ELLIOTT BAY SEAWALL PROJECT

Pocket Beach and Other Habitat Elements Design

Creating the New Seattle Waterfront

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Shoreline and Coastal Planners Group

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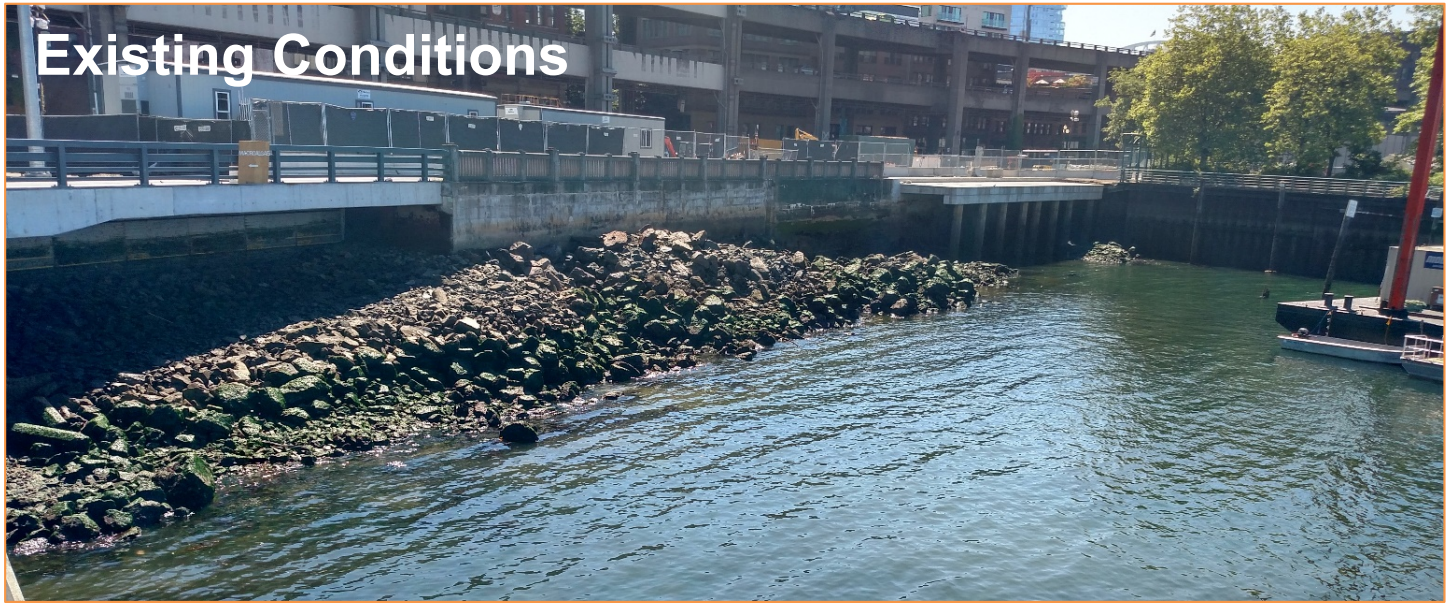
Pocket Beach Between Coleman Ferry and Pier 48

