



Central Waterfront Stakeholders Group

May 12, 2011

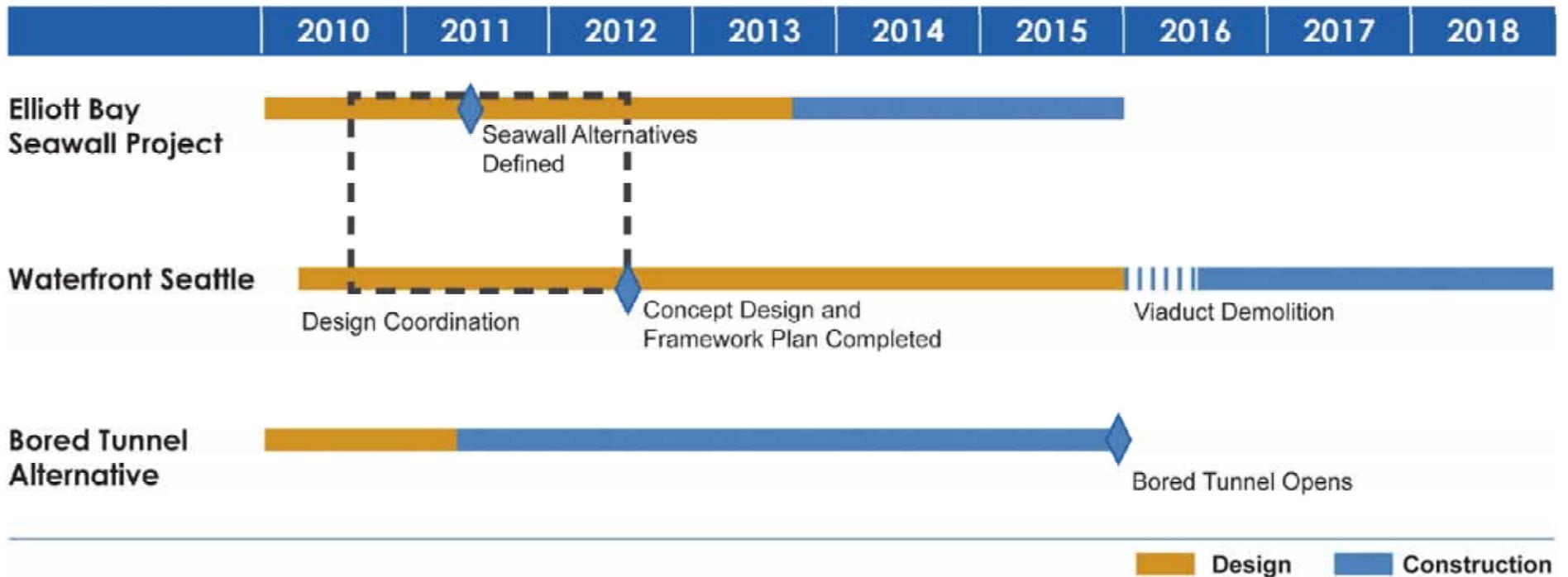


Housekeeping





Project Schedules





Waterfront Seattle Update

Waterfront
Seattle.org



Waterfront Seattle.org

WHAT MAKES A GREAT WATERFRONT?

Waterfront
Seattle.org

February 17th Event Public Input



February 17 Event



Public Input – Survey

Survey—more than 1200 participants

- What makes a great waterfront?
- Which of the following uses are most important to you? Least important to you?
- What are two main uses that would attract you?
- What would you most love to see? Be most disappointed to see?
- If we could do one thing to improve the waterfront now, what would that be?



Public Input – Event Boards



May 19th Event

Goals

- Review public input from February 17th event
- Communicate and get feedback on early design ideas

Details

5:00-6:30	Food and music on the pier!
6:30-8:30	Presentation, Q&A, Feedback

Bell Harbor Conference Center – Elliott Hall

2211 Alaskan Way
Seattle, WA 98121

RSVP at waterfrontseattle.org

Waterfront
Seattle.org



Questions



*Seawall Alternatives Update
and Costs*

Council Briefing: April 25

- Project purpose and need
- Project goals
- Coordination efforts
- Process for developing alternatives
- Alternatives A and B (Zones 1-4)
- Construction phasing
- Preliminary cost estimates



Previous Planning-Level Cost Estimate

Costs (S. Washington to Pine)	Estimate
Environmental and Design	\$41 M
Construction*	\$233 M
Subtotal	\$274 M
Public Utilities Infrastructure	\$11 M
Total (not approved by USACE)	\$285 M

* Construction costs assumed jet grouting method.

Current Cost Assumptions – 10% Design

- Central seawall project boundary extends to Virginia Street
 - Total distance (S. Washington to Virginia): 3,700 lineal feet
 - Increase in length (Pine to Virginia): 240 lineal feet
- Structural cost assumes drilled shafts
 - Less risk associated with cost estimate
 - Better historic price record
- Project includes ecosystem restoration
- Utility costs previously included in Central Waterfront project

Current Central Seawall Costs – 10% Design

Costs in 2014 \$ (S. Washington to Virginia)	Alternative A (wall in place for low-cost structural stability)	Alternative B (wall pulled inland for habitat and design flexibility)
Environmental and Design	\$35 M	\$40 M
Construction		
Structures	\$185 M	\$223 M
Roadway	\$19 M	\$23 M
Other	\$8 M	\$23 M
Contingency	\$63 M	\$81 M
Subtotal	\$310 M	\$390 M
Public Utilities Infrastructure		
SPU Facilities (design, construction, contingency)	\$6 M	\$7 M
SCL Facilities (design, construction, contingency)	\$19 M	\$19 M
Total (not yet approved by USACE)	\$335 M	\$416 M

Cost estimates currently in peer review

Current Central Seawall Costs – 10% Design

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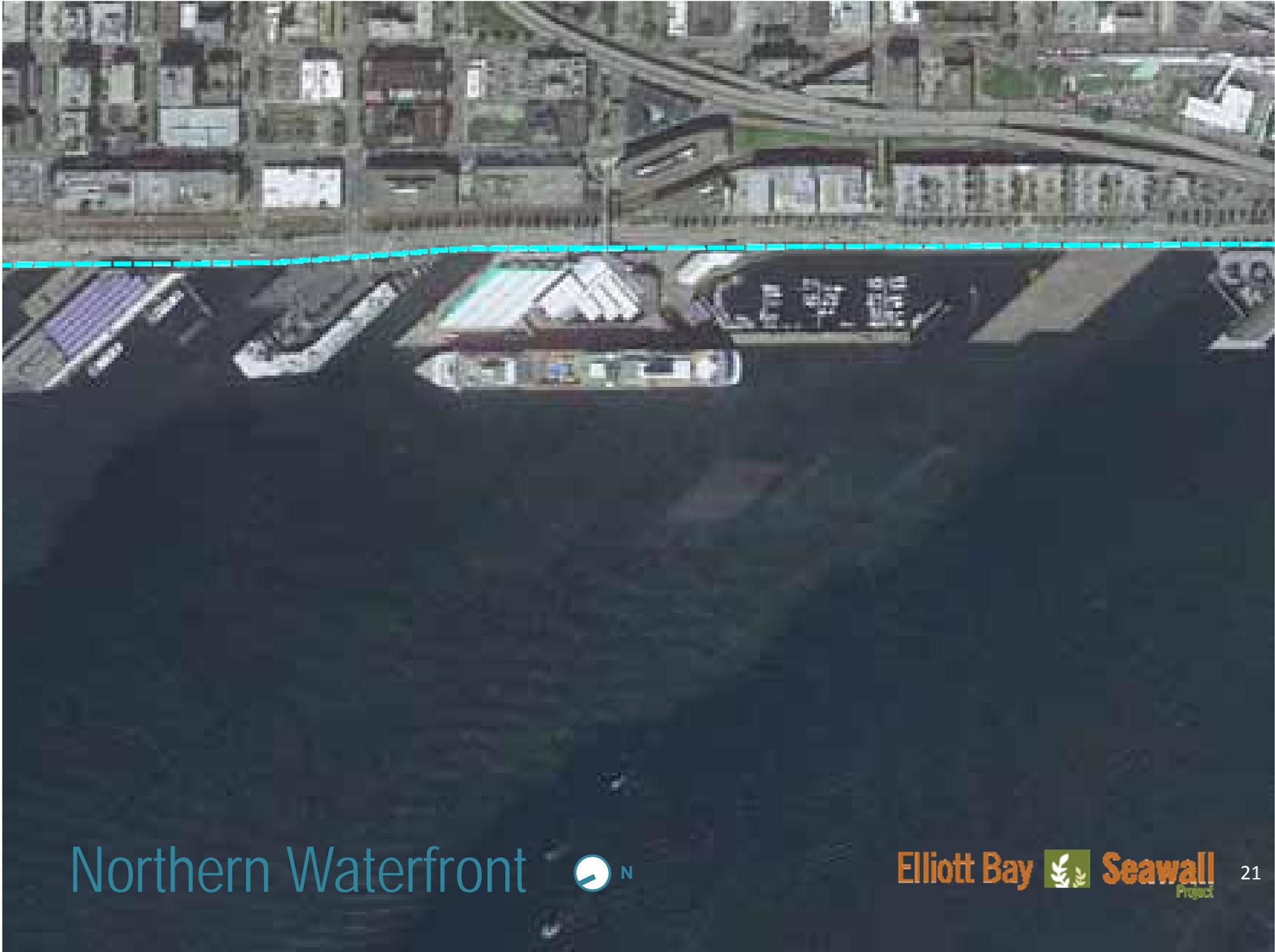
Cost estimates currently in peer review



Northern Waterfront



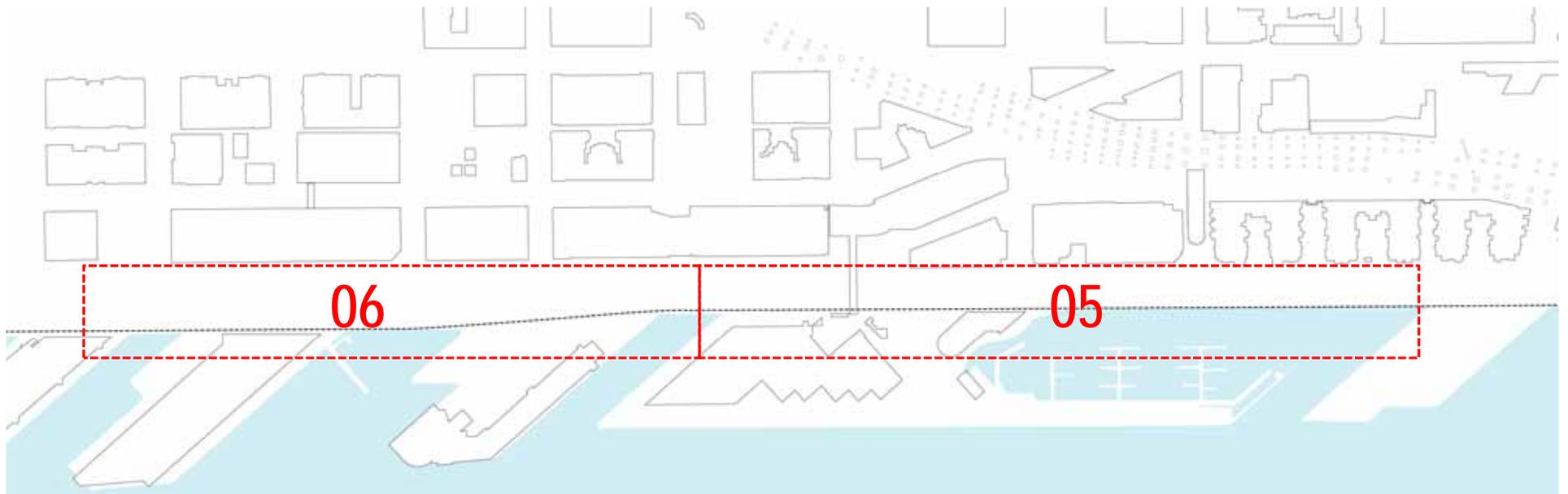
Elliott Bay  Seawall Project



Northern Waterfront

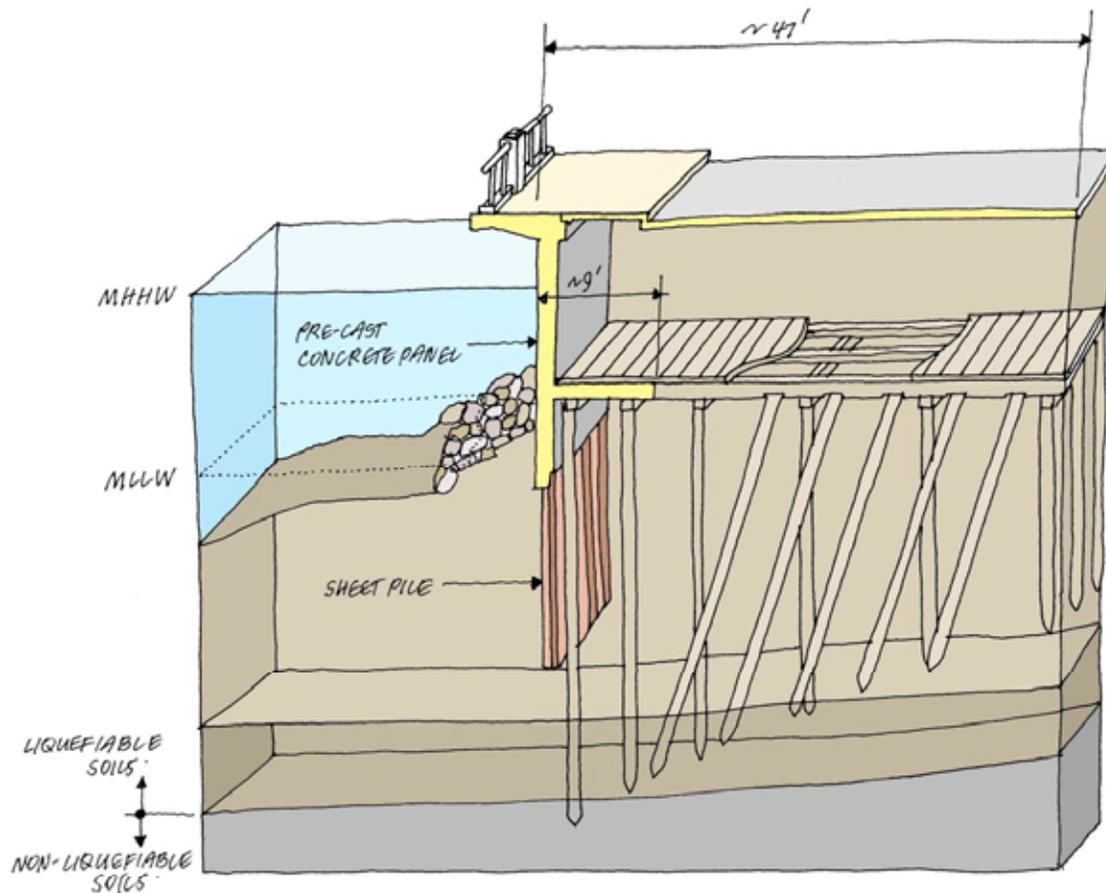
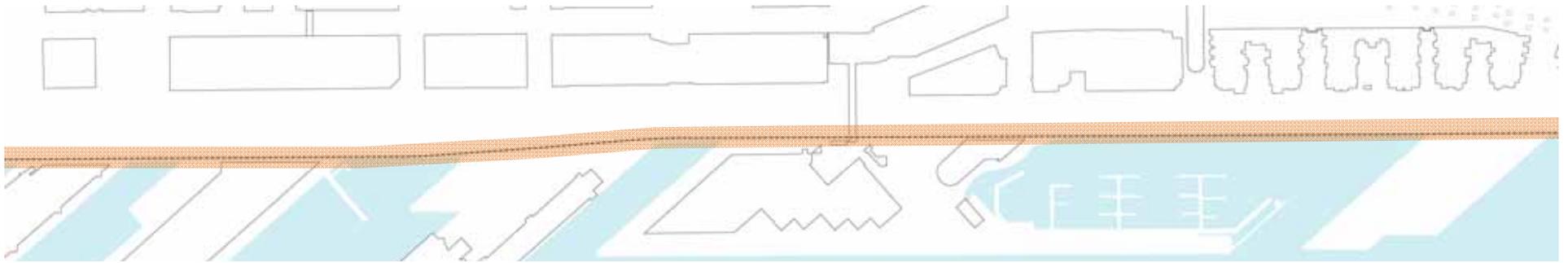


Elliott Bay  Seawall Project

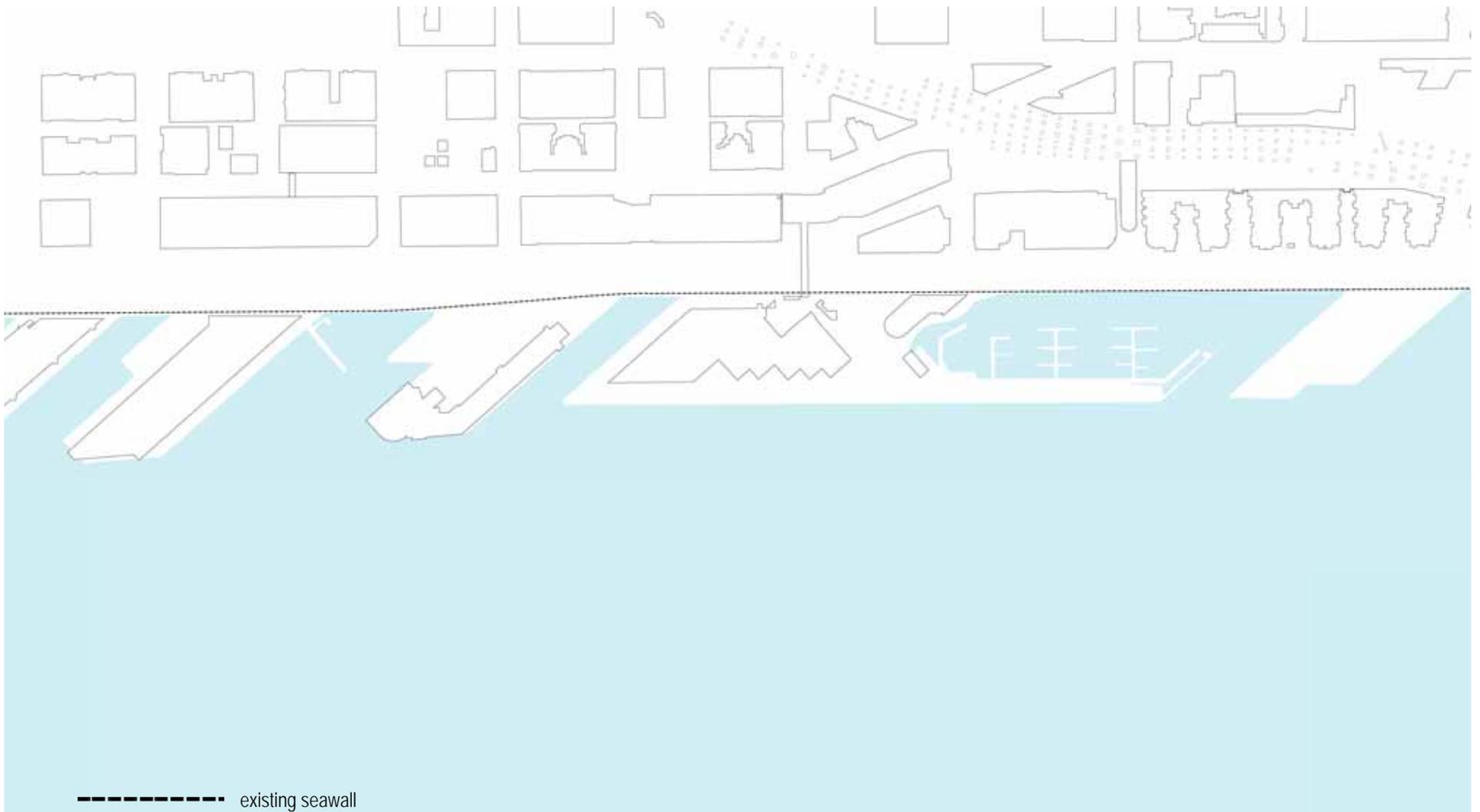


Northern Waterfront 

Elliott Bay  Seawall Project



Existing Type A Seawall



----- existing seawall

Alternative A/B N



Alternative A/B

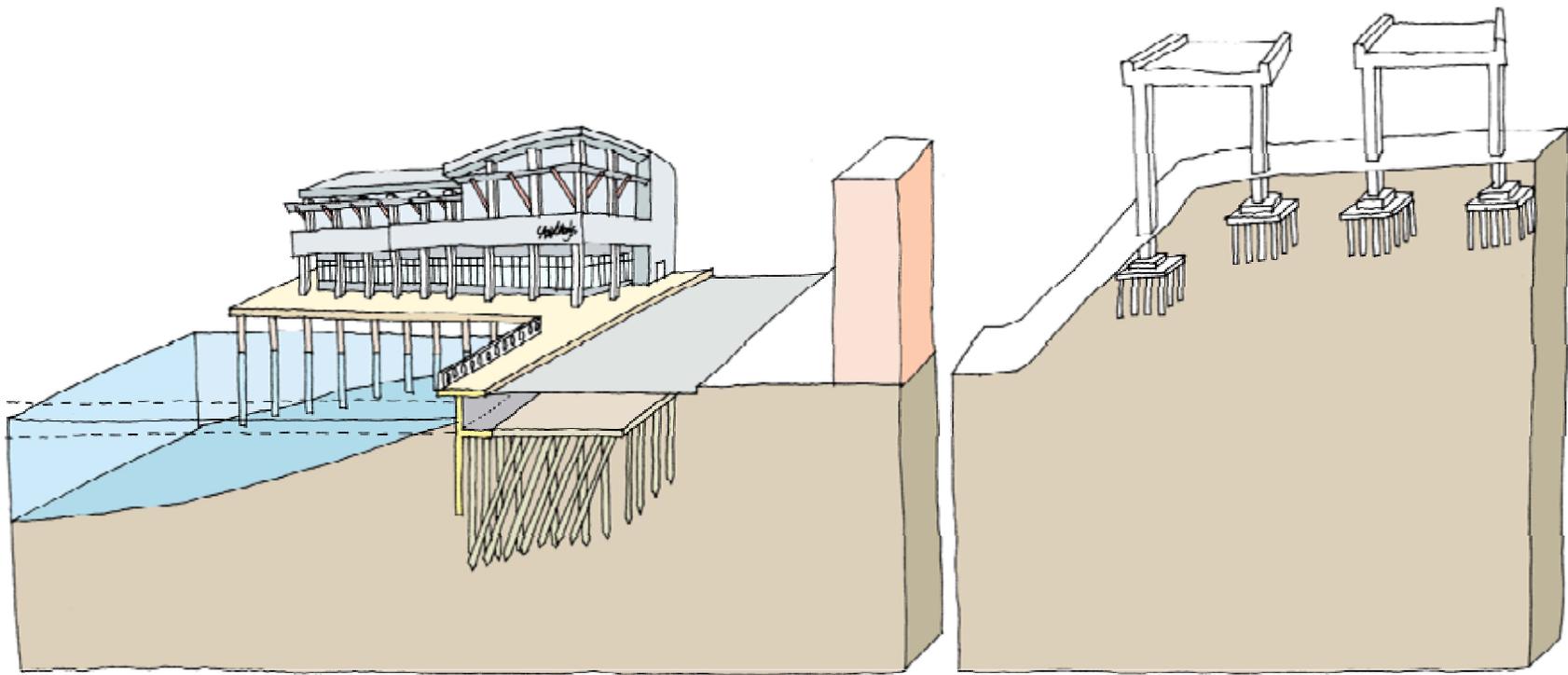
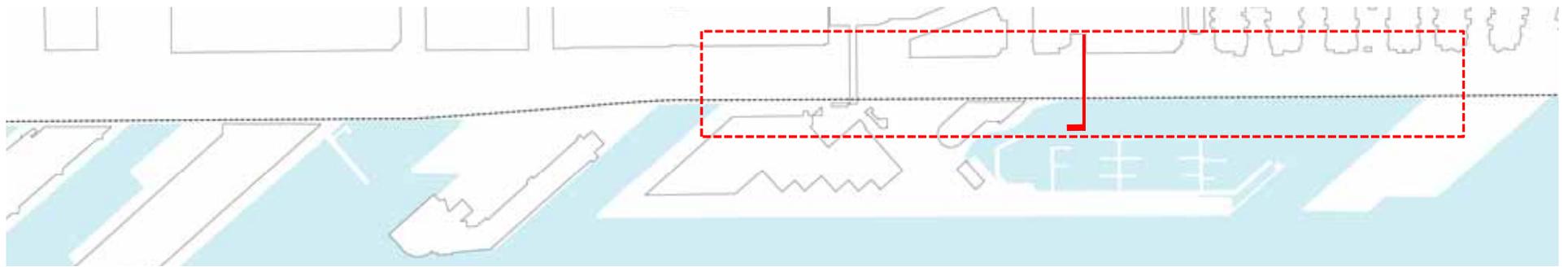


- existing seawall
- alternative seawall
- sidewalk
- multi-use path

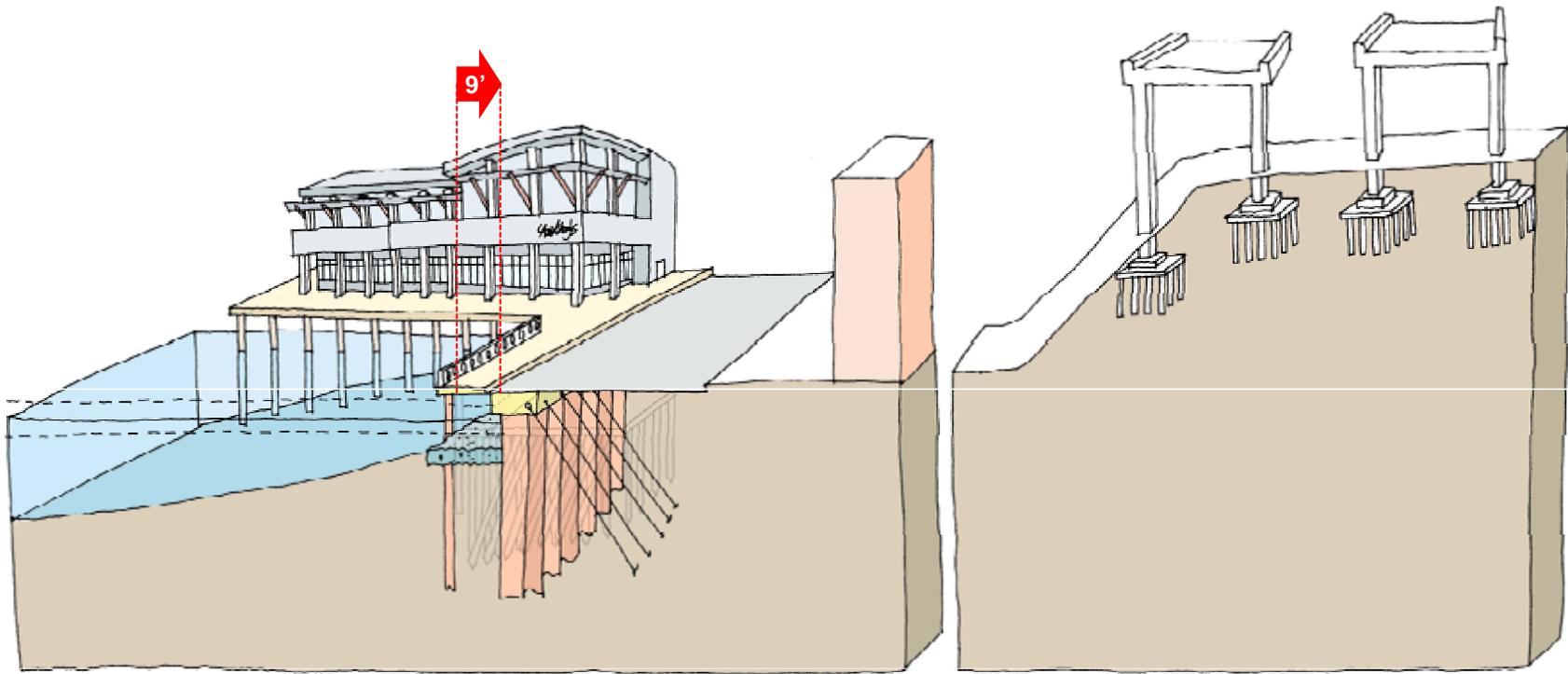
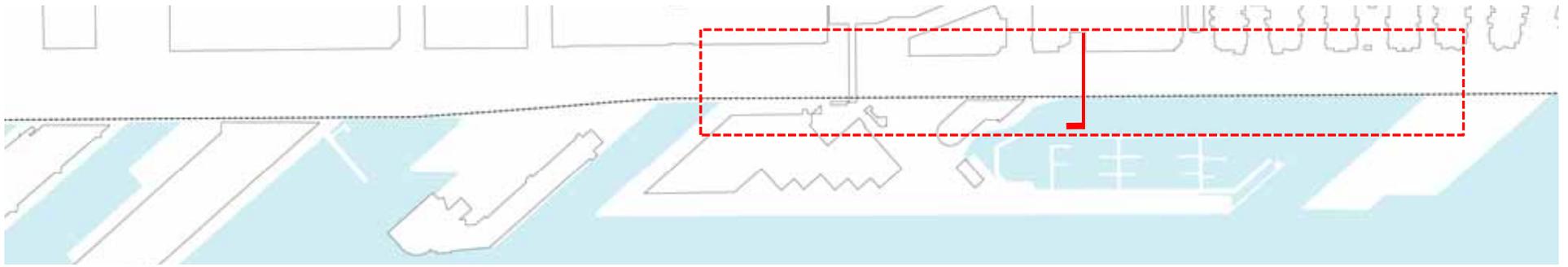
Alternative A/B



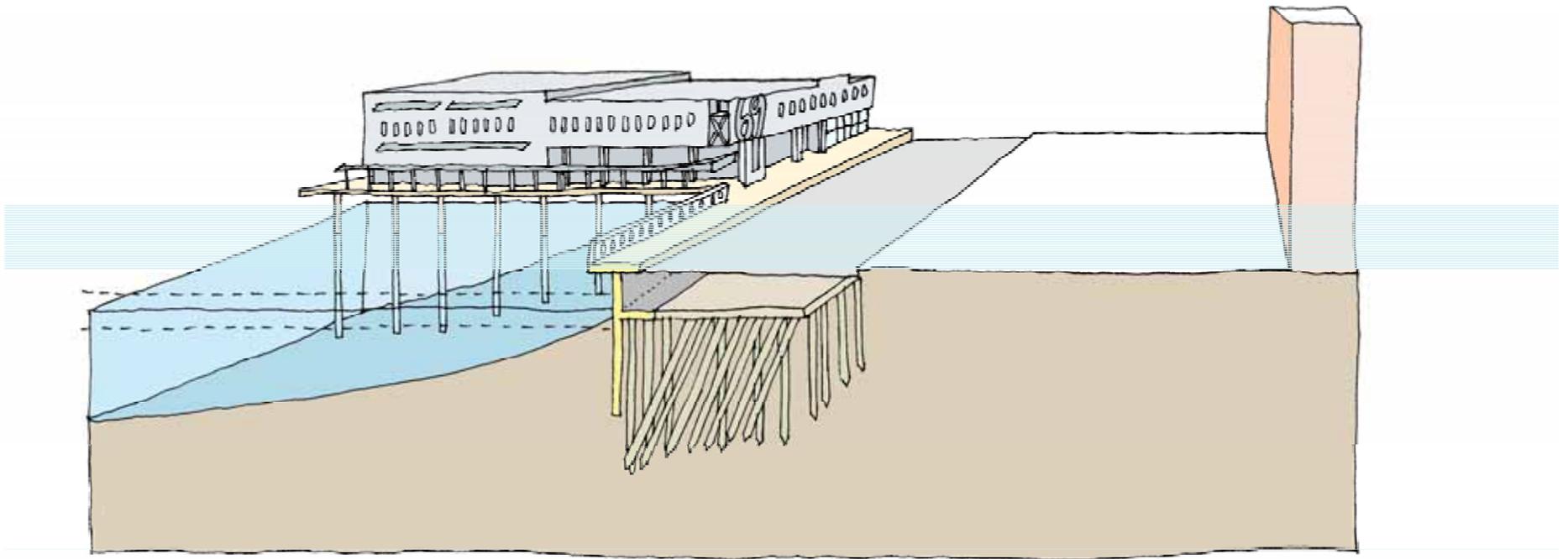
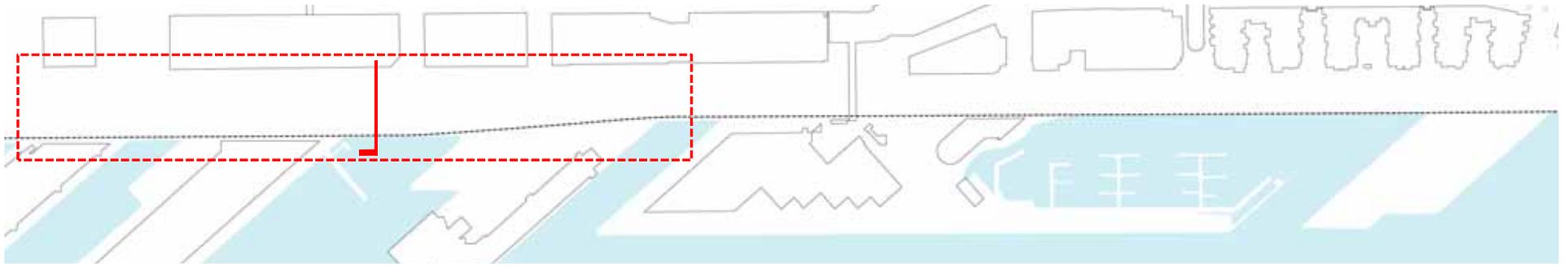
Alternative A/B



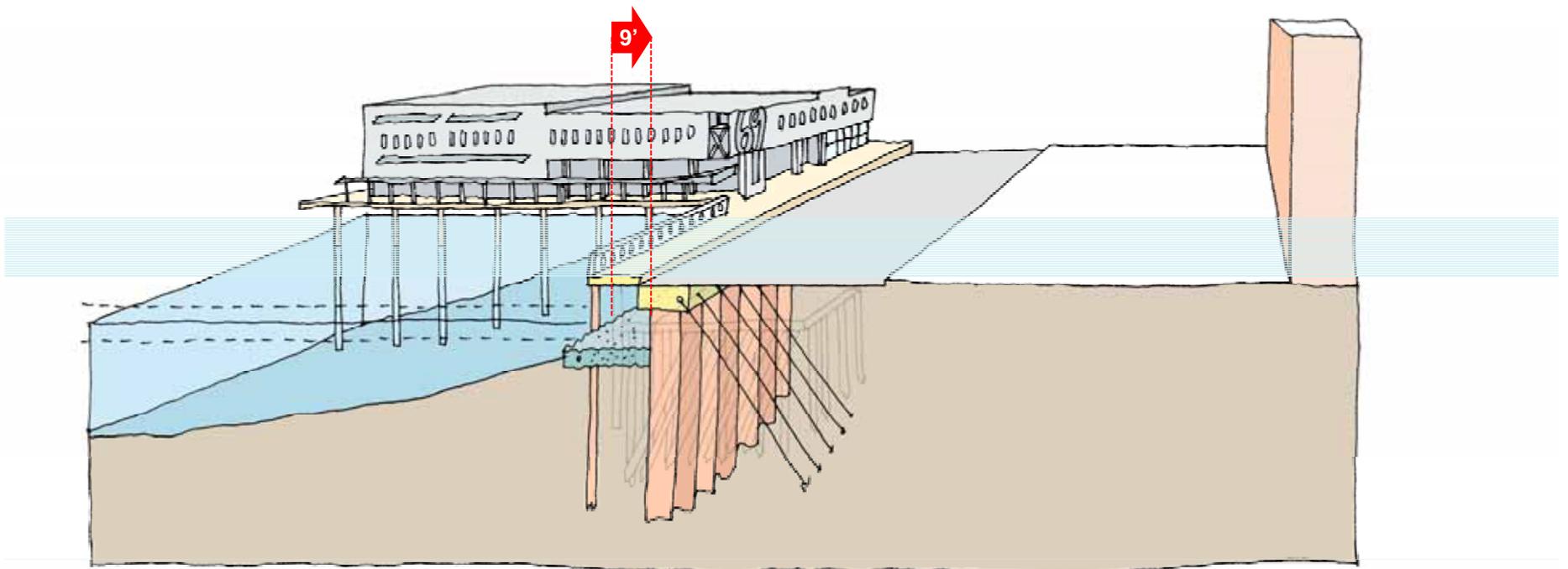
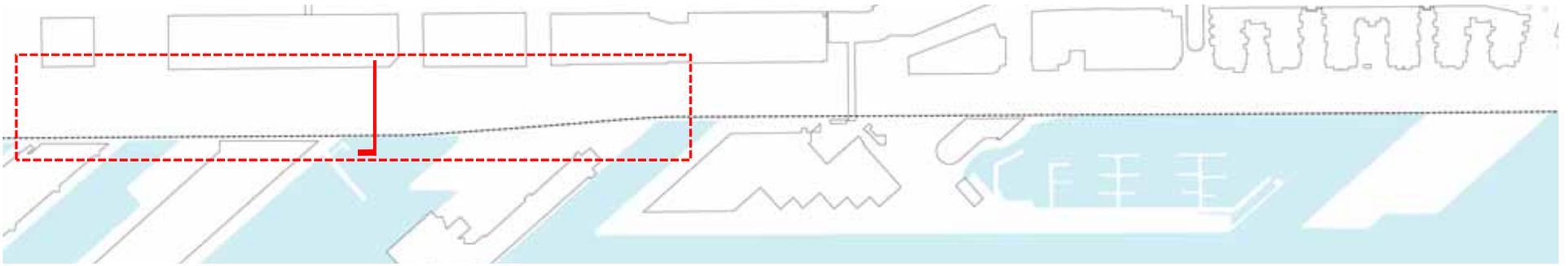
Existing – Zone 05



Alt A/B – Zone 05



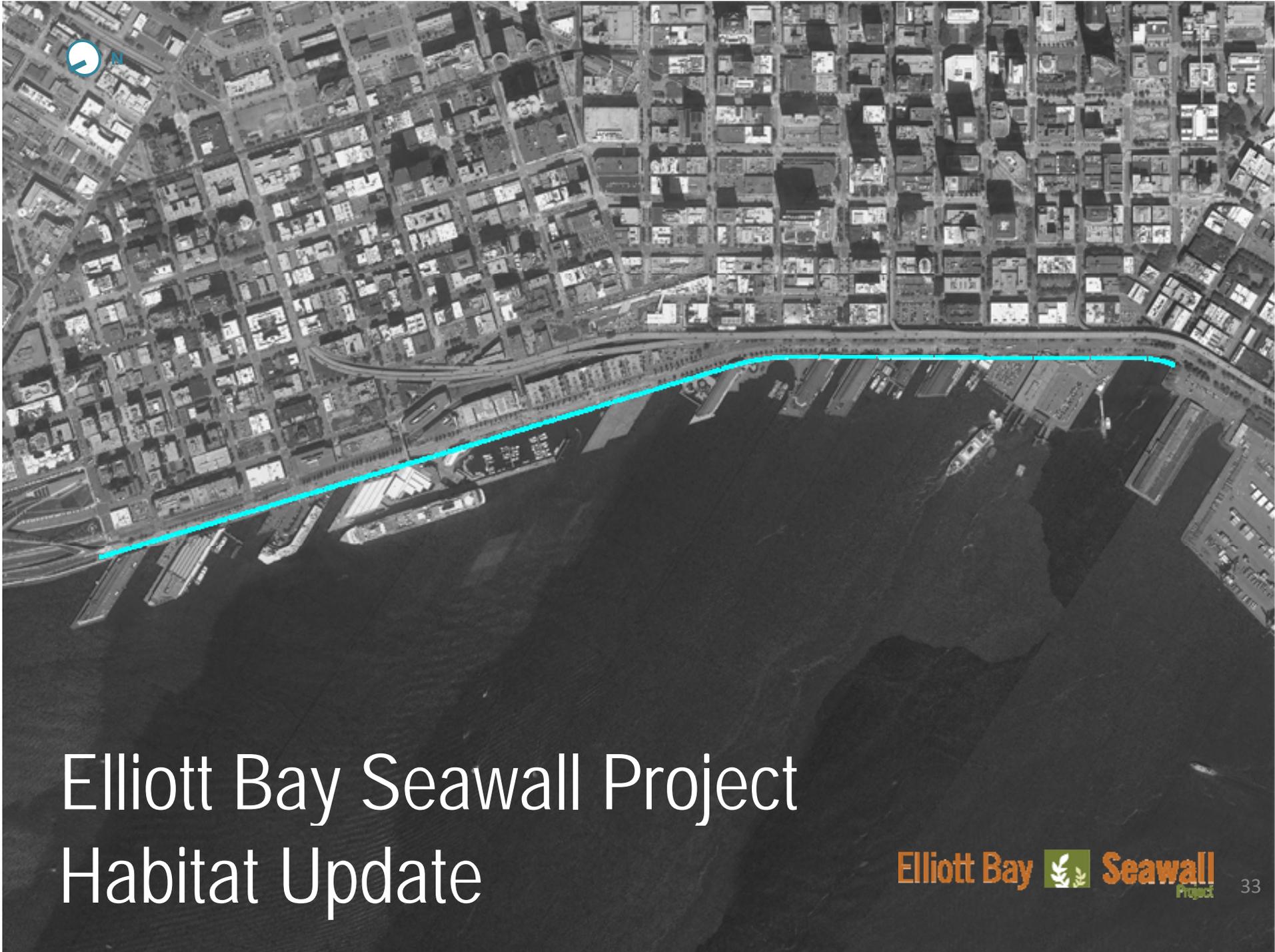
Existing – Zone 06



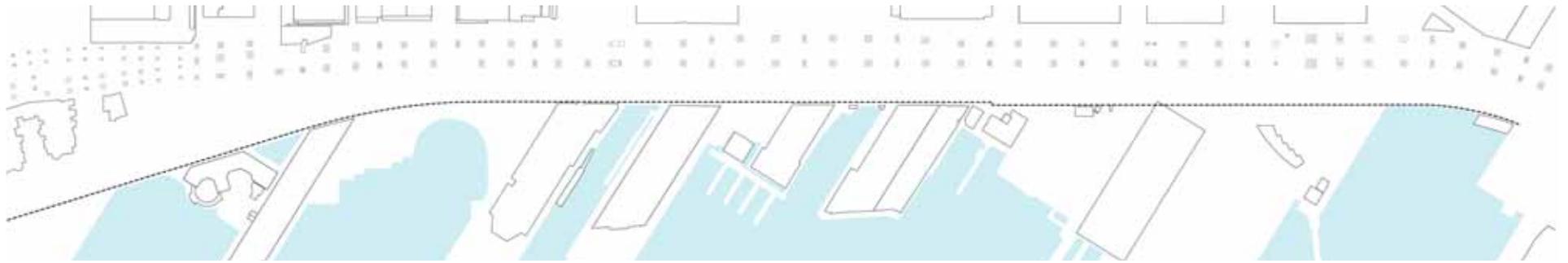
alt A/B – zone 06

Next Steps for Alternatives

- Initiate 35% design (for completion by end of 2011)
- Complete discipline reports for Draft EIS
- Continue habitat study
- Continue working with U.S. Army Corps of Engineers
- Continue coordination with Waterfront Seattle and Central Waterfront Committee
- Continue engagement with Central Waterfront Stakeholders Group and the public



