Cal Maritime Waterfront Master Plan

Produced for California State University Maritime Academy
v 6.0 | August 25, 2022

PREPARED BY

moffatt & nichol

IN CONSULTATION WITH

WRNS Studio

WRT

BKF Engineers

Page & Turnbull

ACKNOWLEDGMENTS

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The Faculty and Cadets of Cal Maritime

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1 Introduction

1.1 Plan Purpose

1.1.1 | OVERVIEW

The California State University Maritime Academy (Cal Maritime) is the only institution of its kind west of the Rocky Mountains. Its rich maritime tradition and unique stature make it a distinctive component of the California State University (CSU) system, offering accredited degree programs in seven undergraduate fields that include marine transportation, marine engineering technology, mechanical engineering, facilities engineering, global studies/maritime affairs, business administration, and oceanography.

The waterfront is one the most visible components of the Cal Maritime campus and supports important teaching and recreational features. These include a publicly accessible waterfront promenade, an operational port for small craft, an operating pier, and the Training Ship Golden Bear (TSGB)—a 500ft training vessel used for cadet instruction and on-board living. Working and learning on the water is a vital part of the Cal Maritime cadet experience.

While symbolically and operationally important, the waterfront has never undergone significant master planning and, as a result, has developed in an ad-hoc manner. The current state of many waterfront facilities and infrastructure varies from good to poor and there are extensive repairs or upgrades needed.

Cal Maritime anticipates academic and operational changes over the next five years (2022 to 2027) that elevate the need for assembly of a master plan specific to its waterfront. Of greatest importance is to make ready for arrival of the next generation of state-of-the-art training ships—the National Security Multi-Mission Vessel (NSMV). Recently funded as part of H.R. 2471, the Consolidated Appropriations Act, 2022, Cal Maritime's new training vessel will be the fifth in a fleet of ships specifically designed for U.S. maritime academies and will replace the TSGB. Arrival of Cal Maritime's NSMV will elevate the level of training and shipboard experience for cadets. As these vessels remain part of the Maritime Administration's (MARAD) National Defense Reserve Fleet, they may be called into specialized national service. This dual role of training and service will place unique demands on the landside and in-water infrastructure supporting its future Cal Maritime home port.

The goal of the 2022 Cal Maritime Waterfront Master Plan (WFMP) is to identify and incorporate projects into a comprehensive document to help guide investment. The WFMP prioritizes improvements into a phased plan spanning 10 years. The document identifies necessary in-water and adjacent landside improvements while also taking into account academic and port operations, environmental factors, and the long-term resiliency of the waterfront.

Legend

Dining Center	1
Mayo Hall - Old Gym / Pool	2
Rizza Auditorium	3
Administration	4
STEAM Plant Simulator	5
Simulation Center	6
Marine Programs Building	7
Naval Sciences Building	8
Alumni Plaza	9
Seamanship Building (Boathouse)	10
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Boat Basin	13
Pier	14
Marine Yard	15

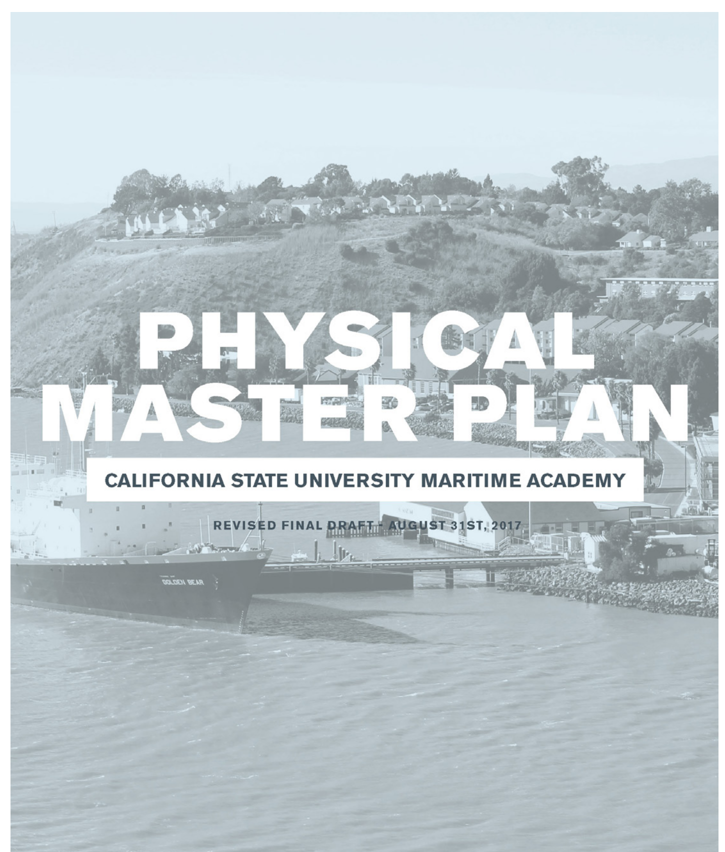
FIGURE 1 – CAL MARITIME'S WATERFRONT TODAY

FIGURE 2 – THE 2017 PHYSICAL MAP PLAN

1.1.2 | A COMPANION TO THE 2017 PHYSICAL MASTER PLAN

Completed in 2017, Cal Maritime's recent Physical Master Plan offers a clear roadmap for the future of the campus to accommodate goals of institutional growth. It depicts the existing and anticipated facilities necessary to accommodate the academic master plan and institutional growth to 2,200 Full Time Equivalent (FTE) cadets by 2032, in accordance with approved educational policies and objectives. It also identifies space needs to host Cal Maritime expanded activities; supports creation of safe, livable, and attractive campus environments; solidifies a vibrant and enduring campus character; seeks to improve campus mobility; establishes sustainable planning and design practices for the stewardship of Cal Maritime's natural resources; and other important endeavors.

The Cal Maritime WFMP is a companion document to the 2017 Physical Master Plan. Both documents are intended for use together to guide Cal Maritime investment in landside and in-water assets. Landward improvements depicted in the Cal Maritime WFMP largely mirror those in the 2017 Physical Master Plan. The proposed restoration and upgrade of the Boathouse and creation of a new Marine Programs Multi-Use Building—both phased waterfront investments described in detail throughout the plan—are the exceptions, and supersede concepts and features presented in the Physical Plan.



1.1.3 | A COMPANION TO MEET THE NSMV PROGRAM OBLIGATIONS

In 2017, the National Defense Authorization Act authorized the NSMV program. The purpose of this program is to primarily address the aging training fleet at the U.S.'s State Maritime Academies (SMAs), allowing these vessels to greatly expand and improve training capabilities, and serve as critical support assets for the federal government in times of need. To be constructed and delivered over a +/-8 year period, the NSMV program represents one of the most far-reaching, transformative changes at SMAs over the last 25 years.

NSMV arrival at each SMA places significant obligations on each institution to make ready and support these unique training ships. Modification and expansion of in-water and upland infrastructure needs to be planned, funded, permitted, and executed prior to vessel arrival.

The Cal Maritime WFMP outlines the improvements necessary to meet the physical and operational requirements of the NSMV vessel. These improvements are prioritized under Phase 1 of the plan and timed to meet the currently slated arrival target of late 2026 / early 2027. All infrastructure elements depicted in the WFMP for the NSMV and other campus needs are presented at a conceptual master planning level. Each project outlined in Section 5 will require additional project definition / description and detailed design work associated with California Environmental Quality Act (CEQA) and other local, state, and federal permitting. Additional detailed design may also be required for grant applications with the U.S. Department of Transportation Maritime Administration (MARAD) and other agencies. A full listing of these agencies is offered in Section 6.1.2.

FIGURE 3 – NSMV FACT SHEET

NATIONAL SECURITY MULTI-MISSION VESSEL

MULTI-MISSION PURPOSE

Established primarily to address an aging training fleet, the new purpose-built NSMV enhances the Nation's six state maritime academies' (SMAs) training capabilities and serves as critical support assets for the federal government in times of need.

STATE-OF-THE-ART TRAINING CAPABILITIES

The size of the new vessel allows it to support the capabilities required to provide the next generation of mariners with a world-class education through state-of-art technologies. NSMV provides training assets to better meet each SMA's needs. By attracting more cadets and better equipping them to become part of and sustain the U.S. Merchant Marine, the NSMV will help close the critical shortfall in the maritime workforce.

Although the NSMVs will be berthed at five state maritime academies, students at all six SMAs and the U.S. Merchant Marine Academy (USMMA) will have access to the state-of-the-art training capabilities and opportunities to cross deck to alternate training vessels when they need additional days at sea. Training capabilities include:

- Convertible classrooms and workshops
- Simulator and laboratory spaces
- Dedicated training bridge and navigation lab
- Large multi-purpose space
- Accommodations for up to 600 cadets and 100 officers, faculty, staff and crew plus an additional 60-person surge capacity

DISASTER RESPONSE CAPABILITIES

When not on training missions, the federal government can mobilize the NSMVs to support humanitarian assistance and disaster relief (HA/DR) in times of need. Disaster response capabilities include:

- Modern medical facilities
- Berthing for up to 1,000 emergency responders, recovery workers and crew
- Helicopter landing area
- Container storage capacity of up to 60 TEUs
- Roll-on/roll-off loading ramp and vehicle stowage capabilities

Photo credit: MARAD

NSMV PROGRAM CREATES JOBS

The NSMV creates and supports good-paying, American jobs, with over **1,200 shipyard jobs during construction and additional jobs at sea and ashore once completed**, while strengthening the U.S. shipbuilding, repair and manufacturing industries.

Photo credit: Philly Shipyard

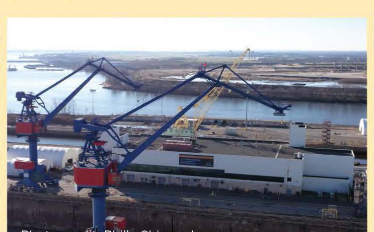


Photo credit: Philly Shipyard

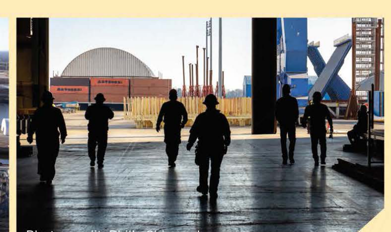


Photo credit: Philly Shipyard

FOR MORE INFORMATION:

Visit *www.maritime.dot.gov*

For media or congressional inquiries, contact the Office of Congressional and Public Affairs at maradpressoffice@dot.gov

INNOVATIVE MODEL

The NSMV showcases a new model of federal government shipbuilding, in which the U.S. leverages the expertise of commercial owners/operators/shipbuilders with experience building U.S.-flagged vessels. By applying this new approach to government-owned vessels, MARAD benefits from commercial best practices of design standards and construction. This efficient and cost-effective process better supports U.S. national security interests by building vessels **as designed, on schedule for a fixed price**. Additionally, each ship will meet or exceed the latest environmental standards.

HIGH LEVEL OF SAFETY

Classed as a Special Purpose Ship, the NSMV design meets national and international safety requirements, such as the Safety of Life at Sea and Public Nautical School Ship requirements.

EACH SHIP WILL MEET THE HIGHEST CURRENT AND FUTURE ENVIRONMENTAL STANDARDS.

BASIC SPECIFICATIONS OF NSMV

PRINCIPLE DIMENSIONS

- Length 160.05 m (525'-1")
- Beam 27.0 m (88'-7")
- Depth 16.8 m (55'-1.5")
- Design Draft 6.5 m (21'-4")
- Range: 10,000+ miles at 18 knots

PROPULSION, SPEED AND CONSUMPTION

- Diesel electric
- Four main engines segregated in two engine rooms
- Total installed power – 16,800 kW plus 900 kW Emergency Generator
- Two sets of electric propulsion motors in series with an output of 9,000 kW
- Full speed – 18 knots with 15% sea margin
- Cruising speed – 12 knots with 15% sea margin

MANEUVERING

- NSMV designed with capability to perform normal docking without assist tugs
- 1800 kW Retractable, Azimuthing Bow thruster
- 890 kW Stern thruster
- Flap type rudder

@DOTMARAD *Maritime Administration*

1.2 Planning Process

1.2.1 | PROCESS

The WFMP planning process commenced in May 2021 and occurred over a 10-month time frame. The engineering firm Moffatt & Nichol led this effort, with extensive contributions provided by WRNS Studio and Wallace, Roberts, Todd (WRT)—firms responsible for the 2017 Physical Master Plan—BKF Engineers, and Page & Turnbull.

The process involved four key activities:

- **STEP 1**. Assemble a detailed understanding of the campus waterfront;
- **STEP 2**. Survey the needs of the campus community and develop a plan framework and initial concepts based on received feedback;
- **STEP 3**. In collaboration with the campus community and stakeholders, prepare and advance initial plan concepts; and,
- **STEP 4**. Finalize a singular planning direction forward with supporting cost and implementation elements.

1.2.2 | COLLABORATION

Each planning activity included extensive client and community outreach and consultation. These included:

- Work sessions with Cal Maritime's WFMP Working Group and Cadet and Faculty Focus Groups;
- One-on-one meetings with faculty and staff;
- Presentations to the Cal Maritime President's Cabinet; and,
- Engagement with broader campus community via web survey and open house meetings.

Outreach activities and results are detailed in Section 2.

DATA COLLECTION, SITE ASSESSMENT, AND CASE STUDY

STEP 1 UNDERSTAND

PLAN FRAMEWORK AND CONCEPTS EXPLORATION

STEP 2 EXPLORE

DRAFT PLAN FORMULATION AND IMPLEMENTATION STRATEGIES

STEP 3 DECIDE

PREPARE FINAL MASTER PLAN AND MOVE TO IMPLEMENTATION

STEP 4 FINALIZE

1.3 Planning Area

1.3.1 | CONTEXT

The Cal Maritime campus is located at the foot of the Carquinez Bridge approximately two miles south of Downtown Vallejo and at the southwest corner of Solano County. Tucked into steep coastal hillsides, the campus affords panoramic views from the Napa River to San Pablo Bay and the Carquinez Strait.

The physical orientation of the Cal Maritime campus tends to be inwardly focused with an identifiable edge. As offered in the 2017 Physical Master Plan, campus design can be characterized as a “village on the cove,” in which Cal Maritime’s programs and activities are centered within the campus while remaining sheltered from the surrounding residential areas. Other surrounding land uses include a highway-oriented commercial corridor along I-80, as well as community facilities such as parks, a school, and a community center.

1.3.2 | PLANNING AREA

Cal Maritime consists of 76 acres of land area (88 acres including Morrow Cove) and over 40 buildings. The approximately half mile of waterfront is the campus’s dominant natural feature and the main focal point of Cal Maritime instruction and activities. The main pier and berth for the TSGB and adjacent boat basin are major features of the southeastern edge of the waterfront. These elements transition into a linear waterfront park punctuated by smaller plazas and open spaces running the length of Morrow Cove Road to the Dining Center found at the northwest extent of the campus. The entirety of the waterfront and in-water marine structures comprise the total planning area of the WFMP.

FIGURE 4 – CAL MARITIME CONTEXT

Source: Physical Master Plan: California State University Maritime Academy, 2017

FIGURE 5 – PLANNING AREA AND LOCATION OF KEY WATERFRONT USES AND BUILDINGS

Legend

Project Limits (Planning Area)	
Dining Center	1
Mayo Hall - Old Gym / Pool	2
Rizza Auditorium	3
Administration	4
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Simulation Center	6
Marine Programs Building	7
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Shoreside Boiler, Workshop & Yard	15

2 Campus Engagement

2.1 Outreach Efforts

2.1.1 | OVERVIEW

Plan-making involves building trust and working collaboratively to translate community desire into compelling, actionable proposals. Community collaboration often includes combinations of in person, one-on-one, and one-on-group work sessions supported by online engagement tools.

A similar approach was taken in developing the WFMP, where the Cal Maritime community's goals, desires, and expectations for the waterfront were critical in plan formulation. In this section, we review the varied approaches, outcomes, and important insights garnered collaboration with cadets, faculty, and staff. Work from each of these interactions was critical in plan formulation.

2.1.2 | PROCESS

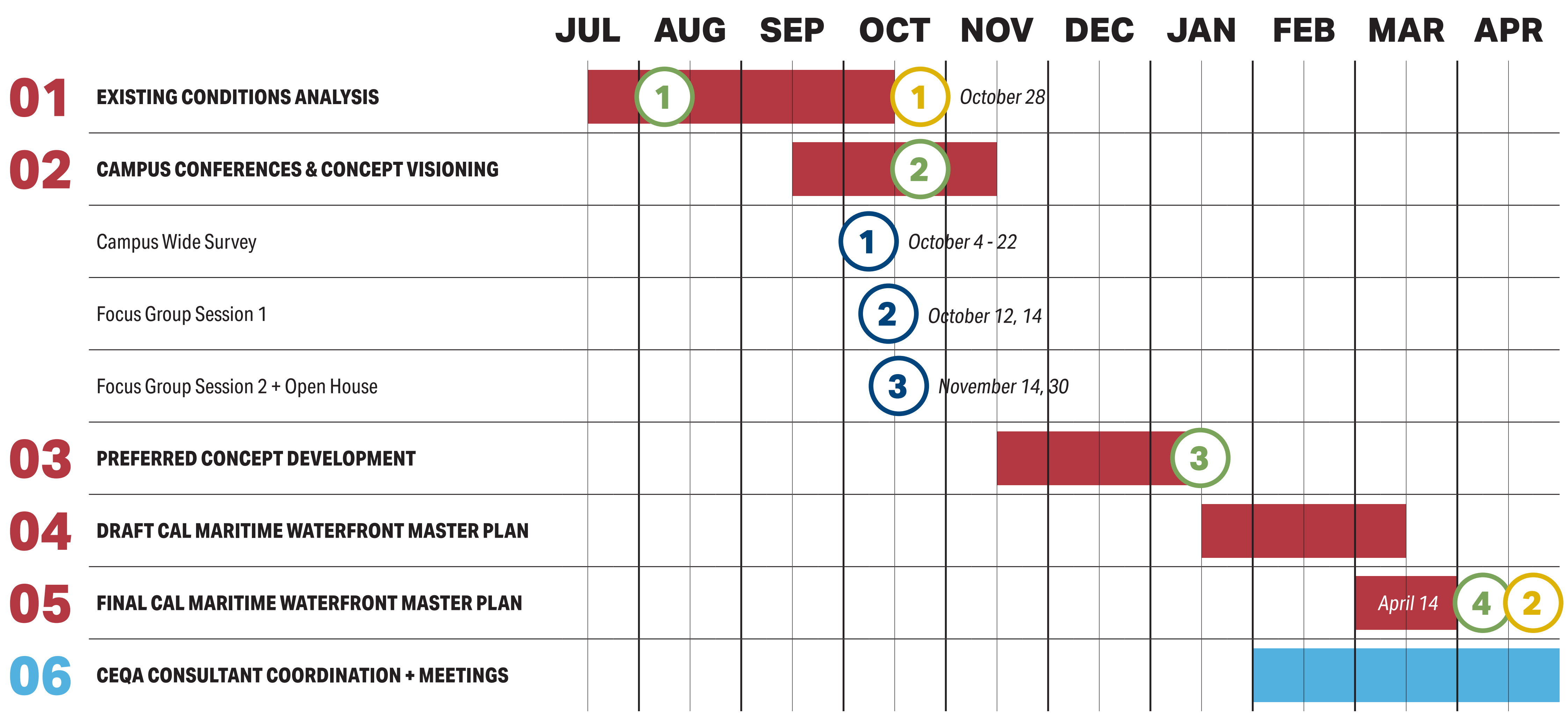
Multiple groups and outreach activities were held over the planning process. These are summarized below.

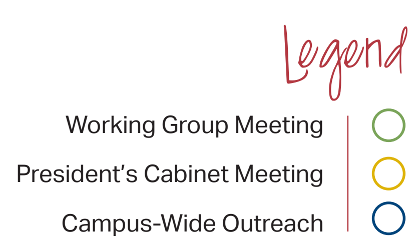
- **WFMP WORKING GROUP.** A seven member Working Group was formed and met in person and virtually throughout the planning process. Members of the working group included: Sam Pecota, Director, Marine Programs and Command Officer TSGB; Robert Brown, Waterfront Manager; Steve Browne, Professor and Chair, Marine Transportation Department; Sheikh Nayeem, Director of Energy and Sustainability; David Taliafero, Commandant of Cadets; Meaghan Smith, University Planner, CSU Office of the Chancellor Capital Planning, Design & Construction; and Tom Van Pelt, Director of Facilities Planning.
- **FACULTY AND CADET FOCUS GROUPS.** Between October 12 and 14, the Planning Team held two focus group meetings with a select group of faculty members and cadets. Additional focus group meetings were held on November 14 (Faculty), and November 30 (Cadets). Seven faculty members were selected representing a broad cross-section of the campus and academic life. Junior and senior level cadets were asked to volunteer as part of a focus group session. A total of seven cadets participated. Each focus group engaged in conversation about their specific priorities for the waterfront. Groups also discussed how best to prepare for NSMV.
- **PRESIDENTS' CABINET MEETINGS.** Work effort and conclusions were presented to the Cal Maritime President's Cabinet on October 28 and April 14.
- **SUBJECT MATTER EXPERT MEETINGS AND INTERVIEWS.** One-on-one meetings were held on campus and virtually with subject matter experts to better understand the issues and opportunities for Cal Maritime's waterfront. Subject matter experts included Cal Maritime's Chief of Police, Athletic Director, Waterfront Manager, and others.
- **CAMPUS-WIDE SURVEY.** An extensive campus-wide survey was conducted online from October 4 through 22. A total of 93 cadets, faculty, and staff participated. The survey challenged participants to prioritize improvements across four categories --the waterfront as a focus of campus recreational activities; a place for hands-on learning; a showcase for marine technology and research; and, an extension of classroom learning.

- **CAMPUS OPEN HOUSE.** On November 30, a campus-wide open house was held at the Compass Room to present WFMP options and generate participant feedback. The open house was advertised online and at key locations around Cal Maritime. The Campus Open House was attended by 25 members of the community.
- **BI-WEEKLY CONFERENCE CALLS.** Conference calls were held with the Cal Maritime WFMP Project Manager (Tom Van Pelt) throughout the entirety of the plan-making effort.

Presentations and posters were disseminated as part of each of the outreach sessions and engagement approaches listed above.

FIGURE 6 – WFMP PROJECT SCHEDULE AND TIMING OF CAMPUS OUTREACH EFFORTS






SHAPE THE FUTURE OF THE CAL MARITIME'S WATERFRONT.
BE PART OF THE FIRST ROUND OF CAMPUS ENGAGEMENT AND LET YOUR VOICE BE HEARD!
CSUMA has embarked on the preparation of a waterfront master plan to make ready for the arrival of our new National Security Multi-Mission Vessel and prepare for the next 25-years of our campus waterfront. Our first campus work sessions are scheduled for October 12 and 13.
We look forward to your involvement!


SHAPE THE FUTURE OF THE CAL MARITIME WATERFRONT
BE PART OF THE SECOND ROUND OF CAMPUS ENGAGEMENT AND LET YOUR VOICE BE HEARD!
You're invited to participate in our next round of Campus Engagement associated with the Cal Maritime Waterfront Master Plan.
When: Tuesday November 30, 5:30 to 6:30 PM
Where: Compass Room
We look forward to your involvement!


SHAPE THE FUTURE OF THE CAL MARITIME WATERFRONT
BE PART OF THE FIRST ROUND OF CAMPUS ENGAGEMENT AND LET YOUR VOICE BE HEARD!
CSUMA has embarked on the preparation of a waterfront master plan to make ready for the arrival of our new National Security Multi-Mission Vessel and prepare for the next 25-years of our campus waterfront.
HERE ARE THREE EASY WAYS TO GET INVOLVED!
TAKE THE SURVEY
1
Visit www.csum.edu, search 'Waterfront Master Plan' and review a synopsis of the project and complete a brief survey about how best the Cal Maritime waterfront should evolve to meet the needs of cadets and campus community.
DROP-IN POSTER GALLERY
2
Drop by our project information display located outside the Dining Center to learn more about the project. Waterfront planners will be available to answer your questions between October 12 and 14.
TOWN HALL MEETING
3
Participate in an upcoming Town Hall Meeting... more info to come!"

ENGAGEMENT SESSION ONE
SURVEY ONE: OCTOBER 4 – 22, 2022

93
survey respondents

277
substantive comments

"Provide a small dock separate from the boat basin that could enable us to collect water samples...have a live lab...and deploy small instruments."

"Larger dock space that is more in line with what we will encounter in industry."

"Outdoor areas that are specifically designed for fitness/ rec activities."

Create a modular Oceanography lab right on the waterfront."

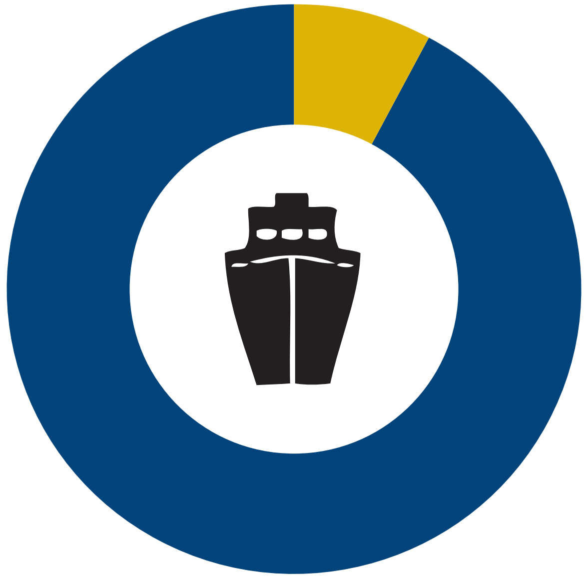
"Purchase and install a containerized Damage Control Locker."

PLEASE INDICATE YOUR AFFILIATION WITH CAL MARITIME.

Legend

	47%	Cadets
	33%	Staff
	15%	Faculty
	5%	Other

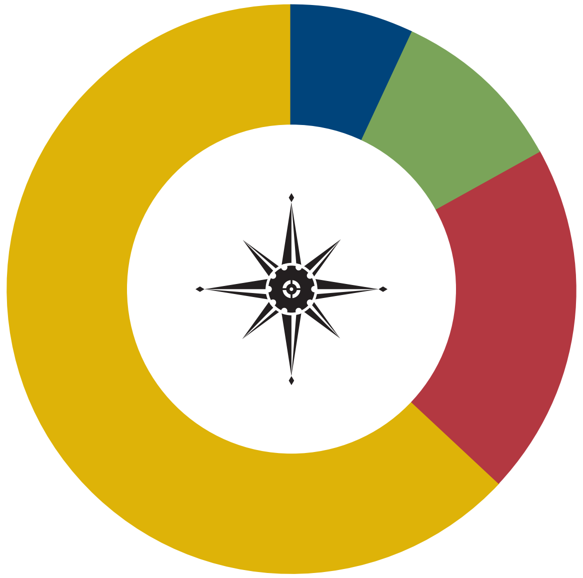
WERE YOU AWARE THAT THE TRAINING SHIP GOLDEN BEAR (TSGB) IS PLANNED TO BE REPLACED BY THE NSMV VESSEL IN 2026/27?



Legend

	92%	No
	8%	Yes

WHILE THE WATERFRONT CAN FUNCTION IN ALL OF THESE CAPACITIES, WHAT SHOULD BE THE PRIMARY MISSION OF CAL MARITIME WATERFRONT?



Legend

	63%	A place for hands-on learning
	20%	A focus of campus recreational activities
	10%	An extension of classroom learning
	7%	A showcase for marine technology and research

2.2 Direction from the Campus Community

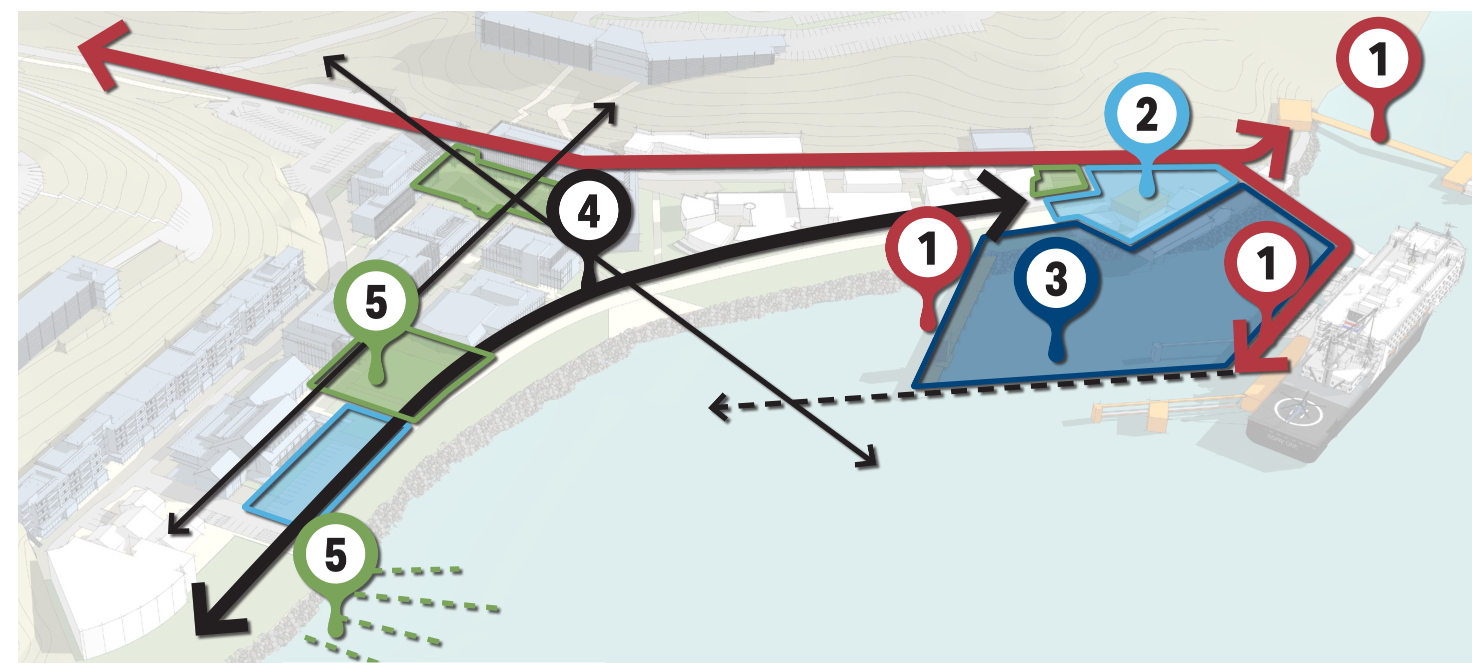
2.2.1 | SUMMARY OF OUTREACH FEEDBACK

The highly engaged Cal Maritime community expressed clear direction for the desired future of the waterfront. Survey respondents indicated by a large majority (63%) that the primary mission of the waterfront should be "a place for hands-on learning" followed by "a focus of campus recreational activities."

During focus group sessions, both faculty and cadets offered a number of areas for waterfront improvement. Suggestions included:

- More slips and boating resources (small craft);
- More public waterfront access and event spaces (multiple forms desired);
- A greater number of waterfront gathering/ recreational areas;
- More traditional use of Boathouse;
- Greater numbers of waterfront classrooms/wet labs (indoor and outdoor);
- Greater operational and ship-based training equipment;
- Improved roll-on/roll-off truck and vessel operational areas (in consideration of the NSMV); and,
- Expanded waterfront storage areas.

FIGURE 7 – WFMP GOALS AND PLANNING FRAMEWORK



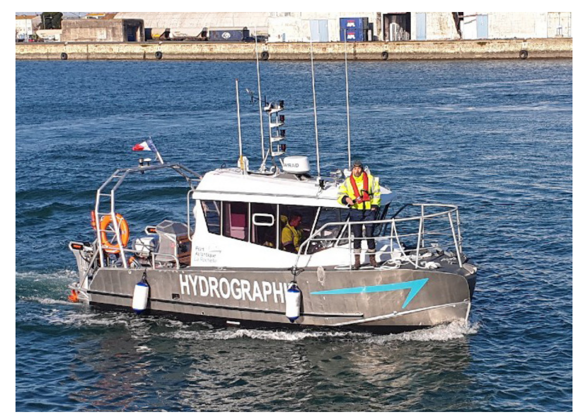
Continued prioritization of investments and planning effort for the impending arrival of Cal Maritime's NSMV was considered by all as paramount. There was also broad support for the expansion and enhancement of the boat basin to accommodate increased areas for specialized on-water instruction and recreational activities. Recreational pursuits were also important.

These and other goals (refer to plan framework) were each used to guide plan formulation. Preliminary and refined planning concepts presented in this plan follow and build upon each of these core goals.

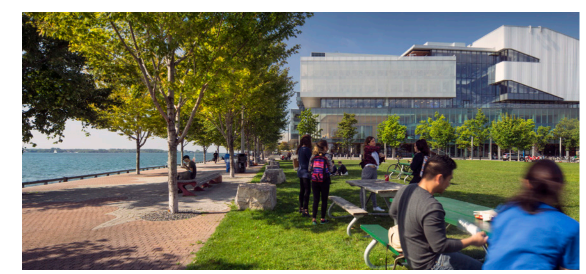
1 PRIORITIZE MAIN PIER AND RELATED NAVIGATION AND BASIN ENHANCEMENTS TO MAKE READY FOR NSMV ARRIVAL

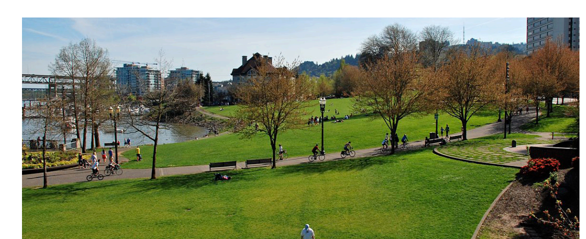
2 ENSURE OPERATIONAL AREAS AND INFRASTRUCTURE ARE SIZED TO SUPPORT PLANNED WATERFRONT FUNCTIONS

3 EXPAND AND ENHANCE THE BOAT BASIN TO ACCOMMODATE INCREASED AREAS FOR SPECIALIZED INSTRUCTION AND RECREATIONAL ACTIVITIES



4 SEEK OPPORTUNITIES TO ACTIVATE THE WATER'S EDGE AND LINKING OPEN SPACES AND CAMPUS BUILDINGS





5 SAFEGUARD COASTAL RESILIENCE AND ECOLOGICAL FUNCTIONING OF THE WATER'S EDGE

3 Waterfront Conditions Analysis

3.1 Overview

3.1.1 | OUR ANALYSIS

The Waterfront is a complex composite of marine and upland infrastructure; hands-on learning areas on land and water; operational and logistical zones; and stretches of shoreline and linear parks. Cal Maritime has endeavored to find the right balance of each while undertaking its distinctive mission of being a leading educational institution recognized for excellence in the business, engineering, operations, and policy of the transportation and related industries.

This section documents the existing Waterfront Conditions Analysis that was undertaken by the Planning Team and used as the baseline for proposed WFMP improvements. This includes a review of in-water marine infrastructure, inclusive of the main pier, jetty, and boat basin. The Planning Team follows this discussion with upland features and elements, inclusive of the historic Boathouse and planned Marine Programs and Naval Sciences Activity Cluster. Topic areas such as utilities, public recreation, and other functioning elements of the planning area round out this section.

WRNS Studio
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BKF Engineers
Page & Turnbull
Moffatt & Nichol

3.2 In-Water Infrastructure

3.2.1 | OVERVIEW

In-water infrastructure found along Cal Maritime's waterfront consists of the following elements:

- Main Pier and Trestle (causeway);
- Floating Docks;
- Boat Basin;
- Mooring Bits/Catwalk; and,
- Historic Boathouse.

MAIN PIER. The original pier was constructed of timber in 1942 (ISES, 2015) and in 1996 was replaced with a reinforced concrete pier supported on steel piles driven into the bay bottom.

Cal Maritime's current ship, the TSGB, ties up to the face of the pier when moored on the port side. There are 4 foam filled fenders along the face of the pier to absorb energy as the ship contacts the pier while berthing. Mooring bits are located on the pier, shore and on a catwalk extension on the north end of the pier to attach mooring lines for the TSGB.

Load capacities of the pier are estimated as:

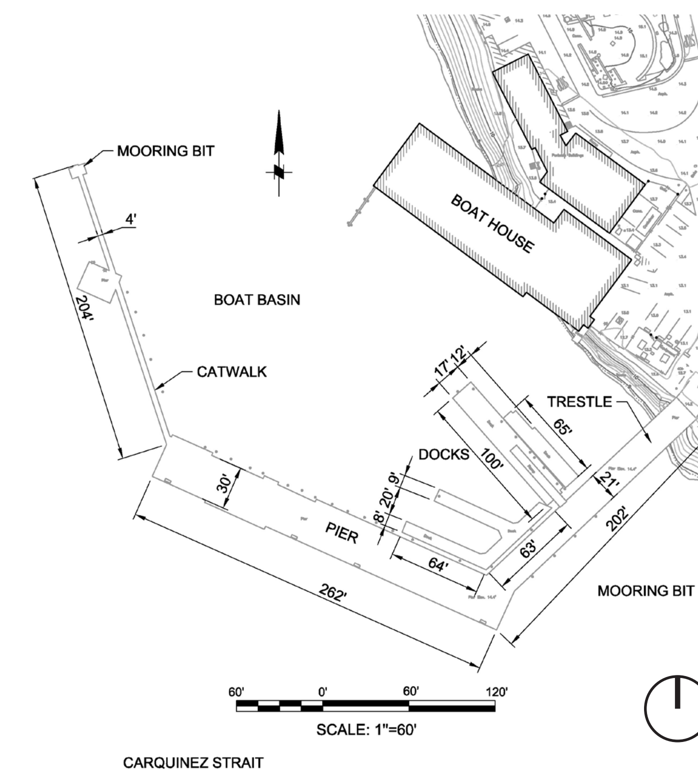
- Uniform load: 400-600 psf; and,
- Point load: 50-100 tons.

The pile-to-deck connection is minimal, and it is likely that some strengthening will be required for seismic capacity.

The ship connects to an electrical shore tie cable when moored at the pier . The capacity of the 500 kVA transformer was upgraded after the construction of the 1996 pier replacement to allow 800 amps 480/vac service to the ship (Brown, 2022).

Steel sheets are attached to the pier and catwalk to provide wave protection for the boat basin.

FIGURE 8 – CAL MARITIME PIER AND BASIN



Source: Sandis, 2018

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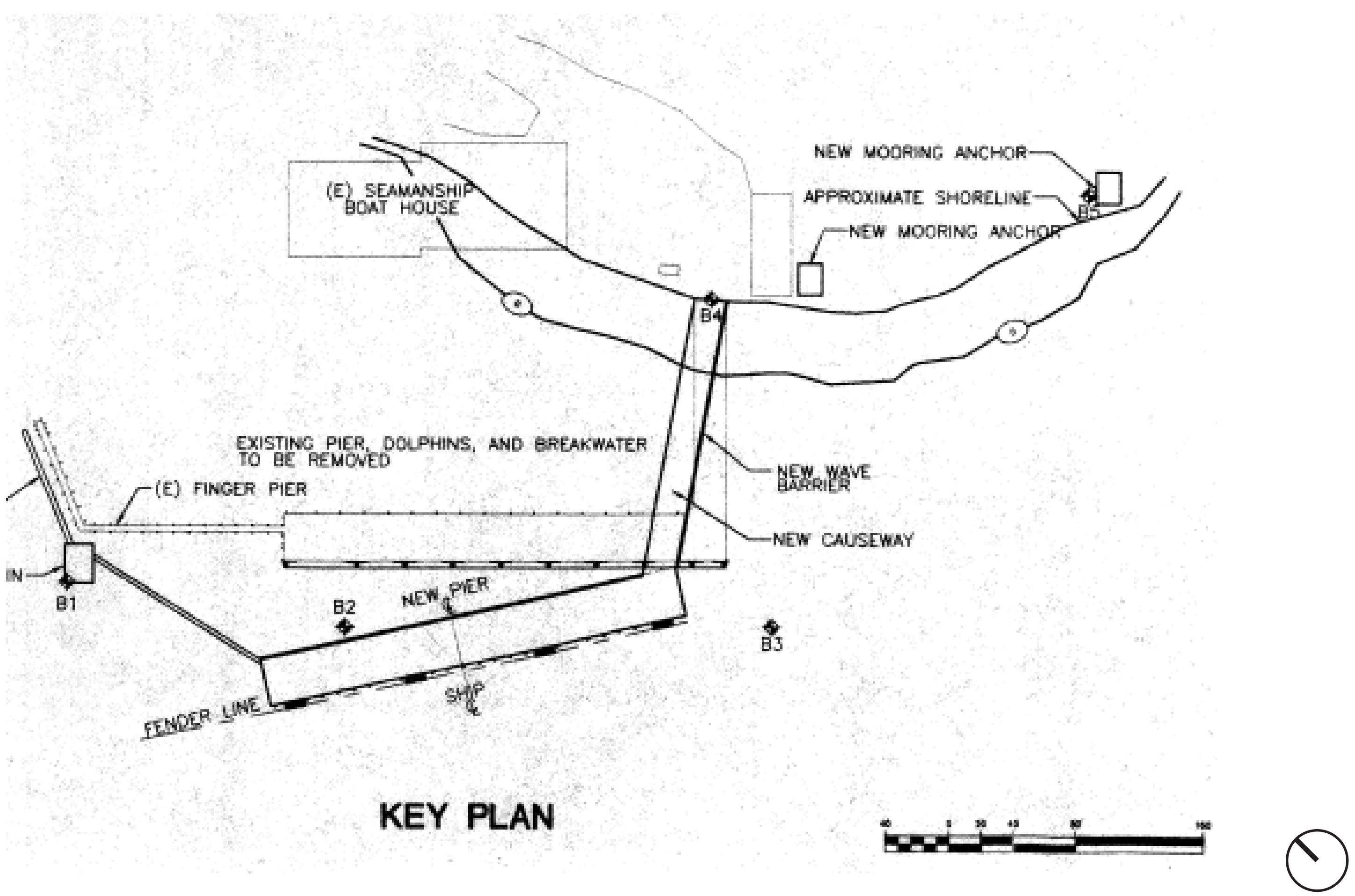
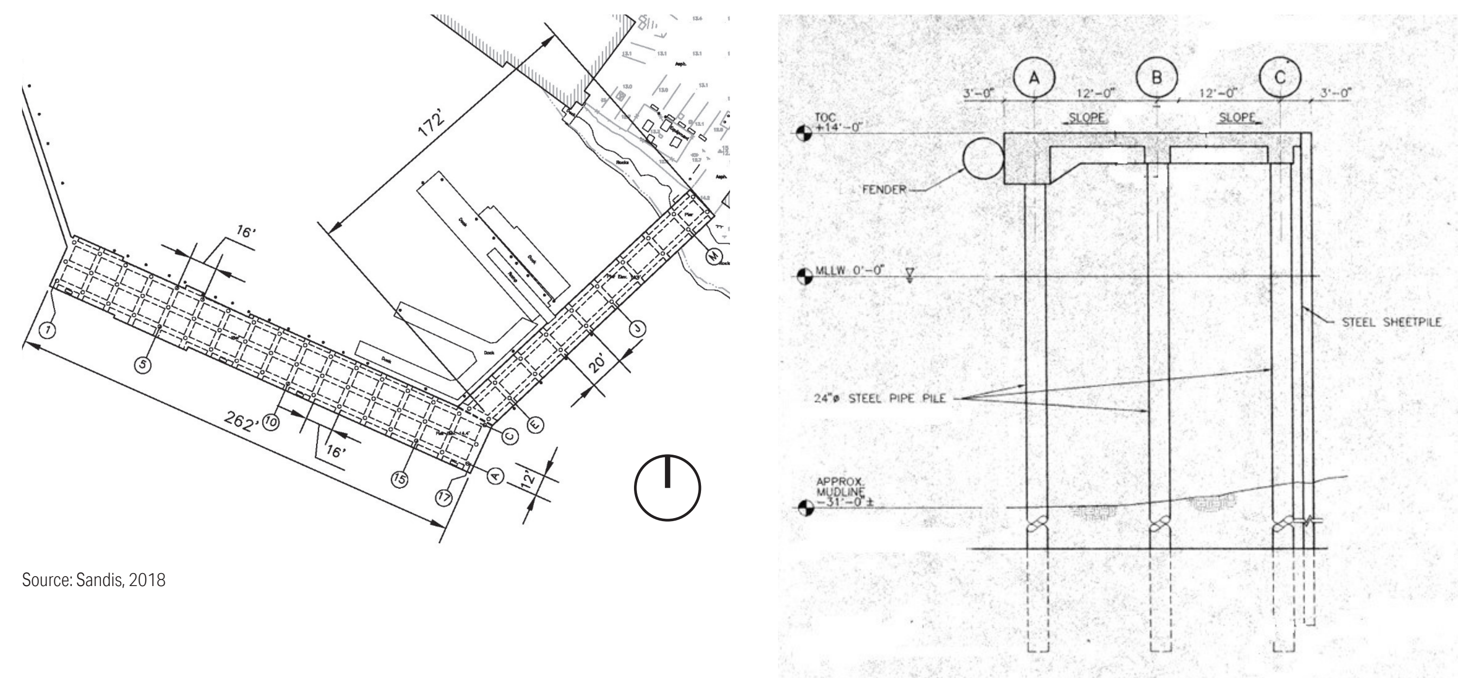
FIGURE 9 – 1996 MAIN PIER REPLACEMENT



Source: Cal Maritime Pier Extension As-Built Drawings, 1997

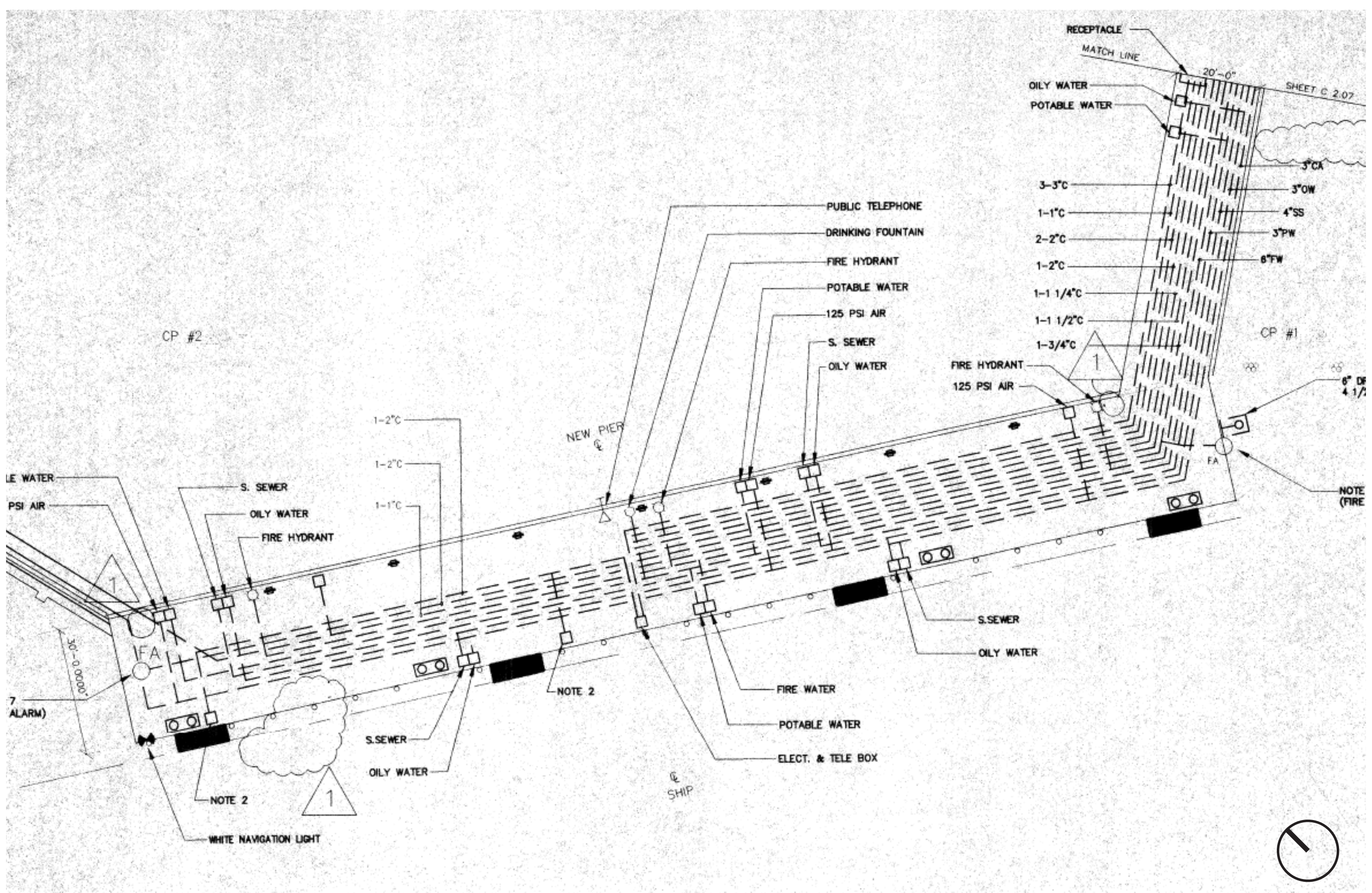
FIGURE 10 – MAIN PIER STRUCTURAL PLAN AND TYPICAL SECTION



Source: Sandis, 2018

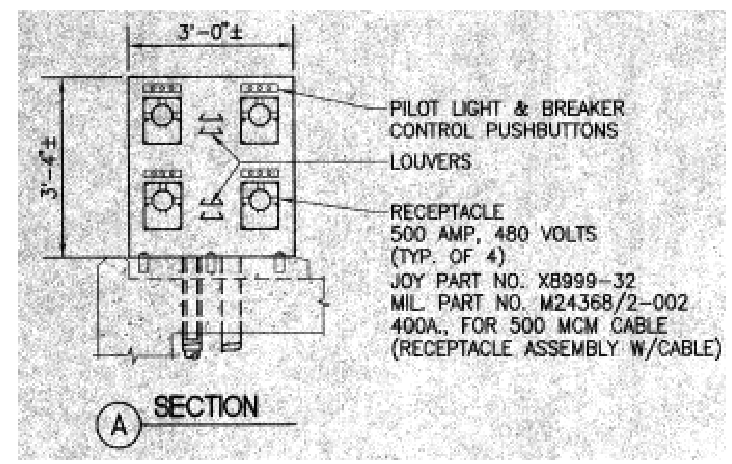
Source: Cal Maritime Pier Extension As-Built Drawings, 1997

FIGURE 11 – PIER UTILITIES (CAL MARITIME)



Source: Cal Maritime Pier Extension As-Built Drawings, 1997

FIGURE 12 – ELECTRIC SHORE TIE DETAIL

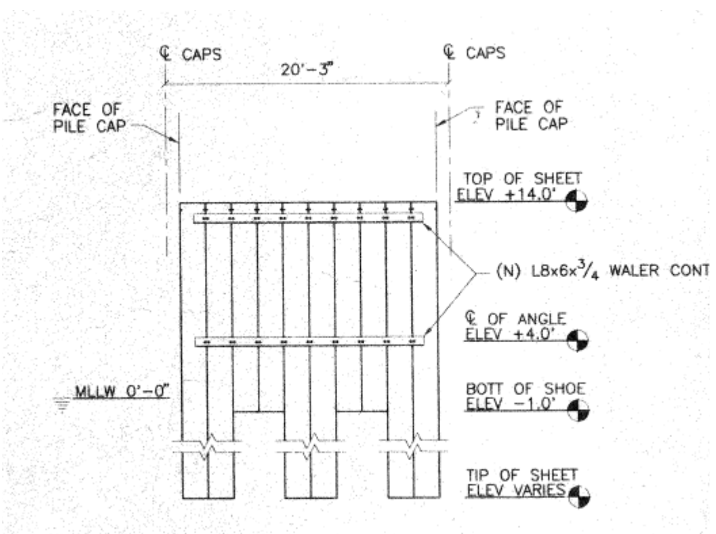


Source: Cal Maritime Pier Extension As-Built Drawings, 1997

FLOATING DOCKS. The floating docks are located within the basin created by the pier. The docks provide mooring for smaller vessels (boats) 60 ft or less in length. These boats provide hands-on training for the cadets in basic seamanship skills and port operations and logistics. In addition, there are small sailboats moored at the docks that provide recreational sailing opportunities.

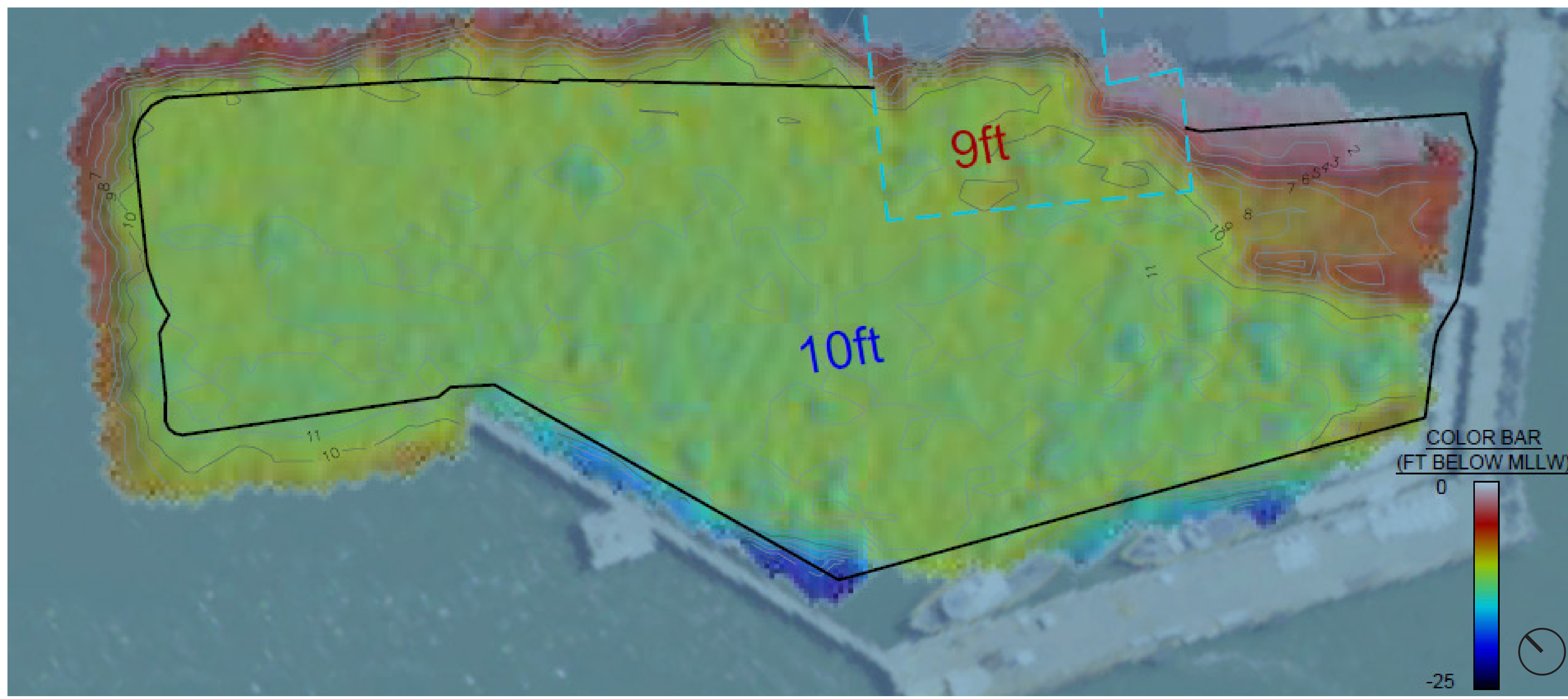
The docks are constructed of concrete encased polystyrene foam modules connected with timber beams (walers) as manufactured by Bellingham Marine Industries. The original date of construction is not known, but it was likely after 1996 as the existing docks at that time are shown to be removed. The docks are held in place by steel guide piles driven into the bay bottom. There are guide piles at end of each dock, three on the head walk and a group of seven on the east side of the east dock.