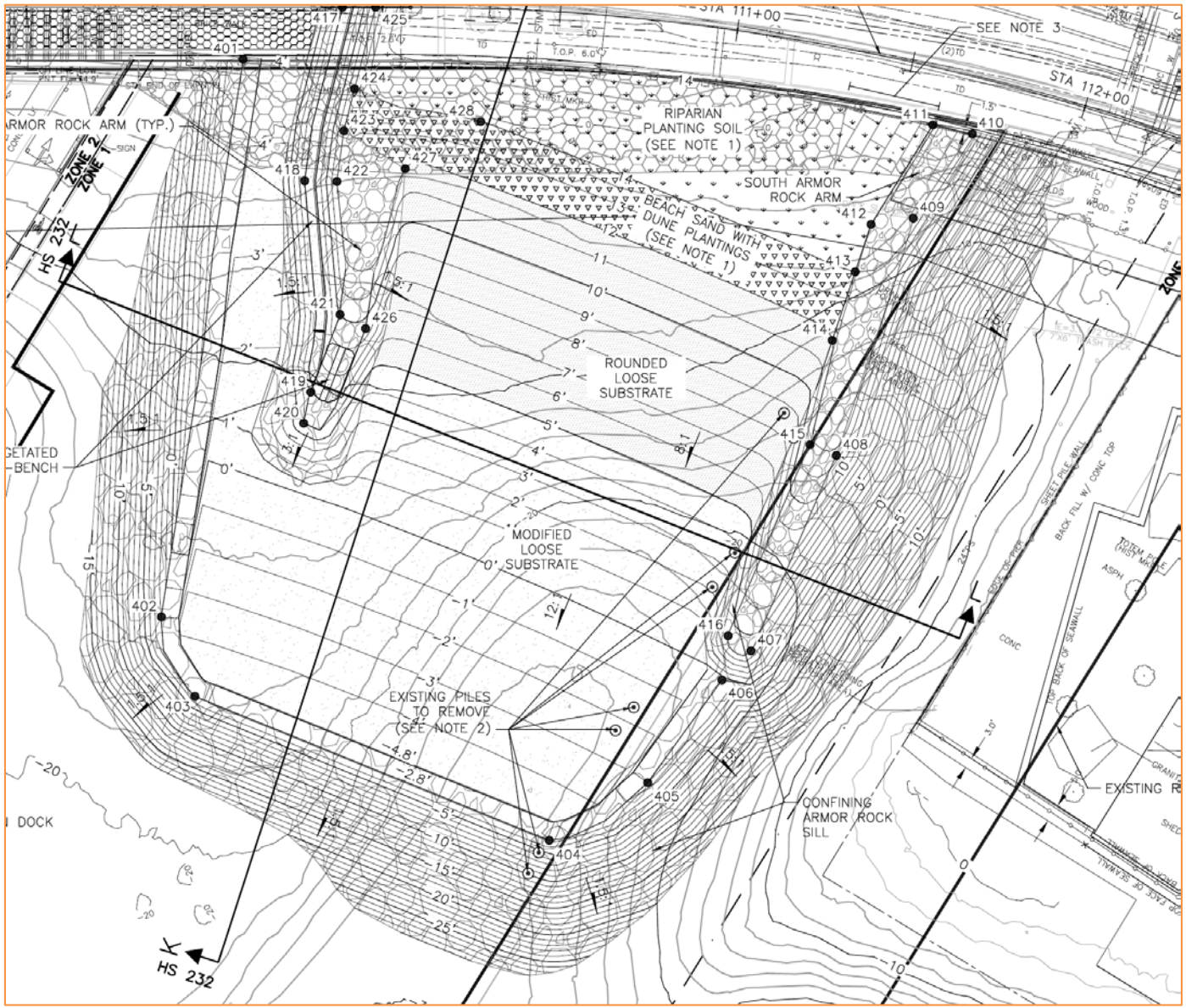


Pocket Beach Engineering Dimensions and Features

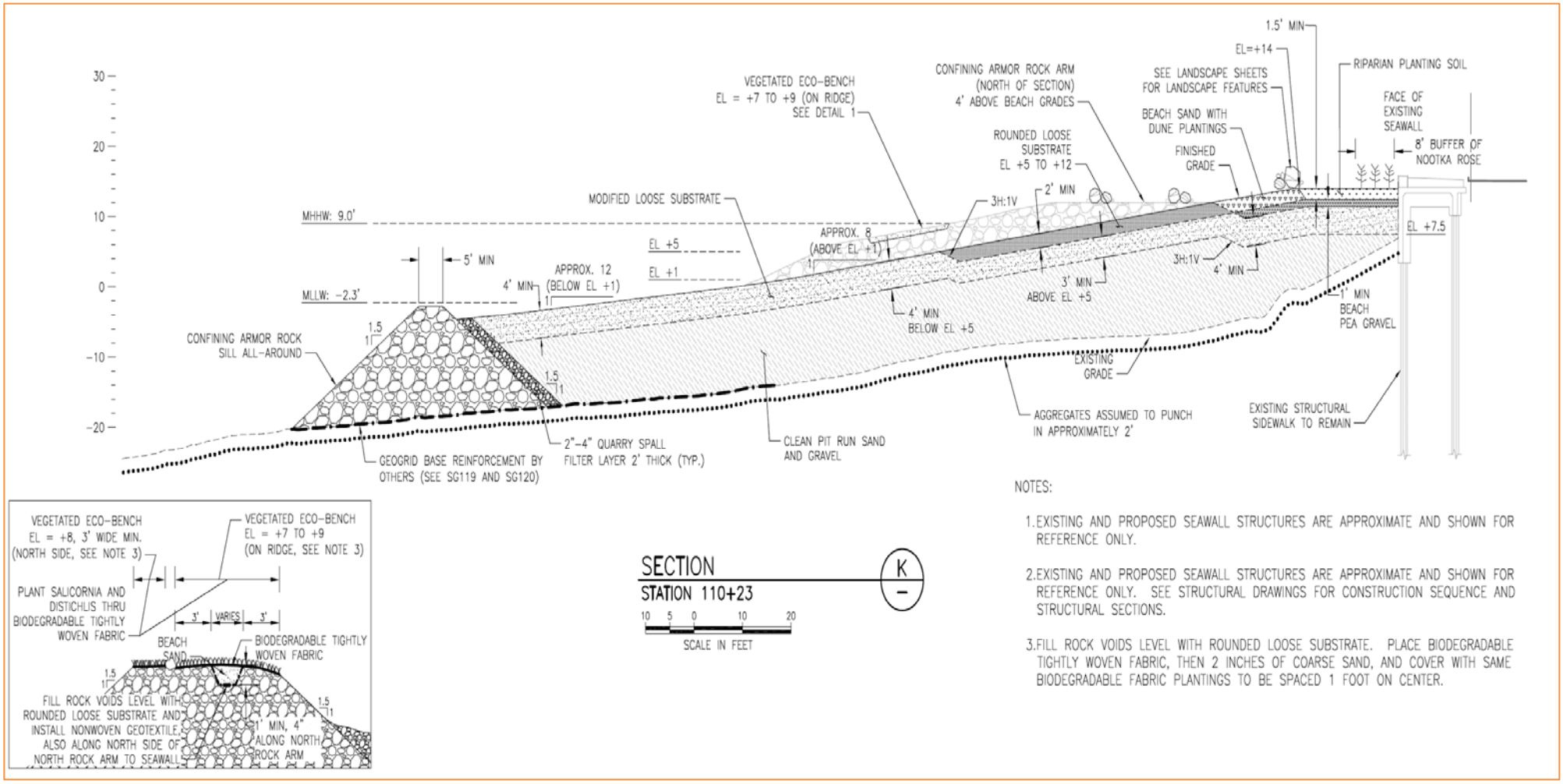
DESCRIPTION	REQUIREMENT
Pocket Beach Dimensions	160 feet by 210 feet (Riparian Zone to lower Intertidal Zone) 240 feet by 260 feet (including confining layer base rock)
Beach elevation range	-2.5 to +14.3 feet MLLW (-4.8 to +12 feet NAVD88)
Transition	+14.3 to +16.3 feet MLLW (+12 to +14 feet NAVD88)
Riparian Zone Elevation Range	+16.3 feet MLLW (+14 feet NAVD88)
Beach slope	approximately 8H:1V
Backshore riparian zone width	30 feet
Habitat bench range	0 feet to +1.7 feet NAVD88
Beach material	
Base Layers	Clean coarse sand topped with 1-foot layer of quarry spalls
Confining Layer and Rock Arms	1.5- to 2.5-foot-diameter riprap
Mid intertidal to supratidal beach face (rounded loose substrate)	6-inch minus round gravel sloped at 7H:1V to 8H:1V placed over clean sand
Low intertidal zone (modified loose substrate)	3-inch minus crushed rock
Riparian Zone	
Vegetation	Native species of riparian and upper beach shrubs and herbaceous vegetation planted on the back beach area.
Soil	Compost/soil mix – 12 inches of compost tilled into the top 2 feet of sand

Pocket Beach Features

100% Plan View



100% Cross Section



SECTION K
STATION 110+23

10 5 0 10 20
SCALE IN FEET

NOTES:

1. EXISTING AND PROPOSED SEAWALL STRUCTURES ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.
2. EXISTING AND PROPOSED SEAWALL STRUCTURES ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY. SEE STRUCTURAL DRAWINGS FOR CONSTRUCTION SEQUENCE AND STRUCTURAL SECTIONS.
3. FILL ROCK VOIDS LEVEL WITH ROUNDED LOOSE SUBSTRATE. PLACE BIODEGRADABLE TIGHTLY WOVEN FABRIC, THEN 2 INCHES OF COARSE SAND, AND COVER WITH SAME BIODEGRADABLE FABRIC PLANTINGS TO BE SPACED 1 FOOT ON CENTER.

