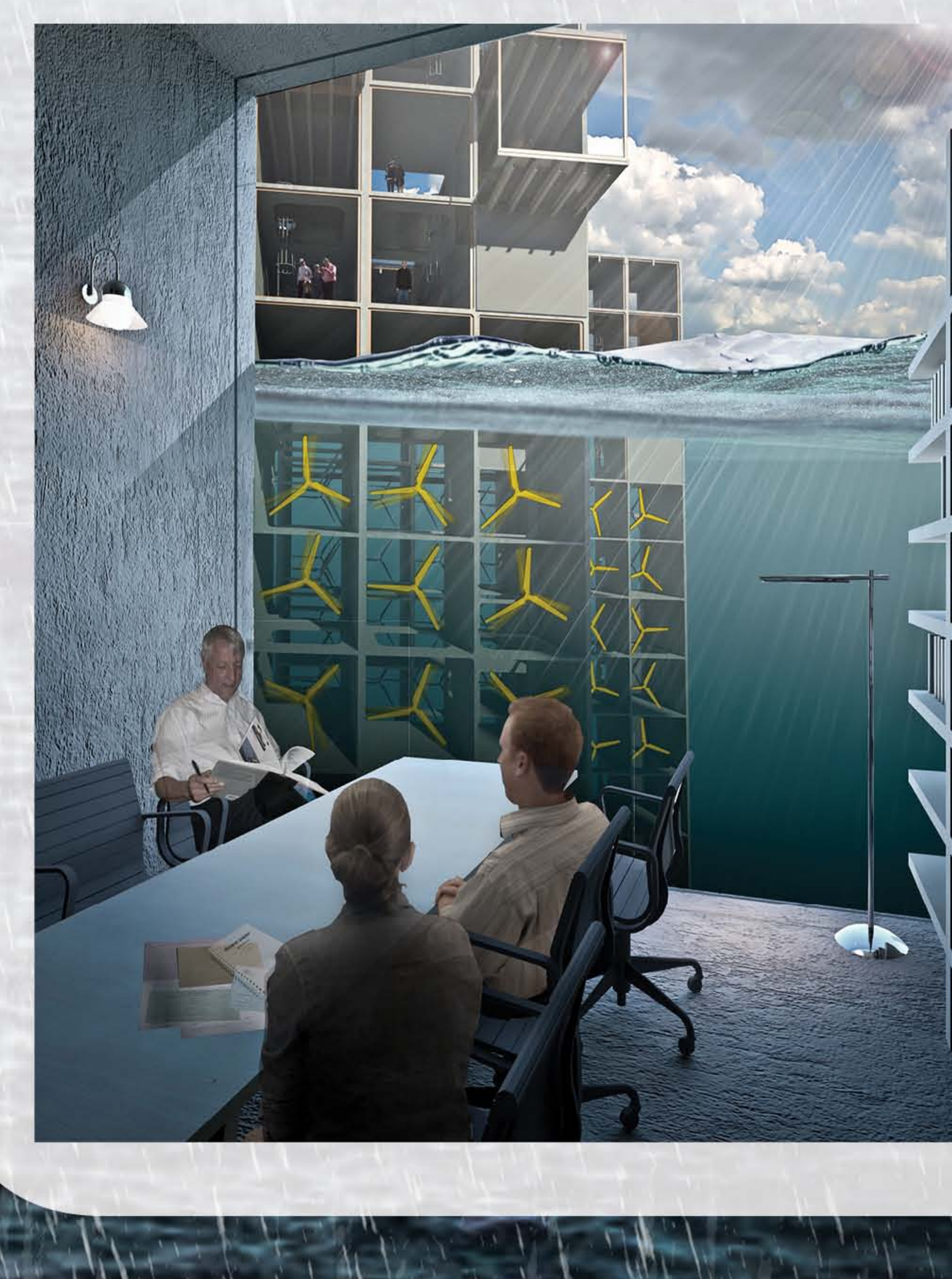
THIS CLUSTER IS BROKEN INTO TWO PARTS: THE VISITORS OBSERVATION DECKS AND THE RESEARCHERS LABORATORIES. FROM HERE THE RESEARCHERS CAN BOAT OUT TO THE DOCKING STATION TO GET A CLOSER LOOK AT THE TURBINE FARM.