FIGURE 13 – SHEET PILE BREAKWATER



Source: AECOM, 2017

FIGURE 14 – BASIN BATHYMETRIC DATA



Source: Etrac, 2019

FIGURE 15 – PRE-DREDGE DEPTHS

Source: Haley Aldrich, 2019

BOAT BASIN/BATHYMETRY. The boat basin is a natural portion of San Pablo Bay/Carquinez Strait.

It is enclosed by the shore on the northeast and by the breakwater panels attached to the pier and catwalk on the south and west that protect it from the predominate wind waves from the west.

The water depth increases rapidly from the south side of the basin into the Carquinez Strait due to scour from the tidal currents (see section 3.4). The water depth at the face of the pier is greater than 30 ft, to accommodate the 30 ft TSGB draft.

Sediment accumulates within the east side of the basin. The accompanying graphic shows the depths in the basin after dredging in 2019 to a nominal depth of 10 ft. In the previous dredge episode, in 2009, sediment from most of the basin area was suitable for aquatic disposal at area SF-9 in the Carquinez Strait. However, the sediment within, and near the Boathouse had levels of contaminants that required landfill disposal.

BOATHOUSE. The Seamanship Building ("Boathouse") and Pier were constructed in 1942 (ISES, 2015).

The Boathouse is a wood framed building with wooden siding. The foundation is creosote treated timber piles driven into the bay bottom. Many of the piles have been encased with grout, inside of a fiberglass jacket, and the remaining piles have been wrapped with PVC sheeting.

Legend

Deck concrete, cracks with some minor delamination | 1
Trestle at seismic joint to pier connection | 2
Utilities entry to pier at abutment | 3
East end of pier, looking west | 4
Pier underdeck, looking east | 5
Pier deck, electric shore tie mound | 6

3.2.2 | CONDITION ASSESSMENT

Each of the following elements are provided in the series of photographs on the following pages. In addition, the accompanying text provides narrative description of key in-water elements.

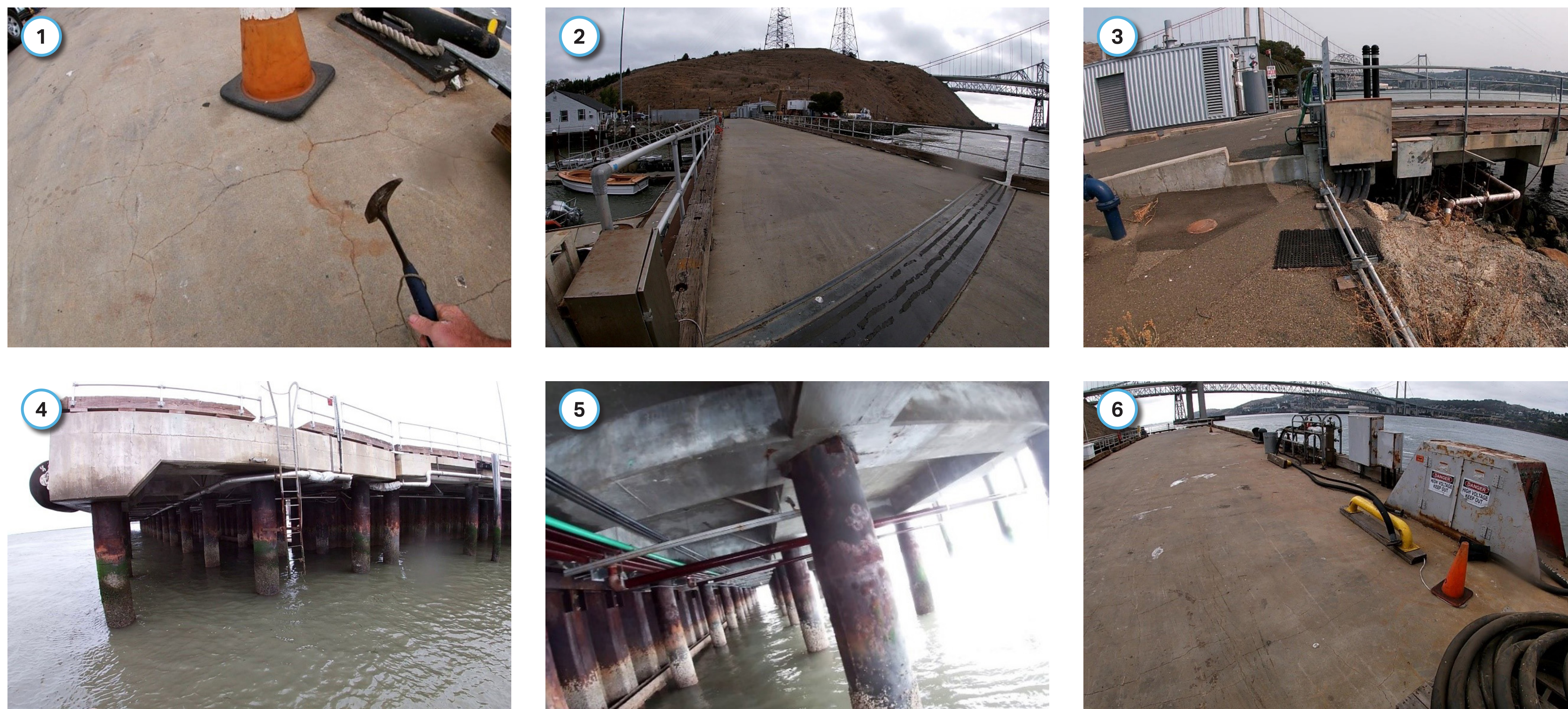
MAIN PIER. The main pier is in good overall condition.

The concrete has no significant spalls nor cracks on the underside, where it is exposed to saltwater wetting. The concrete deck surface is intact with no spalls, however it has visible, but mostly narrow, cracks. The start of delamination was detected and there are some rust stains visible.

RECOMMENDATIONS. The following recommendations are suggested:

- The steel piles should have remaining thickness measurements performed;
- Preventative repair should be performed within 5 years to address cracks in the deck surface;
- Repairs to the tops of the steel piles should be performed within 5 years; and,
- Strengthening of the pile-to-deck connection should be examined to improve seismic capacity.

FIGURE 16 – MAIN PIER CONDITIONS ASSESSMENT



Legend

West end of dock tilting, pile on right possibly broken	1
East end of middle dock, spalling concrete at connection	2
East side of docks	3
Pile guide frame on east side of east dock	4
West dock	5
Middle dock	6

FLOATING DOCKS. The floating docks are in fair overall condition.

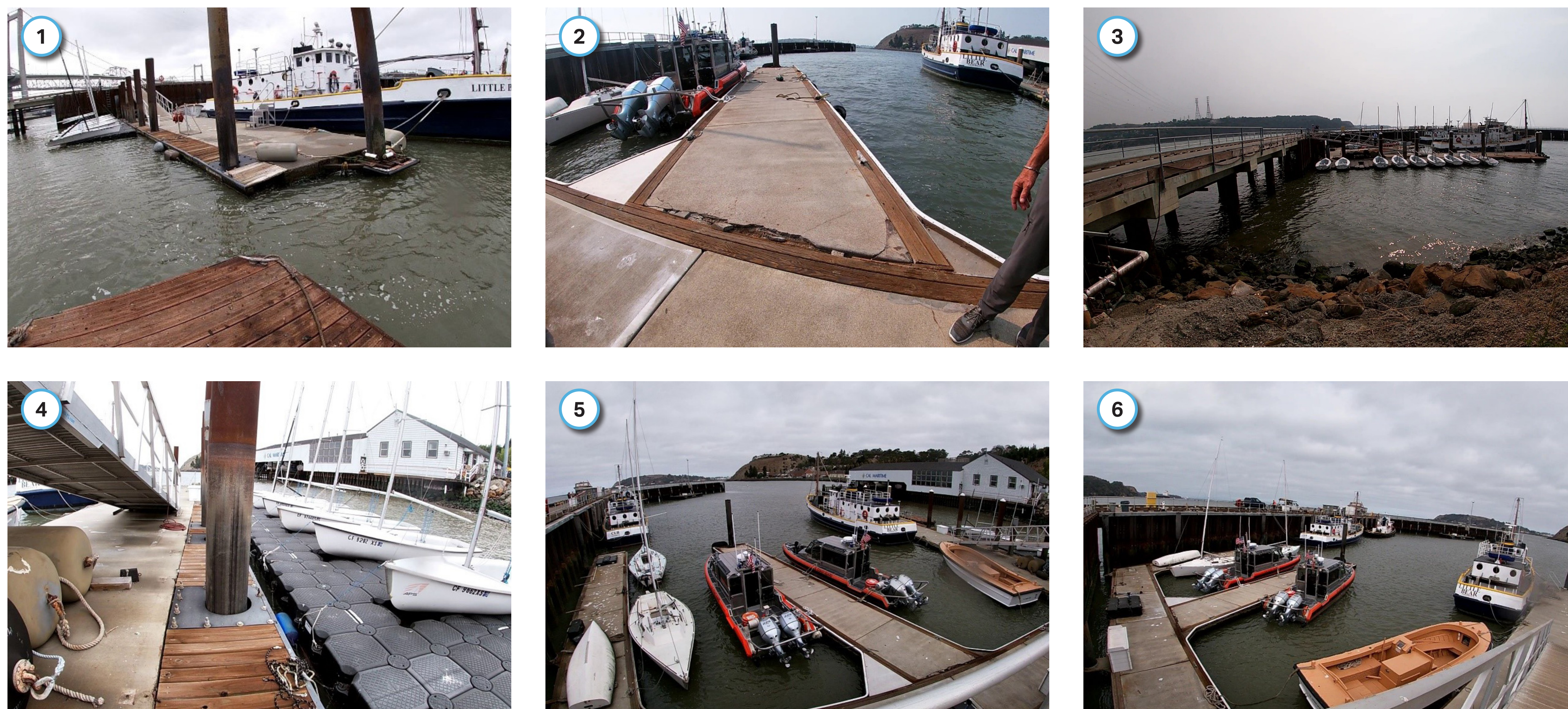
Some of the concrete float modules have spalling in the deck, particularly where they connect to the head walk (2, 4). The connection of the west dock to the head walk is broken and the two sections can pound together. The bolt that connects them has worked loose (4).

The east dock appears to have a tilt at the north end. This may be due to water infiltration into the foam from holes in the concrete shell below water.

RECOMMENDATIONS. The following recommendations are suggested:

- The dock connections should be repaired and strengthened immediately; and,
- Dock replacement will likely be required within the next 10 years as the docks are approaching the end of their useful life.

FIGURE 17 – FLOATING DOCKS CONDITIONS ASSESSMENT



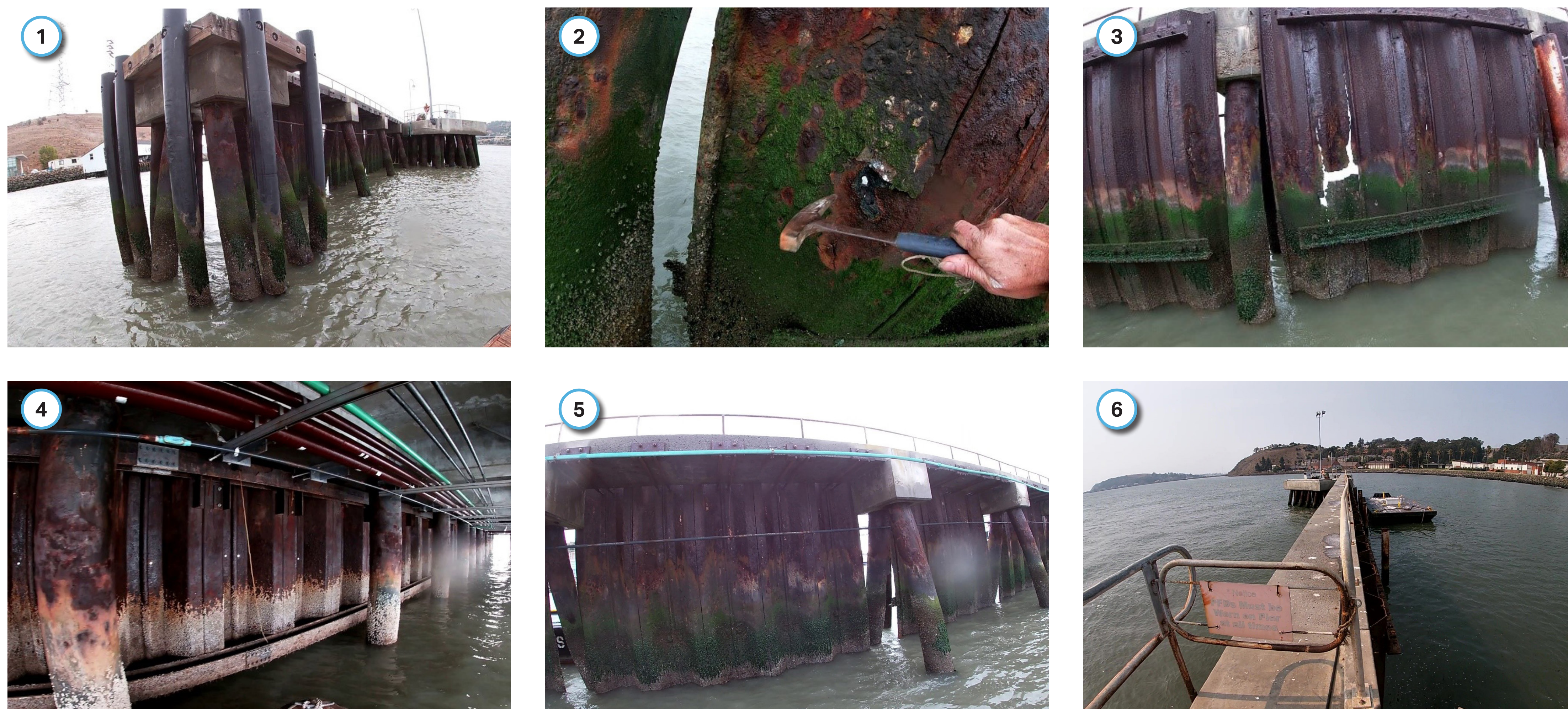
BREAKWATER/CATWALK. The sheet pile breakwater panels on the catwalk are in poor condition, those on the pier are in fair condition. The steel breakwater panels on the catwalk have heavy rust, some entirely through (2, 3). In other areas the panels have little steel remaining and can be easily punctured.

The steel piles supporting the mooring dolphin have heavy rust scaling on the top 4-6 ft (4). It is common for this zone to have the greatest corrosion from salt spray and oxygen in the air. Even with this heavy corrosion on the top, there is often little corrosion on the underwater portion of the pile below 0 ft MLLW. An underwater inspection has not been performed but could be done to measure the remaining steel.

RECOMMENDATIONS. The following recommendations are suggested:

- Dredging should be anticipated within the next 8 years; and,
- Replacement of the sheet piles on the catwalk section.

FIGURE 18 – BREAKWATER / CATWALK CONDITIONS ASSESSMENT



Legend

West end of catwalk	1
Testing sheets, can easily penetrate thin corroded area	2
Catwalk section, sheets deteriorated through	3
Rebuilt breakwater section on back of pier	4
Catwalk, crack in precast sidewalk slab	5
Catwalk and mooring dolphin	6

Legend

Deteriorated siding and beam on north wall	1
Deteriorated siding on slips, sediment buildup	2
Boat slip, deteriorated siding/fender boards at waterline	3
Wrapped piles under south side	4
Boat slips, deteriorated siding boards	5
Jacketed and wrapped piles south of boat slips	6

BOATHOUSE. The Boathouse is in good overall condition.

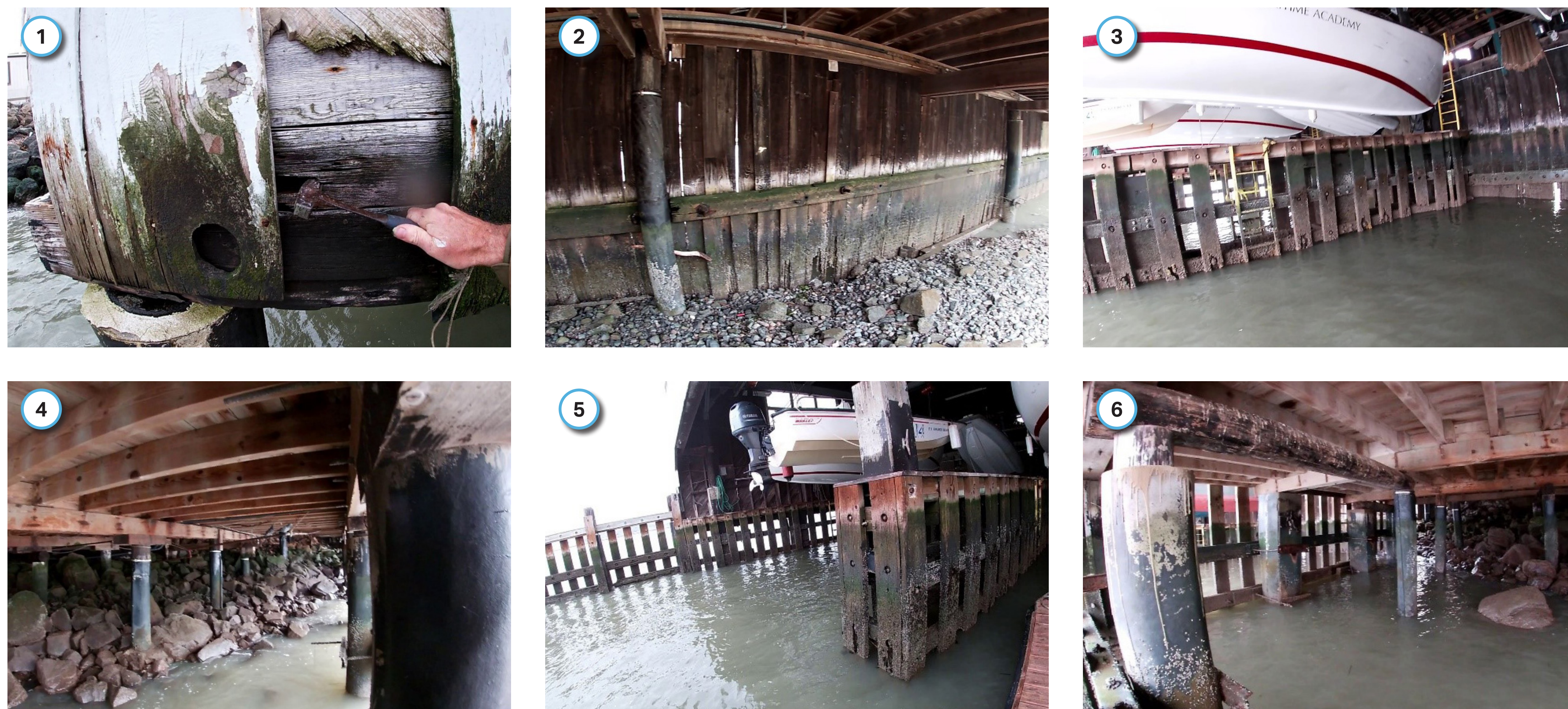
All the exposed piles had no observable defects. The PVC wrapped piles were solid when sounded with a hammer. The piles that were encased with a grout filled fiberglass jacket were generally sound but some of the jackets had torn, exposing the grout within. but this is not a critical defect.

There is deterioration in many of the siding boards within the boat slips (1, 2, 3, 6) and on the north wall within the lower tidal zone (0-2 ft MLLW), this defect is largely visual. The horizontal beams that support the siding/ rub boards within the boat slips are composite (reinforced plastic) members and are in excellent condition.

RECOMMENDATIONS. The following recommendations are suggested:

- Repair to the jackets that have exposed voids should be performed within 5 years; and,
- Deteriorated siding and fender boards should be replaced as needed.

FIGURE 19 – BOATHOUSE / MARINE RELATIONSHIP CONDITIONS ASSESSMENT



BOAT BASIN/BATHYMETRY. The present depths within the boat basin are adequate for current use by the variety of vessels currently in operation (refer to Section 3.5.1 for full description).

Since the most recent dredge episode in 2009, sediment accumulation within the boat slips has occurred such that the bottom of the basin is exposed at low tides at the front of the slip. Sediments have also accumulated within the boathouse area.

The sampling of sediments from the 2009 dredge episode indicated some contaminants were present with the boathouse area that would require landfill disposal. Future actions for needed dredge activities for the basin, slips, and boathouse are addressed in Section 5.

3.3 Navigation Considerations and Vessel Traffic

3.3.1 | VESSEL TRAFFIC PATTERNS

Vessel traffic data is collected by the U.S. Coast Guard via the Automatic Identification System (AIS). The system collects data from navigation safety equipment onboard vessels which transmits vessel data and location in real time. The real-time data is monitored via a national network of AIS receivers and logged in a database, which provides a record of vessel location, speed, and heading at a given time, and identifying information such as the vessel International Maritime Organization (IMO) number, Maritime Mobile Service Identity (MMSI) number, the vessel type, overall length, beam, and draft.

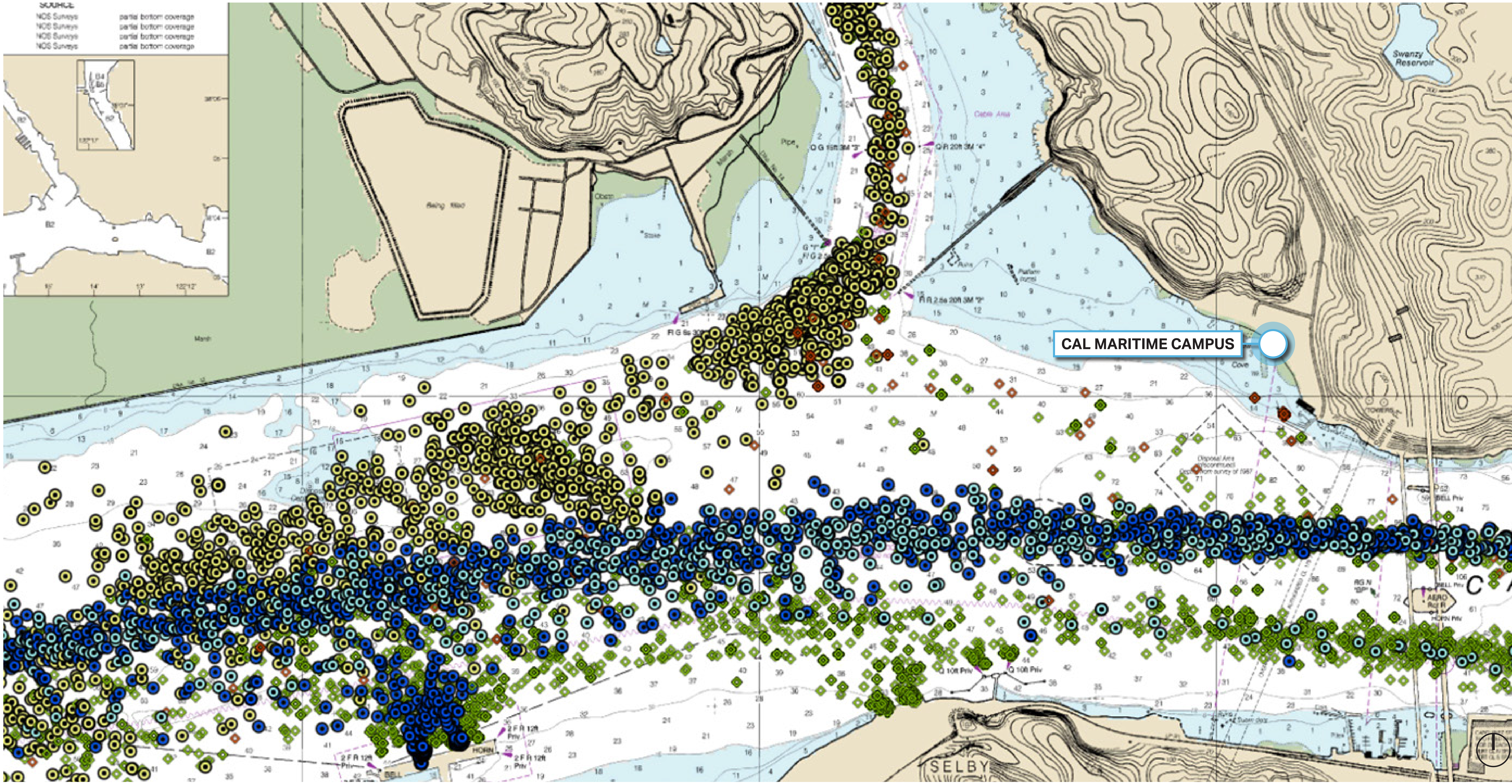
The purpose of the AIS system is to track marine transportation and provide a basis for a collision avoidance system.

AIS data for a representative time frame was collected to depict typical marine traffic patterns in the vicinity of Cal Maritime. The accompanying graphic shows track data for vessels organized by vessel type. Yellow data points indicate high-speed ferries transiting between Vallejo and San Francisco. The dark blue points represent petroleum product carriers (tankers). The cyan data points are representative of cargo vessels.

The green diamond symbols indicate track data for tugs, while the dark orange diamond symbols show track locations for recreational craft.

The most frequent vessel transits past Cal Maritime consist of ocean-going vessels delivering petroleum products to marine terminals in the Carquinez Strait and further into the Bay, and cargo vessels (dark blue and cyan vessel track data).

FIGURE 20 – AIS TRACK DATA FOR VESSELS TRANSITING IN THE VICINITY OF CAL MARITIME



Source: AIS, 2022

3.4 Metocean Conditions, Sea Level Rise, and Coastal Resiliency

3.4.1 | TIDES

The accompanying table summarizes tidal datums applicable to the Cal Maritime location, compiled based on a number of sources.

The lower portion of the table indicates datum planes for normal astronomical tides, occurring due to the gravitational pull of the moon and the sun. The tides vary daily over the cycle of a lunar day, which is approximately 24 hours and 50 minutes. The daily tide cycle can be categorized as a mixed semi-diurnal tidal variation, which has two unequal highs and lows each tidal day. There is also a monthly, annual, and decadal variation of the tides that occurs over a 19-year cycle termed a tidal epoch. The Mean Lower Low Water (MLLW) tidal datum is important for navigation and maintenance dredging of channels as it defines the shallowest water depth for navigational purposes. To support harbor and river navigation, bridge clearances are referenced to a mean high water (MHW). Flood hazards are typically associated with extreme high water levels and wave action as described in the following section.

The upper portion of the table summarizes elevations of extreme tides with storm surge. Extreme high tides in San Francisco Bay are a combination of storm surge due to wind shear and low barometric pressure, high tides, and El Niño effects. The water level at the Cal Maritime location can to some extent also be influenced by outflow from the Delta and the Napa River during wet years with significant amounts of precipitation.

NOTES

A. Flood Insurance Rate Map. Solano County, California and Incorporated Areas. Panel 628 of 730. Version Number: 2.3.2.0. Map Number: 06095C0628G. Map Revised: August 3, 2016. National Flood Insurance Program

B. Flood Insurance Study, Solano County, California and Incorporated Areas. Transect 24. Volume 2 of 3. Revised: August 3, 2016. Federal Emergency Management Agency. Flood Insurance Study Number 06095CV002D

C. San Francisco Bay Tidal Datums and Extreme Tides Study. Prepared by: AECOM, DHI, BakerAecom, BCDC. Final Report, February 2016

D. NOAA Tide Predictions. Crockett, Carquinez Strait, CA. Station ID: 9415143. Source: NOAA/NOS/CO-OPS. https://tidesandcurrents.noaa.gov/

E. Tidal Datums, Crockett, Carquinez Strait, CA. Station ID: 9415143. Epoch: 1983-2001. https://tidesandcurrents.noaa.gov/

TABLE 1 – TIDAL AND STORM SURGE ELEVATIONS

TIDAL PLANE	FEET (NAVD88)
EXTREME TIDES (WITH STORM SURGE)	
100-year RP (FEMA 1% BFE) (a)	Zone VE (El. 12.0)
100-year RP (FEMA 1% SWEL) (b)	+9.6
50-year RP (c)	+9.4
25-year RP (c)	+9.1
10-year Return Period (RP) (c)	+8.7
NORMAL ASTRONOMICAL TIDES	
King Tide (KT), Approx. Annual Max. (d)	+7.4
Mean Higher High Water (MHHW) (e)	+6.3
Mean High Water (MHW) (e)	+5.8
Mean Sea Level (MSL) (e)	+3.6
Mean Low Water (MLW) (e)	+1.4
Mean Lower Low Water (MLLW) (e)	+0.4

Source: Various

3.4.2 | SEA LEVEL RISE

The following section summarizes sea level rise scenarios for San Francisco which are applicable to the Cal Maritime location based upon current best available science. The columns outlined in dark blue reflect the OPC guidance for risk levels, which include low risk aversion, medium to high risk aversion, and extreme risk aversion.

Many facilities in the Bay Area with waterfront infrastructure have adopted the 1-in-200 Chance sea level rise projection. The accompanying table summarizes key water level datums (BFE, SWEL, KT, and MHHW) and their projected increase with future sea level rise following the 1-in-200 Chance Projection.

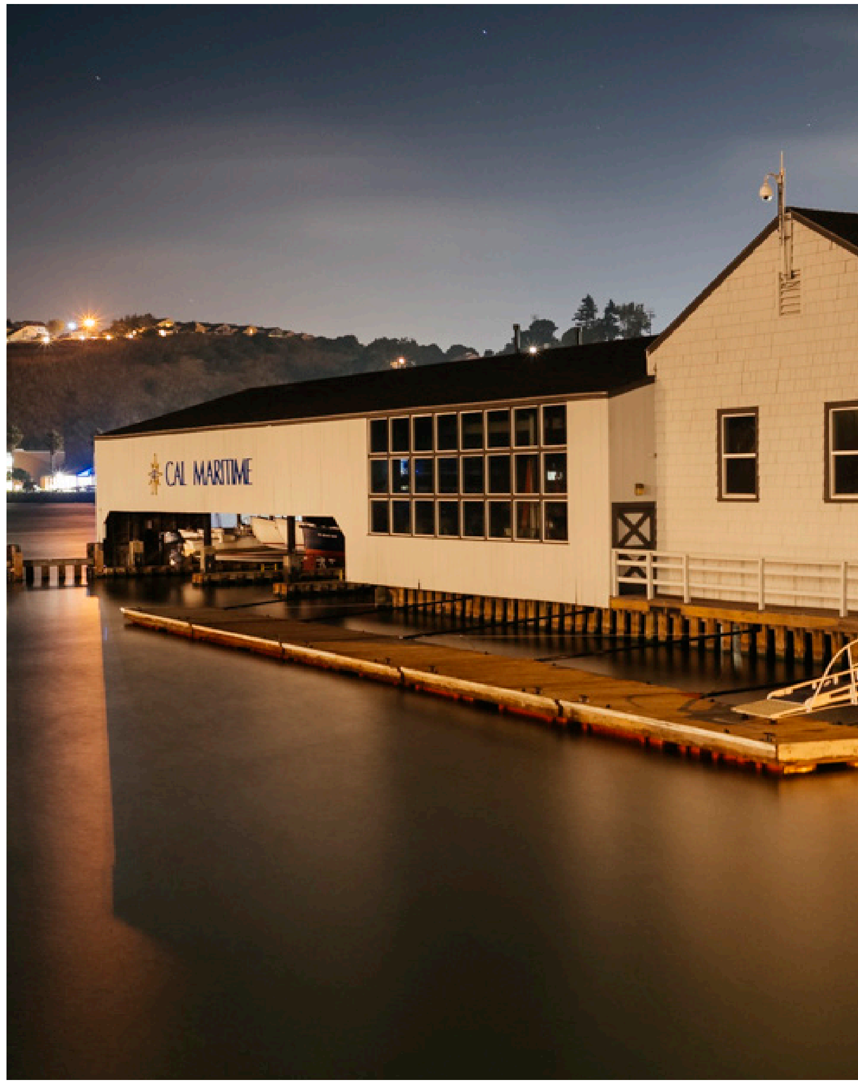
NOTES

MEDIAN. Mean sea level rise taken as an average of probabilistic scenarios.
LIKELY RANGE. Median projection with 66% confidence limits. The upper range (outlined by blue box) is applicable to facilities and infrastructure with a low risk aversion to sea level rise.
1-IN-20 CHANCE. 5% probability that sea level rise meets or exceeds this projection (1 in 20 chance).
1-IN-200 CHANCE. 0.5% probability that sea level rise meets or exceeds this projection (1 in 200 chance). This projection (outlined by a blue box) is representative of medium to high risk aversion and is applicable to facilities and infrastructure that are vulnerable to sea level rise impacts.
H++ Scenario. Worst case scenario representative of rapid ice sheet loss and accelerated sea level rise. This projection is applicable to facilities with extreme risk aversion to sea level rise hazards. For example, critical infrastructure or facilities that are extremely sensitive to sea level rise hazards and unable to adapt.

TABLE 2 – SEA LEVEL RISE PROJECTIONS FOR SAN FRANCISCO, OPC (2018)

		PROBABILISTIC PROJECTIONS (IN FEET) (BASED ON KOPP ET. AL, 2014)						H++ SCENARIO (SWEET ET AL. 2017) *SINGLE SCENARIO
		MEDIAN	LIKELY RANGE			1-IN-20 CHANCE	1-IN-200 CHANCE	
		50% Probability sea level rise meets or exceeds...	66% Probability sea level rise meets or exceeds...			5% Probability sea level rise meets or exceeds...	0.5% Probability sea level rise meets or exceeds...	
					Low Risk		*Medium-High Risk*	*Extreme Risk*
High Emissions	2030	0.4	0.3	-	0.5	0.6	0.8	1.0
	2040	0.6	0.5	-	0.8	1.0	1.3	1.8
	2050	0.9	0.6	-	1.1	1.4	1.9	2.7
Low Emissions	2060	1.0	0.6	-	1.3	1.6	2.4	
High Emissions	2060	1.1	0.8	-	1.5	1.8	2.6	3.9
Low Emissions	2070	1.1	0.8	-	1.5	1.9	3.1	
High Emissions	2070	1.4	1.0	-	1.9	2.4	3.5	5.2
Low Emissions	2080	1.3	0.9	-	1.8	2.3	3.9	
High Emissions	2080	1.7	1.2	-	2.4	3.0	4.5	6.6
Low Emissions	2090	1.4	1.0	-	2.1	2.8	4.7	
High Emissions	2090	2.1	1.4	-	2.9	3.6	5.6	8.3
Low Emissions	2100	1.6	1.0	-	2.4	3.2	5.7	
High Emissions	2100	2.5	1.6	-	3.4	4.4	6.9	10.2
Low Emissions	2110*	1.7	1.2	-	2.5	3.4	6.3	-
High Emissions	2110*	2.6	1.9	-	3.5	4.5	7.3	11.9
Low Emissions	2120	1.9	1.2	-	2.8	3.9	7.4	-
High Emissions	2120	3	2.2	-	4.1	5.2	8.6	14.2
Low Emissions	2130	2.1	1.3	-	3.1	4.4	8.5	-
High Emissions	2130	3.3	2.4	-	4.6	6.0	10.0	16.6
Low Emissions	2140	2.2	1.3	-	3.4	4.9	9.7	-
High Emissions	2140	3.7	2.6	-	5.2	6.8	11.4	19.1
Low Emissions	2150	2.4	1.3	-	3.8	5.5	11.0	-
High Emissions	2150	4.1	2.8		5.8	5.7	13.0	21.9

Source: State of California Sea level Rise Guidance. California Ocean Protection Council (OPC), 2018 Update



The specific datums can be categorized as follows:

BASE FLOOD ELEVATION (BFE). FEMA uses the Base Flood Elevation as a regulatory standard for insurance purposes for habitable structures, which captures the hazard potential corresponding to the 1% annual risk, which has a Return Period of 1-in-100 years on average.

KING TIDES (KT). The approximate highest tides that occur in a given year and generally a good indicator for potential annual disruption in shoreline areas.

MEAN HIGHER HIGH WATER (MHHW). This is an average of the highest daily tides that will occur almost every day.

The shoreline access areas at Cal Maritime are at elevation +13 to +15 feet NAVD88. These areas would not be significantly impacted by inundation until after 2070.

Future adaptation would likely be a low wall, or raise the elevation along the shoreline via a berm or levee.

TABLE 3 – EXTREME AND ASTRONOMICAL TIDAL DATUMS WITH SEA LEVEL RISE

	1-IN-200 CHANCE SLR BY			
	2022	2022	2023	2024
	0.2	1.9	3.5	6.9
DATUM	ELEVATIONS IN FEET NAVD88			
BFE	+12.0	+13.9	+15.6	+18.9
KT	+7.4	+9.3	+11.0	+14.3
MHHW	+6.3	+8.2	+9.9	+13.2

3.4.3 | TIDAL CURRENTS

NOAA provides estimates of tidal currents for the Carquinez Strait and the Mare Island Strait. The magnitude of flood and ebb currents for the Cal Maritime Pier is derived from these, and the current direction assumed to be parallel with the pier.

TABLE 4 – TIDAL CURRENTS IN VICINITY OF CAL MARITIME

	FLOOD CURRENT		EBB CURRENT	
Location	Velocity (knots)	Direction (°N)	Velocity (knots)	Direction (°N)
Carquinez Strait	3.3 knots	98°	3.7 knots	289°
Mare Island Strait	1.0 knots	342°	0.7 knots	177°
Cal Maritime Pier (est.)	1.8 knots	113°	0.8 knots	293°

Source: NOAA Tidal Current Predictions, Carquinez Strait. Station ID: SFB1319. Depth: 12 feet. NOAA/NOS/CO-OPS
NOAA Tidal Current Predictions, Mare Island Strait (Buoy "4"). Station ID: PCT0766. Depth: 20 feet. NOAA/NOS/CO-OPS

FIGURE 21 – CHARACTERISTIC FLOOD CURRENT PATTERN

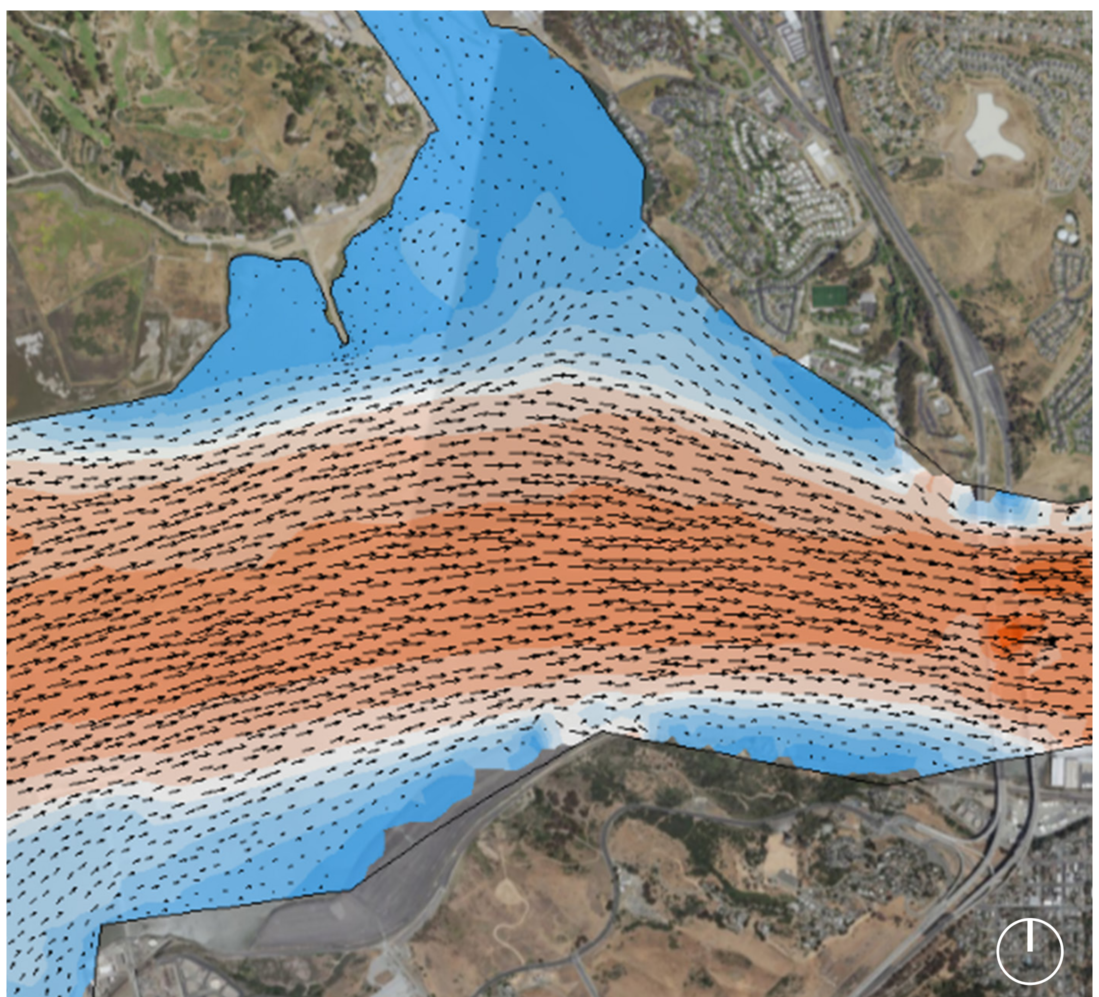
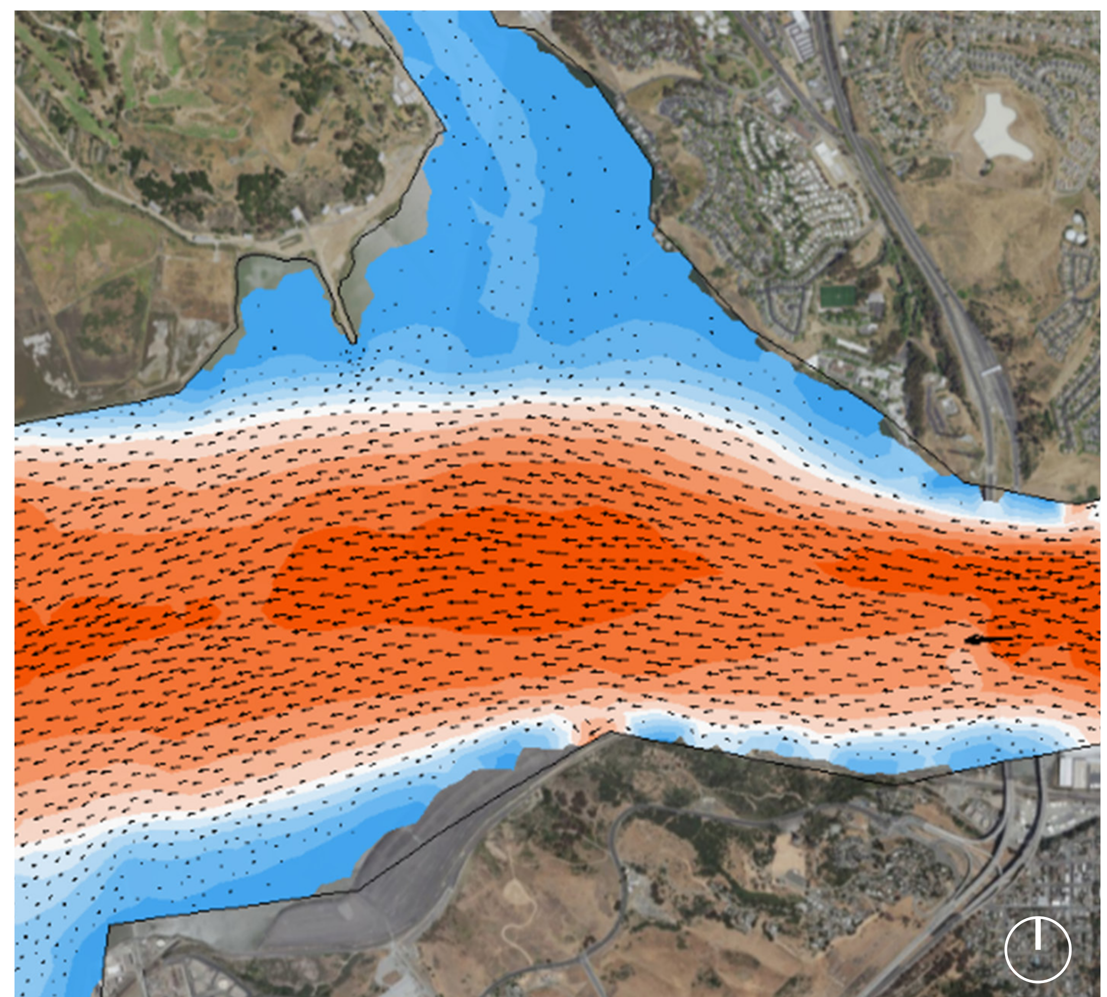


FIGURE 22 – CHARACTERISTIC EBB CURRENT PATTERN



Legend

Values assume Current Speed (Knot)

- Above 2.8
- 2.4 – 2.8
- 2.0 – 2.4
- 1.6 – 2.0
- 1.2 – 1.6
- 1.0 – 1.2
- 0.8 – 1.0
- 0.6 – 0.8
- 0.4 – 0.6
- 0.2 – 0.4
- Below 0.2
- Undefined Value

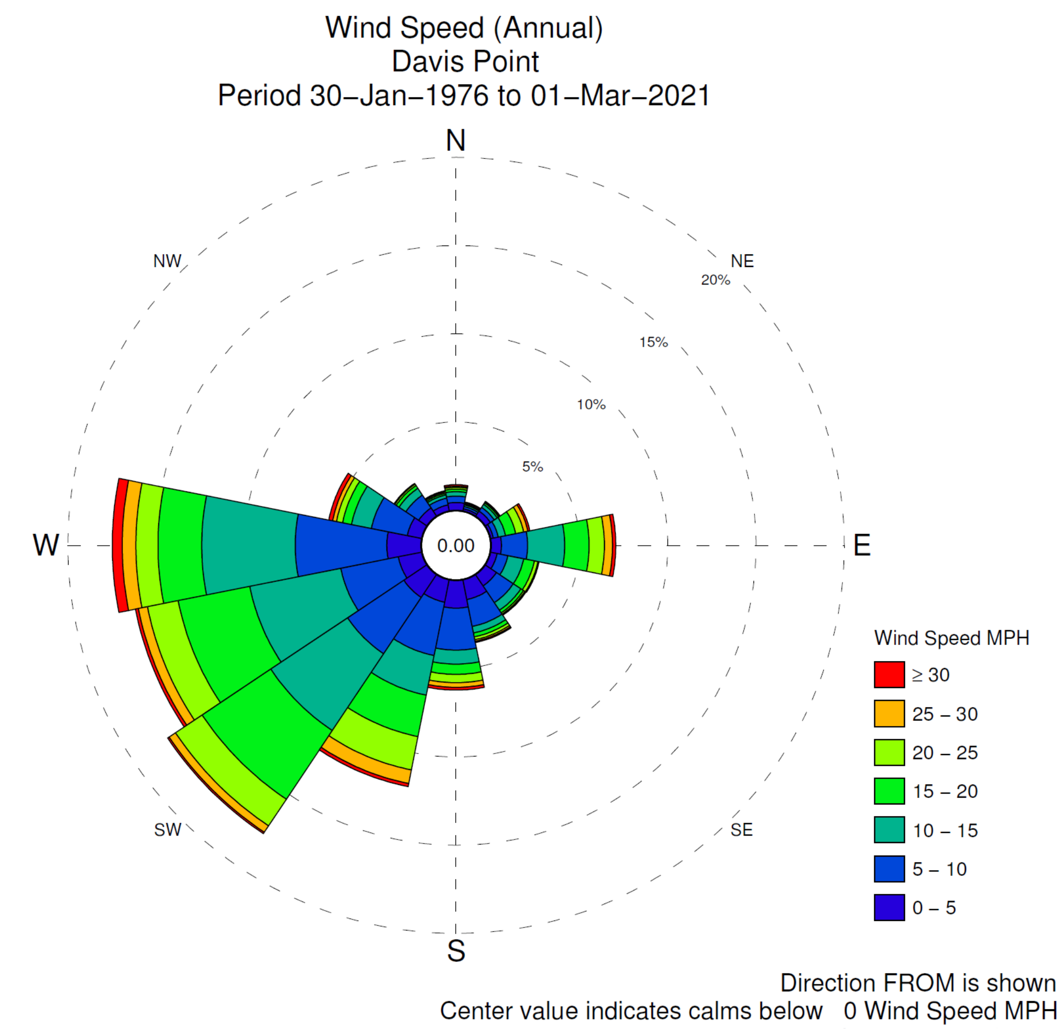
3.4.4 | WIND STATISTICS

NOAA wind data was acquired from the meteorological station at the Davis Point Pier, Station ID 9415141. The following section shows the annual wind rose derived from the dataset. Wind measurements recorded at this station are representative of winds over San Pablo Bay and are well suited for characterization of wind and waves from the Bay incident at the Cal Maritime location.

Winds from westerly to south-westerly directions that will produce waves that propagate in the direction of the Cal Maritime Pier. Per the wind rose, wind from these directions occur 52% of the time on an annual basis. The Percentage of Occurrence table included in the accompanying graphic also reveals that some of the highest winds occurring annually come from these directions.

Waves generated due to wind shear over the open waters of the Bay are described in the following section.

FIGURE 23 – ANNUAL WIND ROSE AND PERCENTAGE OF OCCURRENCE TABLE FOR DAVIS POINT



Percentage of Occurrence

Wind Speed, Wind Speed MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Total	1.45	0.51	1.00	2.26	7.05	2.79	2.76	3.62	6.21	11.95	17.66	16.53	17.48	5.35	2.23	1.16	100.00
≥ 30				0.11	0.18				0.16	0.18		0.17	0.56	0.22			1.95
25 – 30				0.25	0.46				0.27	0.79	0.44	0.53	0.78	0.22			4.07
20 – 25	0.10			0.46	0.87	0.21		0.17	0.47	1.93	1.82	1.77	1.25	0.36			9.78
15 – 20	0.14		0.10	0.59	1.38	0.62	0.18	0.23	0.58	2.39	4.68	4.14	2.48	0.51	0.19		18.36
10 – 15	0.25		0.20	0.42	2.10	0.92	0.52	0.38	0.80	2.29	5.24	5.26	5.30	1.15	0.47	0.19	25.57
5 – 10	0.37	0.13	0.26	0.28	1.48	0.62	1.15	1.56	2.38	3.08	3.84	3.32	5.19	2.07	0.88	0.39	26.99
0 – 5	0.43	0.12	0.34	0.15	0.57	0.37	0.76	1.13	1.56	1.29	1.56	1.34	1.92	0.82	0.56	0.34	13.27

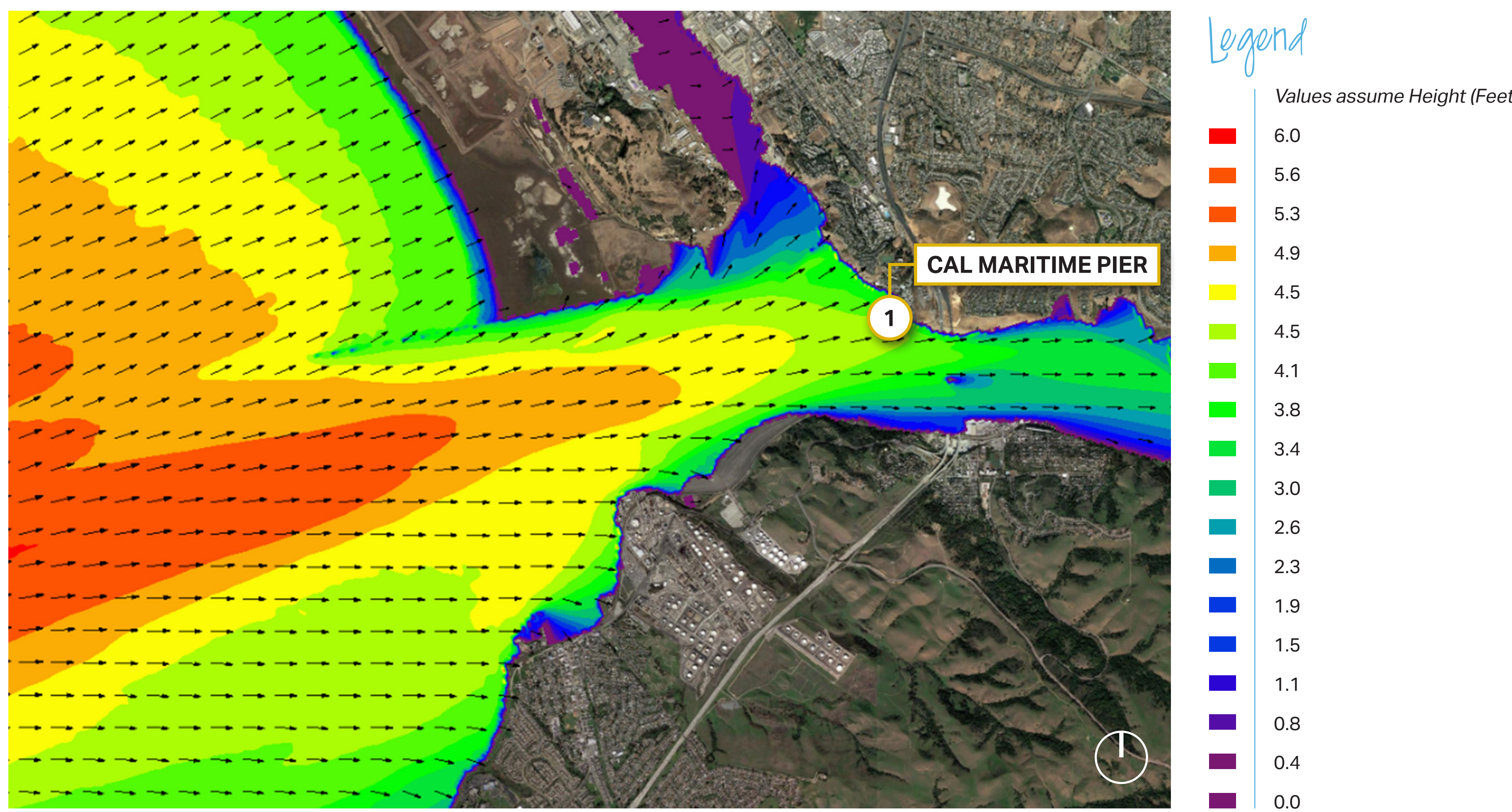
Source: NOAA Station: 9415141, Davis Point, CA

3.4.5 | WAVE CLIMATE

The most direct wind-wave exposure at the Cal Maritime Pier is for wind and waves from west-southwesterly directions developing over San Pablo Bay. In this direction there is a 15-mile fetch over the open water in the Bay. However, there is an approximately 30% reduction in wave heights as waves propagate from San Pablo Bay through the Pinole Shoal Channel to the Cal Maritime Pier.

The accompanying graphic shows the significant wave height variation for west-southwesterly winds with a 100-year recurrence interval.

FIGURE 24 – CHARACTERISTIC FLOOD CURRENT PATTERN



Cal Maritime's Main Pier is generally sheltered from waves developing in the Carquinez Strait for easterly winds, and also somewhat sheltered against waves developing for winds coming down the Mare Island Strait, due to Dike No. 9 projecting out from shore to the north of the Cal Maritime Pier.