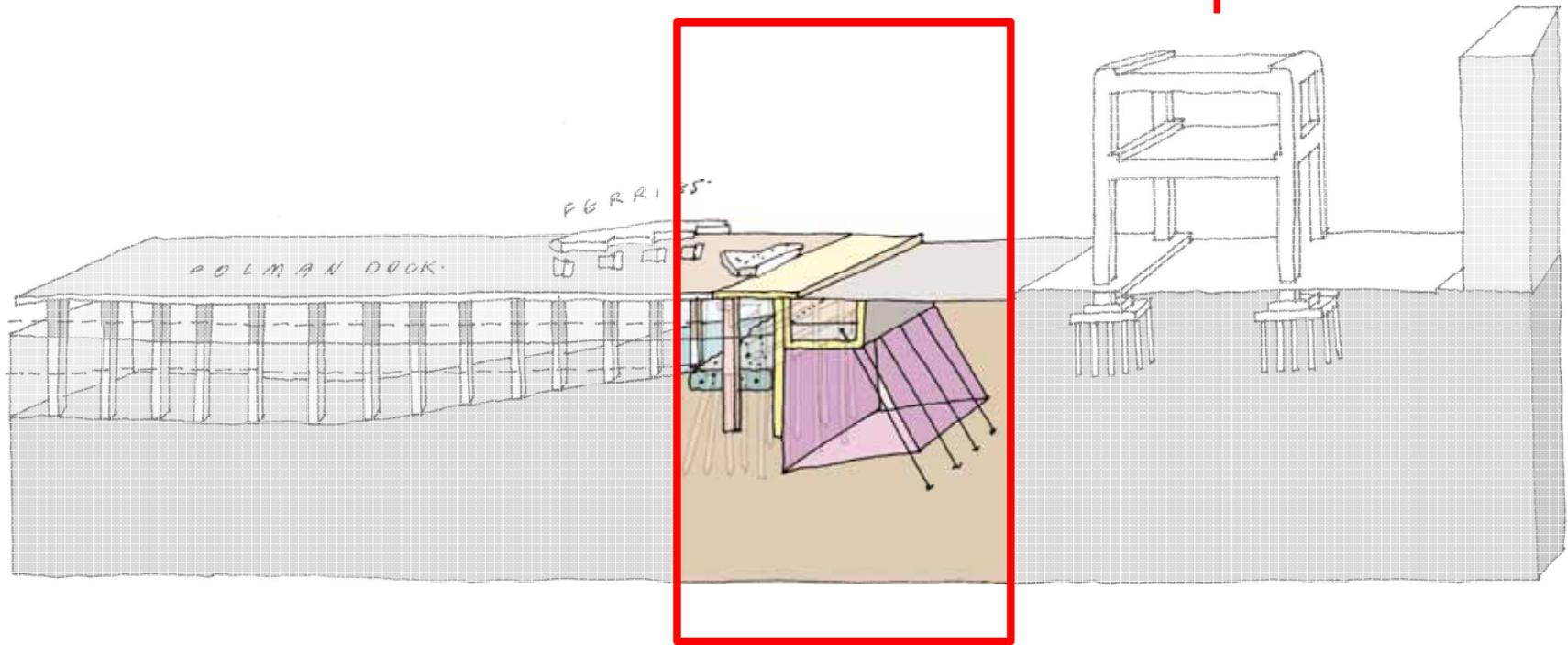
Elliott Bay Seawall Project Habitat Update

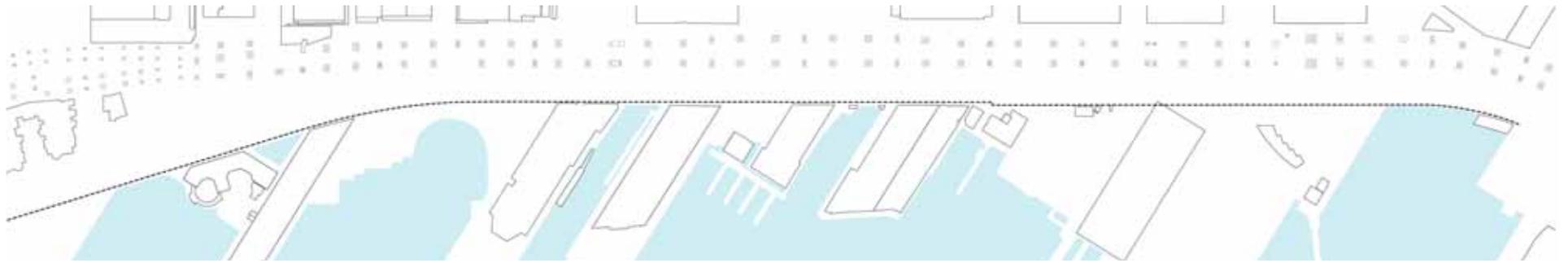


water side

seawall

upland

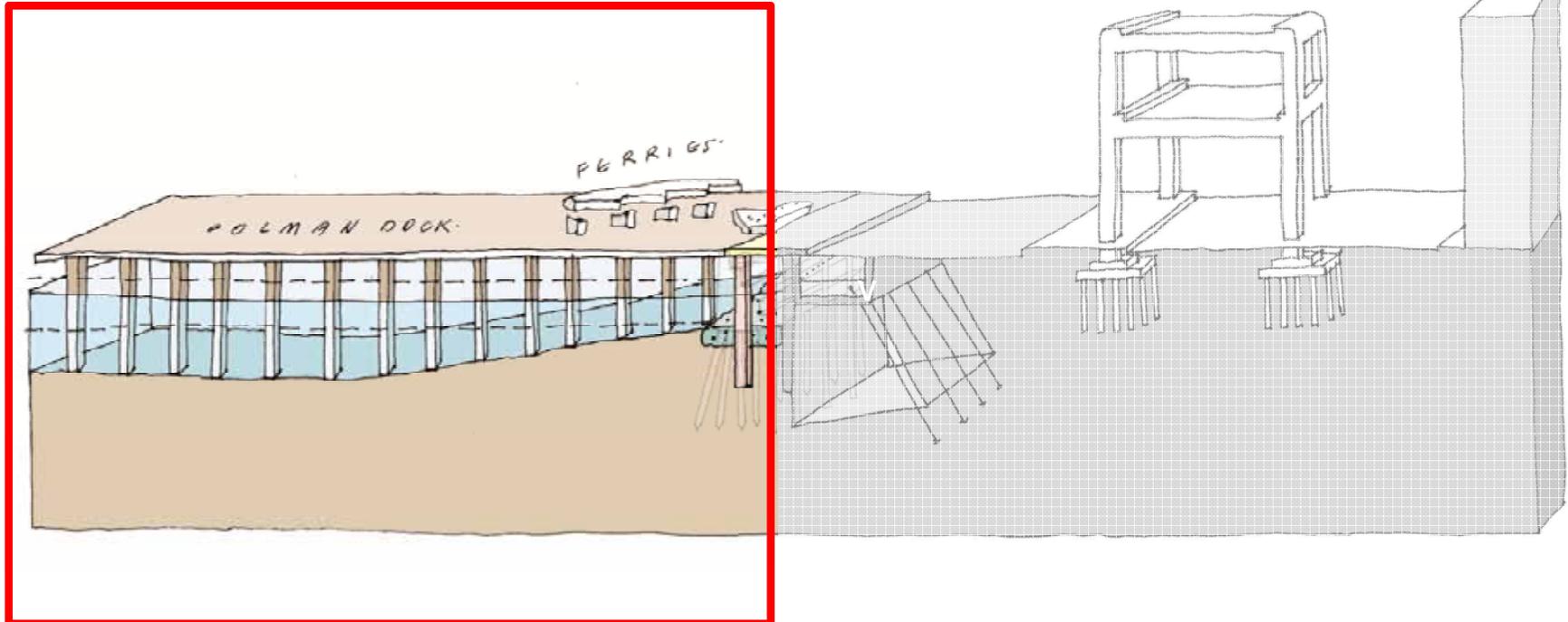




water side

seawall

upland



Comparing Alternatives

		Alternative	Zone 6 North Pier	Zone 5 Bell Harbor	Zone 4 Park/Aquarium	Zone 3 Commercial Piers	Zone 2 Ferry Terminal	Zone 1 Pioneer Square	
Wall Location	Ex		0'	0'	0'	0'	0'	0'	
	A		-9'	-9'	-9'	+3'	-15'	0'	
	B		-9'	-9'	-75'	-30'	-15'	-15'	
Nearshore Habitat	Aquatic	Ex	Minimal habitat	Habitat bench	Minimal habitat	Minimal habitat	Minimal habitat	<ul style="list-style-type: none"> Minimal habitat Advantageous bathymetry 	
		A	<ul style="list-style-type: none"> Cobble reef Substrate enhancement Habitat bench Light penetrating surface 	<ul style="list-style-type: none"> Habitat bench improvement Light penetrating surface 	<ul style="list-style-type: none"> Cobble reef Substrate enhancement Habitat bench Light penetrating surface 	<ul style="list-style-type: none"> Habitat bench Light penetrating surface 	<ul style="list-style-type: none"> Habitat bench Light penetrating surface 	<ul style="list-style-type: none"> Cobble reef Substrate enhancement 	
		B	Same as A	Same as A	Same as A with: <ul style="list-style-type: none"> Natural light Intertidal zone 	Same as A	Same as A	Same as A with: <ul style="list-style-type: none"> Improved habitat Intertidal zone Light penetrating surface 	
	Riparian	Ex	none	none	none	none	none	none	none
		A	Base planting	Base planting	Base planting	Base planting	Base planting	none	Base planting
		B	Additional planting opportunities	Additional planting opportunities	Additional planting opportunities	Additional planting opportunities	Additional planting opportunities	none	Additional planting opportunities
Restored Public Amenities	Ex	<ul style="list-style-type: none"> Sidewalk 	<ul style="list-style-type: none"> Sidewalk Multi-use trail Public short-stay marina 	<ul style="list-style-type: none"> Sidewalk Multi-use trail Waterfront Park Pier 62/63 	<ul style="list-style-type: none"> Sidewalk Multi-use trail 	<ul style="list-style-type: none"> Sidewalk Multi-use trail Public ferry terminal 	<ul style="list-style-type: none"> Sidewalk Multi-use trail Washington St Boat Landing 		
	A	<ul style="list-style-type: none"> Restored sidewalk Potential early wins 	<ul style="list-style-type: none"> Restored sidewalk Restored multi-use trail Public short-stay marina Potential early wins 	<ul style="list-style-type: none"> Restored sidewalk Restored multi-use trail Waterfront Park (existing) Pier 62/63 (existing) Potential early wins 	<ul style="list-style-type: none"> Restored sidewalk Restored multi-use trail Potential early wins 	<ul style="list-style-type: none"> Restored sidewalk Restored multi-use trail Public ferry terminal Potential early wins 	<ul style="list-style-type: none"> Restored sidewalk Restored multi-use trail Restored Washington St Boat Landing Potential early wins 		
	B	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	Same as A	

Why are we doing this?









PLAN OF SEATTLE

1855 - 6

Showing the position occupied by the Decatur's crew, July 26, together with the line of Barricades erected and roads constructed.

John S. Phelps
Commodore U.S.N.



Elliott Bay
Original sketch
Enlarged & Revised
by *Robert S. ...*
December 1930

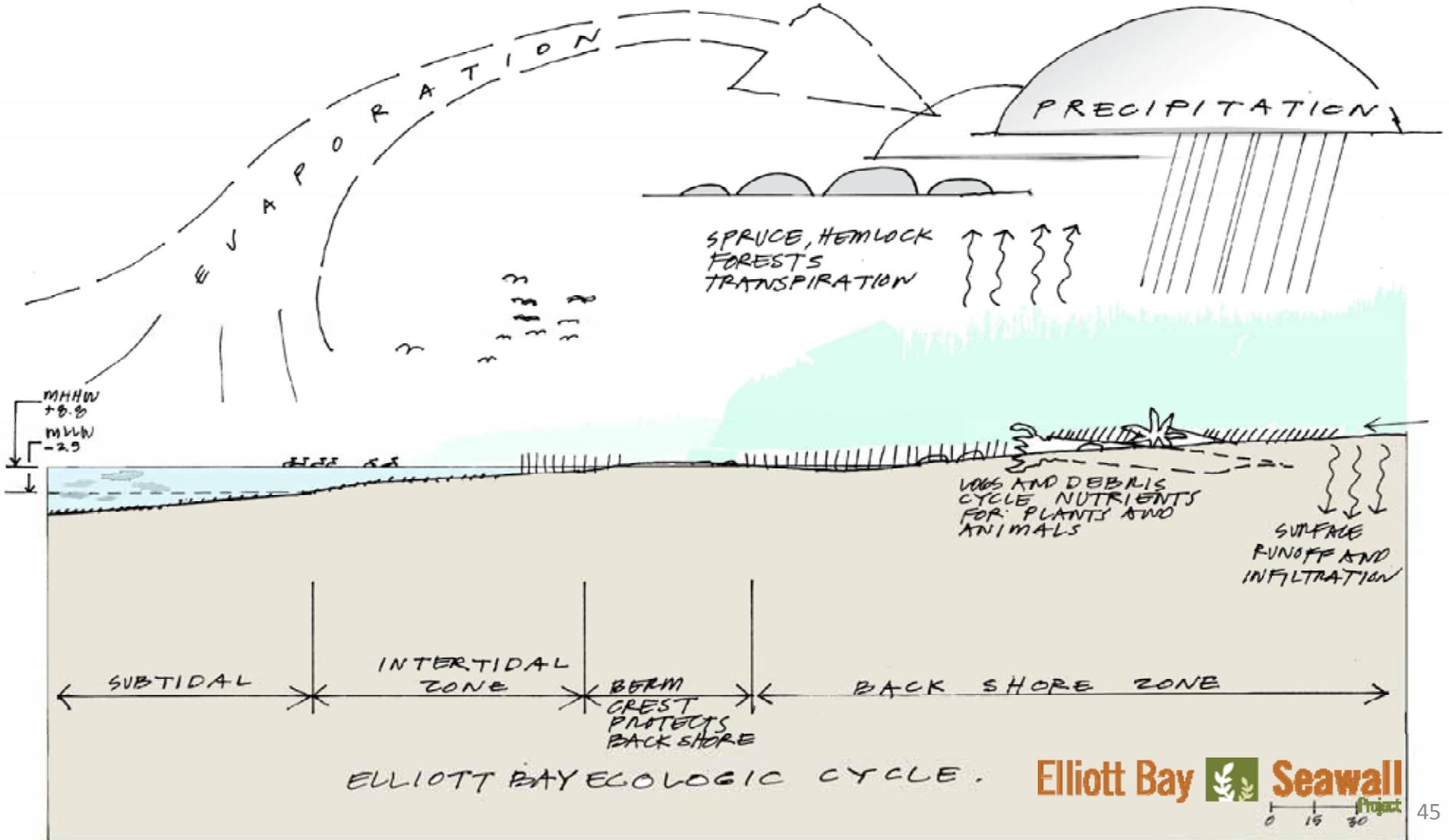
PLAN OF SEATTLE





Elliott Bay  Seawall

THE HYDROLOGIC CYCLE



MHHW +8.8
MLLW -2.9

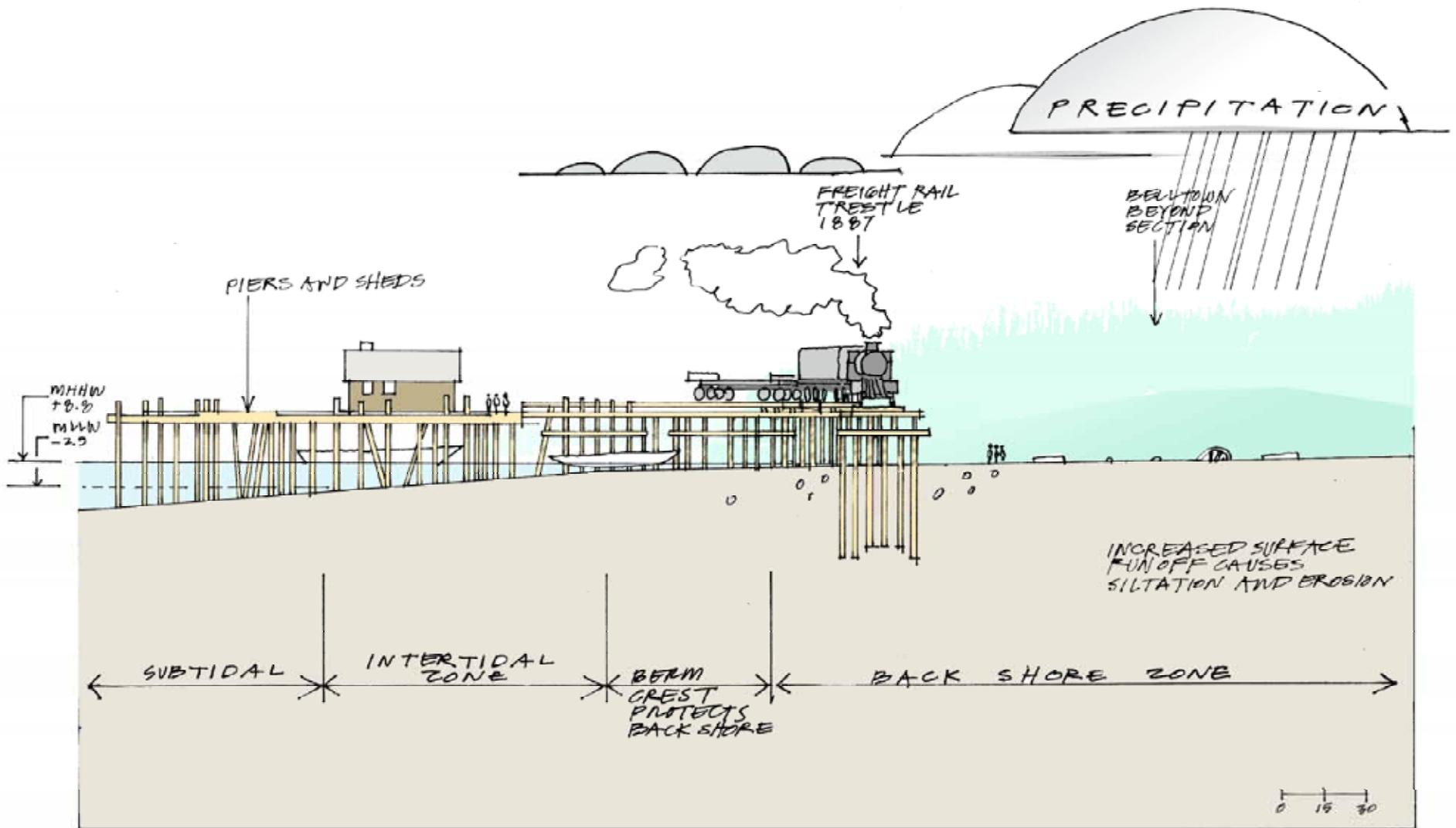
LOGS AND DEBRIS
CYCLE NUTRIENTS
FOR PLANTS AND
ANIMALS

SURFACE
RUNOFF AND
INFILTRATION

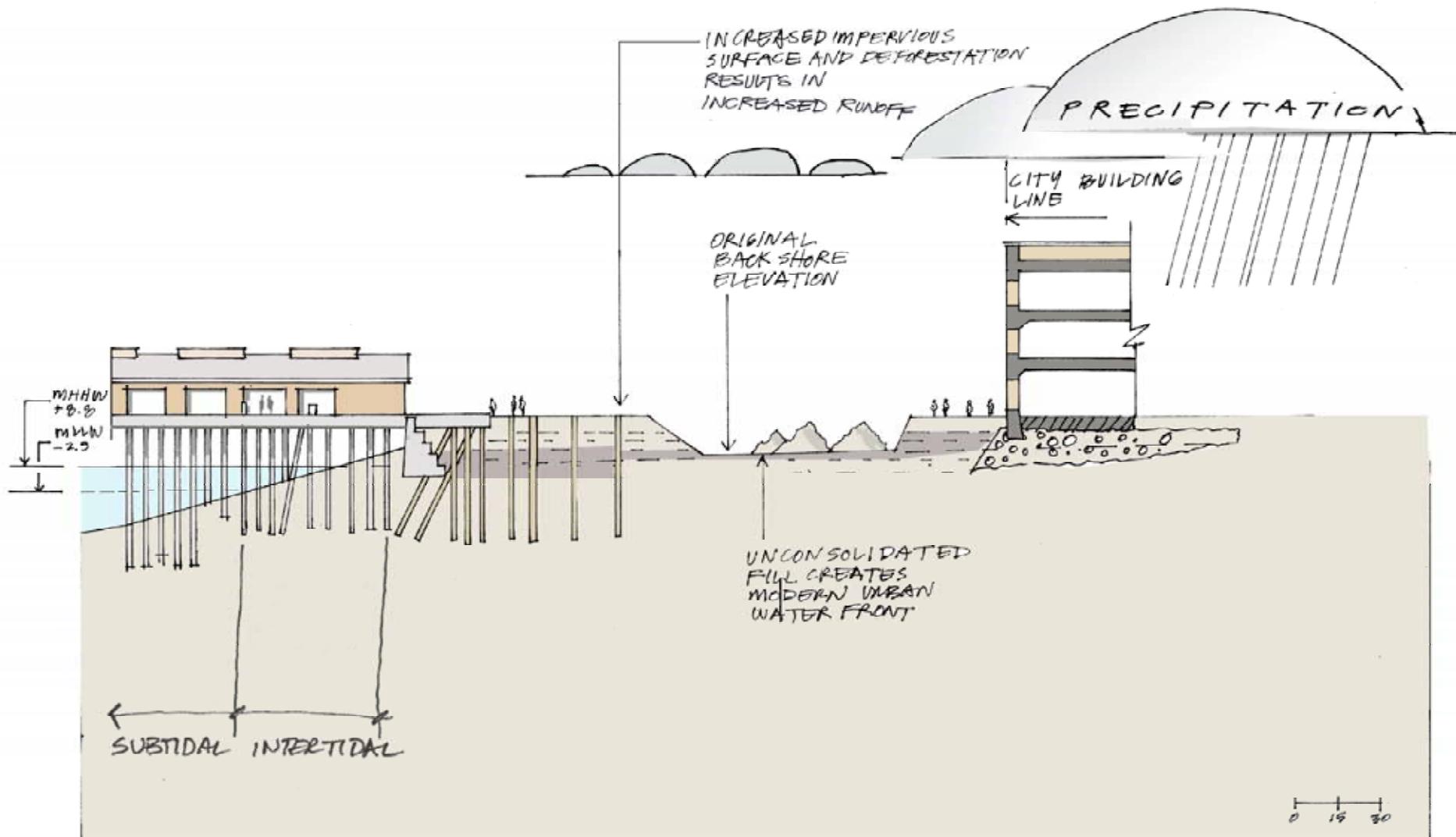
ELLIOTT BAY ECOLOGIC CYCLE.

Elliott Bay  Seawall Project

0 15 30







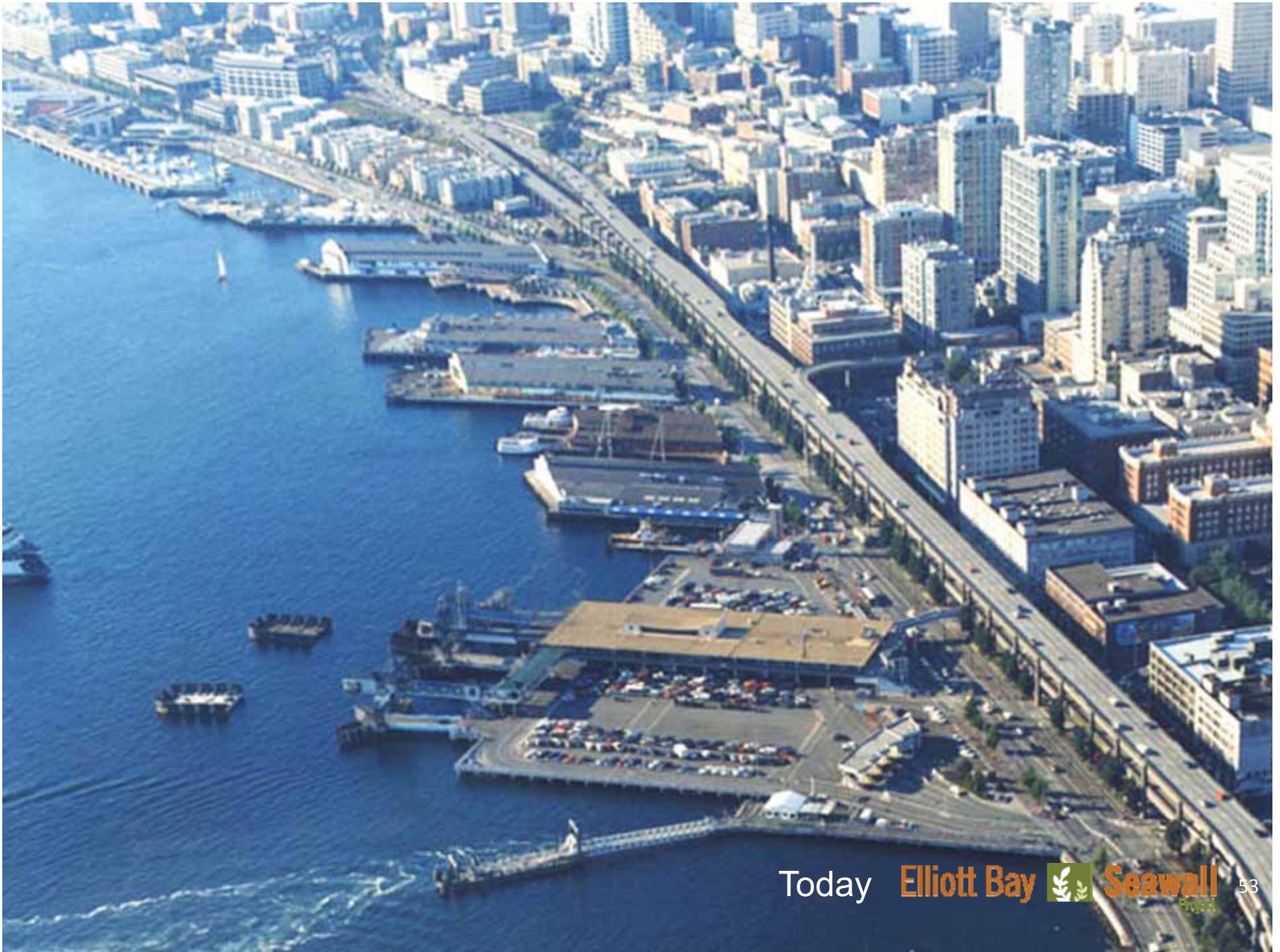


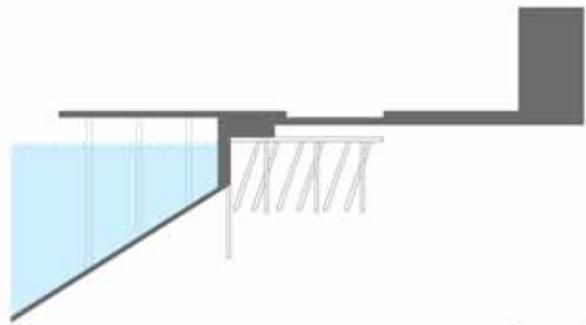


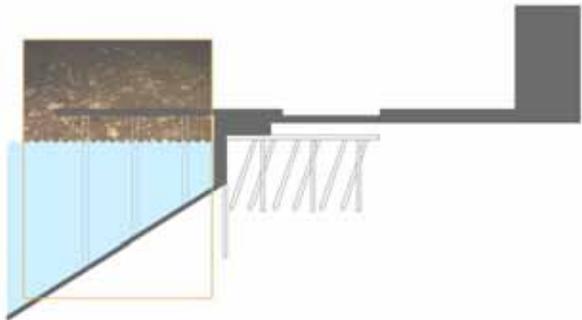
1948 Elliott Bay  Seawall ⁵⁰
years



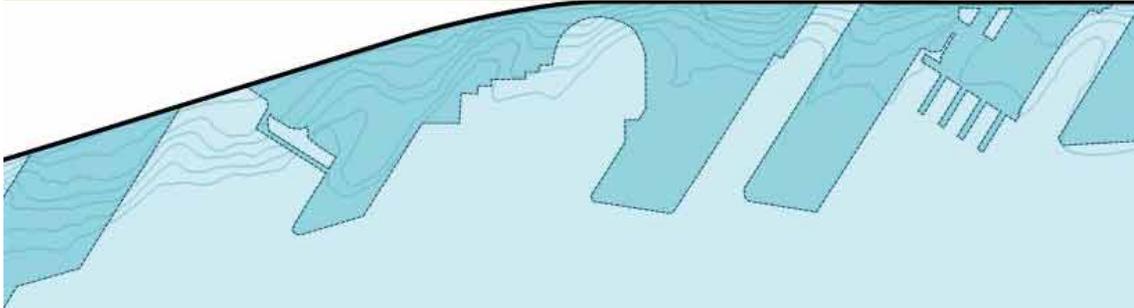








Degraded Nearshore Habitats



- Migratory corridor
 - Depth
 - Light
- Nearshore ecosystem productivity
 - Aquatic and riparian vegetation
 - Macroinvertebrates
 - Substrate diversity



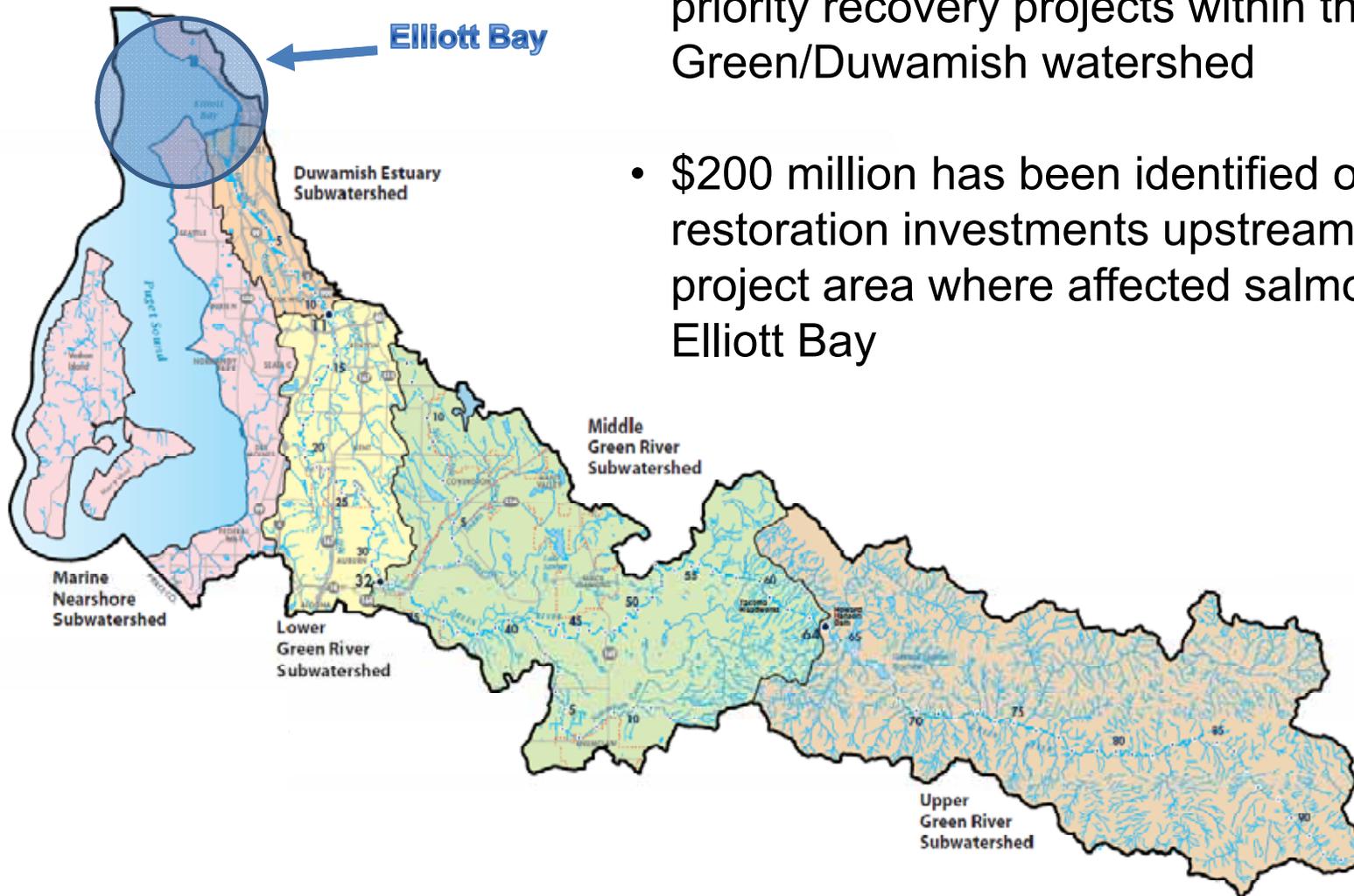
Threatened and Endangered Species

- Salmon
- Trout
- Puget Sound Rockfish

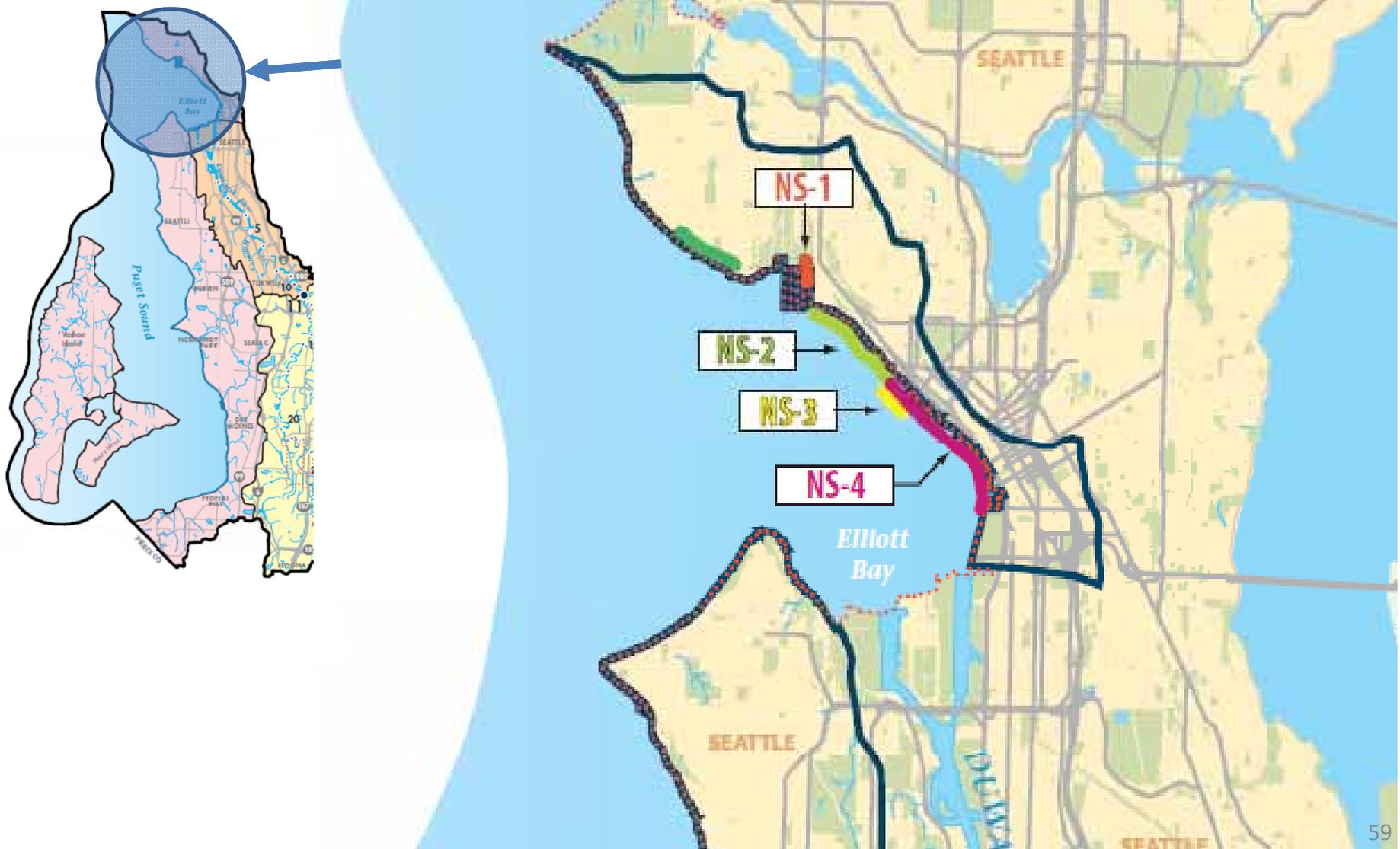


Regional Context: Salmon Recovery Plan

- \$250 million has been identified or spent in priority recovery projects within the Green/Duwamish watershed
- \$200 million has been identified or spent in restoration investments upstream of the project area where affected salmon use Elliott Bay