Pocket Beach Design Approach

Team Approach

- Design Engineers
- Habitat Biologists
- Coastal Engineers
- Geotechnical Engineers
- Landscape Architects
- Permit Specialists and Planners

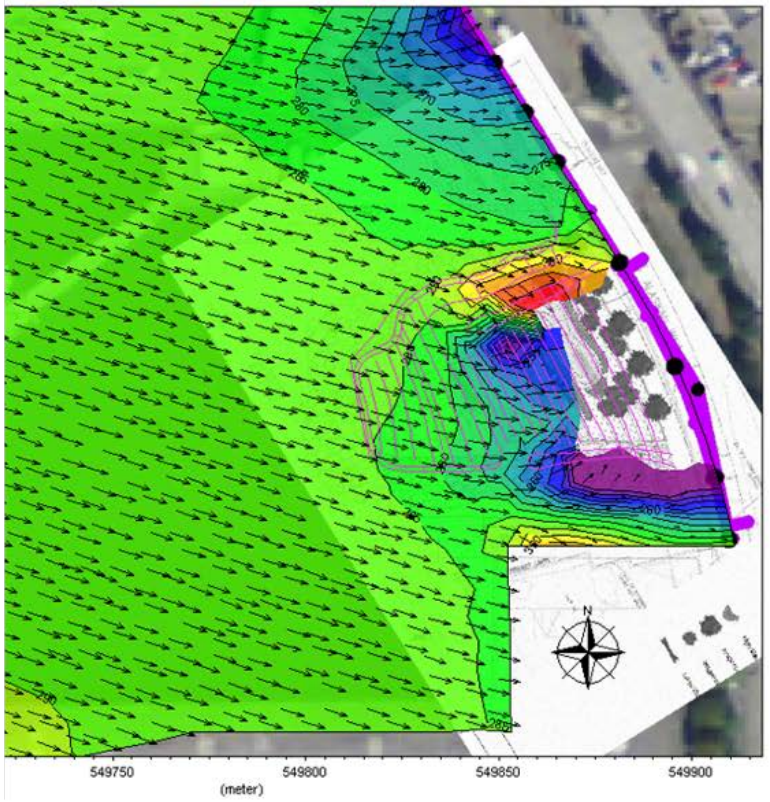
Pocket Beach Stability – Coastal Engineering

Hydrodynamic Modeling

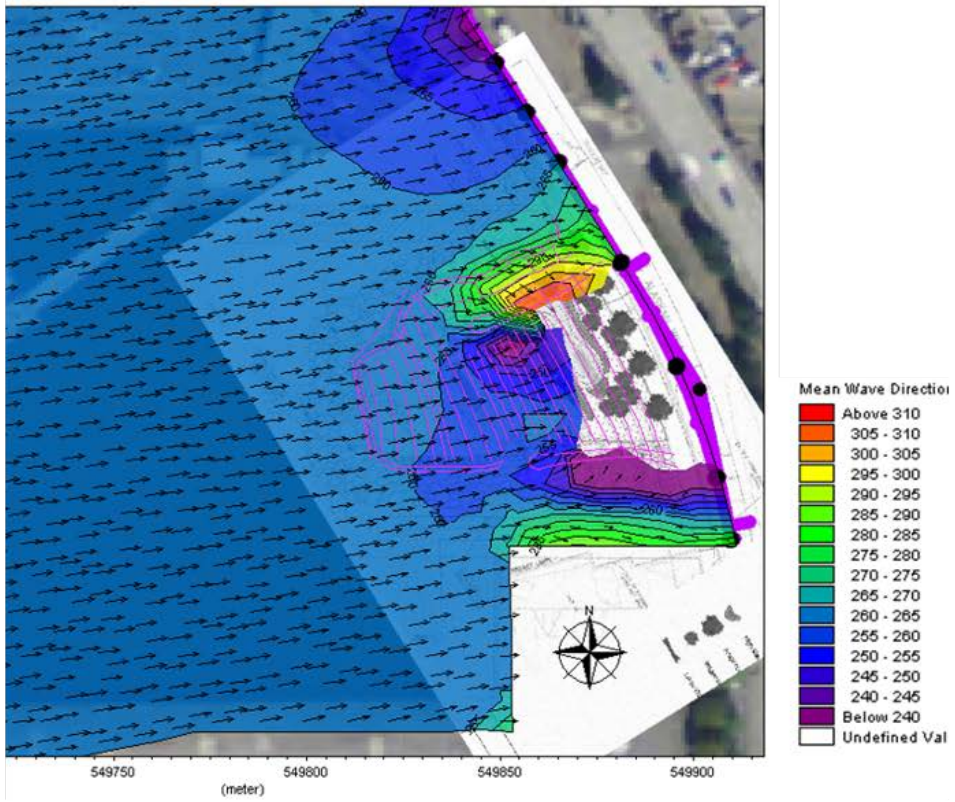
- Conducted during 90 and 100% Design to Choose Most Stable Design that Minimizes the Amount of Fill