The accompanying table provides estimates of significant wave heights (HS) and peak wave periods (TP) associated with west-southwesterly winds for recurrence intervals of 1, 5, 10, 25, 50, and 100 years. The significant wave height is an average of the one-third highest of the waves and is close to what a visual observer would estimate as being the average wave height. The largest individual waves that can occur are typically up to 1.8 times the significant wave height. The peak wave period is associated with the most energetic waves in the total wave spectrum.

The last column in the accompanying table indicates the wave length, L. This can be used to assess the wave response of a vessel moored at the pier. For a vessel such as the TSGB, which has a beam width of 72 feet, it would be expected to have a limited response to wave action for 1-year and 5-year wave conditions. For 10-year wave conditions and higher, the vessel would start to have an increasing response to wave action, but not severe. As a rule-of-thumb, when the incident wave length is shorter than the typical vessel dimension, the wave response of the vessel will be limited. If the wave length is more than two times the vessel dimension, the motion of the vessel will be about the same as the wave motion. But fortunately, this is not the case. At intermediate wave lengths from 1 to 2 times the vessel dimension, the wave response of the vessel will transition from light to moderate.

TABLE 5 – ESTIMATED WAVE HEIGHTS AT CAL MARITIME PIER FOR WSW WIND

RETURN PERIOD	WIND FROM WSW	HS (FEET)	TP (S)	LENGTH (FEET)
1	32.3	2.5	3.3	59.5
5	38.2	2.9	3.7	67.8
10	40.9	3.1	3.7	71.5
25	44.7	3.3	3.7	76.8
50	47.6	3.8	4.2	80.7
100	50.5	3.9	4.2	84.6

Waves incident at the pier will be quarter to the vessel and the motion response of the vessel can therefore include surge, sway, heave, yaw, pitch, and roll. And for these reasons a good mooring is needed. The aforementioned results can for example be utilized to gage the expected wave response of smaller vessels moored at the pier.

3.4.6 | COASTAL RESILIENCY

The Cal Maritime shoreline is protected with rip-rap up to approximately El. +14 feet NAVD88. The 1% Annual Chance Base Flood Elevation for the area is El. +12 feet NAVD88. Consequently, the Cal Maritime shoreline area has a 2-ft allowance in terms of flood hazards associated with sea level rise. Per the 1-in-200 Chance SLR projection, the BFE could exceed the +14' elevation sometime after 2050. King tides are not projected to impact the shoreline area until around the end of the century.

The primary concern is to protect the shoreline area from flooding associated with wave overtopping. The typical adaptation that would be applicable to the shoreline area would be to incorporate a low wall along the shoreline, or raise the elevation along the shoreline via a berm or levee. At many locations where such measures are incorporated, the shoreline trail is often tied into the improvements to enable continued access and vistas of the bay.

3.5 Marine Users, The Boathouse, and Marine Programs and Naval Sciences

3.5.1 | MARINE USES

The Main Pier, Boathouse, and Boat Basin are main features of the learning environment at Cal Maritime. Extensive cadet training occurs in each of these areas, both on land and in the water.

Using the Main Pier outer berth, the TSGB is the primary marine use and user within the area. Cadets use the TSGB to apply technological and leadership skills outside of the classroom while the vessel is at Cal Maritime as well as during annual summer training cruises. The TSGB also serves as a dormitory for cadets.

The Boat Basin too is a focus of learning and recreational activities. Existing floating docks found within the Boat Basin were constructed approximately 25 years ago and experience a high degree of use.

Vessels within the Boat Basin range in size and type and include three 50' long vessels; three 20'-25' vessels; six 20' oar powered boats, a training tug boat, and others. Cal Maritime is currently looking to expand the fleet of vessels to include a new replacement tug and an oceanographic or similar research vessel. The U.S. Coast Guard is currently operating two vessels from the Boat Basin over the next two years. Due to limited space availability, additional Cal Maritime training and recreational vessels are kept off-site.

Cal Maritime reports the limited space within the Boat Basin impacts the scheduling and timing of academic instruction as generally not more than two vessels can move and operate safely within this zone. Oar powered vessels are kept in the Boathouse, requiring time to launch and store. Low Tide and shoaling in and around the Boathouse also limits times when small craft can be launched from the Boathouse.

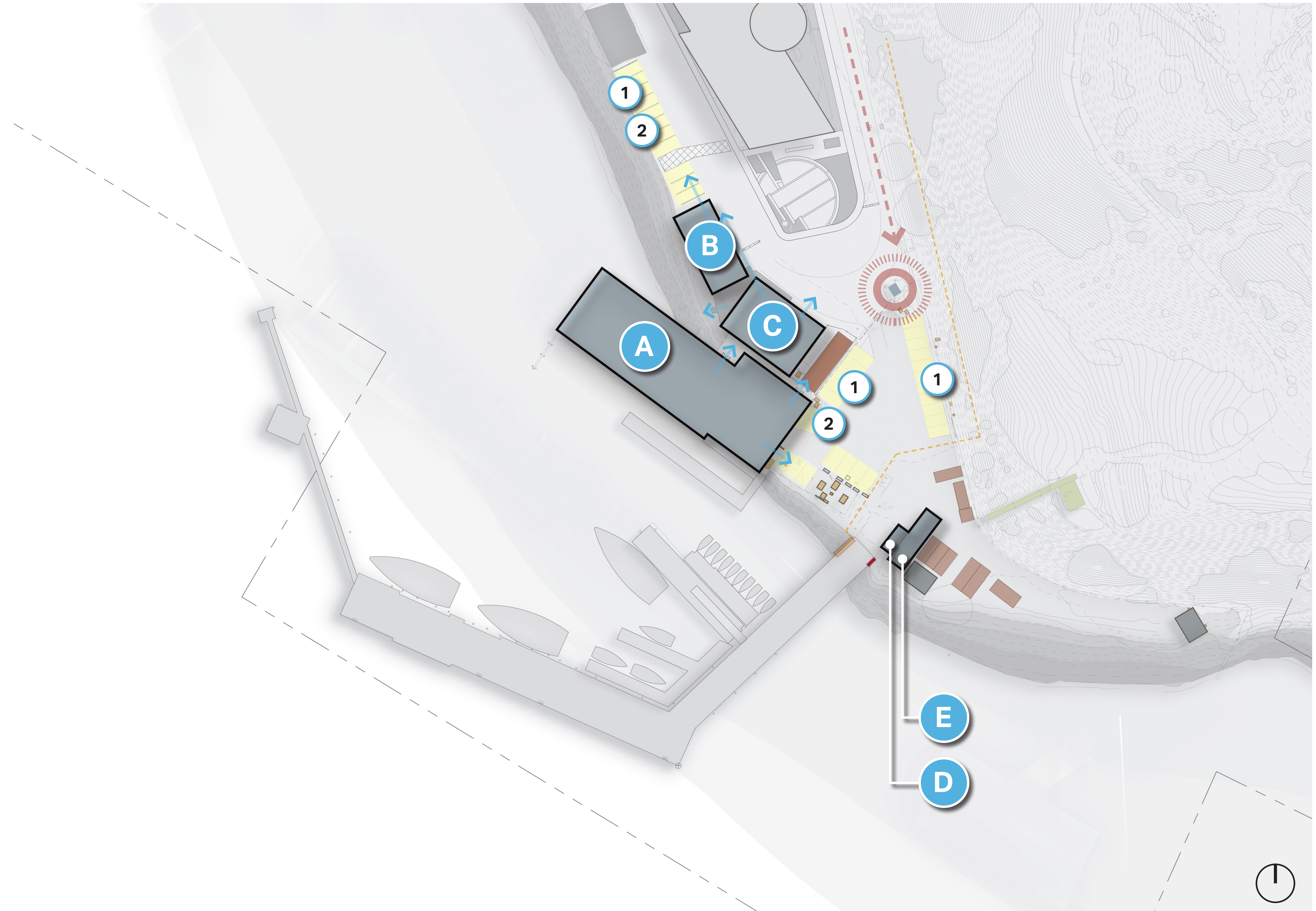
3.5.2 | THE MARINE YARD

The Marine Yard is faced with extensive demands for space associated with landside and waterside operations, a condition anticipated to worsen with arrival of the NSMV. The entirety of the Inner Marine Yard is subject to Cal Maritime and port security requirements and Maritime Security (MARSEC) levels identified by the U. S. Coast Guard. This zone and accessible areas (the Main Pier, Boat Basin, Hydrokinetic Barge, etc) are secured by fencing and a new guardhouse structure. Pedestrian and bike circulation needs to enter the Inner Marine Yard through the security gate. Increases in MARSEC levels require expanded security inspection of people and goods moving through the area.

The Marine Yard hosts a number of services and small buildings and structures, including:

- 11 shipping containers (including one used for hazardous storage);
- One prefabricated metal fabrication facility;
- One prefabricated dock boiler with metal access deck and foundations supporting the TSGB;
- Electrical substation and transformer equipment with slab on grade;

FIGURE 25 – EXISTING BOATHOUSE AND MARINE YARD CONDITIONS



Legend

A	Seamanship Building and Pier (Boathouse)(+/- 9,990 SQF)
B	Marine Programs Modular (+/- 1,687 SQF)
C	Naval Science Modular (2,541 SQF)
D	Boiler (+/- 180 SQF)
E	Metal Fabrication Container (+/-585 SQF)
1	Surface Parking (no. 32)
2	Surface Parking (ADA Compliant) (no.3)

- Existing Structures
- Existing Back Check Valve / Fire Hydrant
- Existing Hazardous Shipping Container
- Existing Shipping Containers
- Existing Electrical Equipment
- Existing Surface Parking
- Existing Site Stair
- Existing Mooring Anchor
- Existing Security Booth
- Existing Marine Yard Access
- Existing Egress
- Existing Electrical Duct Bank – Service
- Existing Pier Electrical Panel
- Existing Fire Alarm

- Fire alarm panel, fire hydrant and back-check valve;
- One monopole hosting emergency communications equipment;
- 35 parking stalls, three of which are marked for ADA use;
- Boat trailer(s); and,
- 2 mooring bollards associated with TSGB berthing.

Outside of the secured perimeter, in the Outer Marine Yard and directly in front of the Boathouse, sit two prefabricated modular structures (the Marine Programs and Naval Science Modulars). Both are in fair condition but considered a temporary solution and scheduled for replacement as part of a new Marine Programs and Naval Sciences Building.

Cadets use areas within the Marine Yard to train with forklifts and ships' cranes to practice loading cargo and other provisioning activities. Cal Maritime faculty indicates expanded area would allow from greater training opportunities for cargo operations.

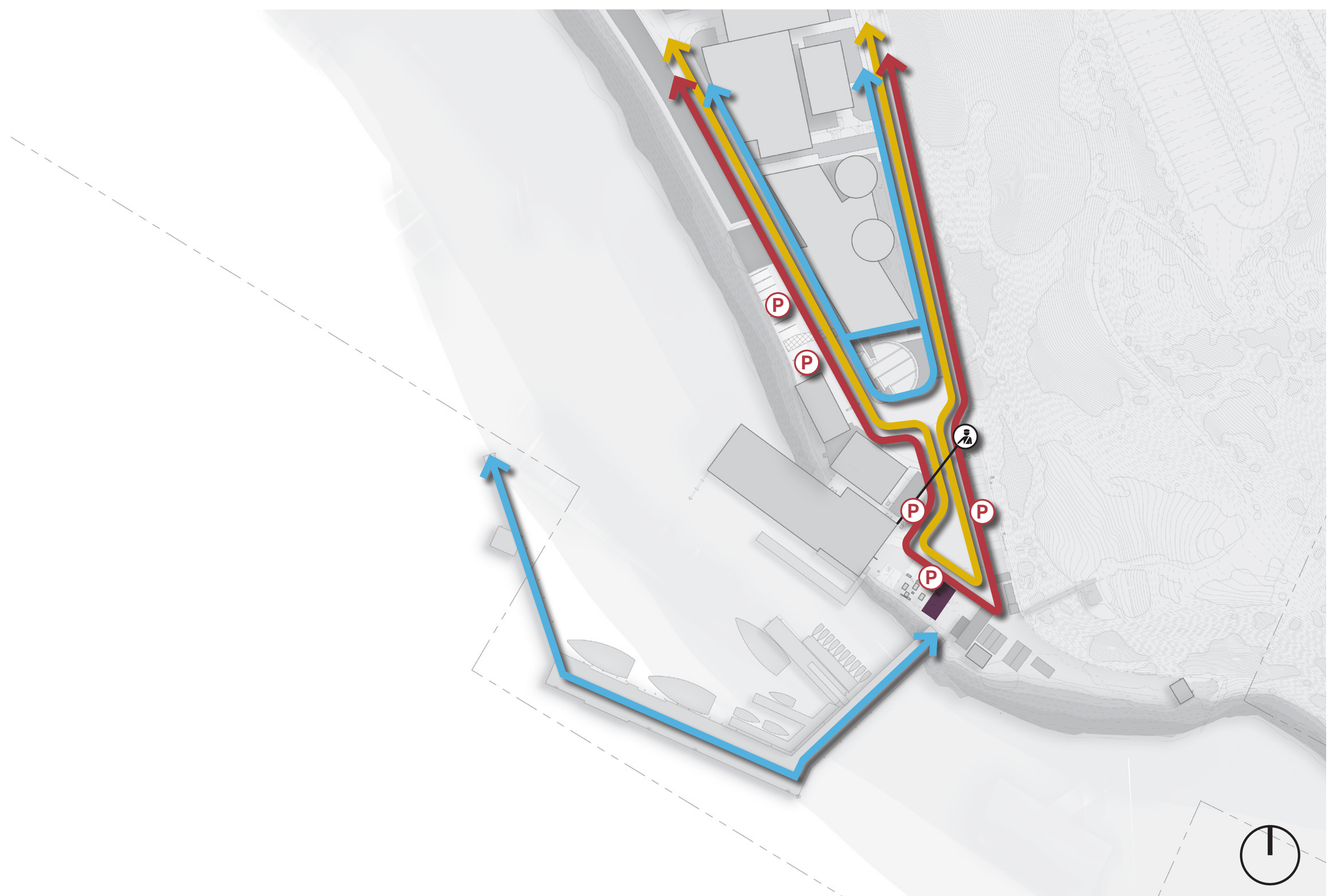
FIGURE 26 – EXISTING BUILDING AND FACILITIES ANALYSIS

Legend

1	Marine yard security gate
2	Marine yard and surface parking
3	Circulation congestion and pedestrian thoroughfare
4	Lay-down and storage area
5	Storage area and view obstruction
6	Primary pier access-point
7	Marine yard security gate and surface parking
8	Fire-lane and overflow storage area

FIGURE 27 – MARINE YARD LOGISTICAL ZONE AND FEATURES

FIGURE 28 – EXISTING CIRCULATION, CONNECTIVITY AND OPEN SPACE ANALYSIS



Legend

- Bicycle Circulation
- Pedestrian Circulation
- Vehicular Circulation
- Parking
- Security Booth
- Gate
- Loading Zone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3.5.3 | THE BOATHOUSE

The Seamanship Building (Boathouse) was originally built in 1942 and is situated on the south end of campus along the conjoining arterials of Maritime Academy Drive and Morrow Cove Drive and partially located within the Marine Yard.

The existing Boathouse facility consists of a single-story, split level, timber and steel-framed building along with a steel and concrete pier. The Boathouse is approximately 9,990 gross square feet which functions include: a large open assembly area, 7 offices, 2 non-compliant unisex restrooms, utility and equipment rooms, a break room, wood and metal workshops, storage spaces, and a partially enclosed boat basin with three boat slips.

A full report on the Boathouse and its historical condition is presented in Appendix A.

ASSET SUMMARY. The Seamanship Building consists of a single-story timber and steel-framed building and a steel and concrete pier. The main building contains offices, a unisex restroom, a break room, workshop/storage space, a partially enclosed boat basin, and a secured asphalt compound for storage and parking.

SITE. Parking Lot C improvements should be on a lower priority, as needed basis, the pavement within the secured compound should be seal coated and restriped, including restriping of the designated handicapped parking space. At the time of this site visit, a large project had been funded to replace loose and damaged vertical sheet piles on the pier. As part of this effort, there is an ongoing assessment being made of the structural integrity of the main deteriorating steel and concrete support columns for the entire pier.

ACCESSIBILITY. The threshold of the Boathouse main entrance has been adequately modified to facilitate wheelchair entry, and a designated handicapped parking space (ADA compliant) has been created in the secured parking compound. However, most personnel doors lack lever hardware and accessible signage.

To improve compliance, install lever actuated door hardware and ADA signage throughout the building. The new signs, which should identify all permanent spaces, should be mounted in the correct location and should contain such code required elements as Braille, pictograms, and high contrast raised lettering. Although some modifications have been made, the unisex single occupancy restroom does not fully comply with modern ADA standards. Renovate this space and relocate the water heater (as necessary) to create a fully accessible restroom. Also, install compliant handrails on both sides of the steps into the boat basin and close open risers. In addition, the aging non-accessible single level drinking fountain should be replaced with a new dual level unit that equally accommodates all potential users.

HEALTH. No health-related issues were observed or reported at the time of the inspection. Therefore, no Health category recommendations or assessment comments are included in this report.

FIRE AND LIFE SAFETY. No major fire/life safety violations were identified during the inspection. However, for increased safety, Academy personnel should determine if the instant step downs outside the east elevation personnel doors should be modified with an exterior plinth. This minor effort should form part of routine maintenance.

Fire detection and alarms are accomplished with updated fire alarm devices connected to an addressable EST3 fire alarm control panel. This modern system appears to be a late 2000’s installation and features smoke detectors, audible alarms, visual strobes, and manual pull stations. There are no automatic fire sprinklers in the building although manual fire extinguishers are available for immediate access.

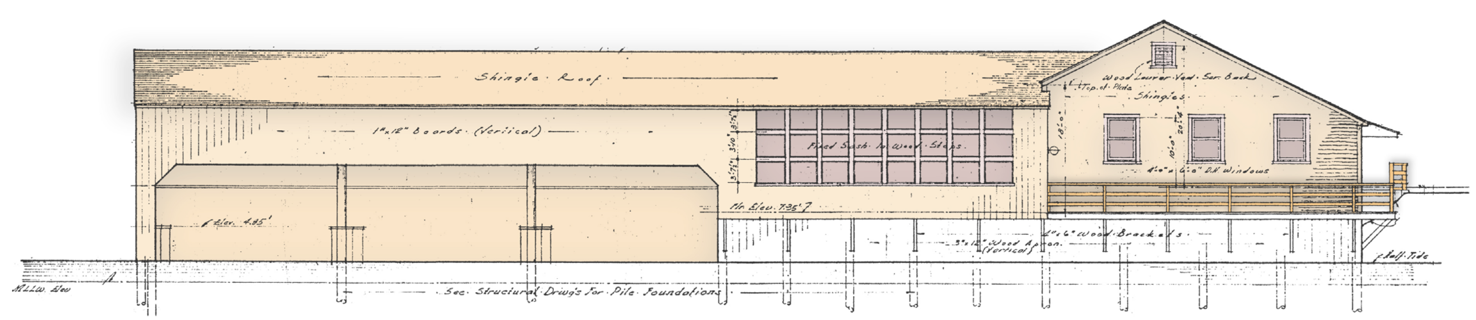
There were no directional exit signage or emergency lighting systems observed on the day of inspection. In an effort to guide occupants safely to the outside of the building, installation of a few battery back-up powered exit signs and emergency lighting units is advised.

EXTERIOR. The painted wooden shingles on the main structure, as well as the painted vertical wooden siding on the boat basin, are showing their age including low level deterioration and flaking paint in some locations. Prior to replacing the wooden siding on the boat basin, make necessary repairs to all elevations and prep and repaint the entire building to retard weathering and maintain its aesthetic.

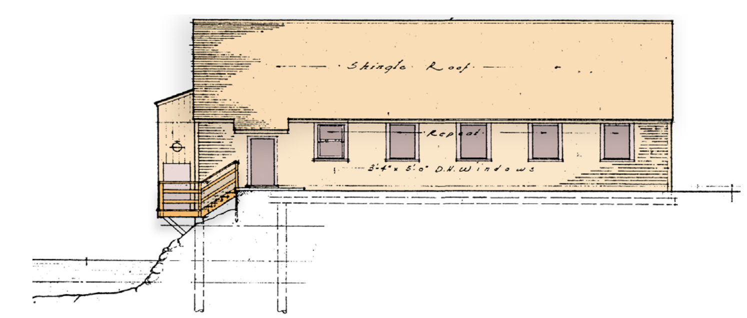
The large picture windows in the boat basin, as well as the double-hung sash windows on the main structure, have been upgraded in the past and are currently in adequate condition. Exterior personnel doors are also in acceptable working condition, except for the proposed signage upgrades. The pitched asphalt shingle roof currently has some visible damage but no reported roof leaks or interior evidence of active water infiltration. This aging roofing system is not expected to outlast the ten-year period covered by this report. On an as needed basis, tear off and replace this roof with a new pitched asphalt shingle application, including new gutters and downspouts.

FIGURE 29 – EXISTING BOATHOUSE ELEVATIONS

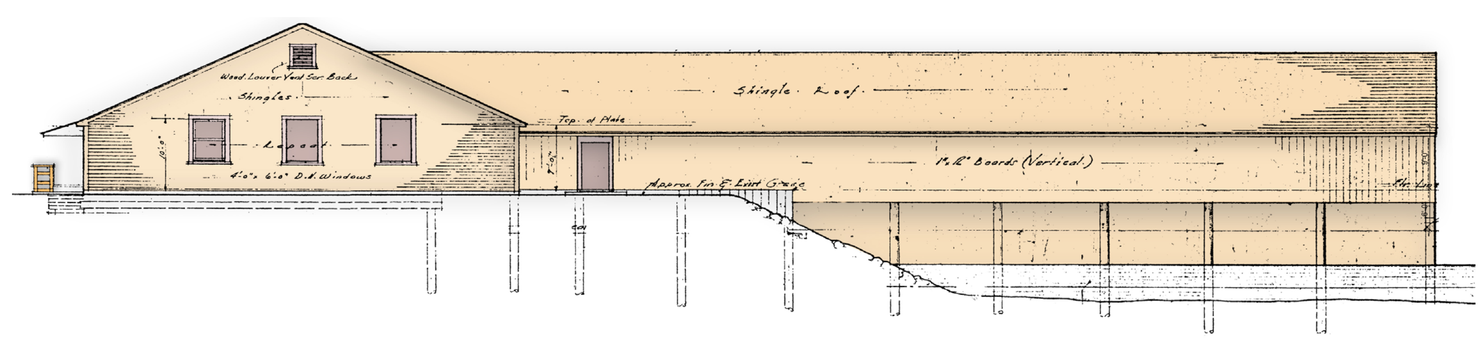
SOUTHWEST ELEVATION



SOUTHEAST ELEVATION



NORTHEAST ELEVATION



NORTHWEST ELEVATION

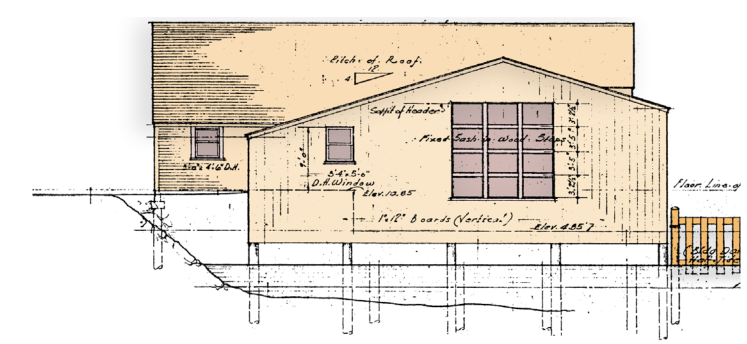


TABLE 6 – BOATHOUSE ROOM-BY-ROOM PROGRAM AREA

ROOM TYPE	AREA (SQF)
Restrooms (no. 2) + Utility and Mechanical Room	219
Break Room	237
Boat Slip Basin	3,332
Wood and Metal Workshops (no. 2)	2,019
Loft / Oar Storage	1,527
Office Area	1,022
Working Gear and Ancillary Storage	371
Open Lounge Area	1,062
Vestibule	98
Existing Boathouse (Seamanship Building) Total Area	9,887

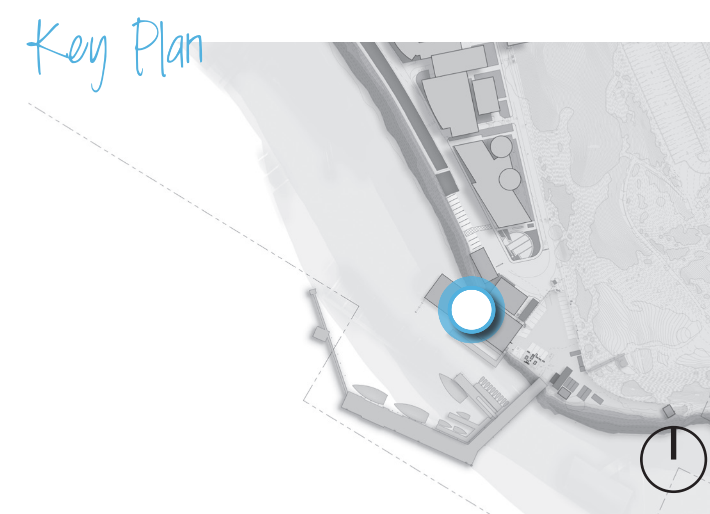


FIGURE 30 – EXISTING BOATHOUSE (SEAMANSHIP BUILDING) – GROUND FLOOR

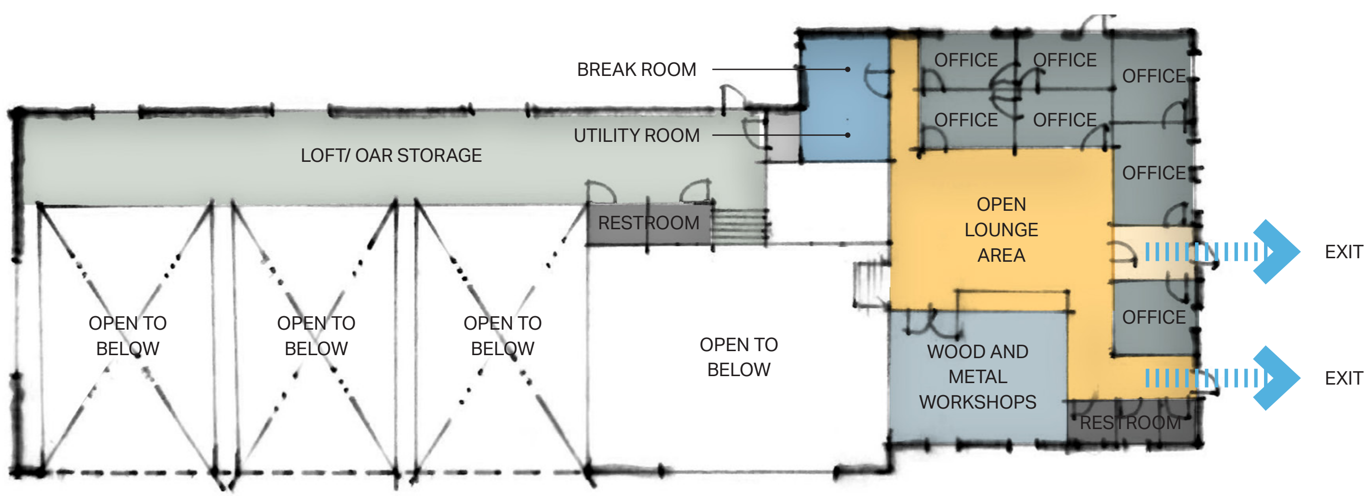
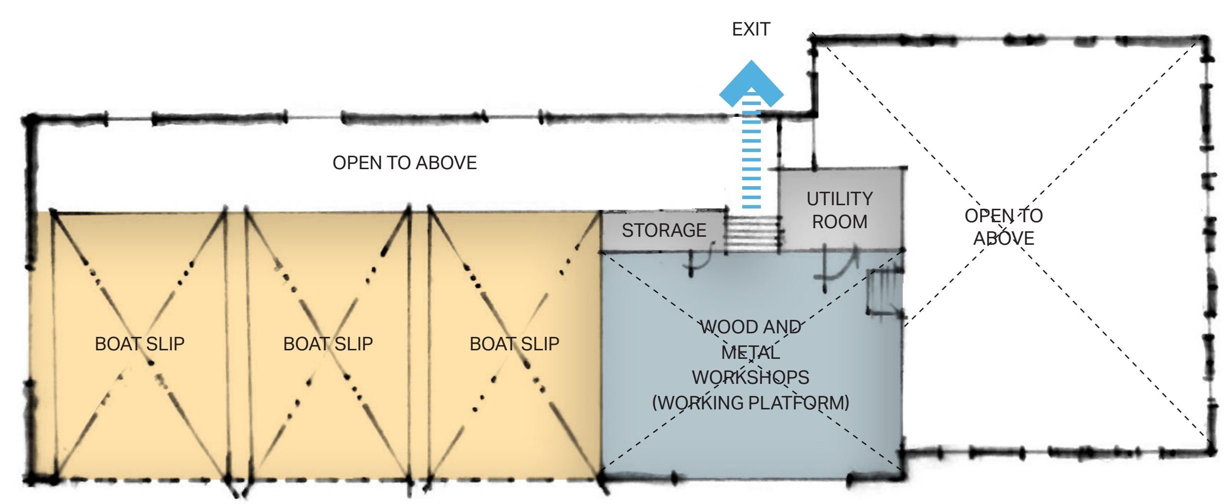


FIGURE 31 – EXISTING BOATHOUSE (SEAMANSHIP BUILDING) – FIRST FLOOR



Legend

- Break Room
- Restroom
- Boat Slip Basin
- Wood and Metal Workshops
- Loft / Oar Storage
- Office
- Storage / Utility Room
- Open Lounge Area
- Vestibule

TABLE 7 – MARINE PROGRAMS AND NAVAL SCIENCES BUILDING ROOM-BY-ROOM PROGRAM AREA

ROOM TYPE	AREA (SQF)
Break Room / Conference Room	344
Commanding Officer T.S. Golden Bear, Area	268
Director Golden Bear Research	149
Administrator Support Coordinator Marine Programs	149
Officer in Charge, Department of Naval Science	149
Assistant Officer in Charge	149
Administrative Assistant Human Resources	149
Office Area	1,010
Vestibule	208
Existing Marine Programs Building Total Area	2,575
Open Office / Multi-Purpose Room	532
Offices (no. 7)	1,160
Restrooms	368
Storage	219
Existing Naval Science Building Total Area	2,279

Key Plan

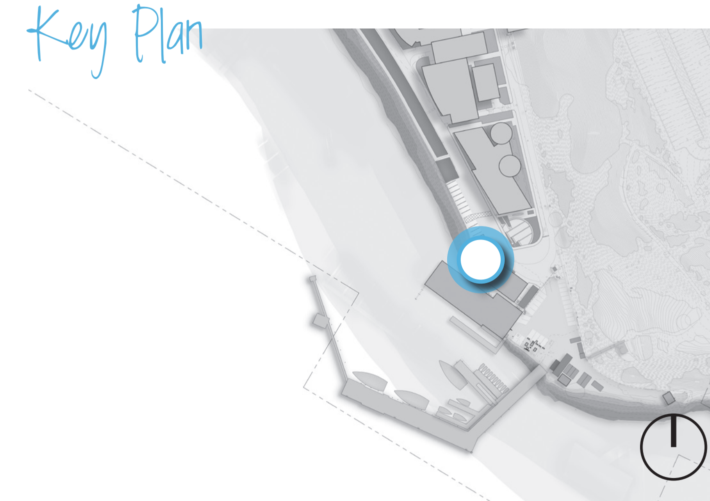
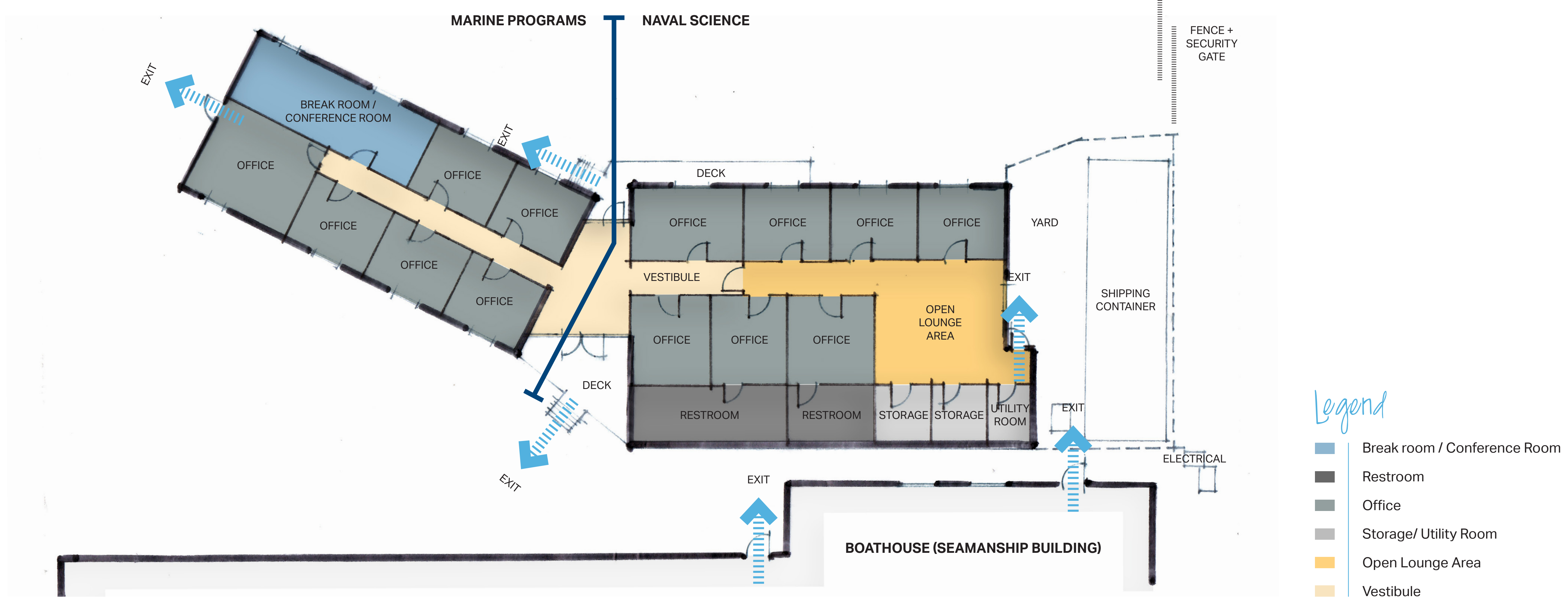


FIGURE 32 – EXISTING MARINE PROGRAMS AND NAVAL SCIENCE BUILDING – GROUND FLOOR



3.6 Waterfront Serving Utilities and Transportation Systems

3.6.1 | OVERALL WATERFRONT SERVING UTILITY SYSTEMS

The Cal Maritime campus and its waterfront are served by a network of utility systems extending from Maritime Academy Drive to buildings and in-water infrastructure installations (as seen in the graphic opposite). Existing utility capacities and future demand associated with the goals of institutional growth are documented in detail in the 2017 Physical Master Plan.

The 2017 Physical Master Plan concluded that for facilities necessary to accommodate the academic master plan and situational growth to 2,200 FTE cadets:

- All off-site utility systems appear to either currently have adequate capacity or capacity can be readily increased with improvements typical of similar development investments. There are no apparent utility supply issues.
- All on-site utility systems will require some degree of upgrade (e.g., upsizing, repair, replacement) regardless of changes in project demands. Primary upgrades identified included the sanitary sewer pump station and improvements to the open storm drain channel along Maritime Academy Drive. Some number of new mains and services will be required to serve the new facilities.
- Some of the existing on-site utility systems will need to be relocated to accommodate the new facilities, or even to avoid existing buildings, most notably the existing storm drain line currently running through the middle of the Cal Maritime campus.
- Some of the existing on-site utility systems will require upgrades, most notably an upgrade to the sanitary sewer pump station and improvements to the open storm drain channel along Maritime Academy Drive;

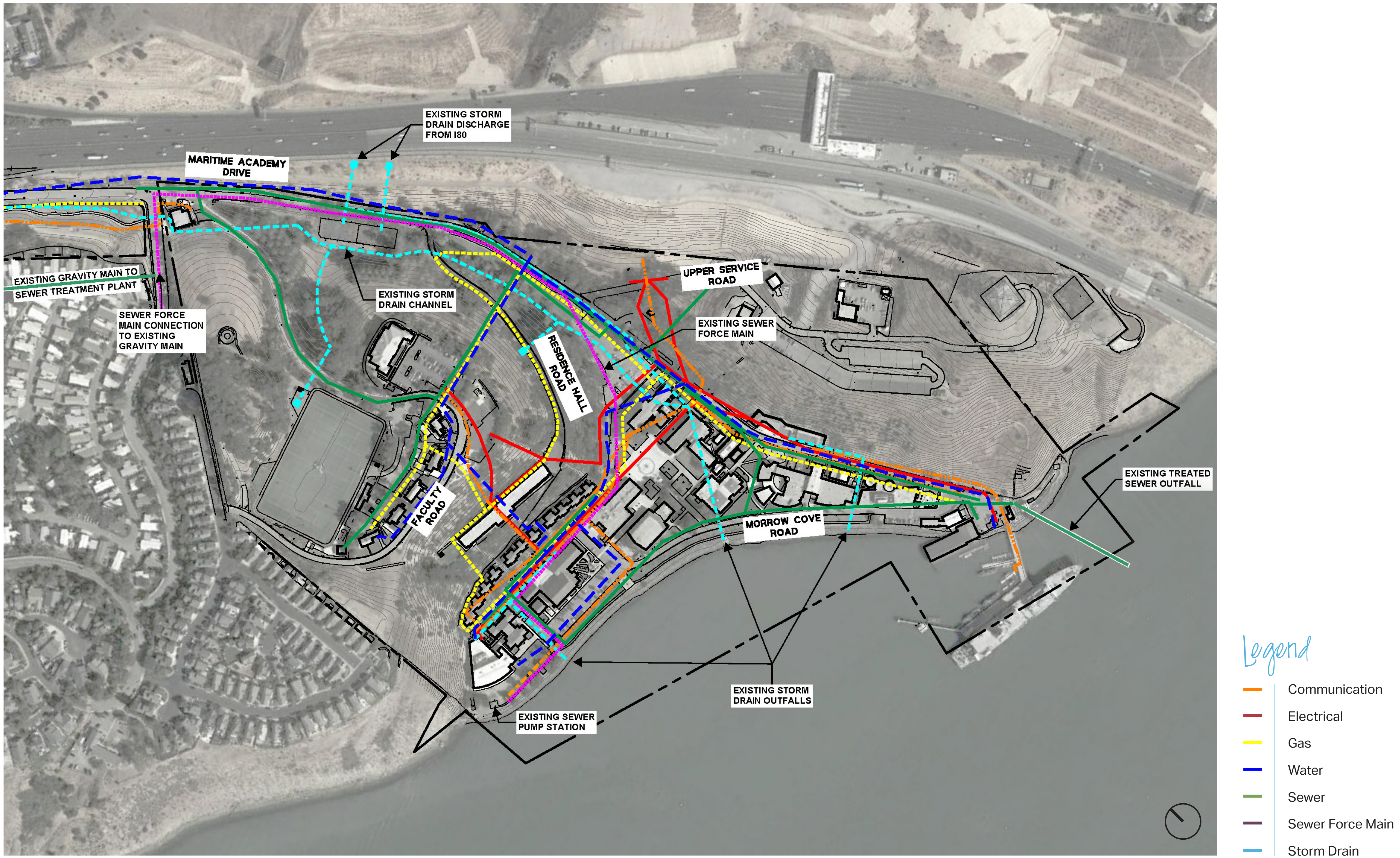
The 2017 Physical Master Plan's associated EIR concluded that, with the installation of the proposed improvements and the implementation of recommended mitigations, there would be no significant impacts related to hydrology, water quality, or utility systems.

- Expansion of the main pier to accommodate the NSMV and any incremental increases in supply needs over the smaller TSGB.
- Relocation of utilities serving the main pier and adjacent marine logistics yard.
- New or modified buildings lining the waterfront as identified in the WFMP.
- Changes to impervious zones and shoreline areas that would impact stormwater systems.

On this last point, as the Marine Programs and Naval Sciences Building and Boathouse renovation were included in the 2017 Physical Master Plan, the majority of their supply needs have already been documented. Any additional sizing of supply for these elements is accounted for in Section 5 and the cost estimate provided in Table 9.

In the following section, we highlight utility systems as documented in the 2017 Physical Master Plans and review needed elements as they relate to impacts anticipated in the WFMP. Please note that as the NSMV is under construction and not presently deployed at any of the SMAs, the direct observed impacts to utilities associated with home port operations are not fully known. Additional detailed investigation will be necessary to properly size and account for utility elements supporting NSMV operations in the project definition / description and detailed design work associated with the CEQA process.

FIGURE 33 – EXISTING CAMPUS SITE UTILITIES



3.6.2 | SANITARY SEWER SYSTEM

SUMMARY. Almost all of the Cal Maritime campus, including the TSGB when it is in port, drains by gravity via a private collection system to a Vallejo Flood and Wastewater District (VFWD) sanitary sewer pump station located at the western point of the Cal Maritime campus near the northern end of Morrow Cove.

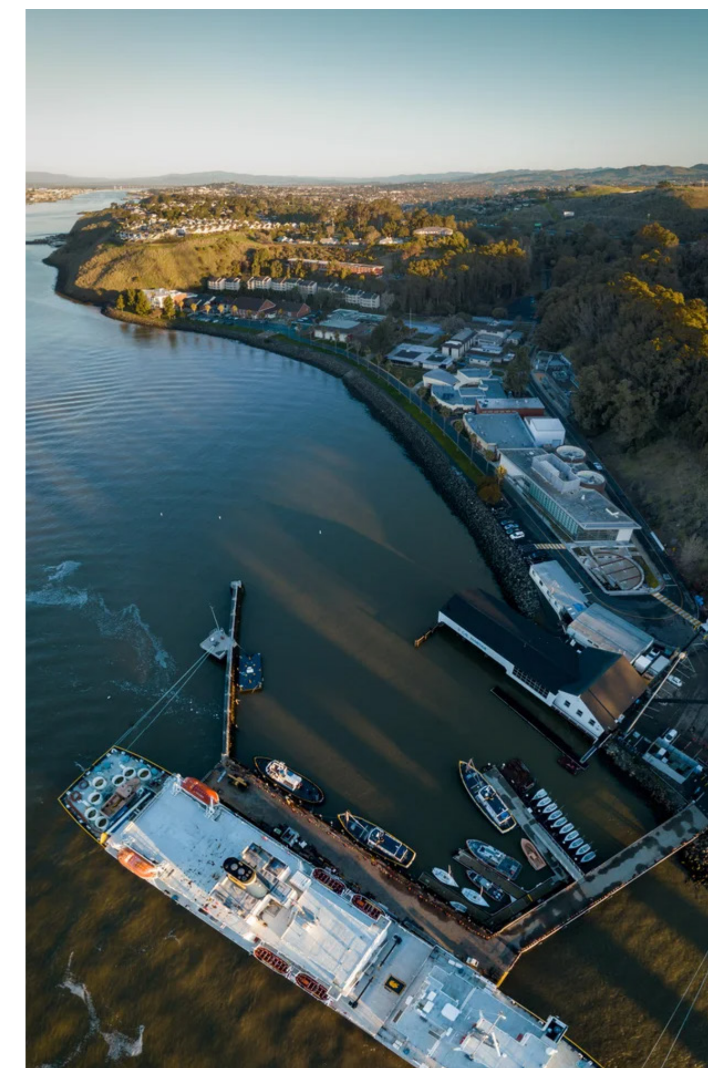
The pump station discharges to a 6” sanitary sewer force main that runs generally north along Maritime Academy Drive until it discharges into a VFWD gravity main in Country Lane Drive, which from there drains north almost 2 miles to the wastewater treatment plant on Ryder Street in Vallejo. The treatment plant’s main discharge line is directed west into the Mare Island Strait, and secondary-treated wastewater is discharged into this outfall. A second / backup discharge line runs south almost 2.4 miles to the Carquinez Strait. Both primary- and secondary-treated wastewater is discharged into this outfall (the plant does not provide tertiary treatment). The portion of the second discharge line within Maritime Academy Drive is 36” in diameter and represents a potential constraint for other utility improvements.

The wastewater treatment plant has a dry weather capacity of 15.50 million gallons per day (MGD) and a wet weather capacity of 60 MGD and treats approximately 11.44 MGD of wastewater, so the current remaining dry weather capacity is approximately 4.06 MGD. The total anticipated project discharge is 0.06 MGD, so the remaining dry weather capacity, accounting for the proposed project, is 4.00 MGD, which represents a treatment capacity reduction of less than 1.5%.

When the Dining Center and Bookstore buildings were completed, the pump station was found to be adequately sized but close to capacity. Increased discharge to the pump station will require it to be upgraded, which may include replacing / upsizing pumps and/or increasing the wet well size.

WFMP CONSIDERATIONS.

- The increased size of the NSMV, inclusive of greater numbers of cadets and crew (288 for TSGB vs. 760 for NSMV) will place additional demands on the Cal Maritime sanitary sewer system. Pump station and discharge lines at or near the Main Pier will need to be studied and resized accordingly.
- The 2017 Physical Master Plan identified several sanitary sewer improvement efforts (e.g., possible upgrade of the pump station near the northern end of Morrow Cove, constraints associated with the existing 36” diameter VFWD discharge line in Maritime Academy Drive, pipe condition) that may need to be advanced concurrent with NSMV arrival.
- Planned waterfront buildings (Marine Programs and Naval Sciences Building and Boathouse) are accounted for in the 2017 Physical Master Plan and are not expected to trigger significant rethought on sizing and arrangement of sanitary sewer features.



3.6.3 | POTABLE WATER SYSTEM

SUMMARY. The City of Vallejo (the City) provides water service to the Cal Maritime campus. The total water demand for the City is about 8,000 MGY, and the City's entitled allocation is about 14,000 MGY.

The existing Cal Maritime site, including the TSGB when it is in port, is within the service area of the Fleming Hill Water Treatment Plant and is served by a City owned and operated water main that runs along Maritime Academy Drive.

The existing Cal Maritime system is a combination of looped and dead-end lines, with PVC and transite pipe. The existing documentation does not indicate issues with the existing pipe condition or major maintenance and repair requirements due to pipe failures. However, there are areas with inadequate fire flow and pressure, as well as areas with unusually shallow pipes. For these reasons, improvements to the system would be required, even without added demands, and should be incorporated into the development plan. These improvements would include replacement of lines that are too small and/or too shallow and connecting dead-end lines.

The NSMV has 1375 tons of potable water storage, or about 14 days for 700 persons. The ship can generate approximately 130 tons of water per day when at sea—sufficient for 1,000 persons on board—using FW Generation by reverse osmosis. Potable water consumption rates for the NSMV are 35 gal/day per person for 700 (93 tons) plus 5 tons for ship services.

WFMP CONSIDERATIONS.

- The potable water supply is generally adequate and is expected to meet any needed elements envisioned under the WFMP.
- The increased size of the NSMV, inclusive of greater numbers of cadets and crew, will come with additional potable water demand. Potable water connections to the vessel will need to be sized to fill NSMV water storage tanks to meet daily consumption rates as well as for needed readiness for deployment at sea.
- Planned waterfront buildings (Marine Programs and Naval Sciences Building and Boathouse) are accounted for in the 2017 Physical Master Plan and are not expected to trigger significant rethought on sizing and arrangement of potable water features.

3.6.4 | RECYCLED WATER SYSTEM

SUMMARY. The VFWD treatment plant produces water that is primary and secondary treated, while recycled water requires tertiary treatment for unrestricted use. The District is reluctant to distribute recycled water that should only be used in limited applications due to concerns of potential misuse. As detailed in the City's Urban Water Management Plan and the VFWD's Reclaimed Water Study, there have been discussions between the City and VFWD regarding the development of recycled water to reduce potable water demand, but those discussions have not advanced due to cost. Since there are no pending investments for delivering recycled water to the site, it is unlikely that any requirements for separate "recycled water ready" systems, such as parallel site recycled water systems in the street (serving irrigation and buildings) and dual plumbing in buildings, all of which would be supplied by the potable water system in the interim, will be imposed

WFMP CONSIDERATIONS. Recycled water service is not available to the Cal Maritime site and will not be available in the foreseeable future. For this reason, it is unlikely that any requirements for separate "recycled water ready" systems will be imposed for the campus overall, and specifically, areas covered under the WFMP.

3.6.5 | STORM DRAIN SYSTEM

SUMMARY. VFWD is responsible for managing stormwater quantity (flood control) and quality in Vallejo. However, most of the stormwater generated on the Cal Maritime campus discharges directly to the bay without going through the public system, and therefore is under the jurisdiction of the Small MS4 General Permit. This permit requires the implementation of Low Impact Development (LID) measures, including stormwater treatment using flow-through planters and bio-retention areas, stormwater detention, and design elements such as reducing impervious areas and incorporating stormwater detention and conveyance into the landscape design as amenities.

The existing Cal Maritime storm drain collection system consists of gravity pipes and open channels. Ultimately almost all the discharge is directed to the San Pablo Bay and is, for the most part, untreated and undetained. Stormwater treatment facilities were installed with the dining center and physical education building investments, but this represents a small portion of the overall site.

The existing drainage channel along Maritime Academy Drive, which accepts run-off from I80 as well as from much of the site, has flooded during past storm events and the project will create increased impervious areas, which will increase discharge to the channel. This will need to be addressed with a combination of improvements to increase channel capacity, such as upsizing an existing culvert and potentially widening some portions of the channel, and reducing peak flow with upstream detentions.

WFMP CONSIDERATIONS. There are no existing stormwater treatment facilities for the waterfront. Improvements contemplated under the WFMP will require stormwater treatment that complies with existing SFRWQCB standards. Additional detailed investigation will be necessary to properly size and account for stormwater elements in the project definition / description and detailed design work associated with the CEQA process.

3.6.6 | TELECOMMUNICATIONS

JURISDICTION. AT&T provides telecommunications service to the Cal Maritime site via two underground lines on Maritime Academy Drive that terminate at Communications Hut 1, which serves as the MPOE for the site. The existing 1 GB internet service is adequate to serve current demands, but campus growth envisioned under the 2017 Physical Master Plan will necessitate upgrade to overall capacity and ductbanks, alternative pathways, and other assets.

WFMP CONSIDERATIONS.

- Dedicated lines serving the TSGB will need to be upgraded and hardened to meet requirements of the NSMV. Lines will need to meet port security requirements.
- Planned waterfront buildings, expansion of WiFi services, and other elements related to the waterfront should be updated accordingly following the broader 2017 Physical Master Plan.

3.6.7 | ELECTRICAL SYSTEM

SUMMARY. Pacific Gas and Electric (PG&E) provides electrical service to the Cal Maritime site via 12.47 kV feeders that also serve other sites. The site distribution system comprises the main 12 kV / 1200 A switchgear, overhead and underground lines, outdoor building transformers, and building services / meters. Existing demand is 1,304 kVA and existing site capacity (main feeders) is 4,320 kVA, which should be adequate to serve the project, but this needs to be confirmed based on final load calculations and discussions with PG&E. Previous reports include recommendations for installing solar photovoltaic facilities and electric vehicle charging stations.

Backup power is limited to a diesel generator for classroom buildings, Communications Hut 1, and the Administration Building, while the sanitary sewer pump station which has City provided backup power. The TSGB has its own generators. In addition, life safety systems utilize batteries and UPS units in various buildings for backup power.

Shore power infrastructure, also known as cold-ironing or alternative marine power, enables ships to turn off their engines while at berth and connect to local electric power. Shore power infrastructure consists of four main elements: (1) Incoming electrical power supply to substation transformers and switchgear; (2) On-site power distribution and control (load transformer and switchgear); (3) Transmission lines and equipment that comprise the Cable Management System (CMS), providing the essential linkage from the substation to the vessel; and (4) Vessel power supply connection point(s).

Shore power systems are present for the TSGB and will likely need to be upgraded to meet requirements of the NSMV. Placement of the CMS jib crane and linking vault will need to be coordinated in the pier design to the NSMV shell door power location.

WFMP CONSIDERATIONS.

- Initial estimates of power connected demand by the NSMV are 4,828 kVA. However, implementation should ensure shore power equipment and related infrastructure meet high-capacity Onshore Power Supply (OPS) installation requirements established under IEC/ISO/IEEE 80005-1:2019 (International Electrotechnical Commission and Institute of Electrical and Electronics Engineers, 2019). These standards typically require an available 16MW. The system should establish on-site power distribution and controls at 6,600 V or 11,000 V, 3 phase, and 60 Hz.
- Planned waterfront buildings (Marine Programs and Naval Sciences Building and Boathouse) are accounted for in the 2017 Physical Master Plan and are not expected to trigger significant rethought on sizing and arrangement of electrical size and distribution features.
- Expanded activities within the basin will require extension and expansion of some level of electrical services.

3.6.8 | MISCELLANEOUS SYSTEMS

SUMMARY. In addition to the main site utility infrastructure systems, there are several important systems that will require upgrades, even without the added demands of the proposed project. These systems include fire detection systems (e.g., alarms, monitoring), energy management, HVAC, chilled water, boilers, and steam piping.

Steam piping and related plant systems presently support the heating needs of the TSGB when at the Main Pier.

WFMP CONSIDERATIONS.

- The more modern NSMV may make steam piping demands to the Main Pier unnecessary. Additional detailed investigation will be necessary in the project definition / description and detailed design work associated with the CEQA process. If the NSMV can take steam heat, a comparative study of power savings and emissions reductions through use of steam versus electric heat should be undertaken.
- The Marine Yard and Main Pier are subject to port security requirements and MARSEC levels identified by the U.S. Coast Guard. Needed security, electrical, lighting, communications, and other infrastructure to continue to meet these requirements should be sized and designed accordingly.
- 2017 Physical Master Plan recommendations for improvements to existing fire alarm and life-safety systems, site-wide Energy Management System (EMS), and other systems should include those in-water and landside elements and features identified in the WFMP.
- The NSMV has 860 square feet of garbage storage space plus an incinerator to burn plastics, paper and food (at sea). The size of the vessel will place increased demands on landside garbage and recyclable offloading, temporary storage, and collection.

3.6.9 | TRANSPORTATION SYSTEMS AND TRANSIT CIRCULATION

VEHICLE ACCESS. Maritime Academy Drive intersects State Route 29 (Sonoma Boulevard) just north of the I-80 entry/exit ramps and provides the primary vehicular access to campus from the surrounding community. The road descends from Upper North Campus and Upper West Campus, directing traffic along the eastern edge of Lower Campus before terminating at the campus pier. Maritime Academy Drive and Morrow Cove Drive form a loop around the Lower Campus and provide access to several service areas and a parking lot adjacent to Mayo Hall. A gate at the end of Morrow Cove Drive next to the Administration Building prevents non-service vehicles from full completion of the loop and drivers must retrace their path past the pier to the exit. Access to Upper East and Upper West Campus are available via Upper Campus Road and Residential Hall Road/Faculty Drive. The campus can also be accessed through the residential community to the north of campus via Country Lane Drive.

Maritime Academy Drive and Morrow Cove Drive are the primary points of access to the Marine Yard and Pier. Security fencing and a periodically manned security booth prevent access to the Marine Yard and Pier. The Pier serves as a port facility for training vessels and other ships, and as such, this zone must maintain port security and MARSEC levels.