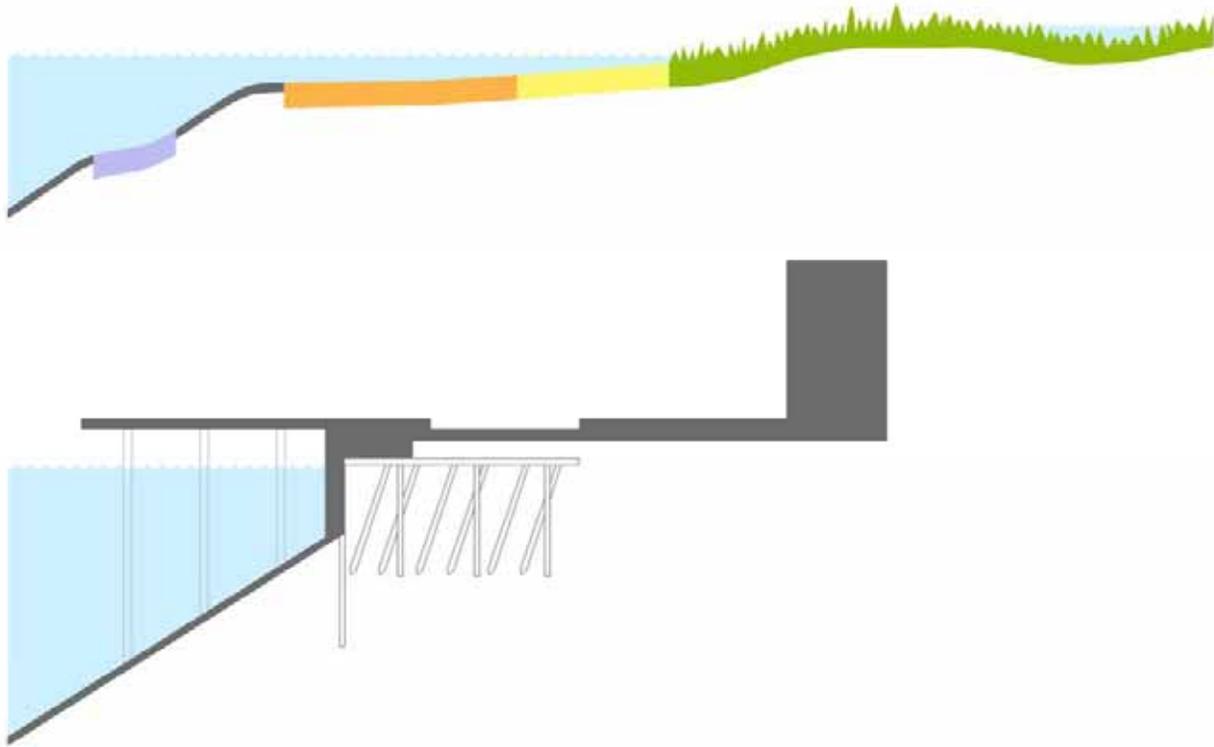


Regional Context: Salmon Recovery Plan

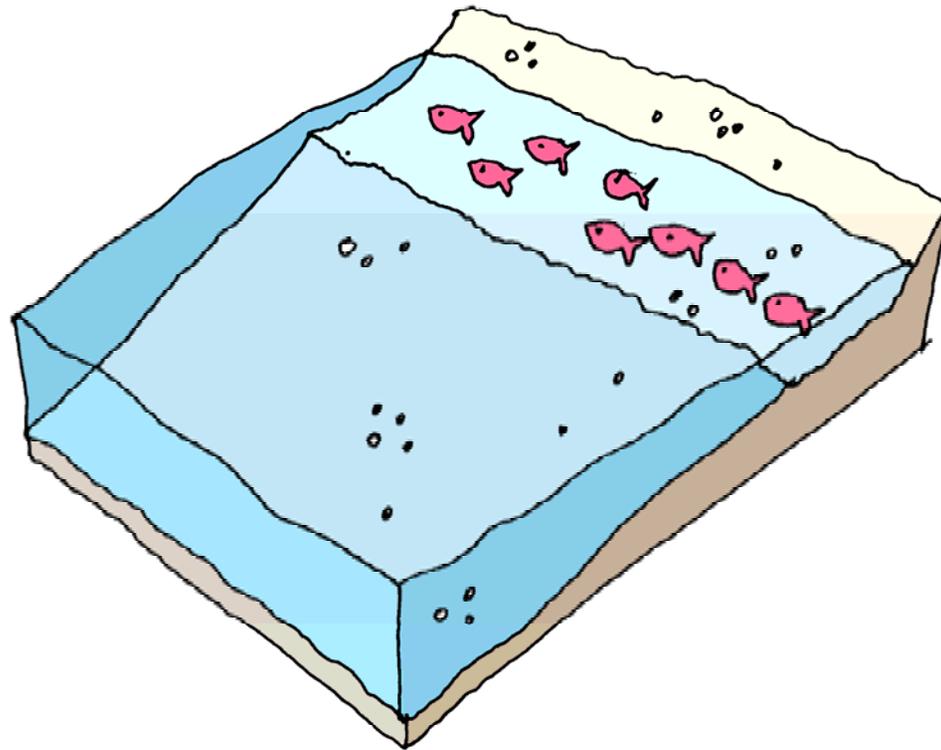


Regional Context: Salmon Recovery Plan

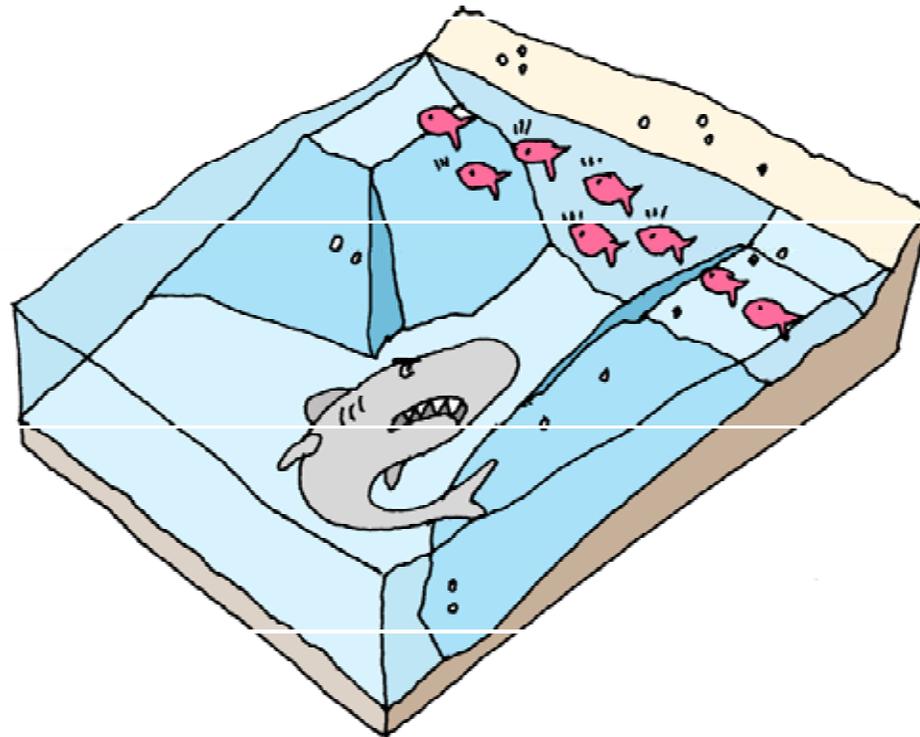




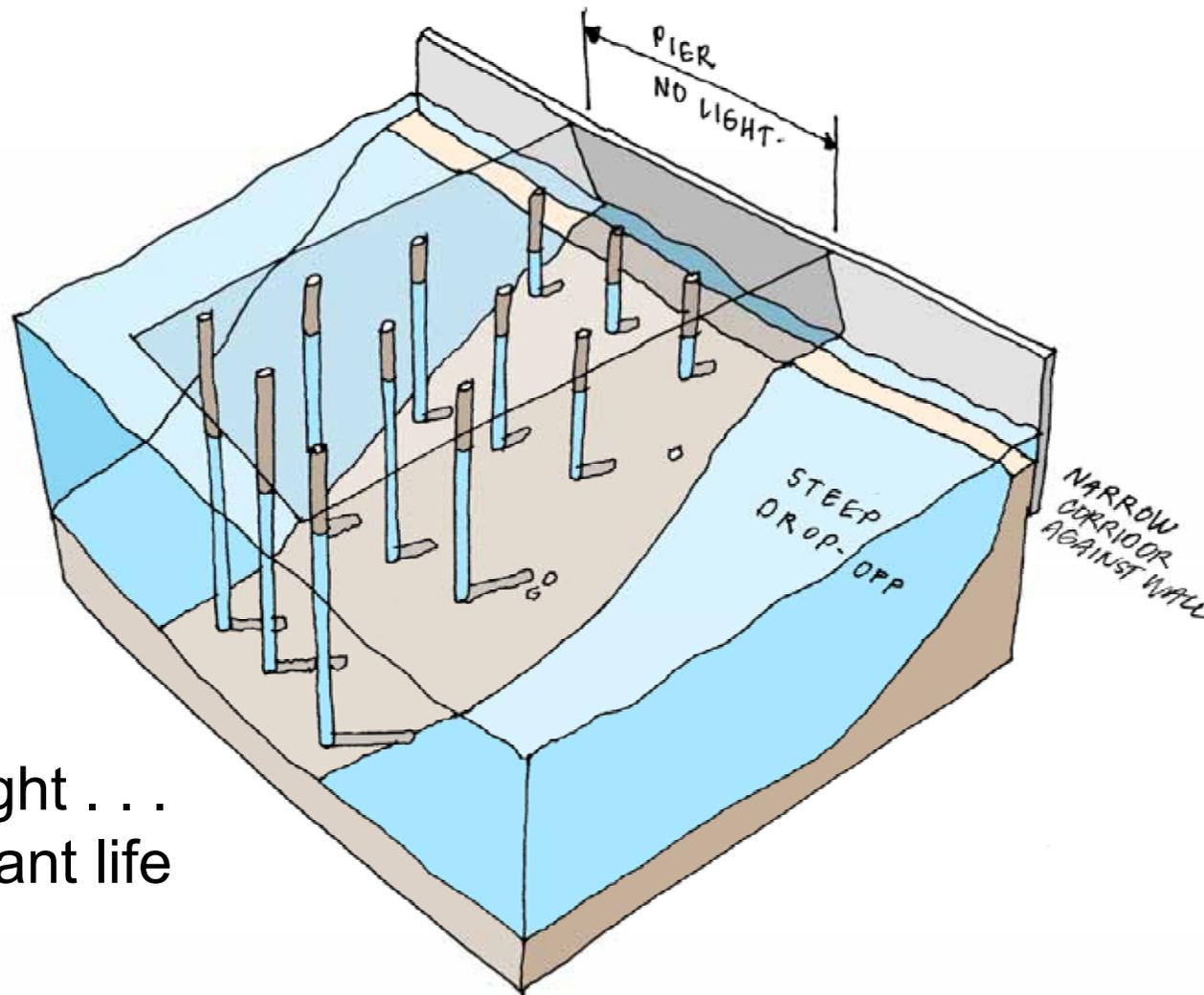
Migratory Corridor: Depth



Migratory Corridor: Depth



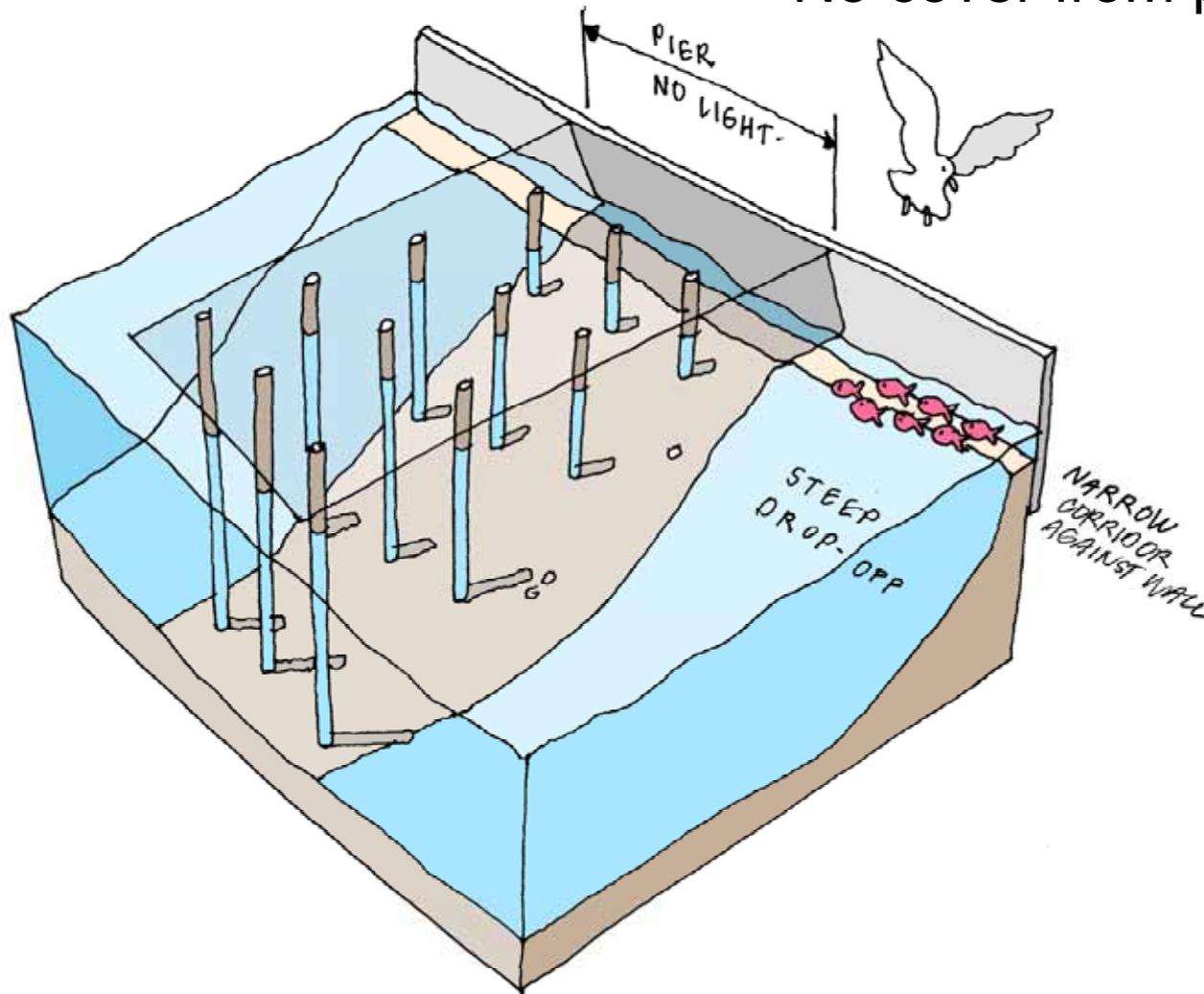
Migratory Corridor: Light



No light . . .
no plant life

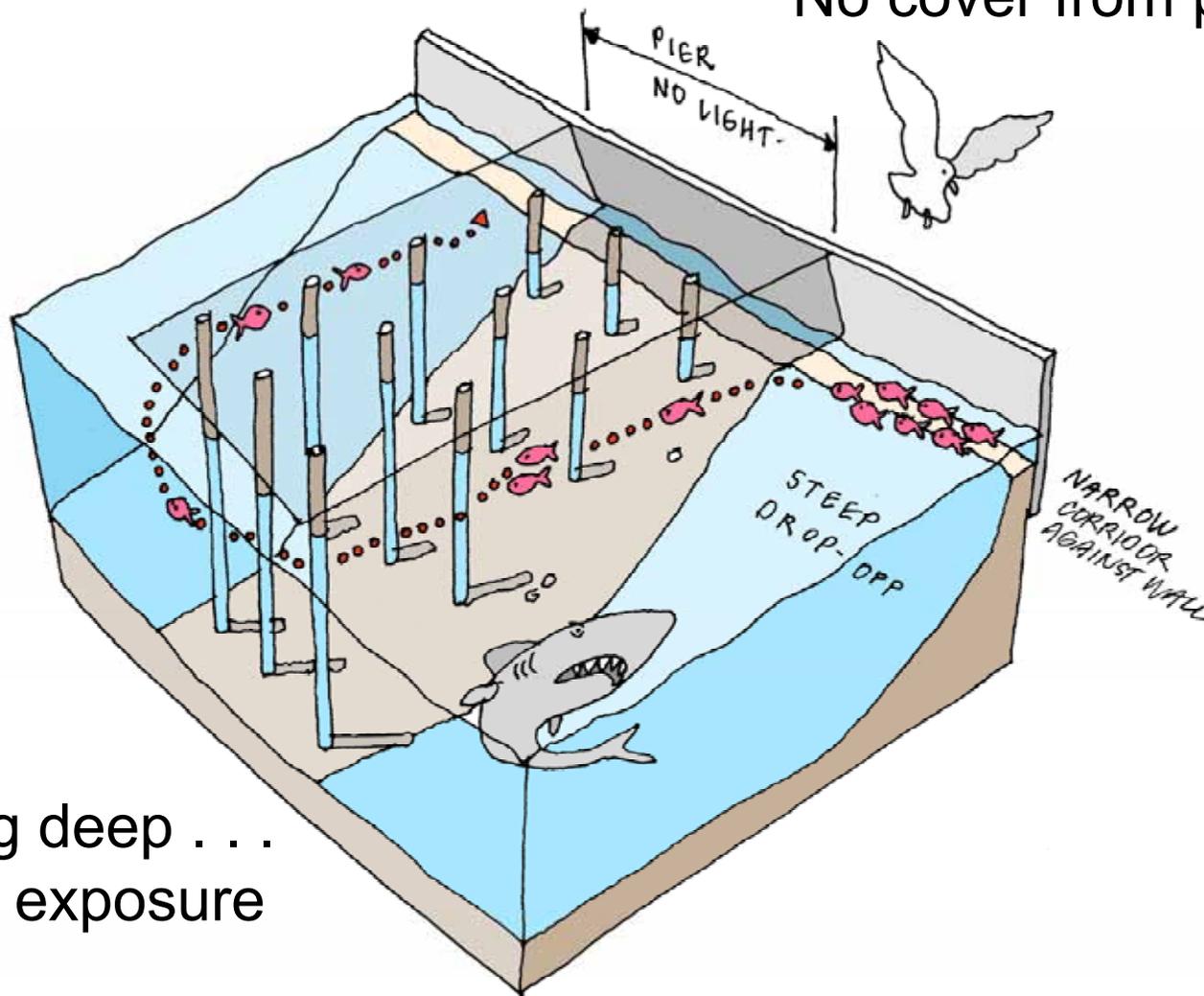
Migratory Corridor: Light

No cover from predators



Migratory Corridor: Light

No cover from predators

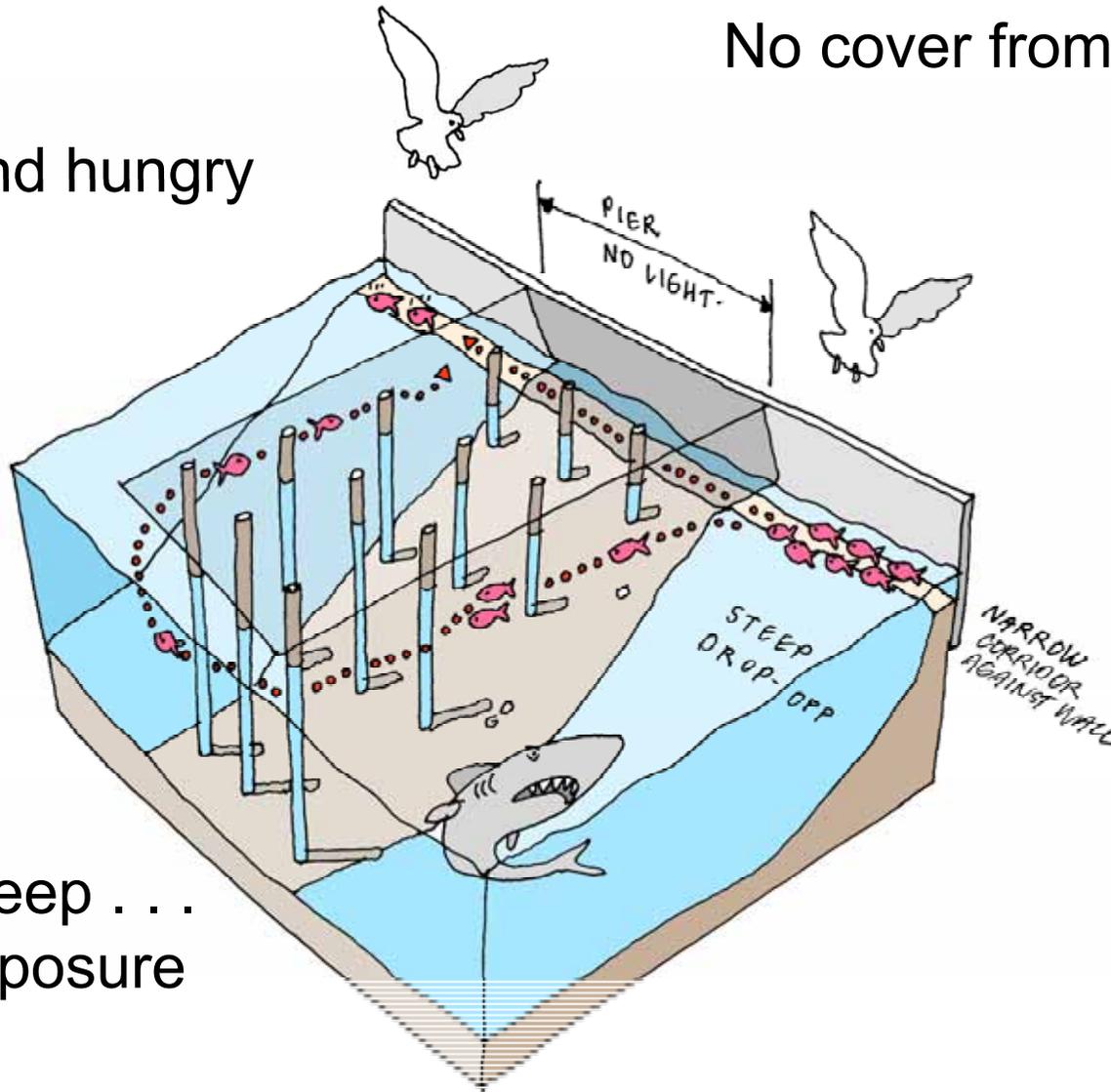


Going deep . . .
more exposure

Migratory Corridor: Light

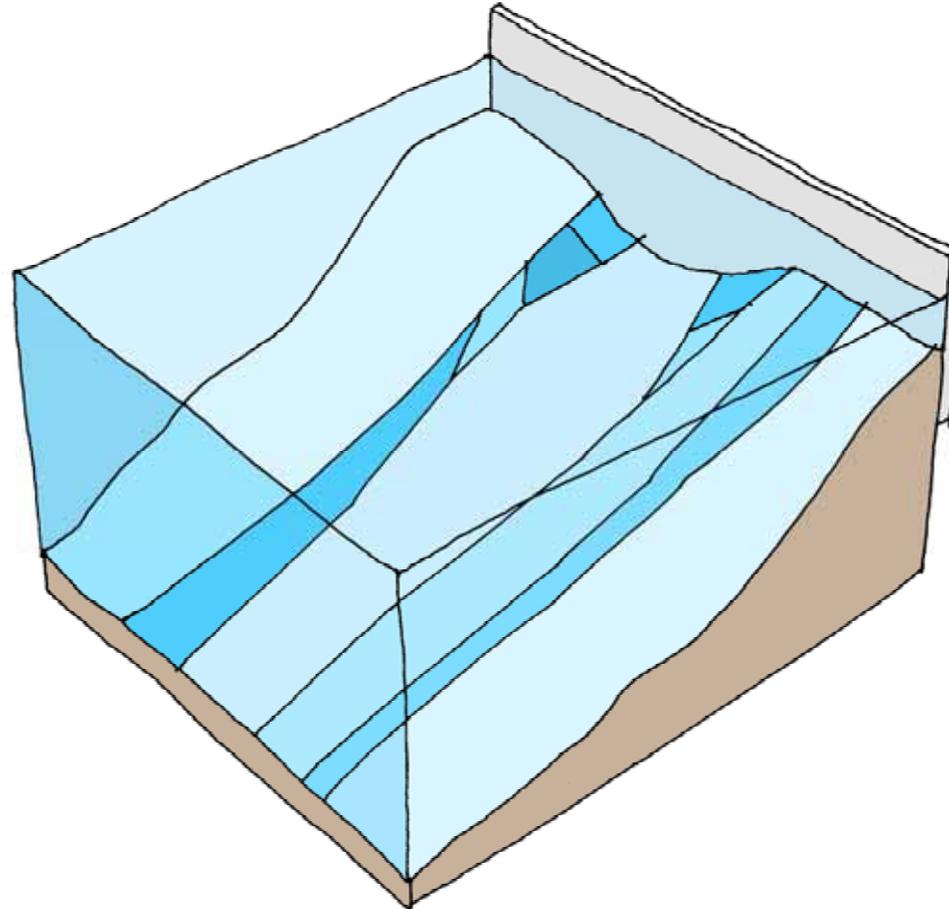
Delayed and hungry

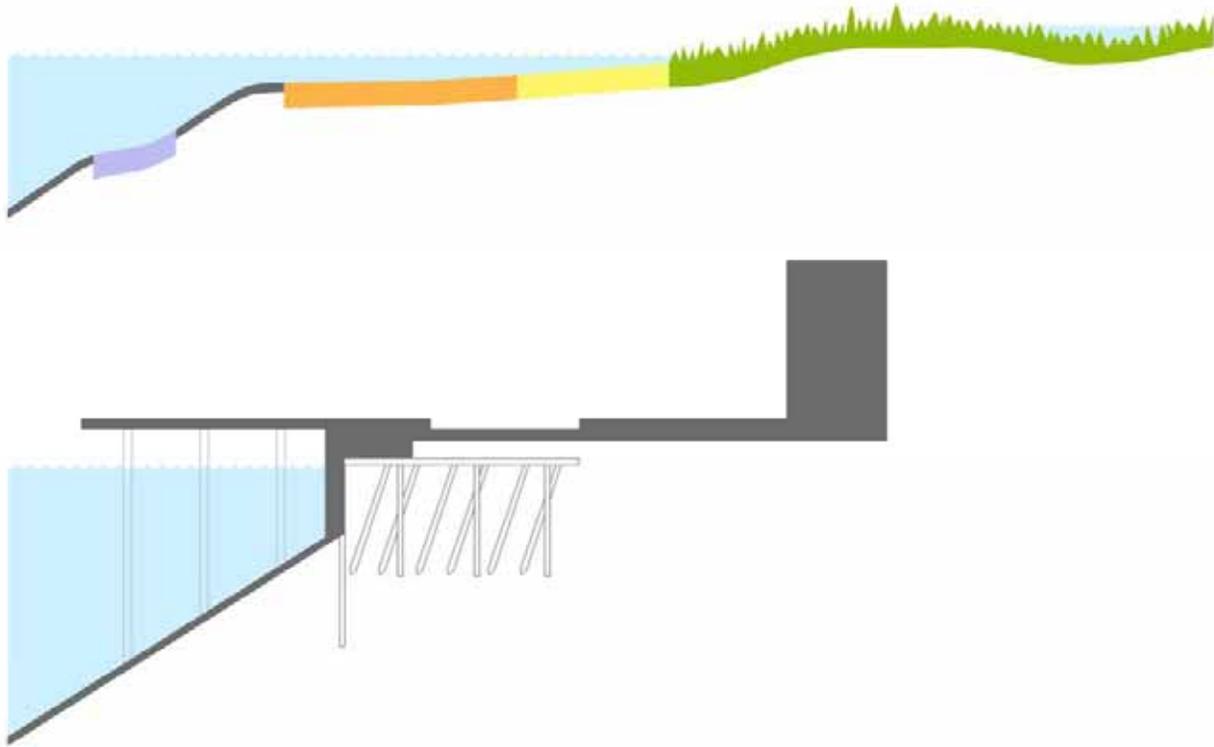
No cover from predators

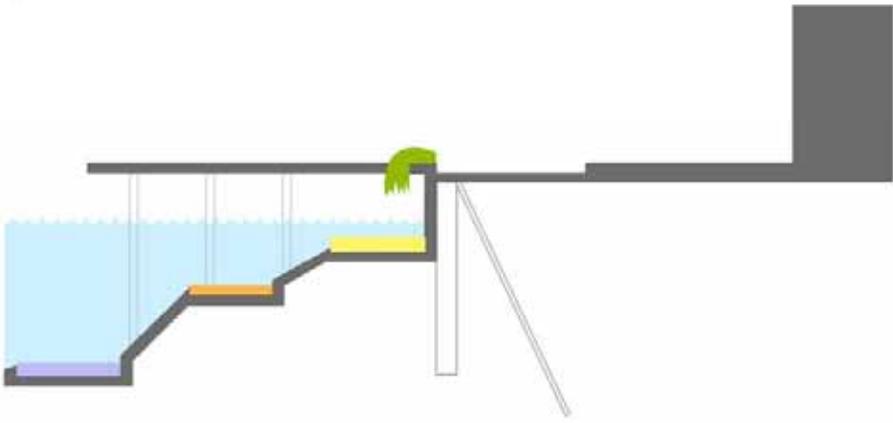
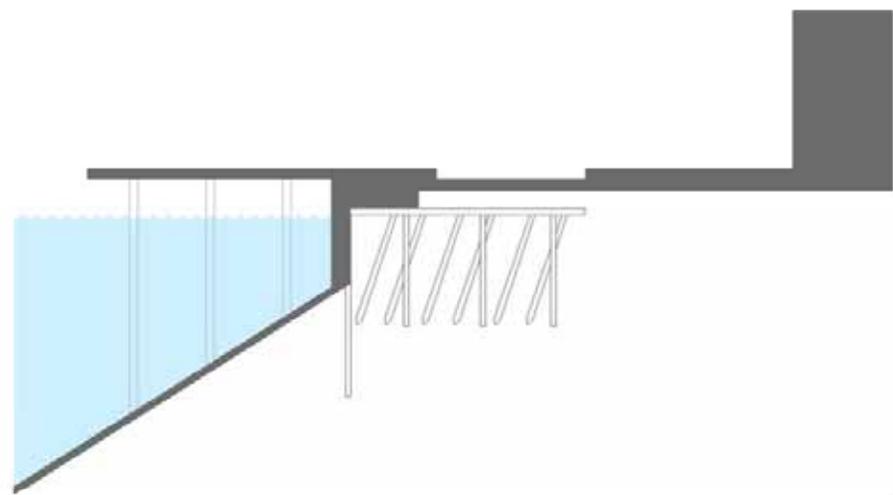
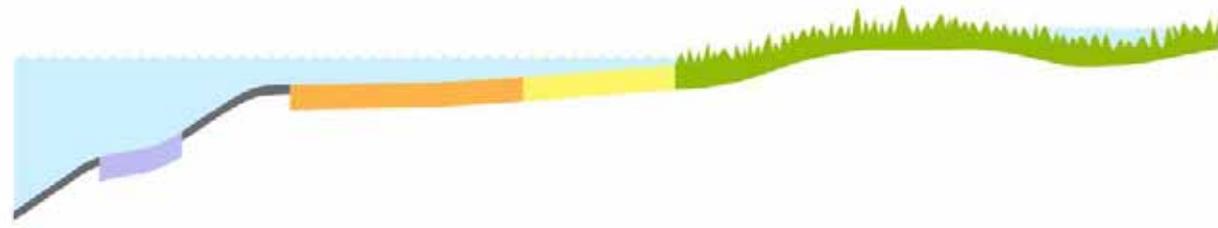


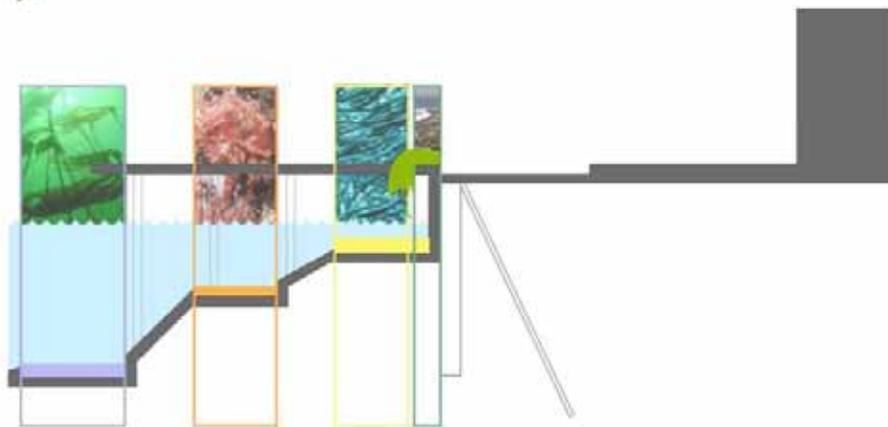
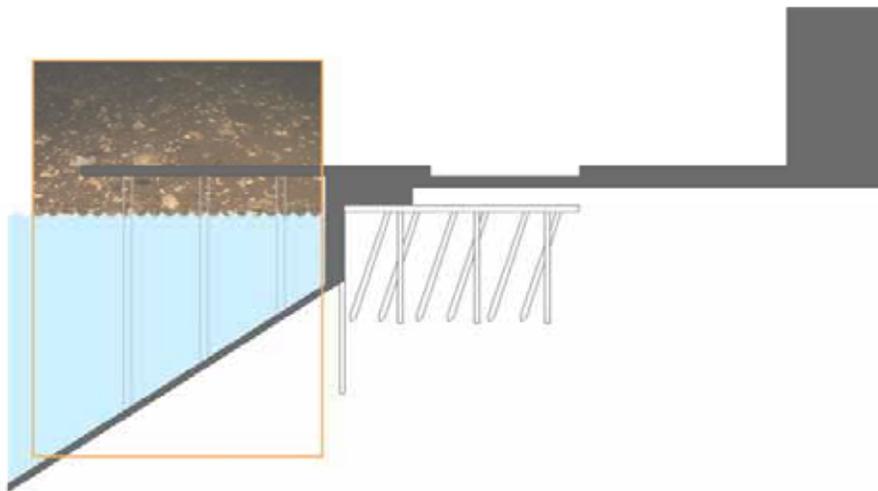
Going deep . . .
more exposure

Nearshore Environmental Productivity











How are we doing this?

Elliott Bay  Seawall 

Goals and Objectives

10-19-10

Goal:

Provide enhanced habitat and environmental quality.

Objectives:

Establish an active migratory fish corridor.

Enhance nearshore (intertidal, shallow subtidal, riparian) habitats.

Provide diversity and connectivity between habitats.

Interdisciplinary Habitat Approach

- Marine biology
- Coastal hydraulics
- Landscape architecture
- Urban design
- Civil engineering
- Structural engineering
- Geotechnical engineering
- Economics



Collaboration and Coordination



NOAA FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



WASHINGTON STATE DEPARTMENT OF
Natural Resources



Washington
Department of
**FISH and
WILDLIFE**



THE SUQUAMISH TRIBE



UNIVERSITY of
WASHINGTON



**US Army Corps
of Engineers®**

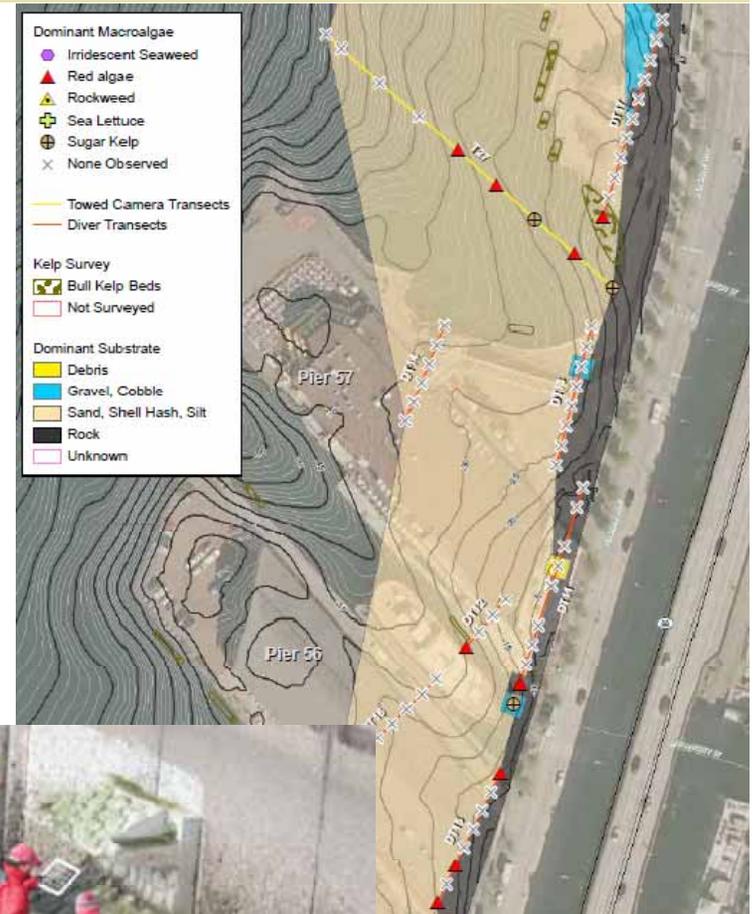
State of the Science

- Elements of a functional salmonid migratory corridor
- Studies on effects of overwater structures
- Studies on light treatment options and effectiveness



Seawall Habitat Investigations

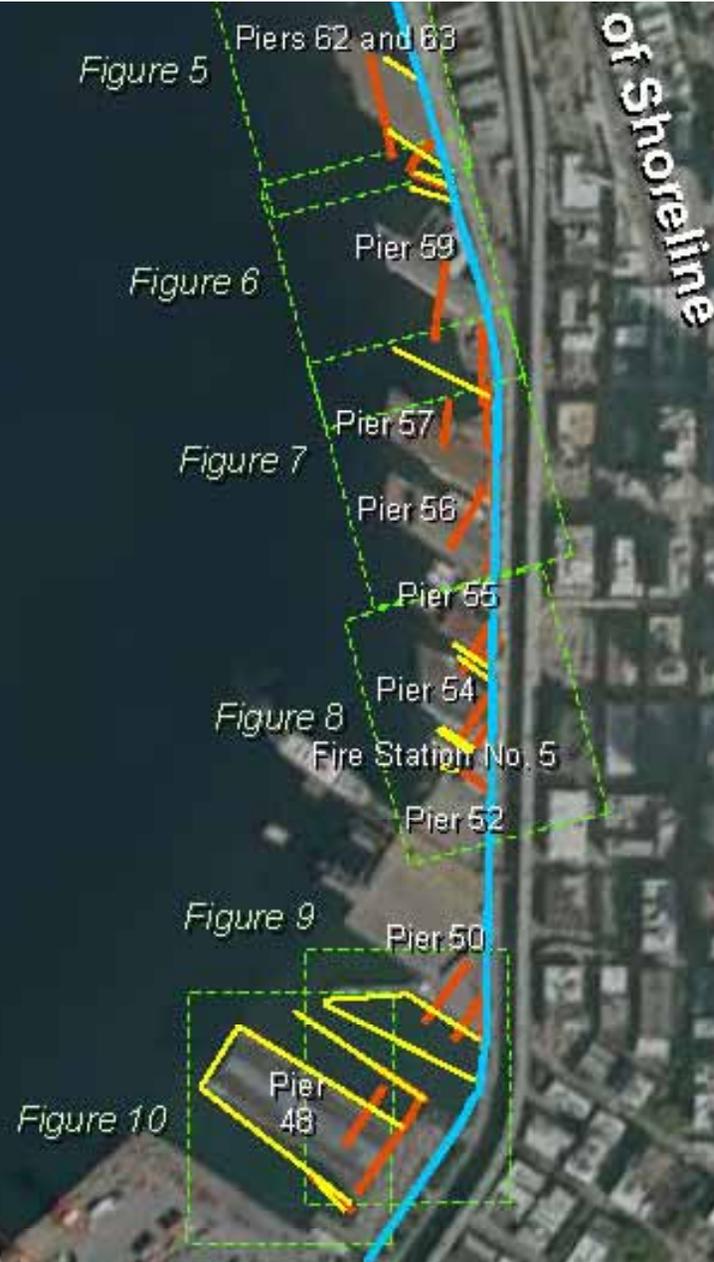
- Ongoing textured wall monitoring by UW
- Olympic Sculpture Park monitoring
- Vancouver Convention Center monitoring
- Habitat inventory and underwater video
- Salmonid out-migration and light data collection
- Fish use and distribution by season



Habitat Mapping in Fall 2010



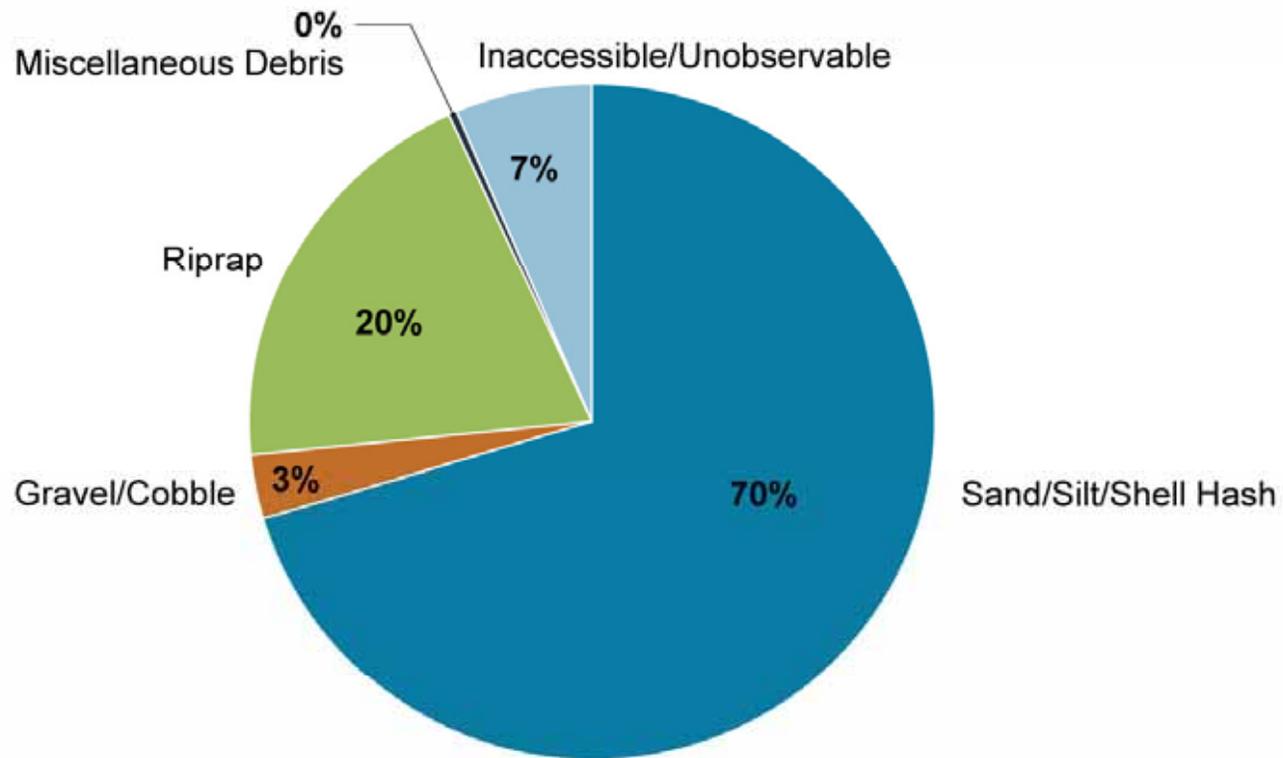
ELLIOTT BAY



- Towed Camera Transects
- Diver Transects
- Survey Location

Figure 5 Piers 62 and 63 of Sh...