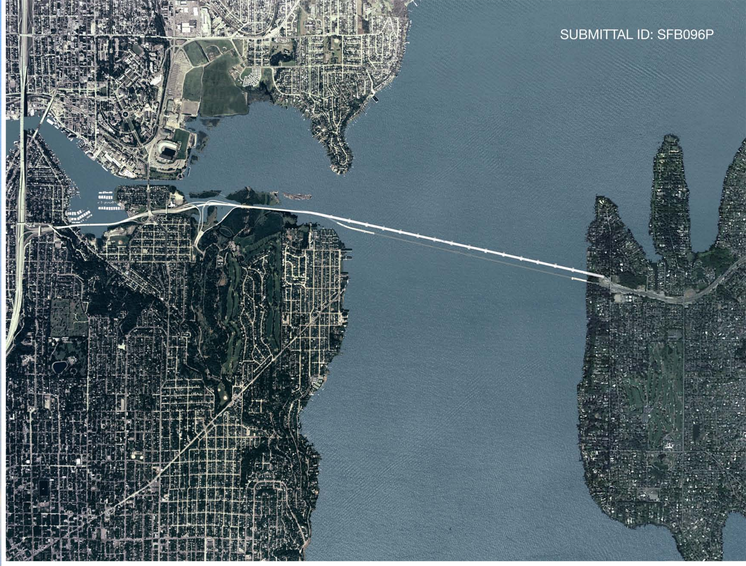


4 TESTING SITE

THE MAJORITY OF THIS CLUSTER IS UNDERWATER AND DEDICATED TO THE TURBINE FARM. ONE LONE PONTOON STICKS UP ABOVE THE WATER LINE FOR BOAT DOCKING AND OBSERVATION.

