

Tide Pool Units

Flood Adaptation Measure



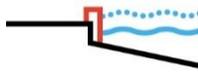
ECOLOGICAL INFRASTRUCTURE



WATER LEVEL RANGE:

Intertidal

SHORELINE LOCATION:



Shoreline



ECONcrete tide pool ©ECONcrete, Inc. (Vendor)

DESIGN LIFE Decades	ADAPTABILITY Low	IMPACT ON THE WATERFRONT Minor Intervention	CONSTRUCTION COST TBD
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COASTAL FLOOD HAZARDS MITIGATED:

Enhancements can provide flood protection when combined with other physical infrastructure



MEASURES COMPATIBILITY:		ECOSYSTEM SERVICES: Measure may affect these shoreline values			
Flood	Seismic	↑	—	—	—
Revetments, Breakwaters, Artificial Nearshore Reefs	N/A	Aquatic Habitat	Terrestrial Habitat	Water Quality	Carbon Storage
		—	—	—	—

DESCRIPTION:

Prefabricated tide pool units can be incorporated into shoreline protection structures in the intertidal zone. They are made of concrete and designed to mimic natural rock tide pools.

CONSIDERATIONS:

- Tide pool units are an attractive ecological enhancement to existing or new armor structures. Their design can enhance public experience of the waterfront while creating subtidal and intertidal habitat. Consideration should be given to create safe public access.

ADVANTAGES:

- Possible integration into structural flood and erosion protection structures.
- Increased habitat value and biodiversity.
- Can provide educational benefits to waterfront users.
- Construction can proceed with landside equipment.

DISADVANTAGES:

- Lifetime of units could be long. However, no long-term data are available about lifetime in different wave environments.
- Can present a hazard to people who are attracted to tide pools.

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- Wave environment, water levels, and geotechnical conditions are key to habitat development.

CONSTRUCTION IMPACTS TO THE PUBLIC:

- Construction impacts are minimal because units can be prefabricated offsite and installed using landside equipment.

SEA LEVEL RISE ADAPTATION OPPORTUNITIES:

- Habitat depends on the location of the units within the intertidal zone.
- Transient changes in water levels (e.g. storm surge) will not affect ecological value of the units.
- Intertidal habitats will not survive permanent submergence in the event of sea level rise due to climate change, but subtidal habitats will replace them.

CASE STUDIES:

- None cited.

DESIGN OPPORTUNITIES:

Ecological Enhancements

- Increase in biodiversity and marine habitat. Can be used in conjunction with stepped slopes to augment biodiversity.

Urban Design

- Design can be incorporated in public access to the waterfront. Opportunity for educational engagement with Bay habitat.

Form

- Form is maximized to provide shelter to marine organisms, but also can enhance visual interest.

DESIGN CONSIDERATIONS:

- Armor layer must be sized to remain stable under extreme wave conditions, as well as propeller wash from marine operations on-site.
- Consideration should be given to stability of surrounding armor units due to potential loss of interlocking with the tide pool units.
- Potential loss of foundation material may result in differential settlement and damage of the units.
- Placement within the intertidal area should be consistent with desired habitat.

SITE-SPECIFIC CONSIDERATIONS:

- Water levels, waves, currents, geotechnical conditions, propeller wash should be well defined.

URBAN DESIGN CONSIDERATIONS:

- Will attract people if incorporated in a waterfront accessible to the public. Structures surrounding the tide pool units should be designed to reduce hazards (e.g., walking, climbing, etc. on slippery surfaces).

INSTALLATION AND CONSTRUCTABILITY CONSIDERATIONS:

- Units are fabricated offsite.
- Stability requires careful placement of units to prevent damage and ensure adequate interlocking with adjacent units.
- Construction could be performed with landside equipment.

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OPERATIONS AND MAINTENANCE CONSIDERATIONS:

- Tide pool units could be more prone to damage than surrounding armor units under wave action. Periodic inspections should be performed to check for damage.