PEDESTRIAN ACCESS. The campus affords a network of walkways connecting buildings and open spaces, including the Quad and shoreline. Pedestrian access between Lower Campus and Upper Campus is provided via a sidewalk and a raised boardwalk along Maritime Academy Drive and through staircases where hillside topography necessitates.

The 2017 Physical Master Plan identified noticeable gaps in the in the pedestrian network, including: a lack of sidewalks or other protected pedestrian facilities on Residence Hall Drive and portions of Morrow Cove Drive, a lack of defined pedestrian crossings at key street and walkway intersections, and a lack of sidewalks or other designated pedestrian facilities connecting the academic core the Marine Yard and Main Pier.

WFMP CONSIDERATIONS.

- The WFMP is not expected to significantly change main traffic and pedestrian flows as observed and planned for the 2017 Physical Master Plan. The WFMP in many ways is an additional implementing mechanism for many of the 2017 Physical Master Plan's waterfront linking features and elements.
- The Marine Logistics Yard will need to operate in both a 'normal' and 'emergency deployment' manner for the NSMV, placing some unique requirements for greater levels of container and palletized materials to be organized, staged, and made available to the ship. The Marine Logistics Yard will need to be flexibly planned to accommodate these activities (refer to Section 5.3.9).
- Increased pedestrian flows to/from the main pier are expected given the larger size of the NSMV and anticipated cadet housing on the ship.

FIGURE 34 – EXISTING VEHICULAR CIRCULATION AT CAL MARITIME AND TO/FROM THE WATERFRONT

Source: Physical Master Plan: California State University Maritime Academy, 2017

4 Reviewed Plan Alternatives

4.1 Reviewed Plan Alternatives

4.1.1 | OVERVIEW

Preliminary plan alternatives were reviewed and assessed during the Cal Maritime WFMP planning process. Plan alternatives were considered for pier and boat basin improvements as well as for waterfront-related buildings—the Boathouse, the Marine Program and Naval Science Replacement Building, and others. Concepts were generated from the survey effort and campus engagement sessions held throughout October 2021, as well as through site situational analysis and project research. Case study examples for the Woods Hole Oceanographic Institution and Coast Guard Base Alameda were also assembled and are offered in Appendix C.

Selection of preferred options and follow-up on alternatives for refinement occurred during WFMP Working Group, Focus Group, President's Cabinet, and other campus work sessions held in late October and throughout November. This section summarizes several of the plan options reviewed.

4.1.2 | REVIEW OF INITIAL PROJECT ALTERNATIVES

From review of existing site conditions, input from the Cal Maritime WFMP project scoping document, and discussions with project stakeholders, the following projects were determined to be essential for inclusion in plan alternatives:

- **MAIN PIER EXPANSION.** Improvements necessary to meet the needs of the NSMV vessel, inclusive of a substantially larger pier and operational apron.
- **ACCESSIBLE BREAKWATER (PREVIOUSLY CAPPED JETTY).** In concept with Main Pier extension, creation of a new jetty to expand the size and configuration of the Boat Basin. Since the proposed structure is a pile-supported pier, as opposed to a solid rock-mound structure, the term Accessible Breakwater is used in this document.
- **EXTENSION OF FLOATING DOCKS INSIDE OF MAIN PIER.** Reconfiguration and expansion of the number of Boat Basin floating docks to accommodate training and recreational vessels.
- **DREDGING OF THE BOAT BASIN AND APPROACHES AND INSTALLATION OF NAVIGATION AIDS.** Needed additional dredging to meet reconfigured Boat Basin needs as well as navigation aids.
- **RECONFIGURATION OF THE MARINE LOGISTICS YARD.** Aligned with in-water and upland improvements, development of a flexible space used for training and teaching activities will also support the functional operations of the Boathouse, Marine Programs Building, Main Pier, and Boat Basin.
- **BOATHOUSE RESTORATION.** Needed renovation and, as potentially feasible given its historic resource finding for purposes of CEQA, expansion to continue the building's boating and other academic and training activities.
- **MARINE PROGRAM AND NAVAL SCIENCE REPLACEMENT BUILDING.** Over time, removal of obsolete trailers adjacent to the boat basin hosting Cal Maritime's Marine Programs and Naval Science Departments and provision of a replacement building.

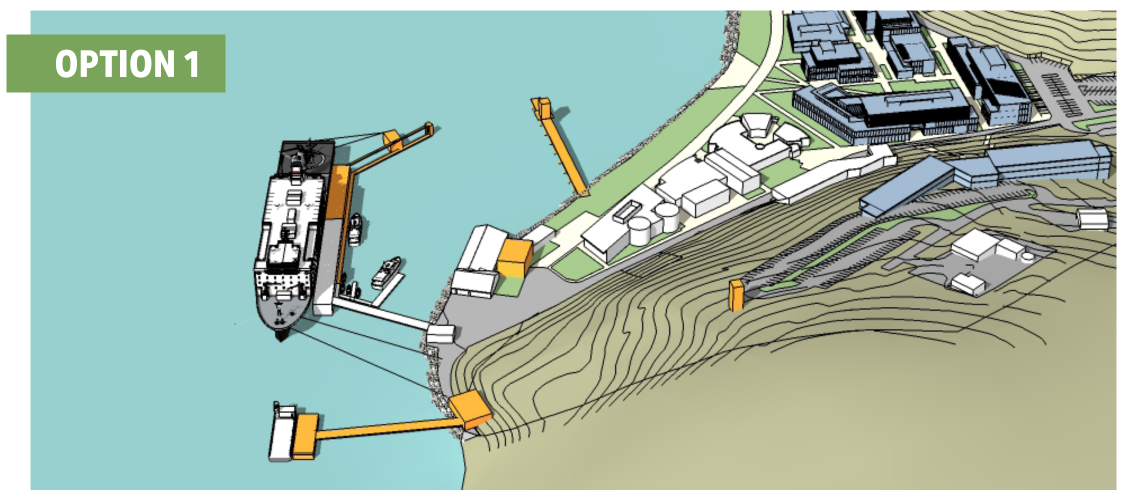
Reviewed Plan Alternatives

- **LOOKOUT AND HARBOR CONTROL TOWER.** Creation of a lookout and harbor control tower to provide campus monitoring and on-shore control capabilities as well as offer teaching functions.
- **MARINE HYDROKINETIC (MHK) BARGE SUPPORT STRUCTURE.** A Marine Hydrokinetic power barge anchored close to shore and upstream of the main pier to provide a renewable energy source to campus of up to 10 megawatts.

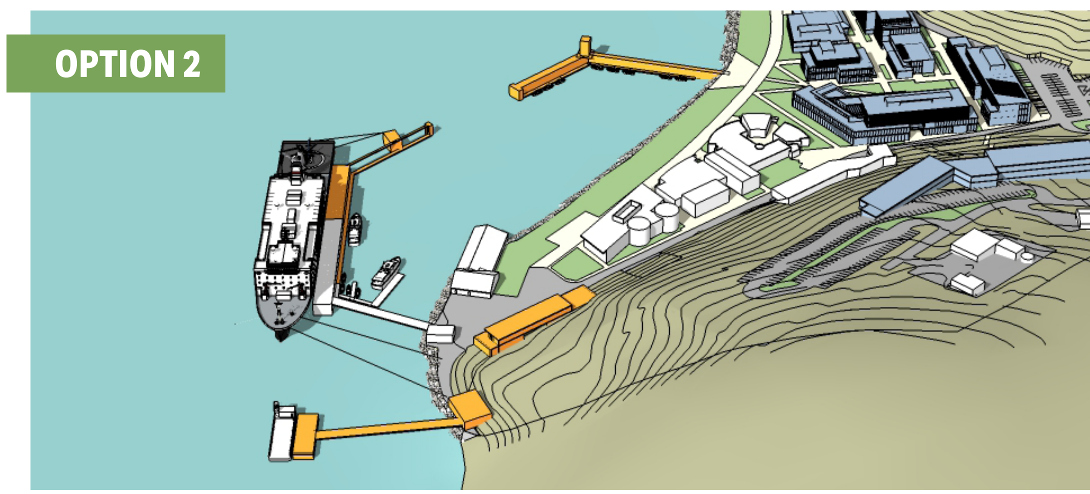
Each of these projects were initially explored as part of three preliminary planning options, as presented in the accompanying graphics. Of greatest differentiation and discussion was the placement of the NSMV along a modified Main Pier and the extent to which the Boat Basin could be expanded through placement of the proposed new jetty. Of the preliminary planning options explored, Cal Maritime WFMP working groups preferred Option 2 and the positioning of the NSMV and configuration of the expanded Boat Basin.

FIGURE 35 – INITIAL PLANNING ALTERNATIVES FOR THE CAL MARITIME WATERFRONT

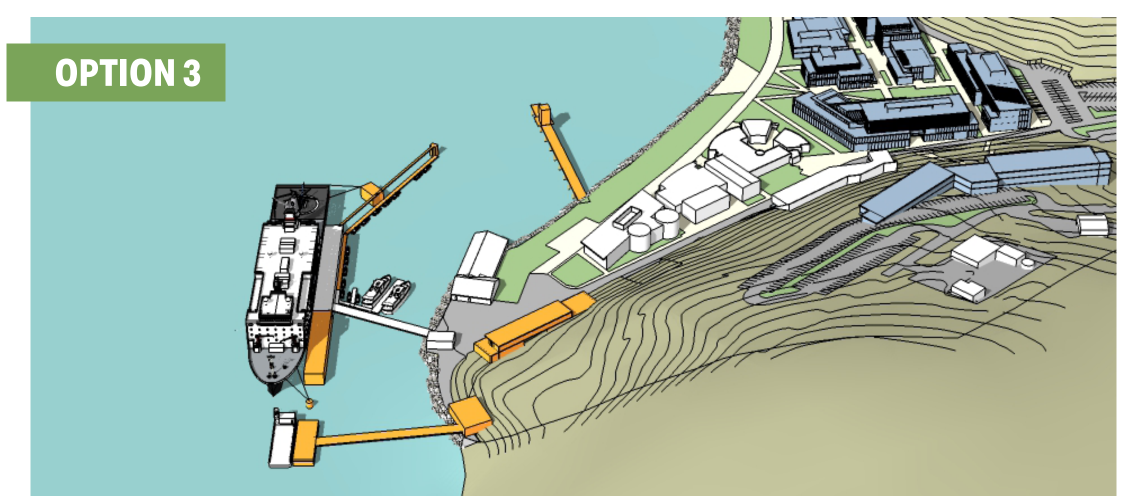
OPTION 1



OPTION 2



OPTION 3



Legend

Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

4.2 Initial Plan Alternatives for Key In-Water Facilities

4.2.1 | OVERVIEW

The NSMV is a larger, longer ship than the TSGB, with windage estimated at three times greater than that of the current training vessel. MARAD reports the NSMV's greater sail area requires more robust mooring and fendering elements (e.g., Weather Mooring Type 3 for Category 1 Hurricanes). The draft of the new training vessel, however, is less than that of the TSGB.

As discussed previously, one of the operational requirements of NSMV is for it to be available for deployment into specialized service as part of the National Defense Reserve Fleet. To this end, MARAD desires some degree of staging and loading of NSMV during emergency deployment activities, thereby, necessitating access to the starboard side roll-on / roll-off loading ramp. The loading ramp is estimated to extend 27' +/- into an operational berth and also requires ample staging and turning areas for truck and supplies movement.

Initial analysis of NSMV at Cal Maritime contemplated placement of the ship at the Main Pier with only mooring improvements. Options reviewed, however, failed to provide adequate berth alongside to access all vessel shell doors and the starboard side loading ramp.

FIGURE 36 – MOORING FOR NSMV AT EXISTING MAIN PIER

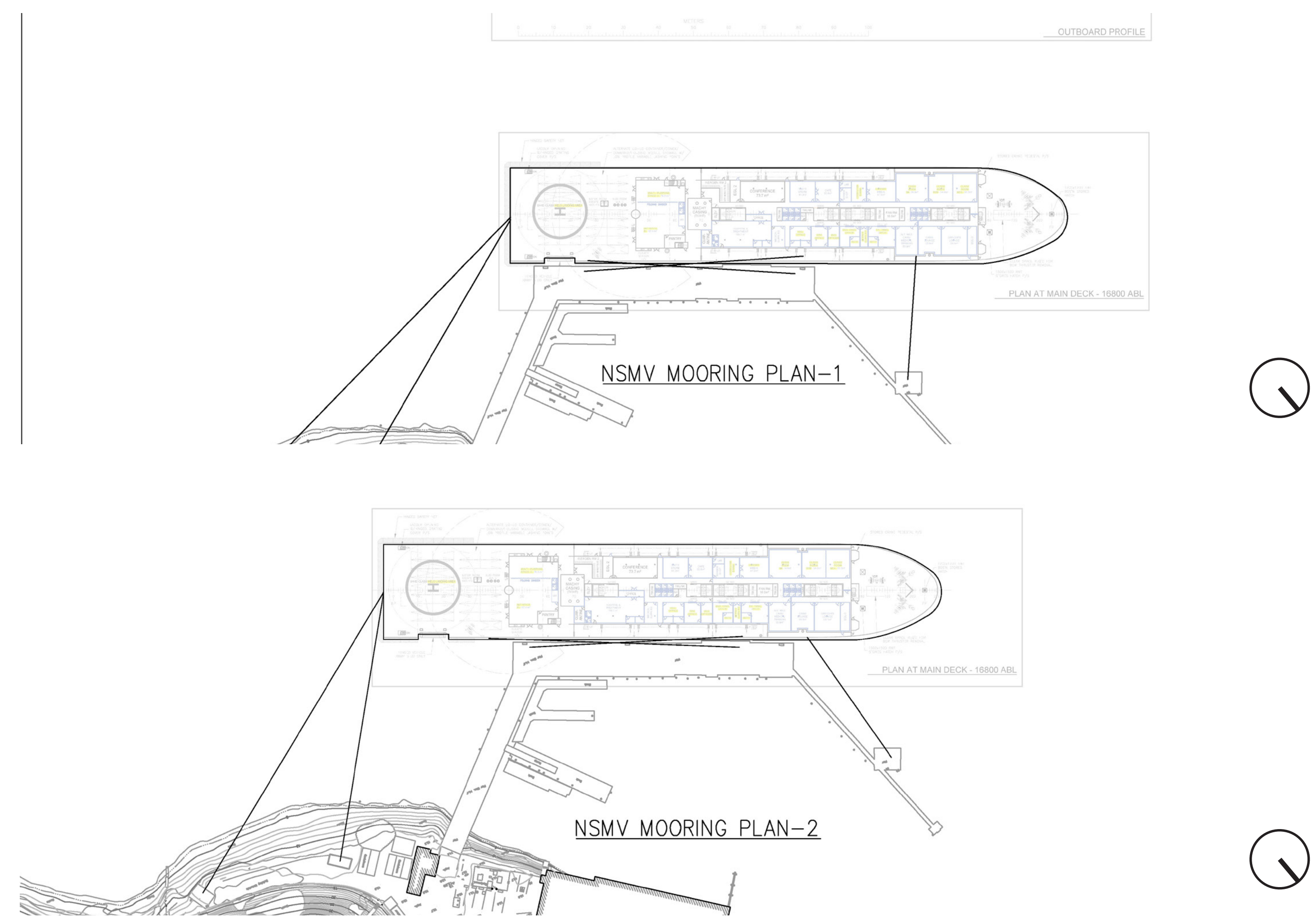


FIGURE 37 – COMPARISON OF DESIGN VESSELS (TSGB AND NSMV)

CHARACTERISTIC	TSGB	NSMV
LOA	499.0 ft	524.0 ft
Beam	72.0 ft	88.5 ft
Draft	30.5 ft	21.3 ft
Height	151.0 ft	144.3 ft
Range	17,280 miles	10,000 miles
Capacity	288	760
Propulsion	Twin Diesel 17,000SHP	Diesel Electric 9,000KW
Speed (Full)	20 knots	18 knots
Speed (Cruise)	-	12 knots
Maneuvering	Single Screw	Bow and Stern Thrust
Constructed	1985	2025 (est.)
Original Purpose	US Navy Hydrographic Ship, Transferred to Cal Maritime in 1996	Multi-Mission

General operation and use of the Main Pier surface area would experience high levels of congestion. Case study review of Coast Guard facilities, such as Coast Guard Base Alameda, indicated that Legend-class and similar vessels have vessel berths running the full length of ship with a minimal operational pier width of 40'.

Analysis shifted to widening and extension of the Main Pier to accommodate the near-full length of NSMV. These options contemplated reuse of the existing main pier structure and surface with a newly-constructed outer berth measuring +/- 470' in length. Both options contemplate a wider linking area between the pier and landside logistics zone, with a maximum width of 70' considered optimal to accommodate the demands of NSMV and Main Pier operations. Expansion of the landside connection of any significance requires some degree of relocation of the electrical substation, boiler building, and storage areas found at the foot of the Main Pier.

Demolition of the current jetty and creation of a new accessible breakwater provides opportunities to expand the Boat Basin into two zones and grow the overall number and size of floating docks to accommodate training and recreational vessels.

FIGURE 38 – MAIN PIER AND BOAT BASIN OPTION 1

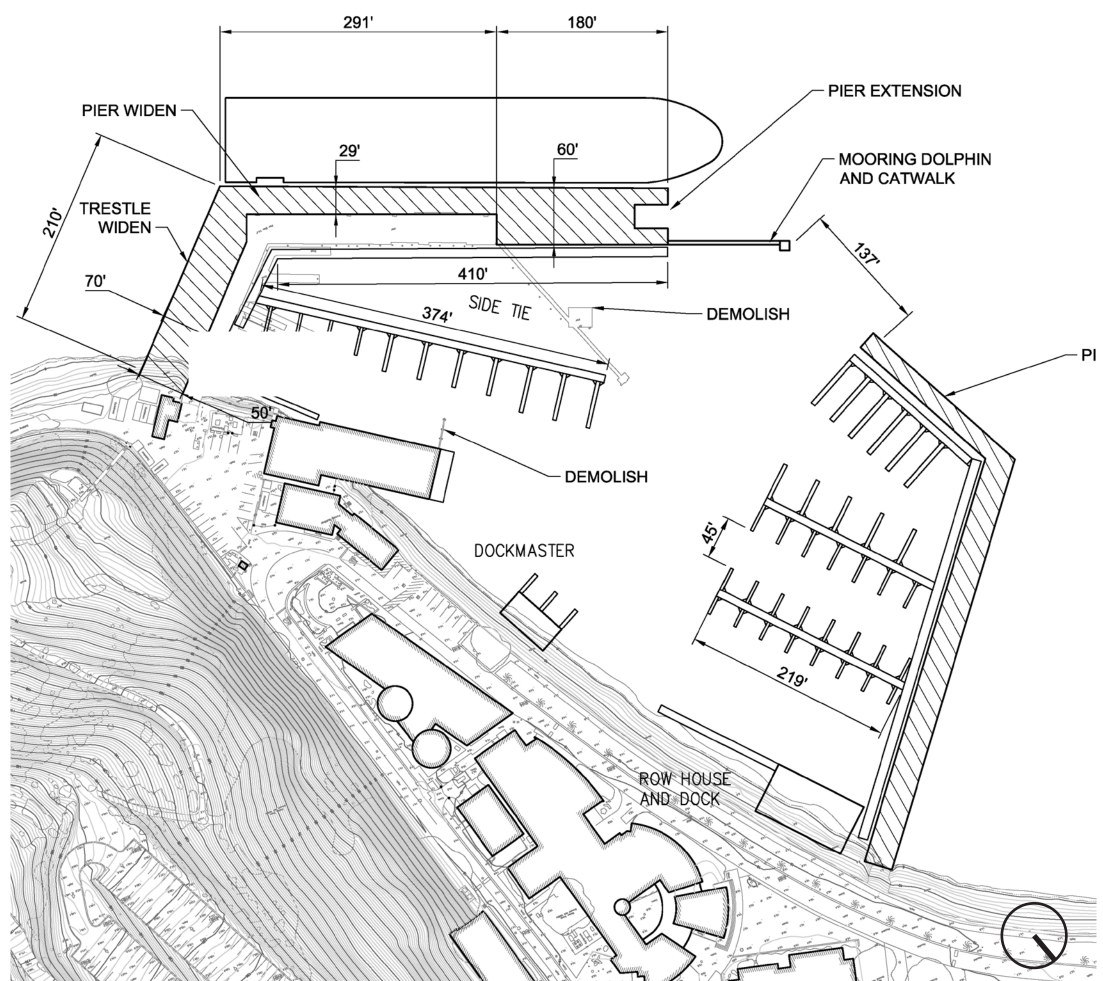
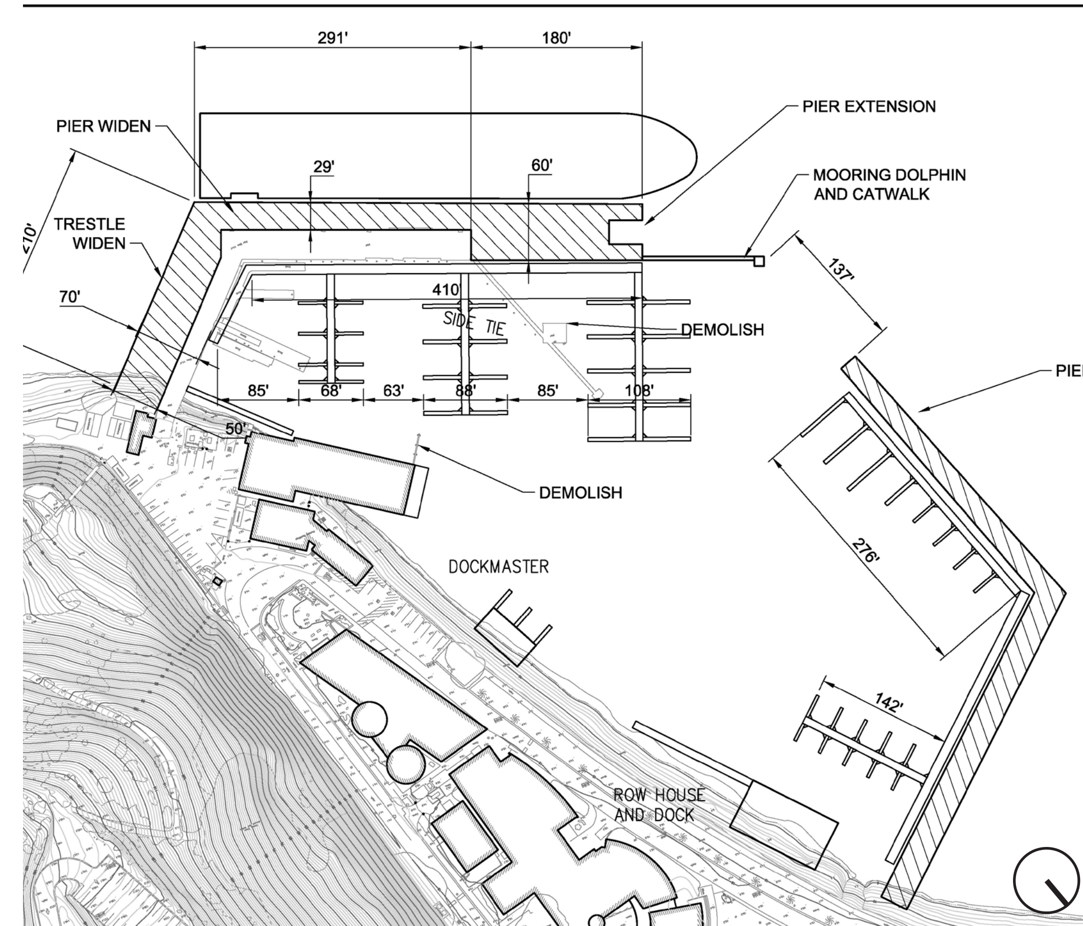


FIGURE 39 – MAIN PIER AND BOAT BASIN OPTION 2



4.3 Initial Plan Alternatives for Key Landside Buildings and Open Spaces

4.3.1 | KEY LANDSIDE BUILDINGS

The Boathouse, Marine Program and Naval Science Replacement Building, and Lookout and Harbor Control Tower were identified as key landside buildings for WFMP assessment. Additional consideration was also provided for other waterfront activity-supporting structures and elements, including the creation of a rowing house. General program development and evaluation of built examples were explored during WFMP Working Group and Cadet and Faculty Focus Group meetings.

The general program for the Marine Program and Navel Science Replacement Building—renamed during work sessions as the Marine Program Multi-Use Building—was brought forward from the 2017 Physical Master Plan. Creation of a flexible ground floor for indoor / outdoor teaching spaces and storage area was considered optimum given its proximity and relationship to the marine activity areas. Classroom and offices along with an integrated lookout and control tower were explored for upper levels. The entire building was set back to the greatest extent possible to increase the overall size of the Marine Logistics Yard.

For the Boathouse, three design options reflecting minimal-extensive intervention were prepared.

FIGURE 40 – INITIAL BOATHOUSE EXPLORATION

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FIGURE 41 – INITIAL MARINE PROGRAMS MULTI-USE BUILDING EXPLORATION

FIGURE 42 – INITIAL ROW HOUSE EXPLORATION

4.3.2 | BOATHOUSE OPTION ONE

Restoration and rehabilitation under Boathouse Design Option One include seismic upgrades and tectonic modifications of the existing structure. The headhouse is reverted back to its originally-intended use as a sail loft. Interior upgrades are made to provide a new, barrier-free ADA-compliant lift, servicing the split ground floor level. Additionally, restroom, mechanical, electrical, and plumbing systems are reworked.

Limited redesign and reconfiguration of the lower level woodworking and vessel service / demonstration area is contemplated under this design option. New elements are also suggested, such as prefinished aluminum storefront glazing systems at primary ingress and egress points. Overall, the majority of spaces under this option are protected and preserved to maintain historic value.

The exterior face of the Boathouse is appropriately restored and integrated into adjacent waterfront training and pedestrian gathering, destination, and campus site amenities. This option includes the addition of a detached entry canopy structure.

4.3.3 | BOATHOUSE OPTION TWO

Design Option Two seeks to maintain a majority of historical elements associated with the Boathouse while also adding new interior and some exterior modifications. This option includes needed seismic upgrades and tectonic modifications of the existing structure, as well as similar preservation of the headhouse, lower level wood working, and vessel service / demonstration areas. A point of departure is the relocation of the existing metal workshop and the addition of new storage areas directly accessible to the sail loft. Interior upgrades are made to provide a new barrier-free ADA-compliant lift, servicing the split ground floor level. Restroom, mechanical, electrical, and plumbing systems are also reworked.

A new prefinished aluminum storefront glazing system is suggested at primary ingress / egress points to the Boathouse and along the primary face (Northeast Elevation) of the headhouse. The reworked elevation is adjacent to the newly-proposed outer yard, serving to connect the maritime historical culture, including waterfront training, technological and professional development.

FIGURE 43 – PROPOSED BOATHOUSE DESIGN OPTION ONE – GROUND FLOOR

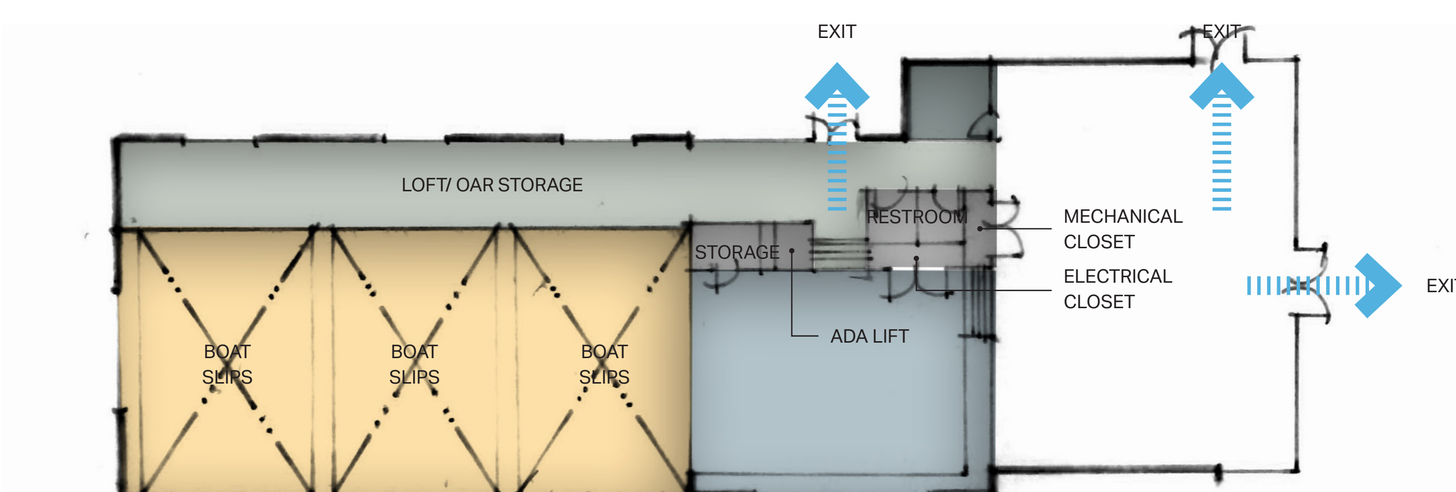
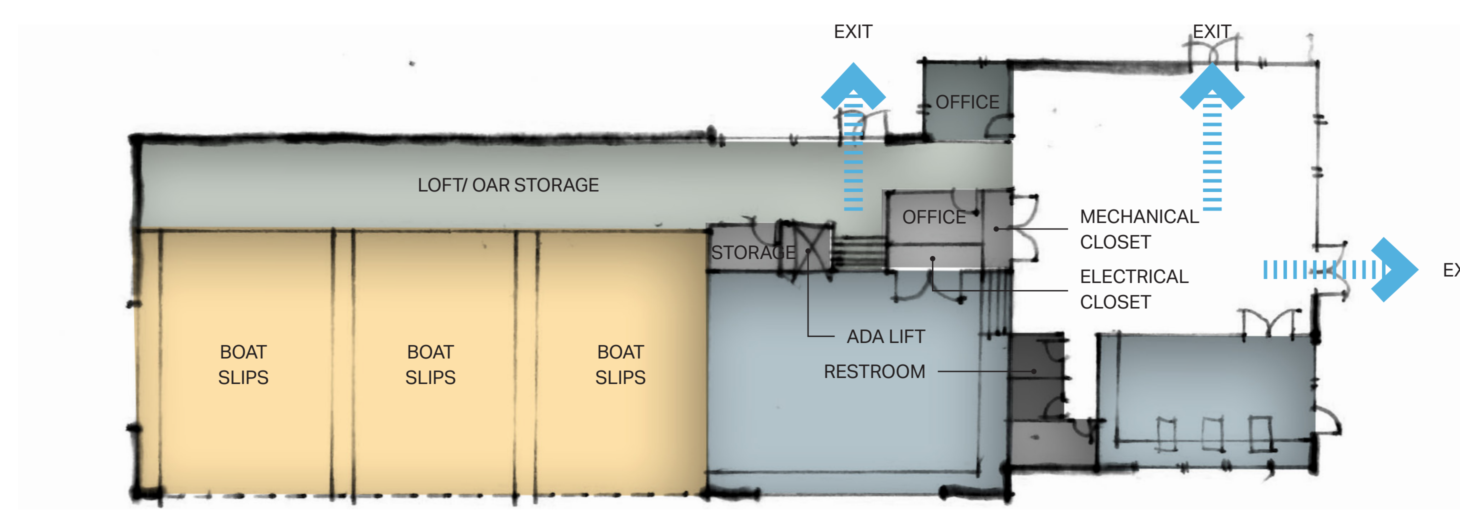


FIGURE 44 – PROPOSED BOATHOUSE DESIGN OPTION TWO – GROUND FLOOR



4.3.4 | BOATHOUSE OPTION THREE

Under this option, the headhouse is completely reconfigured to include a connected two-story atrium. The open ground floor emphasizes improved connections to the surrounding marine yard as well as the Boat Basin and Morrow Cove. The second level would provide approximately 2,250 square feet of space, accommodating 7 offices, 1 conference room, and an open lounge area.

The plan proposes to relocate, reconfigure, and retrofit the existing metal workshop and other elements. Redesign and reconfiguration of the lower level woodworking and vessel service / demonstration area would also occur.

Similar to Option Two, a new prefinished aluminum storefront glazing system is contemplated at the primary ingress / egress points to the building and along the primary face (Northeast Elevation) of the two-story headhouse. A new canopy would be introduced and emulate the existing gable roof as a two-story, portal-framed detached structure. The canopy would incorporate a contemporary vernacular that counter-balances the historical architectural style of the existing boathouse with the ongoing modernization of the current campus.

FIGURE 45 – PROPOSED BOATHOUSE OPTION 3 – GROUND FLOOR

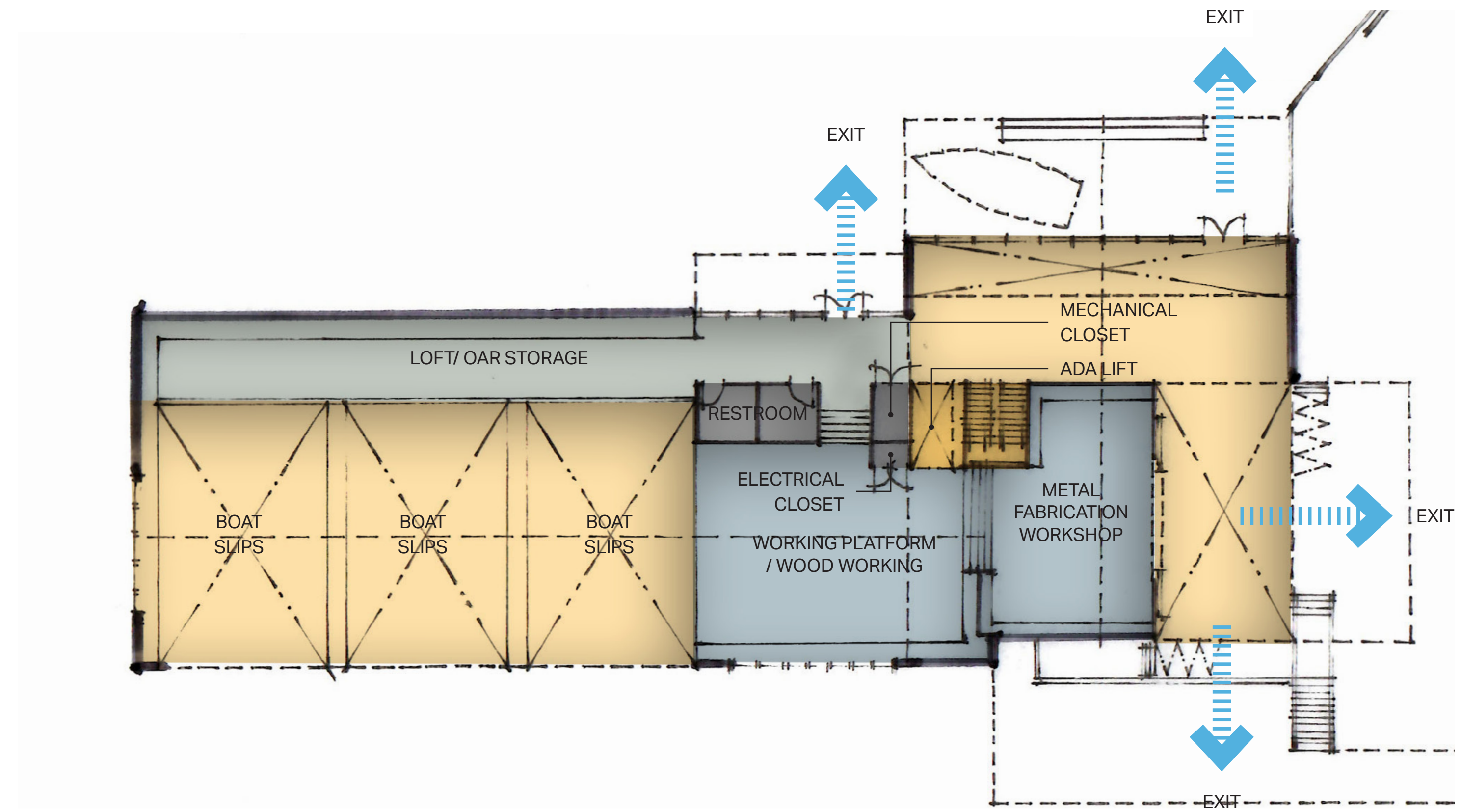
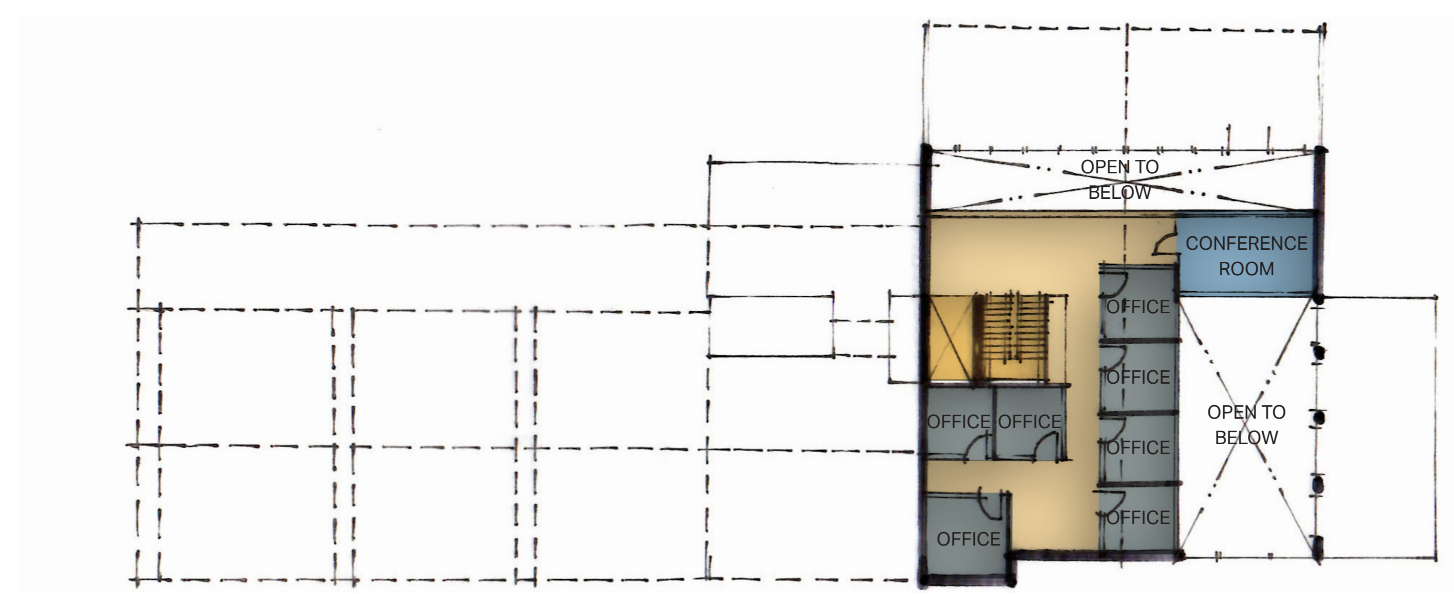


FIGURE 46 – PROPOSED BOATHOUSE OPTION 3 – FIRST FLOOR



4.3.5 | OPEN SPACE CONSIDERATIONS

The Cal Maritime community expressed a desire to connect major open spaces, including the Campus Commons, Mayo Quad, Campus Main Quad, and Simulation Center Plaza. Based up these requests, preliminary landscape designs were prepared.

Depicted concepts link nodes and corridors with the waterfront and intentionally connect users to the water's edge. At each focal point, piers, lookouts, plazas, and other outdoor rooms strengthen corridors and desire lines, providing new physical connections between the Cal Maritime Campus and the waterfront.

The shoreline was contemplated as an opportune space to explore a series of secondary open space elements, including pocket beaches, resting nodes, waterfront access. Each of the shoreline's edge conditions—shoreline upland, shoreline transition, and shoreline rock intertidal areas—were considered opportunity zones to expand open space and environmental areas while also building in adaptability for sea level rise.

FIGURE 47 – SHORELINE CONNECTIVITY

FIGURE 48 – INITIAL SITE PLAN AND LANDSCAPE LAYOUT

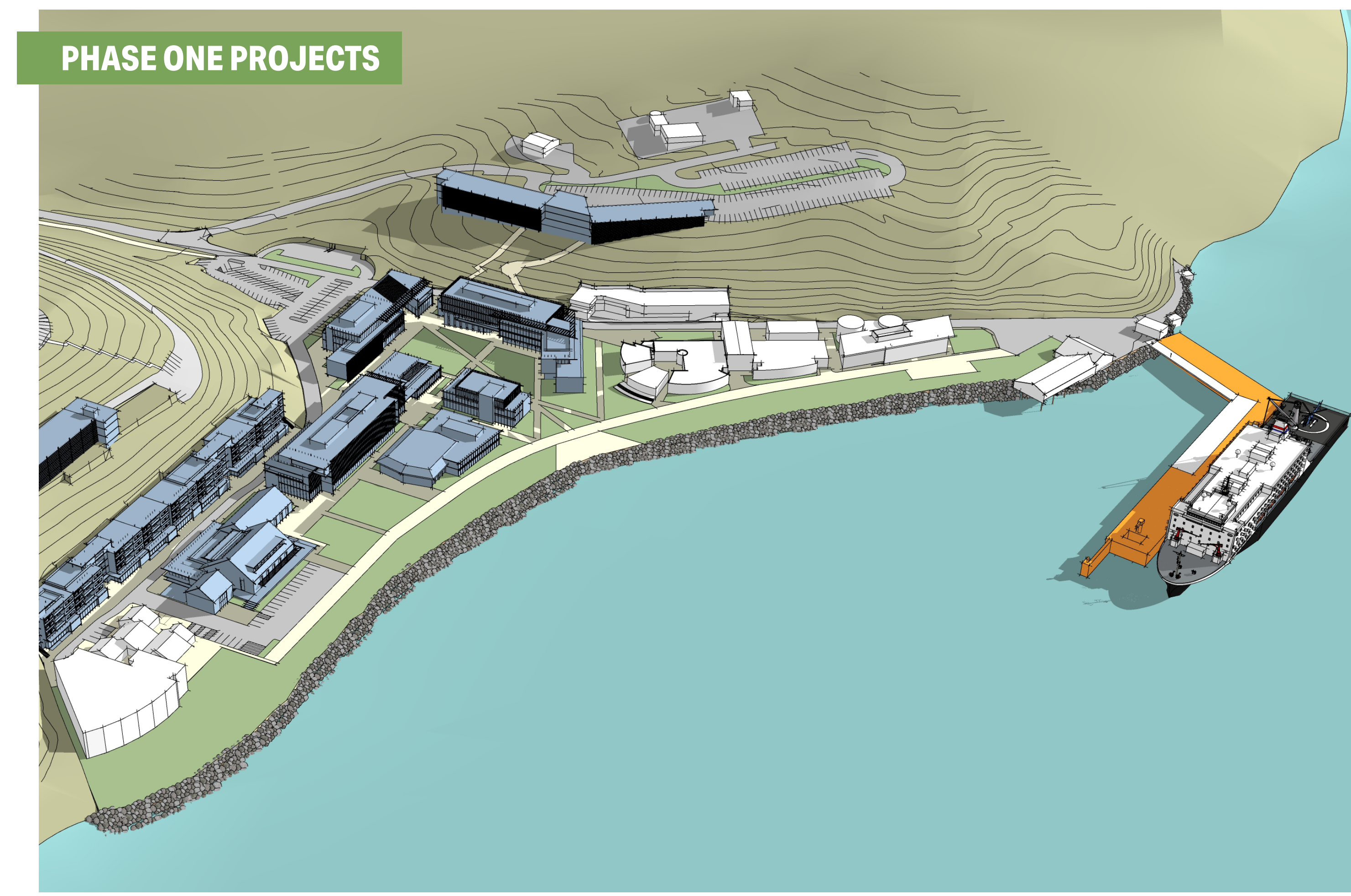
4.4 Revised Plan Alternatives

4.4.1 | OVERVIEW

Building on the initial plan alternatives assessment, a revised set of planning options were assembled. In-water and landside plan elements were organized into three preliminary phases—Phase One Projects (next 5 years), Phase Two Projects, and Phase Three Projects.

Revised concepts and thoughts on the timing of projects were presented to the President's Cabinet on October 28, 2021. The President's Cabinet recommended these revised concepts and suggested phasing advance to refinement and detail in the Cal Maritime WFMP (refer to Section 5). Additional presentations of revised concepts were made to the WFMP Working Group, Cadet and Faculty Focus Groups, and the campus at large.

FIGURE 49 – REVISED PLAN ALTERNATIVES (PRESENTED TO PRESIDENTS CABINET OCTOBER 2021)



Legend

Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

Note: Options reviewed at President's Cabinet October 2021

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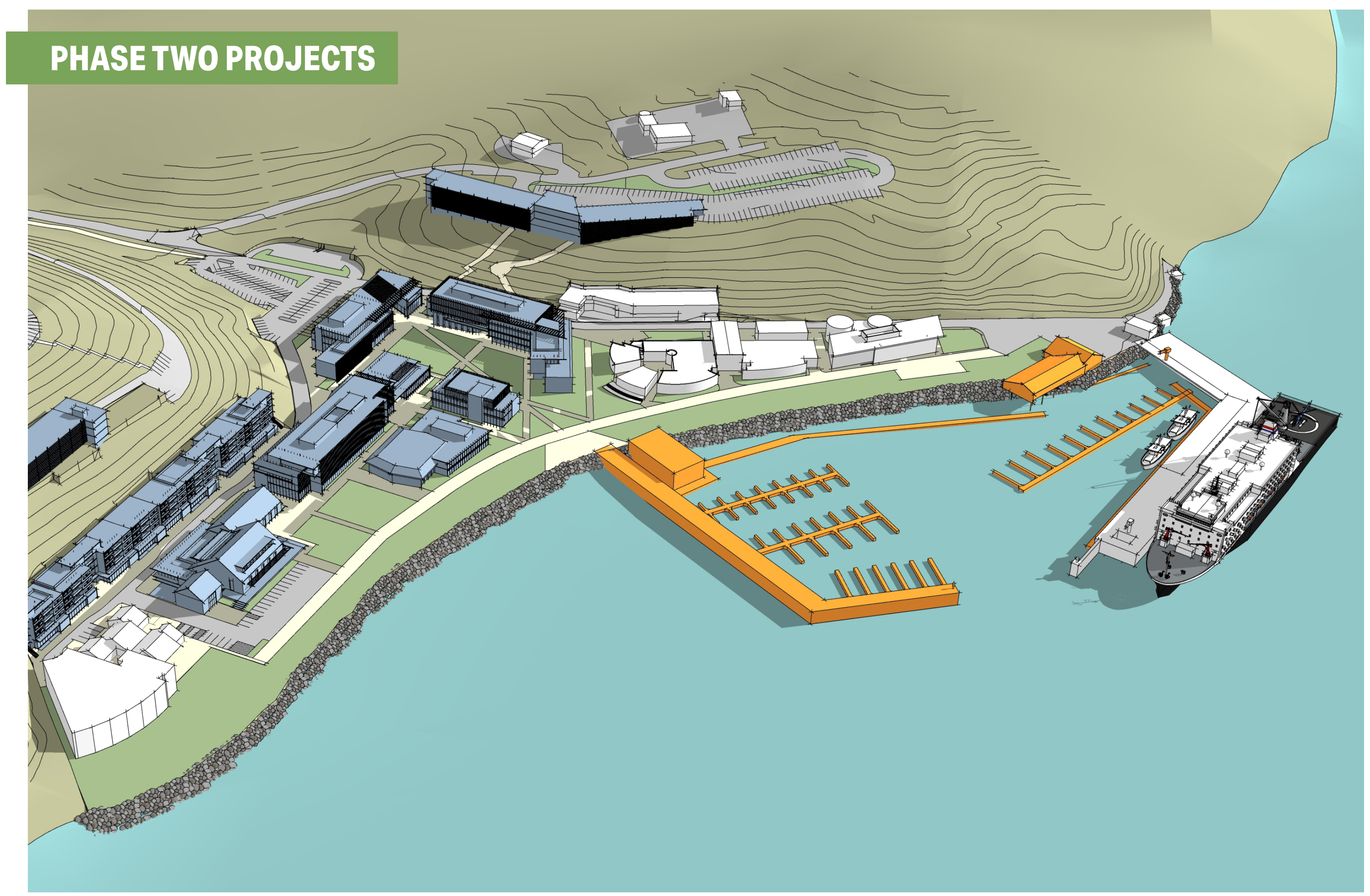
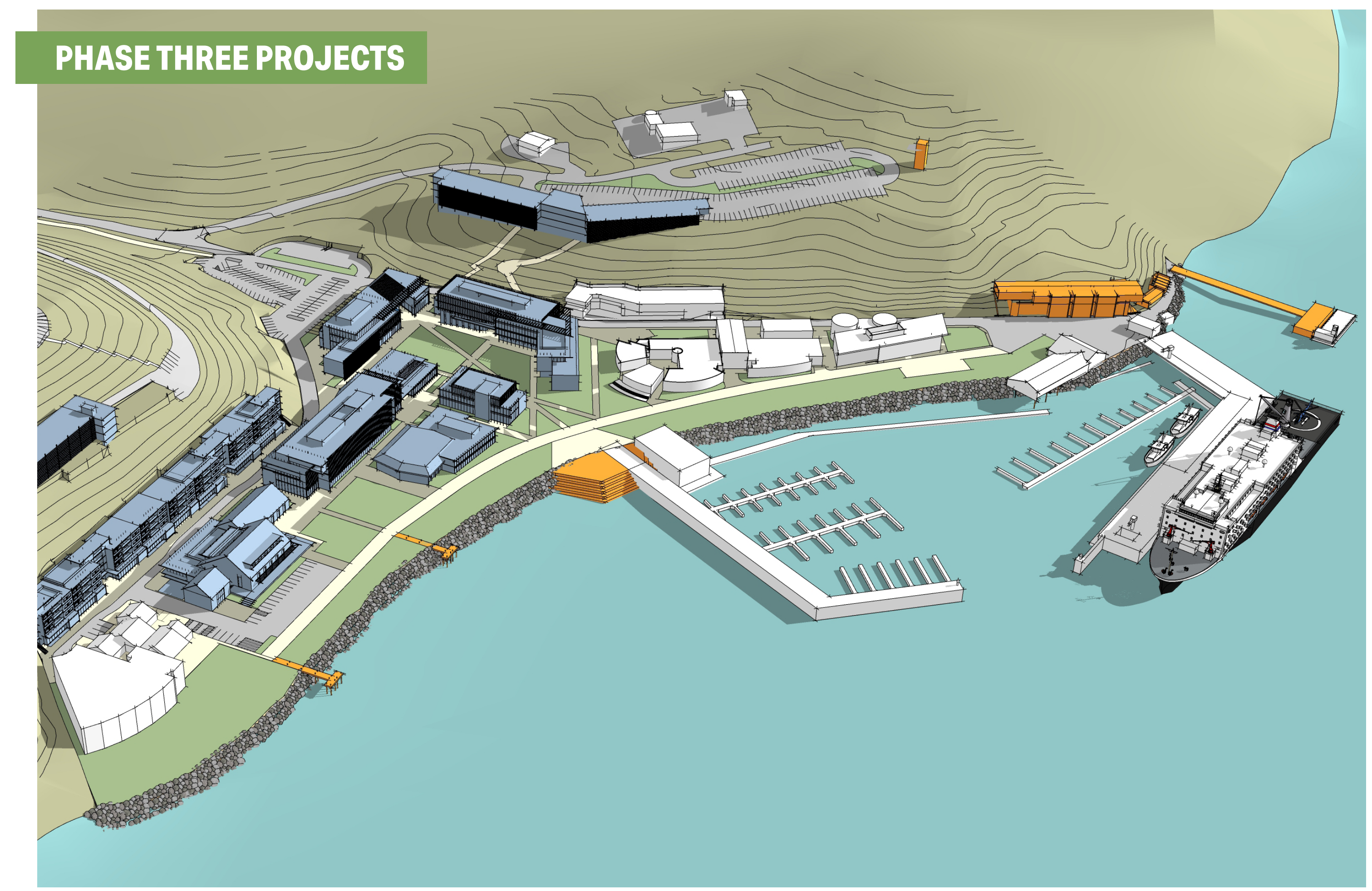

PHASE TWO PROJECTS


PHASE THREE PROJECTS

5 The Waterfront Master Plan and Projects

5.1 Waterfront Master Plan Program and Alternatives Overview

5.1.1 | OVERVIEW

The 2022 Cal Maritime WFMP establishes a bold vision for achievement of a truly world-class campus waterfront, aligned with the unique academic and maritime operations, environmental factors, and resiliency mission critical needs of Cal Maritime. The plan builds from the initial Preliminary Concepts explored in Section 4. Importantly, the WFMP is aligned with campus community sentiment. The WFMP builds on campus optimism that, with careful stewardship and investment, can help Cal Maritime make marked gains in ushering in the next generation of maritime training to prepare cadets for success in the global maritime marketplace.

During the plan-making process and aligned with the need for readiness to receive the NSMV, three phases of investments were identified (refer to graphic opposite). Phase One projects are those essential to fulfilling Cal Maritime readiness for NSMV arrival and include expansion of the main pier and installation of a series slips and berthing areas for Cal Maritime's fleet of work boats, tug boats, T-boats, and other vessels currently located offsite and/or planned for future acquisition. Phase One efforts also include improvement to upland operational areas and site infrastructure.

Phase Two projects are those important to expansion of cadet instruction and marine programs. WFMP investments include expansion of the basin through development of a new accessible breakwater. Renovation of the historic Boathouse is also envisioned.

Phase Three projects add classrooms and outdoor learning spaces associated with the Marine Programs Multi-Use Building. Improvements also seek to expand the experiential fabric of the water's edge and foster greater use by cadets, faculty, staff, and the community-at-large. Investments in this category focus on betterment of the campus-coastline open spaces and ensure a heightened level of resilience to climate and storm related stresses.

While the sequence prioritizes necessary work under Phase One, investments found in other phases can be moved forward as needed.