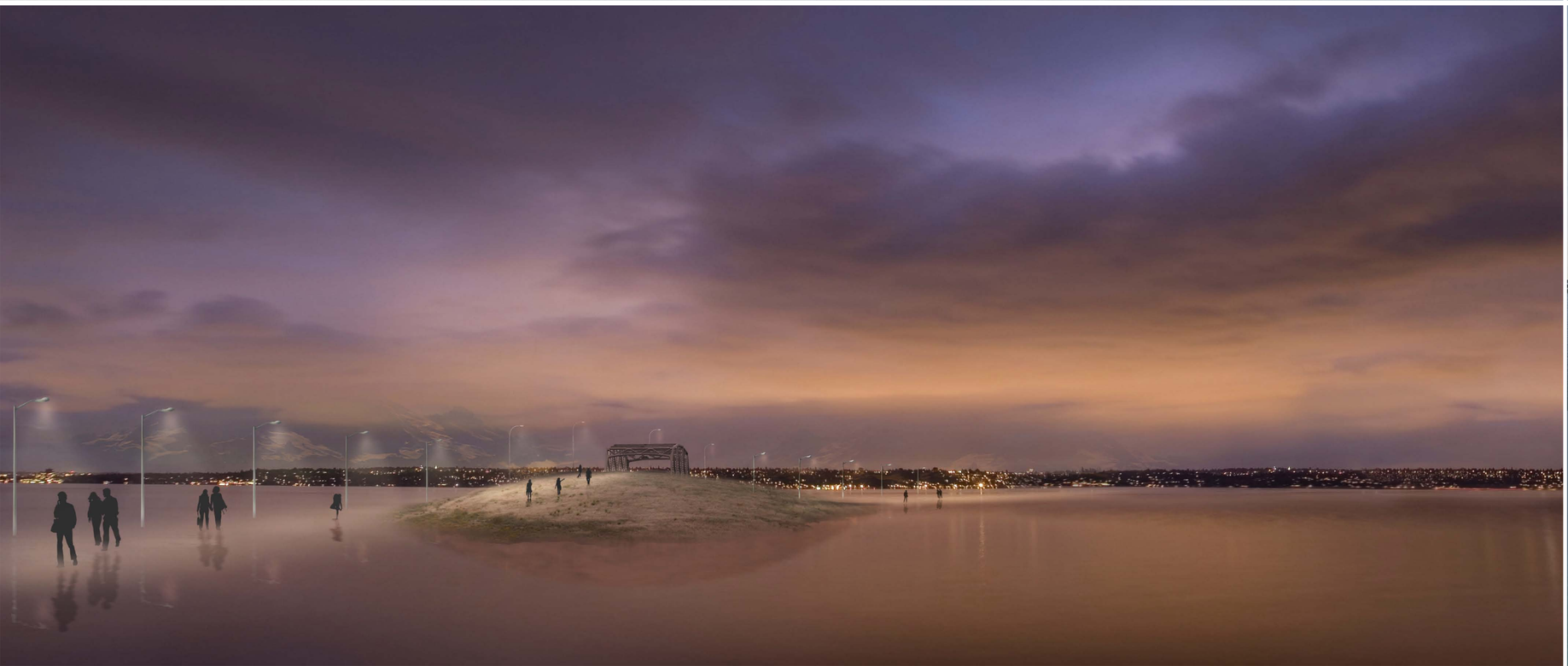


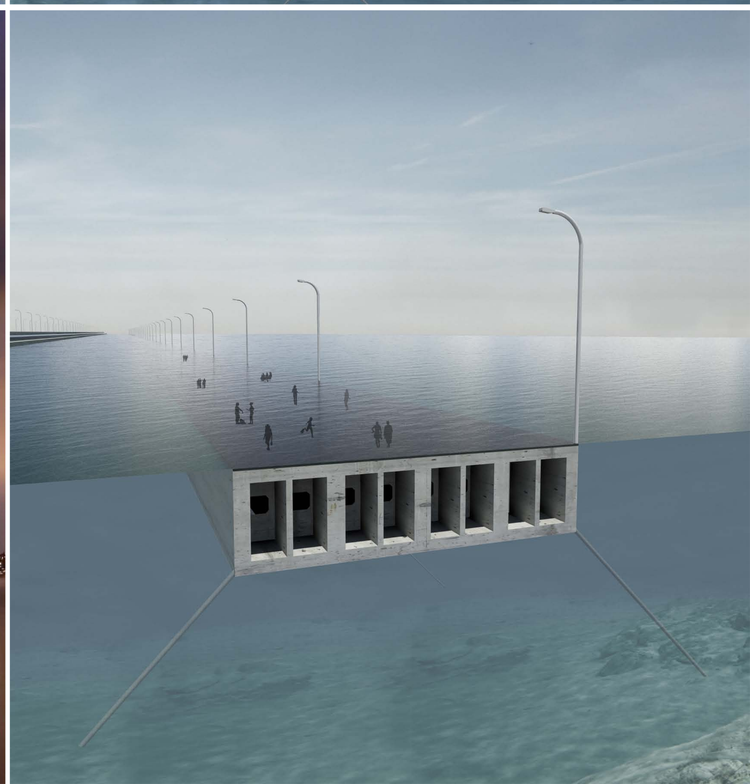


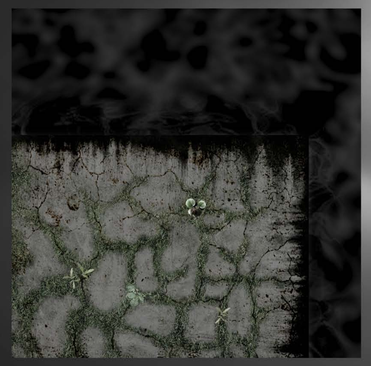


Five Twenty Minus Five

After 50 years as a major vehicular corridor across Lake Washington, we propose to submerge the 520 floating bridge five centimeters below water level in Lake Washington to transform it from the world's longest floating bridge to the world's longest subsurface pedestrian walkway. By enabling visitors to set foot on this submerged walkway and appear to be mysteriously treading on water, the old 520 creates a unique experience that questions our relationship with nature and tension with vehicular infrastructure. This transformation has the potential to integrate and reconnect outdated infrastructure into part of our everyday urban nature. We intend to create an experience that brings about intimate collisions between a once dominating urban structure and urban nature at the horizon by invoking the memory of the floating bridge, an absent presence that continues to endure beneath the lake surface.







THE FLOATING MEMORIAL

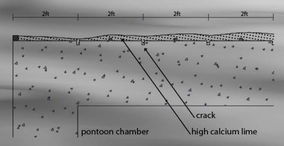
The purpose of the project is to celebrate the most useful and convenient bridge for the residents in Bellevue and Seattle. The pontoons representing, and also a part of the Seattle 520 Floating Bridge, will become a historical relic giving the residents a piece of memory and history to hold onto.