- Wind Generated Wave Analysis
- Slight Adjustments to Beach Configuration
- Substrate Gradation Adjustments

north waves



south waves



Pocket Beach Stability – Coastal Engineering

Substrate Size Profiles	
Modified Loose Substrate	
Grain Size	Percent Passing
3-in	100%
2-in	75% to 95%
1-in	30% to 55%
0.5-in	10% to 30%
0.25-in	5% to 15%
#4	< 3%
Rounded Loose Substrate	
Grain Size	Percent Passing
6-in	100%
4-in	75% to 95%
2-in	30% to 55%
1-in	10% to 30%
0.5-in	5% to 15%
#4	< 3%

Pocket Beach Stability – Geotechnical Analysis

- Existing Bottom Sediments
  Highly Organic Silt and Wood

- Static Stability Analysis - Need for a Geogrid Layer between Base of Beach and Existing Sediment to Prevent Lateral Movement

Riparian Zone – Landscape Analysis

Balance Between Ecological Function and Institutional Requirements

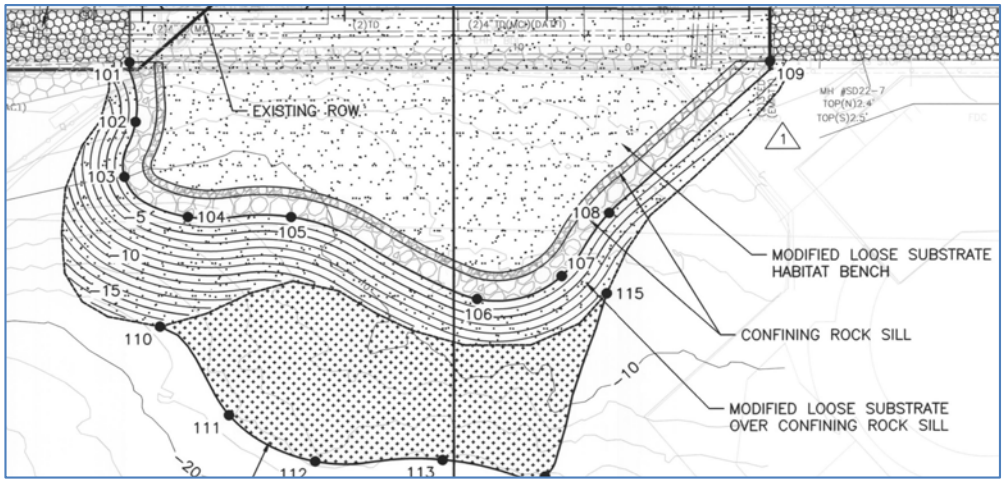
- State Ferries Security MARSEC Requirements
- Hardy Coastal/Native Species
- View Corridor Requirements
- Agency Permitting Requirements