Substrate Area Percent

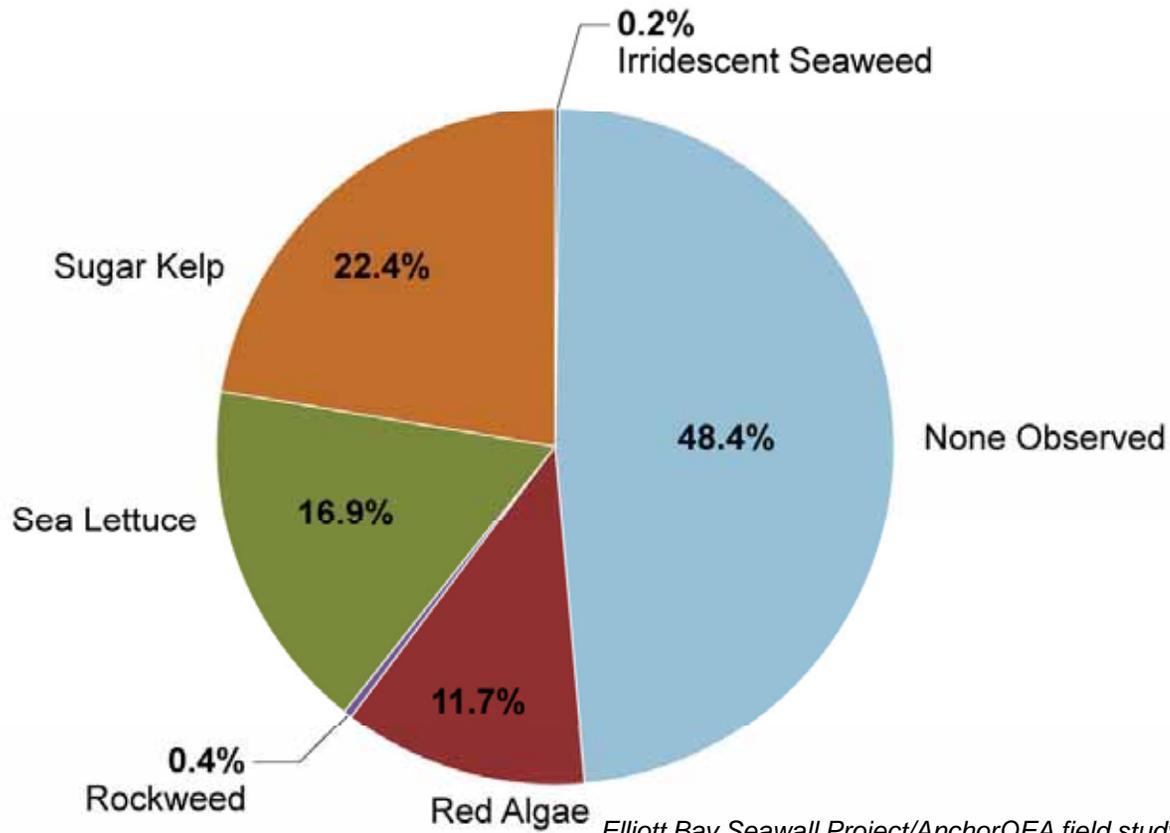


Elliott Bay Seawall Project/AnchorQEA field study, Fall 2010

- Towed Camera Transects
- Diver Transects
- Survey Location

Figure 5 Piers 62 and 63 of St

Dominant Macroalgae Observations

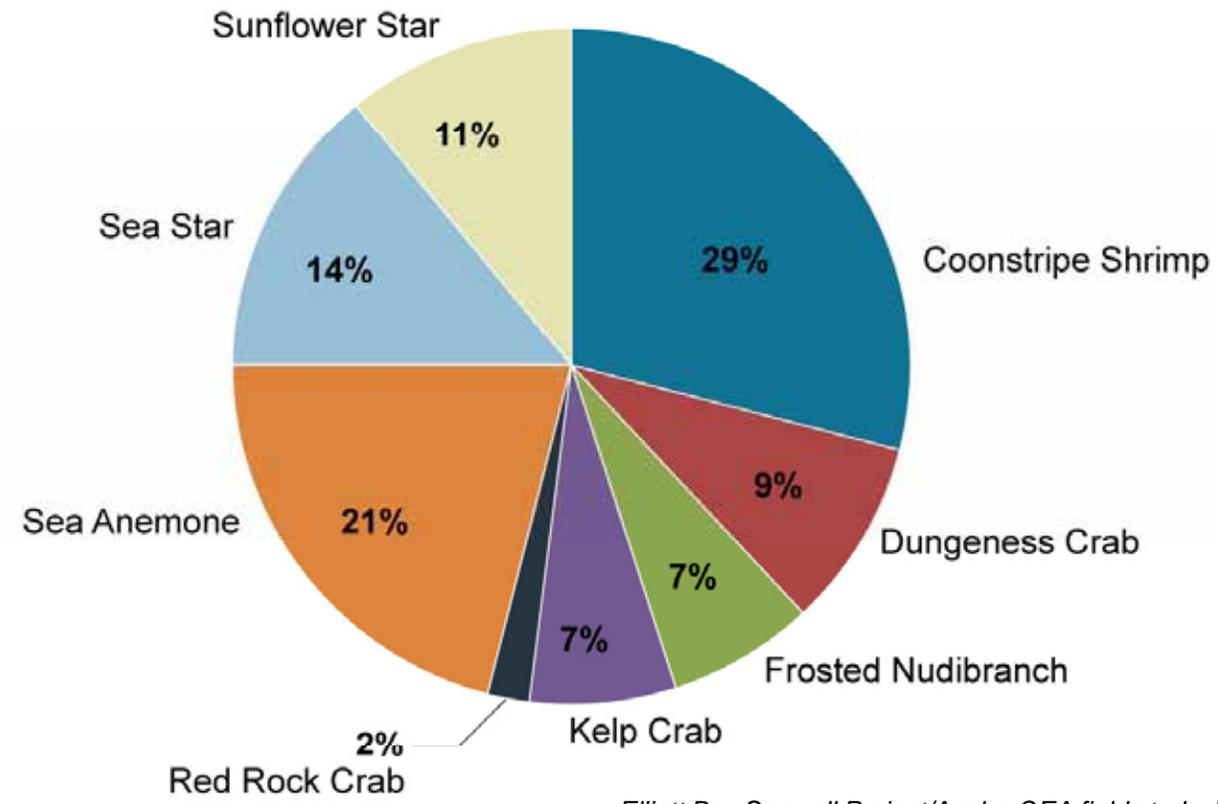


Elliott Bay Seawall Project/AnchorQEA field study, Fall 2010

- Towed Camera Transects
- Diver Transects
- Survey Location

Figure 5 Piers 62 and 63

Percent Invertebrate Observations



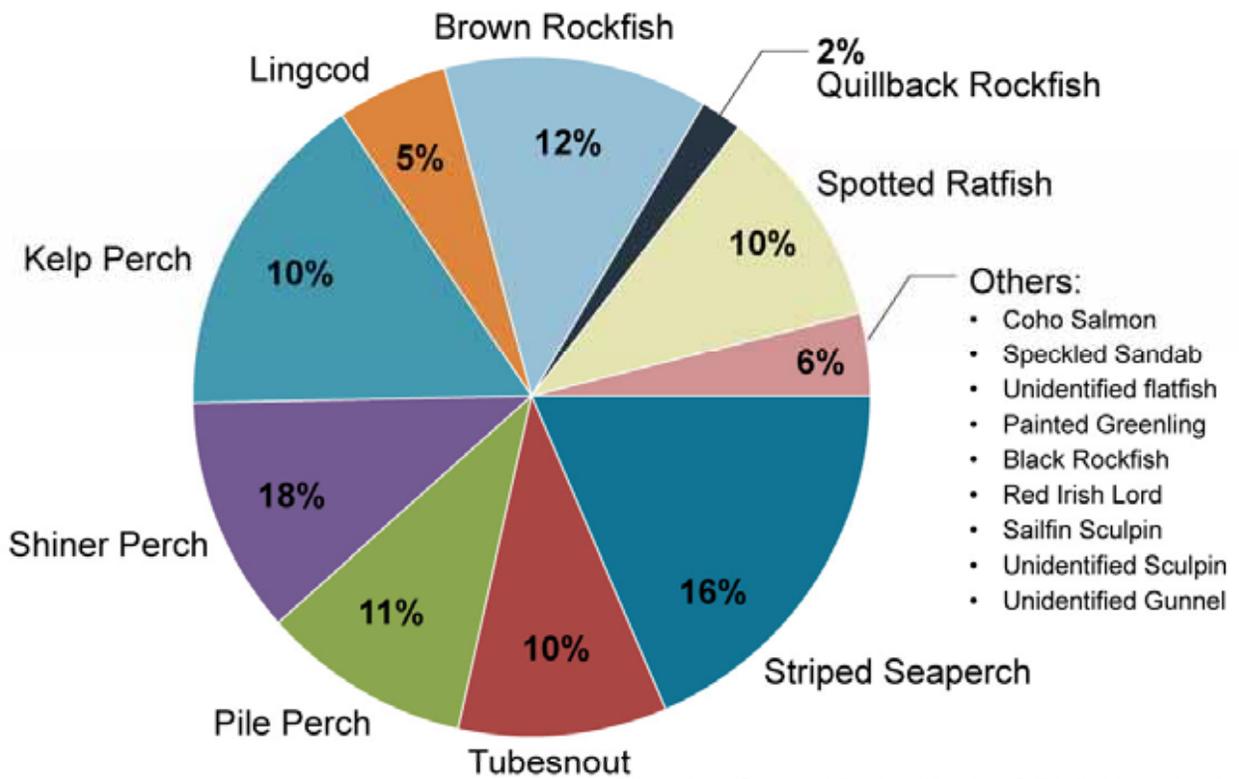
Elliott Bay Seawall Project/AnchorQEA field study, Fall 2010

- Towed Camera Transects
- Diver Transects
- Survey Location

Figure 5

Piers 62 and 63

Percent Fish Observations



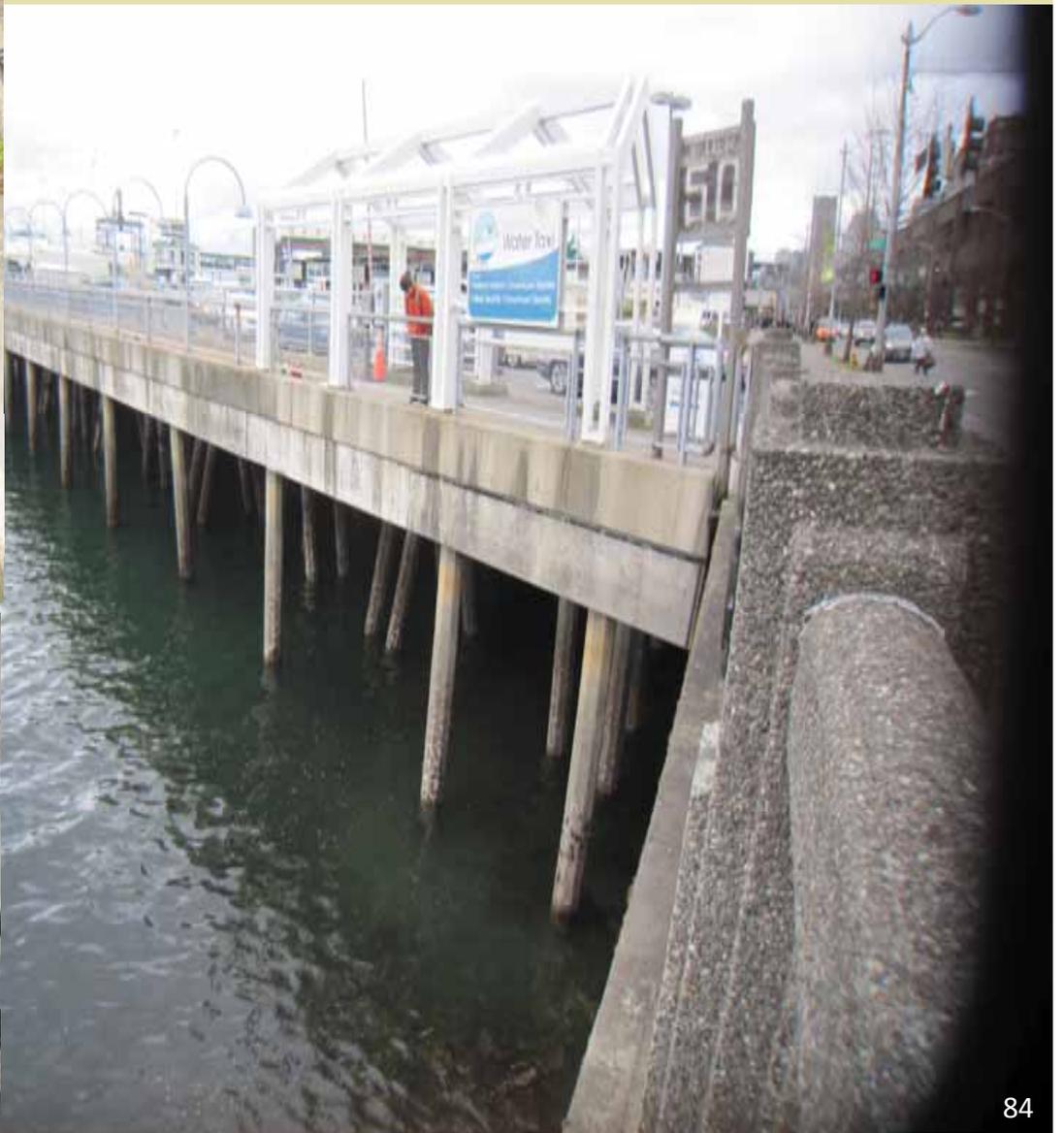
Elliott Bay Seawall Project/AnchorQEA field study, Fall 2010

Figure 10

Pier 48

— Towed Camera Transects
— Diver Transects
— Survey Location

Fish Surveys 2011-2013



Fish Survey Preliminary Results

- Observing multiple species including: Chinook salmon, chum salmon, perch, surf smelt, Pacific sand lance, tubesnout, lingcod, sculpin, cutthroat trout – over 15,000 chum observed to date
- Fish behavior has included schooling, feeding, and swimming (typically not affected by snorkeler presence)
- Salmonids are schooling near the corners of piers and generally occur within 3 meters of the wall (shallowest water)

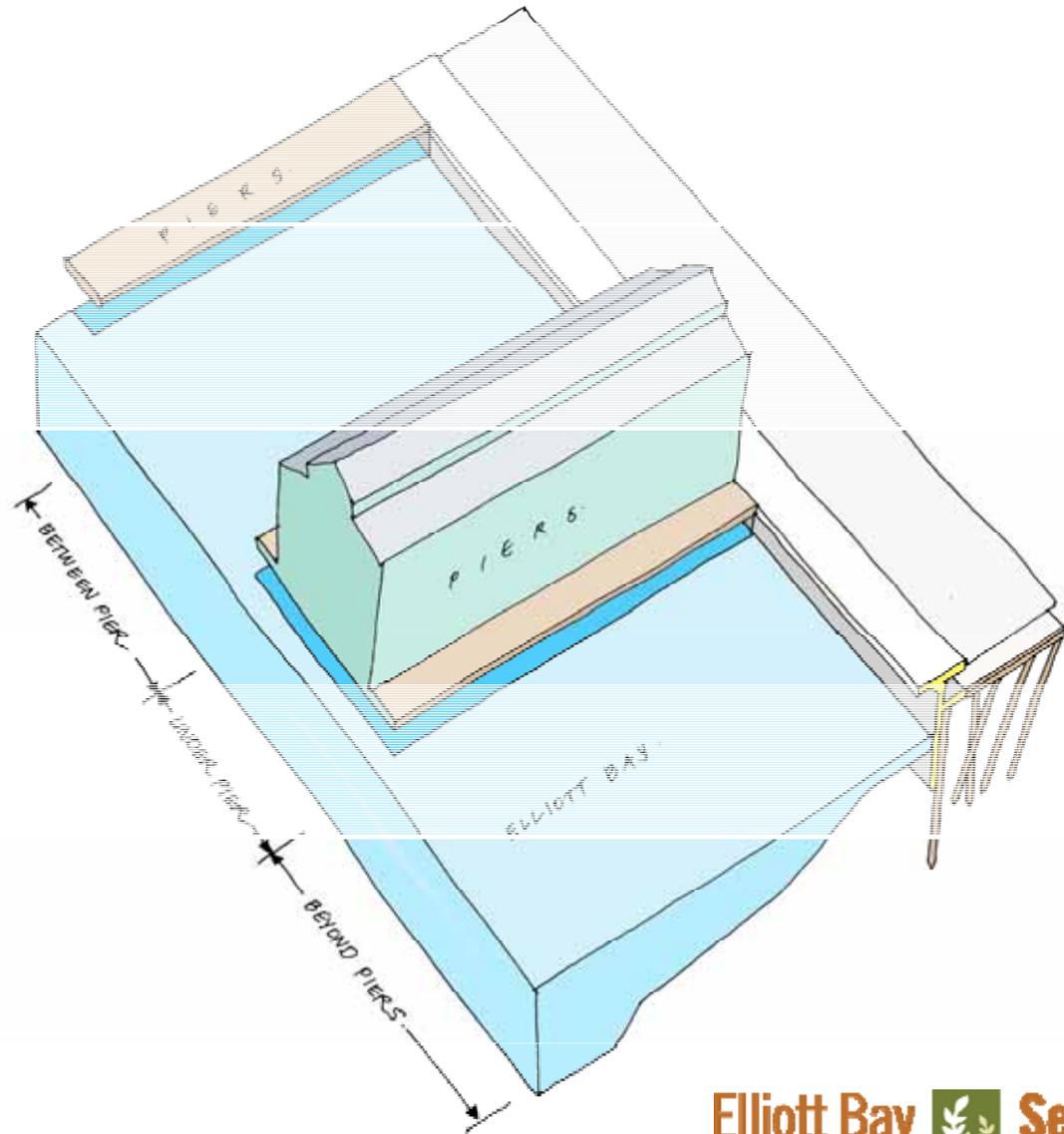
Lighting Study

- Stark contrasts between light and dark contribute to fish delays
- Light monitoring incorporated into snorkel and land-based survey from March through September (when juvenile salmon are present)
- Exploring options to install and test lighting treatments to help inform design criteria

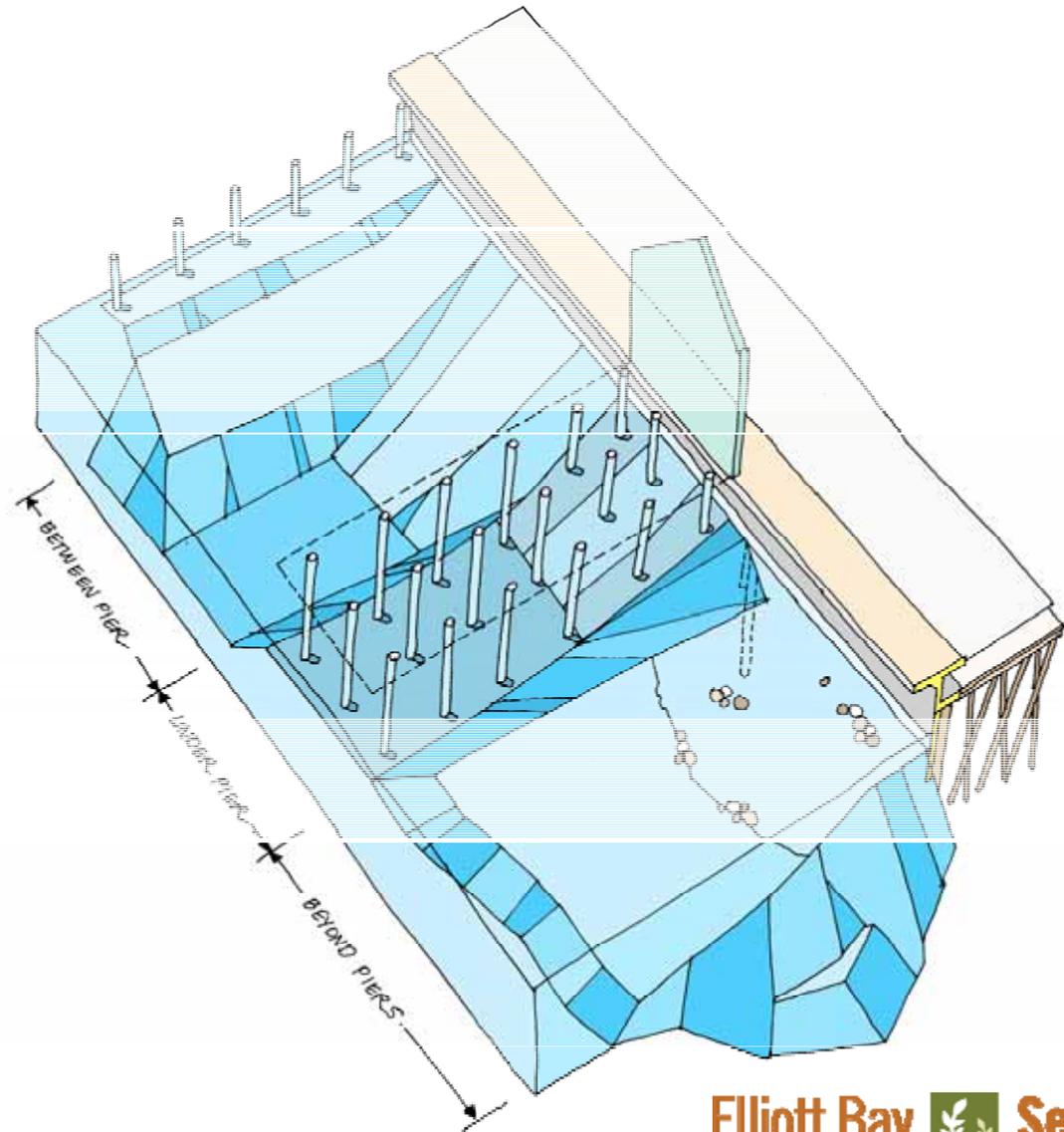


What are the opportunities?

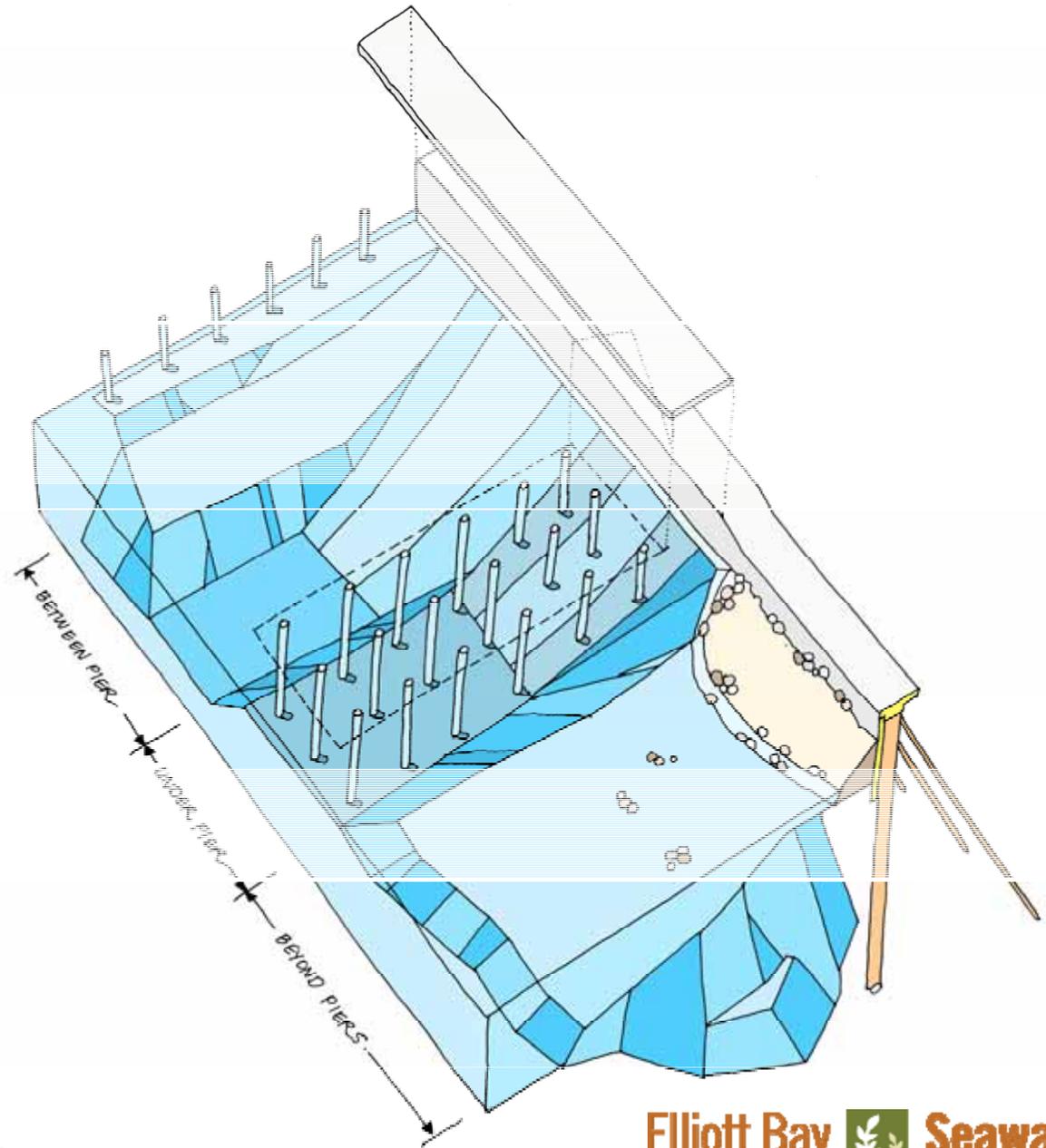
Existing Condition



Existing Condition

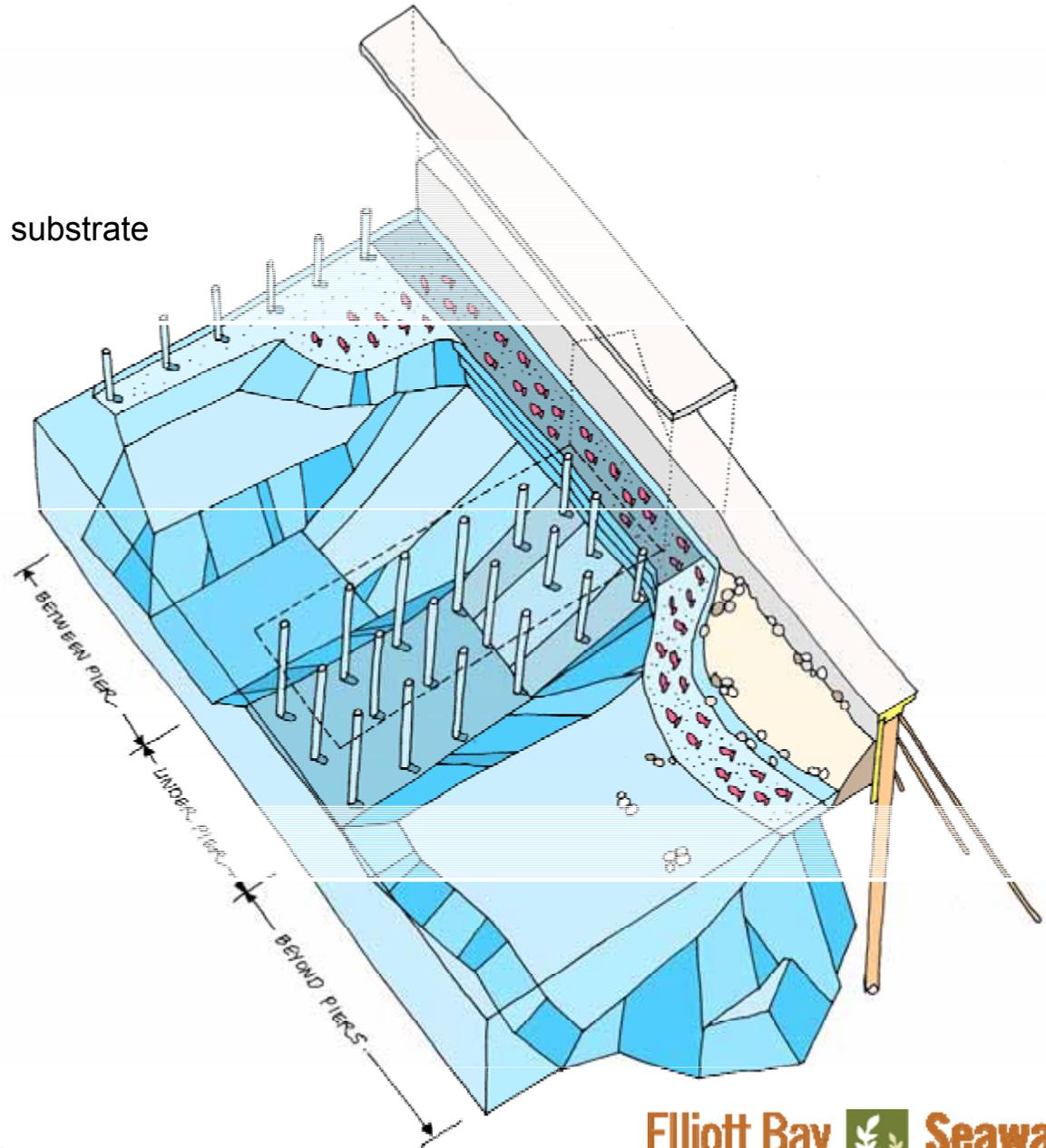


Existing Condition
New Seawall



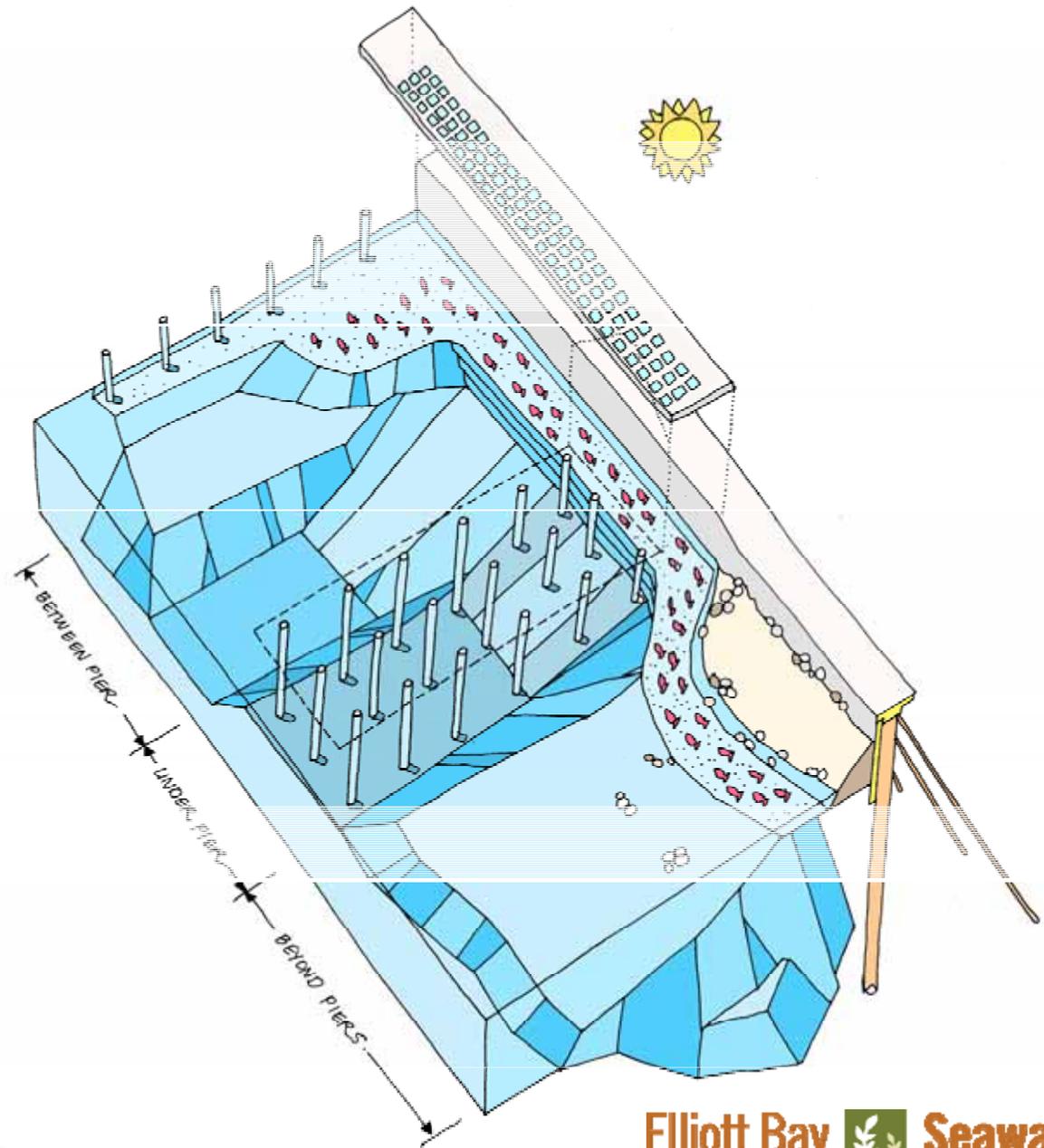
Existing Condition New Seawall Intertidal Corridor

- Depth of -2.5 feet NAVD88 with substrate



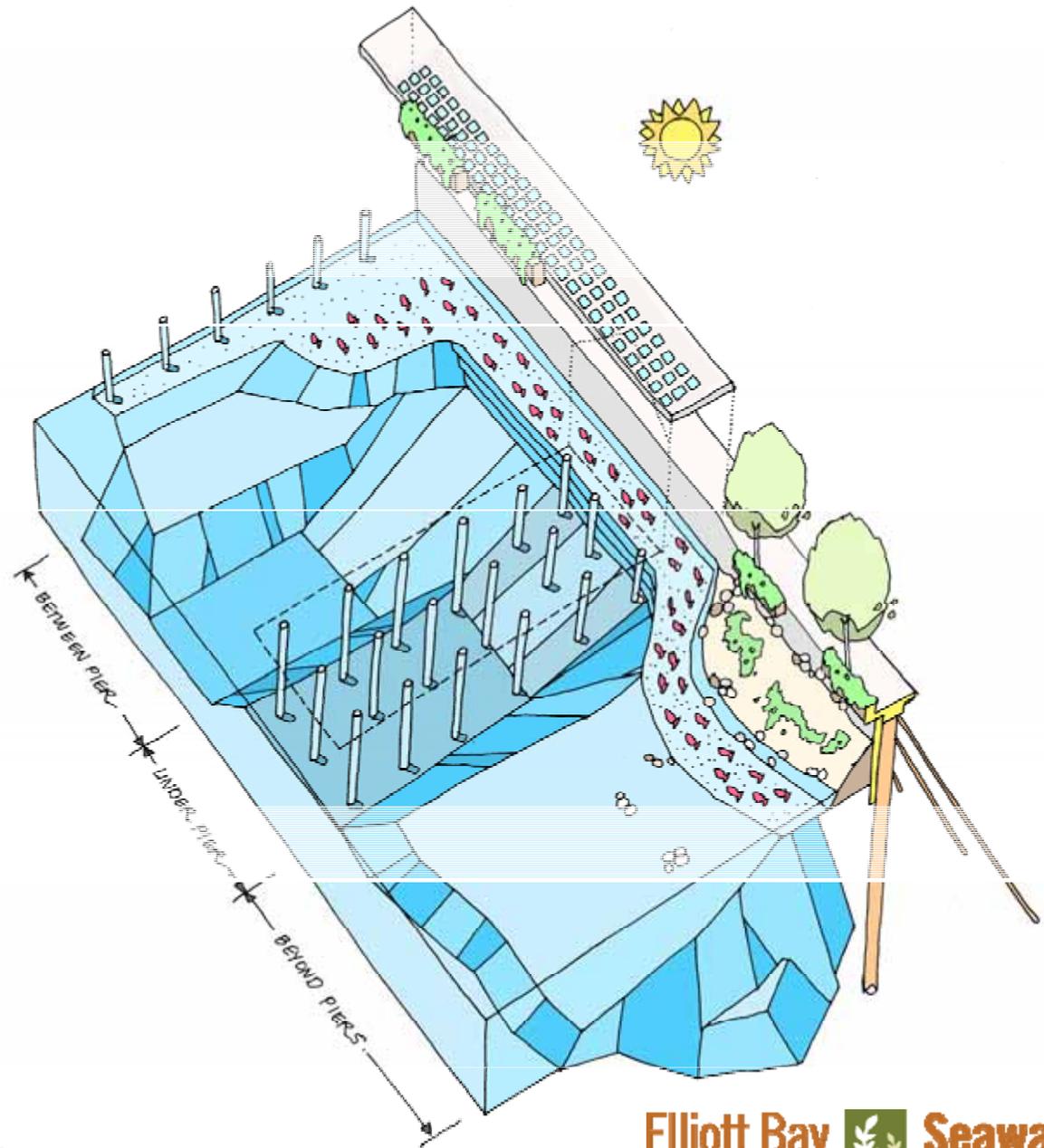
Existing Condition New Seawall Intertidal Corridor Lighting

- Glass blocks
- Grating
- Prisms
- Solar tubes
- LED lighting

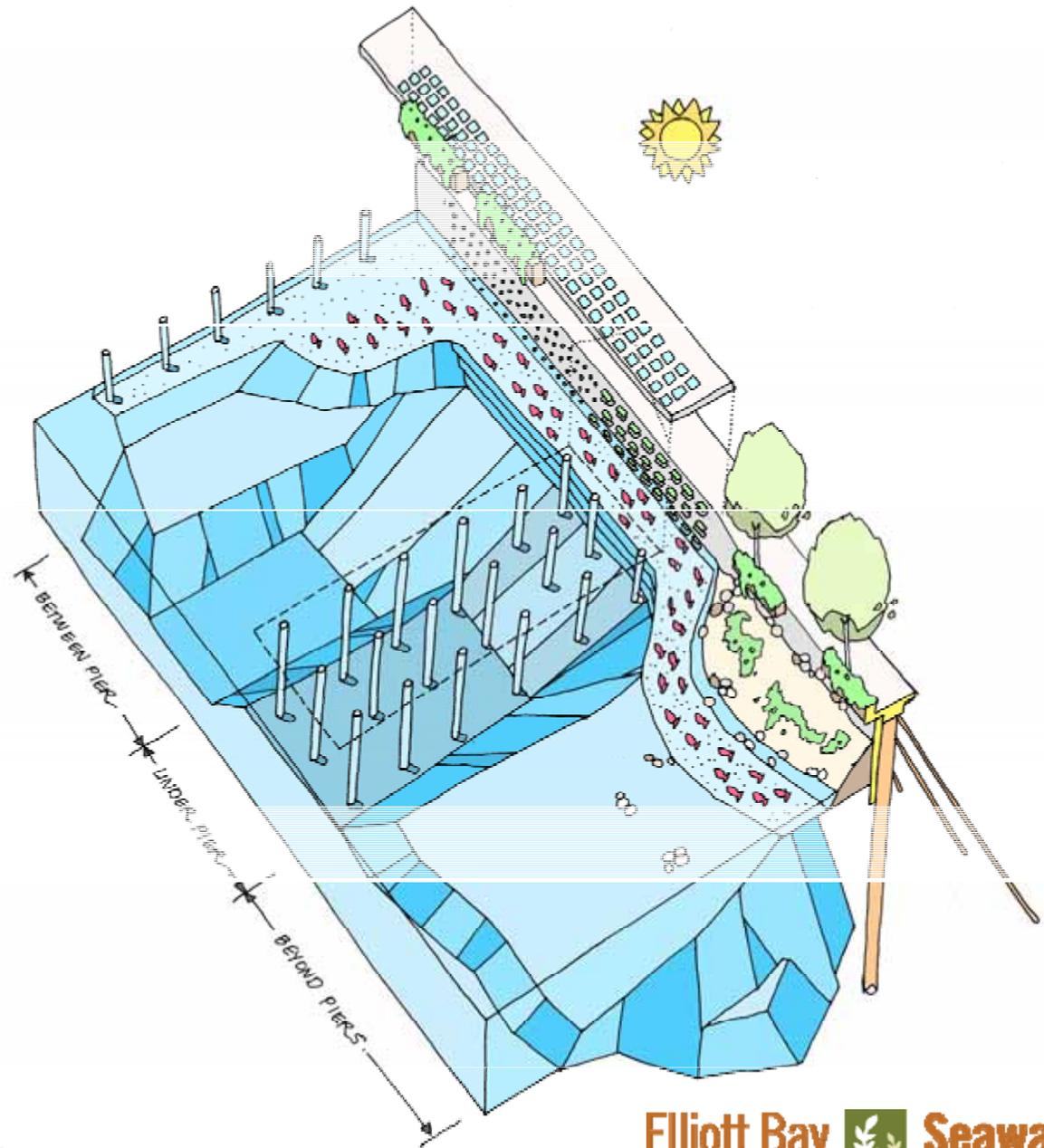


Existing Condition
New Seawall
Intertidal Corridor
Lighting
Riparian Vegetation

- Willows
- Shore pine
- Sitka spruce
- Alder
- Dune grasses



Existing Condition
New Seawall
Intertidal Corridor
Lighting
Riparian Vegetation
Textured Wall