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PHASE ONE

5 Years

MAIN PIER EXPANSION

MAIN PIER EXPANSION (LENGTH / WIDTH)
- Length, a function of ship LOA
- Width, a function of operations

DREDGING OF BOAT BASIN AND APPROACH
NAVIGATION AIDS
EXPANSION OF THE MARINE YARD
- Access, emergency, staging, storage, and security

UPLAND UTILITIES EXPANSION AND HARDENING
EXTENSION OF FLOATING DOCKS INSIDE OF MAIN PIER
- Big or small boat basin

PHASE TWO

6+ Years

RESULTING FROM EXPANSION

BOATHOUSE RESTORATION
NEW ACCESSIBLE BREAKWATER
- Upgrade site elements to include new pier plaza
- Small boat basin
- Public access fishing pier
- Wetland or other mitigation

PHASE THREE

Variable

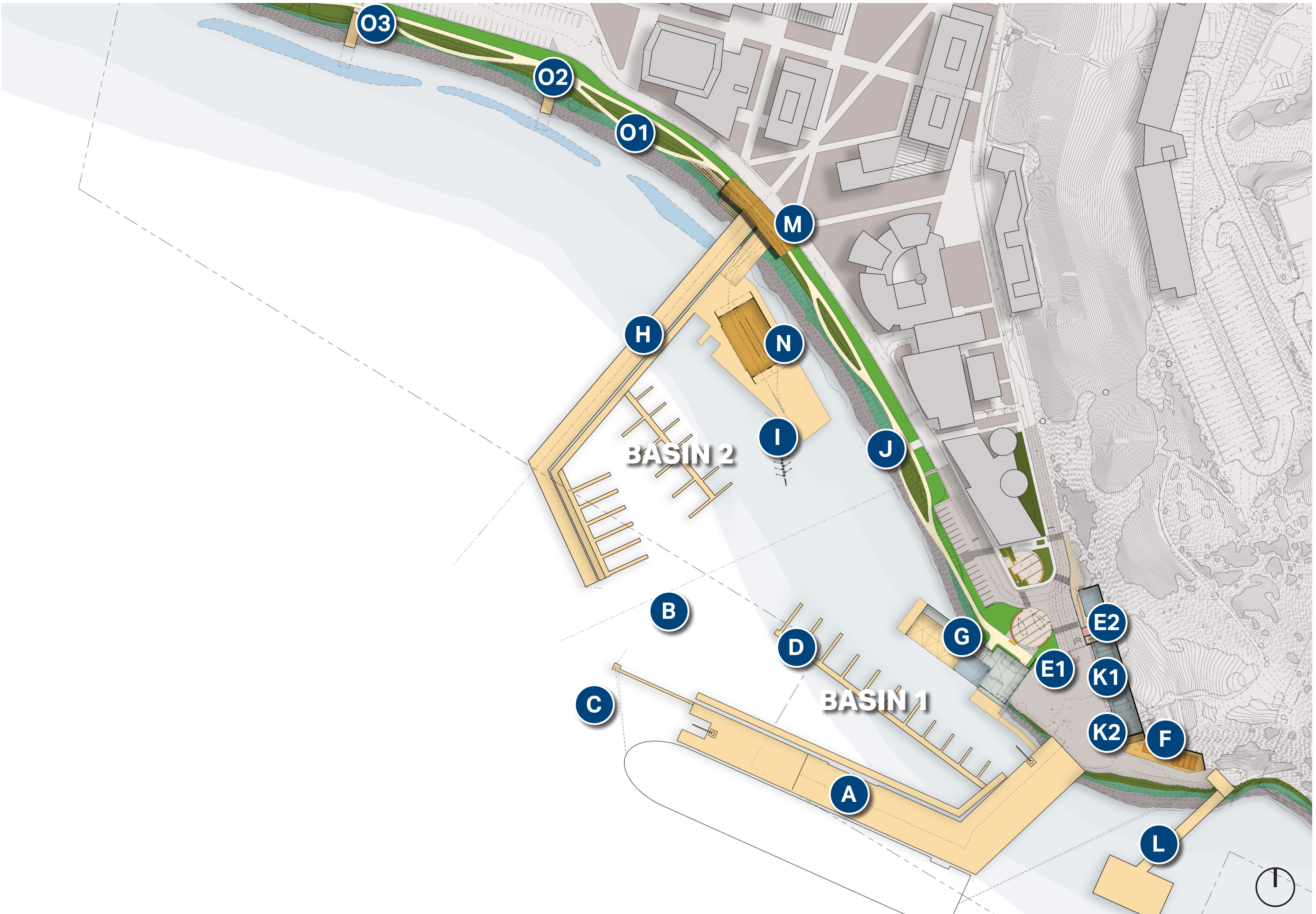
ADDITIONAL OPPORTUNITIES

MARINE HYDROKINETIC BARGE
MARINE PROGRAM and MULTI-USE BUILDING
- Staging and storage for Naval Science Building

LOOKOUT AND HARBOR CONTROL TOWER
CONNECTIVITY AND OPEN SPACE ENHANCEMENT
- Shoreline and cadet hangout spaces
- Wetlands and Mitigation

FIGURE 50 – ILLUSTRATIVE MASTER PLAN RENDERING

FIGURE 51 – A VISION FOR THE FUTURE – CAL MARITIME'S WATERFRONT (ILLUSTRATIVE MASTER PLAN)



Legend

A	Main Pier Expansion
B	Dredging of Boat Basin and Approaches (As Necessary)
C	Navigation Aids
D	New Floating and Training Docks at Basin 1
E1	Marine Logistical Yard Upgrade (Linking Gatehouse to Pierhead)
E2	Yard Expansion and New Site Retaining Wall
F	Utilities Relocation and Upgrade
G	Seismic Retrofit and Renovation of Boathouse
H	New Accessible Breakwater and Creation of Basin 2
I	New Floating and Training Docks at Basin 2
J	Shoreline Enhancements (Boathouse to New Accessible Breakwater)
K1	Marine Programs Multi-Use Building
K2	Harbor Control Tower
L	Marine Hydrokinetic (MHK) Barge and Linking Trestle
M	Central Waterfront Esplanade Canopy
N	Row House and Floating Landing
O1	Shoreline Enhancements (Row House to Dining Center)
O2	Waterfront Overlook / Outdoor Room One
O3	Waterfront Overlook / Outdoor Room Two

5.2 Master Plan Program

5.2.1 | PHASE ONE

Phase One projects are those directly related to design, permitting, funding, and construction prior to arrival of the NSMV. Investments in this category include expansion and upfit of the main pier to a new length of +/- 471 feet and widening of the linking trestle to +/- 70 feet.

While dredging is not envisioned for the NSMV at the future berth pocket, the navigation approach will need to be simulated and reviewed for potential modification. Dredging of the Boat Basin may occur under this stage or be shifted to Phase Two to align with Boat Basin expansion as well as to coincide with the Boathouse upgrade. New navigation aids will also be developed under this stage.

Floating docks measuring approximately 4,500 SQF are replaced, with new and expanded facilities offered to accommodate training and recreational vessels. The new floating docks cover 9,500 SQF and offer +/- 23 slips / berthing positions.

FIGURE 52 – PHASE ONE PROJECTS

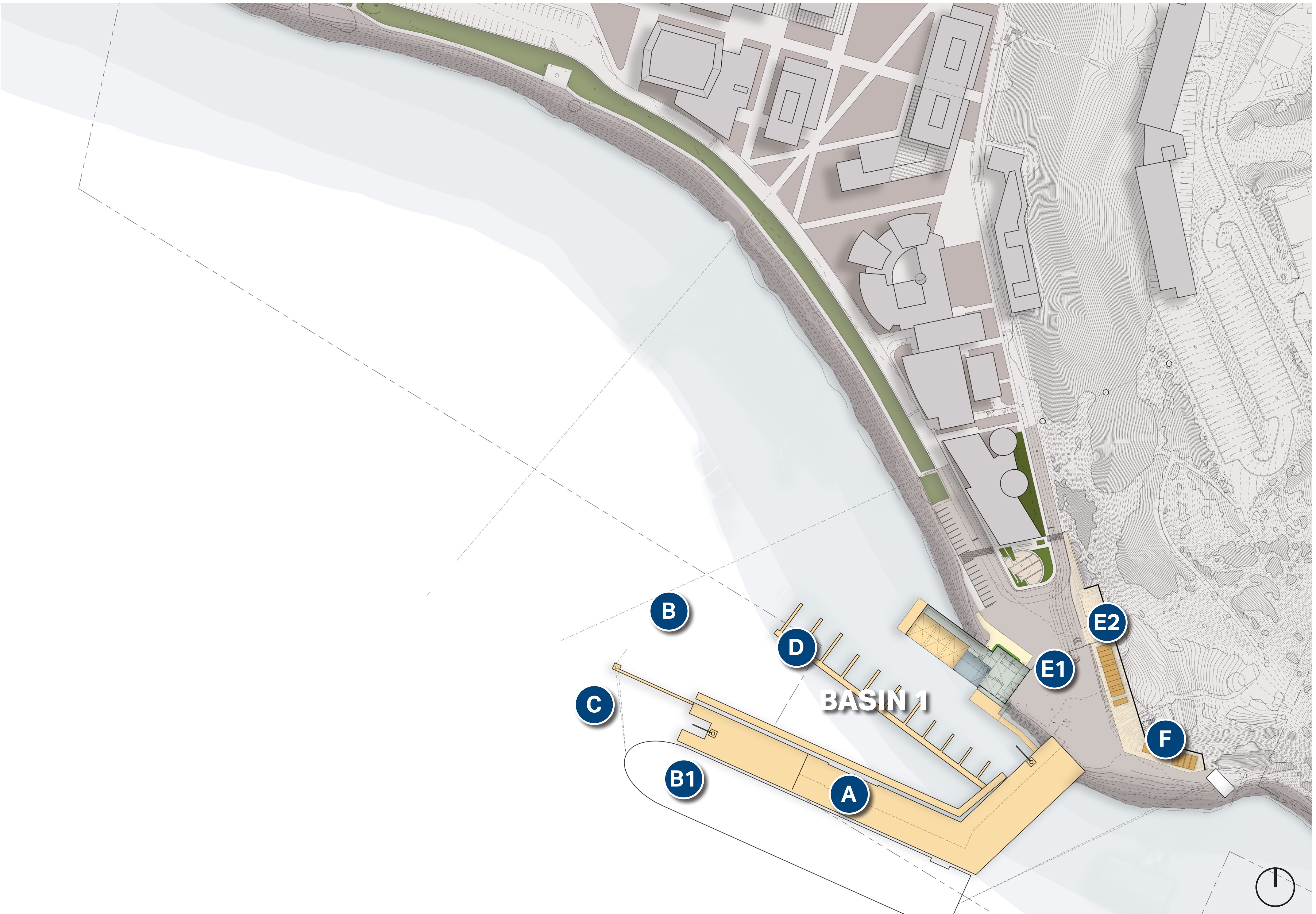
Legend

Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

FIGURE 53 – PHASE ONE PROJECTS (ILLUSTRATIVE MASTER PLAN)



Legend

A	Main Pier Expansion
B	Dredging of Boat Basin and Approaches (As Necessary)
C	Navigation Aids
D	New Floating and Training Docks at Basin 1
E1	Marine Logistical Yard Upgrade (Linking Gatehouse to Pierhead)
E2	Yard Expansion and New Site Retaining Wall
F	Utilities Relocation and Upgrade

5.2.2 | PHASE TWO

Phase Two projects are not critical to support the arrival of the NSMV, and instead are important for expansion of cadet instruction. Phase Two projects include expansion of the basin through development of a new breakwater and installation of an additional number of slips and berthing areas for Cal Maritime's fleet of work boats, tug boats, T-boats, and other vessels currently located off site and/or planned for future acquisition. A total of 10,800 SQF of additional floating slips are provided in Basin Two.

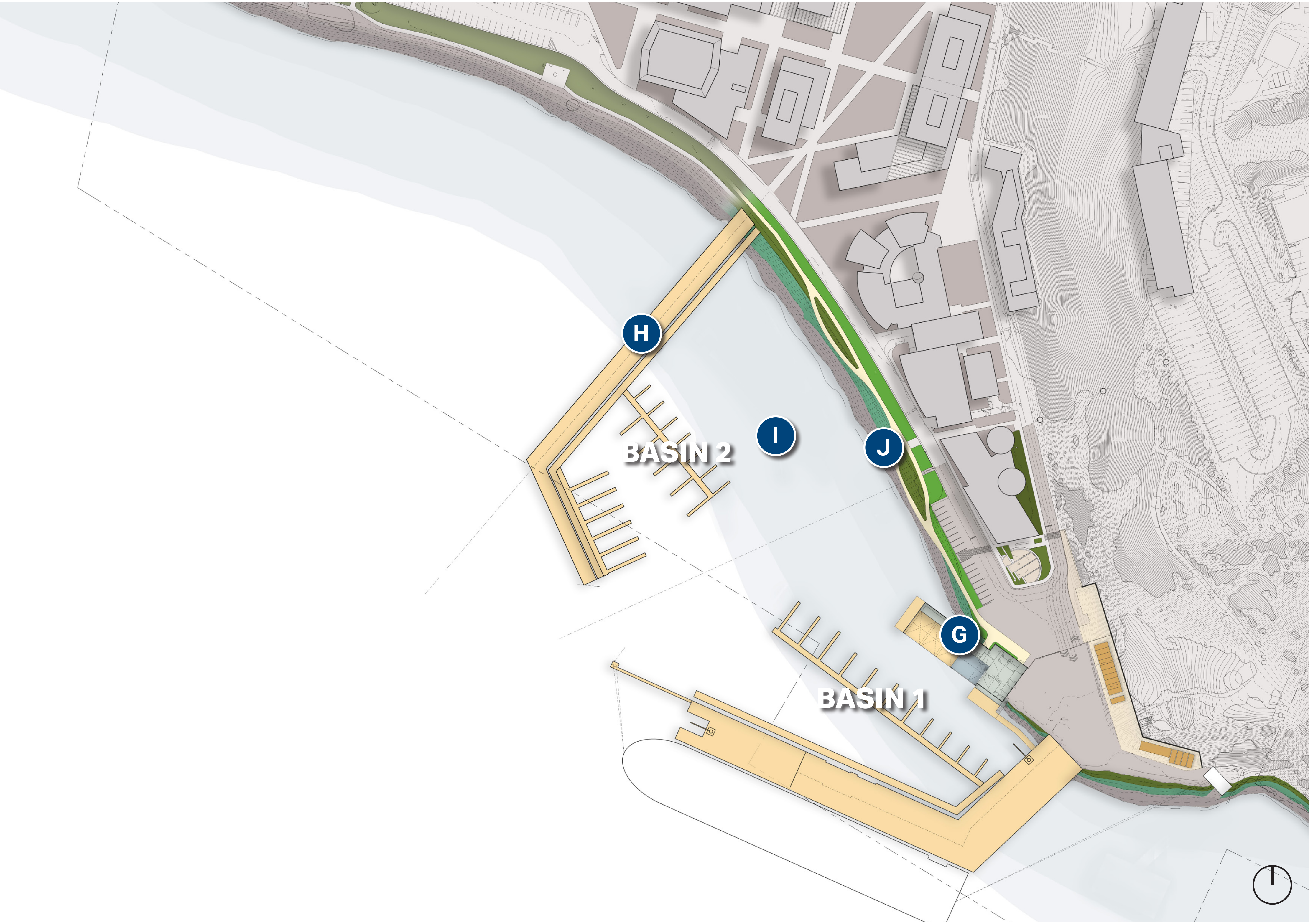
Renovation of the Boathouse also occurs under Phase Two. As discussed in Section 5.3, Boathouse modifications follow preliminary Option One to help minimize impacts to the overall historical quality and stature of the current building.

FIGURE 54 – PHASE TWO PROJECTS

Legend

- Existing Buildings
- 2017 Physical Master Plan Projects
- Waterfront Master Plan Projects

FIGURE 55 – PHASE TWO PROJECTS (ILLUSTRATIVE MASTER PLAN)



Legend

G	Seismic Retrofit and Renovation of Boathouse
H	New Accessible Breakwater and Creation of Basin 2
I	New Floating and Training Docks at Basin 2
J	Shoreline Enhancements (Boathouse to New Accessible Breakwater)

5.2.3 | PHASE THREE

Phase Three projects add classrooms and outdoor learning spaces associated with the Marine Programs Multi-Use Building. The MHK Barge and Linking Trestle are also introduced at this stage but may be advanced to occur sooner based on Cal Maritime's prioritization.

Improvements also seek to expand the experiential fabric of the water's edge and foster greater use by cadets, faculty, staff, and the community-at-large. Investments in this category focus on betterment of the campus-coastline open spaces and ensure a heightened level of resilience to climate and storm related stresses.

FIGURE 56 – PHASE THREE PROJECTS

Legend

Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

FIGURE 57 – PHASE THREE PROJECTS (ILLUSTRATIVE MASTER PLAN)

Legend

K1	Marine Programs Multi-Use Building
K2	Harbor Control Tower
L	Marine Hydrokinetic (MHK) Barge and Linking Trestle
M	Central Waterfront Esplanade Canopy
N	Row House and Floating Landing
O1	Shoreline Enhancements (Row House to Dining Center)
O2	Waterfront Overlook / Outdoor Room One
O3	Waterfront Overlook / Outdoor Room Two

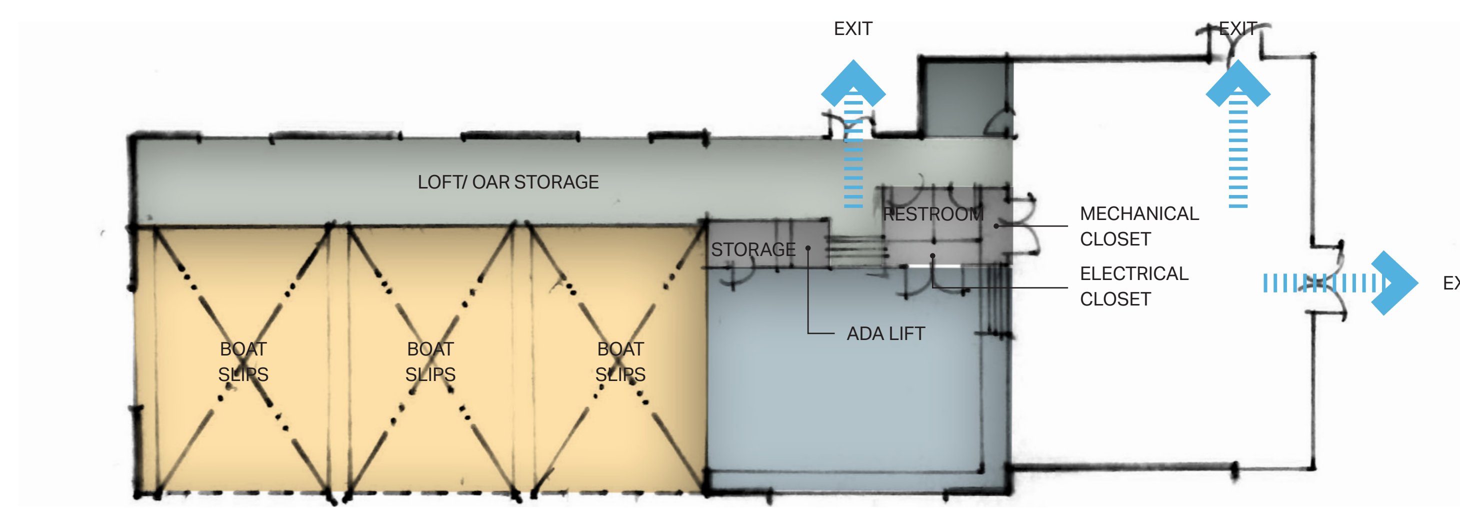
5.3 Waterfront Buildings and Campus Integration

5.3.1 | BOATHOUSE (SEAMANSHIP BUILDING) RENOVATION

As presented in Section 4.3, several options were evaluated to address needed update of the historic Boathouse. Options were reviewed and informed by the Cal Maritime Boathouse Historic Resource Evaluation prepared and offered in Appendix A. As noted in this study, the Boathouse is one of the earliest permanent structures established on the Cal Maritime campus and appears to be significant for individual listing in California Register under Criteria 1 (Events). Therefore, it appears to be an individual historic resource for purposes of CEQA process reviews.

With the above in mind, the more minimal intervention approach reviewed under Option One is suggested for advancement under the WFMP. This option seeks to restore and rehabilitate the building to address needed seismic upgrades and tectonic modifications of the existing structure as well as address observed issues and associated sediment removal. The sail-loft and other historic features found in the headhouse are reverted back to its originally intended use. Interior upgrades are made to provide a new, barrier-free ADA compliant lift servicing the split ground floor level. Restroom, mechanical, electrical, and plumbing systems are reworked.

FIGURE 58 – PROPOSED BOATHOUSE RENOVATION – GROUND FLOOR



While limited redesign and reconfiguration of the lower-level wood working and vessel service / demonstration areas are suggested for additional study and advancement, but overall, the majority of spaces under this option are protected and preserved to maintain historic value.

The exterior elevations of the Boathouse are appropriately restored and integrated into adjacent waterfront training and pedestrian gathering, destination, and campus site amenities. A detached canopy structure is suggested to incorporate additional functionality and blend the historic building with the ongoing modernization of nearby campus buildings.


GOLDEN BEAR

5.3.2 | PROPOSED MARINE PROGRAMS MULTI-USE BUILDING

The new Marine Programs Multi-Use Building replaces obsolete trailers adjacent to the boat basin and found throughout the Inner Marine Yard into a singular multi-story building set back into the hillside. The proposed gross building area is approximately 20,300 SQF, of which 7,350 SQF of mixed-use, separated assembly and storage areas situated at the ground floor. An additional open-air exterior space is dedicated to relocated utilities and flat-lay material storage. The Lookout and Harbor Control Tower is incorporated into the building and is set to a proposed height of between 50' and 60'. This element directly overlooks the controlled security checkpoint between the outer and inner marine yards and access to port security areas and the Main Pier.

GROUND FLOOR. The main floor academic use functions primarily as an extension of the Outer Marine Yard. At the north end of the building, a wet lab classroom has been situated to have its strongest connection to campus, the outer yard, and the renovated Boathouse building. The main entry lobby, security checkpoint, ADA accessible unisex restrooms, elevator and egress stair elements, and other elements are all programmatically oriented adjacent to the outer yard, reinforcing way finding, security and ingress / egress.

The balance of the ground floor serves as a natural extension of the functions from the Inner Marine Yard (Marine Logistics Yard), hosting both short- and long-term storage, cadet training areas, container modules, equipment areas, and other elements. This zone is approximately 20'-0" tall and is serviced by a built-in gantry crane. Access to the storage area is accomplished by the use of four automated, overhead service doors.

FIRST FLOOR. The first-floor program functions include academic assembly and administrative uses. The programmatic distribution places a higher priority at the north end of the structure, which has the strongest physical and visual connection to campus. Administrative offices and a multi-functional conference room have been placed in this area. At the south end of the second floor, an exterior terrace creates a strong connection to Morrow Cove, the Boat Basin, and the new NSMV. The adjacency serves to reinforce a deep and lasting campus-wide cultural connection to the maritime.

PHASING. Construction of the Marine Programs Multi-Use Building is divided into two stages. During Phase One, the main site is cleared and stabilized along with construction of a site retaining wall approximately 26'-0" high. Demolition of the existing guardhouse structure and security fence occurs, with immediate replacement in line with the newly proposed building and surrounding yard area. Aggregation and relocation of existing shipping containers, outdoor training areas, utilities, parking, and other elements occurs in this zone until Phase Three when the Marine Programs Multi-Use Building is built above.

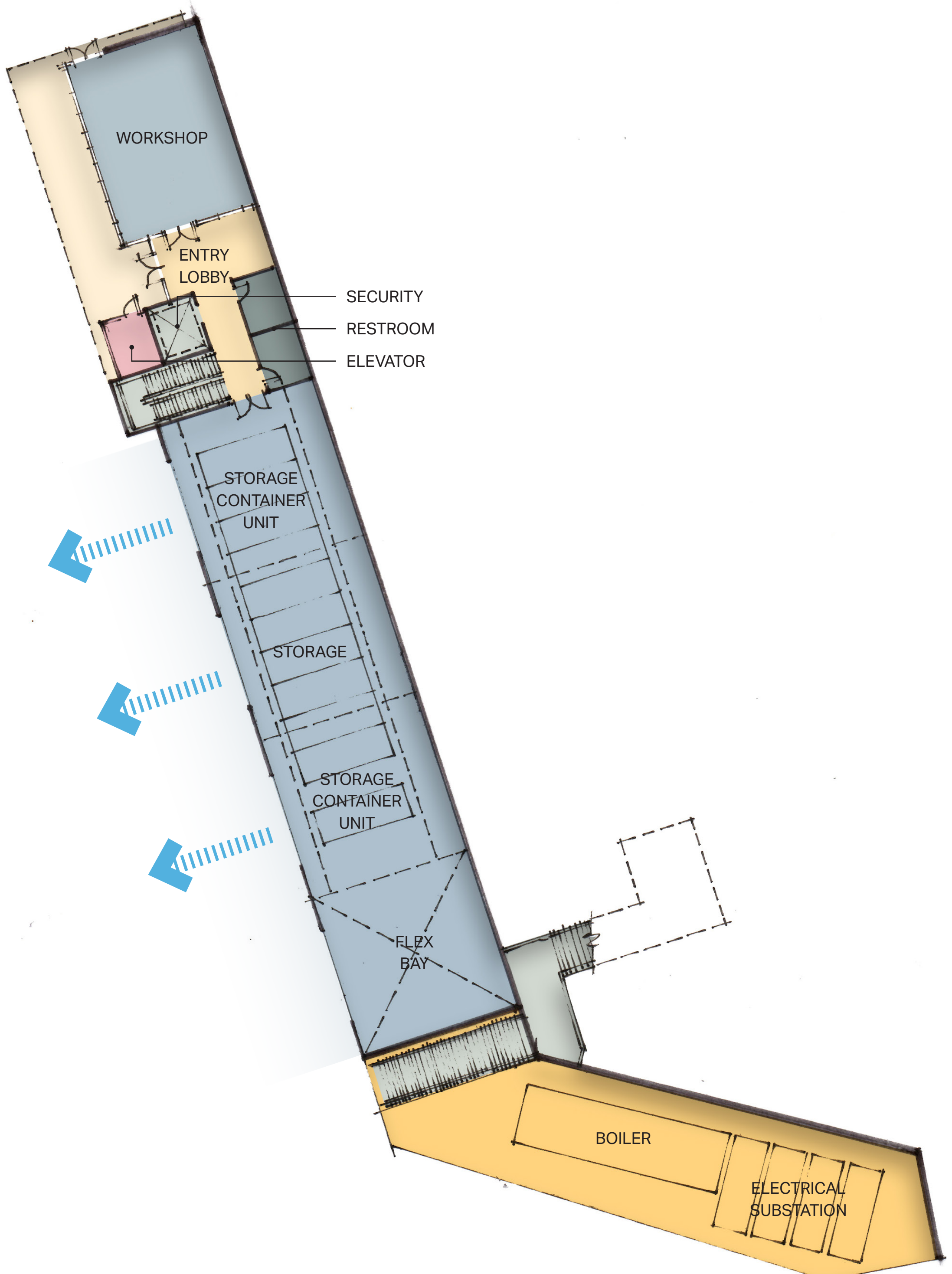
FIGURE 59 – PROPOSED MARINE PROGRAMS AND NAVAL SCIENCES BUILDING PERSPECTIVE

TABLE 8 – ROOM-BY-ROOM PROGRAM AREA

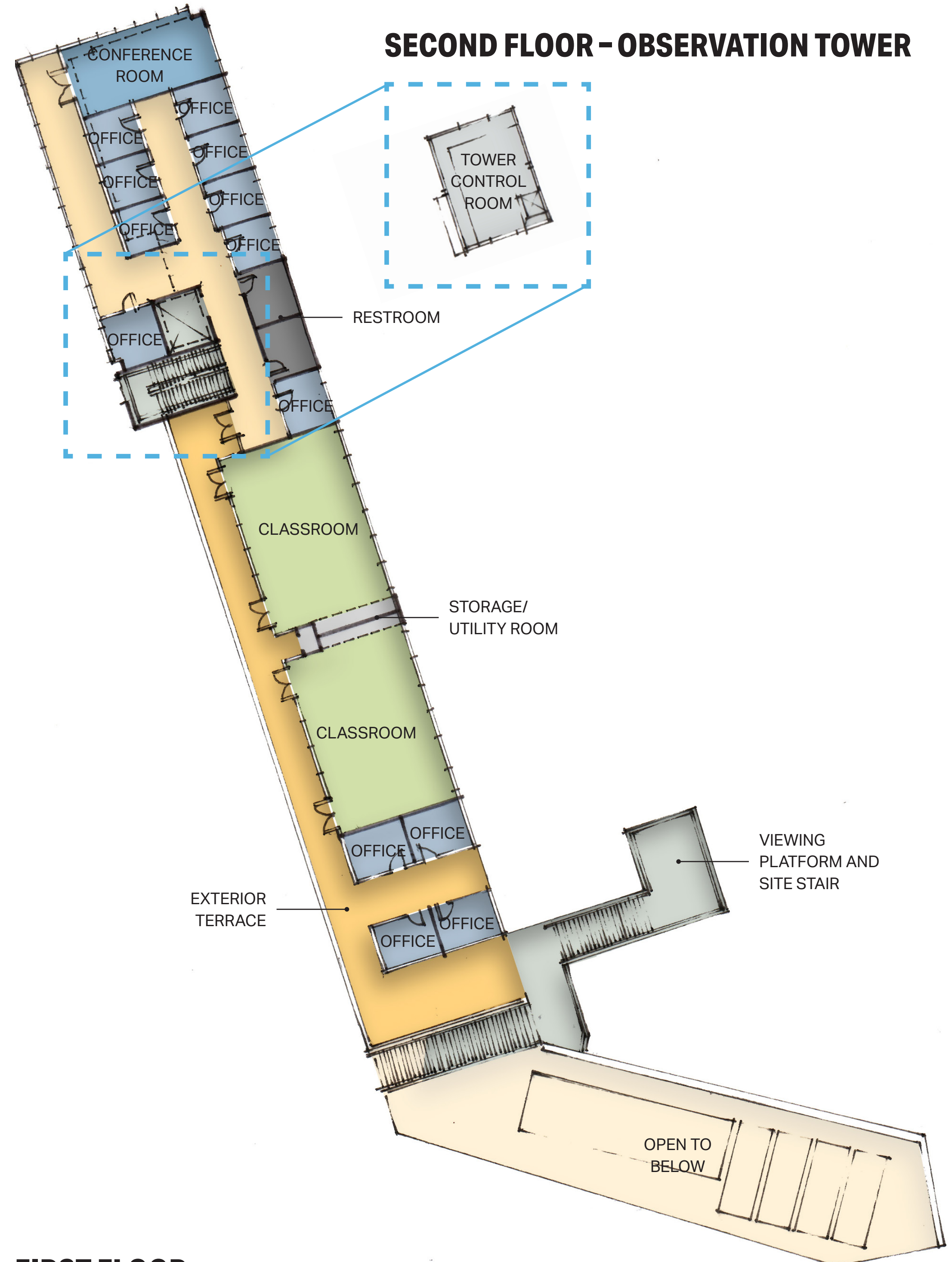
ROOM TYPE	AREA (SQF)
Exterior Plaza	1,686
Main Entry Lobby	515
Wet Lab Workshop	1,093
Security Checkpoint	138.5
Restrooms	212.5
Storage Facility	4,827
Vertical Circulation	7,155
Exterior Utilities	3,032
Offices	1,010
Proposed Marine Programs Multi-Use Building Ground Floor Total Area	19,669

ROOM TYPE	AREA (SQF)
Open Office / Multi-Purpose Room	476
Administrative Offices (no. 13)	1,551
Classrooms (no. 2)	2,080
Corridors, Exterior Terrace and Rooftop Deck	3,166
Vertical Circulation	1,295
Accessible Restrooms	232
Storage and Mechanical Utilities	110
Level 3 Lookout and Harbor Control Tower	498
Offices	1,010
Proposed Marine Programs Multi-Use Building First Floor Total Area	10,418

FIGURE 60 – PROPOSED MARINE PROGRAMS MULTI-USE BUILDING



GROUND FLOOR



FIRST FLOOR

Legend

- Conference Room
- Restroom
- Office (Inc. Storage Container Unit, Flex Bay, Etc.)
- Storage/ Utility Room
- Open-Air Space (inc. Exterior Plaza, Boiler, Electrical Substation, Etc.)
- Vestibule
- Elevator
- Security
- Tower Control Room

5.3.3 | PROPOSED FLOATING ROW HOUSE

A floating row house is proposed to provide Cal Maritime with critical waterfront athletic facilities while serving a dual purpose as a public-facing welcome center and focal point of campus culture. The proposed Row House structure is a natural fit for the maritime culture connecting the Cal Maritime Athletics Department (Keelhaulers) directly to Morrow Cove and the Carquinez Strait.

The proposed floating row house consists of new 2-story, mixed-use, portal framed structure. Gross area is proposed to be approximately 10,750 SQF which includes 6,150 SQF at the first floor and 4,600 SQF at the second floor mezzanine. The main floor functions as storage and maintenance for racing shells. The second floor mezzanine functions as rowing training facility. Double overhead service / access doors are located at either end of the facility, accommodating circulation and connection from land to cove. The west elevation is comprised of a prefinished aluminum window wall glazing system with an integrated sun shade louver system. The louver system could be composed of building-integrated photovoltaic technology (BIPV), per the Campus' prerogative.

The structure is proposed to be pre-engineered, portal framed steel roof purlins, steel wall girts with lateral purlins. The structure is proposed on the waterside, situated over a floating dock system composed of high-density polyethylene cubes. These elements naturally undulate with cyclical tidal conditions and movement of waves within the small boat basin. The exterior finishes include vertically oriented, clear grade, T&G stained wood, rainscreen siding.

FIGURE 61 – PROPOSED FLOATING ROW HOUSE LAYOUT PLAN

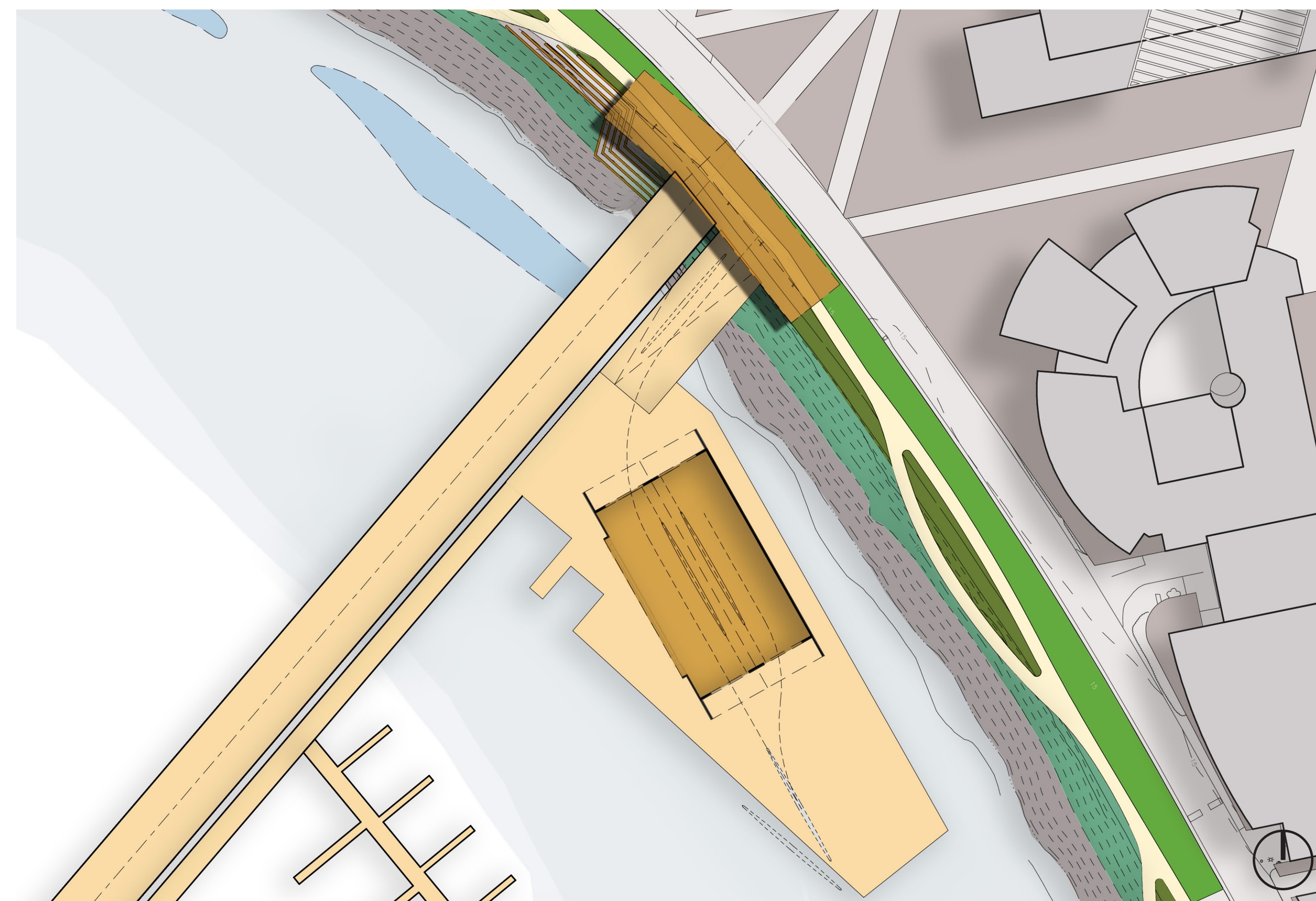
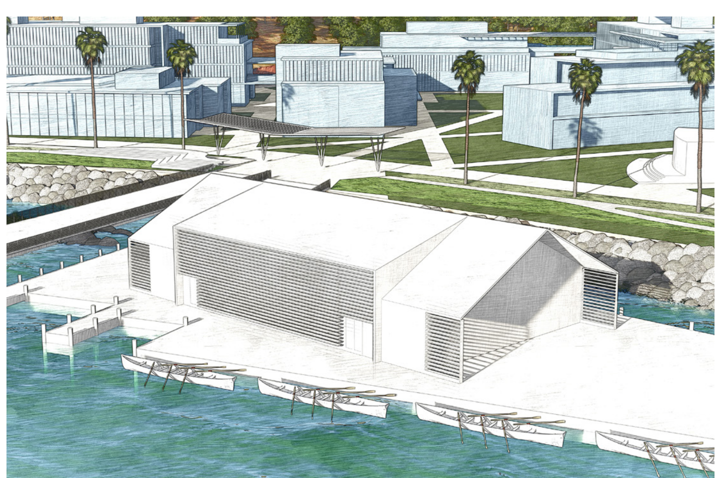
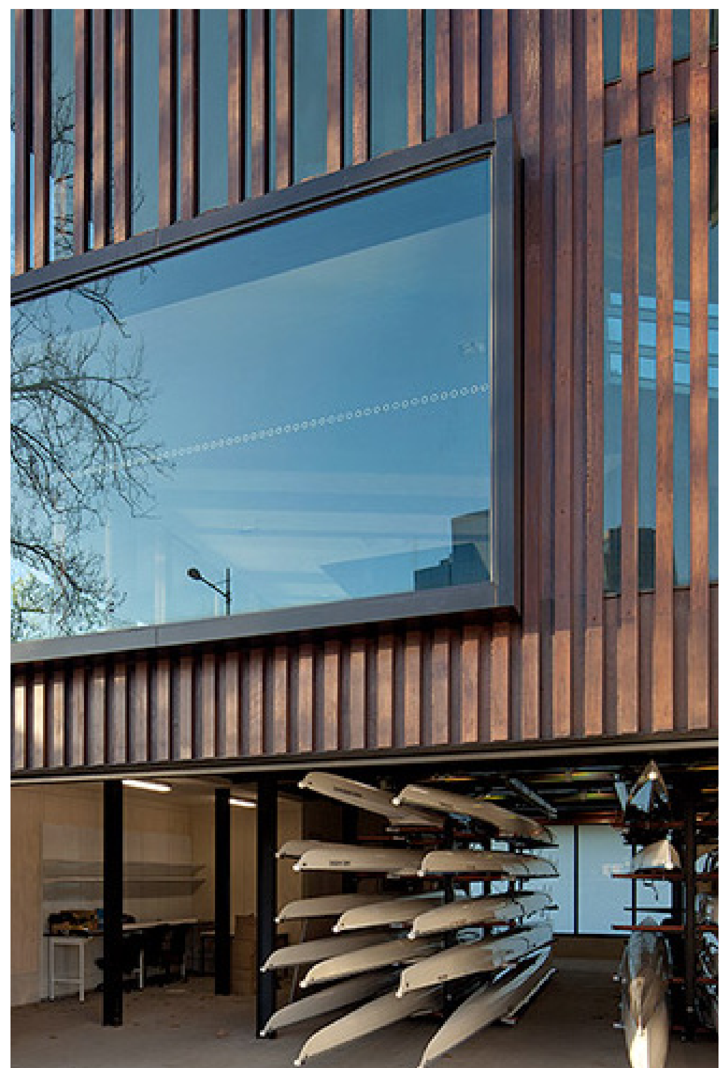
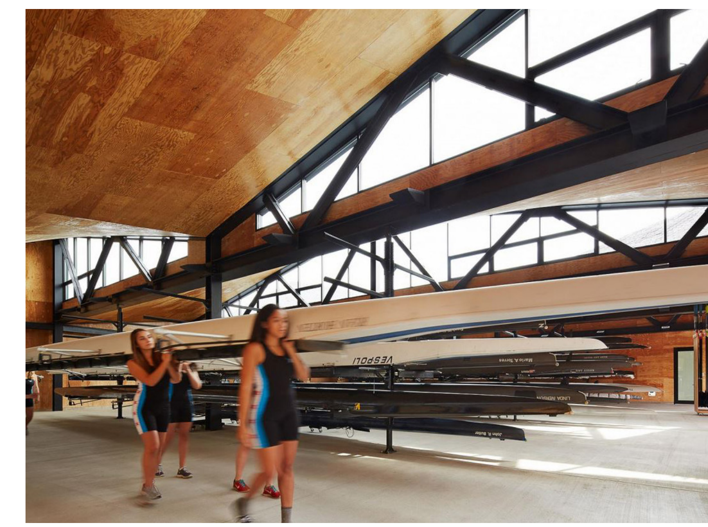


FIGURE 62 – MASSING PERSPECTIVE







5.3.4 | THE CANOPY AND CENTRAL WATERFRONT PLAZA

The canopy is situated at the terminus of an axial pedestrian connection to the Campus Quad, situated in a way that follows Morrow Cove Drive. It serves as a destination, framing the access to both the new public pier and hinged ramp servicing the proposed Row House.

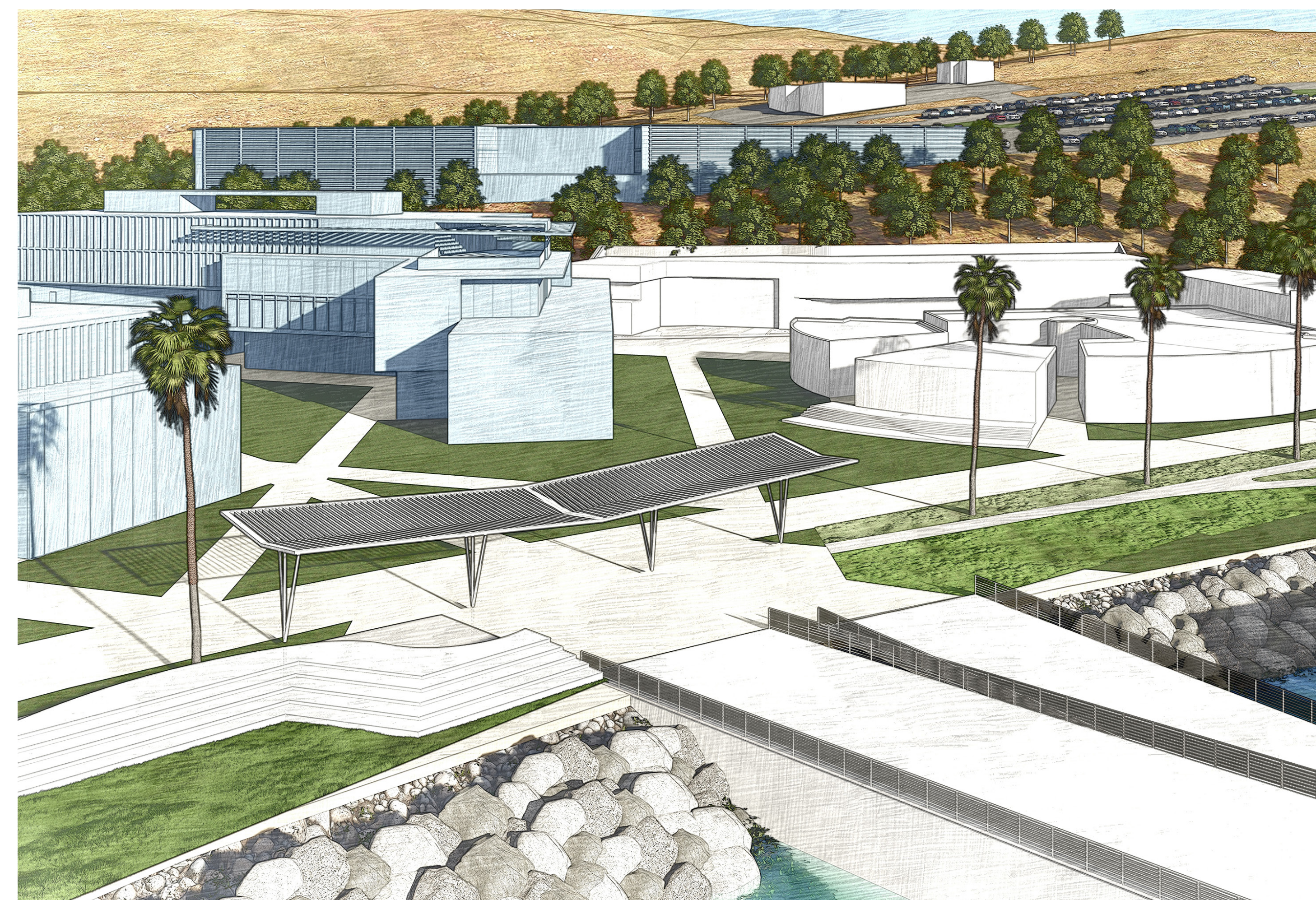
The Canopy serves the campus cadet and faculty request to provide improved site amenities and gathering spaces,,and acts as a nexus linking the landside pedestrian use to the new Small Boat Basin beyond. The Canopy proposal consists of a compound bent plate, analogous to the rhythm of oar movement propelling a racing shell through the water. The Canopy area is approximately 3,780 SQF with a clear 14'-0" height. Its proposed construction consists of a prefabricated, prefinished steel structure with louvered slat or custom perforated metal panel finish set flush within structural framing depth. The structural supports are spaced on 24'-0" O.C and comprised as a multi-column array projecting from the ground a single tectonic connection.

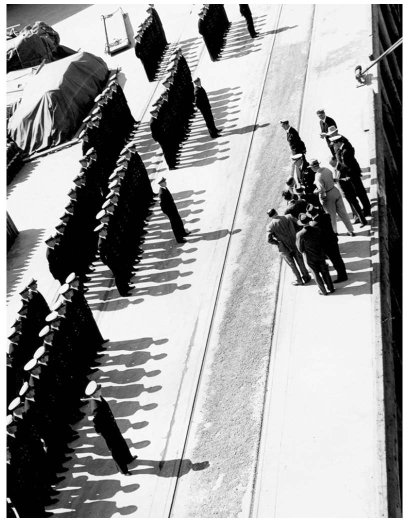
The campus may consider providing utilities at this location. Exterior light fixtures, integrated atmospheric misting, outdoor ceiling fans, built-in furniture, gas barbecue equipment or fire pits might be considered for added value. Alternatively, construction materials could include solar panel elements to support wider campus sustainability initiatives.

The Central Waterfront Plaza is located at the terminus of the major campus axis. It connects to the proposed main quad and extends into the new accessible breakwater. The design for the Central Waterfront Plaza envisions an iconic canopy structure, feature paving, fire pits, educational signage, and interactive furnishing elements. It also incorporates large, stepped seating on the west edge providing access to the water's edge at different tidal levels. These seating areas accommodate the grading and step down to the Transition Zone. It provides a great opportunity for viewing, resting, and social gathering.

The landscape design establishes a vocabulary that is nautically inspired and contemporary in terms of both materials and forms. It encourages the interactions between campus users and provides comfort all year round.

FIGURE 63 – PROPOSED WATERFRONT CANOPY PERSPECTIVE





5.3.5 | SHORELINE MITIGATION AND IMPROVEMENTS

Responding to the planned arrival of Cal Maritime's NSMV, the WFMP proposes extension of the Main Pier, new marine infrastructure, creation of a new jetty, and a revitalized boat basin. These facilities will encroach into Morrow Cove's existing open water. From a regulatory standpoint, this encroachment will likely trigger the need for mitigation. The mitigation strategy will be further addressed with the environmental regulatory agencies once the Master Plan effort is complete. The landscape design for the master plan proposes shoreline mitigation measures to address these environmental issues.

The mitigation measures include maximizing ecological and recreational value of the shoreline, which are currently lacking with the existing underutilized rip-rap shoreline. Four shoreline ecological zones are proposed based on existing regional shoreline ecology expressed at the scale of the Cal Maritime campus waterfront. The four zones are as follows:

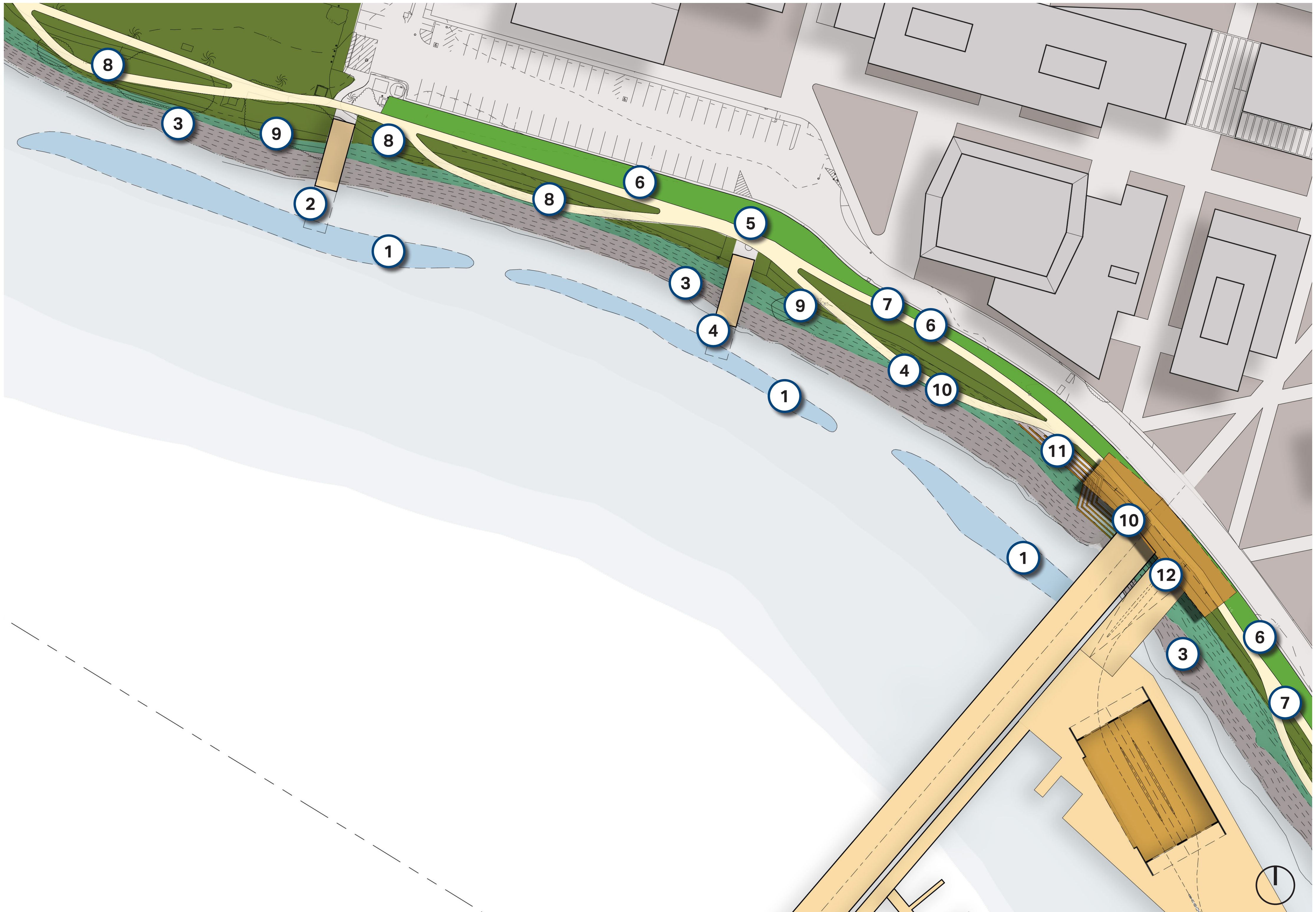
SHORELINE UPLAND ZONE. Adjacent to Morrow Drive, the Shoreline Upland Zone is proposed at the same elevation of the promenade—which is at roughly 15 feet of elevation. This Zone provides a continuous and accessible west-to-east linkage for campus users, and ornamental vegetation with rich color and textural interest responding to upland shoreline ecological zone. Existing palm trees are kept as a defining element for the Waterfront. In addition, resting nodes with seating elements are envisioned along the major pedestrian path. Waterfront plaza, public pier and look-out deck with shade structure, fire pit, feature furnishing elements are also proposed in the Upland Zone, providing diverse recreational opportunities for different scales of gathering and social events.

SHORELINE TRANSITION ZONE. The Shoreline Transition Zone's elevation raises from 10 feet to 15 feet. This Zone consists of plantings that can help reduce coastal erosion, tolerate occasional inundations, and provide aesthetic value. A secondary pedestrian path is proposed in the Shoreline Transition Zone which connects the campus users from the Upland area closer to the water's edge, provides a waterfront experience and outdoor educational opportunities.

SHORELINE ROCKY INTERTIDAL ZONE. The Shoreline Rocky Intertidal Zone is envisioned as a mix of coarse-grained pocket beach and rocky habitat. It is cost-effective and provides multiple benefits. It transitions from an elevation of 10 feet to the water level. The Intertidal Zone creates future habitat for specific species and sea level rise resilience over time. It also encourages new relationships between campus users and their waterfront.

LIVING REEF. The Living Reef is a subtidal living shoreline component. These elements are located at the terminus of the public pier, look-out, and waterfront plaza zones. They create native habitat for oyster, eel, mussels, and other organisms and help restore the biodiversity and improve water quality.

FIGURE 64 – SHORELINE MITIGATIONS AND IMPROVEMENTS ENLARGEMENT MASTER PLAN



Legend

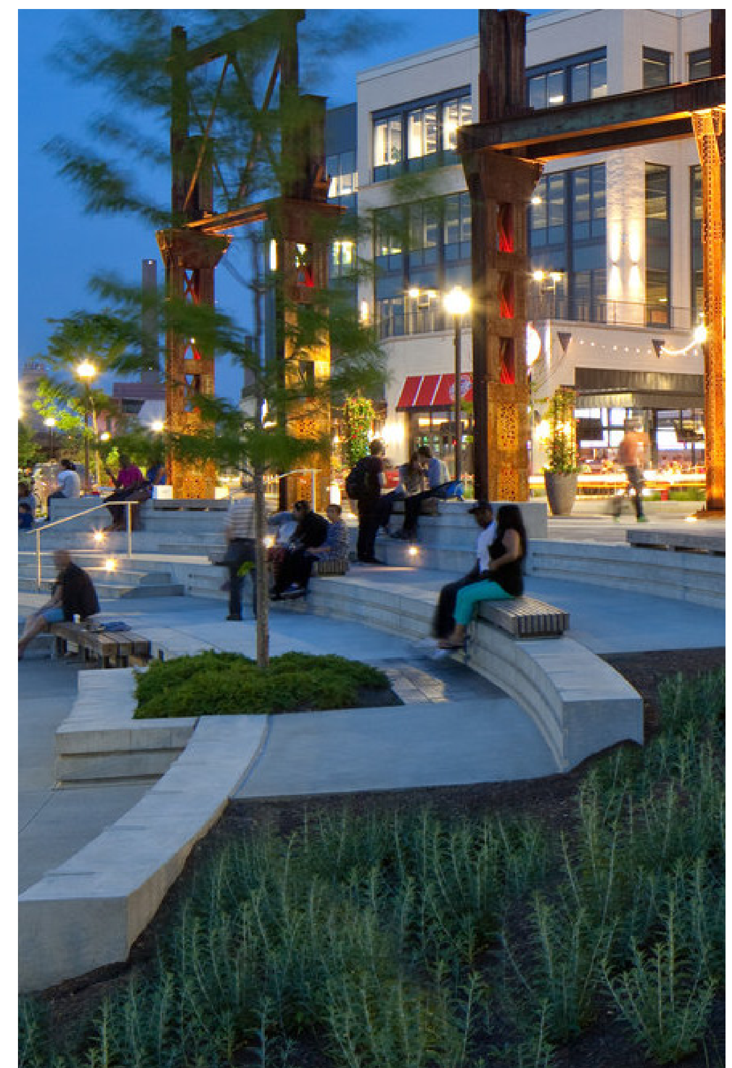
1	Living Reef
2	Public Pier
3	Rocky Intertidal Zone
4	Lookout Deck
5	Picnic Plaza
6	Upland Planting Zone
7	Accessible Major Pedestrian Path
8	Transition Planting Zone
9	Rocky Beach Pocket
10	Waterfront Gathering Plaza w/Feature Paving, Seating Elements, Shade Structure
11	Step Seating
12	Upper Deck to Row House

5.3.6 | TYPICAL SHORELINE SECTIONS AND SLR SCENARIOS

The current tidal and storm surge elevations analysis show the Mean High Water is at an elevation of 5.8 feet, and the Sea Level Rise projection suggests the king tide in 2050 is at an elevation of 9.3 feet, and in 2100 is at an elevation of 14.3 feet. The existing average elevation of campus upland is around 15 feet, thus it does not appear to be at immediate risk due to inundation from sea level rise. The 100-year extreme water level in the project area is 9.6 feet. Proposed top of deck elevation for both Piers (Main Pier and Public Access Pier) is 15′ NVD or higher, which would provide about 5.4′ of SLR allowance.

