Mission Bay Park Improvements Program: Implementation Framework

The City of SAN DIEGO

DRAFT July 2025

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Mission Bay Park Improvements Program:
Implementation Framework

The City of SAN DIEGO

Acknowledgments

Mayor: Todd Gloria

City Attorney: Heather Ferbert

City Council:

Joe LaCava – District 1
Jennifer Campbell – District 2
Stephen Whitburn – District 3
Henry L. Foster III – District 4
Marni von Wilpert – District 5
Kent Lee – District 6
Raul Campillo – District 7
Vivian Moreno – District 8
Sean Elo-Rivera – District 9

Engineering & Capital Projects Department

Parks and Recreation Department

Mission Bay Park Committee & Mission Bay Park Oversight Board

Consultants:

Dudek
Moffat & Nichol
Rick Engineering

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ADA	Americans with Disabilities Act
BMP	best management practice
BMPU	Bicycle Master Plan Update
CCC	California Coastal Commission
CEQA	California Environmental Quality Act
CHRMP	Conceptual Habitat Restoration and Management Plan
CLT	California least tern
EIR	Environmental Impact Report
EP	Environmental Protocol
GDP	General Development Plan
MBPMP	Mission Bay Park Master Plan
MHHW	Mean Higher-High Water
MHPA	Multi-Habitat Planning Area
MSCP	Multiple Species Conservation Program
NGVD	National Geodetic Vertical Datum of 1929
NRMP	Natural Resources Management Plan
PEIR	Programmatic Environmental Impact Report
PER	Preliminary Engineering Report
SLR	sea level rise
USFWS	U.S. Fish and Wildlife Service

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Introduction

Mission Bay Park Improvements Program:
Implementation Framework

The City of SAN DIEGO

1 Introduction

Mission Bay Park is one of San Diego's largest, well-used regional parks and is the largest recreational aquatic park of its kind in the country. In 1944, a San Diego Chamber of Commerce committee recommended developing Mission Bay, historically known as False Bay, into a tourist attraction. In the late 1940s, the conversion of Mission Bay into an intensively used aquatic park began through massive dredging and filling operations. By the early 1960s, most of the dredging to create the water and land bodies evident today had been completed. A total of 25 million cubic yards of sand and silt had been dredged and used as fill to create the landforms, making most of Mission Bay Park an artificially created environment. Once fully developed and opened to the public, Mission Bay Park quickly became a focal point of outdoor recreation in San Diego. With calm waters, miles of shoreline, open parkland, preserved habitat, and dedicated space for sports and other activities, Mission Bay Park provides a valuable connection to natural resources and recreational opportunities for residents and visitors within surrounding communities and to the entire San Diego region. Today, it is estimated that 15 million people visit Mission Bay Park every year.

Recognizing this value, through voter-approved initiatives (Proposition C in 2008 and Measure J in 2016), the City of San Diego amended the City Charter to add Section 55.2, which created the Mission Bay Park Improvement Fund (Improvement Fund) to develop, repair, and invest in assets within Mission Bay Park. The Improvement Fund was established to implement priority projects within the Mission Bay Park Improvement Zone (Improvement Zone). To ensure proper oversight and allocation of funds, Proposition C established the Mission Bay Park Improvement Fund Oversight Committee (Oversight Committee). The Oversight Committee is responsible for managing the prioritized project list and determining allocations from the Improvement Fund. It also verifies that the funds are appropriately collected, segregated, retained, and allocated in accordance with City Charter Section 55.2.

Following its establishment, the Oversight Committee identified a list of projects to address the priorities established in City Charter Section 55.2. Further analysis and refinements of these identified projects resulted in the Mission Bay Park Improvements Program (Improvements Program). The following are the final components included in the Improvements Program and how each relates to the Section 55.2 priorities:

Priority: Restoration of navigable waters within Mission Bay Park and elimination of navigational hazards. When depth conditions no longer support and ensure safe navigation, those areas that pose a danger or impede the passage of watercraft shall be dredged in accordance with the Mission Bay Baseline Chart.

- Mission Bay Navigational Safety Dredging Project: Construction completed in 2018, currently in post-construction mitigation for eelgrass restoration.

Priority: Wetland expansion and water quality improvements, and the protection and expansion of eelgrass beds as identified in the Mission Bay Park Master Plan (MBPMP).

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Identified Projects:

- North Fiesta Island Wetland Restoration
- Cudahy Creek Wetland Restoration
- Tecolote Creek Wetland Restoration

Priority: Restoration of shoreline treatments within the Improvement Zone, including restoration of beach sand and stabilization of erosion control features.