Existing Condition

New Seawall

Intertidal Corridor

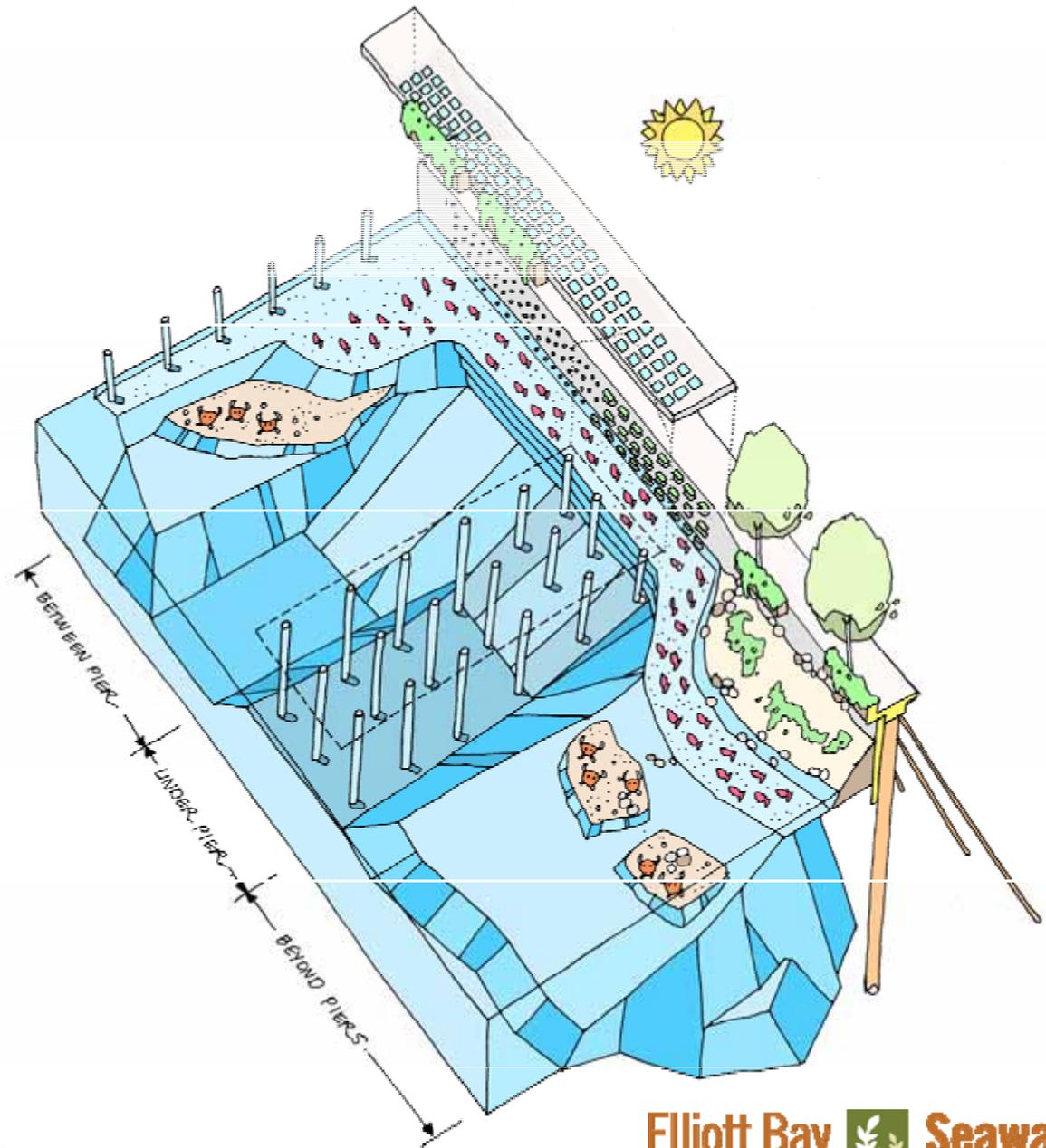
Lighting

Riparian Vegetation

Textured Wall

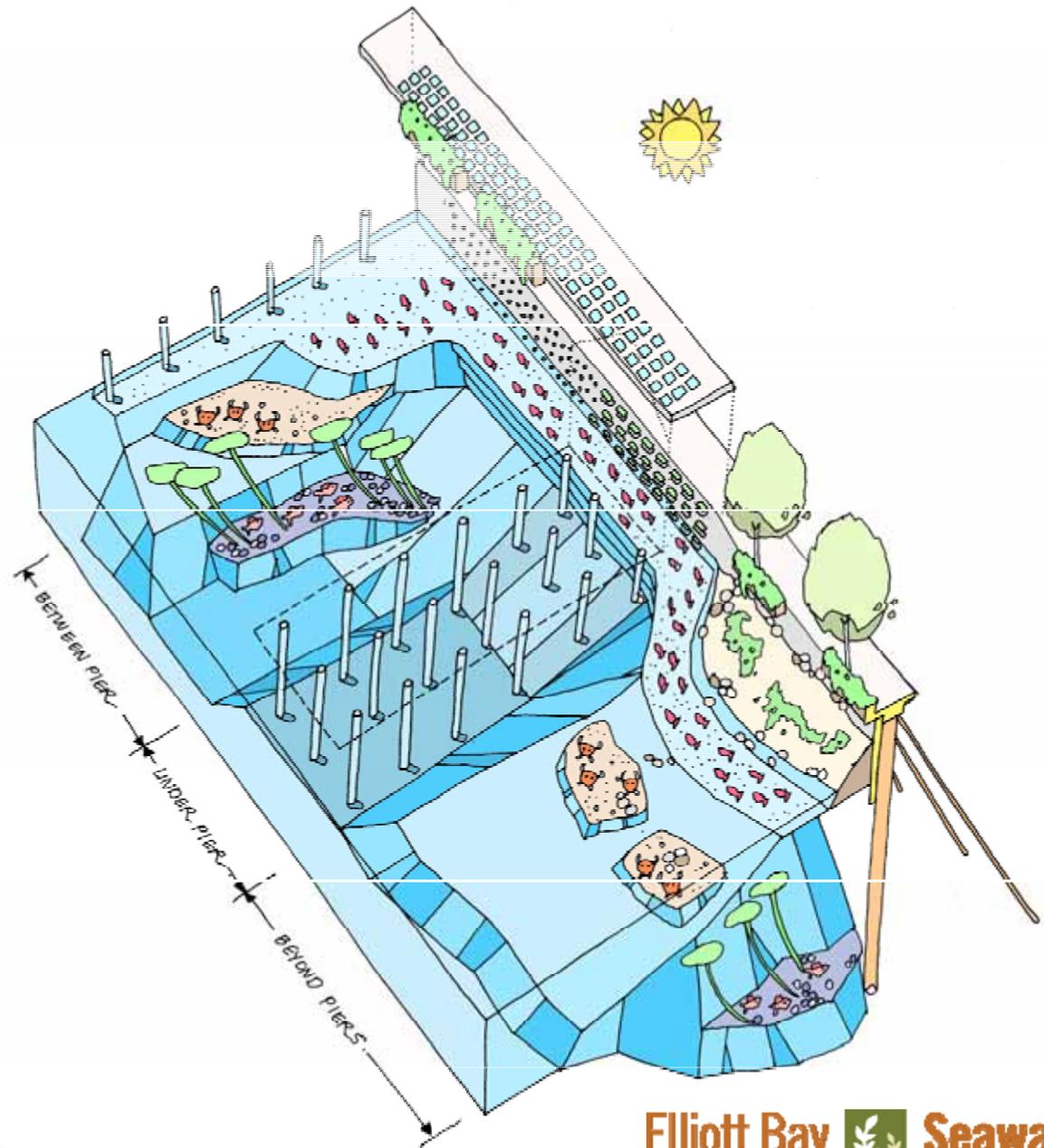
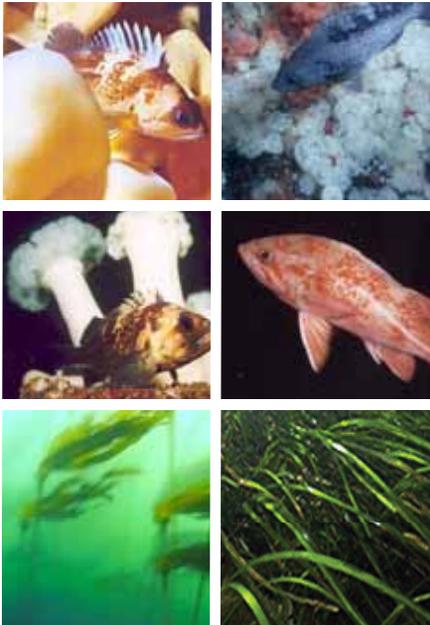
Substrate Enhancement

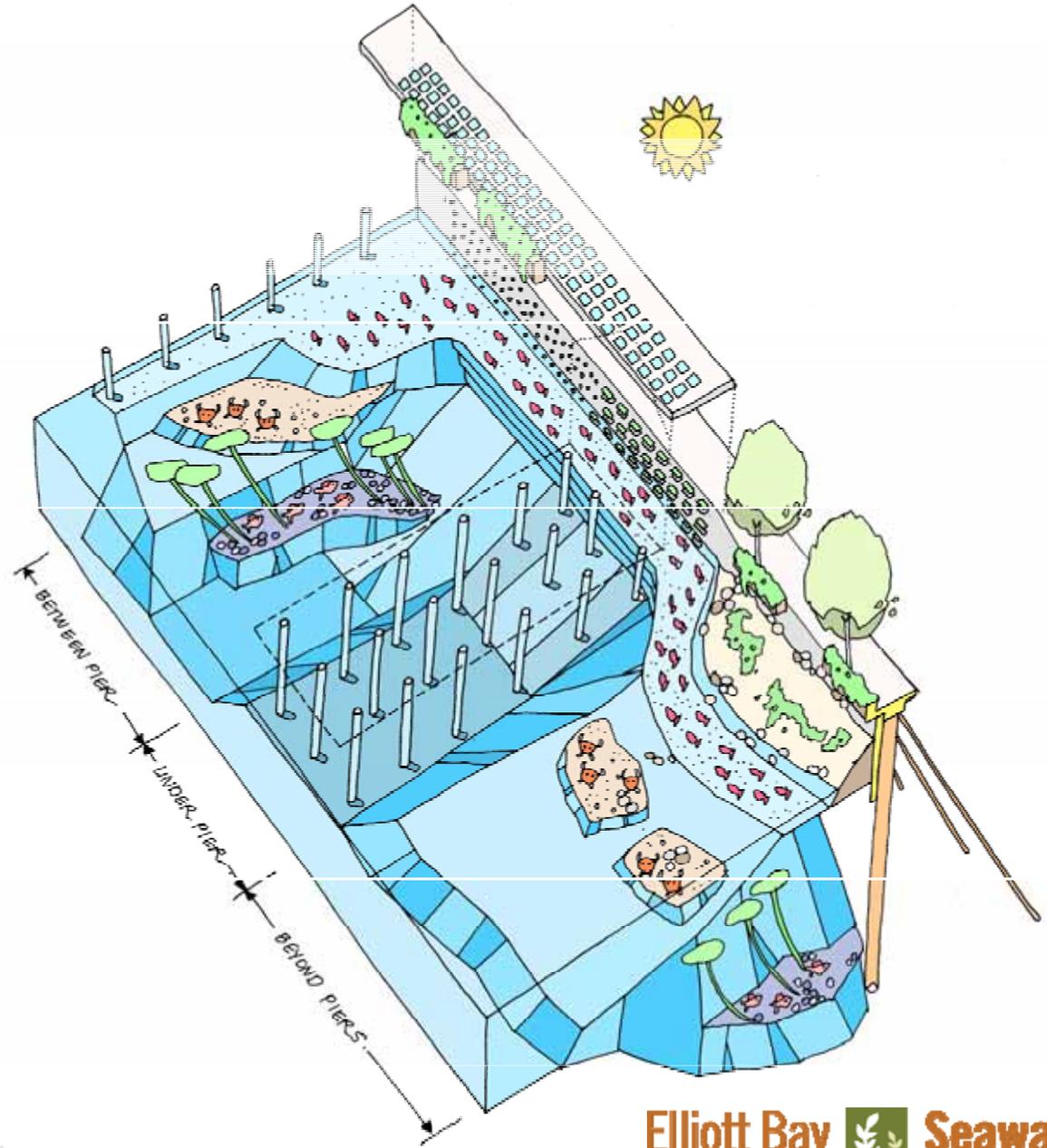
- Depth of -10 feet NAVD88
- Substrate for juvenile crabs and other invertebrates



Existing Condition
 New Seawall
 Intertidal Corridor
 Lighting
 Riparian Vegetation
 Textured Wall
 Substrate Enhancement
Cobble Reefs

- Depth of -25 feet NAVD88
- Rockfish and kelp colonization



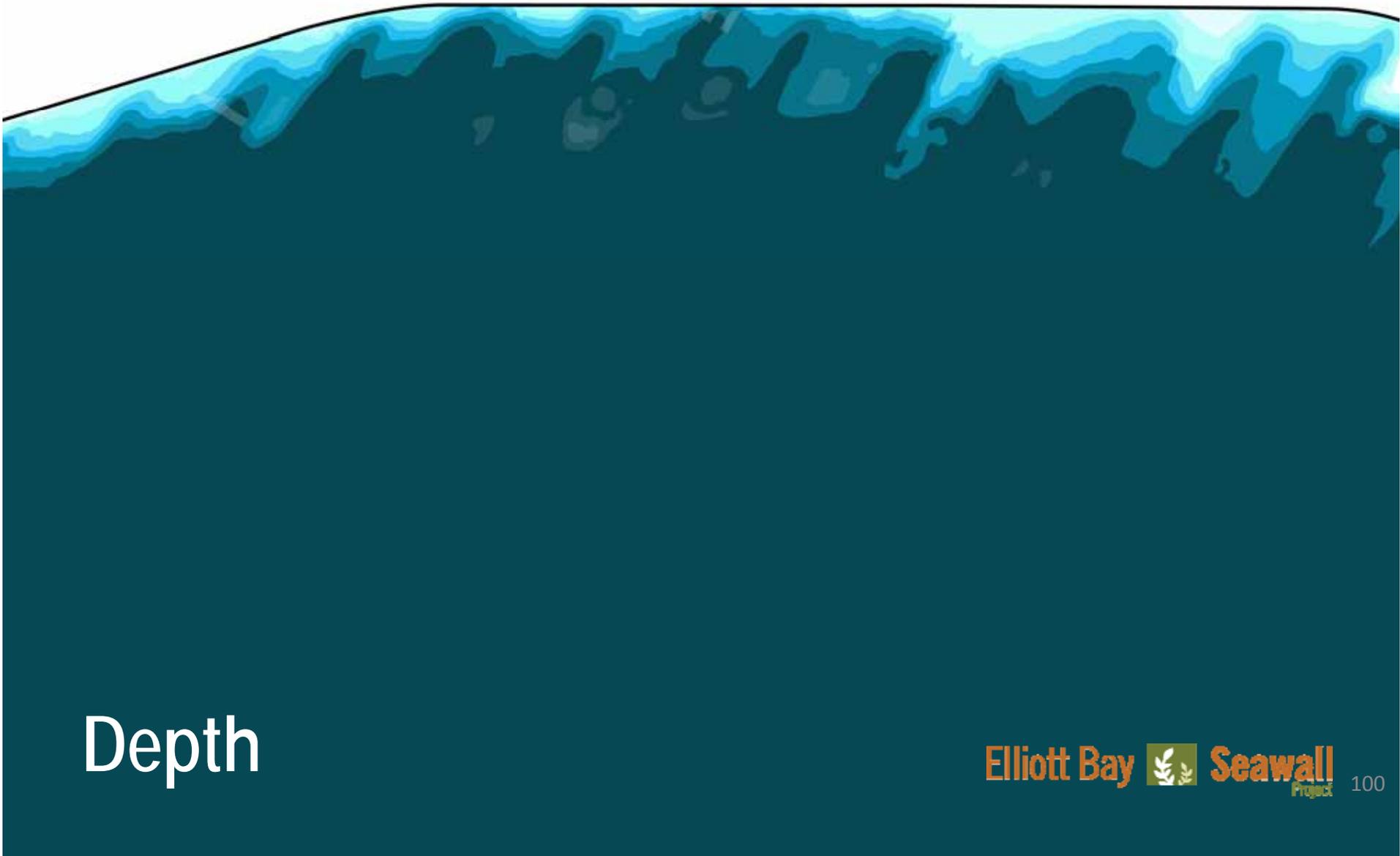




Where are we going?

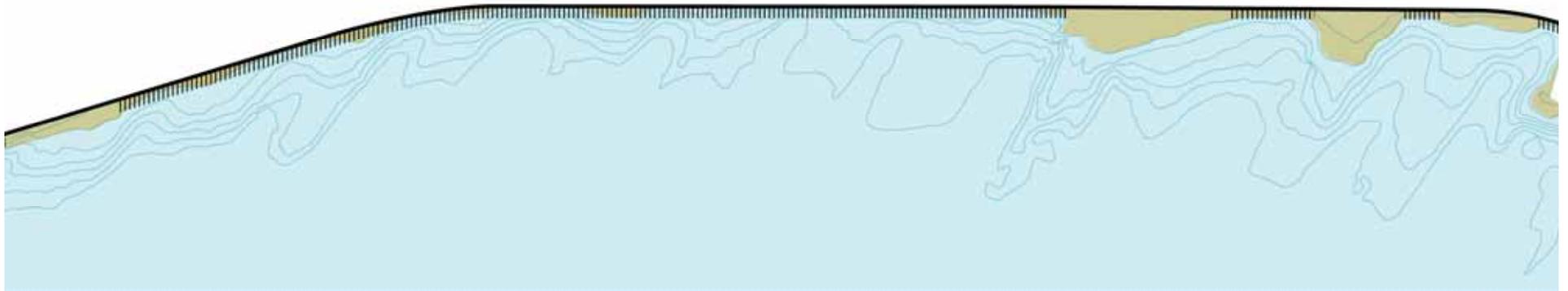


Existing Seawall

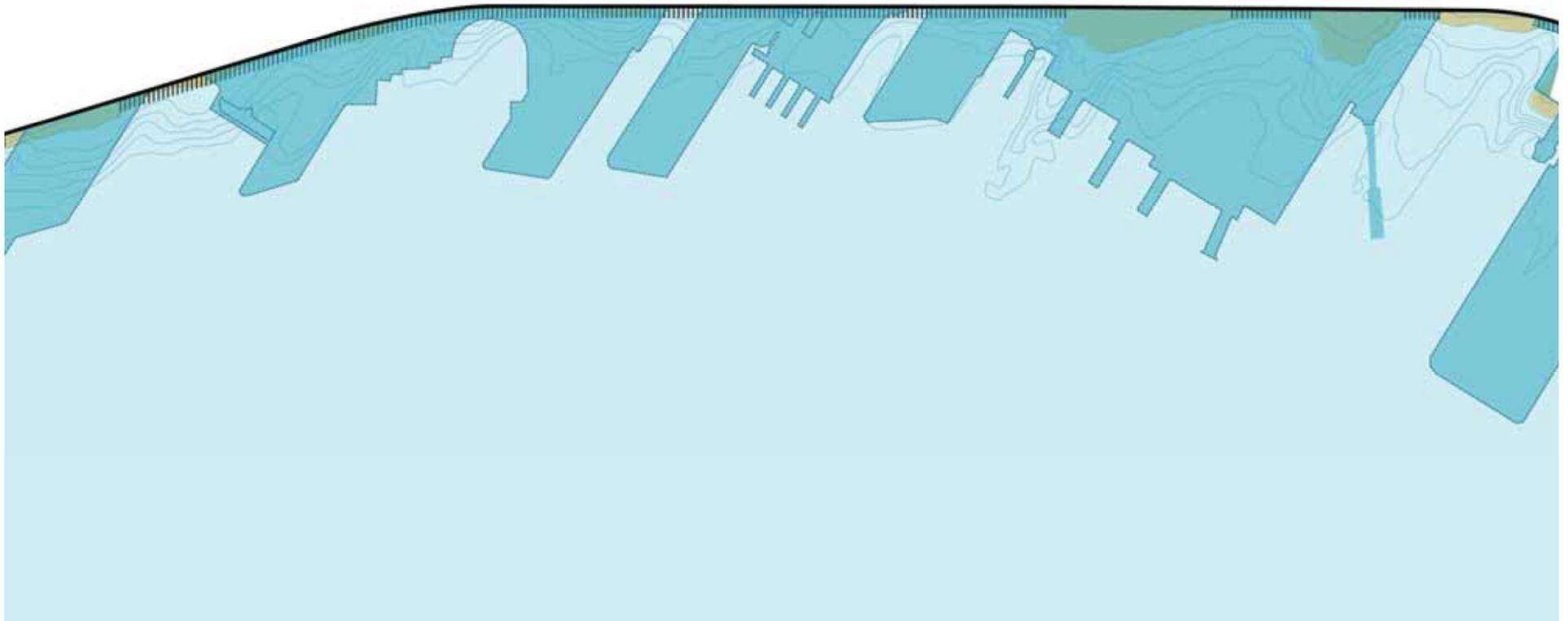




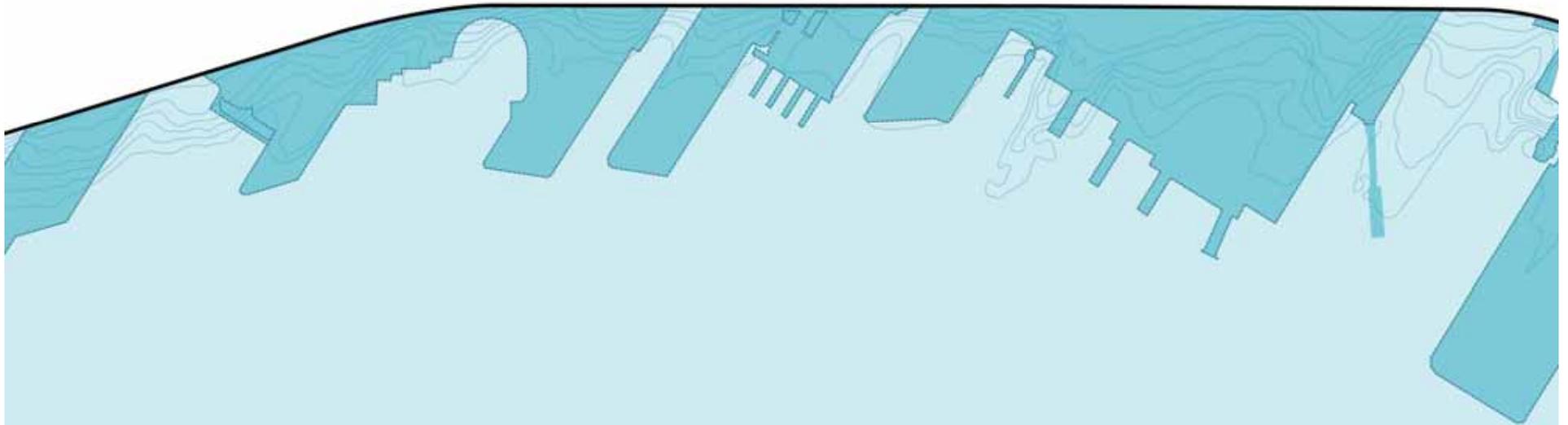
Depth



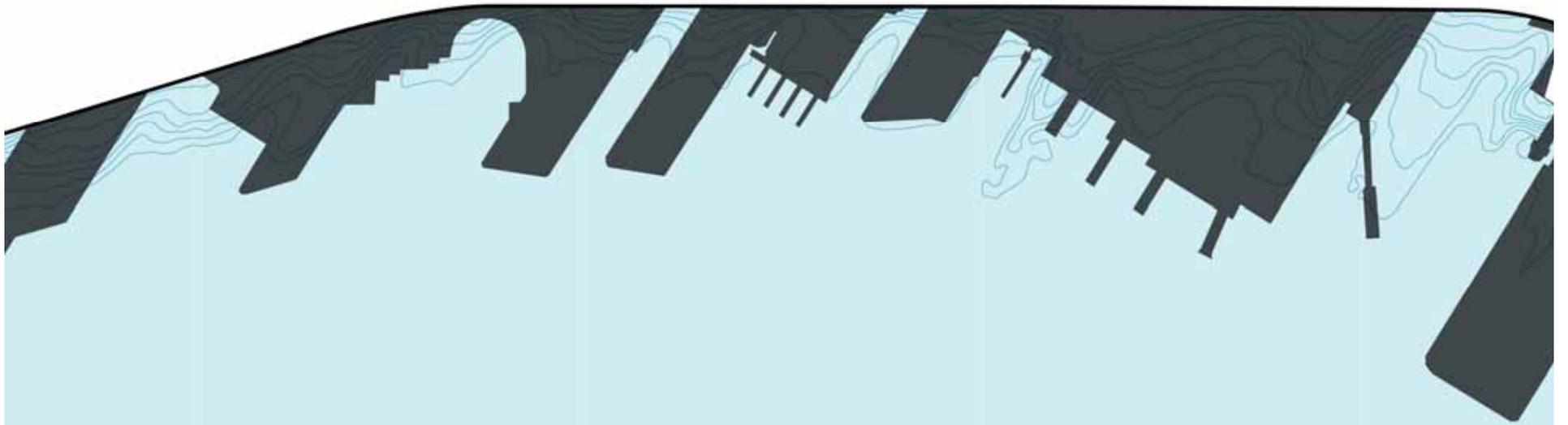
Depth



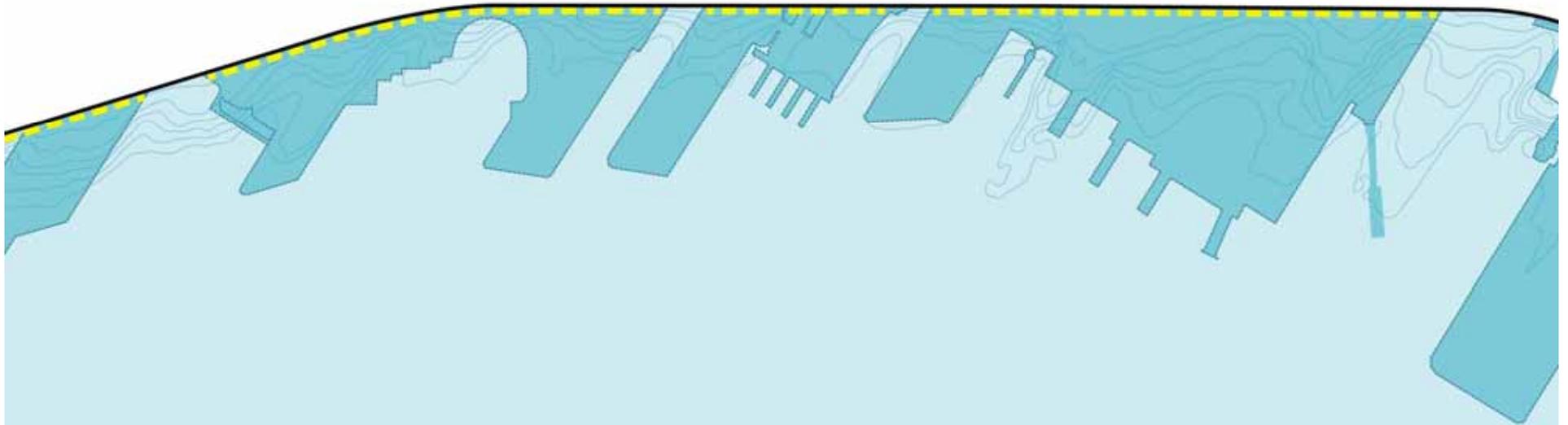
Depth



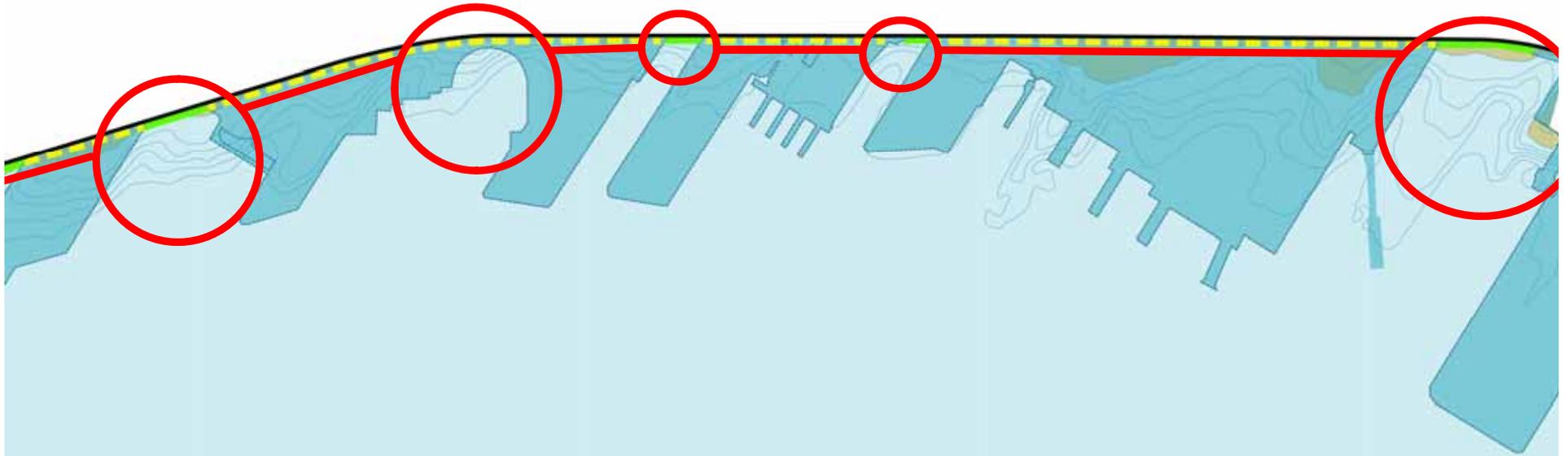
Light



Light



Light



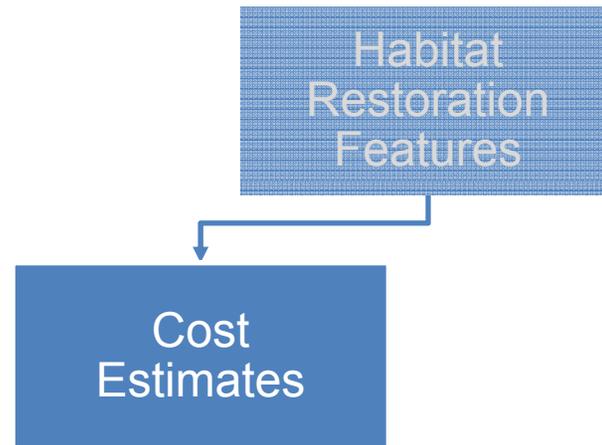
Nearshore Ecosystem Productivity

How do we know a good investment?

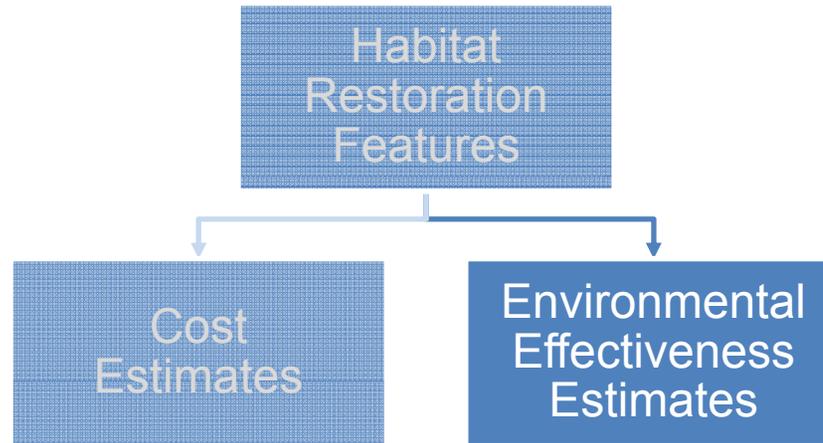
Process for Habitat Evaluation

Habitat
Restoration
Features

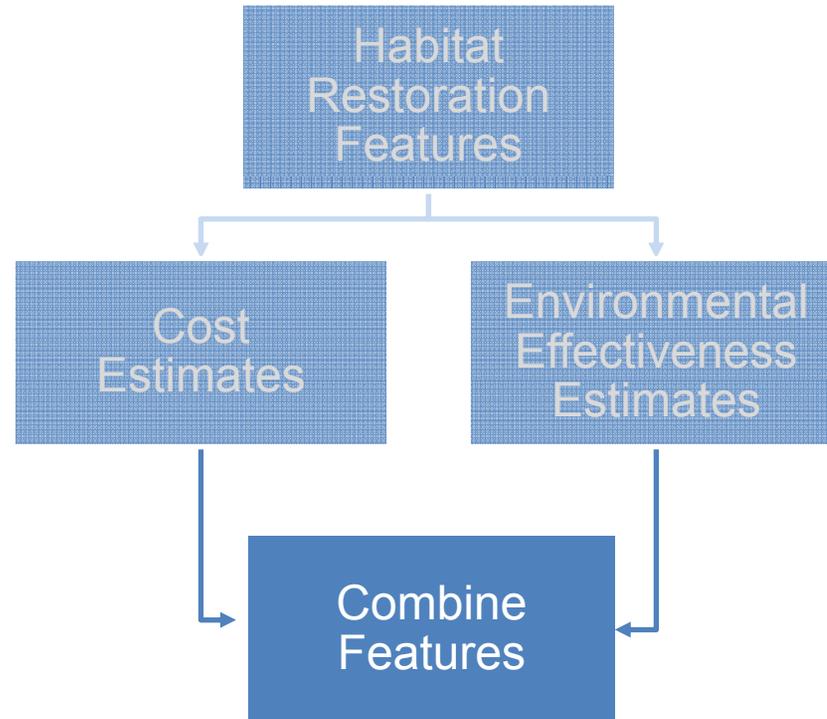
Process for Habitat Evaluation



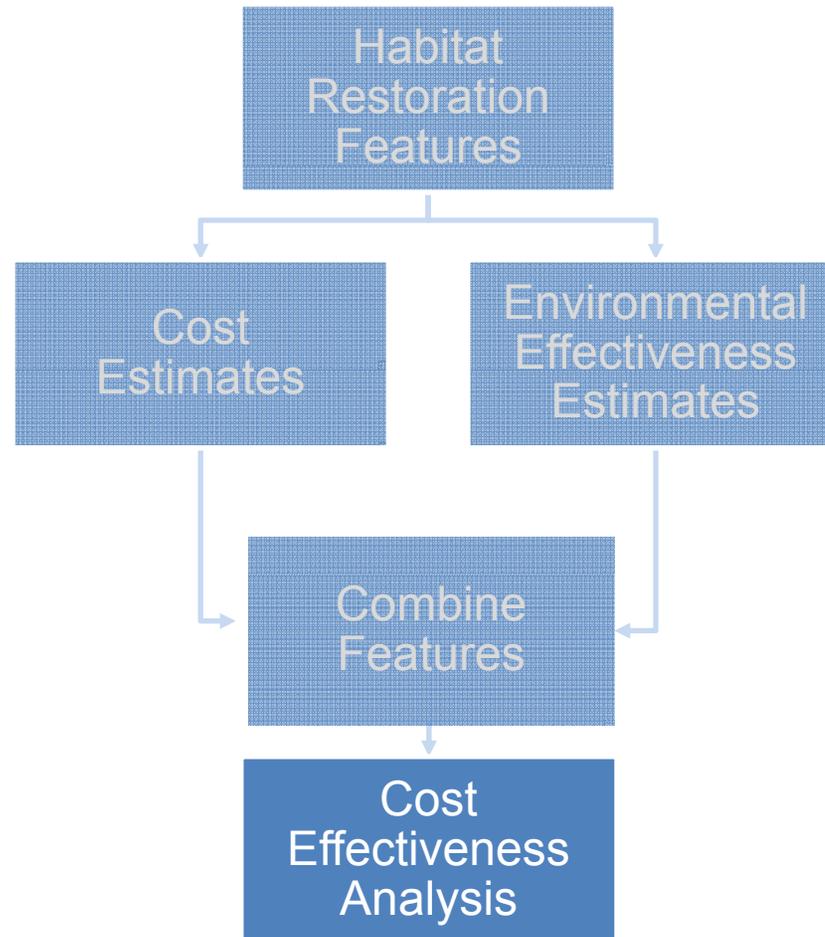
Process for Habitat Evaluation



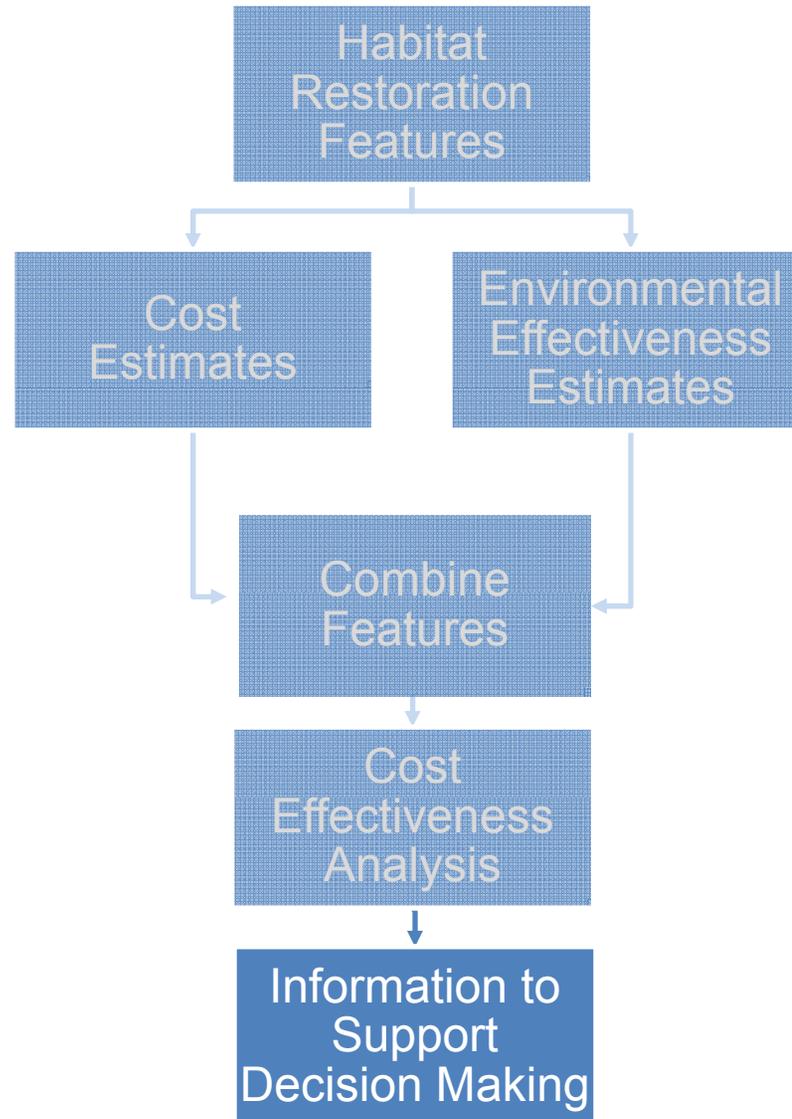
Process for Habitat Evaluation



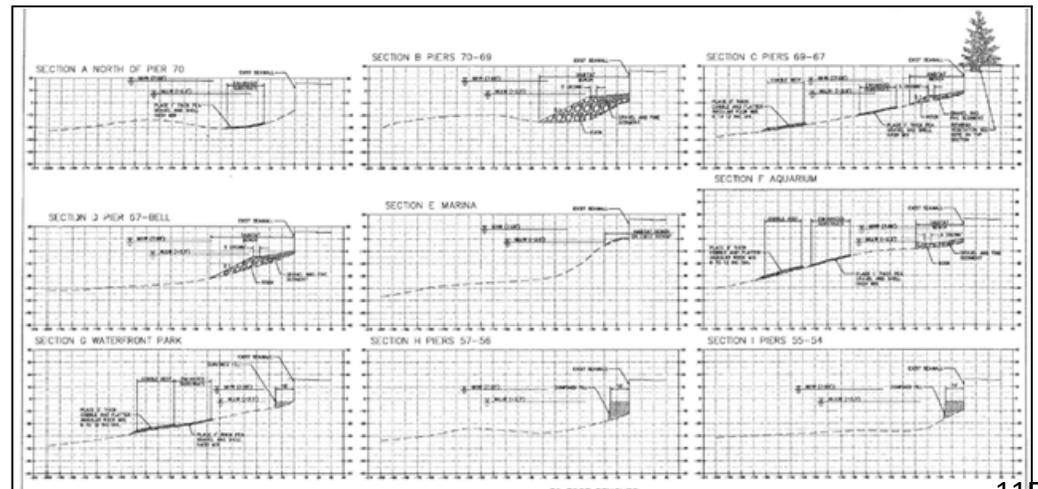
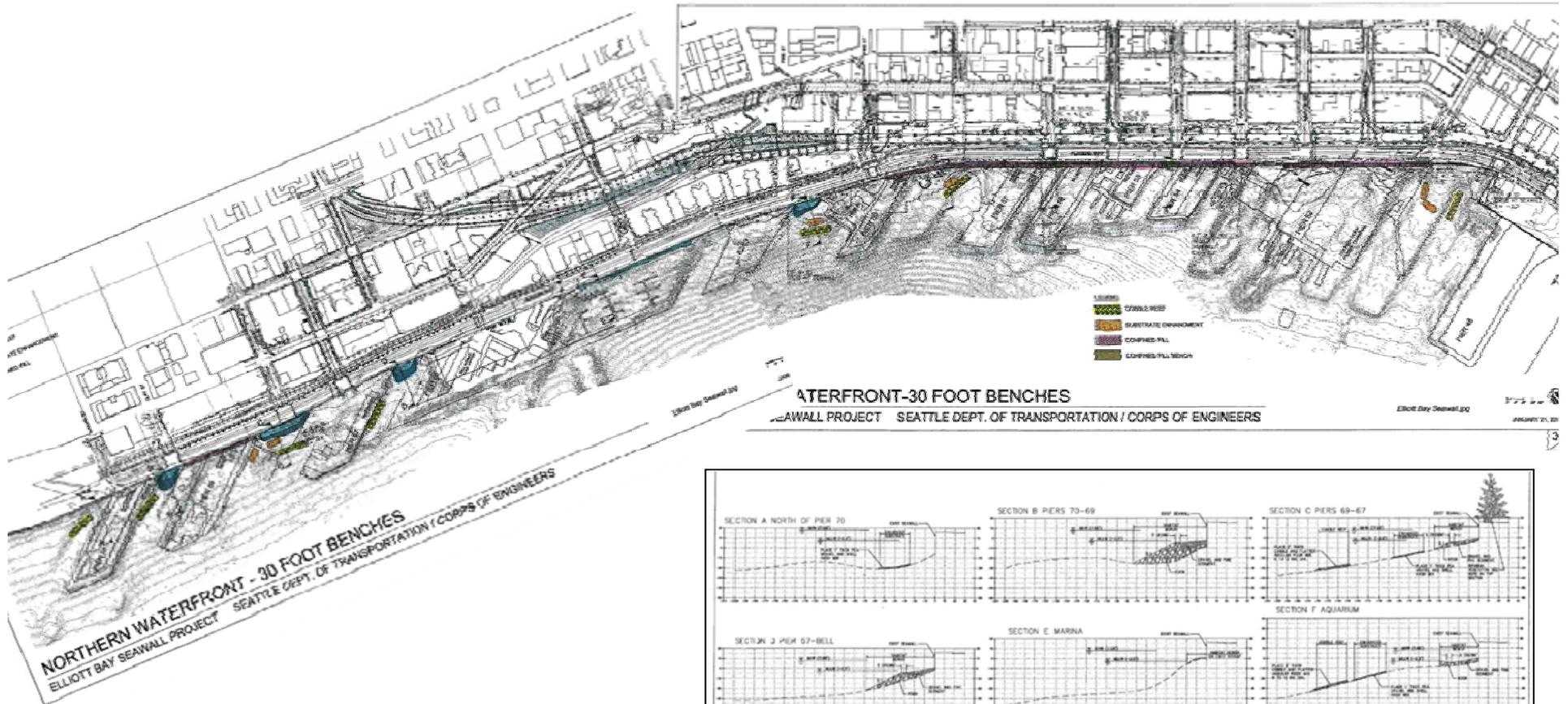
Process for Habitat Evaluation