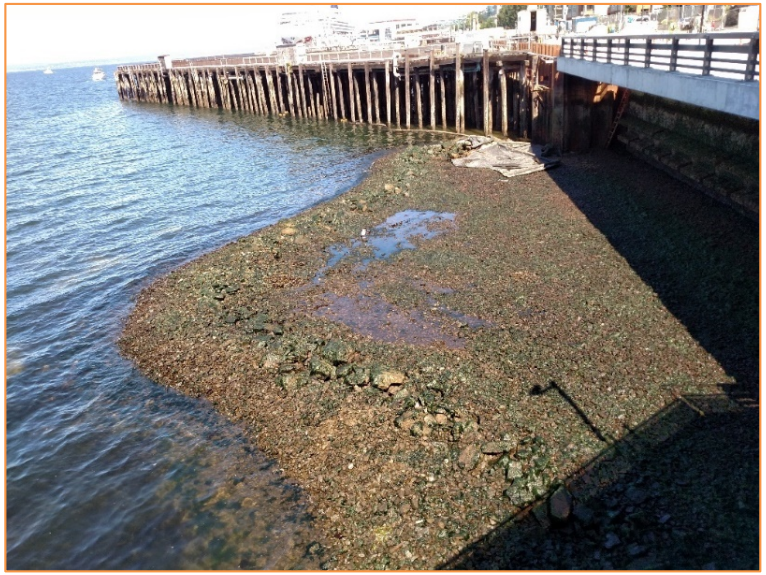
Primary Riparian Species

- Nootka Rose
- Shore Pine
- Oregon Grape
- Beach Pea
- Pacific Gumweed
- Dune Grass

Other Habitat Features
Extended Habitat Bench (Pier 59)

- Constructed in Early Spring, 2017
- Approximately 6,000 square feet of surface habitat
- Elevation at MLLW
- Similar Surface Substrates and Base Layer as Pocket Beach



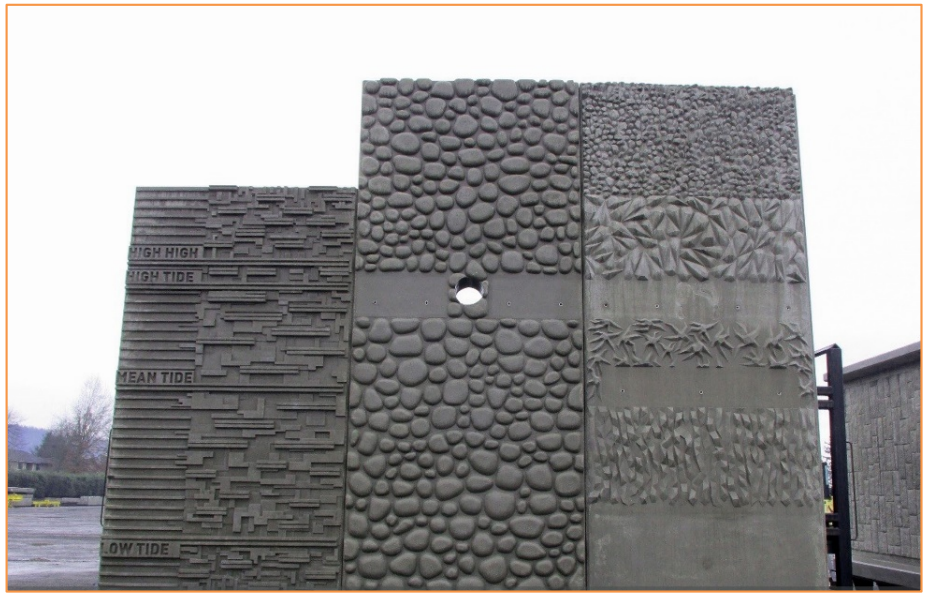


Other Habitat Features

- Habitat Bench
  - Substrates at MLLW at Seawall Face Beneath Piers Under Cantilevered Sidewalk
  - Sidewalk Allows Light Penetration
  - Substrates Confined in Geogrid "Marine Mattresses" for Ease of Placement and Stability
  - Typically 12 to 16 feet Wide
  - Runs along the Entire Face of the Seawall From Coleman Dock to Pier 62/63

Other Habitat Features

Textured Seawall Face and Shelves to Improve Ecological Functions Along Bench



QUESTIONS?

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