Identified Projects:

- Bonita Cove
- Ventura Cove Park
- Vacation Island Southwest
- Bahia Point
- West Sail Bay
- Crown Point
- Vacation Island Northwest
- Vacation Island Northeast

Priority: Expansion of endangered or threatened species preserves and upland habitats on North Fiesta Island and along the levee of the San Diego River floodway as identified in the MBPMP.

Identified Projects:

- Site No. 1 – Fiesta Island South
- Site No. 2 – Fiesta Island North Central
- Site No. 3 – Fiesta Island near Youth Camping
- Site No. 4 – Fiesta Island North California Least Tern Preserve Area
- Site No. 5a – Cloverleaf Enhancement Area
- Site No. 5b – Triangle Enhancement Area
- Site No. 5c – South Shores Restoration and Enhancement Area

Priority: Restoration of the seawall bulkhead on Oceanfront Walk to a condition no less than the quality of restoration previously performed in 1998 from Thomas Street to Pacific Beach Drive, or to conditions as may be required by historic standards.

Identified Projects:

- Restoration of the Seawall Bulkhead Segments A-C

Priority: Completion of bicycle and pedestrian paths and bridges as identified in the MBPMP, installation of sustainable lighting in the Improvement Zone, installation of signage and landscaping at points of entry to Mission Bay Park and the South Shores, and the repair, resurfacing and restriping of parking lots within the Improvement Zone.

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Identified Projects:

- Rose Creek Bike Path
- Fiesta Island Causeway Path
- Ocean Beach Bike Path
- Deferred Maintenance Program
- Signage Wayfinding Update

Priority: Deferred maintenance that are also Capital Improvements hereunder on existing assets within the Improvement Zone as may be recommended by the Oversight Committee and approved by the City Council.

Identified Projects:

- Deferred Maintenance Program

To effectively and holistically analyze these projects and their associated environmental impacts, a Programmatic Environmental Impact Report (PEIR) is prepared in accordance with the California Environmental Quality Act (CEQA), affording opportunities for streamlining future environmental and permitting review and engaging the public. The PEIR analyzes up to 30% designs of core program elements at a project level, while bay-wide programmatic elements are analyzed at a program level. The Mission Bay Park Improvements Program: Implementation Framework (Implementation Framework) provides an overview of the components of improvements and outlines future implementation procedures and next steps for implementing the Improvements Program.

1.1 Geographic Overview

Mission Bay Park is located within the San Diego River Estuary in the City of San Diego. Mission Bay Park is a Community Planning Area bounded by the following Community Planning Areas: Mission Beach to the west; Pacific Beach to the north; Clairemont Mesa, Linda Vista, and Mission Valley to the east; and Ocean Beach, Peninsula, and Midway-Pacific Highway to the south. Mission Bay Park offers boat docks and launching facilities, sailboat and motorboat rentals, bike and walking paths, basketball courts, picnic areas, children's playgrounds, and bonfire pits. Mission Bay boasts 27 miles of shoreline, 19 of which are sandy beaches with eight locations designated as official swimming areas. Kendall-Frost Marsh, Mariner's Point, Fiesta Island, and the San Diego River Estuary provide habitat and viewing opportunities for nesting birds and other wildlife.

In addition to these public amenities, private leaseholds have been granted to public-serving entities such as SeaWorld San Diego, Bahia Resort Hotel, Paradise Point Resort & Spa, and the Mission Bay Yacht Club. The Mission Bay Aquatic Center, Mission Bay Boat & Ski Club, and Fiesta Island Youth Camp offer aquatic recreation opportunities to kids, teens, and low-income families. Fiesta Island is the birthplace of the modern triathlon, which still runs today as the Mission Bay Triathlon, and features the popular Fiesta Island off-leash dog park. De Anza Cove is home to the Mission Bay Golf Course, the McEvoy Sports Fields, the Mission Bay Boat & Ski Club, and the Mission Bay RV Resort. Waterfront visitor accommodations for campers and hotel guests are provided at several locations

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around the bay. Mission Bay Park is the central coastal attraction for San Diego residents and visitors alike, emphasizing the need to invest in its long-term health and viability.