Vegetation that would grow onto the pontoon surfaces will be acting as an element of landscape, providing a close view of another kind of beautiful scenery other than the lake and mountain. Also, they can function as a breakwater structure to reduce the intensity of waves from the new floating bridge.

Site plan

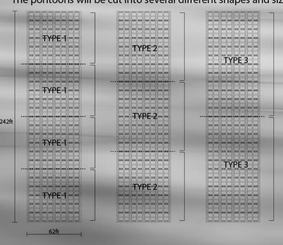
Lime surfacing

The surface of the pontoons will be cracked in grids and will be covered with high calcium lime. Calcium is an essential mineral for plant growth, therefore, it will contribute to the plant growth on each pontoons.



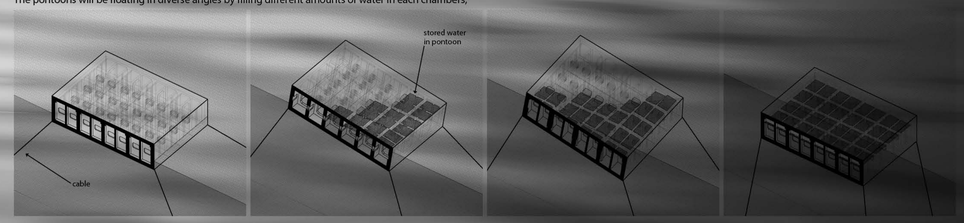
Types of pontoons

The pontoons will be cut into several different shapes and sizes.



Angling strategy

The pontoons will be floating in diverse angles by filling different amounts of water in each chambers,



SKIP

WATER TAXI

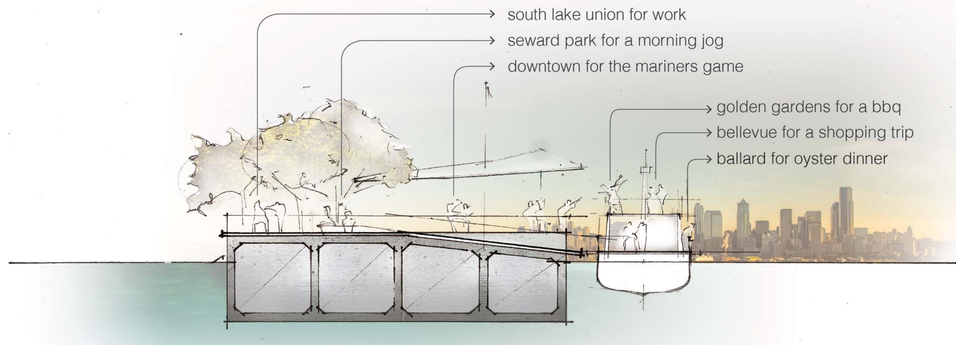
Greater Seattle Water Taxi

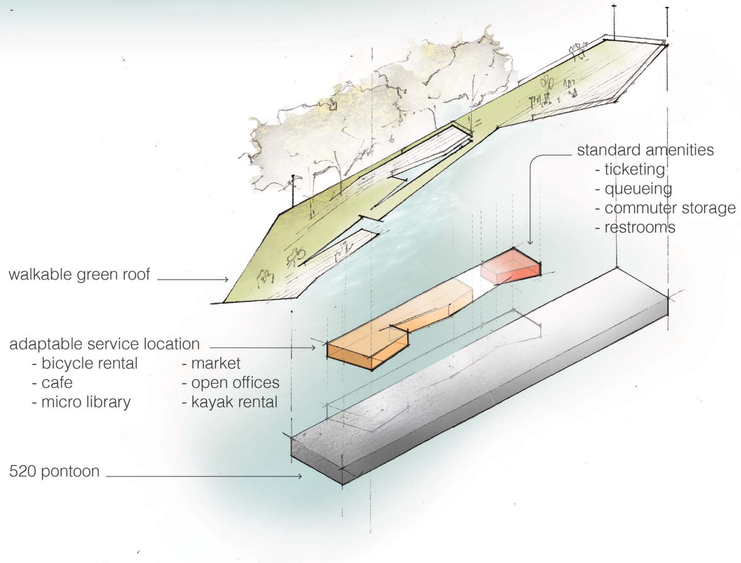
Repenting for carrying billions of cars across Lake Washington over the past thirty-eight years, the existing 520 bridge has been broken apart and reassembled into the SKIP, Seattle's new water taxi system. Repurposing each of the floating pontoons of the former 520, the SKIP gives pedestrian and cycle commuters access to routes only serviced by congested freeways and buses thus far.