Process for Habitat Evaluation



Habitat Restoration Features



Cost Estimates for Habitat Features

- Under peer review
- Life cycle cost estimates for 50 year period of analysis
 - Lands, easements, relocations
 - Construction costs
 - Operation and maintenance costs



Collaboration and Coordination



NOAA FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



WASHINGTON STATE DEPARTMENT OF
Natural Resources



Washington
Department of
**FISH and
WILDLIFE**



THE SUQUAMISH TRIBE



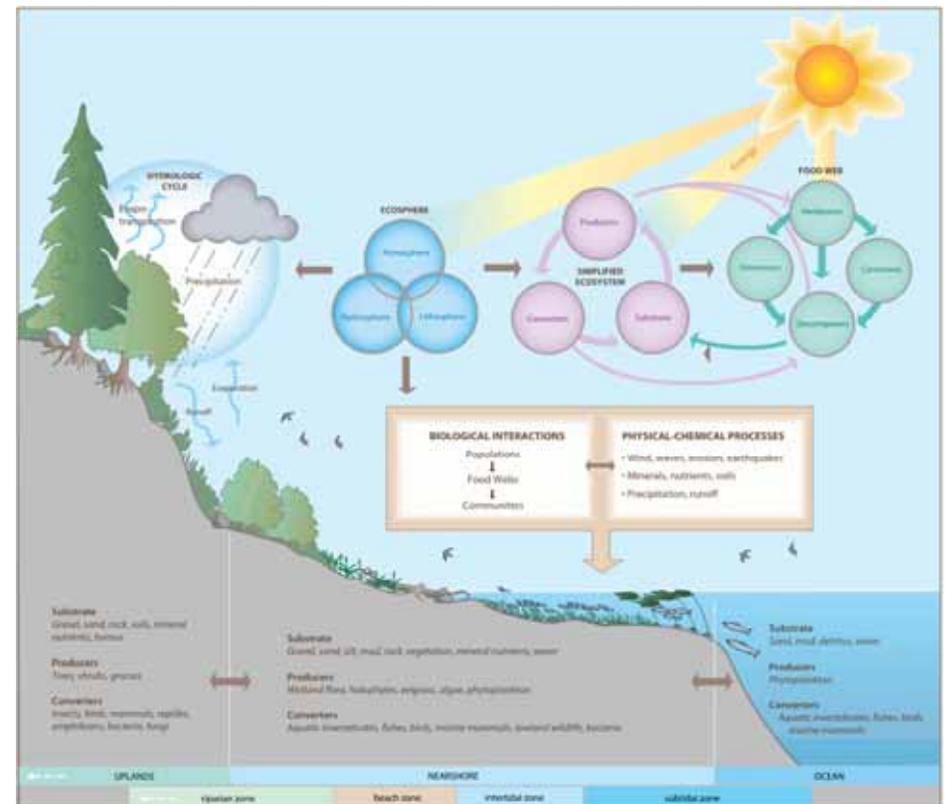
UNIVERSITY of
WASHINGTON



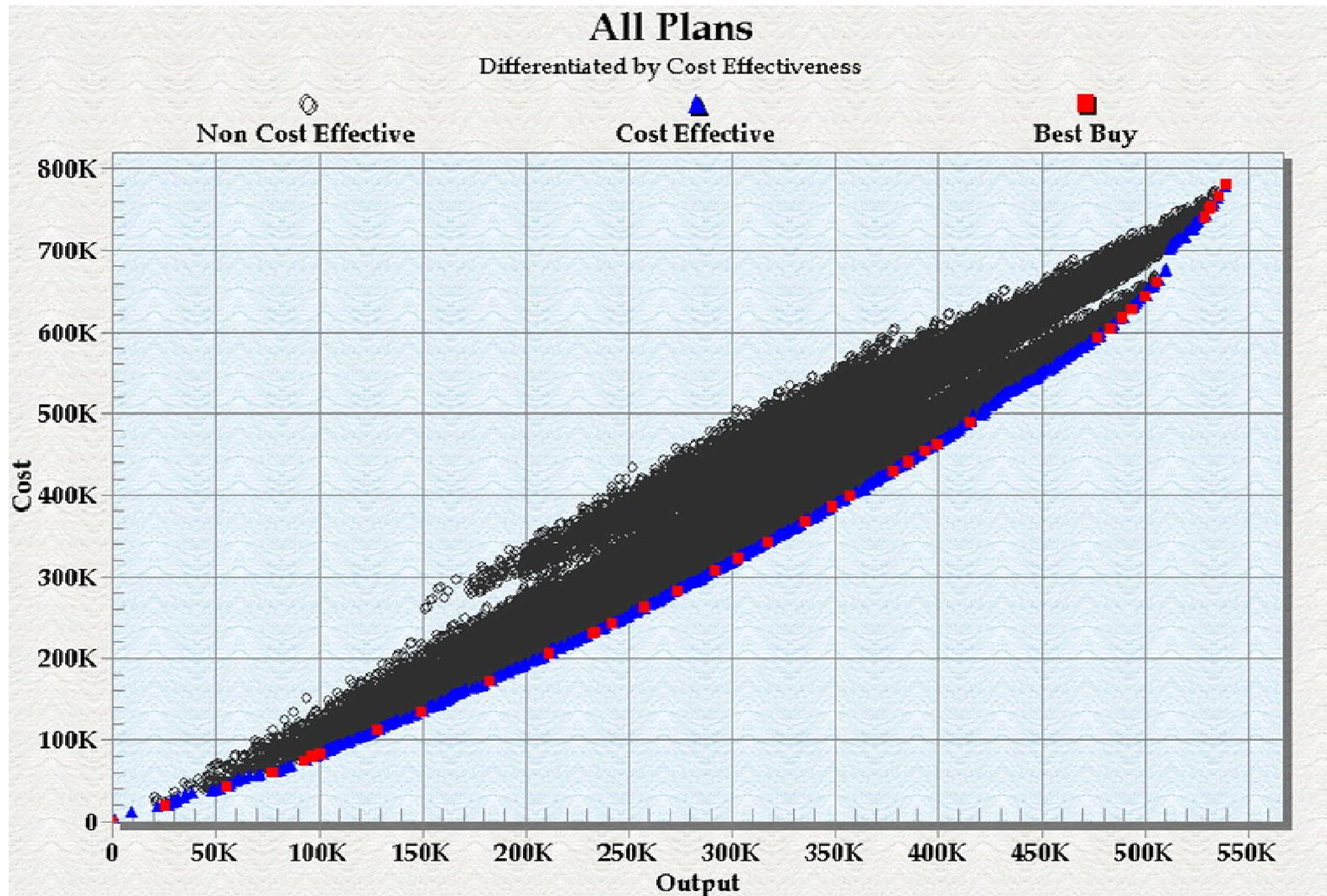
**US Army Corps
of Engineers®**

Effectiveness of Measures: Evaluation Model

- Water depth
- Wave energy/scour
- Sediment size/type
- Sediment quality
- Primary productivity/vegetation
- Invertebrates/food web
- Salmonids
- Waterbirds/shorebirds
- Biota movements/migration
- Piers/shading/light



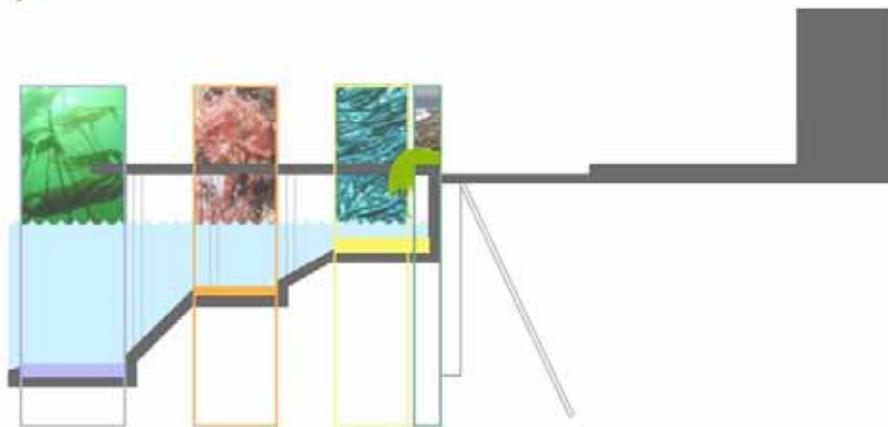
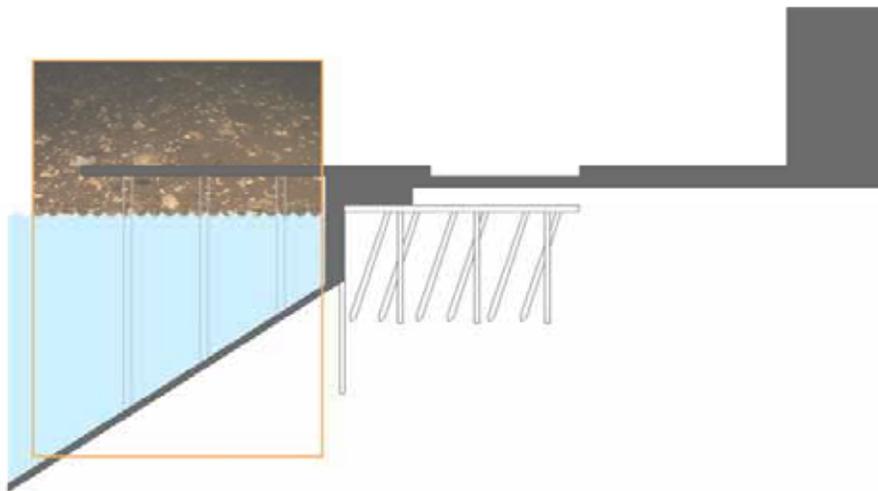
Example Cost Effectiveness Analysis

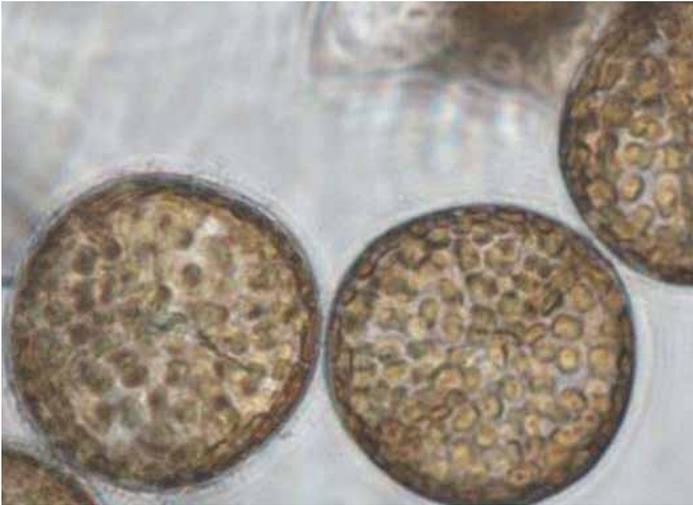


Example Incremental Cost Analysis

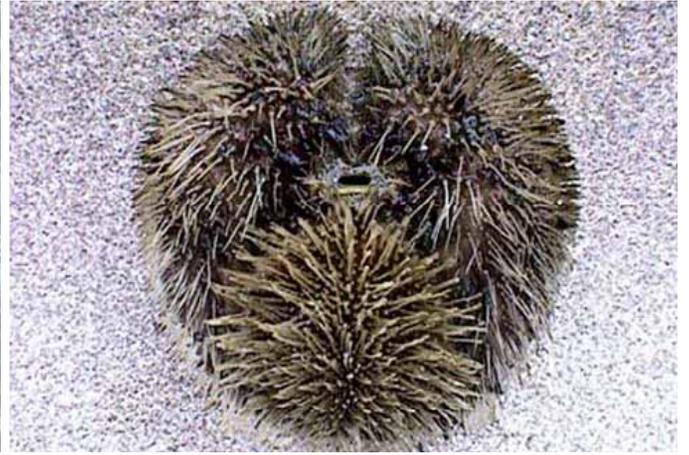
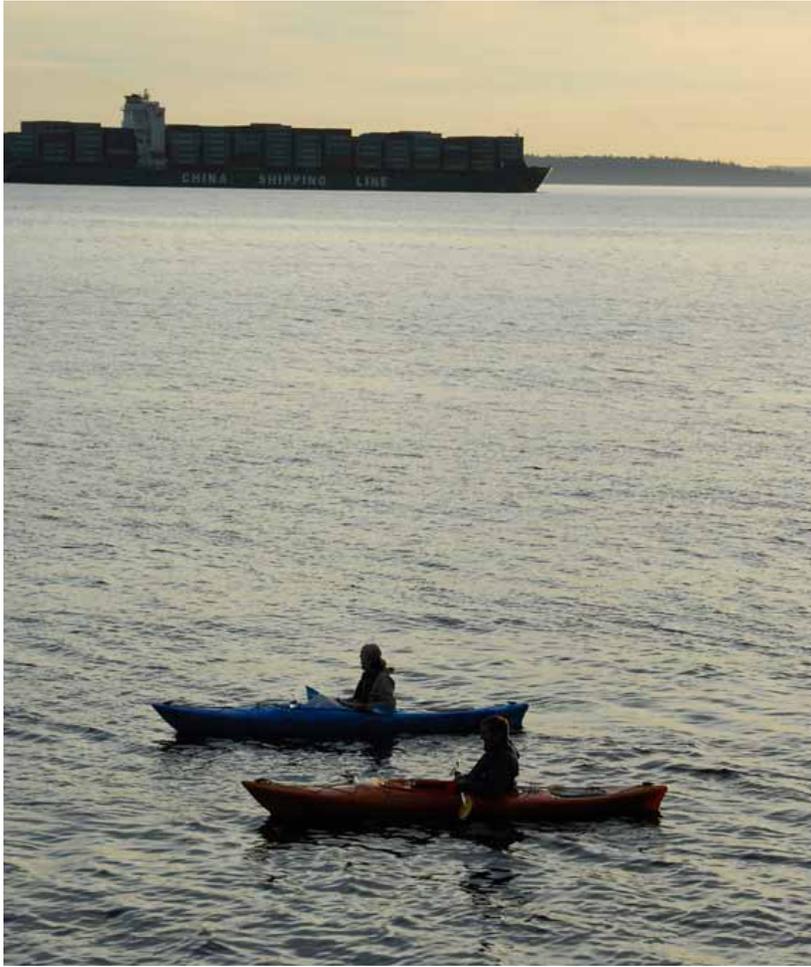
- Organization of data to aid in determining level of investment
- “Is it worth it?”

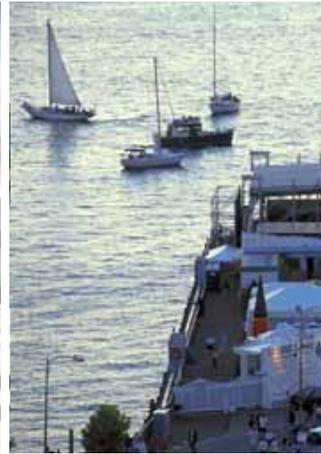


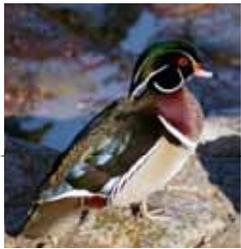
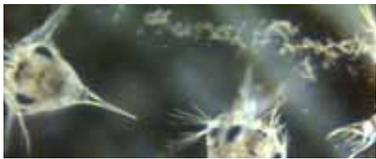














*Stakeholder Check-In
and Once Around*



Next Steps and Action Items

Next Meeting

*Central Waterfront Stakeholders Group Meeting #5
July 26, 2011 (tentative)
5:15-7:15 p.m.
Location TBD*

Actions and Contact Information

Elliott Bay  Seawall
Project

Stephanie Brown, Project Manager

Phone: 206-386-4635

Web: <http://www.seattle.gov/transportation/seawall.htm>

Waterfront
Seattle.org

Steve Pearce, Project Manager

Phone: 206-684-8371

Web: <http://www.waterfrontseattle.org>

Email for both projects: seawall@seattle.gov



Back Pocket Slides

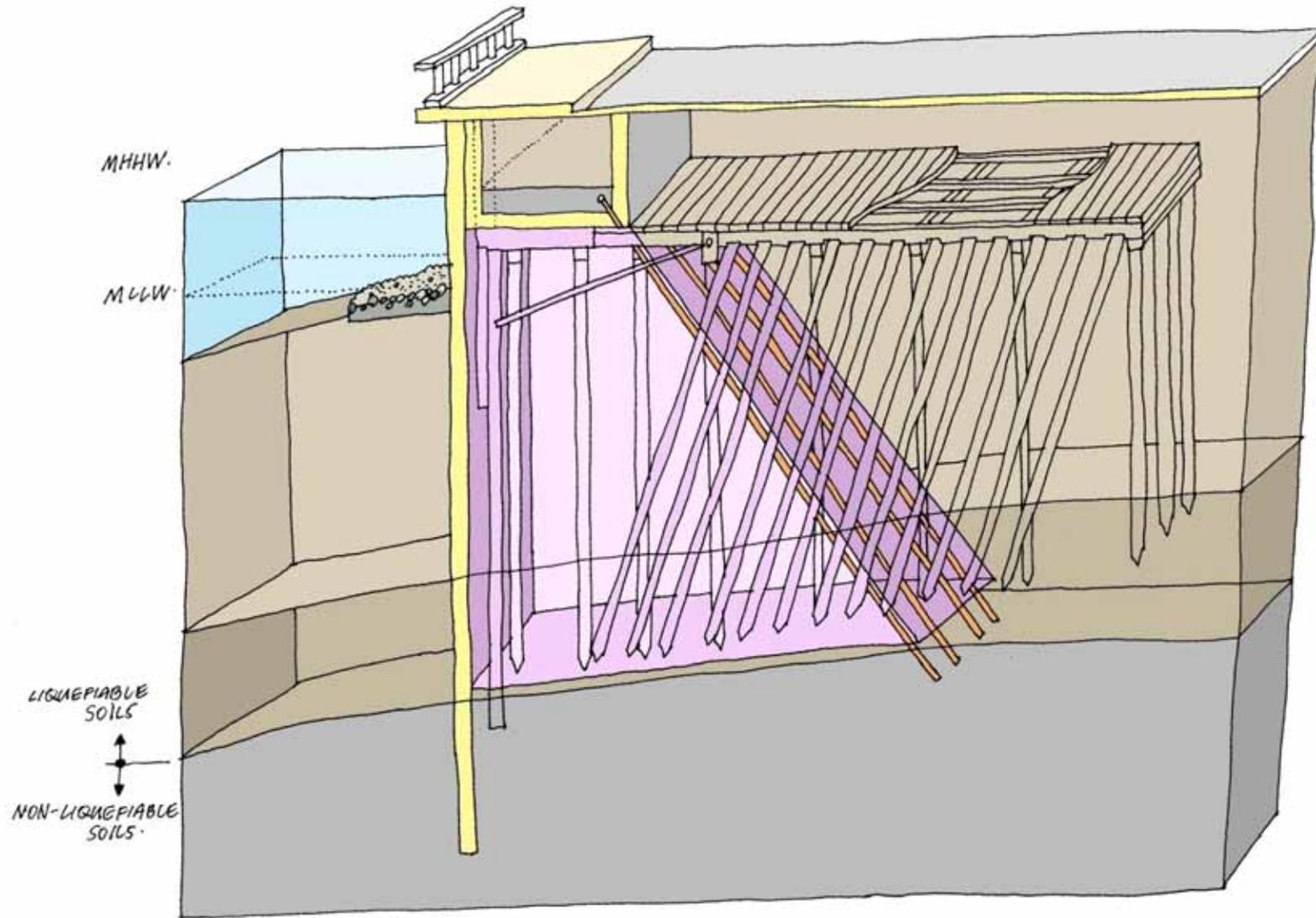
Environmental Impact Statement (EIS)

Spring (June) 2010	Winter 2011	Spring 2011*	Fall 2011	TBD**	TBD**	TBD**
Define project's Purpose and Need	<i>Establish range of alternatives for analysis</i>	<i>Write environmental discipline reports for alternatives</i>	<i>Summarize discipline reports into Draft EIS</i>	Publish Draft EIS	Publish Final EIS	Issue Record of Decision

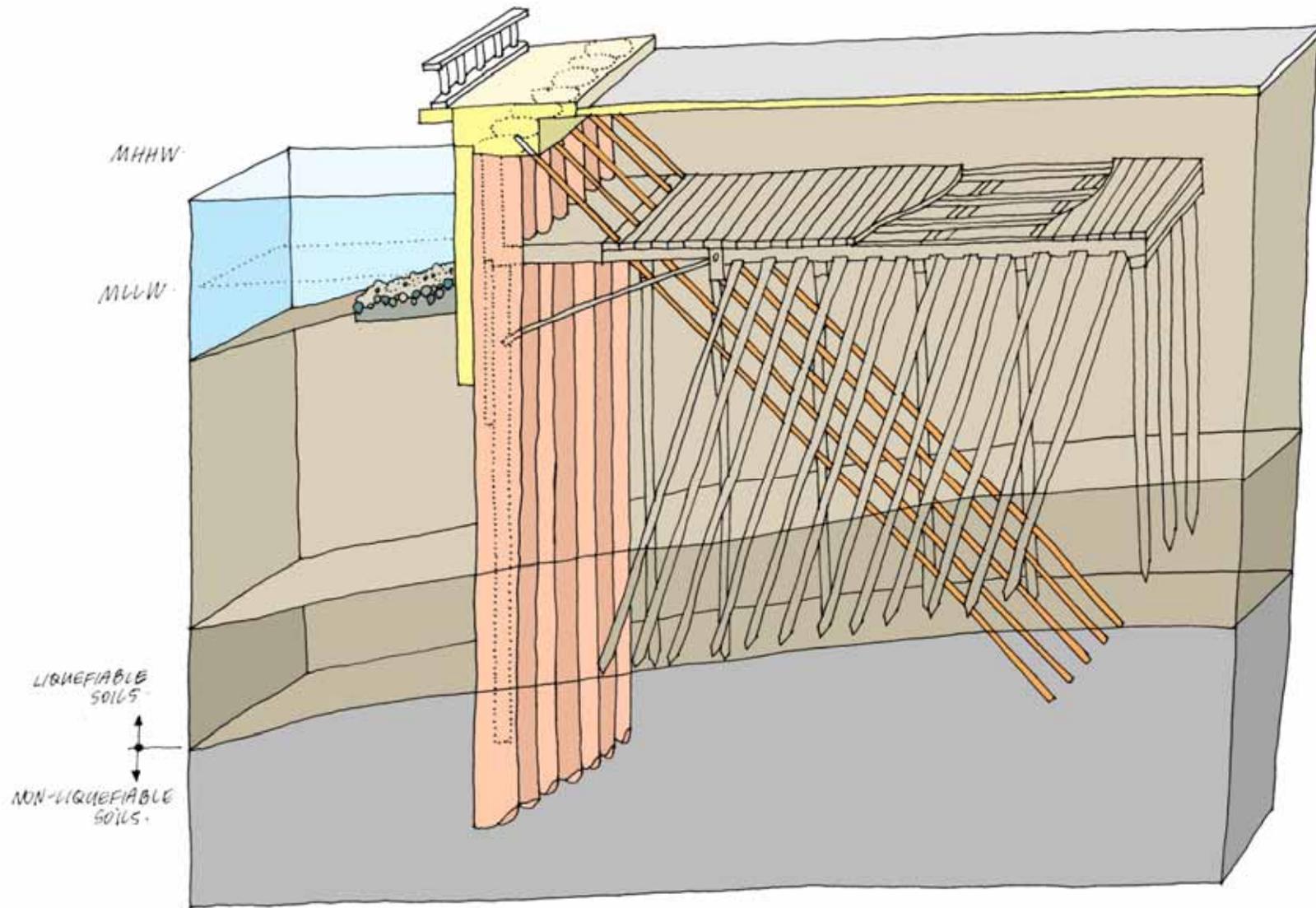
**April 2011: Define local alternatives*

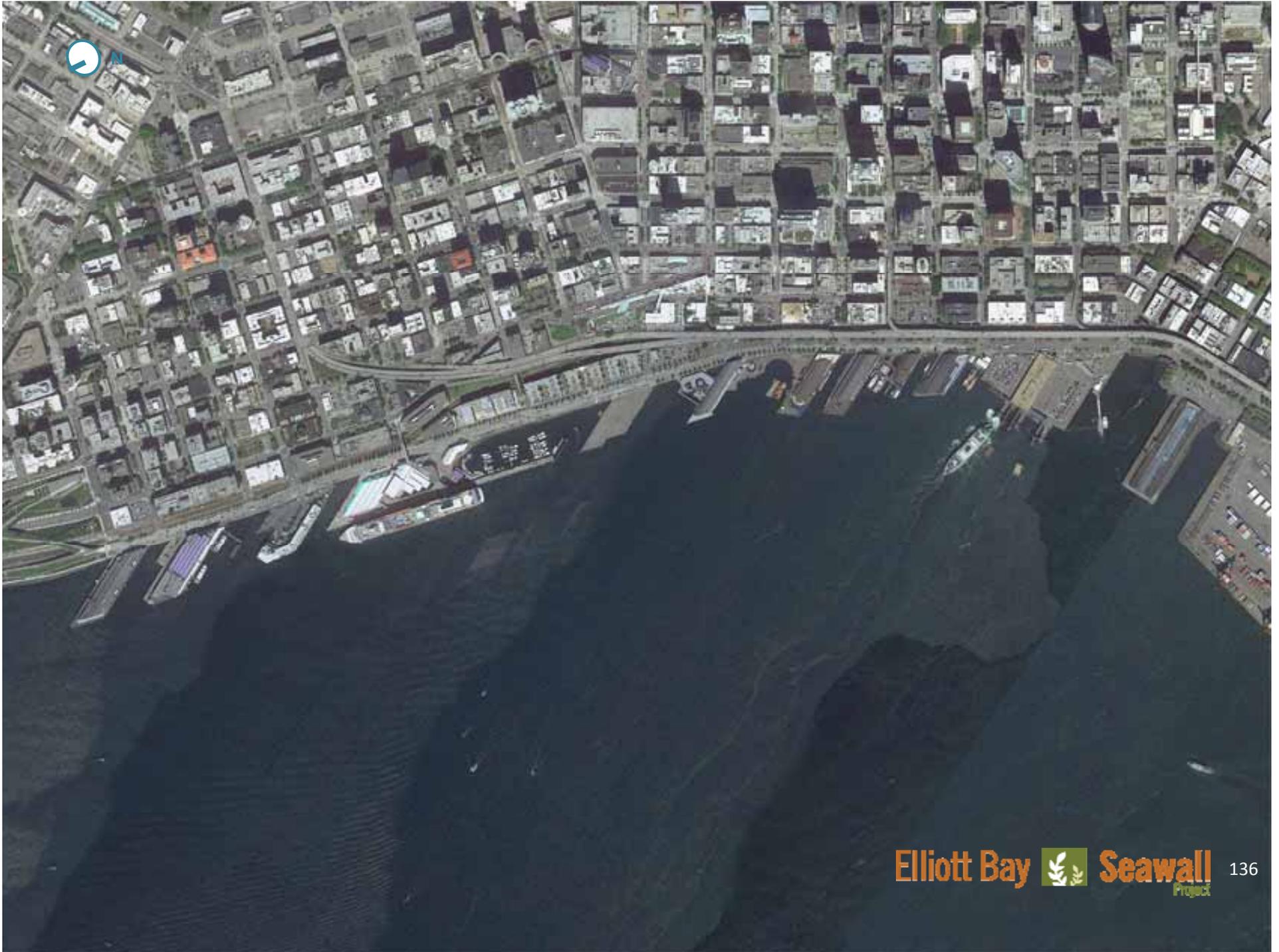
***Pending schedule coordination with U.S. Army Corps of Engineers*

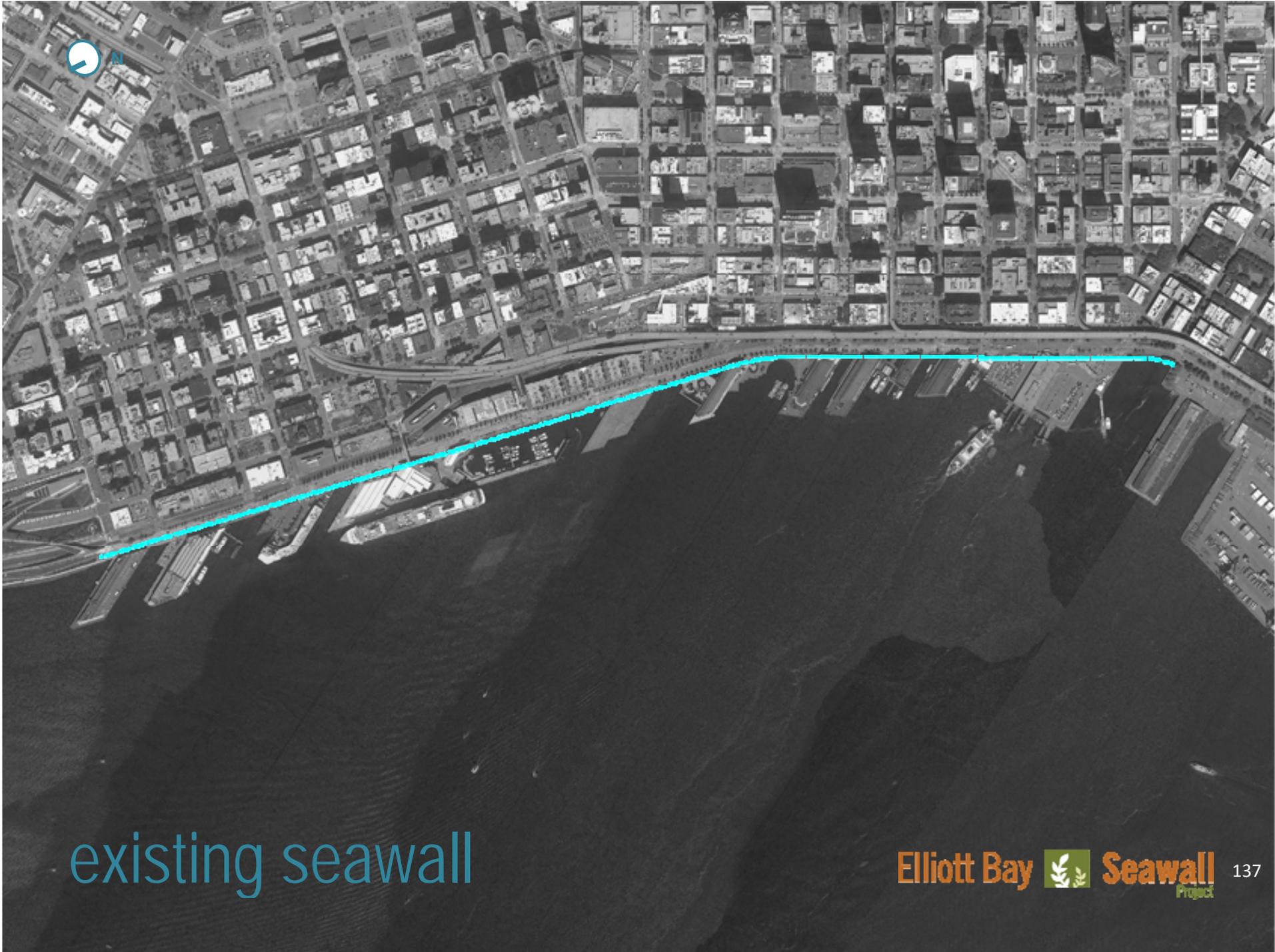
Structural Solutions: Jet Grouting



Structural Solutions: Drilled Shafts







existing seawall



alternative A

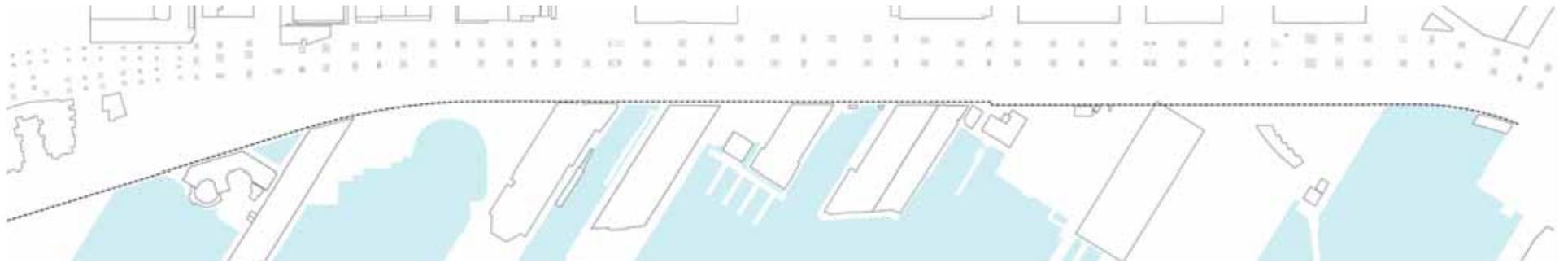


alternative B





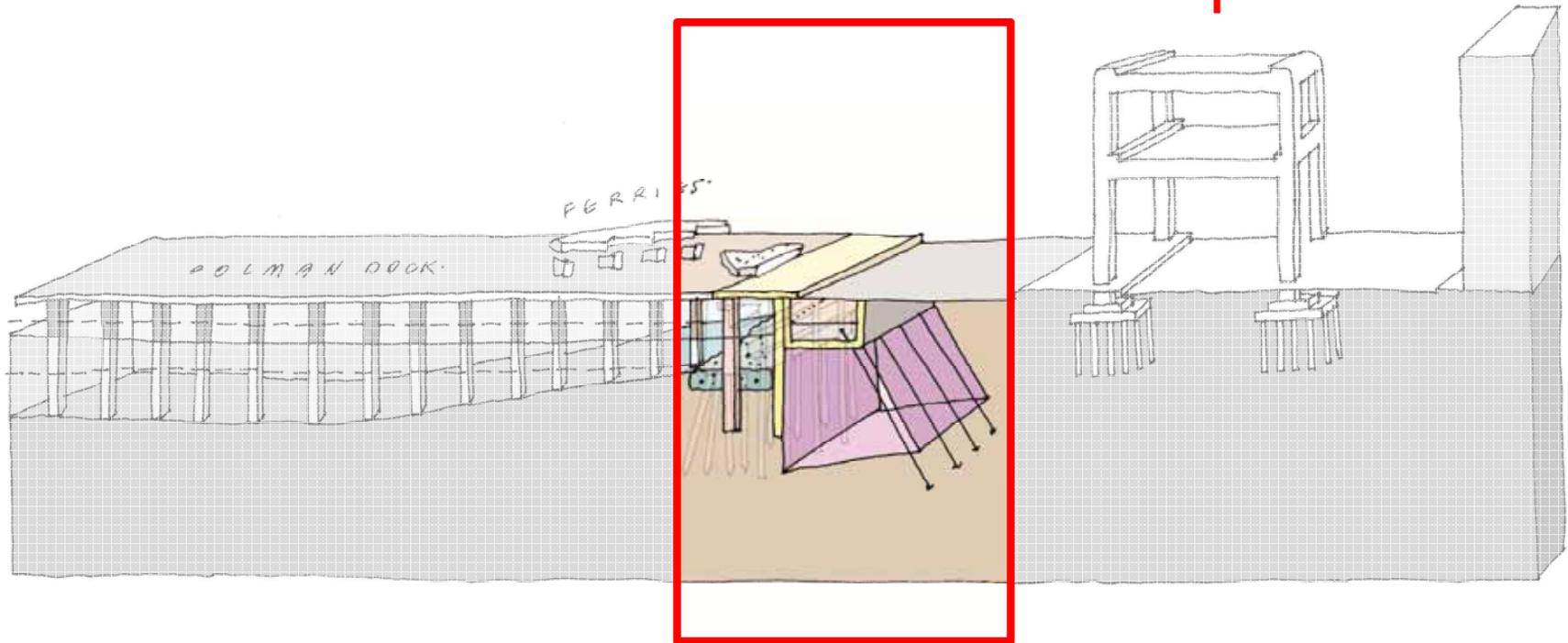


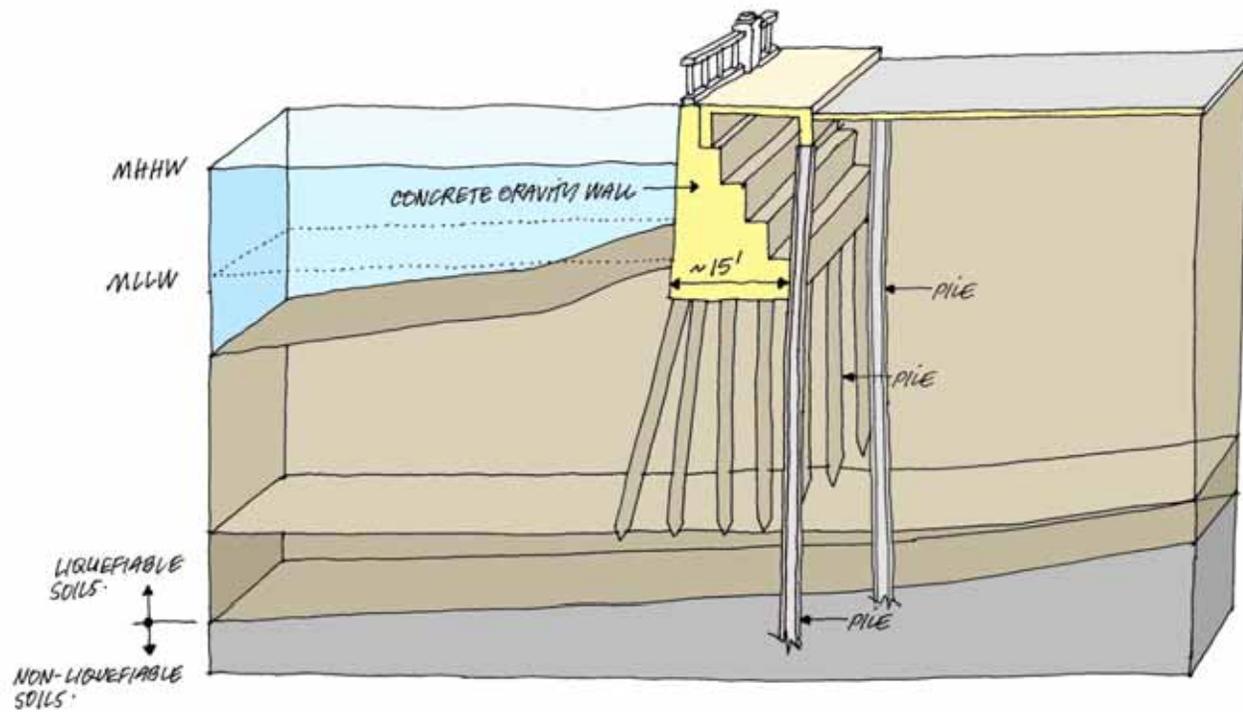
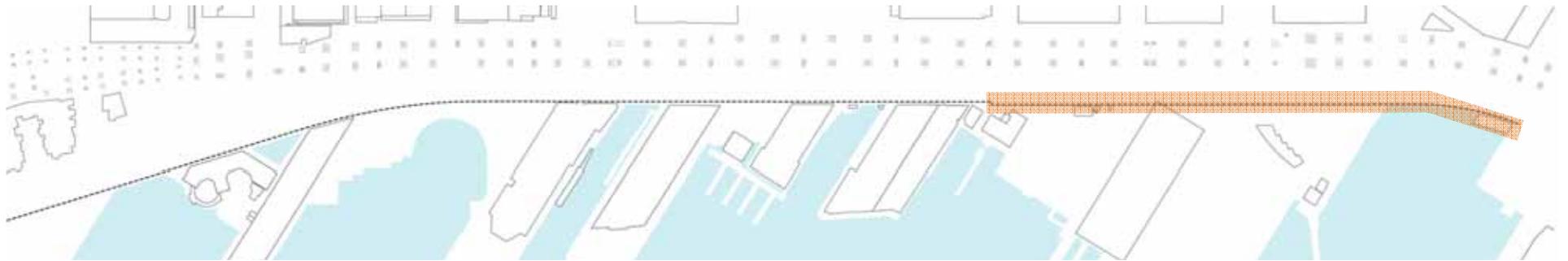