The different zones of the proposed shoreline not only provide mitigation measures, but also showcase the resiliency of the Waterfront over time. In today's tidal conditions, it provides an active shoreline with diverse activity opportunities. In 2050, the king tide elevation will rise to 9.3 feet. The Rocky Intertidal Zone will be inundated, and gradually become tidal marsh. However, the Upland Zone and Transition Zone are still above the extreme high water level. The circulation, plantings, and open spaces can still be enjoyed by the campus users. In 2100, the king tide elevation will increase to 14.3 feet. At this time, the Transition Zone will also be under water. The Upland Zone can still provide pedestrian connection and waterfront access, however major campus improvements regarding coastal protection should be reassessed periodically.

Two design alternatives are proposed for the two major shoreline public open spaces—public pier and look out. Option 1 has structures going into the water. It reinforces the campus axes, provides opportunities to observe the living reef over the water, gets campus users closer to the water, and becomes a defining focal point. Option 2 envisions open spaces extending only to the edge of the Transition zone, and without in-water structures. This option provides plazas that complement the organic geometry of the shoreline design.




WHARF

5.3.7 | SHORELINE PHASING

The shoreline improvements are envisioned as a phased approach. The first phase will establish the key elements for the Upland Zone, including the primary pedestrian path, plantings, and the upland portion of the public pier, look out, and waterfront plaza. The second phase will involve mass grading and implementation of the Transition Zone, Intertidal Zone, and Living Reef. The third phase will implement remaining major structures extending into the water, including piers and look out.

FIGURE 65 – EXISTING SHORELINE

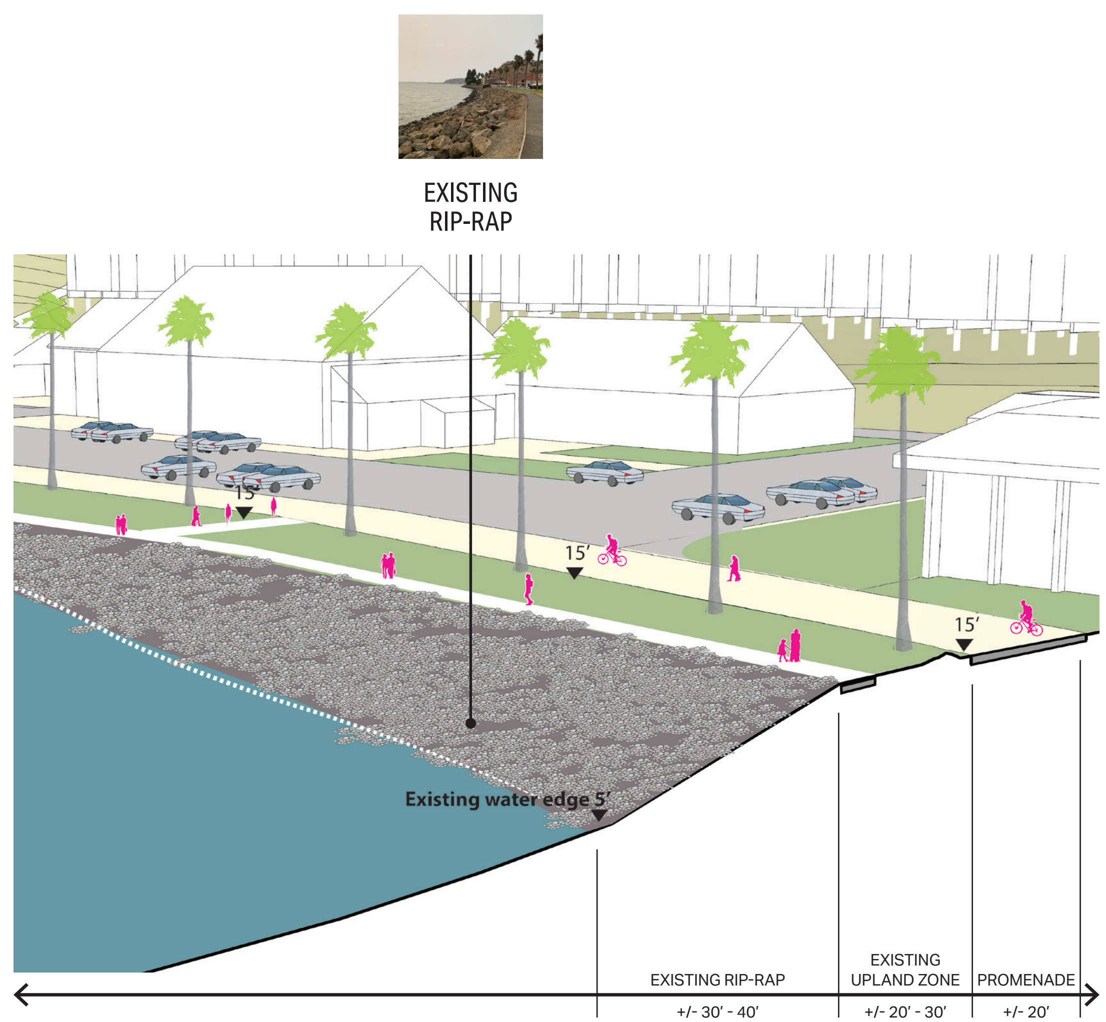


FIGURE 66 – PROPOSED SHORELINE SECTION (2025)

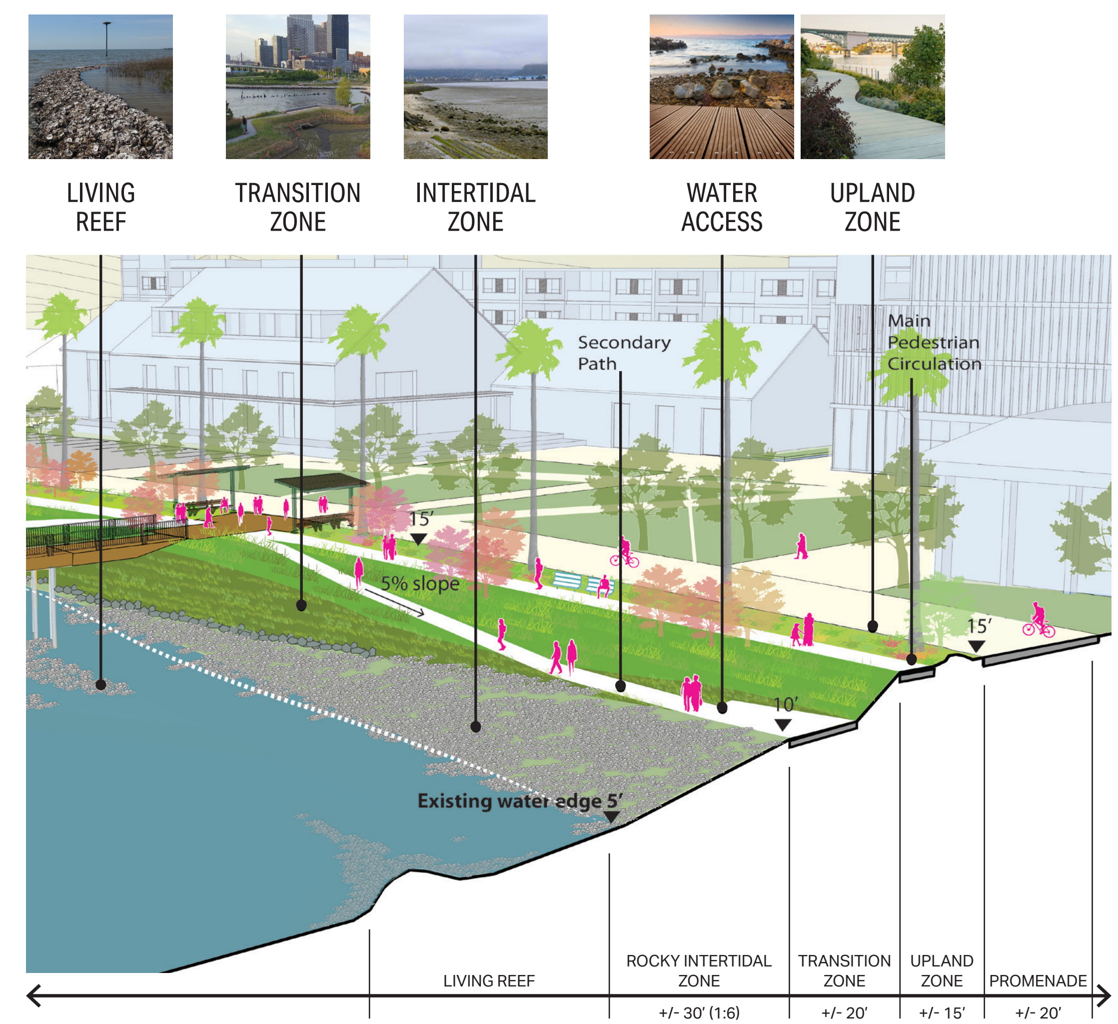


FIGURE 67 – PROPOSED SHORELINE SECTION (2050)

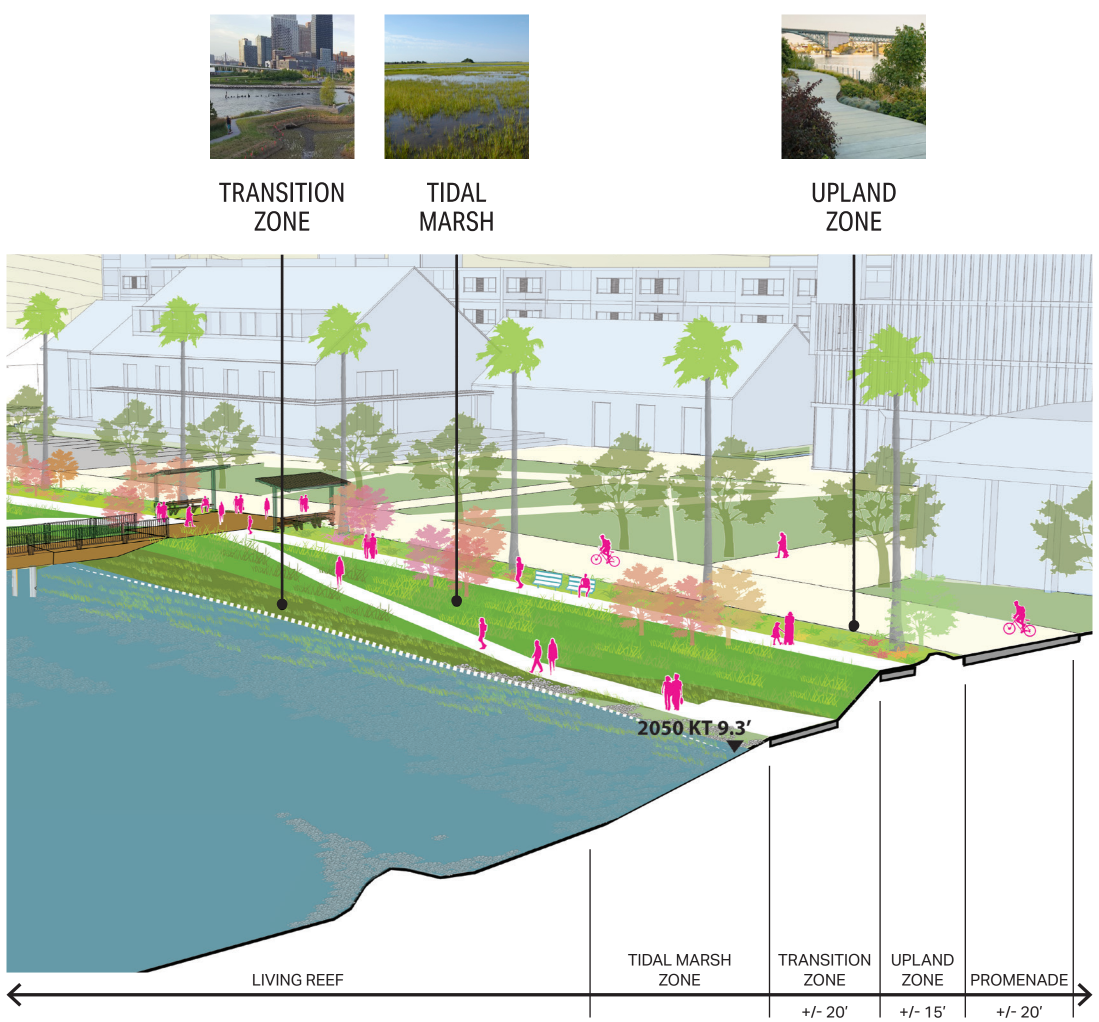
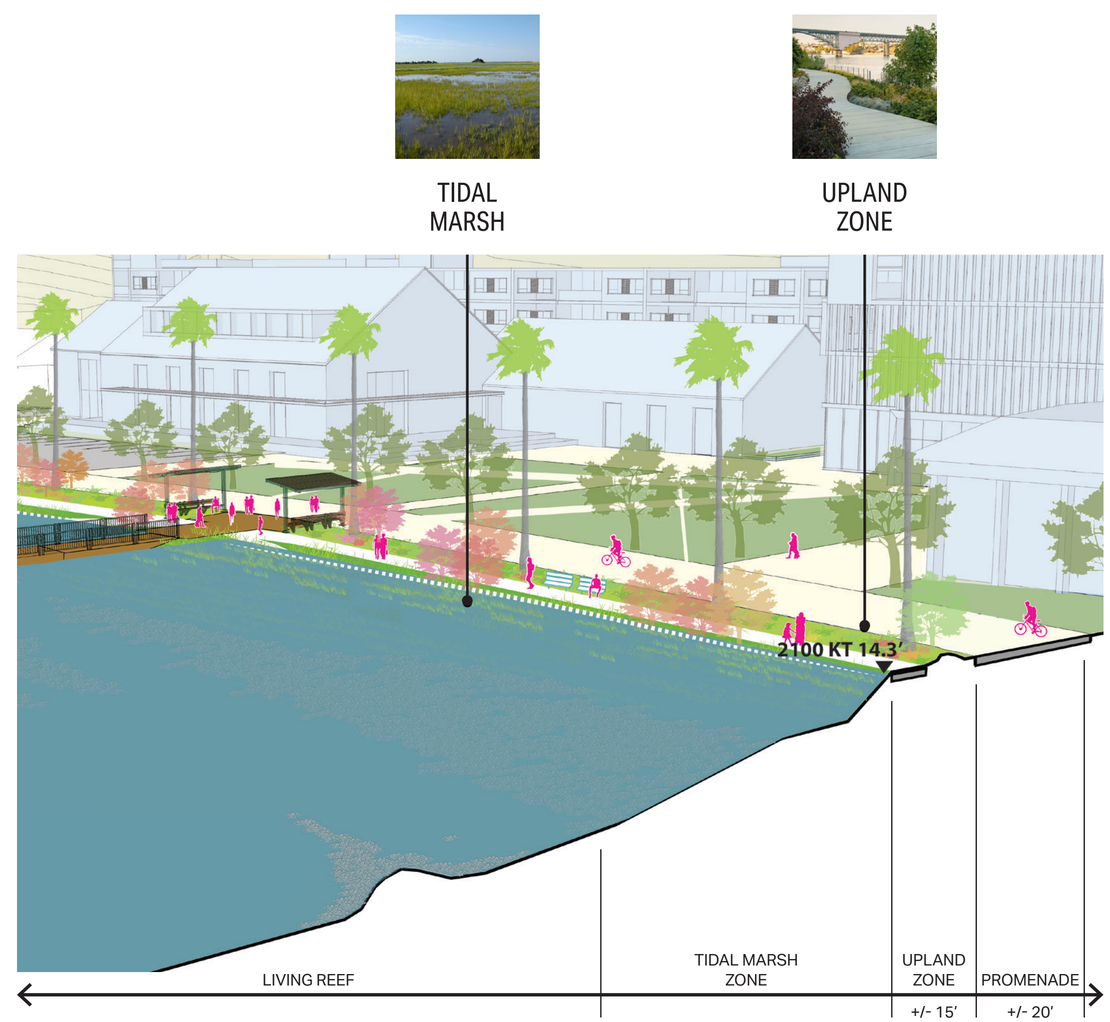
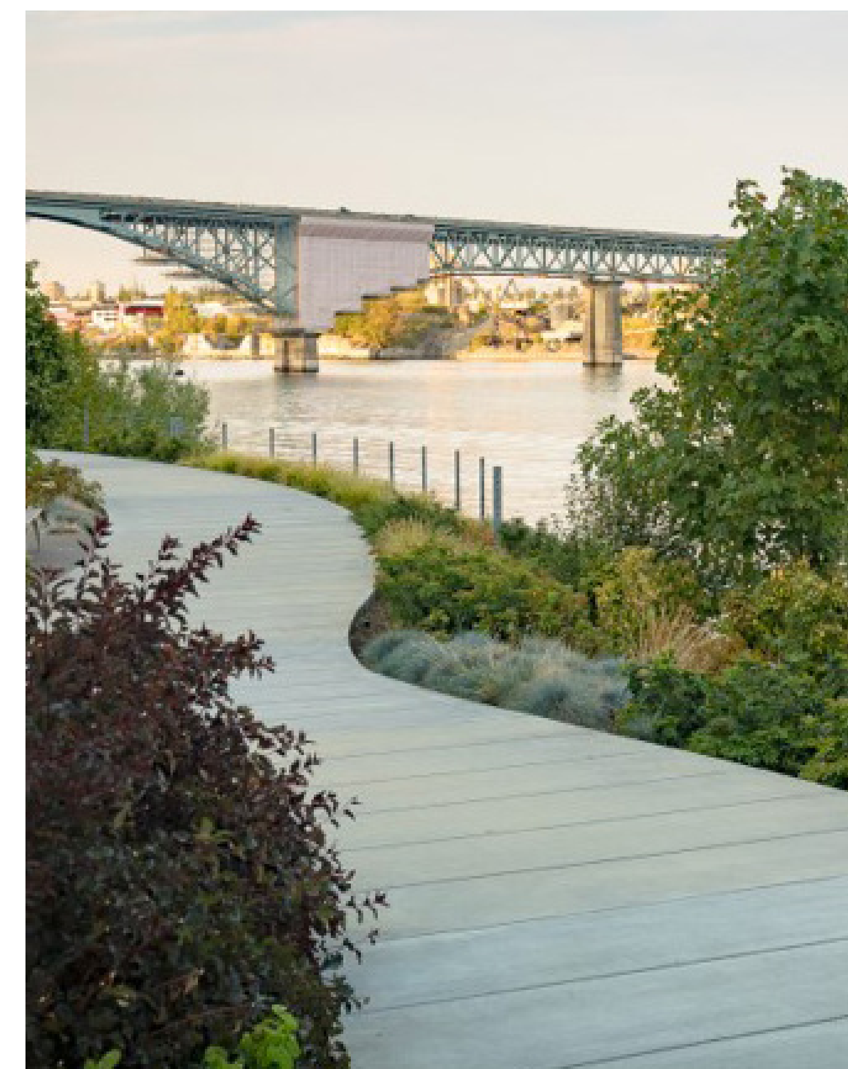


FIGURE 68 – PROPOSED SHORELINE SECTION (2100)

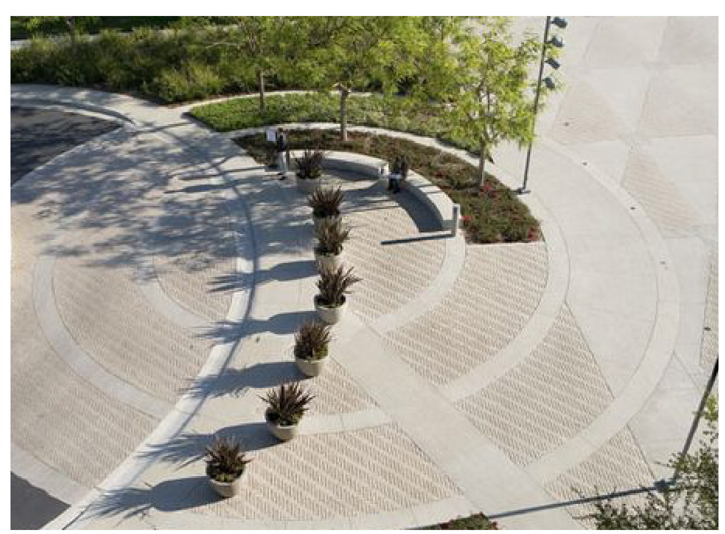




5.3.8 | OUTER MARINE YARD OPPORTUNITIES

The Outer Marine Yard is envisioned as a pedestrian-oriented plaza with a strong connection to the adjacent Simulation Center Plaza. The Outer Marine Yard serves the functional activities related to the new vessel, and contains staging, storage, and truck access. Landscape improvements along the shoreline visually connect the Outer Marine Yard to other parts of the waterfront, and the axes to the water from both Maritime Academy Drive and Morrow Cove Drive.

The landscape elements for the Outer Marine Yard include circular paving patterns, feature seat wall, and ornamental plantings. The design intent is to respond to the adjacent existing Simulation Center Plaza, to create a focal point at the terminus of Morrow Cove Drive and Maritime Academy Drive.

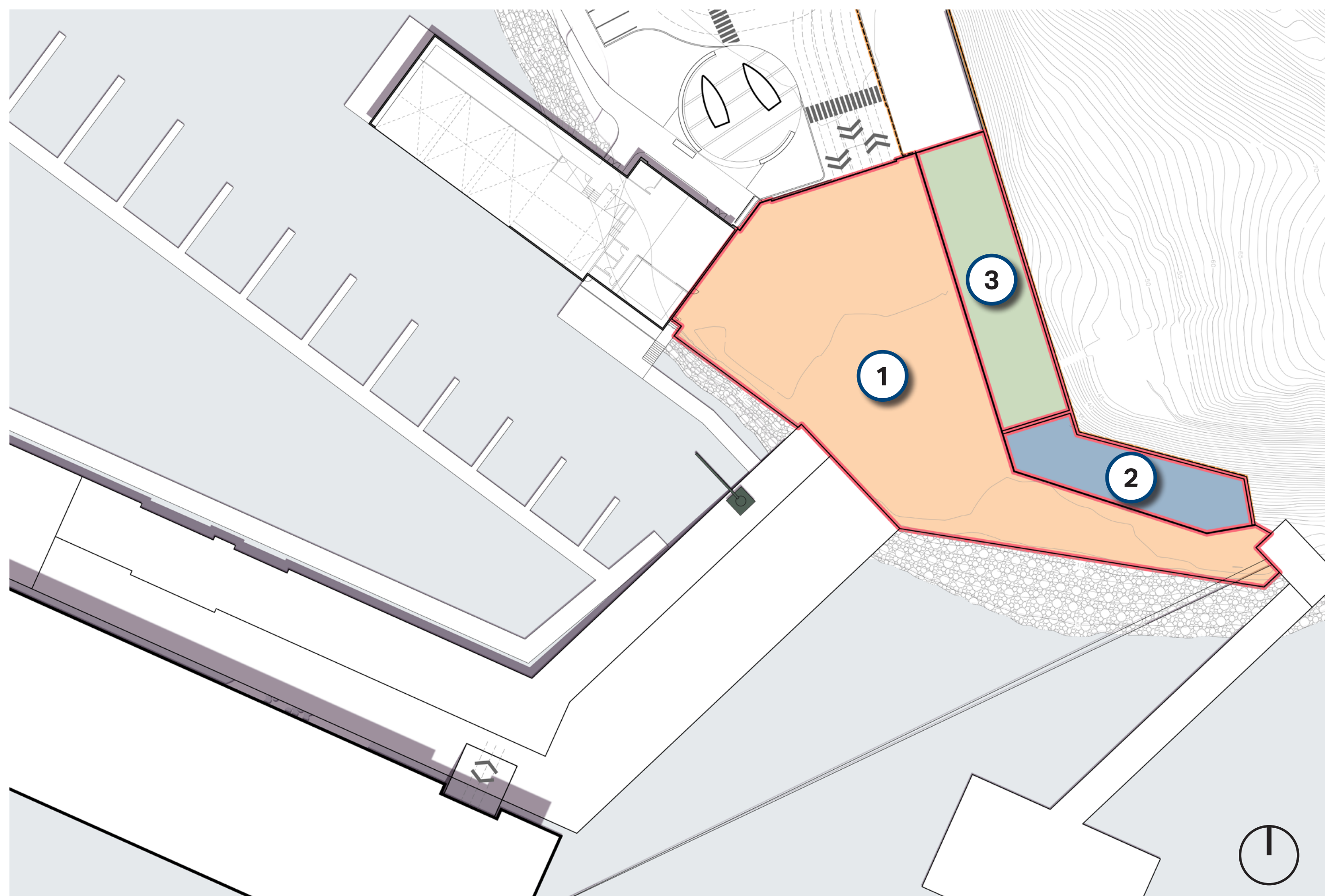


5.3.9 | INNER MARINE YARD OPPORTUNITIES (MARINE LOGISTICS YARD)

The entirety of the Inner Marine Yard is subject to Cal Maritime and port security requirements and MARSEC levels identified by the U.S. Coast Guard. This zone and accessible areas (the Main Pier, Boat Basin, Hydrokinetic Barge, et.al.) are secured by fencing and a new guardhouse structure (see Section 5.3.2).

Under the Cal Maritime WFMP, the Inner Marine Yard is enlarged and resurfaced to approximately 21,680 SQF (just under a half-acre). Utilities and storage areas shift to zones created as part of the Marine Programs Multi-Use Building and along the perimeter of the area. The purpose of this shift is to create an as-large-as-possible operational zone for academic program functions and overall logistical needs of the Main Pier and area overall. Cadet training with cargo yard (e.g., top-pick container loaders, forklifts, yard hostlers) and other equipment are provided in this area. The Inner Marine Yard is also capable of accommodating marine research container, WH pods, provisions staging, heavy-lifting cranes, and outdoor shop(s) operation with cadets, faculty, and tradespeople.

FIGURE 69 – MARINE YARD OPPORTUNITY ZONES



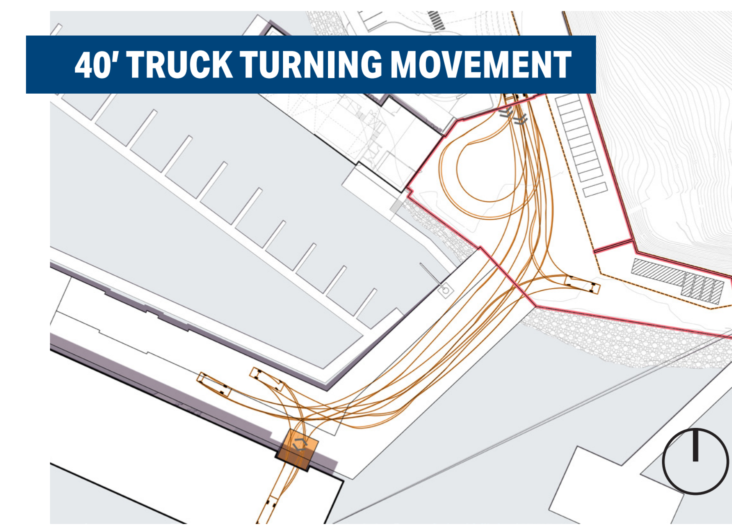
Legend

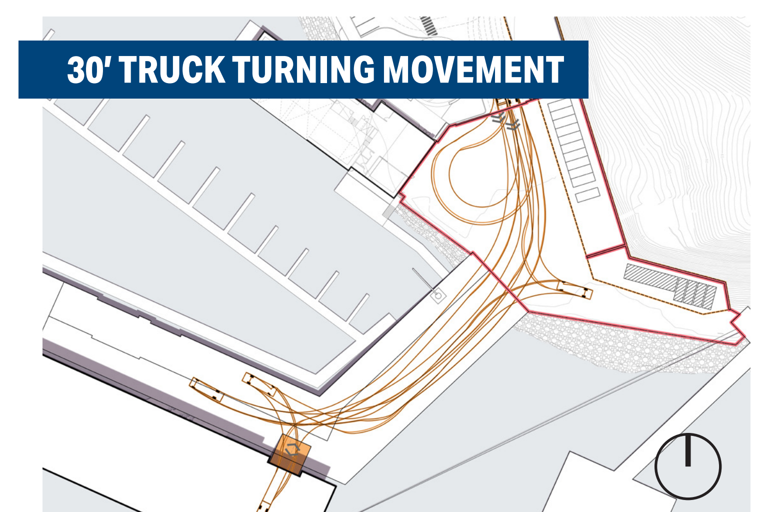
1 | Marine Logistics Yard (+/- 21,680 SQF)

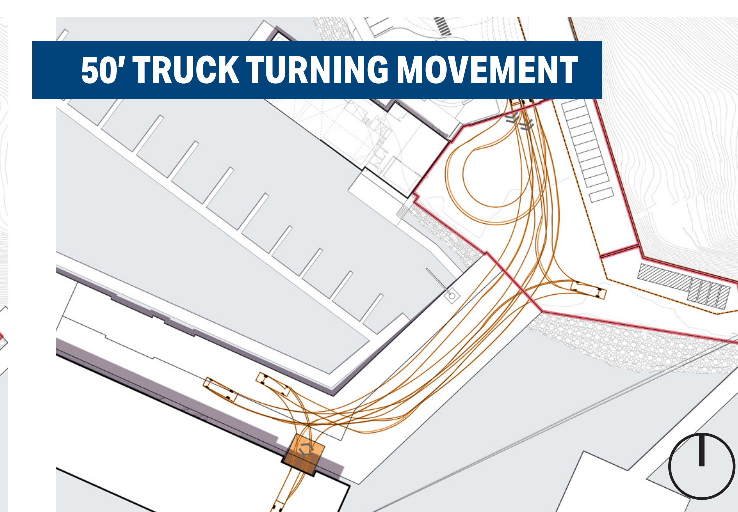
2 | Consolidated Utilities Yard (+/- 3,360 SQF)

3 | Mobile Classrooms and Labs (Phase 1 & 2) , Marine Programs Multi-Use Building & Harbor Control Tower (Phase 3) (+/- 4,900 SQF)

The Inner Marine Yard is organized to operate in both a 'normal' and 'emergency deployment' manner. During NSMV emergency deployments, the Inner Marine Yard is shifted to allow greater levels of container and palletized materials to be organized, staged, and made available to the ship. Vehicle maneuvering areas are planned to accommodate vehicle turning movements of up to 50'. Emergency operations and provisioning functions within the yard can be simulated as part of cadet training.







Legend

FIGURE 70 – NORMAL LOGISTICS YARD OPERATION

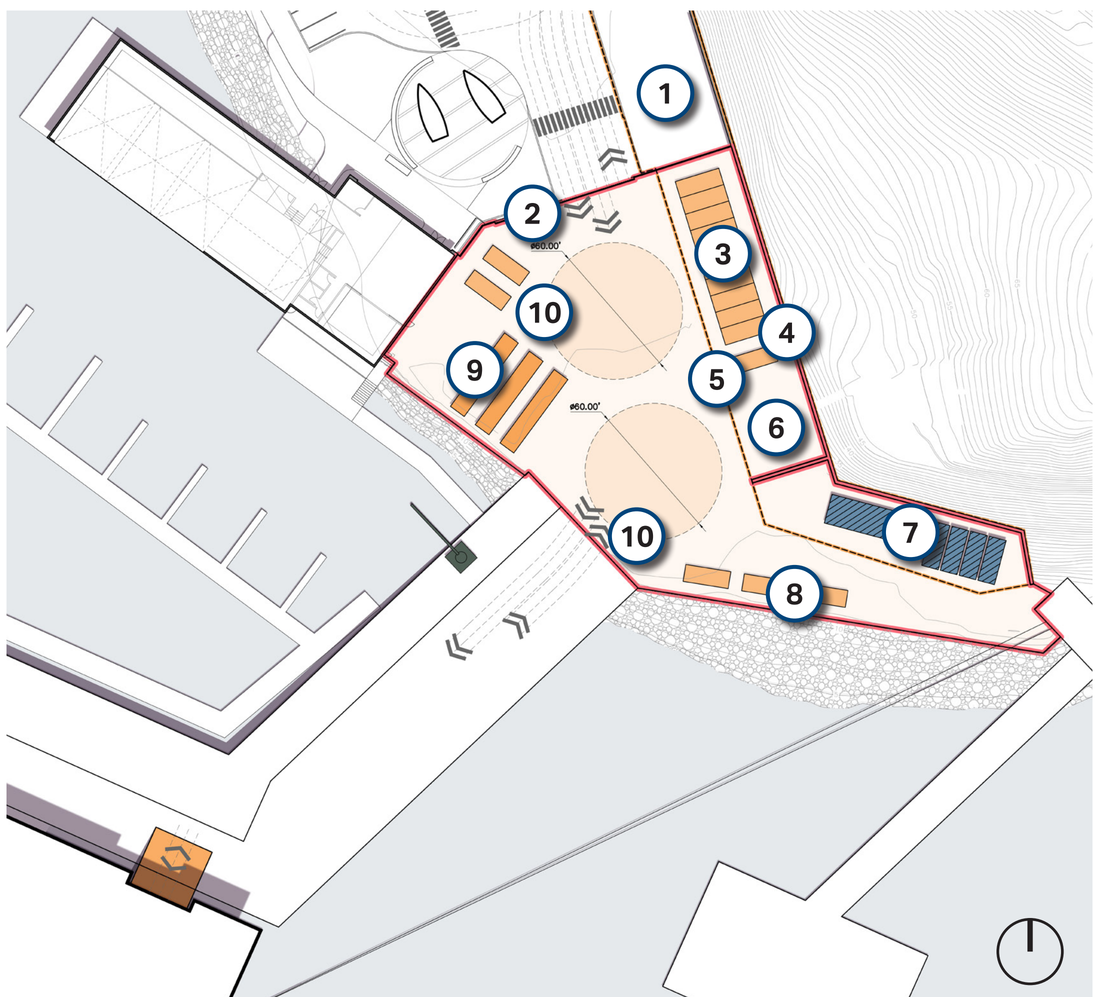
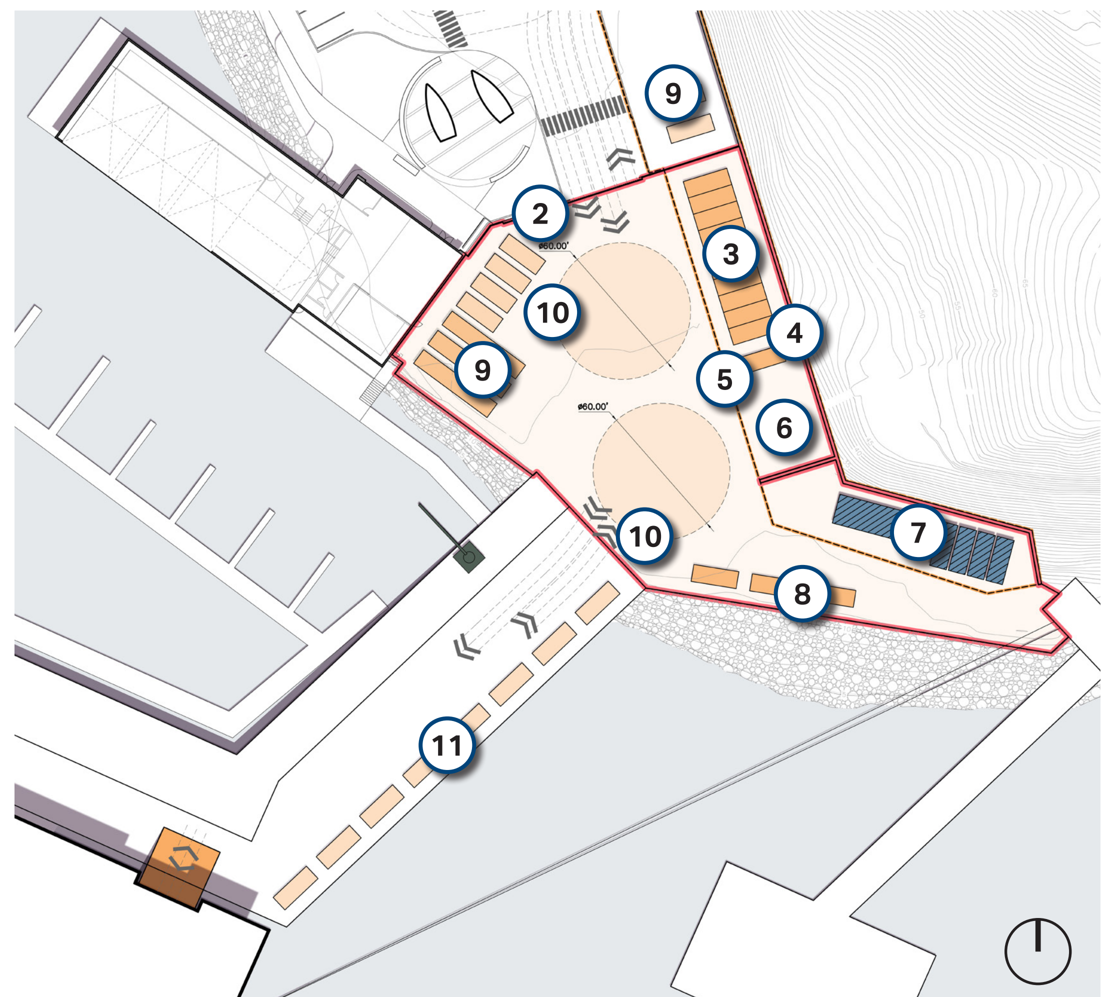


FIGURE 71 – NSMV STAGING & EMERGENCY DEPLOYMENT



Legend

1	Parking
2	Security Fence
3	Mobile Classrooms & Labs
4	Retaining Wall
5	Future Building (Overhang)
6	Parking for Yard Area and Other Training Equipment
7	Consolidated Utilities, Transformer, and Substation
8	Temporary Storage & Staging
9	Trailers (Contractors) / Provisions Staging
10	Yard Equipment Turning Circle (+/- 60' Diameter)
11	Provisions Staging

5.3.10 | SHORELINE AND MARINE YARD IMPROVEMENTS

The concept for landscape improvements of the Outer Marine Yard takes advantage of additional space left over from removing the temporary Marine Programs and Naval Science Replacement Building where a pedestrian-oriented plaza is proposed. The plaza is located at the terminus of two major campus axes – the Shoreline axis and the Main Pier axis. The key design considerations are to emphasize the visual corridor, maintain the vehicular / pedestrian connections, and create a flexible space.

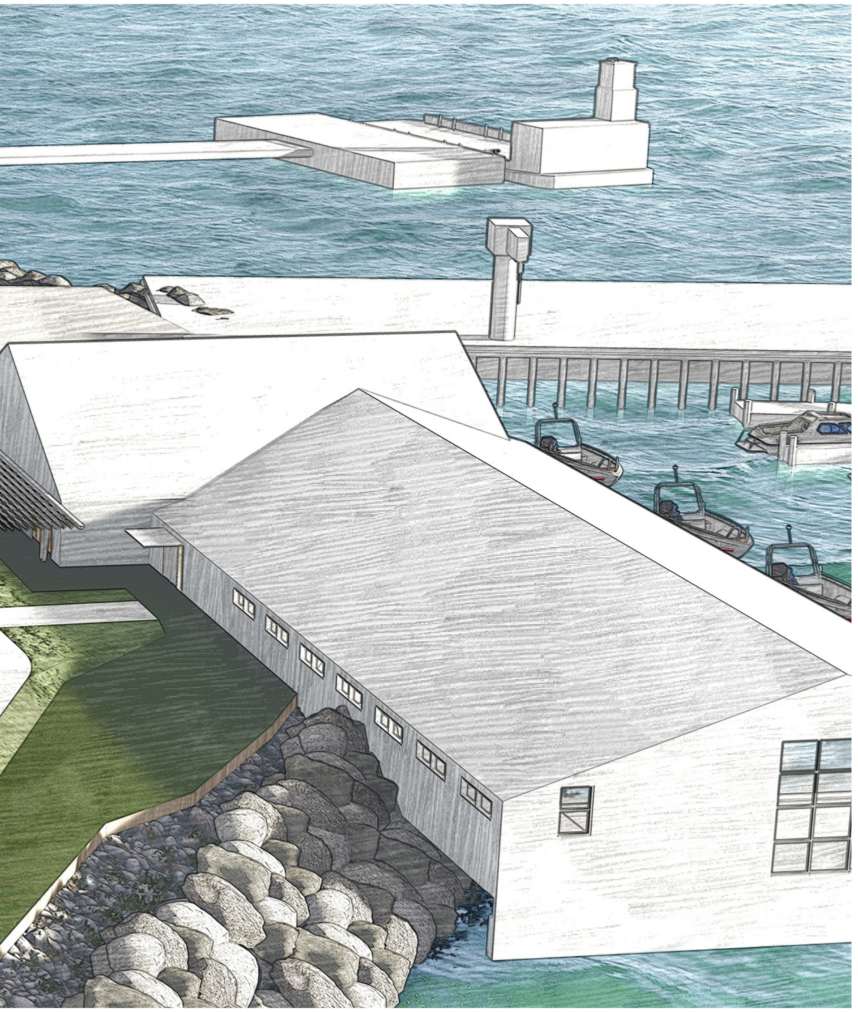
The landscape design responds to the existing Simulation Center Plaza circular design language, establishes a new pedestrian connection between the renovated Boathouse and the new Marine Programs and Naval Science Replacement Building, maintains ample space for vehicular circulation – including truck turning radii, provides flexible functional space for demonstration and outdoor learning purposes, and creates continuous visual and circulation shoreline linkages.

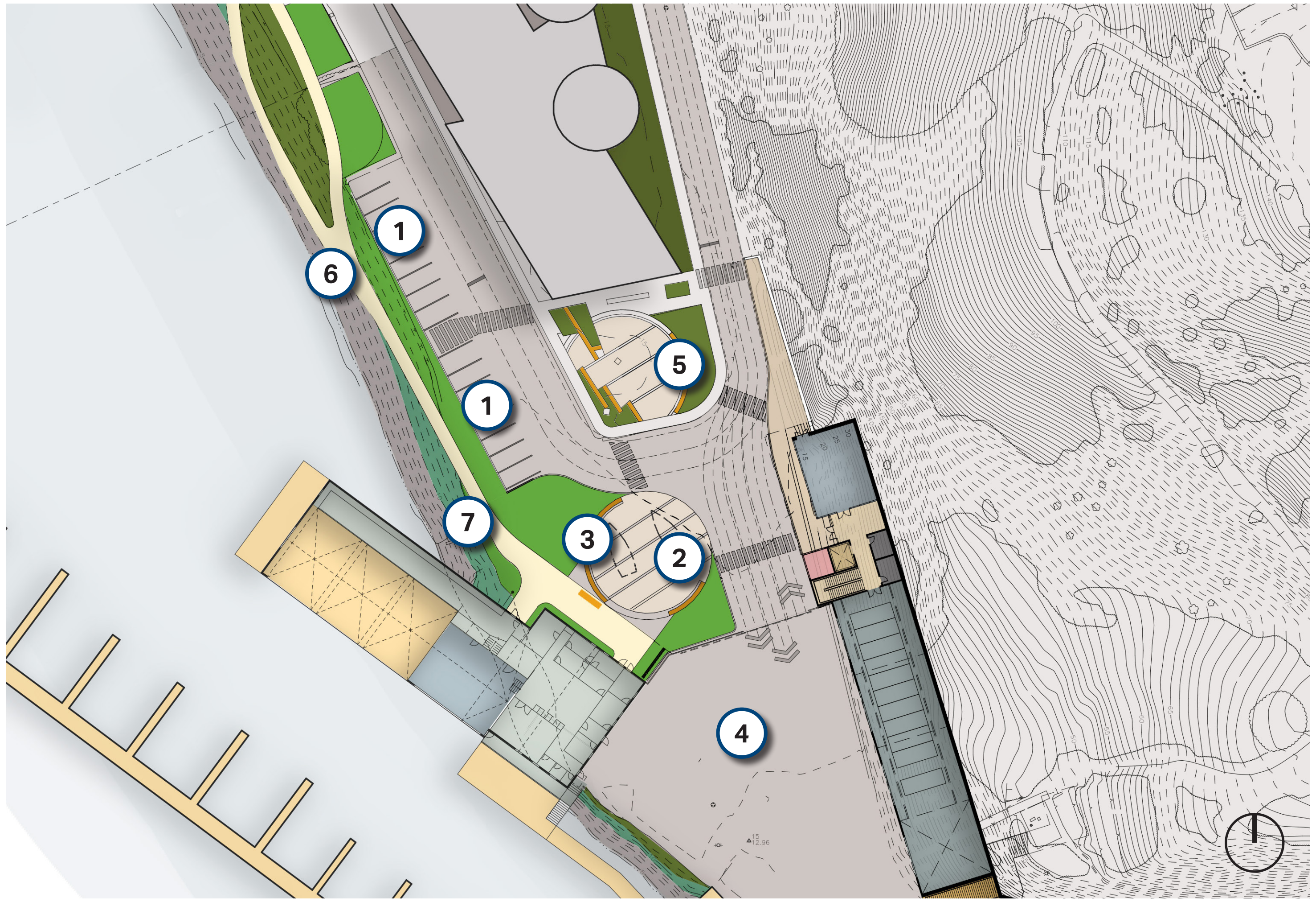
The landscape design proposes feature paving, furnishings, and planting to create spaces for different uses, while also creating a pleasant environment for cadets to gather.

The Inner Marine Yard accommodates practical programming uses and maintains visual/physical connection to the water. With this in mind, the landscape design proposes that the inner plaza can feature supergraphics representing Cal Maritime's logo on the refurbished paving.

FIGURE 72 – SHORELINE AND MARINE YARD IMPROVEMENTS PERSPECTIVE

FIGURE 73 – SHORELINE AND MARINE YARD IMPROVEMENTS MASTER PLAN





Legend

1 Parking
2 Demonstration Zone / Boathouse Forecourt
3 Seating Wall
4 Inner Plaza / Boat Yard
5 Existing Simulation Center Plaza
6 Rocky Intertidal Zone
7 Transitional Planting Zone

5.3.11 | UTILITY UPGRADES

Utility upgrades are necessary to meet the requirements of in-water enhancements associated with the Main Pier and NSMV as well as planned buildings along the water's edge. Utility upgrades are necessary for shore power and water systems supporting the vessel. Buildings will also require electrical, potable water, wasterwater, communications, and other features.

The NSMV requires significantly more power than the TSGB. New buildings will also need upgrades to increase to the existing building services. Medium voltage and other support infrastructure are accounted for in the Boat Basin expansion.

Upgrades accounted for within the WFMP and contained within the Opinion of Probable Cost offered in the following section include the following for Phase One:

- Relocation of existing substation and transformer facilities to an area south of the Inner Marine Yard;
- Shifting of the steam plant to an area south of the Inner Marine Yard;
- Related site demolition, earthwork, and smaller scale utility element shifts;
- Potable water line expansion out to the Main Pier along with associated expansion of existing fire hydrant and back-check valves;
- Potable water line expansion out to the Main Pier along with associated expansion of existing fire hydrant and back-check valves;
- Sanitary sewer expansion, manhole(s), and lift station;
- Shore power transformer, switch gear, and cable management system;
- Relocation, rerouting, and potential expansion of existing dock boiler, gas supply, and metering; and,
- Sitewide lighting upgrades.

For Phase Two and Three, allowances for increased water, wastewater, and electrical services to planned shoreline buildings are also anticipated.

5.4 ROM Cost Estimate

5.4.1 | OVERVIEW

The Cal Maritime WFMP supports investments across each of its three project phases. Each project works together to transform the water's edge into the fully realized ideas and initiatives offered in Section 5.1.

A list of investments contemplated by project phase is presented in the accompanying tables and figures section. Each entry includes a project code, name, and proposed phase. Entries also identify linking investments--those efforts needing implementation prior to or concurrent with the listed initiative.

The cost estimate is an Opinion of Probable Cost (OPC). In providing opinions of construction cost, it is recognized that Cal Maritime WFMP planners have no control over the cost of labor, equipment, and materials or over the contractor's means and methods of determining constructibility, pricing, or schedule. The OPC is based on the consultant's reasonable professional judgment and experience and does not constitute a warranty, expressed or implied, that the contractor's bids, negotiated prices, or actual execution of the work will not vary from the OPC.

TABLE 9 – ROM COST ESTIMATE BY PHASE

ID	ITEM	PHASE ONE	PHASE TWO	PHASE THREE
A	Main Pier Expansion	$30,720,000	-	-
B	Dredging of Boat Basin and Approaches	$800,000	-	-
C	Navigation Aids	$3,000	-	-
D	New Floating and Training Docks at Basin 1	$2,813,500	-	-
E1	Marine Logistical Yard Upgrade (Linking Gatehouse to Pierhead)	$1,225,000	-	-
E2	Yard Expansion and New Site Retaining Wall	$7,156,655	-	-
F	Utilities Relocation and Upgrade	$4,134,000	$374,000	$300,000
G	Seismic Retrofit and Renovation of Boathouse	-	$5,319,452	-
H	New Accessible Breakwater and Creation of Basin 2	-	$15,435,000	-
I	New Floating and Training Docks at Basin 2	-	$2,942,375	-
J	Shoreline Enhancements (Boathouse to New Accessible Breakwater)	-	$2,831,968	-
K1	Marine Programs Multi-Use Building	-	-	$15,064,062
K2	Harbor Control Tower	-	-	Inc. in K1 Above
L	Marine Hydrokinetic (MHK) Barge and Linking Trestle	-	-	TBD (Proprietary)
M	Central Waterfront Esplanade Canopy	-	-	$3,298,094
N	Row House and Floating Landing	-	-	$8,450,995
O1	Shoreline Enhancements (Row House to Dining Center)	-	-	$6,674,930
O2	Waterfront Overlook / Outdoor Room One	-	-	$532,120
O3	Waterfront Overlook / Outdoor Room Two	-	-	$532,120
	Sub-Total	**$46,852,155**	**$26,902,795**	**$34,852,321**
	Soft Costs (30%)	$14,055,647	$8,070,839	$10,455,696
	Contingency (25%)	$11,713,039	$6,725,699	$8,713,080
	Total (incl. Soft Costs + Contingency)	**$72,620,841**	**$41,699,333**	**$54,021,097**

NOTES
- Costs contain 25% contingency and 30% soft costs (design, permitting, environmental monitoring, CA).
- Figure includes surfaces and infrastructure; excludes containers, labs, et al.
- Segments of shoreline enhancement may occur over time.