Anchored to the shores of state parks and other water-edged neighborhoods throughout the artea, the SKIP gives the region a comprehensive water taxi system aiding freeway traffic and reducing greenhouse gas emissions while providing greater accessibility to alternative forms of public transportation.

Most importantly, the SKIP benefits the general community by increasing public access to water. Each station is landscaped, providing a pleasant place for commuters to wait while creating versatile community spaces to gather on the waterfront.

Just as the 520 bridged a gap in the past, the SKIP addresses the future of regional commuting by connecting individuals with their destination and communities with the waterfront.



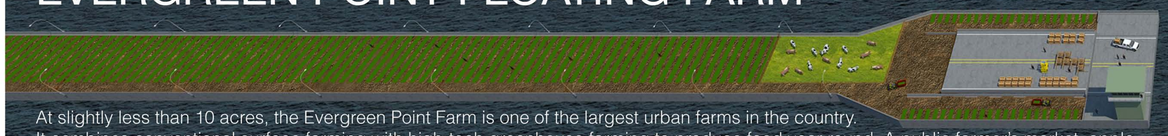


View of Station from Madison Park

Entry platform in Ballard

EVERGREEN POINT FLOATING FARM

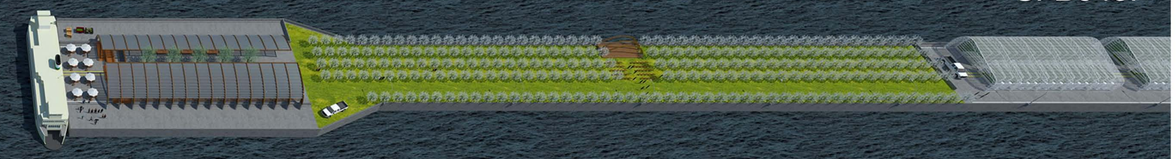
SFB045P



At slightly less than 10 acres, the Evergreen Point Farm is one of the largest urban farms in the country. It combines conventional surface farming with high-tech greenhouse farming to produce food year-round. A public farmer's market, apple orchard, and event area will draw visitors from downtown Seattle who are seeking locally grown food from a unique setting.

The greenhouses' curved profile mitigates the forces of the strong lake winds. The greenhouses collect and filter rainwater for use in a hydroponic growing system; the structures can also be outfitted for aquaculture. A portion of the surface farm is devoted to raising livestock.

Visitors arrive by ferry at the permanently opened drawspan. A person can shop for produce, meat, or fish at the open-air market, or go apple picking in the adjacent orchard. A public event space in the midst of the orchard is a novel location for a multitude of possible uses. In its new role as floating farm, the Evergreen Point Bridge continues to serve the Seattle community.