water side

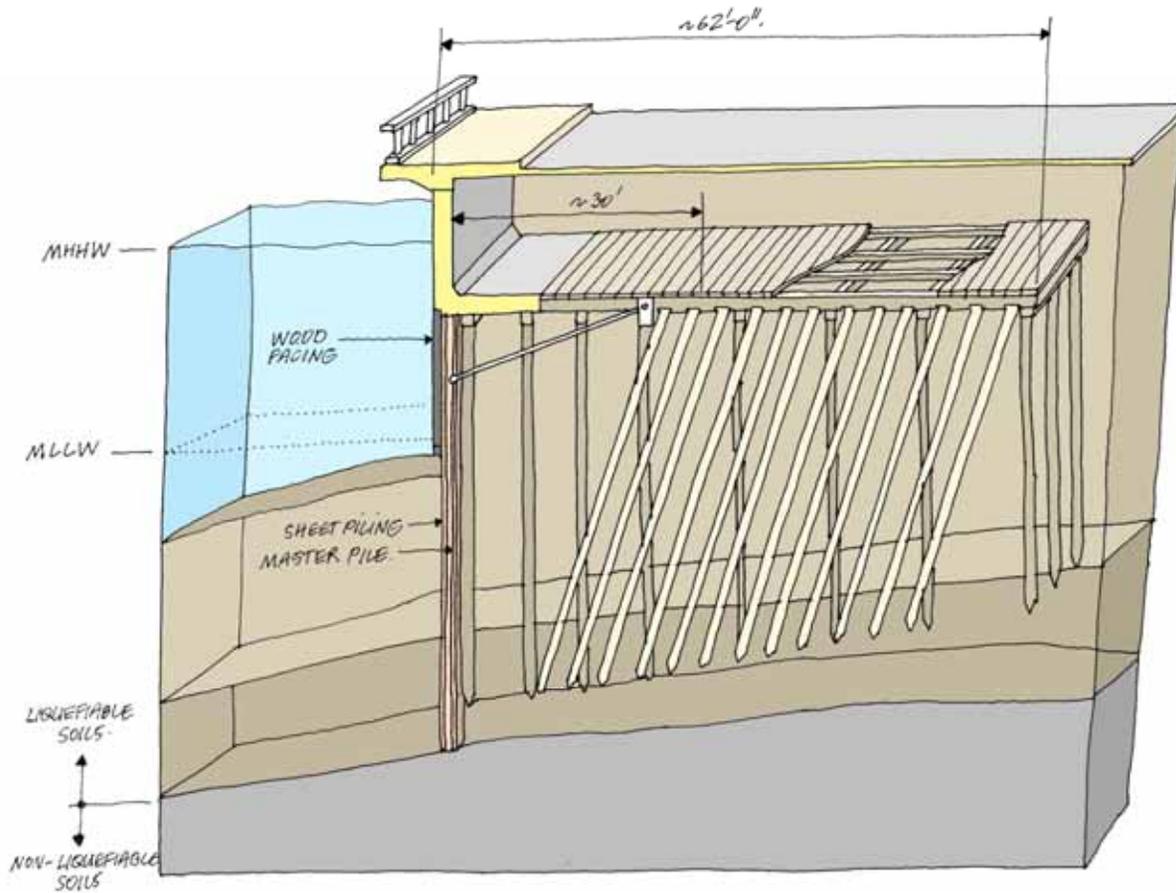
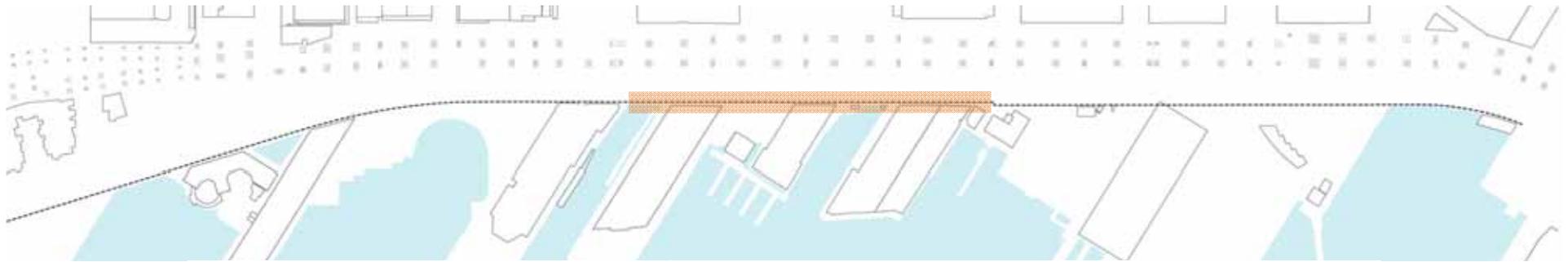
seawall

upland

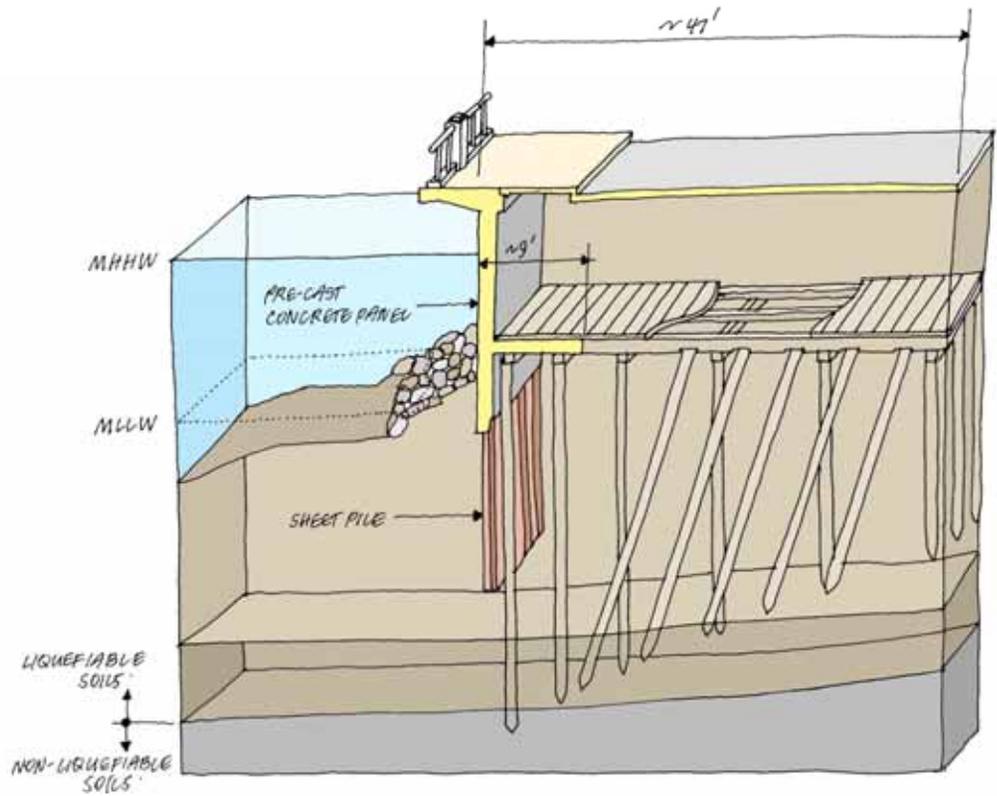
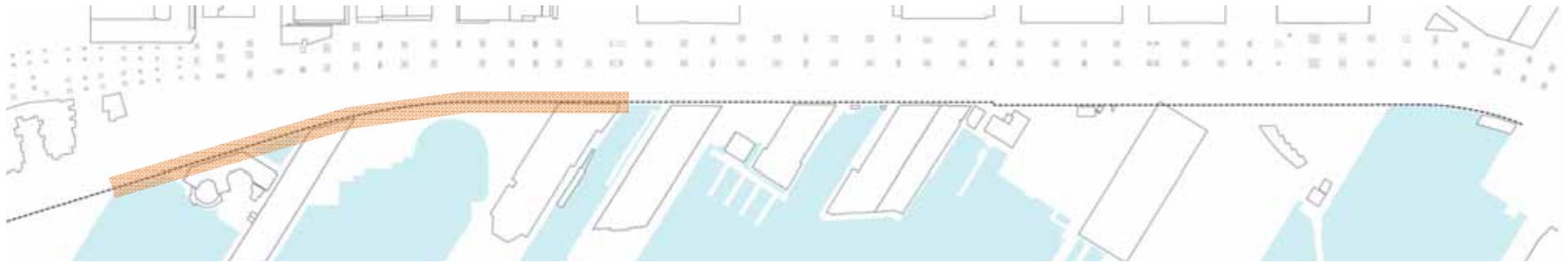




existing gravity wall



existing type B seawall



existing type A seawall



----- existing seawall

alternative A 



----- existing seawall
———— alternative seawall

alternative A  N



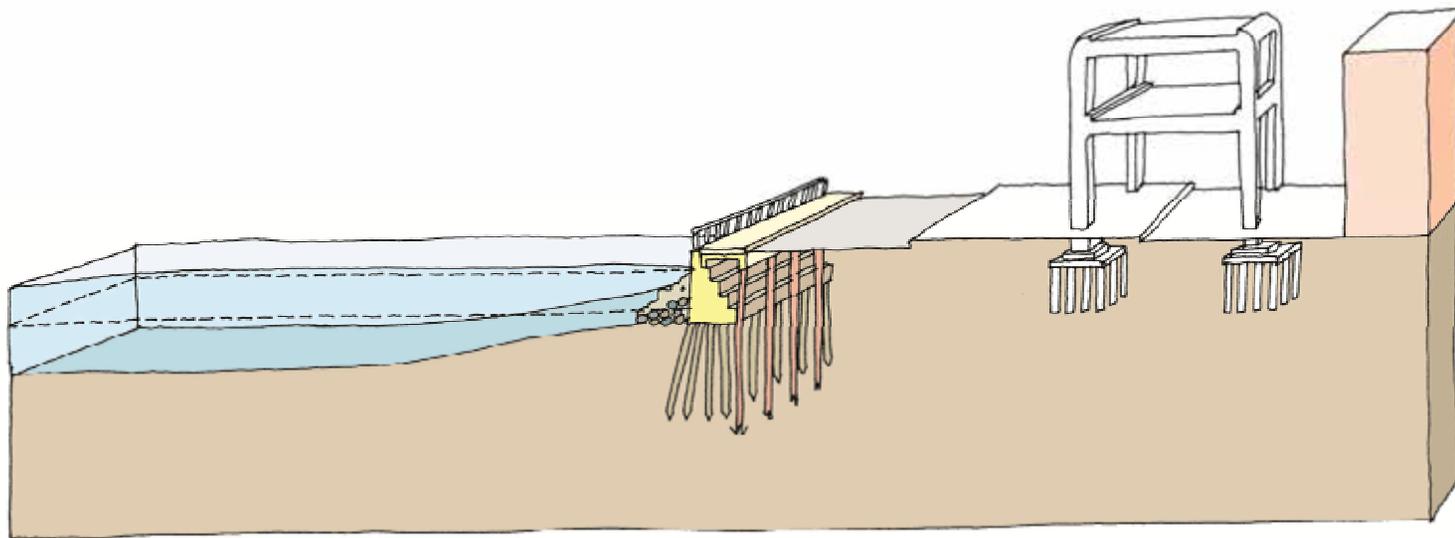
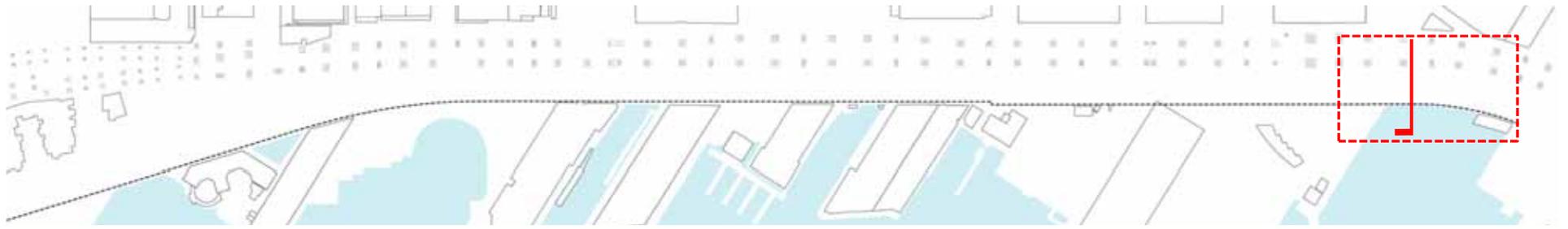
- existing seawall
- alternative seawall
- sidewalk
- multi-use path

alternative A 

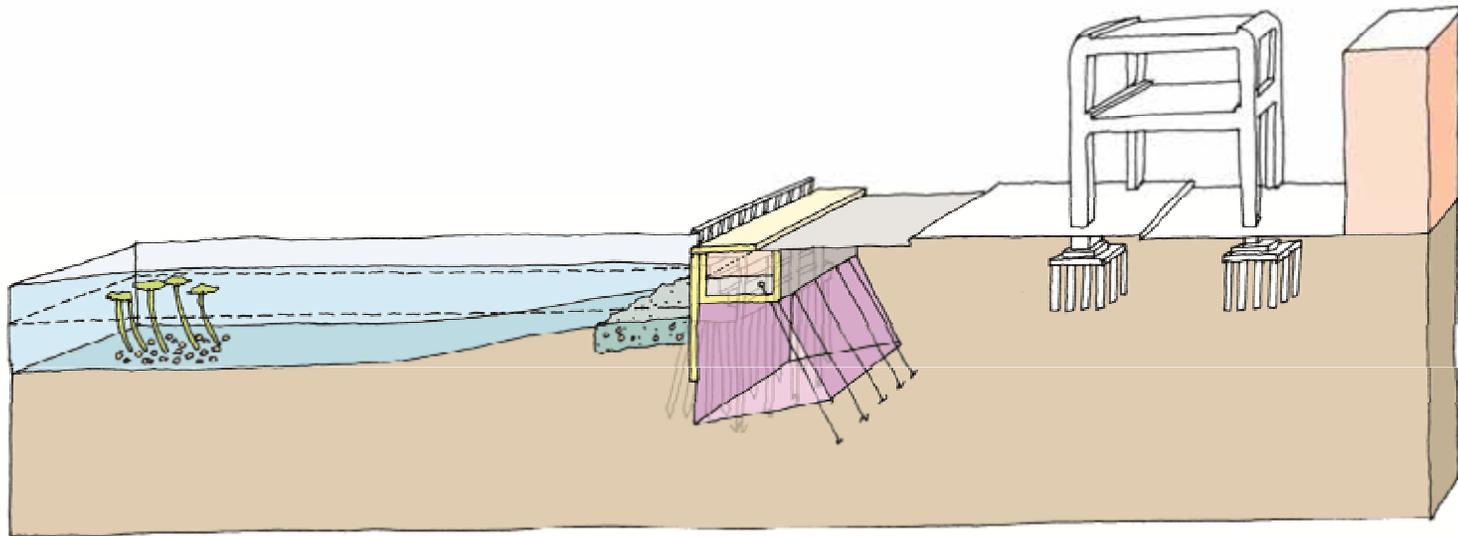
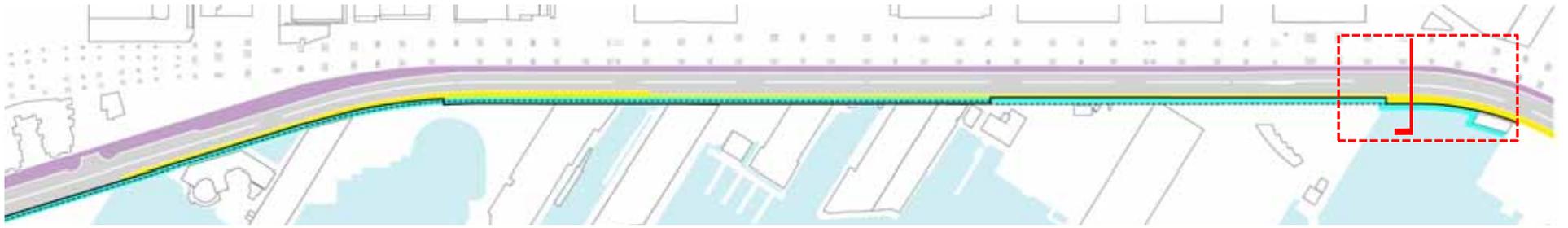


- existing seawall
- alternative seawall
- sidewalk
- multi-use path
- habitat corridor enhancement

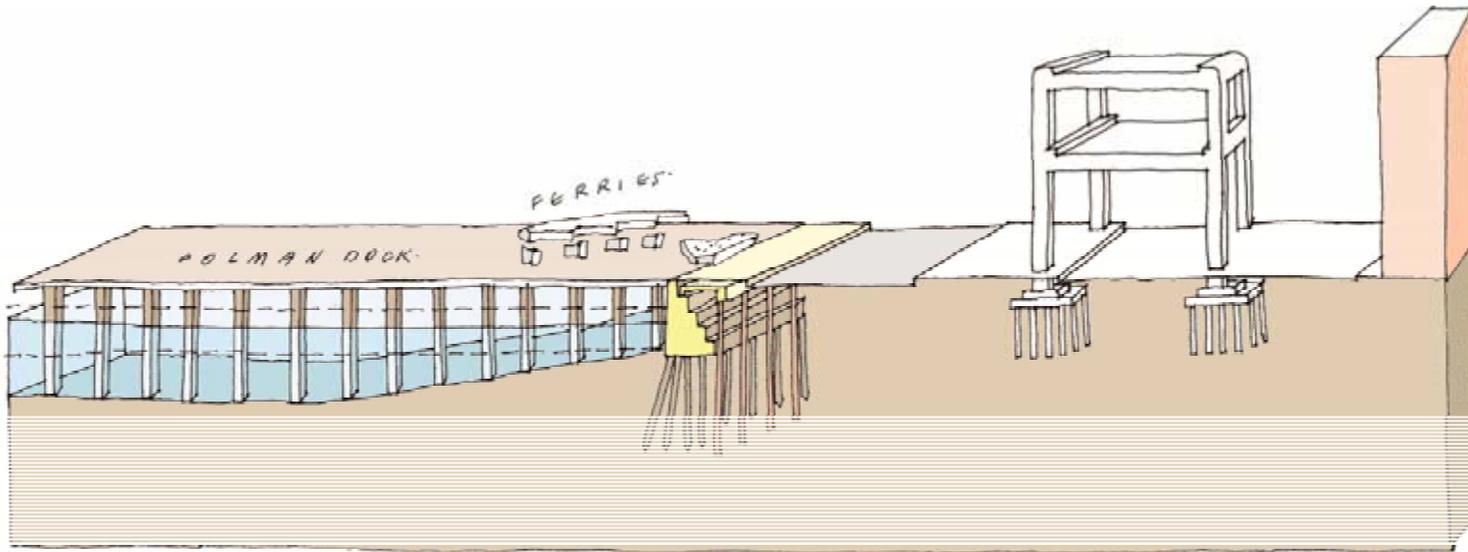
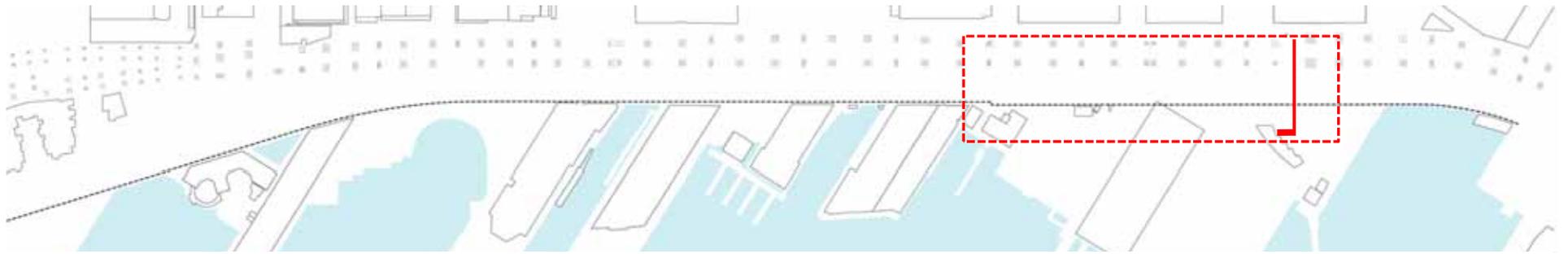
alternative A 



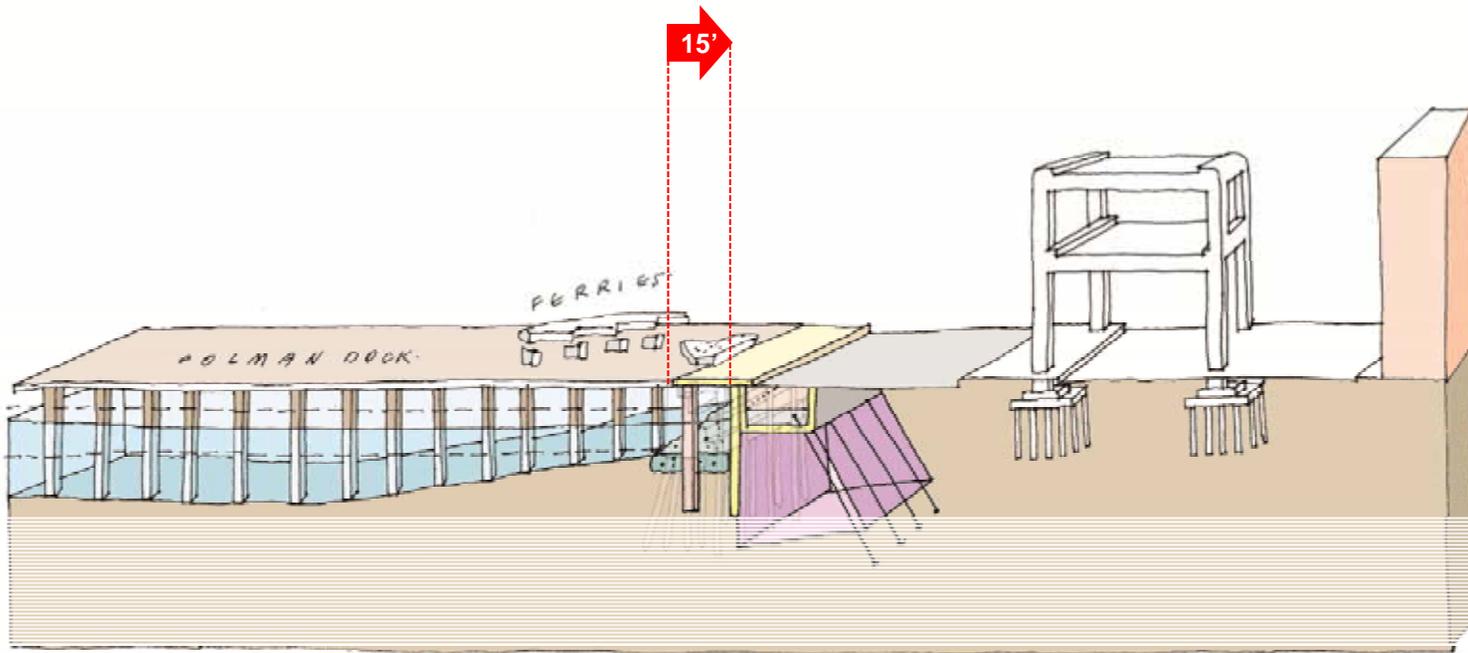
existing – zone 01



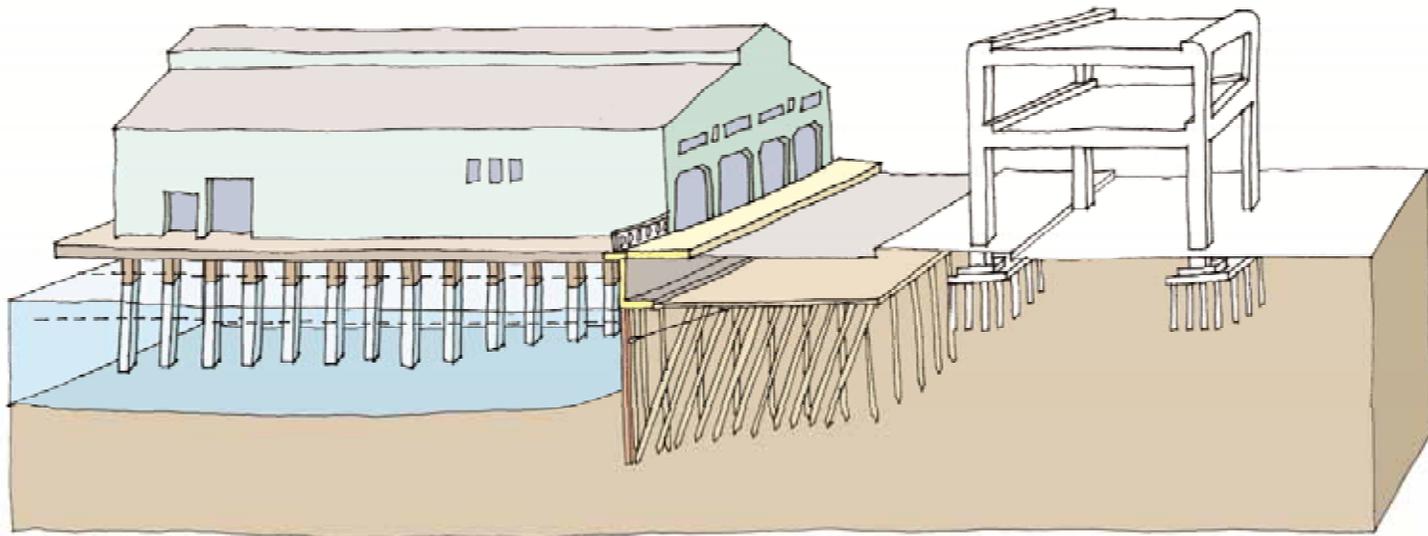
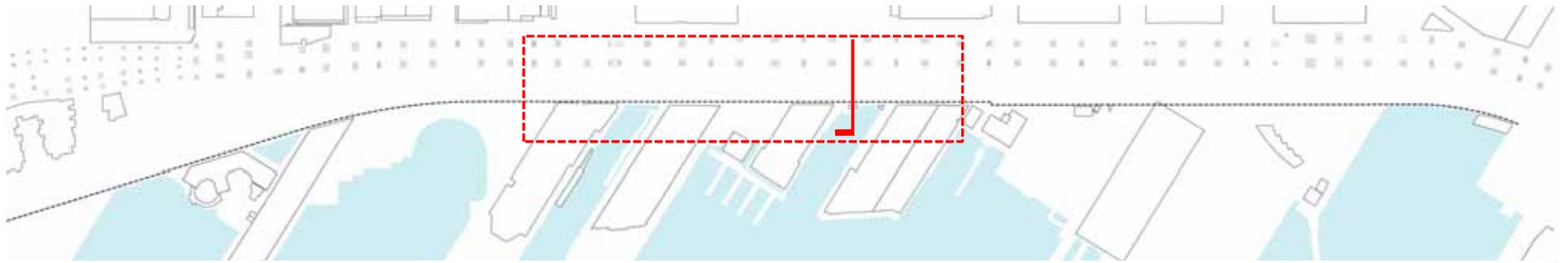
alt A – zone 01



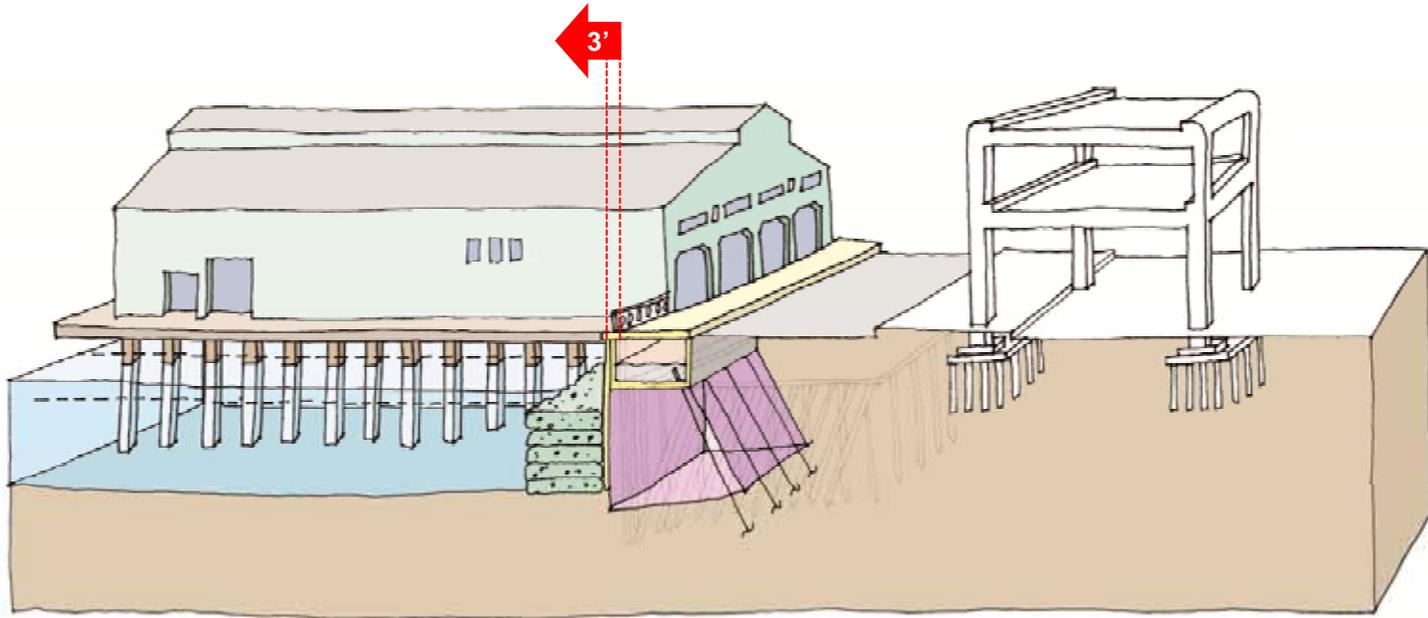
existing – zone 02



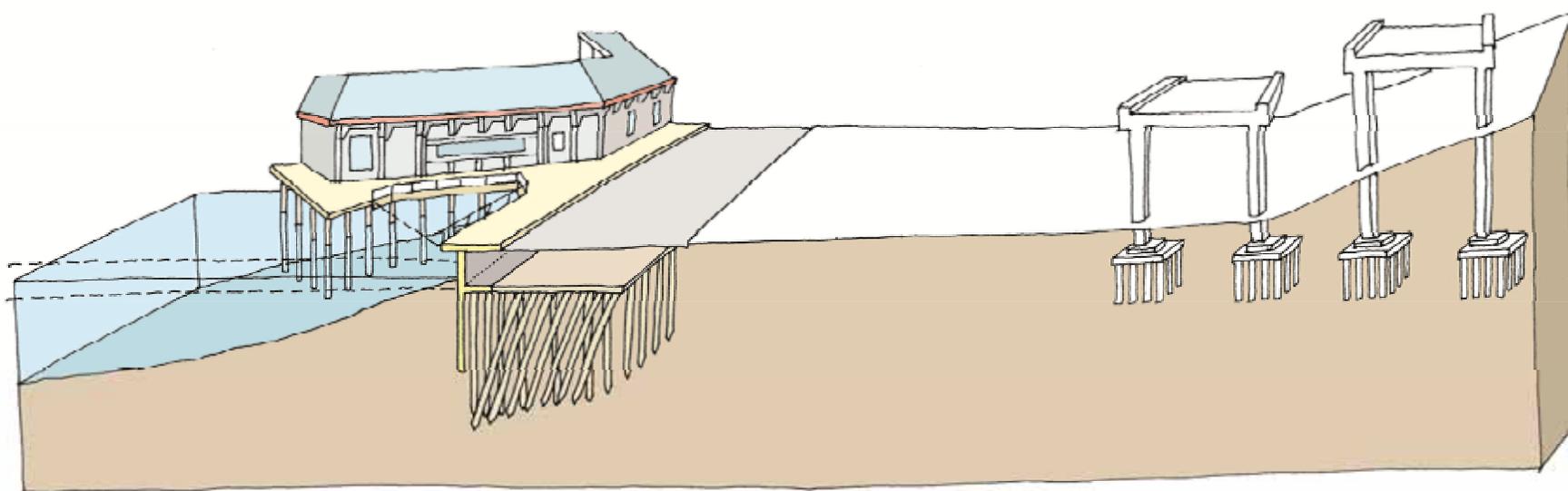
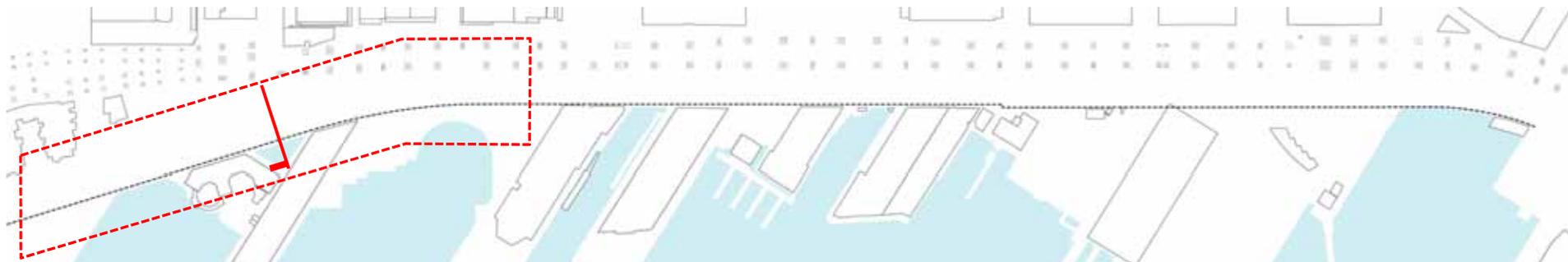
alt A – zone 02