5.4.2 | PHASE ONE

TABLE 10 – PHASE ONE ROM COST ESTIMATE

ID	ITEM	PHASE ONE
A	Main Pier Expansion	$30,720,000
B	Dredging of Boat Basin and Approaches	$800,000
C	Navigation Aids	$3,000
D	New Floating and Training Docks at Basin 1	$2,813,500
E1	Marine Logistical Yard Upgrade (Linking Gatehouse to Pierhead)	$1,225,000
E2	Yard Expansion and New Site Retaining Wall	$7,156,655
F	Utilities Relocation and Upgrade	$4,134,000
	Sub-Total	**$46,852,155**
	Soft Costs (30%)	$14,055,647
	Contingency (25%)	$11,713,039
	Total (incl. Soft Costs + Contingency)	**$72,620,841**

Legend

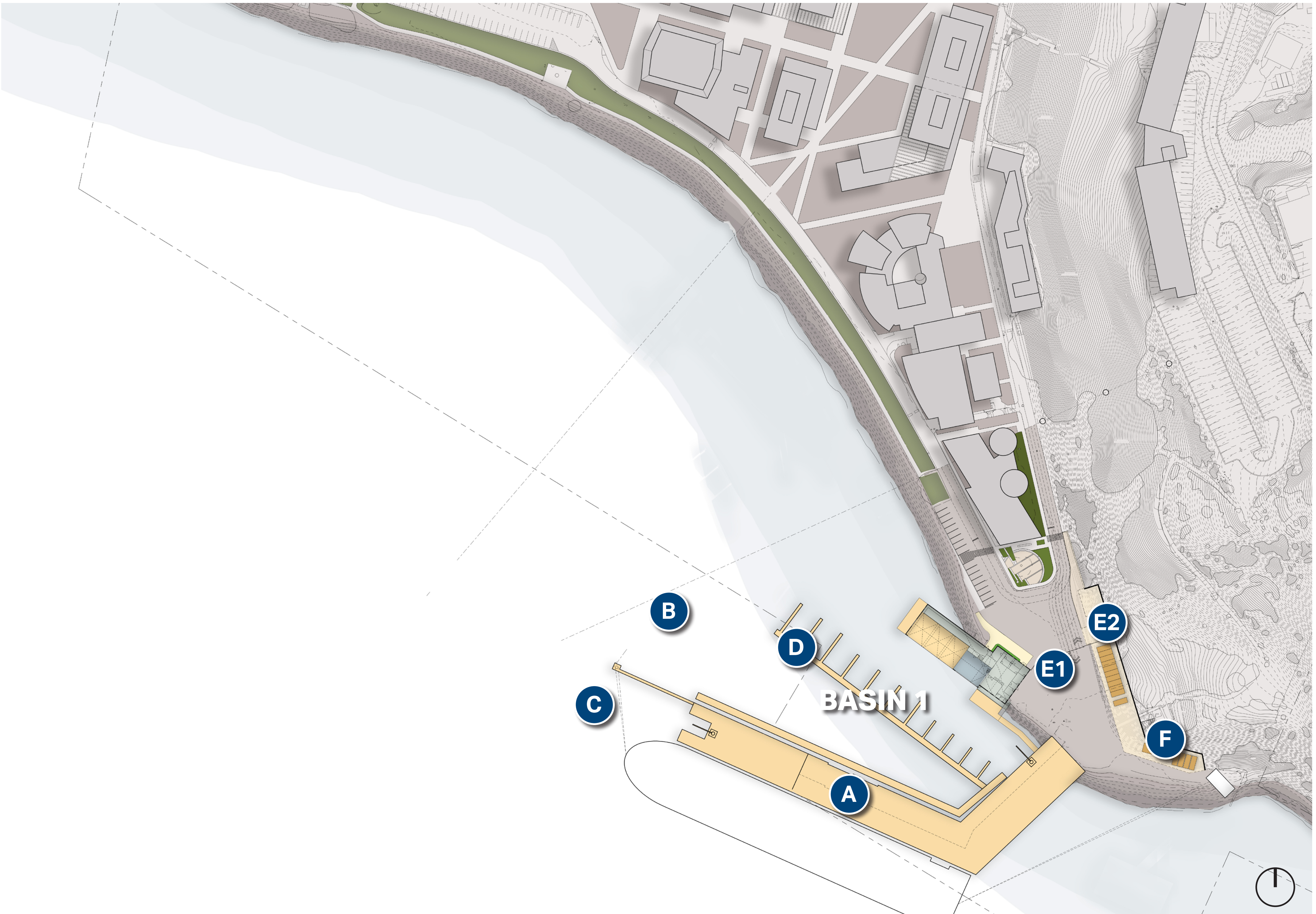
Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

FIGURE 74 – PHASE ONE PROJECTS

FIGURE 75 – PHASE ONE PROJECTS (ILLUSTRATIVE MASTER PLAN)



Legend

A	Main Pier Expansion
B	Dredging of Boat Basin and Approaches
C	Navigation Aids
D	New Floating and Training Docks at Basin 1
E1	Marine Logistical Yard Upgrade (Linking Gatehouse to Pierhead)
E2	Yard Expansion and New Site Retaining Wall
F	Utilities Relocation and Upgrade

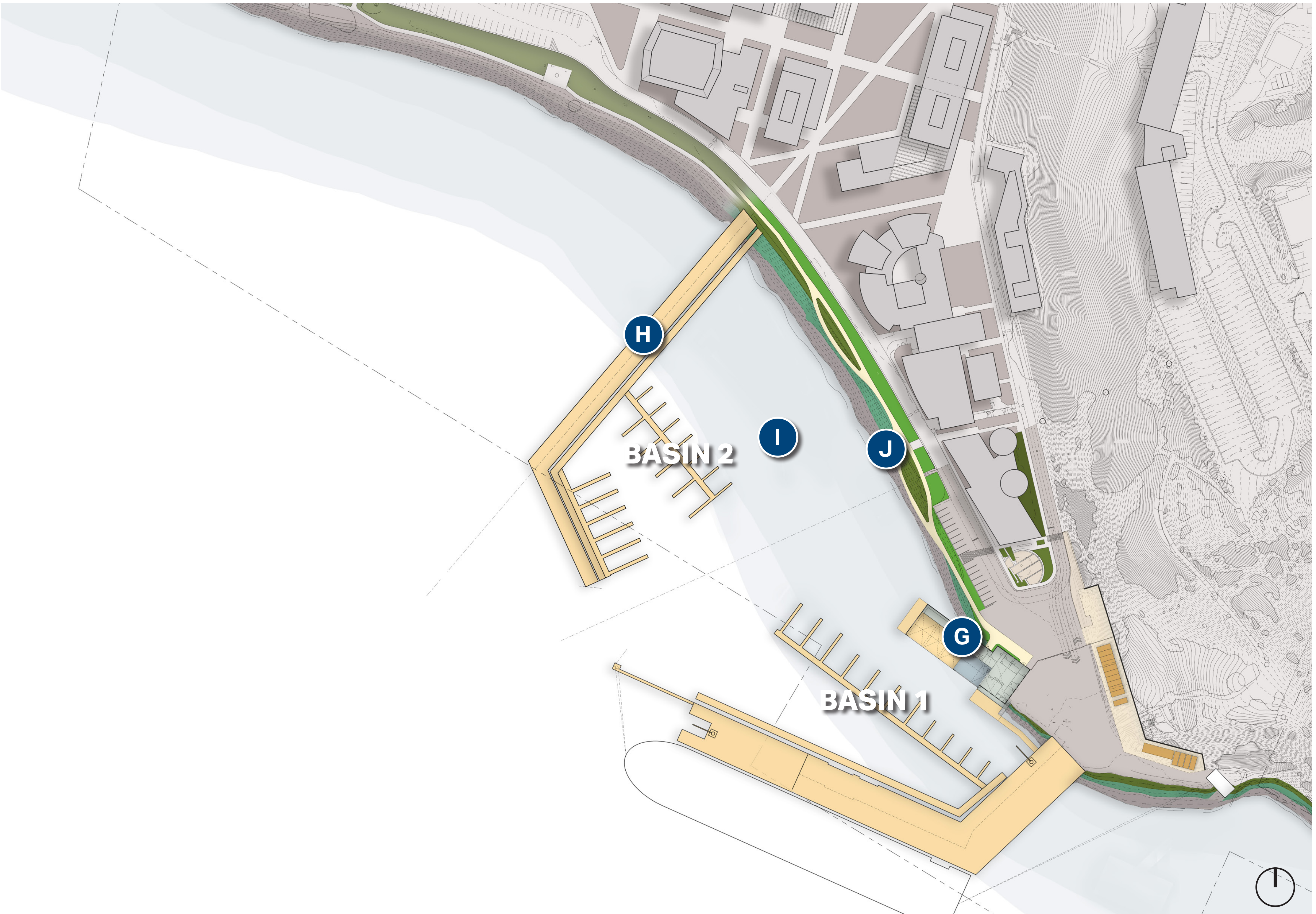
5.4.3 | PHASE TWO

TABLE 11 – PHASE TWO ROM COST ESTIMATE

ID	ITEM	PHASE TWO
F	Utilities Relocation and Upgrade	$374,000
G	Seismic Retrofit and Renovation of Boathouse	$5,319,452
H	New Accessible Breakwater and Creation of Basin 2	$15,435,000
I	New Floating and Training Docks at Basin 2	$2,942,375
J	Shoreline Enhancements (Boathouse to New Accessible Breakwater)	$2,831,968
	Sub-Total	**$26,902,795**
	Soft Costs (30%)	$8,070,839
	Contingency (25%)	$6,725,699
	Total (incl. Soft Costs + Contingency)	**$41,699,333**

FIGURE 76 – PHASE TWO PROJECTS

FIGURE 77 – PHASE TWO PROJECTS (ILLUSTRATIVE MASTER PLAN)



Legend

G Seismic Retrofit and Renovation of Boathouse

H New Accessible Breakwater and Creation of Basin 2

I New Floating and Training Docks at Basin 2

J Shoreline Enhancements (Boathouse to New Accessible Breakwater)

5.4.3 | PHASE THREE

TABLE 12 – PHASE THREE ROM COST ESTIMATE

ID	ITEM	PHASE THREE
F	Utilities Relocation and Upgrade	$300,000
K1	Marine Programs Multi-Use Building	$15,064,062
K2	Harbor Control Tower	Inc. in K1 Above
L	Marine Hydrokinetic (MHK) Barge and Linking Trestle	TBD (Proprietary)
M	Central Waterfront Esplanade Canopy	$3,298,094
N	Row House and Floating Landing	$8,450,995
O1	Shoreline Enhancements (Row House to Dining Center)	$6,674,930
O2	waterfront Overlook / Outdoor Room One	$532,120
O3	Waterfront Overlook / Outdoor Room Two	$532,120
	Sub-Total	**$34,852,321**
	Soft Costs (30%)	$10,455,696
	Contingency (25%)	$8,713,080
	Total (incl. Soft Costs + Contingency)	**$54,021,097**

Legend

Existing Buildings

2017 Physical Master Plan Projects

Waterfront Master Plan Projects

FIGURE 78 – PHASE THREE PROJECTS

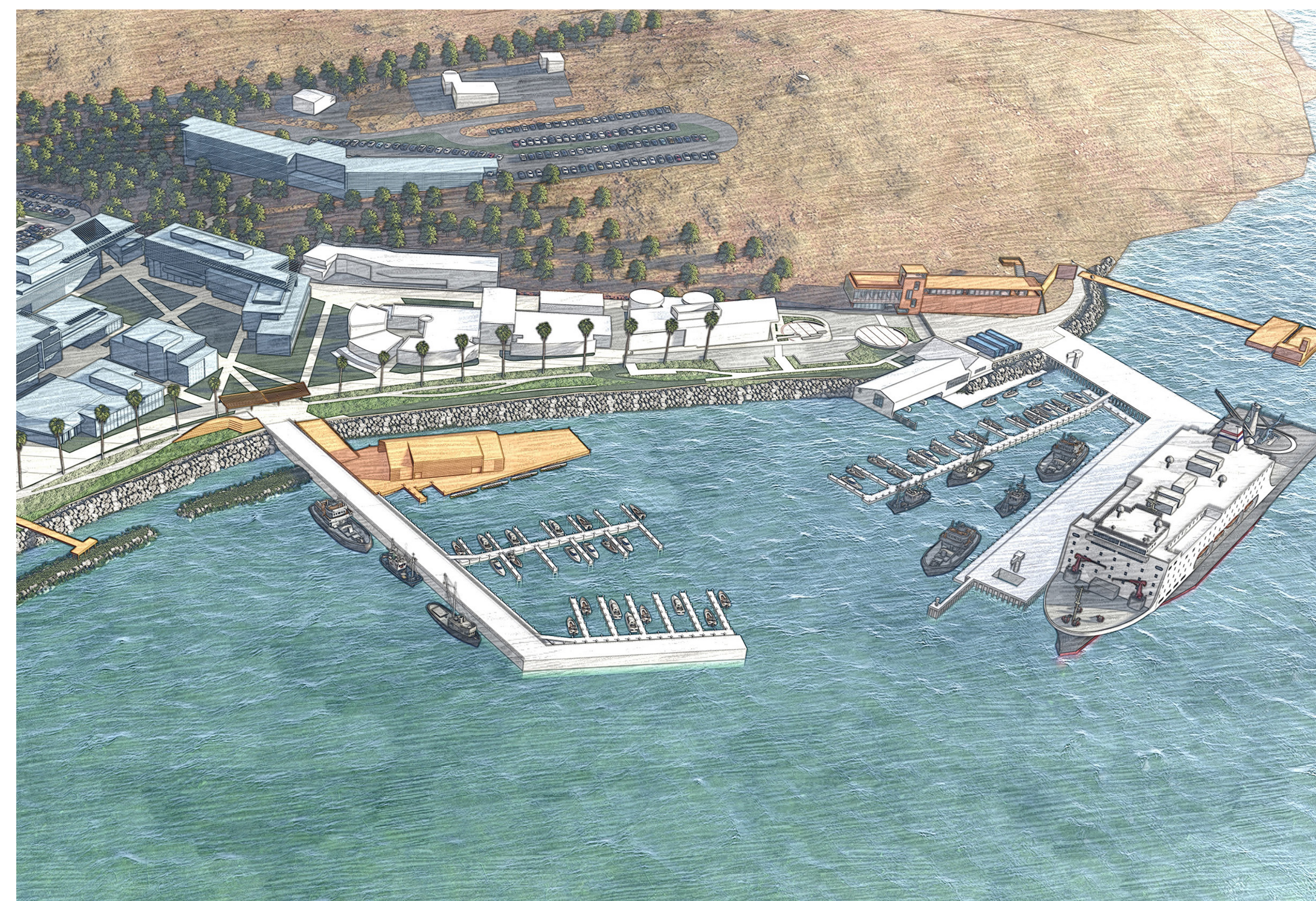


FIGURE 79 – PHASE THREE PROJECTS (ILLUSTRATIVE MASTER PLAN)

Legend

K1	Marine Programs Multi-Use Building
K2	Harbor Control Tower
L	Marine Hydrokinetic (MHK) Barge and Linking Trestle
M	Central Waterfront Esplanade Canopy
N	Row House and Floating Landing
O1	Shoreline Enhancements (Row House to Dining Center)
O2	Waterfront Overlook / Outdoor Room One
O3	Waterfront Overlook / Outdoor Room Two

6 Implementation and Next Steps

6.1 Implementing Phase One of the Waterfront Master Plan

6.1.1 | OVERVIEW

The Cal Maritime WFMP and its companion, the 2017 Physical Master Plan, are roadmaps to ensure both the implementation of the academic master plan as well as mission readiness to meet the academic and operational changes of the campus over the next ten years. Specifically, the Waterfront Master Plan prioritizes desired in-water and adjacent landside improvements while also taking into account academic and port operations, environmental factors, and the long-term resiliency of the waterfront. Of greatest importance are those projects outlined within the WFMP Phase One to make ready for arrival of the NSMV.

Implementation of initial investments under Phase One creates a foundation for subsequent steps and investments if adequately planned. Also acknowledging that priorities change and available funding fluctuates, the WFMP is flexible in its implementation strategy, with projects predominately identified in Phase Two and Phase Three able to shift forward or back in time as desired by the campus.

Based on discussions with Cal Maritime's WFMP Working Group and feedback received from presentations to the President's Cabinet, it became evident that Phase One project elements have the highest priority and should be completed within the next five years to ensure that the NSMV can be adequately accommodated and is mission ready. Given the long lead time for environmental review, regulatory approvals, contractor procurement, and construction, it becomes imperative that initial design for Phase One of the WFMP be initiated as soon as possible.

A preliminary timeline for implementing Phase One is presented in the accompanying figure with the approximate durations for each task; CEQA review has already been initiated by Cal Maritime for Main Pier Expansion and Boat Basin redevelopment and should be expanded to include all elements of Phase One.

WRNS Studio
WRT
BKF Engineers
Page & Turnbull
Moffatt & Nichol

FIGURE 80 – MAKING READY FOR THE NSMV: PHASE ONE DELIVERY SCHEDULE

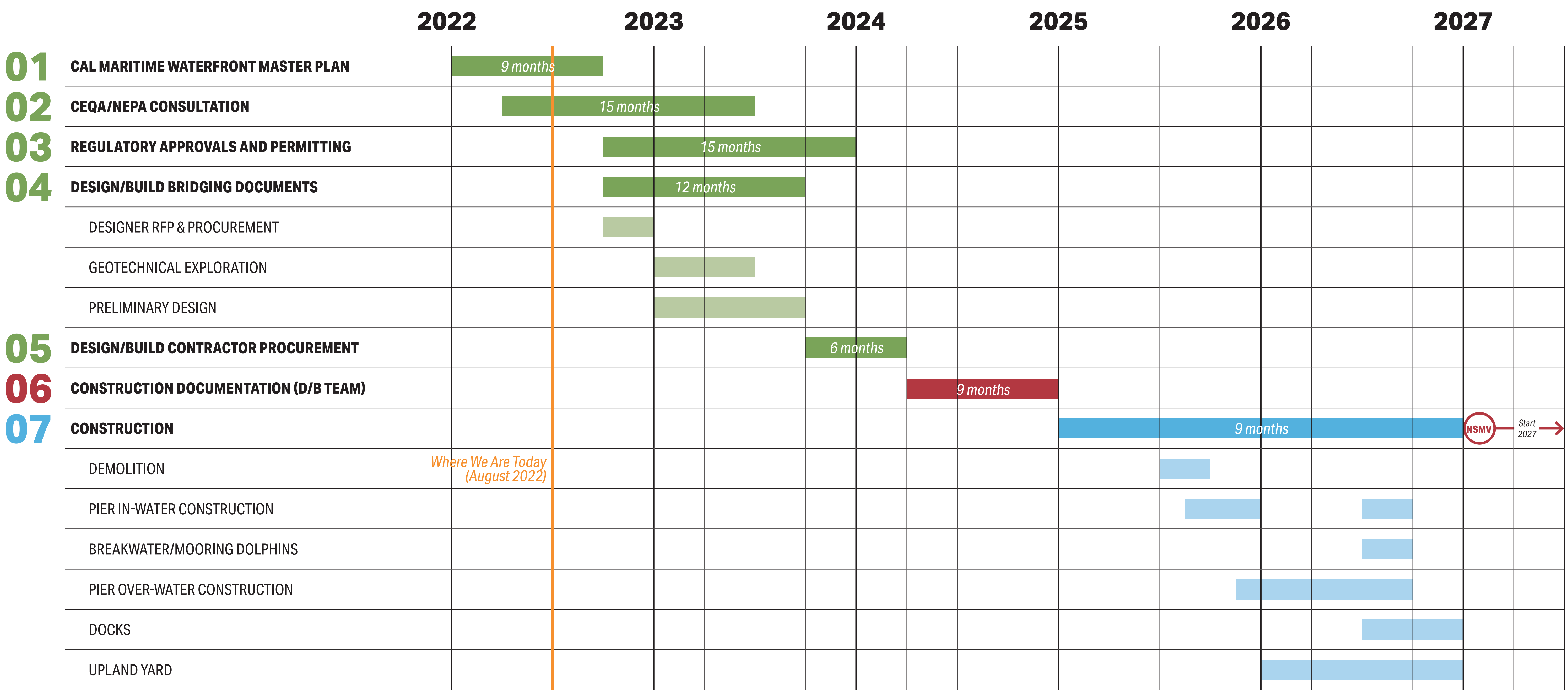


TABLE 13 – WATERSIDE PRIORITY INVESTMENTS - NEXT STEPS (ASSUMES DESIGN-BID-BUILD PROCUREMENT PROCESS)

STEP	NAME	DESCRIPTION	DURATION/ STATUS
1	Concept design	Advance the master plan design to 10%-15% completion to understand scope, costs, impacts, construction schedule, risk to ship arrival.	3 Months
2A	Notice of Preparation for Environmental Impact Report (EIR)	Assist EA team with project purpose and need. Project description.	3 Months
2B	Geotechnical Investigation and Dredge Sediment Characterization	To set grounds for demonstration project, educate agencies in shoreline/coastline investments, and facilitate the permit process.	90 Days
3	Project vetting	To assess project size based on cost, constructibility, and other potential constraints.	Ongoing
4	Soil sample collection permit application	To collect soil samples for permit application.	60 Days
5	Additional Data Collection	Topography and bathymetry; sediment characteristics, sediment transport, and currents; geotechnical; cultural resources; wetland delineation; environmental surveys.	3 Months
6	Coastal Engineering Analysis Update	To understand and evaluate physical processes driving circulation, waves, and sediment transport changes due to dredging at the project site.	3 Months
7	Alternative development and analysis	To develop alternatives that meet the project goals within the framework of physical processes. Selection of preferred alternative.	2 Months
8	Preliminary engineering design (30%)	First set of plans based on the preferred alternative. Plans, specification outline, cost update.	3 Months
9	Draft EIR and Permit Applications	Package includes results from Steps 5, 6, 7, and 8.	12 Months
10	60% design plans and specifications	Advanced set of construction documents. Plans, specifications, cost update.	3 Months
11	Final EIR and Obtain Permits	Needed for project construction.	12 Months
12	90% design plans and specifications	Includes any final comments from Cal Maritime and permitting agencies.	3 Months
13	For bid design plans and specifications	Plan set used for procurement and construction.	3 Months
14	Procurement	Support during procurement process, contractor pre-approval, bid form creation, and bid review.	TBD
15	Construction	Support as required.	TBD

6.1.2 | REGULATORY CONSIDERATIONS FOR IMPLEMENTATION

RELEVANT AGENCIES

All capital improvement phases involve construction activities in the water (below High Tide Line), and will require regulatory approvals for construction. It is expected that the following agencies will be involved in the review process for these project elements.

1. U.S. Army Corps of Engineers. An individual permit under Section 10 of the Rivers & Harbors Act, and under Section 404 of the Clean Water Act. The Corps will also consult with the following agencies as part of the permit review process:
   - NOAA Fisheries;
   - U.S. Fish & Wildlife Service (USFWS);
   - California Department of Fish & Wildlife (CDFW); and,
   - U.S. Coast Guard.
2. San Francisco Bay Conservation and Development Commission (BCDC). A major permit under the McAteer Petris Act for activities related to in-water work, shoreline band work, and public access.
3. San Francisco Regional Water Quality Control Board (SFRWQCB). A Water Quality Certification under Section 401 of the Clean Water Act, and a Waste Discharge Requirement Order under the State Porter Cologne Act.
4. Additional Approvals and Anticipated Coordination:
   - State Lands Commission (related to Basin Expansion and Hydrokinetic Barge);
   - U.S. Coast Guard (related to Basin Expansion and Hydrokinetic Barge);
   - State Historic Preservation Office (related to Boathouse Building);
   - City of Vallejo (related to transportation and public access); and,
   - Solano County (related to construction and grading).

6.1.3 | ENVIRONMENTAL DOCUMENTATION AND PERMITTING

Appropriate environmental review documents will be needed to complete the permit application process. Given that the anticipated improvements could include multiple construction phases spanning several years to keep pace with needs and funding, a potential strategy is to prepare a Programmatic Environmental Impact Report for all phases, with a specific review for Phase One of the project. Potential future review documents could be Supplemental Initial Studies, leading to Mitigated Negative Declarations, or a Supplemental EIR depending on the extent of environmental impacts.

From a permitting standpoint, it would be beneficial to explore different strategies for the various agencies depending on their jurisdiction and level of scrutiny. For example, it may be possible to apply for a permit of all phases of the project from the Army Corps and State Lands Commission, a Master Permit from BCDC (complete permit for Phase 1 and conditional approvals for future phases), and a Phase 1 permit only from the SFRWQCB.

As an initial step, it would be critical to present the entire Cal Maritime WFMP to all agencies at the same time at the Interagency Meeting forum the Army Corps hosts. For this project, where several agency permits are required, the use of the Joint Aquatic Resource Permit Application (JARPA) should be explored. The review process, fees, and timing for each agency permit is still the same as individual permits, but the application process could be streamlined because all agencies will receive the same information. If there is dredging involved in the project, the agencies may require at their discretion the Dredged Material Management Office (DMMO) application form to be completed too.

6.1.4 | DESIGN AND PROCUREMENT STRATEGY

CEQA review typically requires a comprehensive project description, including a description of the physical setting and coastal processes, dimensions of proposed structures, construction methods and duration, and approximate quantities of fill and cut within the Area of Potential Effects (APE) such that potential impacts can be identified and mitigations can be developed. It therefore becomes important that appropriate technical studies and preliminary designs for the proposed elements be completed early in the CEQA review phase. While the Cal Maritime WFMP identifies and prioritizes the main elements and features of waterfront improvements campuswide, the document by its nature is not intended to offer a level of design detail and technical due diligence necessary for fulfillment of all elements needed in the CEQA review effort.

In terms of procurement strategies for construction, there are several options that can be considered, such as Design-Bid-Build where final designs and permits are provided to bidders, Design-Build where bridging documents (preliminary designs) are provided to bidders who then complete the design, or Early Contractor Involvement (also called Construction Manager/General Contractor, CM/GC or Construction Manager at Risk, CMAR). Each procurement strategy has its own unique advantages and constraints and making a decision to go with a selected strategy requires adequate vetting of risks and benefits during the preliminary design phase of a project.

6.1.5 | CONSIDERATIONS DURING CONSTRUCTION OF PHASE ONE

Construction of Phase One improvements between late 2025 and 2026/27 will pose significant and unique challenges to Cal Maritime in its ability to deliver academic programs and cadet housing. Reconstruction and expansion of the Main Pier is expected to require TSGB to be relocated during the construction period. Cal Maritime will need to explore opportunities to berth the TSGB at another location and/or determine if some type of operation from an anchorage is technically feasible. Furthermore, Boat Basin operations will need to be rethought and assessed as to the ability to continue during all or some portion of the construction period.

While not addressed in the WFMP, the importance of addressing these operational issues needs to continue and be thought through over the coming two to three years leading up to Phase One construction period.

A

Appendix: Cal Maritime Boathouse Historic Resource Evaluation

PAGE&TURNBULL

P&T

CAL MARITIME BOATHOUSE HISTORIC RESOURCE EVALUATION

VALLEJO, CALIFORNIA
[21067]

SUBMITTED TO
CALIFORNIA STATE UNIVERSITY MARITIME ACADEMY

January 5, 2022

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TABLE OF CONTENTS

I. INTRODUCTION

This Historic Resource Evaluation (HRE) has been prepared at the request of the California State University Maritime Academy ("Cal Maritime") for the Boathouse building at the Cal Maritime campus in Vallejo, California. The Boathouse, which was completed in 1946 and was designed in a utilitarian style by the California Department of Public Works, Division of Architecture, is located at Morrow Cove where the Napa River and Carquinez Strait meet San Pablo Bay **(Figure 1)**. The Boathouse, which was historically also called the Seamanship Building, was dedicated in honor of Edwin C. Miller, a past graduate of and teacher at the Academy, and renamed the Edwin C. Miller Seamanship Center in 1989.

Figure 1: Aerial view of the Cal Maritime campus. The Boathouse is identified with a red arrow. Source: Google Maps, 2021. Edited by Page & Turnbull.

Cal Maritime was originally established as the California Nautical School in 1929, was renamed the California Maritime Academy in 1939, and joined the California State University system in 1995, becoming the CSU Maritime Academy. The Cal Maritime campus was established at Morrow Cove in the 1940s and a permanent building campaign for the campus was started in 1943. Mayo Hall, which was constructed as a gymnasium and natatorium in 1945, was the first building to be erected on the site, and the Boathouse was completed the following year, in 1946.

The Boathouse has been in use as an educational building since its construction. It serves the Cal Maritime campus by storing the school's smaller boats; providing a location for maintenance and storage of small watercraft, sails, rigging, and tools; and includes small offices for staff and a workshop. The Boathouse also has a close connection to the waterfront and the adjacent wharf where Cal Maritime's Training Ship (currently the T.S. Golden Bear III) is regularly docked.

Methodology

This report follows a standard outline for Historic Resource Evaluation (HRE) reports, and provides a summary of the current historic status, a building description, and historic context for the Boathouse at Cal Maritime in Vallejo. Page & Turnbull prepared this report using research provided by the staff at Cal Maritime and shared by the Cal Maritime Campus History Center. Additional online sources that were consulted include HistoricAerials.com, UC Santa Barbara's FrameFinder Geospatial Collection, and Newspapers.com. Key primary sources consulted and cited in this report include Cal Maritime's Campus History Collection, historic photographs, records, past issues of Cal Maritime's yearbook *Hawsepipe*, and historical newspapers. Page & Turnbull staff conducted a site visit of the Boathouse on September 18 and November 22, 2021. All photographs within this report were taken on those dates, unless otherwise noted.

Summary of Findings

The Boathouse at Cal Maritime, as one of the earliest permanent structures established at the campus, appears to be significant for individual listing in the California Register under Criterion 1 (Events) as a building that was critical to the development and success of the new campus, and demonstrates the recognition of the importance of Cal Maritime in the support of national maritime industries. The Boathouse also serves an important role in demonstrating the vital connection between the campus and the waterfront.

II. EXISTING HISTORIC STATUS

The following section examines the national, state, and local historic status currently assigned to the Boathouse at the Cal Maritime campus in Vallejo.

National Register of Historic Places

The National Register of Historic Places (National Register) is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level.

The subject building is <u>not</u> currently listed in the National Register.

California Register of Historical Resources

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places.

The subject building is <u>not</u> currently listed in the California Register.

California Historical Resource Status Codes

Properties listed or under review by the State of California Office of Historic Preservation are listed within the Built Environment Resource Directory (BERD) and are assigned a California Historical Resource Status Code (Status Code) of "1" to "7" to establish their historical significance in relation to the National Register of Historic Places (National Register) or California Register of Historical Resources (California Register).[1] Properties with a Status Code of "1" or "2" are either eligible for listing in the California Register or the National Register, or are already listed in one or both of the registers. Properties assigned Status Codes of "3" or "4" appear to be eligible for listing in either register, but normally require more research to support this rating. Properties assigned a Status Code of "5" have typically been determined to be locally significant or to have contextual

[1] California State Office of Historic Preservation, Built Environment Resource Directory (BERD), Solano County, updated March 2020.

importance. Properties with a Status Code of "6" are not eligible for listing in either register. Finally, a Status Code of "7" means that the resource has not been evaluated for the National Register or the California Register or needs reevaluation.

The subject building is not currently listed in the BERD database for Solano County with a status code. The most recent update to the BERD database for Solano County was in March 2020.

Historic Status of Other Buildings at Cal Maritime

As part of preparation of the most recent 2018 Master Plan for the Cal Maritime campus, some of the other buildings on campus were evaluated for their eligibility as historic resources in the California Register in order for CSU to meet the requirements of CEQA and the Section 106 process. The Student Services Center Building and Mayo Hall and were preliminarily evaluated at that time.[2]

The Student Services Center Building, which was erected in the 1950s and subsequently altered, was not found to be eligible for the California Register under any criteria.

Mayo Hall, which is believed to be the first permanent building erected on the campus in 1945, was found to be eligible for the California Register under both Criterion 1 (Events) for its significant role in the establishment of the new campus, and under Criterion 3 (Architecture) as a representative example of the Colonial Revival style. DPR forms were prepared for Mayo Hall in 2020 when California Public Resources Code (PRC) Section 5024 and 5024.5 consultation for a rehabilitation project at Mayo Hall was undertaken with the California Office of Historic Preservation (OHP).[3]

[2] LSA, *Historic Resource Evaluation: Mayo Hall and Student Services Center Building, CSU Maritime*, February 2018, 28-33.
[3] Dudek, *Mayo Hall*, DPR 523A (Primary Record) and 523B (Building, Structure, and Object) forms, updated August 2020.

III. ARCHITECTURAL DESCRIPTION

Cal Maritime Boathouse

The Boathouse is located along Morrow Cove near the Carquinez Strait at the south end of the Cal Maritime campus **(Figure 2)**.

Figure 2: Boathouse at the Cal Maritime Academy campus. Building identified with dashed red line. Source: Google Maps, 2021. Edited by Page & Turnbull.

The building is not aligned to the cardinal directions, but for the ease and clarity of the building description, the façade that faces the bay and the wharf will be described as the west façade, the façade with the primary entrance will be described as the south façade, and so on.

The Boathouse is L-shaped in plan, with the primary entrance located on the south façade of the building, which sits on land, while the north end of the building projects over the water of Morrow Cove to allow for boat slips along the north end of the west façade. The one-story, wood frame building sits on a foundation of wood piles on concrete footings; it is clad in a combination of painted wood shingles and painted vertical wood siding and has an asphalt shingle-clad cross-gable roof. The overall style of the building is utilitarian with decorative elements limited to the cross-brace pattern applied to the building's original wood doors.

The base of the building's L-shaped plan contains the primary entrance and "sail loft," where historically sails were cut, sewn, and repaired, beneath a steeply pitched side-gable roof. This section of the building is clad in painted wood shingles. The remaining length of the building, which will be referred to as the transverse wing, is clad in vertical painted wood siding and has a lower pitched roof. This area contains a work platform, boat slips, and some areas for storage and tooling.

SOUTH FAÇADE

The south façade contains the main entrance to the building and faces a small paved parking area located immediately north of the dock. The original entrance door consists of a painted wood door with an applied cross brace pattern. It is located at the west (left) end of the south façade but is currently not in use and blocked with a bench at the exterior **(Figure 3 and Figure 4)**. A small shed roof extends from the primary roof form over this entrance and has a wood paneled soffit with a ceiling-mounted light. To the west (left) of the entrance door, a wood staircase with a wood railing descends to a small wood walkway and dock along the west façade that extends over the water.

Figure 3: South façade of the Boathouse, looking northeast.

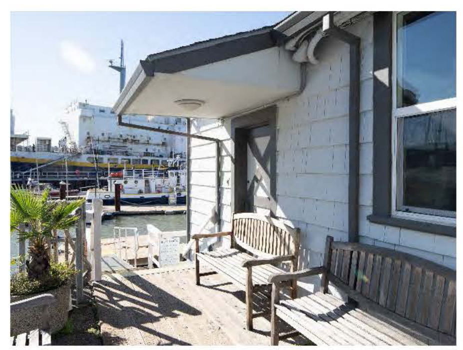

Figure 4: Detail of original primary entrance to the Boathouse, looking slightly northwest.

The remaining openings of the south façade consist of a single one-over-one vinyl replacement window to the east (right) of the original entrance door, a single leaf wood door that is currently used as the primary entrance door, and three evenly spaced one-over-one vinyl replacement windows **(Figure 5)**. A decorative dedication plaque is mounted to the east (right) of the current primary entrance door that reads "Edward C. Miller Seamanship Building." A wood sign over the entrance reads "Boat House."

Figure 5: Detail of east portion of the south façade. Looking northeast.

EAST FAÇADE

The east façade of the sail loft portion of the Boathouse has a louvered vent centered within its gable peak and openings at the ground floor consist of two non-original partially glazed wood doors and two non-original, double-hung, one-over-one vinyl windows **(Figure 6 and Figure 7)**.

Figure 6: Detail of doors at east façade of the sail loft portion of Boathouse, looking south.

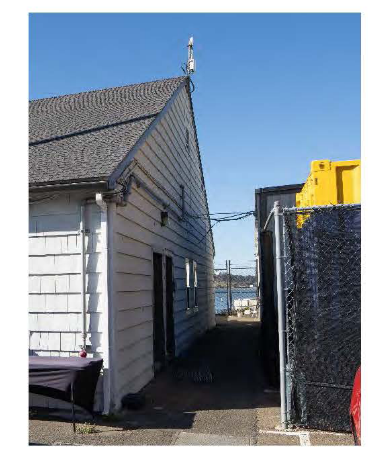

Figure 7: Oblique view of east façade of the sail loft portion of the Boathouse. Looking southwest.

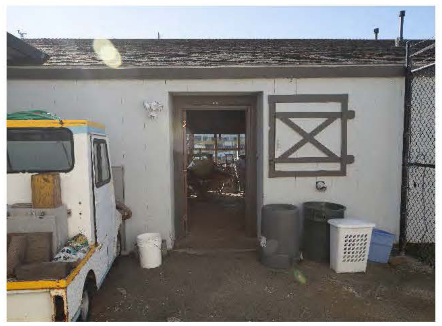

Figure 8: South end of the east façade of the transverse wing of the Boathouse, looking west.

Figure 9: East façade of the transverse wing of the Boathouse. Looking slightly southwest.

The transverse wing of the Boathouse has a single-leaf wood door within a recessed opening near its south end, a wood utility door with an applied cross-brace pattern to the north of the door, and four evenly spaced non-original aluminum slider windows along the remaining length of the building **(Figure 8 and Figure 9)**.

NORTH FAÇADE

The north-facing wall of the sail loft portion of the building has a single one-over-one vinyl replacement window **(Figure 10)**. The north façade of the transverse wing features a one-over-one vinyl replacement window at its east side and a gridded window arrangement of fixed glazing that is three panels wide and four panels tall with painted wood mullions **(Figure 11)**.

Figure 10: North-facing wall of sail loft portion of Boathouse. Looking slightly southwest.

Figure 11: North façade of Boathouse, looking southwest.

WEST FAÇADE

The west façade of the Boathouse along the transverse wing is open to the wharf and Morrow Cove for approximately half of its length to accommodate a number of boat slips **(Figure 12)**. The corners of this wide opening are clipped, and wood posts are visible that separate the boat slips and support the interior structure. The Cal Maritime logo and lettering reading "CAL MARITIME" is centered over this opening. To the south (right) of opening for the boat slips is a large gridded window arrangement of eight windows wide and three windows tall with painted wood mullions.

The west façade of the sail loft of the Boathouse has a louvered vent centered within its gable peak and three evenly spaced one-over-one vinyl replacement windows **(Figure 13)**. A wall-mounted air conditioning unit is located near the south corner of the west façade.

Figure 12: West façade of the Boathouse as seen from the Cal Maritime dock, looking east.

Figure 13: West façade of sail loft portion of the Boathouse. Looking slightly northeast.

INTERIOR OF BOATHOUSE

As mentioned previously, the Boathouse consists of a sail loft, where historically sails were cut, sewn and repaired, and a transverse wing that contains the boat slips, work platform, and storage aisle **(Figure 14)**. The interior of the sail loft portion of the Boathouse has been divided into a number of small rooms including offices, workspaces, storage, and a kitchen **(Figure 15 to Figure 18)**. Some original wood doors with applied cross braces are extant, including the door between the sail loft and the work platform and the door to the kitchen **(Figure 17 and Figure 18)**. Floors consist primarily of wood, but some areas within the sail loft portion of the building have applied linoleum tiles, including the kitchen, entrance lobby, some offices, and the bathroom. Lighting throughout the building consists of non-original, ceiling-mounted, fluorescent lighting. The kitchen and some offices along the midpoint of the building have drop ceilings.

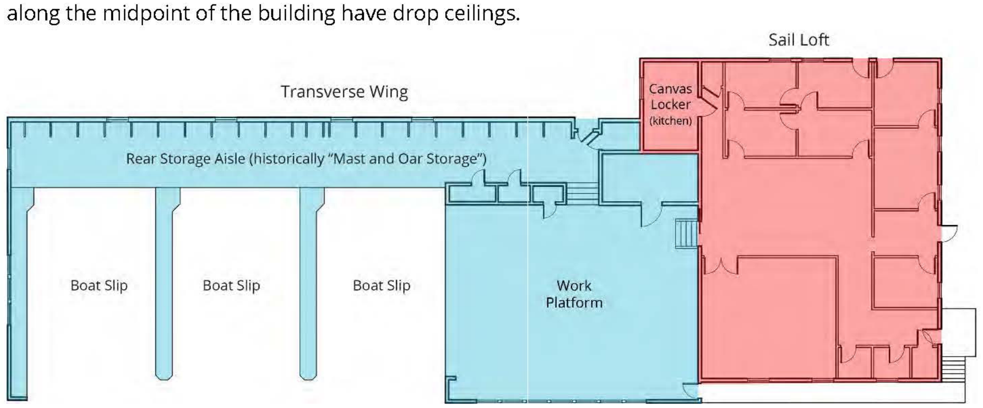

Figure 14: Floor plan of Boathouse, with transverse wing shaded blue and the sail loft including the canvas locker (now the kitchen) shaded red. Source: Page & Turnbull, based on original 1945 floorplan and measurements of existing partitions.

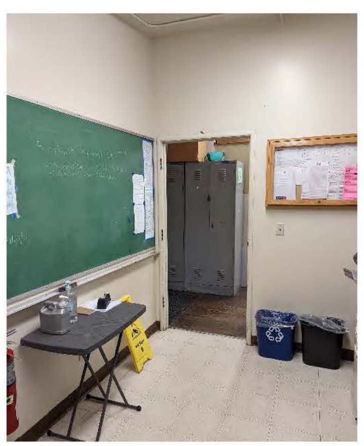

Figure 15: Looking slightly northwest from within the sail loft portion of the Boathouse.

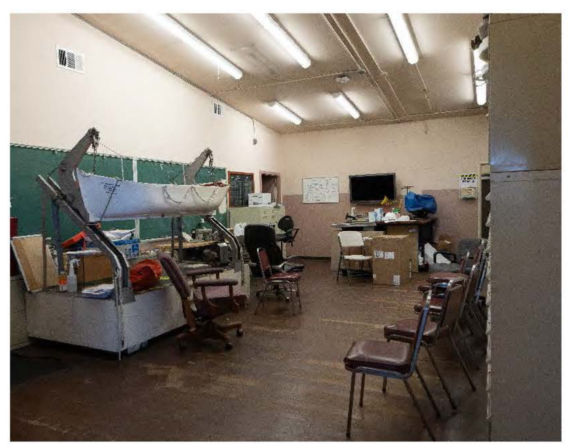

Figure 16: Original door extant in sail loft portion of Boathouse.

Figure 17: Looking slightly northwest from within the sail loft portion of the Boathouse.

Figure 18: Original door extant in sail loft portion of Boathouse.

The transverse wing is divided into three areas including the boat slips, which fill the majority of the north end of the wing and are open to the exterior; a work platform that is positioned behind the windows of the west façade and connects to the sail loft with a small flight of wood steps and an original wood door with applied cross bracing; and an elevated aisle along the east wall of the wing that is labeled as mast and oar storage on the original plans and used for general storage of rope, lifejackets, masts, oars, and other related material **(Figure 19, Figure 20, and Figure 21)**.

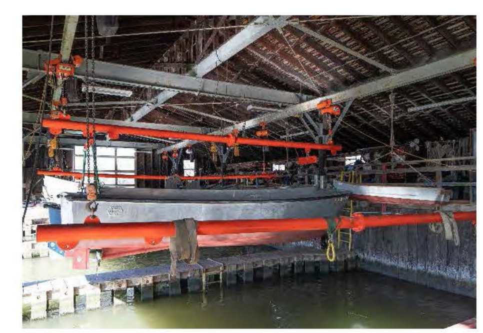

Figure 19: Looking north at the boat slips from the work platform. Note the yellow painted metal ladders from the rear storage area.

Figure 20: The work platform, as viewed from the elevated rear storage area, overlooking the south end of the boat slips. Looking southwest.

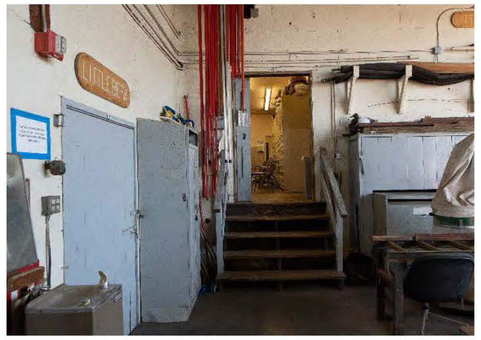
Figure 21: Looking south into the sail loft from the work platform.

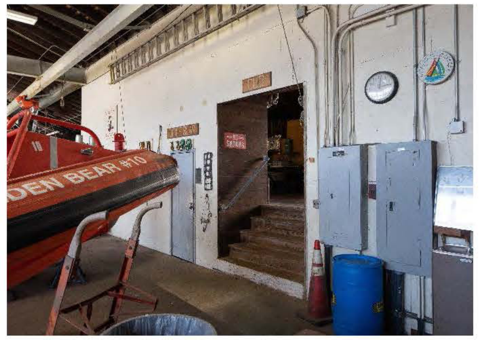
Figure 22: Looking northeast from the work platform to the elevated storage area.

This elevated aisle is reached by wood stairs from the work platform and overlooks the boat slips **(Figure 22)**. A wood railing separates the elevated storage area from the boat slips, and small metal ladders along its west side provide access to the boat slips **(Figure 23)**. An enclosed section at the south end of the rear storage area houses a restroom and storage areas **(Figure 24)**. A notable feature of the transverse wing of the Boathouse is the exposed steel frame that supports the wood framed roof and connects to the foundation piers at key locations **(Figure 25)**.


Figure 23: Looking north along the elevated rear storage area.


Figure 24: Looking south along the elevated rear storage area.


Figure 25: Looking southwest and up at metal framing of building.

Related Site Features

The Boathouse is located at the southern end of the Cal Maritime campus, and it is closely associated with the pier that has been present at this location since the early 1940s. The existing pier was constructed in 1995-1997, replacing a 1940s wood wharf, and features a concrete deck with timber piers, a steel frame structure, and a steel sheet pile breakwater.[4]

A number of temporary buildings, sheds, and utility structures have been erected in the area of the Boathouse since its construction in 1946 **(Figure 26)**. This area, including the parking lot at the southeast end of the Boathouse, is currently blocked off with a metal fence and security station.

[4] Refer to "California Maritime Academy: Pier Extension" drawings, dated June 28, 1995.

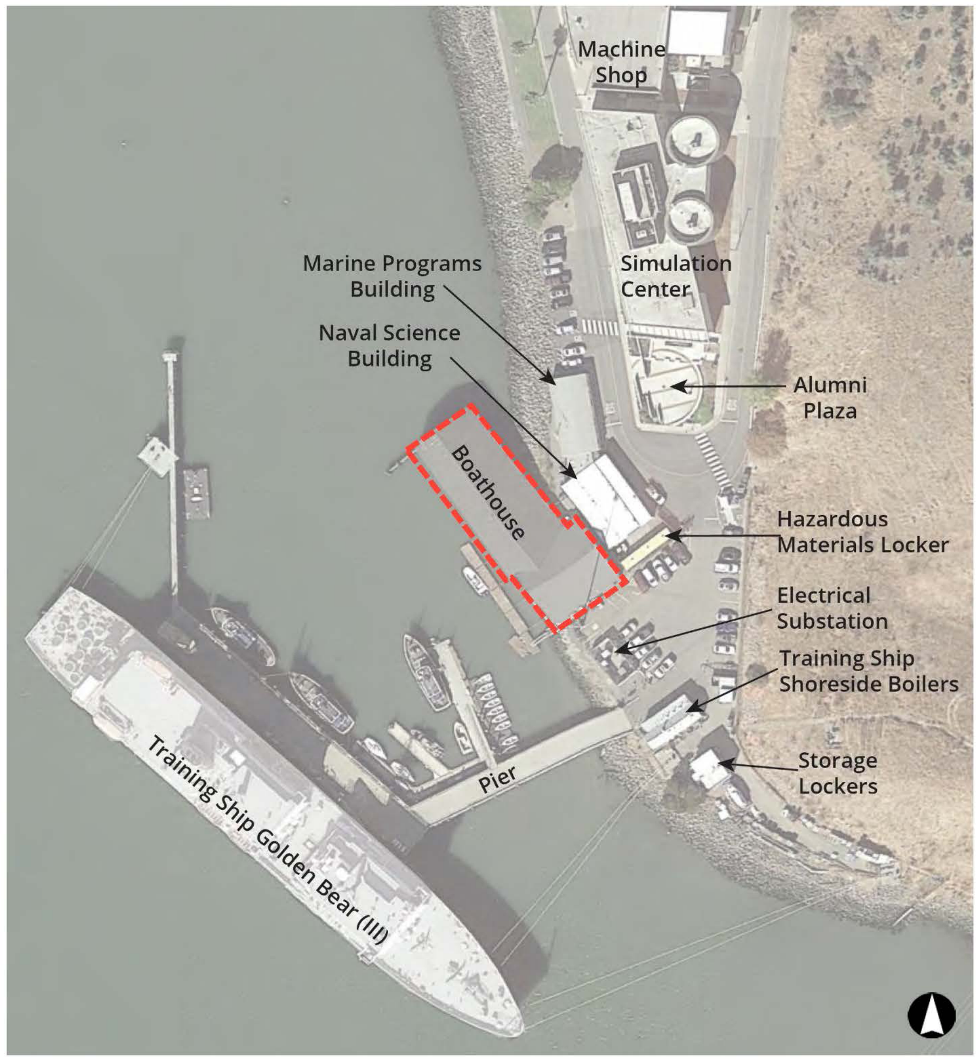

Figure 26: Buildings and structures located around the Boathouse (outlined with dashed red line). Source: Page & Turnbull. Base map: Google Earth aerial photograph, 2021.

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IV. HISTORIC CONTEXT

Brief History of Morrow Cove Prior to 1940

Located at the mouth of the Carquinez Strait, Morrow Cove is now the southernmost tip of Vallejo, but until the construction of the Carquinez Bridge in 1927 this area remained remote from the growing city of Vallejo.

The following brief history of Morrow Cove is summarized from several sources including *A Brief History: The California Maritime Academy Historical Archives* written by archivist Doug Peterson for the 75th anniversary of the school, the Historic American Engineering Record (HAER) report on the Carquinez Bridge, historical newspaper articles, and various articles on the history of the campus that were included in *Hawsepipe,* the yearbook of Cal Maritime.[5]

Prior to the construction of the Carquinez Bridge in 1927, several ferries and automobile ferries operated along the Strait in order to allow navigation from Vallejo to the East Bay. Early automobile ferries that operated along the Strait include the Martinez-Benicia Ferry & Transportation Company in 1913, the Rodeo-Vallejo Ferry Company in 1918, and the Six-Minute Ferry in 1919, which operated between Morrow Cove and the town of Crockett.[6] Unfortunately, the Six-Minute Ferry's terminal at Morrow Cove was destroyed by a landslide in 1922. The Rodeo-Vallejo Ferry Company acquired the holdings of the Six-Minute Ferry and expanded its ferry business, which transported over one million passengers annually in approximately 400,000 vehicles in 1923 and 1924 **(Figure 27).**[7]

[5] Doug Peterson, *A Brief History: The California Maritime Academy Historical Archives,* CSU Maritime (website), Accessed September 21, 2021, https://www.csum.edu/about/media/cal-maritime-history-75th-anniversary.pdf; National Park Service, *Carquinez Bridge,* Historic American Engineering Record (HAER No. CA-297).
[6] George H. Harlan, *San Francisco Bay Ferryboats,* (Berkeley: Howell-North Books, 1967), 17.
[7] Charles Derleth. "Cantilever Highway Bridge Across Carquinez Strait." *Engineering News-Record*, September 24,1925, 504.

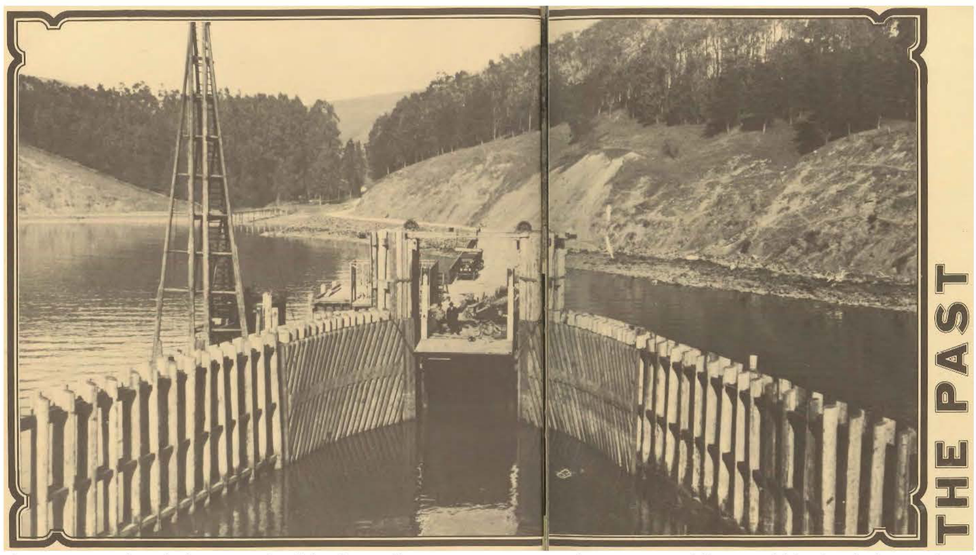

Figure 27: Undated photograph of the ferry slip at Morrow Cove where automobiles would be loaded onto the ferry to cross the Strait. Source: *Hawsepipe*, 1979.

The automobile ferry business was highly successful, but many drivers still chose to take the land route, consisting of an additional 30 miles, to avoid waiting for the ferry which struggled to meet the demand. Therefore, the owners of the Rodeo-Vallejo Ferry Company began to plan for the construction of a toll bridge to cross the Carquinez Strait and formed the American Toll Bridge Company. When the Carquinez Bridge opened in 1927, with its two main spans of 1,100 feet each, it had the second longest cantilever spans in the country and the fourth longest in the world.[8] In addition to its status as an engineering marvel, when completed, the Carquinez Bridge shortened the route from Sacramento to the Bay Area and was integrated into the transcontinental Lincoln Highway.

In the late 1920s, it appears that Morrow Cove had already become popular as a local fishing spot for bass, which feed in the area. By the early 1930s, the American Toll Bridge Company (who developed the Carquinez Bridge) sought to expand the appeal of the area and create a popular recreation area that would serve the citizens of Vallejo, the residents of the larger Bay Area who could now easily reach Morrow Cove for a day of leisure, and the tourists moving along the Lincoln Highway route. In 1933, the American Toll Bridge Company undertook a number of improvements including landscaping the Cove and installing a dance platform, playgrounds, picnic areas, and

[8] National Park Service, *Carquinez Bridge*, HAER No. CA-297, 22.

bathing facilities **(Figure 28).**[9] Fishing clubs sprung up along the shoreline, and the cove even had a small café to provide refreshments. Enhancing the swimming area was a significant man-made breakwater, in the form of two abandoned ships: the *Bangor*, a sailing schooner, and the *Contra Costa*, a ferryboat that transported railcars.[10]

Figure 28: View of recreation area at Morrow Cove in 1933. Source: *The Oakland Tribune*, May 1933.

At the beginning of U.S. involvement in World War II in December 1941, the California Department of Public Works issued an order to restrict access to Morrow Cove due to its proximity to the base of the Carquinez Bridge, which was seen as a strategic link between the "lower bay region and the Vallejo-Mare Island defense area."[11] This protective measure against possible sabotage of the bridge closed Morrow Cove to swimmers and fishermen in the 1940s. It is likely that public access to Morrow Cove remained restricted throughout World War II and allowed for this area to be considered as a possible location for the future Cal Maritime campus.

[9] "Morrow Cove Playground," *Oakland Tribune*, August 13, 1933, 10.; "New Bathing Beach Open on Carquinez Straits Today," *The San Francisco Examiner*, May 7, 1933.; "Morrow Cove Beach Opens Next Sunday," *Oakland Tribune*, April 30, 1933.
[10] Doug Peterson, unpublished manuscript on file at the Campus History Center.
[11] "State Acts to Ban Residents In Morrow Cove," *The Sacramento Bee*, December 9, 1941.

History of Cal Maritime

The following brief history of the early establishment of Cal Maritime, originally called the California Nautical School, has been excerpted from the 1979 volume of *Hawsepipe,* on the 50th Anniversary of the school.[12]

> California Maritime Academy was established [in 1929] by an Act signed into law by California Governor Young. This legislation was called the California Nautical School Act of 1929 and made possible the formation of a state owned school to train Engineering and Deck officers of the U.S. Merchant Marine. In 1931, after two years of preparations, the first group of midshipmen were enrolled at the California Nautical School's temporary campus at the U.S. Navy Coaling Station near Tiburon [in Marin County]. [....]
>
> But the fledgling California Nautical School soon faced serious financial and political problems and was in danger of being shut down. This period of uncertainty and hardship for the school started in 1933 and lasted for about six years. There were several attempts to close the California Nautical School due to an ailing national economy and an apparent drain on desperately needed government resources. Only through the efforts of many dedicated supporters were these attempts successfully circumvented and minimal funding was continued by the state.
>
> When news came in 1939 of a possible war with Germany, the Navy needed the Tiburon coaling station and the California Nautical School had to look for another location. After more than a year of searching and after the consideration of many sites for a campus, the Board of Governors of the school decided on Morrow Cove in Vallejo. The people of Vallejo were very much in favor of the proposition and gave the school some greatly needed support. During the interim, however, the school was first moved to Pier 54 in San Francisco, and then to the Ferry Building on Pier 2 a year later.
>
> The future of the California Nautical School began to look much better with the growing demand for Merchant seamen in the early 1940's. It was during this period, [...] that the California Nautical School was renamed the California Maritime Academy.[13] However, there were many delays and problems in trying to secure the expected $2.5 million estimated to develop the Morrow Cove site. In fact, after Pearl Harbor was attacked, the plans for construction of the new campus were almost completely dropped. In 1942, the Wartime Shipping Administration took over the

[12] *Hawsepipe*, 1979, 6-12.
[13] The adoption of the name California Maritime Academy occurred in 1939. This excerpt from *Hawsepipe* mistakenly lists the date as 1940, which appears to be incorrect based on other sources. It has therefore been omitted in this instance.

> Academy and through this agency, the original construction plans for Morrow Cove were revived.

Although the school was displaced from its Tiburon campus due to World War II, the California Maritime Academy continued to serve a critical role in the training and supplying of officers during the war. The educational program, which had introduced a three-year program for students to qualify for a merchant marine officer's license, was shortened to 18 months to supply trained officers more quickly.[14] Eleven graduates lost their lives in the line of duty during the war and were remembered at a dedication ceremony for Mayo Hall in 1946.[15] Immediately after World War II, the three-year program was restored, and the traditional training cruises were resumed. The school's annual training cruises, which provide students with hands-on experience navigating, piloting, maintaining, and running a ship, are held on the Cal Maritime Training Ship (T.S.), currently the T.S. Golden Bear III, which is on long-term loan from the United States Maritime Administration. The Academy has had four training ships: T.S. Golden State (1931–1946), T.S. Golden Bear I (1946–1971), T.S. Golden Bear II (1971–1995), and T.S. Golden Bear III (1996–present).[16] When not involved in the various cruises, the training ship is docked at the wharf adjacent to the Boathouse and provides additional educational facilities.