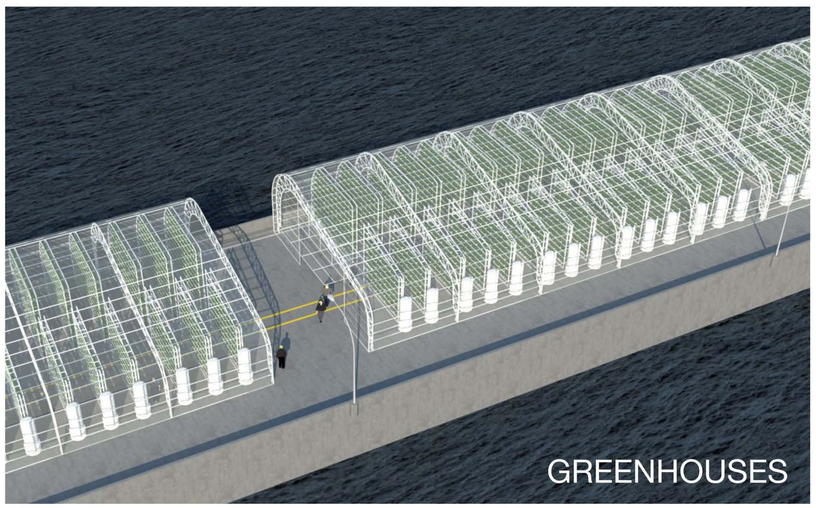


AERIAL OVERVIEW

ON THE FARM

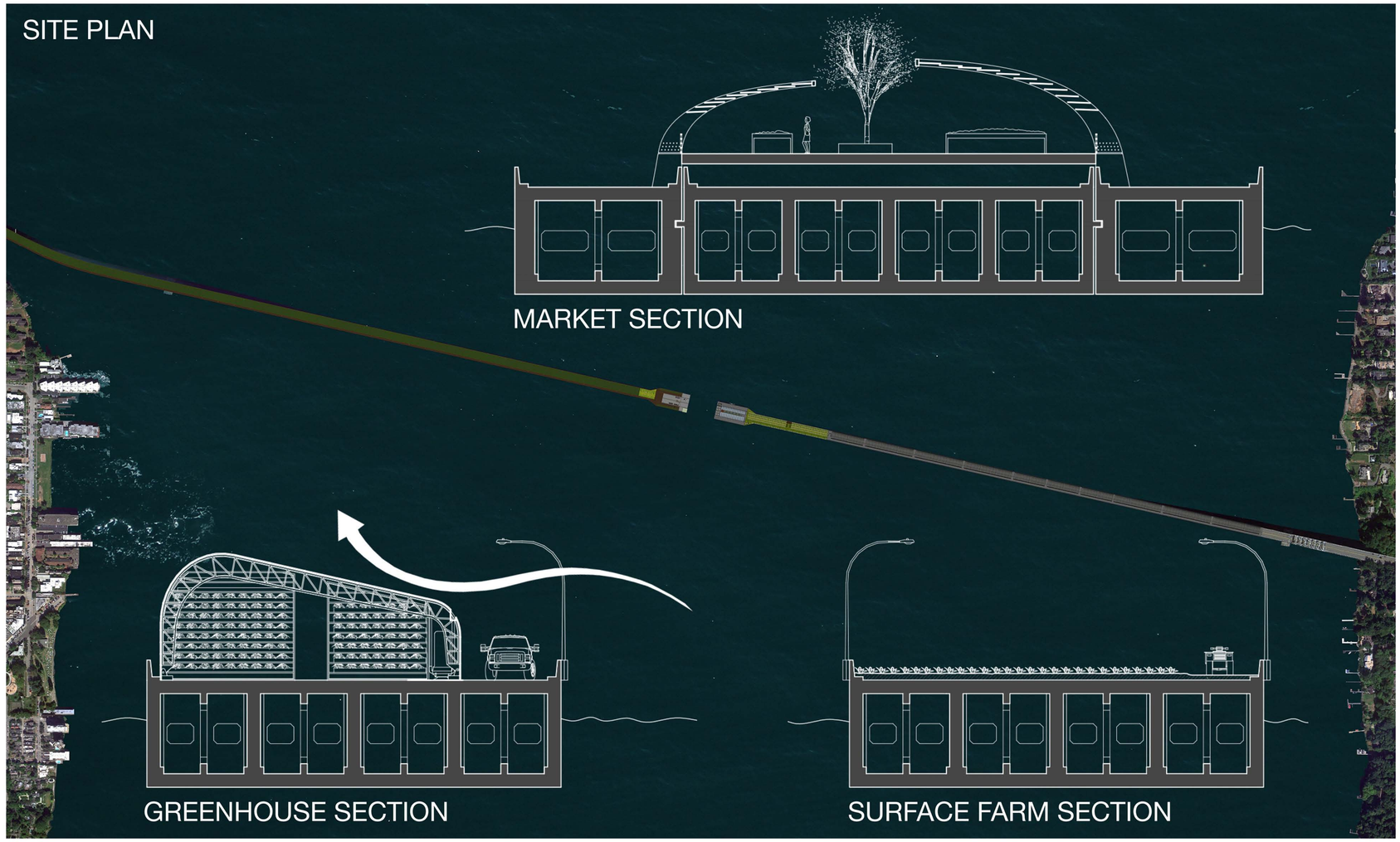
IN THE MARKET

ORCHARD EVENT AREA



GREENHOUSES

SITE PLAN



MARKET SECTION

GREENHOUSE SECTION

SURFACE FARM SECTION