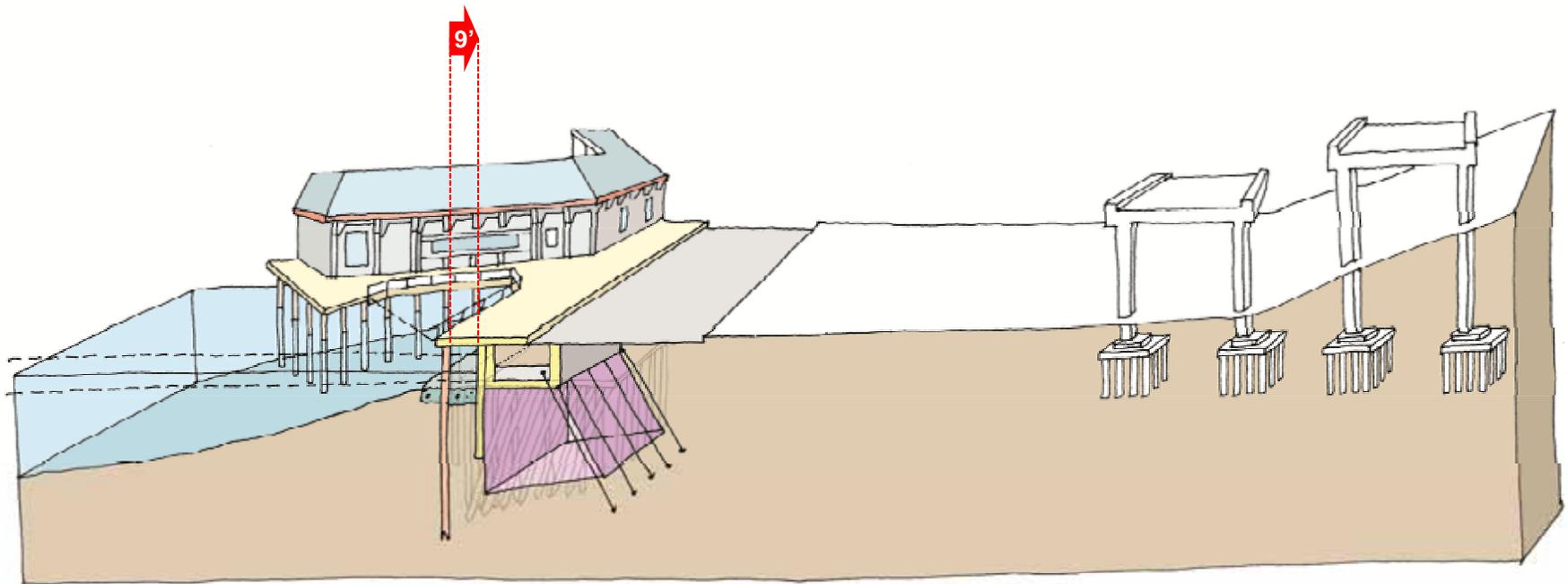
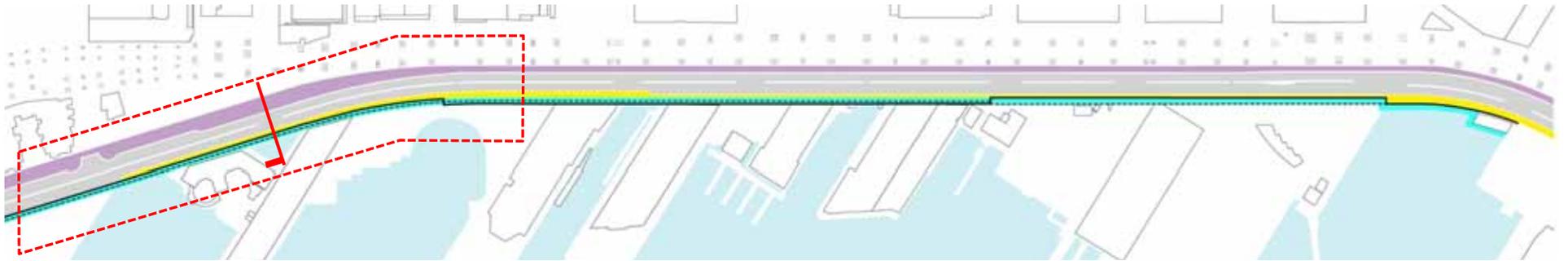
existing – zone 03



alt A – zone 03



existing – zone 04



alt A – zone 04



----- existing seawall

alternative B 



----- existing seawall
———— alternative seawall

alternative B  N



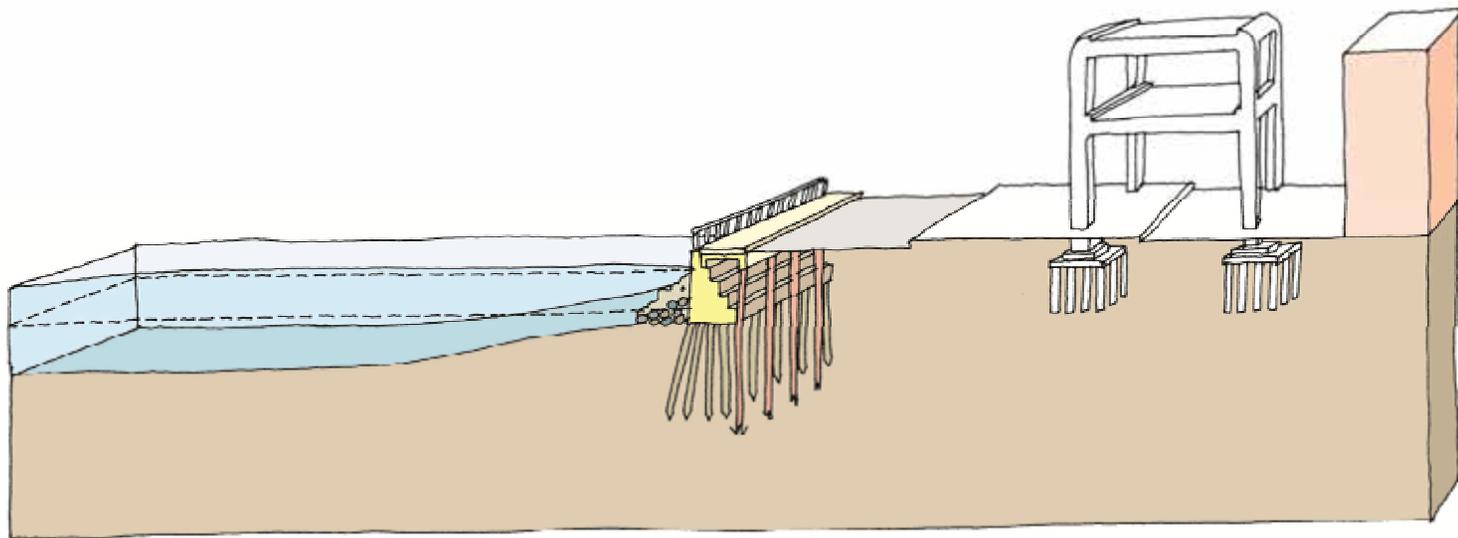
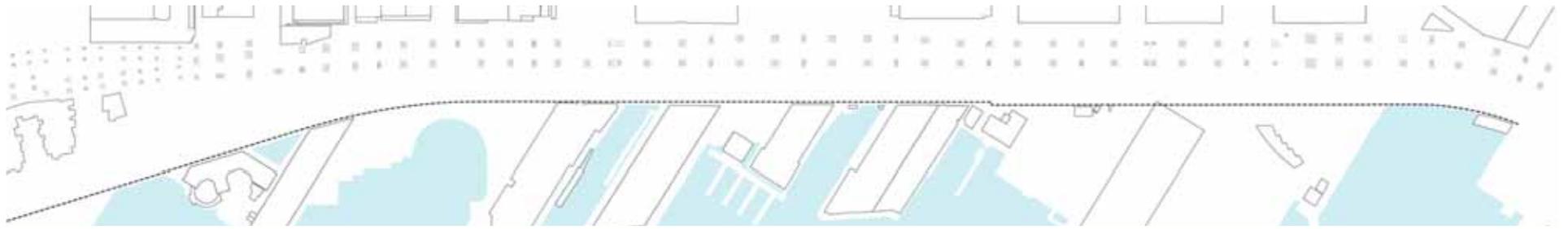
- existing seawall
- alternative seawall
- sidewalk
- multi-use path

alternative B  N

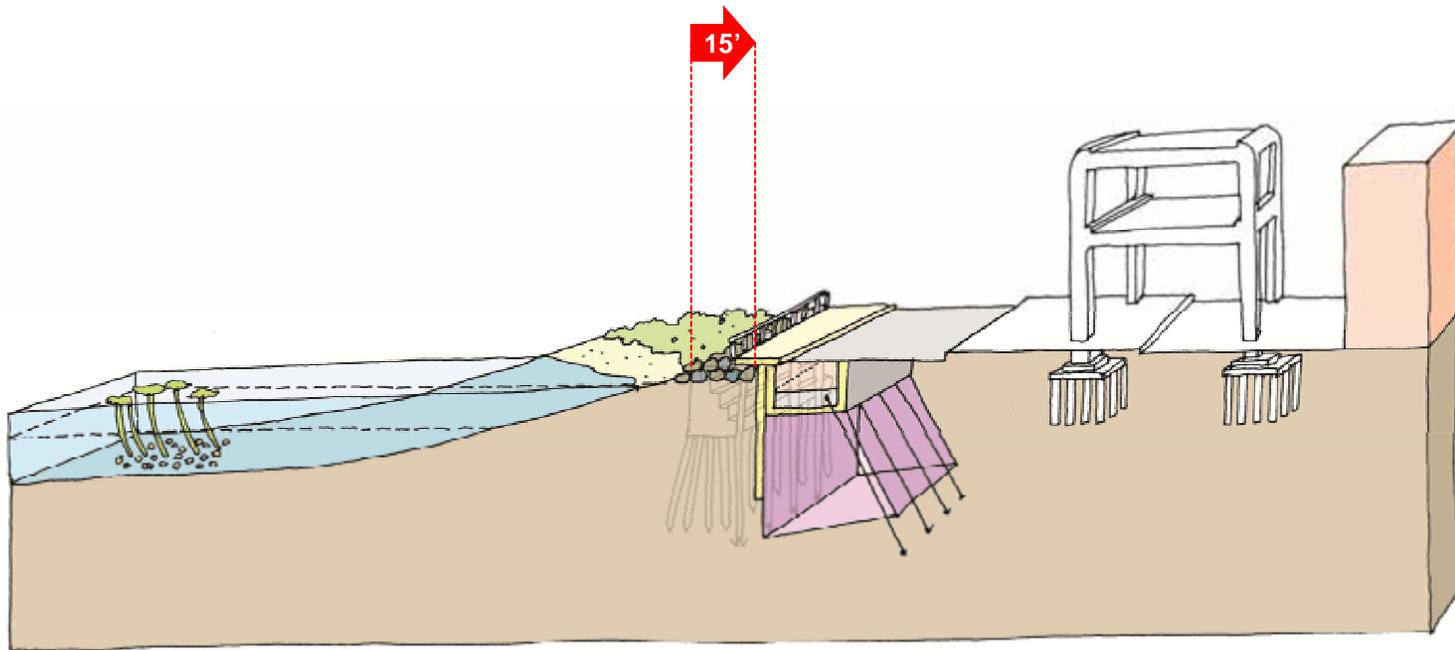


- existing seawall
- alternative seawall
- sidewalk
- multi-use path
- habitat corridor enhancement

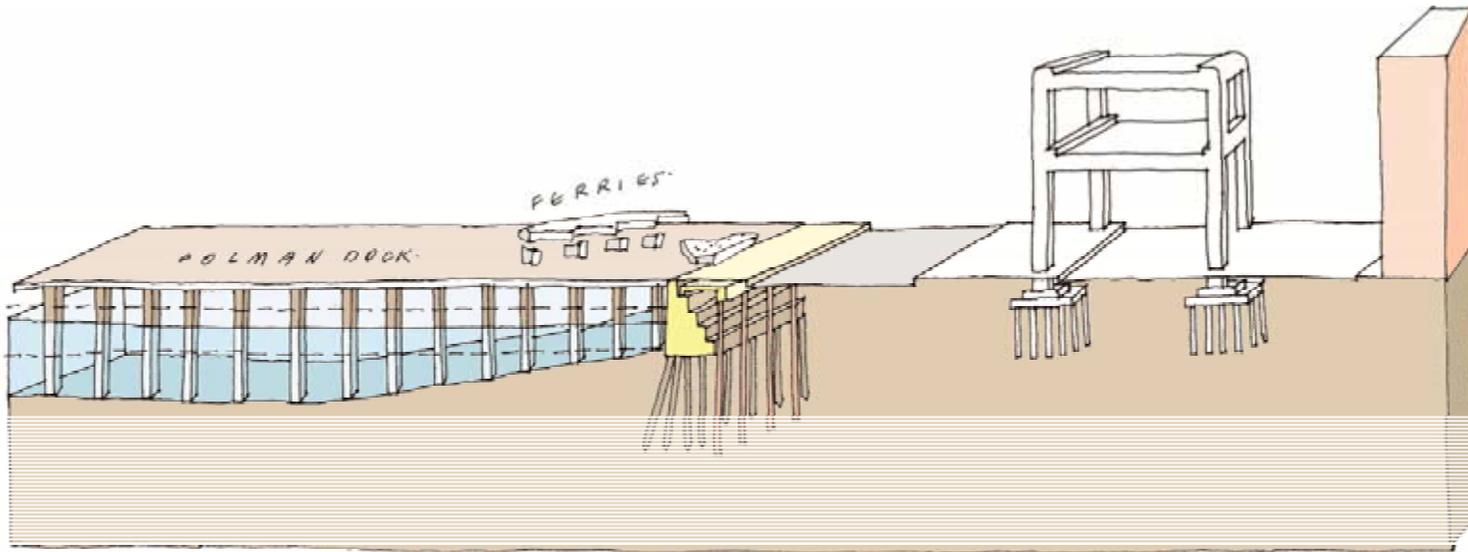
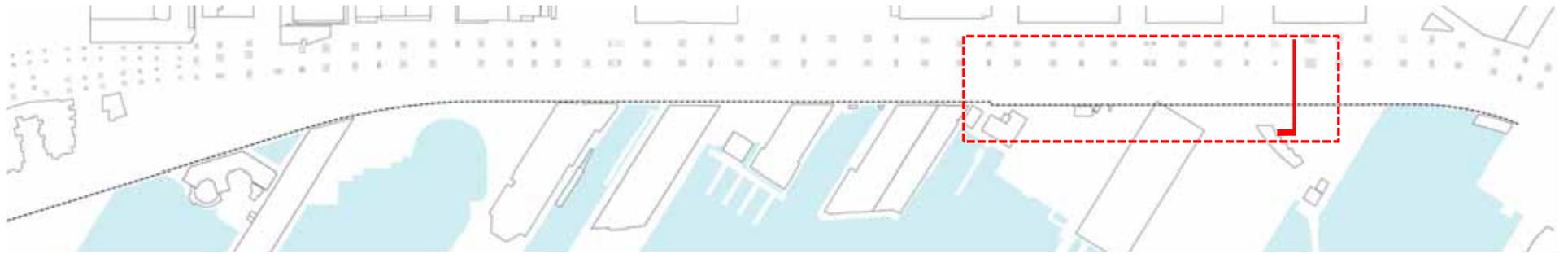
alternative B



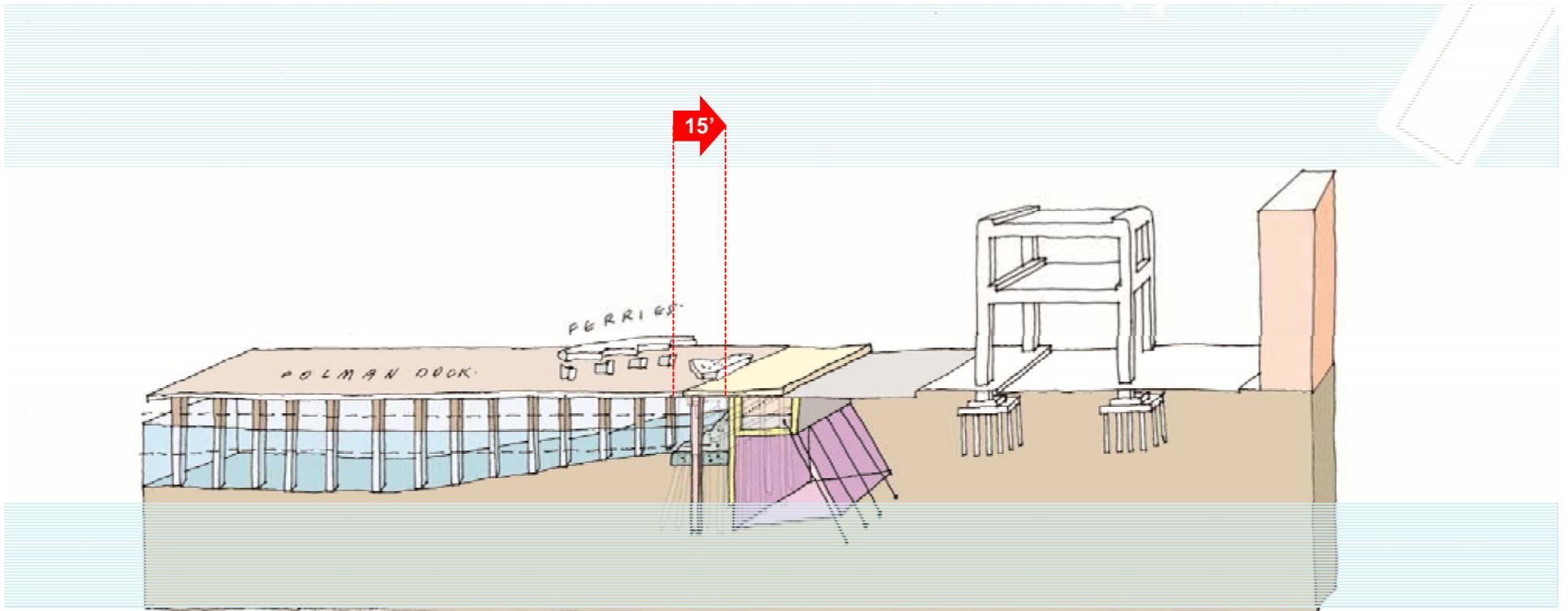
existing – zone 01



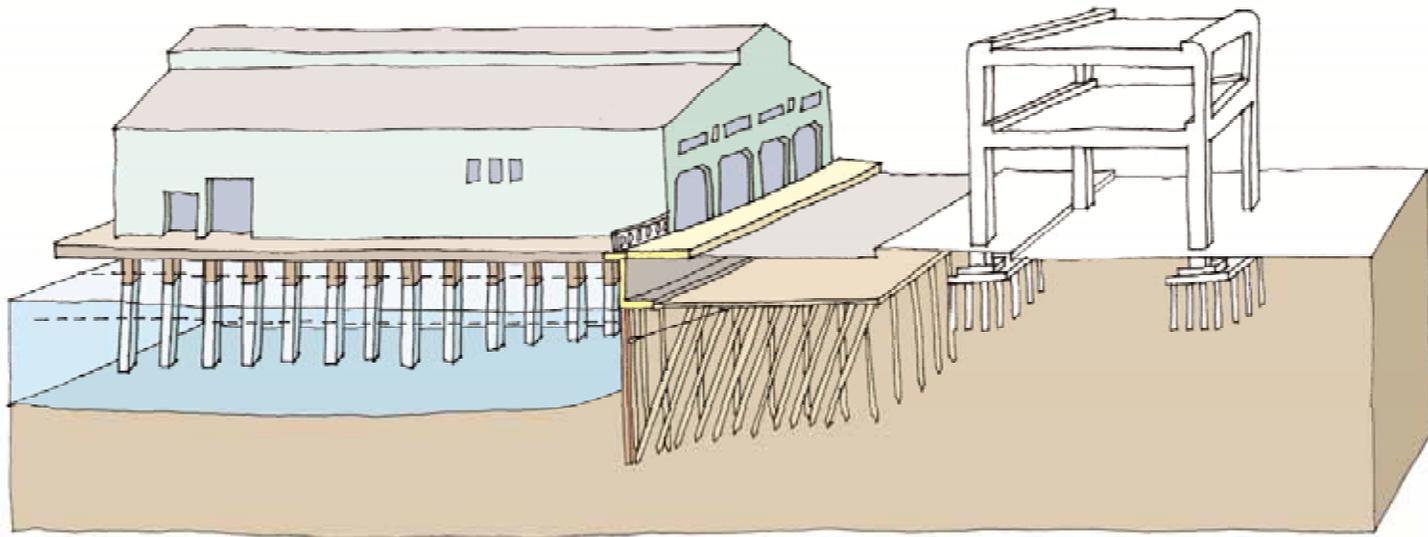
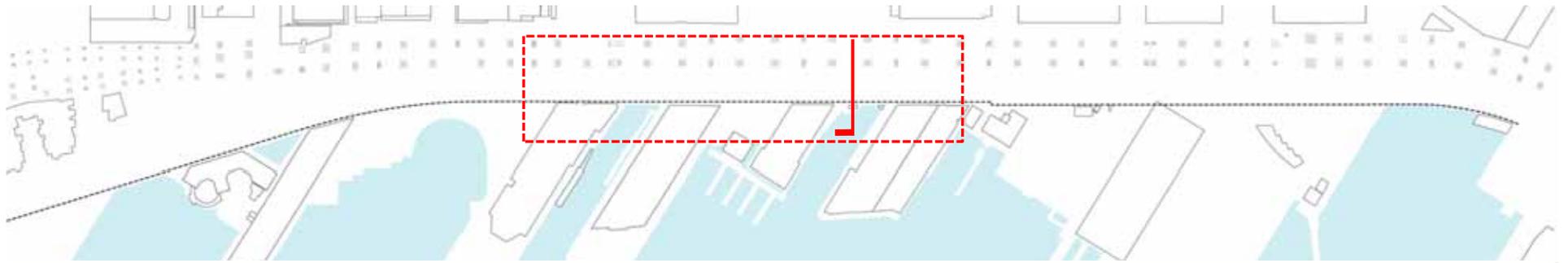
alt B – zone 01



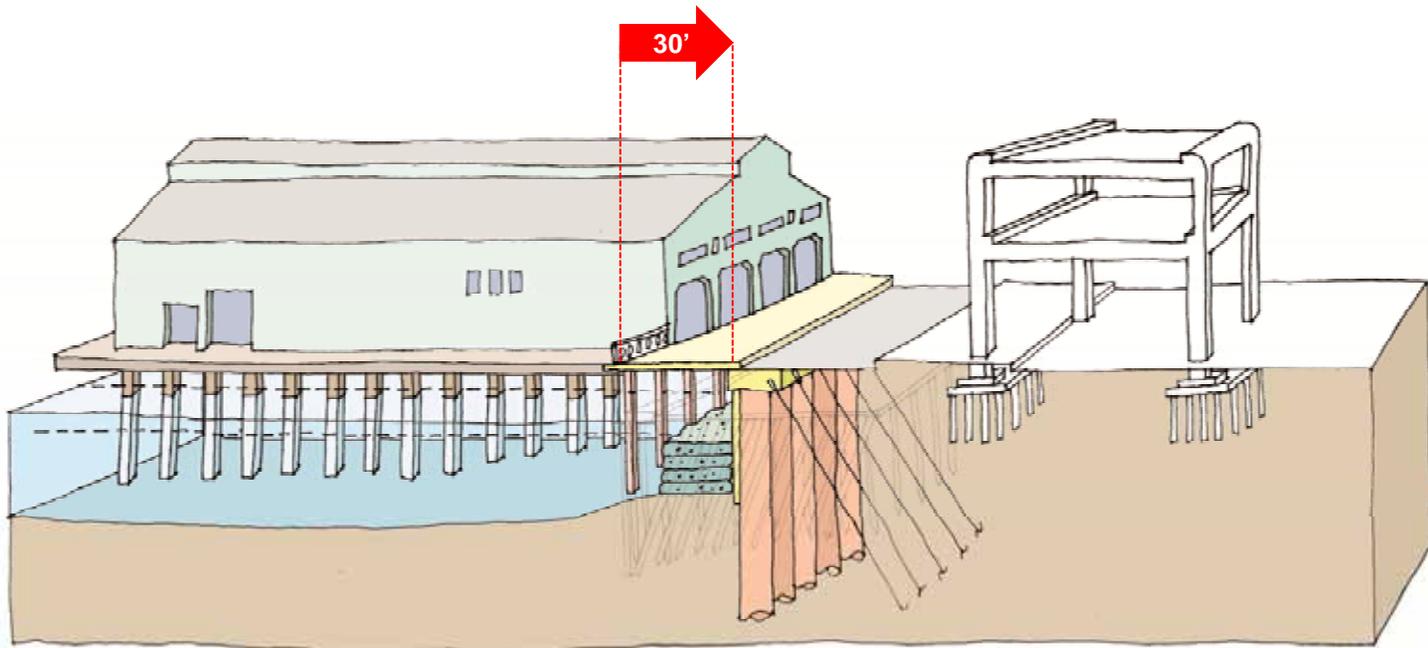
existing – zone 02



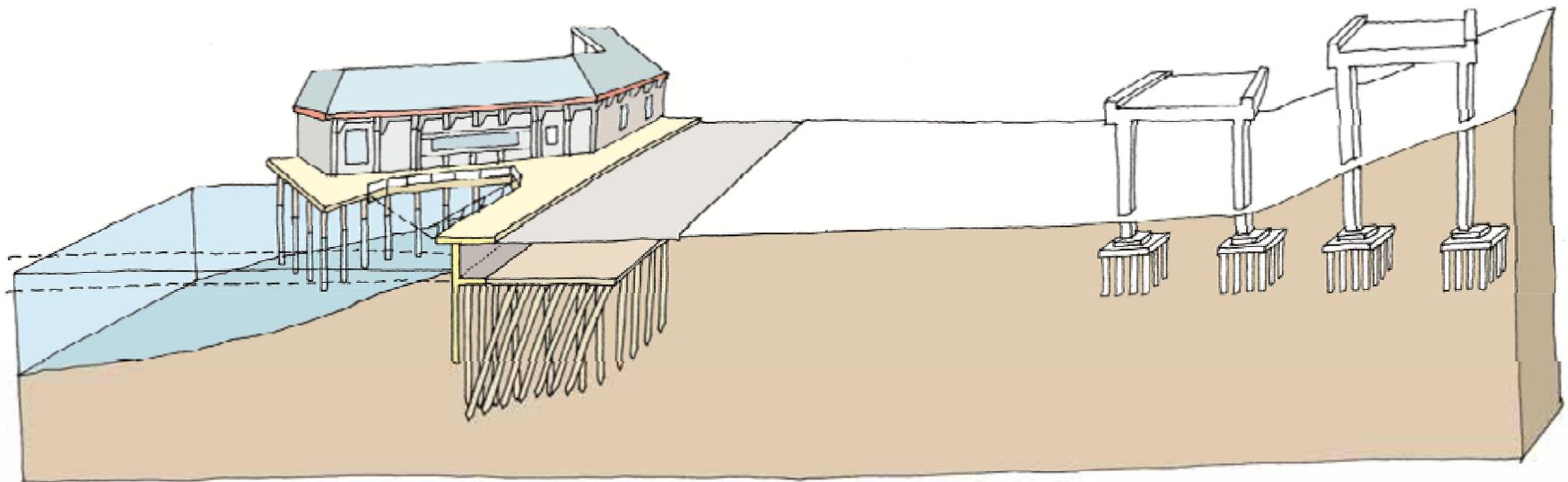
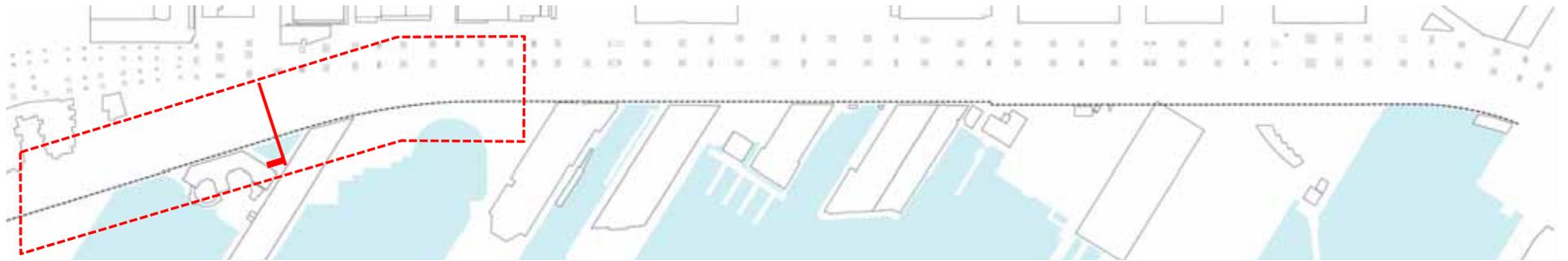
alt B – zone 02



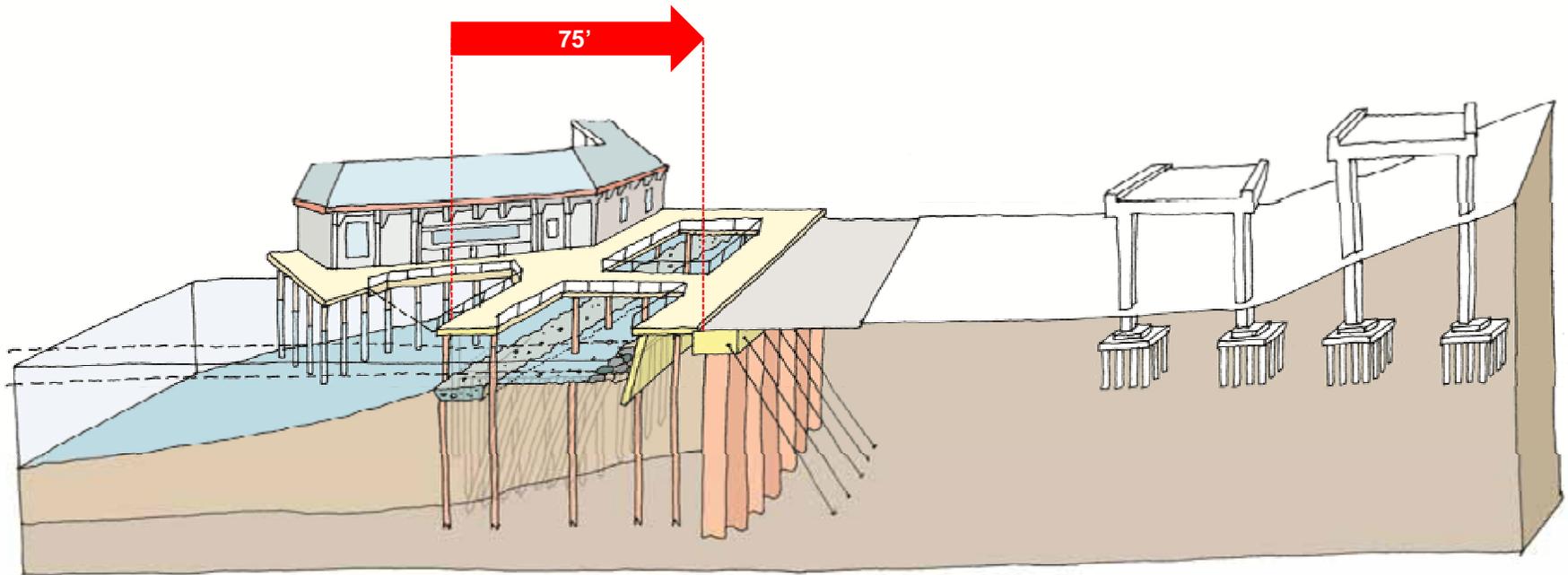
existing – zone 03



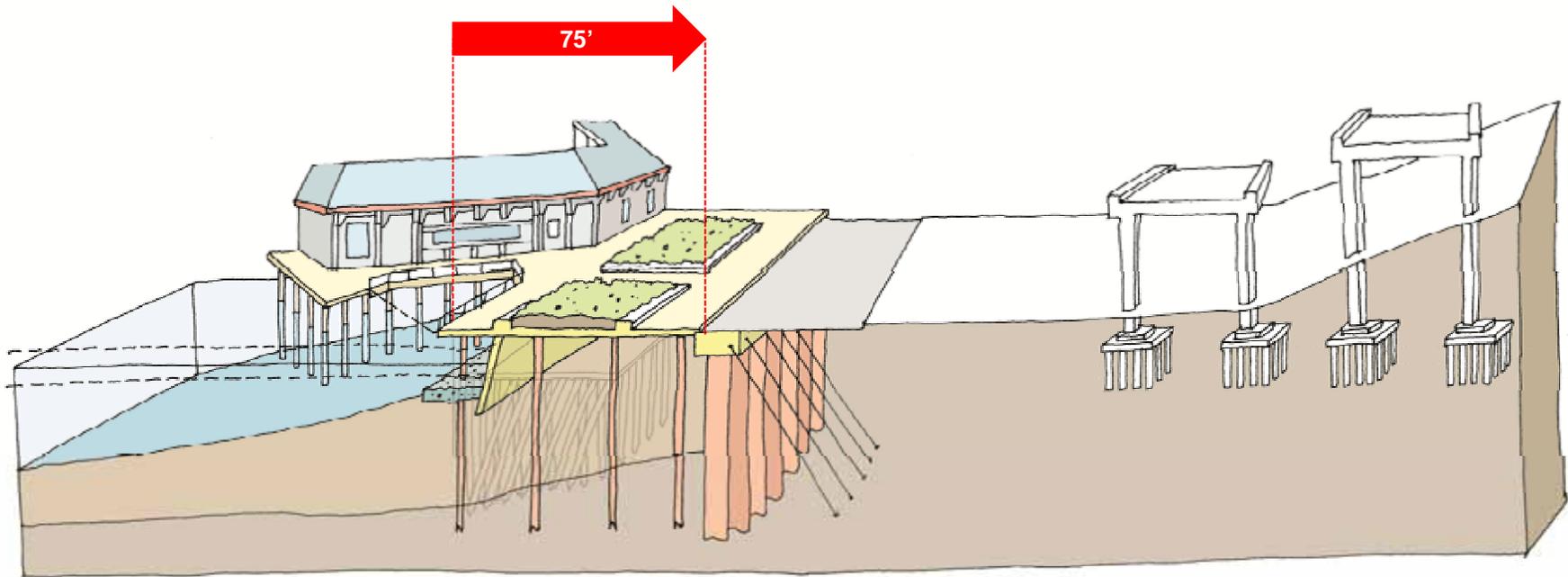
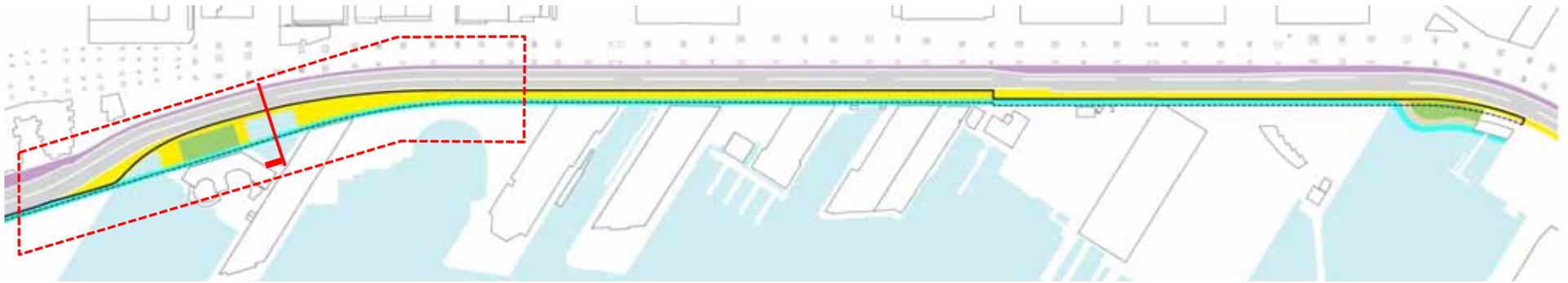
alt B – zone 03



existing – zone 04



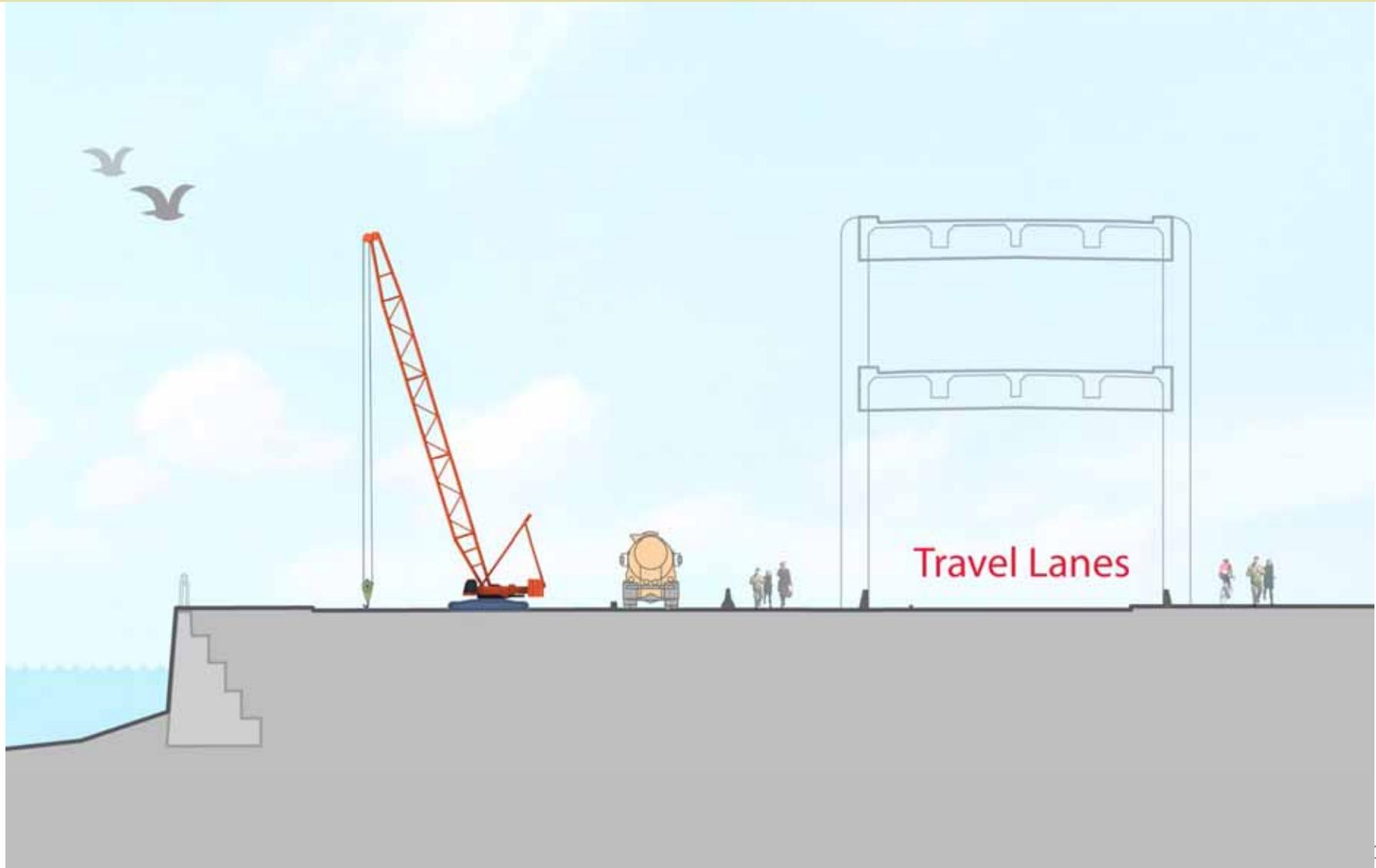
alt B – zone 04 (water)



alt B – zone 04 (land)

Seawall Construction

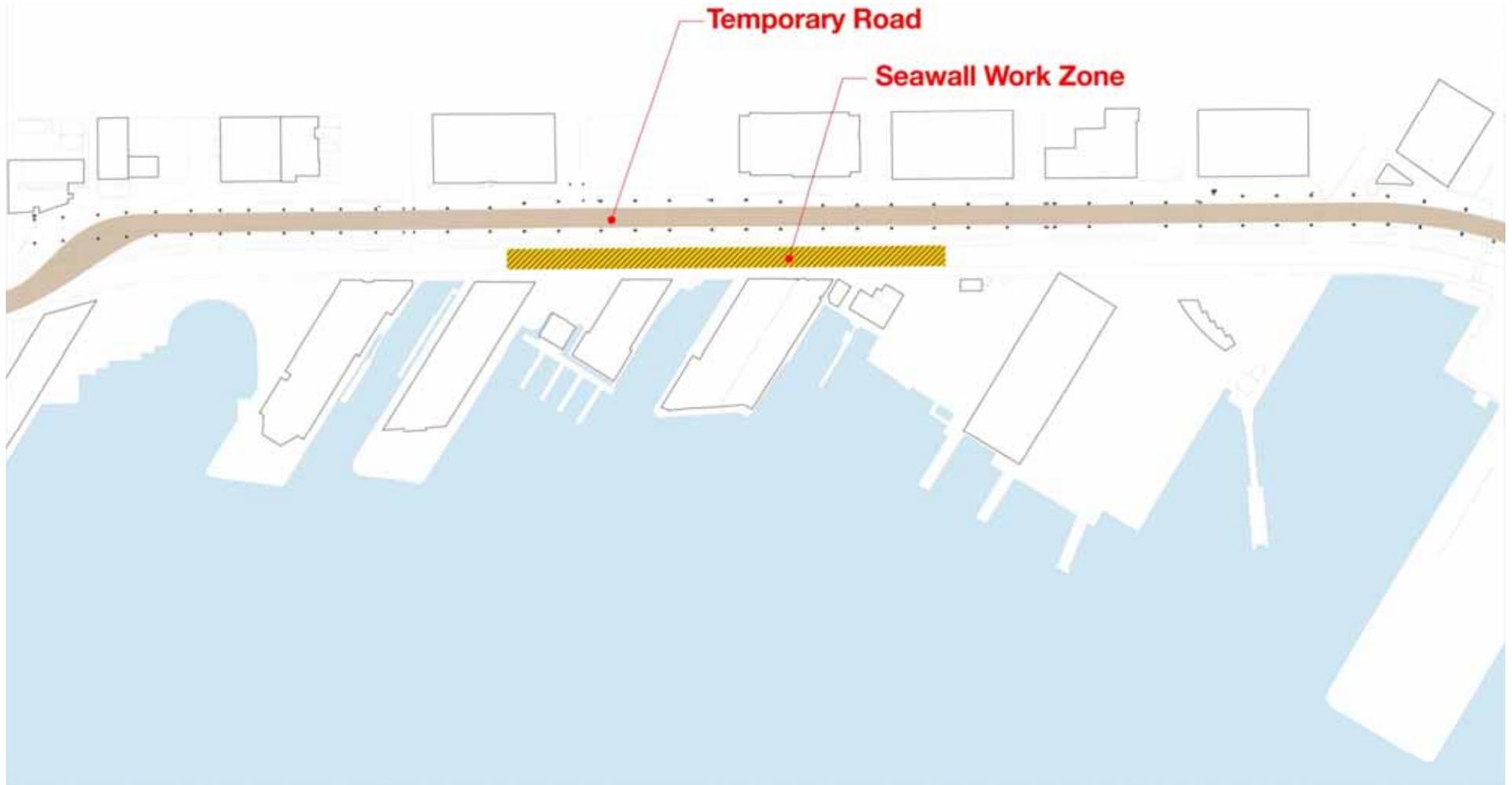
Potential Construction Roadway Configuration



Potential Temporary Road: Phase 1



Potential Temporary Road: Phase 2



Potential Temporary Road: Phase 3