Despite the Academy's role in helping supply a trained Merchant Marine both during and outside of the war effort, the California Maritime Academy and the other state-run maritime academies were under threat of budget cuts and closures in the 1950s and in the 1970s. This was partially due to their complicated financial position where funding was supplied both from the federal government and each respective state legislature. In 1954, discussions on the need to crew the United States' vastly enlarged naval fleet strongly supported the ongoing funding of these institutions by the federal and state legislatures. In both instances, the value of these maritime academies was seen as essential to meeting the personnel needs of the merchant marine, the Coast Guard, and the Naval Reserve, in addition to staffing allied shipping industries – all industries that support the long-term maritime defense capabilities of the nation.[17]

Other notable milestones in Cal Maritime's history include the acceptance of women to the school in 1973, the establishment of a four-year college degree in the mid-1970s, and the full academic accreditation of the school in 1977.[18] In 1995, the California Maritime Academy became the 22nd

[14] "State Maritime Academy Marks 25th Anniversary," *Sacramento Bee*, September 9, 1954, F1.
[15] Peterson, *A Brief History: The California Maritime Academy Historical Archives*, 8.
[16] Cal Maritime, "History of the Training Ship Golden Bear," *Cal Maritime* (website), Accessed November 30, 2021, https://www.csum.edu/about/tsgb/history.html
[17] "California's Academy," *Maritime Reporter*, October 1, 1952, 16.
[18] *Hawsepipe*, 1979, 19.

campus of The California State University (CSU) system, officially becoming California State University Maritime Academy.[19]

Additional context regarding the physical development of the Cal Maritime campus at Morrow Cove is addressed in the following section, titled **Site Development,** within **Section V. Site History.**

Brief Biography of Edwin C. Miller

The Boathouse was renamed and dedicated in 1989 in honor of Edwin C. Miller, a 1934 graduate of the California Nautical School (prior to the time it became known as Cal Maritime).

Miller enrolled at the California Nautical School in 1931 and graduated in 1934.[20] He briefly returned to the school to teach in 1935, after working as a Third Mate for the Grace Lines fleet. He appears to have remained actively involved with Cal Maritime into the early 1940s, despite a career with the U.S. Navy, and he was one of the members of the survey party that visited Morrow Cove in 1940 while looking for a new campus location.

During World War II, as part of his position in the Navy, Miller was assigned to teach seamanship and navigation to cadets at Cal Maritime. In 1945, Miller left his teaching post at the school to return to a full-time position with the Navy and did not retire until 1960. At that time, Miller returned to Cal Maritime to teach for the next nine years, retiring in 1969. In 1971, Miller briefly returned to Cal Maritime to serve as Interim President and was notably the first graduate of the school to then serve as its President.

Miller was well-regarded by the staff and students of Cal Maritime. He continued to be involved in the school through its Alumni Association (of which he was a charter member). In 1989, his many contributions to the school were recognized with the dedication and renaming of the Boathouse in his honor. Edwin C. Miller passed away in 1993.

[19] Peterson, *A Brief History: The California Maritime Academy Historical Archives,* 13.
[20] This brief biography of Edwin C. Miller is largely based on the material included in "Did You Know…?" *Pacific Northwest News*, November 2009. A copy of this publication was provided to the author by the staff of the CSU Maritime Campus History Collection.

V. SITE HISTORY

Site Development

Morrow Cove was one of the many sites that was visited during the search for a new campus for the California Maritime Academy in the early 1940s. In December 1940, a survey party of administrators from Cal Maritime visited Morrow Cove, which had some piers, structures, and the remnants of the *Bangor* sailing schooner and the *Contra Costa* ferryboat **(Figure 29).**

Figure 29: Photograph of Morrow Cove taken by Edwin C. Miller in December 1940, while at the site as part of a survey party of Maritime Academy administrators. Existing piers and structures were fully removed by 1946. At the far right is the *Contra Costa*, which served as a breakwater. Source: Cal Maritime, Campus History Collection.

As early as 1941, the 67-acre area along the shore of Morrow Cove was approved as the location of the new California Maritime Academy campus; but acquiring funding and navigating the political situation during World War II delayed the school's occupation of the site.[21] While piles were driven for a new pier as early as 1941, the site was not suitably completed for occupation by the school until August 1943 **(Figure 30).** At this time, the T.S. Golden State was able to dock at the new wharf, and several temporary buildings provided facilities for students and teachers.[22] The site was developed in earnest in 1943 while the land was cleared, leveled, and graded and 330,000 cubic yards of earth were relocated from higher on the site to fill in a portion of the Cove.[23] At this time, the remnants of the hull of the *Bangor* were buried in the area that was infilled. Attempts to remove the hull of the *Contra Costa*, including refloating, towing, dredging, and dynamiting, all failed and

[21] Confusion around the federal agencies involved in the administration of the Merchant Marine was one of the factors that caused additional delay as Cal Maritime's campus project was placed under the jurisdiction of the Coast Guard and then subsequently reverted to the War Shipping Administration through an executive order by President Roosevelt. "Work Ordered on Maritime School at Morrow Cove," *Long Beach Sun*, July 10, 1942.
[22] The last temporary building from the early 1940s was removed in 1979. Refer to "1940s,"*Hawsepipe,* 1993, 51.
[23] "Sea Academy Contract is Let, *The Sacramento Bee,* November 4, 1943. This contract was let to A. Teichert & Company of Sacramento.; For number of yards of earth moved refer to: "The Interim Years: 1940-1943," *Hawsepipe,* 1963, 254.

elements of the hull remain extant and can be seen at low tide.[24] This process of infill extended the shoreline westward into the bay and created 12 additional acres of flat land along the shore.[25] Permanent structures were then added through phased construction.

Figure 30: View of the shoreline c. 1943 showing the completed wharf in the background with the T.S. Golden State. The old pier is partially extant, and the hulls of the *Contra Costa* and the *Bangor* are visible, prior to the regrading of the site. The Boathouse had not been constructed at this time. Source: *Hawsepipe*, 1979.

The construction program to erect permanent buildings on the campus was announced in early 1944 and started in September 1945 with the laying of a cornerstone for a gymnasium and natatorium (now called Mayo Hall).[26] This permanent building plan followed the guidance of a Master Development Plan developed by the California Department of Public Works, Division of Architecture, that proposed a symmetrical arrangement of buildings and pavilions that flanked a central Drill Field located along the shoreline **(Figure 31)**. The Master Plan showed a "Boat Shed" at the location of – and with a similar footprint to – the sail loft portion of the existing Boathouse; a separate sail loft building was proposed to be located north of the Boat Shed. The Master Development Plan appears to have helped guide the placement of some of the early facilities of the campus. However, the Boathouse – as it was constructed with its L-shaped footprint – did not adhere to the Master Development Plan. It was designed in 1945 and completed in 1946.[27]

[24] Peterson, unpublished manuscript on file at the Campus History Center.
[25] "The Interim Years: 1940-1943," *Hawsepipe*, 1963, 254.
[26] "Maritime Academy Expansion Planned," *Oakland Tribune*, February 15, 1944, 11.; "California Maritime Academy," *Pacific Marine Review*, October 1945, 579.
[27] Refer to 1945 drawings of the Boathouse and Wharf. Supplied to the author by the administration of Cal Maritime.

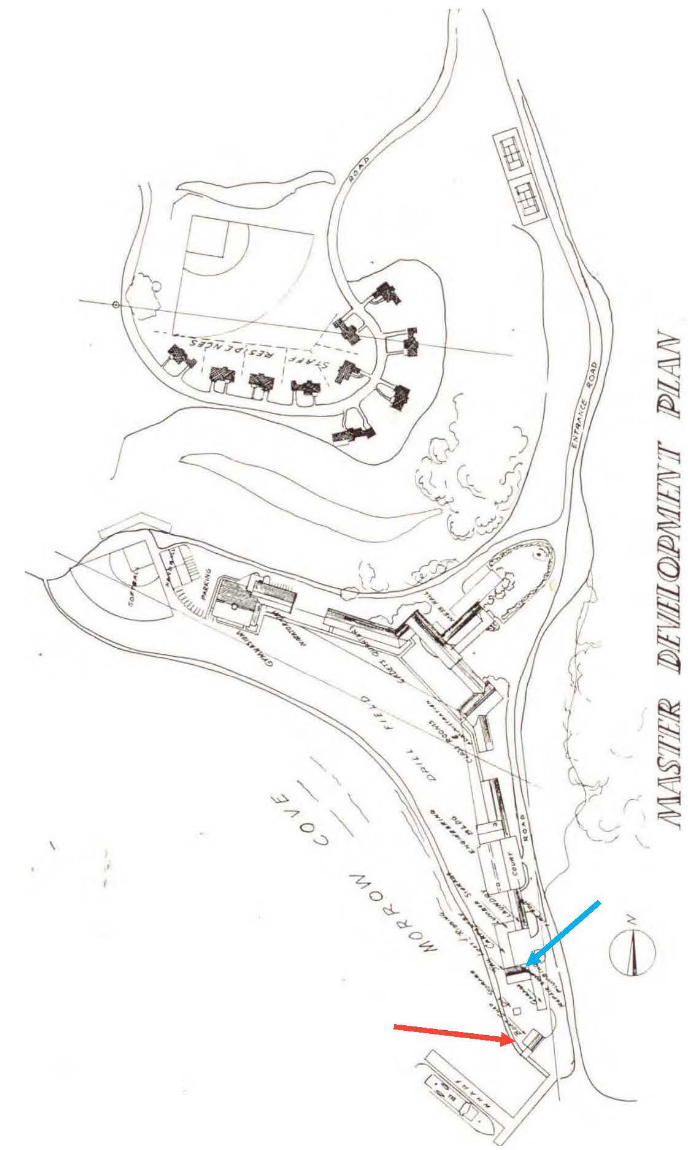

Figure 31: Master Development Plan for the Cal Maritime campus, c. 1945. Red arrow shows the location of the proposed Boat Shed; blue arrow shows the location of the proposed Sail Loft. Source: *Pacific Marine Review*, October 1945. Edited by Page & Turnbull.

When completed, the Boathouse was used for "instruction in manila and wire splicing, canvas work, boat overhaul, and the reeving of blocks and tackles."[28] The campus remained relatively open along its southern end until the erection of Dwyer Hall, which was completed in 1960 and was the first large campus building located near the Boathouse **(Figure 32)**. Since that time, a number of new buildings have been erected at the campus, including the replacement of Dwyer Hall. Today, two modular buildings are located just east of the Boathouse – for Marine Programs and Naval Science – and the Simulation Center and the Steam Plant Simulator are located just north of that.[29]

Figure 32: Aerial photograph of the Cal Maritime campus with Vallejo in the background (top left of the image), c. 1961. T.S. Golden Bear I at the wharf. Source: Cal Maritime Campus History Collection.

[28] Committee on Efficiency and Cost Control, *The California Maritime Academy: Report of the Committee on Efficiency and Cost Control*, April 26, 1971, 4.
[29] LSA, *California State Maritime Academy, Physical Master Plan, Final Environmental Impact Report*, May 2018. Existing Facilities, Figure 3-3.

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CONSTRUCTION CHRONOLOGY

Due to the ownership of the campus by the California State University system, building permits are not on file with the City of Vallejo. Beyond the original drawings of the Boathouse, the staff at Cal Maritime was unable to locate permits or drawings in their records that depicted alterations.

The Boathouse, as it appears today, is largely unaltered from its original form and design at the exterior, as illustrated by the 1945 drawings by the Department of Public Works, Division of Architecture and from mid- and late 1940s photographs **(Figure 33, Figure 34, and Figure 35)**. Along the interior, alterations have been made primarily to the south end of the building within the area historically called the sail loft. Alterations to the exterior and the interior are listed below.

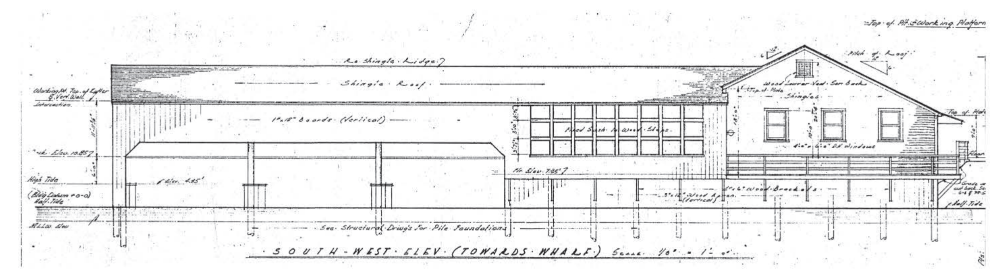

Figure 33: Detail of original drawing of Boathouse, dated December 1945. Source: Cal Maritime administration.

The following list of exterior alterations have occurred since the Boathouse was completed in 1946; alterations have been established through visual comparison between the original drawings from 1945, available historic photographs, and the Boathouse today.

- Reroofed at an unknown date, replacing the original wood-shingle roof
- Doors and windows installed along east façade of the sail loft portion of building after 1971 **(Figure 36)**
- Door installed at primary (south) façade between 1976 and 1989 **(Figure 37 and Figure 38)**
- Small aluminum slider windows installed at east façade of transverse wing at an unknown date[30]
- Edwin C. Miller dedication plaque installed circa 1989[31]

[30] A c. 1960s photograph in the collection of the CSU Maritime Campus History Collection offers a rare view of this rear façade and shows that no windows were present at that date. Refer to **Appendix B – Historic Photographs of the Boathouse**, **Figure 34**.
[31] Refer to *Hawsepipe*, 1989 or *Pacific Northwest News*, November 2009. Both sources describe the dedication of the Boathouse to Edwin C. Miller.

- Original one-over-one double-hung wood windows replaced with vinyl windows at all locations since 2008 **(Figure 39)**
- Fixed glazing of large window arrangements at west and north façades replaced in kind at an unknown date

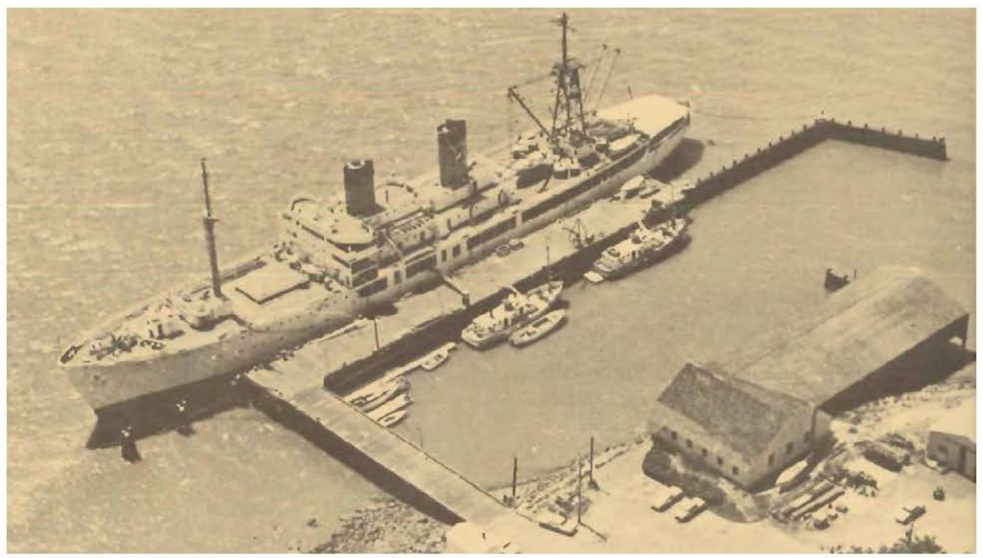

Figure 34: View of the Boathouse and docked ship, c. 1946. Source: *Hawsepipe*, 1979, Cal Maritime Campus History Collection.

Figure 35: Looking south over the Boathouse and wharf, towards the Carquinez Bridge, c. 1948. Source: Cal Maritime, Campus History Center.

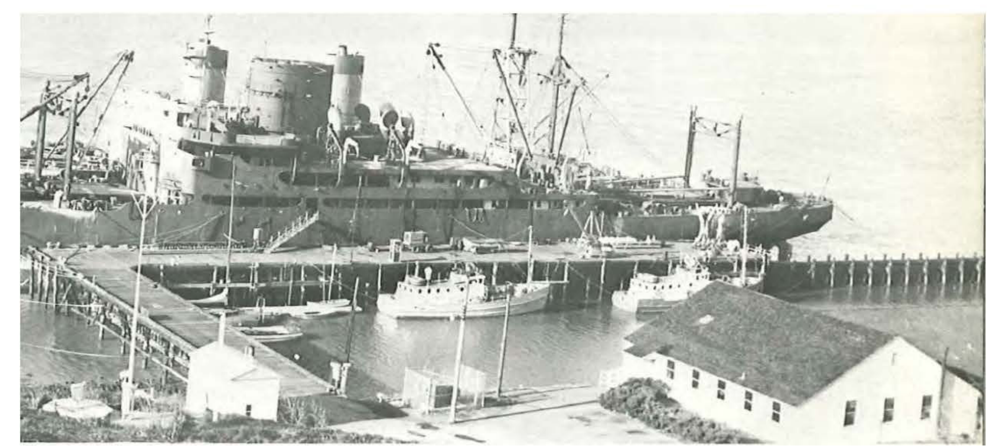

Figure 36: View of the Boathouse and wharf, c. 1971. Source: *Hawsepipe*, 1971, Cal Maritime Campus History Collection.


Figure 37: View of Boathouse, 1976. Source: *Hawsepipe*, 1976, Cal Maritime Campus History Collection


Figure 38: South façade of the Boathouse, door at far left of frame present by 1989. Source: *Hawsepipe*, 1990, Cal Maritime, Campus History Collection.

Figure 39: View showing the west façade of the sail loft portion of the Boathouse, 2008. Source: *Hawsepipe*, 2008, Cal Maritime, Campus History Collection.

The following list of interior alterations relate primarily to the sail loft portion of the Boathouse. All alterations were identified through visual observation of the existing conditions of the Boathouse's interior and a comparison with the original 1945 drawings of the building.

- Erection of several interior partitions within the sail loft for offices, an entrance vestibule, machine shop, storage areas, and restroom
- Installation of linoleum flooring in some offices
- Installation of drop ceilings in some offices along the east of the sail loft
- Installation of ceiling-mounted fluorescent lighting

Overall, the Boathouse remains largely unaltered in its original materials, form, use, and location.

VI. EVALUATION

California Register of Historical Resources

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places.
In order for a property to be eligible for listing in the California Register, it must be found significant under one or more of the following criteria.

- **Criterion 1 (Events):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
- **Criterion 2 (Persons):** Resources that are associated with the lives of persons important to local, California, or national history.
- **Criterion 3 (Architecture):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.
- **Criterion 4 (Information Potential):** Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

The following section examines the eligibility of the Boathouse for individual listing in the California Register.

CRITERION 1 (EVENTS)

The Boathouse at Cal Maritime was constructed from 1945-1946 and was one of the earliest permanent structures to be completed at Cal Maritime's new campus at Morrow Cove. Other structures that had already been completed by this time include the original wood wharf and Mayo Hall. The Boathouse, in its use and its location along the waterfront, is closely associated with the establishment of the new campus. The creation of a purpose-built campus in the 1940s was a

significant investment in the establishment of the California Maritime Academy that illustrated the important role that the school had played during World War II and recognized the importance of retaining and supporting the only degree-granting maritime academy on the West Coast. The Boathouse was an important investment in the teaching facilities of the campus and, like Mayo Hall, was critical to the development of the permanent campus.[32] Additionally, the Boathouse is a unique element of the campus that is closely associated with the maritime nature of the Academy itself, and unlike the other buildings of the campus, provides a close connection to the water through its placement and its use. The Boathouse serves a key function as the location where small watercraft are stored, maintained, and repaired. It stores the necessary equipment to support the maritime activities of the students, including life jackets, oars, and sails, and supports the outfitting and running of the Training Ship. Therefore, the Boathouse appears to be eligible for the California Register under Criterion 1, with a period of significance that dates to 1946 and corresponds to the completion of the building.

CRITERION 2 (PERSONS)

The Cal Maritime Boathouse is not associated with any individual person such that it would be individually eligible for the California Register under Criterion 2. The building has been owned and operated by the Cal Maritime since its construction and has been associated with many teachers and students since the 1940s. The building was dedicated to Edwin C. Miller in 1989 to recognize his many contributions to the school, which included his many years of teaching and a period as the Interim President of Cal Maritime. While the Boathouse was dedicated in his honor, the available material on Miller's career is not clearly associated with the Boathouse and it is not known whether he was particularly involved with the use of the Boathouse during his time as a teacher at Cal Maritime. As such, the Boathouse does not appear to be eligible for the California Register under Criterion 2 for its association with any individuals.

CRITERION 3 (ARCHITECTURE)

The Boathouse was designed in 1945 by the California Department of Public Works, Division of Architecture, and was completed in 1946. The building is relatively simple in its design as a utilitarian Boathouse that serves the Cal Maritime waterfront. The building has undergone some alterations to its exterior and interior, but remains largely intact in regard to its materials, form, and massing.

[32] As mentioned in **Section II. Existing Historic Status: Historic Status of Other Buildings at Cal Maritime**, Mayo Hall was found significant under Criteria 1 and 3. The significance evaluation of Mayo Hall under Criterion 1 stated that "the building remains a visible and prominent remnant of the early formation of the California Maritime Academy and was crucial to the school's early development." The finding of the Boathouse as significant under Criterion 1 is consistent with the previous finding for Mayo Hall.

Along the exterior, alterations include the replacement of the roof, the replacement of all original double-hung wood windows with double-hung vinyl sash, the alteration to openings along the east façade where three windows were replaced with two doors and two windows, the installation of small aluminum slider windows along the east façade of the transverse wing, and the removal of an original window opening at the south façade to install a new entrance door. In areas where windows were replaced, the original openings have been retained and the replacement windows have matched the original design of a one-over-one double-hung window. At the interior, the sail loft portion of the Boathouse has been altered from its original form as a single open space with the erection of some partitions. Drop ceilings and linoleum flooring have been installed at some locations within the sail loft. Despite the Boathouse's retention of integrity (refer to the following section for analysis), it does not appear to be individually significant for its architecture as it is not a high-style example of a boathouse, nor was it designed by a master architect. Therefore, the Boathouse does not appear eligible for the California Register under Criterion 3.

CRITERION 4 (INFORMATION POTENTIAL)

The "potential to yield information important to the prehistory or history of California" typically relates to archeological resources, rather than built resources. When California Register Criterion 4 (Information Potential) does relate to built resources, it is relevant for cases when the building itself is the principal source of important construction-related information. The analysis of the property at the Boathouse for eligibility under Criterion 4 is beyond the scope of this report.

INTEGRITY

In order to qualify for listing in any local, state, or national historic register, a property or landscape must possess significance under at least one evaluative criterion as described above and retain integrity. Integrity is defined by the California Office of Historic Preservation as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance," or more simply defined by the National Park Service as "the ability of a property to convey its significance."[33]

Page & Turnbull used established integrity standards outlined by the *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation,* to evaluate whether the subject property retains sufficient integrity to convey its historic significance. Seven variables, or aspects, that define integrity are used to evaluate a resource's integrity—location, setting, design, materials,

[33] California Office of Historic Preservation, *Technical Assistance Series No. 7: How to Nominate a Resource to the California Register of Historical Resources* (Sacramento: California Office of State Publishing, 4 September 2001) 11; U.S. Department of the Interior, National Park Service, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Washington, D.C.: National Park Service, 1995) 44.

Historic Resource Evaluation
Project Number 21067
Boathouse, California State University Maritime Academy
Vallejo, California

workmanship, feeling, and association. A property must possess most, or all, of these aspects in order to retain overall integrity. If a property does not retain integrity, it can no longer convey its significance and is therefore not eligible for listing in local, state, or national registers.

The seven aspects that define integrity are defined as follows:

> Location is the place where the historic property was constructed or the place where the historic event occurred;
>
> Setting addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s);
>
> Design is the combination of elements that create the form, plan, space, structure, and style of the property;
>
> Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form the historic property;
>
> Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
>
> Feeling is the property's expression of the aesthetic or historic sense of a particular period of time; and
>
> Association is the direct link between an important historic event or person and the historic property.

Location

The Boathouse retains integrity of location, as it has remained situated at its location of original construction since 1946.

Setting

The Boathouse largely retains integrity of setting. The Boathouse was constructed close to the entrance to the pier at the south end of the Cal Maritime campus following the regrading of the campus in the mid-1940s. While many additional structures have been erected on the campus since the completion of the Boathouse, the Boathouse has retained its original connection to the shoreline of Morrow Cove and is closely associated with the maritime activities that take place along the wharf, including the docking of the training ship. The various additional structures that have been erected near the Boathouse are temporary and utilitarian in nature and do not overwhelm the 1946 building. These buildings and structures do not block access between the Boathouse and the historic location of the pier or its access to the water of Morrow Cove. Overall, the Boathouse retains its relationship to the shoreline and its setting within the larger Cal Maritime campus.

Design

The Boathouse was designed by the California Department of Public Works, Division of Architecture and has remained largely unaltered since its erection in 1946. The building retains its overall form, massing, and material palette, and therefore its original design as a 1946 boathouse.

Materials

The Boathouse retains integrity of materials. While the building has been reroofed with asphalt shingles, and its original double-hung wood windows have been replaced with vinyl sash, the building retains its overall materials with wood shingle and vertical wood siding, original wood doors, timber pier foundations, and its internal steel framing.

Workmanship

The Boathouse was designed to serve a utilitarian function as an active boathouse for Cal Maritime and has minimal decorative features. Features providing evidence of period workmanship and construction methods include its structure, which sits over the water on timber piers, its vertical wood cladding and shingles, and its original wood doors with applied cross-bracing. The Boathouse retains its original materials and design elements that demonstrate the workmanship of the period.

Feeling

The Boathouse retains integrity of feeling as a working Boathouse that was completed in 1946 to serve the students of Cal Maritime and provides an essential connection between the school and the water of Morrow Cove. The building is closely identified with the maritime focus of the Academy and serves an integral function for the maintenance and storage of small watercraft and provides a key educational space for the cadets of the Academy. The building retains its location and setting that directly relate to the feeling of the building as a boathouse, and the building continues to represent the early history of the Cal Maritime campus as it was just being established.

Association

The Boathouse retains its integrity of association with the early period of construction of the Cal Maritime campus and the maritime purpose of the Academy through the retention of the Boathouse's materials, design, setting, and feeling.

Overall, the Boathouse retains all seven aspects of integrity such that it conveys its significance under Criterion 1, with a period of significance of 1946.

CHARACTER-DEFINING FEATURES

For a property to be eligible for national or state designation under criteria related to type, period, or method of construction, the essential physical features (or character-defining features) that enable the property to convey its historic identity must be evident. These distinctive character-defining features are the physical traits that commonly recur in property types and/or architectural styles. To be eligible, a property must clearly contain enough of those characteristics to be considered a true representative of a particular type, period, or method of construction, and these features must also retain a sufficient degree of integrity. Characteristics can be expressed in terms such as form, proportion, structure, plan, style, or materials.

The character-defining features of the Boathouse include, but are not limited to:

<u>Exterior Features</u>

- Waterfront location with close relationship to the wharf
- Building partially extends over the water
- One-story volume with a cross-gable roof
- Dock at the west side of the sail loft portion of the Boathouse
- Wood walkway along the southwest edge of the building
- Mixture of shingle cladding and vertical wood cladding
- Original wood doors with an applied cross-brace pattern
- Large, gridded arrangements of fixed windows
- Evenly spaced window openings with the character of one-over-one double-hung window type along the south and west façades of the sail loft portion of the Boathouse
- Large opening for boat slips

<u>Interior Features</u>

- Two main volumes consisting of the sail loft and the transverse wing
- Organization of the transverse wing with its work platform, boat slips, and elevated rear storage aisle

- Original wood flooring throughout the building, including wood steps
- Original wood doors with applied cross brace pattern (including the barn door between the sail loft and the transverse wing, and the door to the kitchen, originally the canvas locker)
- Wood railing and metal ladders between the elevated rear storage aisle and the boat slips

Features that are not character-defining features of the Boathouse consist of alterations that have been made to the building since its construction in 1946. These include, but are not limited to:

- Replacement windows (vinyl replacement windows are not historic)
- Non-original doors installed at the south and east façades
- Non-original windows installed at the east façade of the sail loft
- New openings with aluminum slider windows located at the east façade of the transverse wing
- In-wall air conditioning unit at the west façade

VII. CONCLUSION

Cal Maritime was originally established as the California Nautical School in 1929 and was one of four degree-granting maritime academies operating in the United States. The school was renamed the California Maritime Academy in 1939, and joined The California State University system in 1995, becoming the California State University Maritime Academy. The establishment of the current campus at Morrow Cove in Vallejo was a significant investment by the state and federal government during World War II that illustrated the growing need to train maritime officers who go on to careers in the nation's maritime industries, whether that is related to naval defense or the merchant marine. The Cal Maritime campus was established at Morrow Cove in the 1940s with a permanent building campaign started in 1943.

The Boathouse, as one of the earliest permanent structures established at the campus, appears to be significant for individual listing in the California Register under Criterion 1 (Events) as a building that was critical to the development and success of the new campus and demonstrates the recognition of the importance of Cal Maritime in the support of national maritime industries. The Boathouse also serves an important role in directly demonstrating the connection of the campus to the waterfront in a way that other early permanent buildings on the campus, like Mayo Hall, do not. Under Criterion 1, the Boathouse has a period of significance of 1946, corresponding to the year the building was completed. Therefore, the Boathouse appears to be an individual historic resource for the purposes of CEQA, California Public Resources Code (PRC) 5024 review and Section 106 review.

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IX. APPENDICES

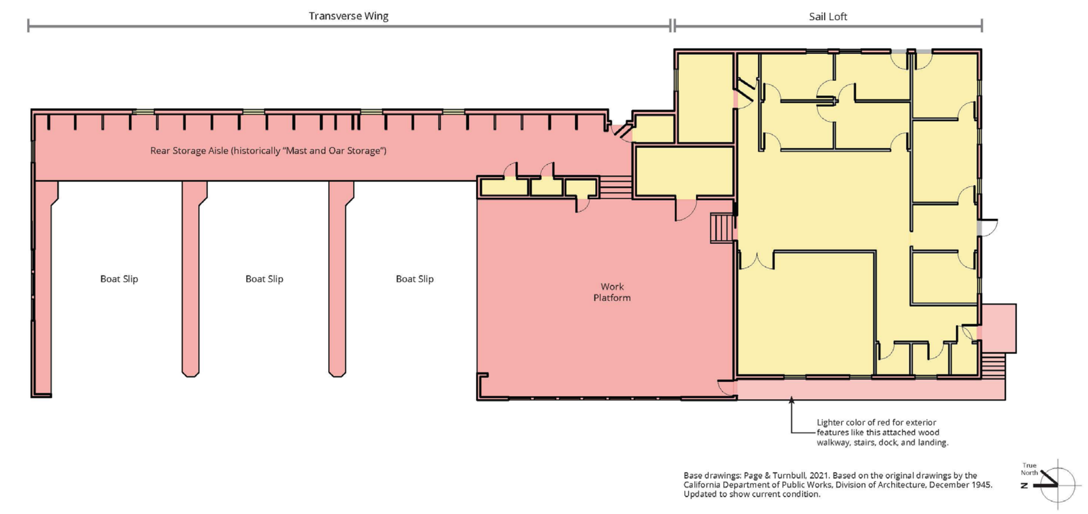
Appendix A – Significance Diagrams

CATEGORIES OF SIGNIFICANCE

PRIMARY SIGNIFICANCE
Features or spaces that date to the period of significance (1946) and are the most historically significant components of the building.

CONTRIBUTING
Features or spaces that date to the period of significance (1946) and cumulatively contribute to the historic character of the building. These features are characterized by a lesser degree of significance or have been slightly altered.

NON-CONTRIBUTING
Features or spaces that were constructed after the period of significance (post-1946), have been significantly altered, or do not contribute to the overall historic character of the building. These features are not considered historic.



Base drawings: Page & Turnbull, 2021. Based on the original drawings by the California Department of Public Works, Division of Architecture, December 1945. Updated to show current condition.

Significance Diagrams

CAL MARITIME BOATHOUSE - VALLEJO, CA

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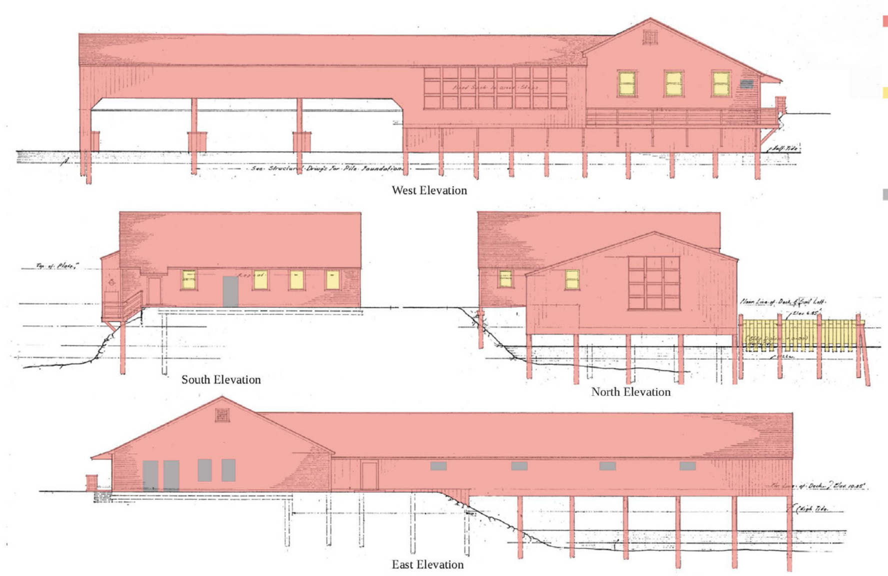

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Features or spaces that were constructed after the period of significance (post-1946), have been significantly altered, or do not contribute to the overall historic character of the building. These features are not considered historic.

Base drawings: California Department of Public Works, Division of Architecture, December 1945. Updated by Page & Turnbull, 2021.

Significance Diagrams

CAL MARITIME BOATHOUSE - VALLEJO, CA

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Appendix B – Historic Photographs of the Boathouse

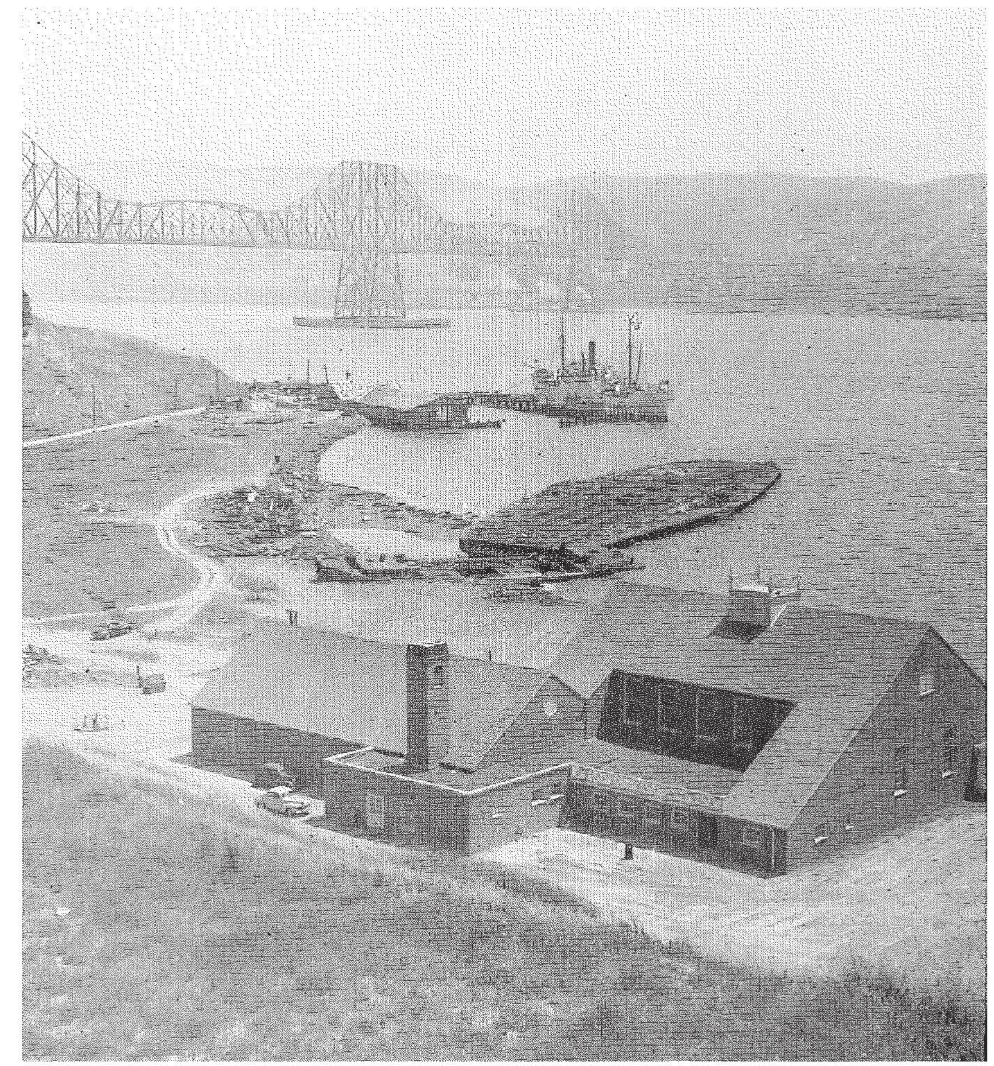

Figure 40: View of the Cal Maritime campus, 1946. Source: *Hawsepipe*, 1946, Cal Maritime Campus History Collection.

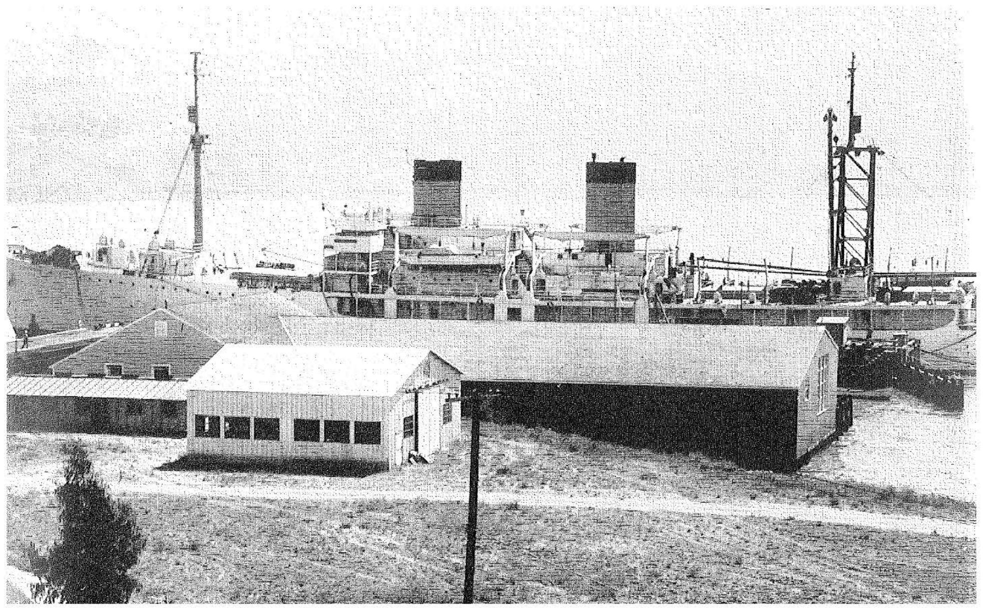
Figure 41: View of the Boathouse and wharf, 1949. Source: *Hawsepipe*, 1949, Cal Maritime Campus History Collection.


Figure 42: Aerial view of the Cal Maritime campus, 1957. Source: Cal Maritime Campus History Collection.


Figure 43: View of the Boathouse, 1958. Source: Cal Maritime, Campus History Collection.

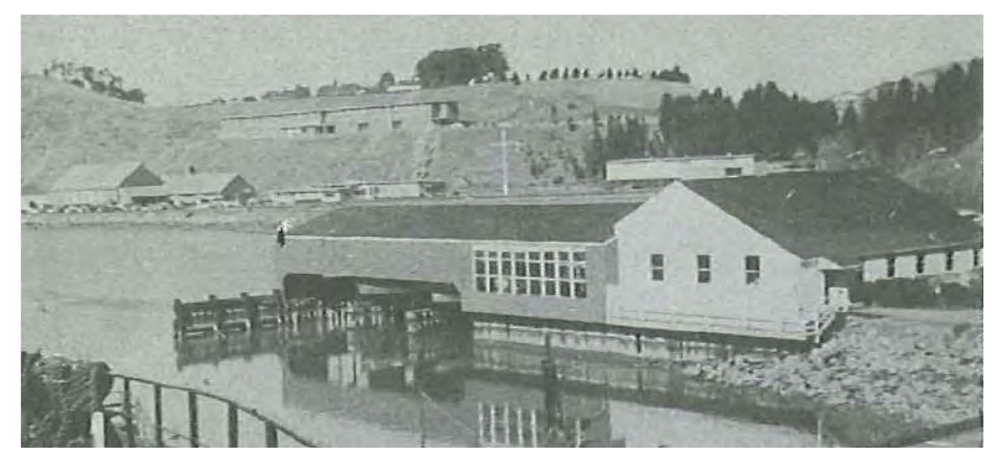
Figure 44: View of the Boathouse from the Golder Bear, 1959. Source: *Hawsepipe*, 1959, Cal Maritime Campus History Collection.

Figure 45: View of the campus looking south, c. 1959, with foundations underway for Dwyer Hall. East façade of Boathouse is visible in background. Source: Cal Maritime Campus History Collection.

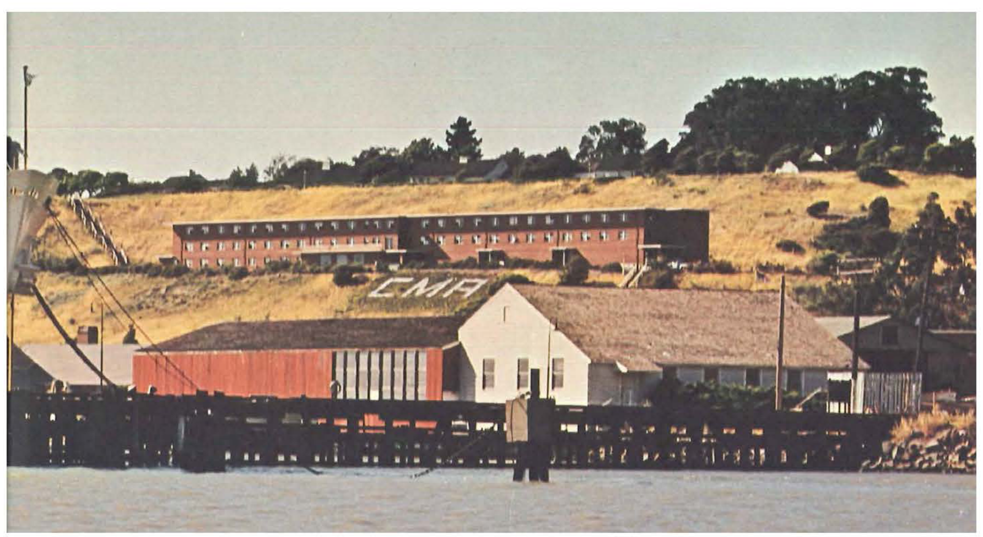

Figure 46: View of the campus with the Boathouse, c. 1968. Source: *Hawsepipe*, 1968, Cal Maritime Campus History Collection

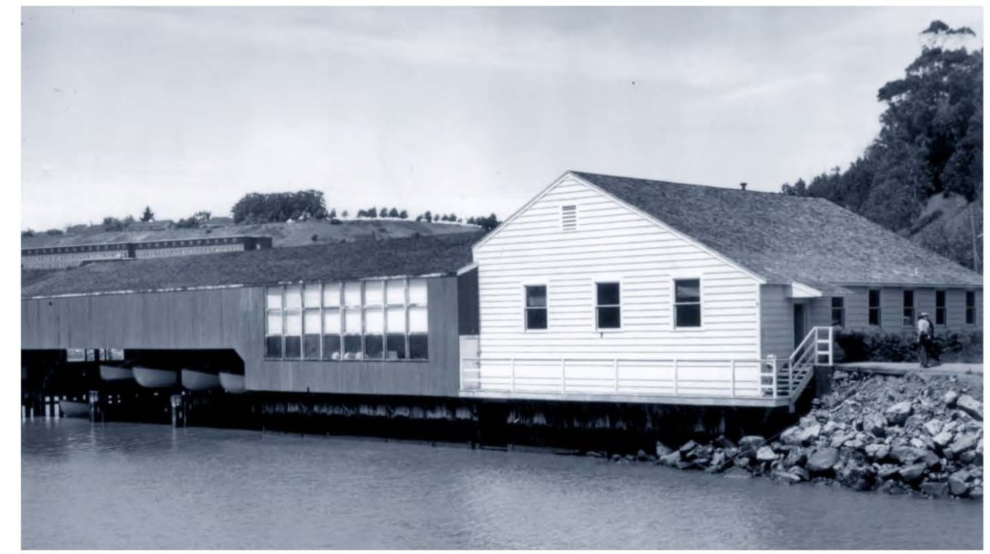

Figure 47: West and south façades of the Boathouse,1960s. Source: Cal Maritime Campus History Collection.

Figure 48: Boathouse in background, c. 1971. Source: Cal Maritime Campus History Collection.


Figure 49: West façade of the Boathouse, c. 1978. Source: *Hawsepipe*, 1978, Cal Maritime Campus History Collection.

Appendix C – Statement of Qualifications

This Historic Resource Evaluation was prepared by Page & Turnbull of San Francisco, California. Page & Turnbull staff responsible for this report include Ruth Todd, FAIA, Principal-in-charge; Christina Dikas, Senior Architectural Historian and project manager; Barrett Reiter, Architectural Historian and author, all of whom meet or exceed the Secretary of the Interior's Professional Qualification Standards for Historic Architecture, Architectural History, or History.

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Appendix
Case Study Considerations

B Case Study Considerations

B.1 | ALTASEA AT THE PORT OF LA

WHERE. 35-acre campus of underutilized Port of Los Angeles lands and waterfront areas located in San Pedro, California. Adjacent to SSA Marine cargo facilities, Cabrillo Way Marina and the historic ship S.S. Lane Victory.

WHAT. More than ten years in the making, AltaSea is a stand-alone nonprofit corporation creating a knowledge cluster of ocean-related science, business and education. AltaSea is "a place where innovators collaborate to develop solutions critical to the survival of the earth and its inhabitants."

AltaSea started in 2007 with a private foundation grant to conduct a visioning study for the new home of the Southern California Marine Institute (SCMI). AltaSea entered into a 50-year lease with the City of Los Angeles that included significant capital upgrades of the site by the City's Harbor Department. Following lease establishment, AltaSea convened a group of top business and civic leaders and philanthropists to create a Board of Trustees to oversee project organization, construction and capital campaign efforts. Master planning of the site followed, with initial rounds of site redevelopment and revitalization ongoing—restoration of Warehouses 58-60, creation of the Education Pavilion and Wharf Plaza and others. The master plan envisions AltaSea as an "urban, ocean-based campus."

Science, business, and education hubs accelerate scientific collaboration, facilitate job creation, and inspire the next generation for a more sustainable ocean. Key tenants, such as The Boeing Company and its Echo Voyager program anchor the site and pay market level rents to help balance lower lease rates for business incubators and other campus spaces and amenities.

TAKEAWAYS. Strong proof of concept project highlighting market and community acceptance for a blue-economy, defined as any economic activity in the maritime sector, and its facilities focused on science, research, business and education.
Plan and facility showcases itself as a "urban, ocean-based campus," spatially occupying a place between cargo, marina, downtown (San Pedro) and other uses.

AltaSea took over a decade to implement and was reliant on initial grant(s) to advance key first steps.

WRNS Studio
WRT
BKF Engineers
Page & Turnbull
Moffatt & Nichol


PORT OF LOS ANGELES

B.2 | WOODS HOLE OCEANOGRAPHIC INSTITUTION

WHERE. The Institution is located at Woods Hole in the town of Falmouth, Massachusetts, at the southwestern extreme of Cape Cod. Its primary coastal shipyard, the Iselin Marine Facility, is located on the Great Harbor, abutting the channel linking Buzzards Bay with Vineyard Sound, a popular route for ships connecting Massachusetts proper with nearby islands like Martha's Vineyard and Nantucket. The Institution also operates a research campus, a short distance inland from their shipyard.

WHAT. Formally established in 1930, the Woods Hole Oceanographic Institute (WHOI) is the largest independent oceanographic research institution in the United States. In addition to its research function, WHOI also operates as a higher education facility with approximately 1,000 students and staff. The Institute conducts research across six unique departments related to coastal, marine, and climate sciences and policy, as well as operates a variety of labs, working groups, and collaborative centers with both internal and external partners. WHOI operates a full-service port at the Iselin Marine Facility with two principal berths, 430 feet and 256 feet long respectively, a logistical area capable of both scientific and provisions staging, heavy-lifting cranes, hangar bays, and a shop operation with on-site tradespeople. WHOI operates three (3) main research vessels out of Iselin, the R/V Atlantis, which is vehicles, ocean observatories, and cruise planning services for outside research teams, the R/V Neil Armstrong, Owned by the United States Navy, and the R/V Tioga, as well as underwater vehicles, ocean observatories, and cruise planning services.

TAKEAWAYS. Through consolidated operations, Woods Hole Oceanographic Institution is able to function year-round both as an educational research institution and active marine logistics yard, capable of handling provisions and staging not only for research use, but also for emergencies. Containers, portable laboratory and research modules, operational vehicles, and other elements and equipment are found in this triangular-shaped yard. Additionally, the 29,750 logistics zone provides a working example of the anticipated vision for the Cal Maritime Marine Logistics Yard.

B.3 | COAST GUARD BASE ALAMEDA

WHERE. Also known as "Coast Guard Island," the Base is located on a 67-acre artificial island in the Brooklyn Basin section of the Oakland Estuary, situated between Alameda and Oakland, CA, separated from San Francisco Bay by Alameda Island.

WHAT. Coast Guard Base Alameda is one of the largest bases on the West Coast. Though it has been operating continuously as a Coast Guard installation since 1926, it was not officially designated as a permanent base until the 1931. Since then it has played a key role in the military history of the United States, serving as the site of the Coast Guard's recruitment training center from 1942 to 1982 and still serving to this day as a facility of high importance. Currently, there are 1,200 personnel stationed at the Base and it is the homeport for four Legend-class cutters which, at approximately 418 feet in length, are the largest of such boats operated by the United States Coast Guard. The Base's principal marine operations use a 1330-foot long, 40-foot wide single pier with no adjacent yard for nor major marine logistics operations.

TAKEAWAYS. While Coast Guard Base Alameda lacks the logistical and academic components of Cal Maritime, there are several key takeaways, namely in the functionality of the pier facility. The 40-foot width of the pier should be considered as the minimum operative capacity for any marine operation of this size. With that in mind, it can be surmised that for a site with a marine logistics operation, something wider would be necessary, as is the vision for Cal Maritime. The 1300-foot length of the pier at Coast Guard Base Alameda was built to extend the entire length of ships that access it, offering maximum flexibility to both operators on land and of the vessels themselves, and similar is envisioned for the Cal Maritime. Additionally, it is worth noting that the Legend-class cutters that utilize Coast Guard Base Alameda are approximately 100 feet shorter than the NSMV.

B.4 | COAST GUARD STATION CHARLESTON

WHERE. The Station is located on the southwest corner of the Charleston Peninsula at the end of historic Murray Boulevard and fronts on the Ashley River, approximately 5 nautical miles from the Atlantic Ocean.

WHAT. Despite being in a region well-known for its military presence, Coast Guard Station Charleston is a relatively modest installation. For what it lacks in size, the Station is significant in stature as it is homeport for three of the Legend-class cutters, which, at approximately 418 feet in length, are the largest of such boats operated by the United States Coast Guard. Because of the relatively small footprint of this facility, it has limited berthing space, with only one roughly L-shaped pier with only about 250 feet of waterside area to moor a ship. That said, the pier is roughly 50 feet wide, well above the minimum operative width of 40 feet, and that width is complemented by a roughly 39,000 square foot logistics yard on-site

TAKEAWAYS. While Coast Guard Station Charleston lacks the academic component of Cal Maritime, they share many other characteristics. Coast Guard Station Charleston has a wide pier, that is capable of vessel-adjacent logistical and provisioning operations, as well as an on-site marine logistics yard, as is envisioned for Cal Maritime.

B.3 | COAST GUARD BASE HONOLULU

WHERE. The Base is located along the northeastern coast of Sand Island fronting on Honolulu Harbor, a major port area for shipping and other deep-water activities.

WHAT. Colloquially known as “the best base in the Coast Guard,” Coast Guard Base Honolulu is a large facility, serving as a focal point for the 1,150 active personnel stationed to the Coast Guard’s 14th District, which covers all Hawaiian and Asia-Pacific activities. The Base’s size is matched by its importance as it is homeport for two of the Legend-class cutters, which, at approximately 418 feet in length, are the largest of such boats operated by the United States Coast Guard. Due to the Base’s location on the deep waters of Honolulu Harbor, its pier follows the shoreline at-grade. While the pier is approximately 1,200 in feet in length and can comfortably dock both of the base’s Legend-class ships simultaneously, it is only 40 feet wide for most of its run, the minimum operative capacity. Additionally, there is no dedicated marine logistics yard except for a small area of parking spaces along the border of the pier and land.

TAKEAWAYS. While there are many significant differences between Coast Guard Base Honolulu and the vision for Cal Maritime, there are still some key takeaways. Because of the Base’s 40-foot pier width, there is little room for any logistical or provisioning operation and that is proven by the lack of a yard. The vision for Cal Maritime calls for a wider pier and a marine logistics yard to match. For what it lacks in width, the pier’s length allows a ship to be serviced in its entirety, which is what is envisioned for the NSMV at Cal Maritime.

B.6 | THE NEW YORK HARBOR SCHOOL

WHERE. The school campus is located on Governors Island, New York. Students and faculty access the school by ferry either from Lower Manhattan or points in Brooklyn.

WHAT. A unique public high school where the school bus is a ferry, teachers are known as the crew, and some classes are held underwater. The New York Harbor School aims to engage city children by relating every aspect of the curriculum to the water, providing a unique college-preparatory education built upon maritime experience. Students receive not only traditional academics, but also a work-based learning environment in career and technical education. The students obtain industry certification in marine science or technology by specializing in one of seven programs: aquaculture, marine biology research, marine policy and advocacy, marine systems technology, ocean engineering, professional diving, and vessel operations.

With the New York Harbor surrounding the school, the blend of indoor lesson plans with outdoor experimental laboratory days provides a unique and exciting opportunity to train the next generation of skilled labor; students venture into the harbor every Tuesday and Thursday for experiential, hands-on learning.

The New York Harbor School opened in 2003 with private and public funding supporting the programs. Since then, the school has become the model for marine-themed schools around the world. Now more than thirty schools in the United States have some form of a nautical program. Every year, the school hosts an annual regatta to support their environmental education program. As part of their community outreach effort, the school partnered with the New York Harbor Foundation to create and implement the Billion Oyster Project, an ambitious effort to reestablish the oyster beds once lining the harbor. Since 2008, 25 million oysters have been replanted in the estuary.

TAKEAWAYS. An innovative, experiential school program that connects youth education with the local environment and ecosystem.

Incorporates the youth as a new target demographic for site activity, enabling students to connect to the site and gain a sense of pride and ownership for their port and city.

Opportunity to help the City raise awareness about degraded waterways and the local environment by engaging students in their local ecosystem, while providing on-the-job skill training.