The Improvements Program will be implemented within the Improvement Zone, as defined in City Charter Section 55.2 and shown in Figure 1, Location and Improvement Zone. The Improvement Zone is comprised of approximately 164 acres out of a total of 4,233 in Mission Bay Park, specifically, "Oceanfront Walk from the Mission Bay jetty to Crystal Pier and the adjoining seawall, coastal parks and ocean beaches contiguous thereto, Rose Creek from its terminus in Mission Bay to the southern end of the Santa Fe Road flood control channel, Tecolote Creek from its terminus in Mission Bay to the western end of the Tecolote Creek flood control channel and the San Diego River as it passes through the boundaries of Mission Bay Park. The boundaries of the San Diego River, Rose Creek and Tecolote Creek shall be the width of those waterways to the nearest property line" (San Diego City Charter, Section 55.2 [a][4]). Within the Improvement Zone are various identified sites for planned location-specific elements of the Improvements Program. An overview map is provided in Figure 2.

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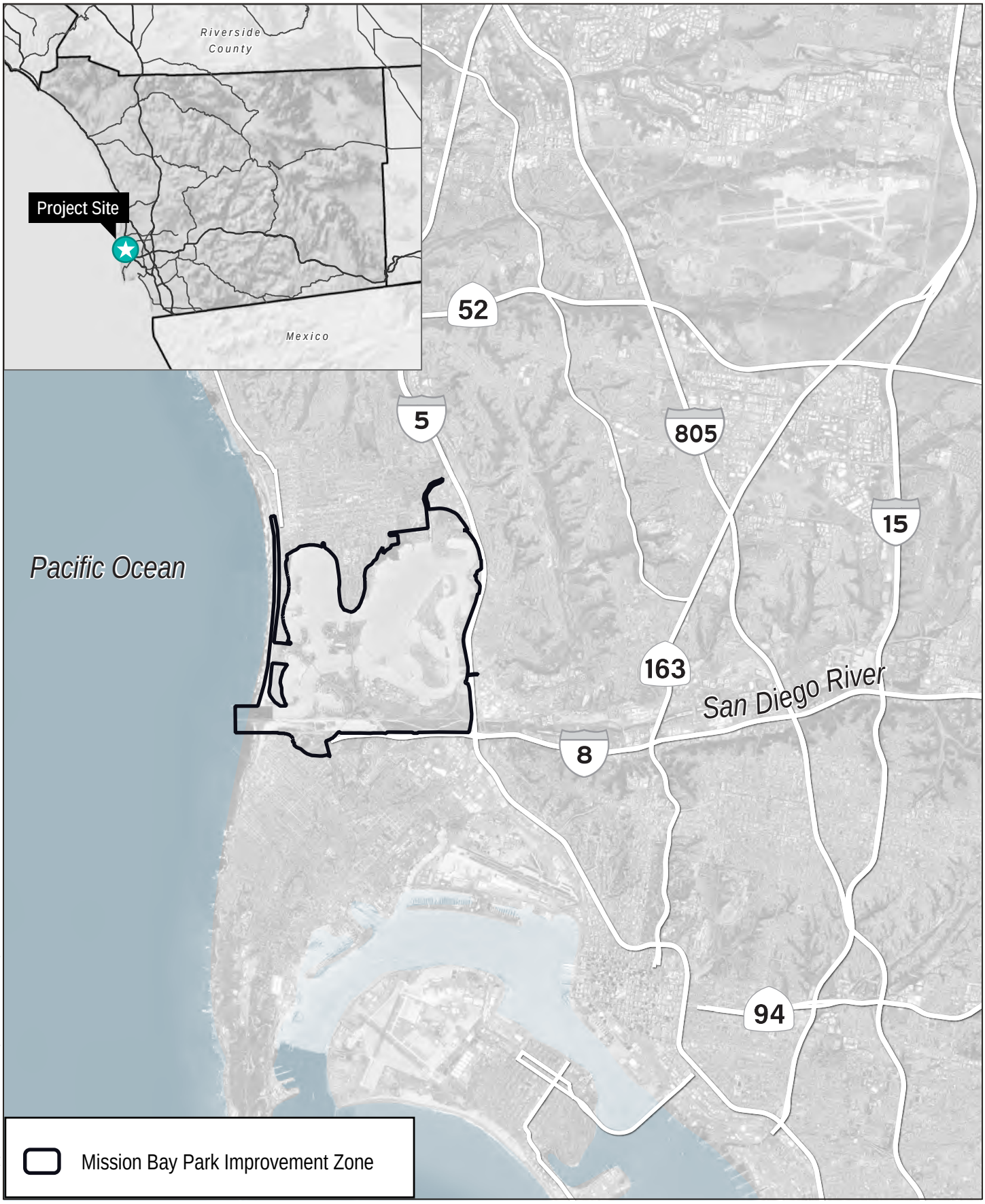

SOURCE: SANGIS 2023

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0 4,200 8,400
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FIGURE 1

Location and Improvement Zone

Mission Bay Park Improvements Program

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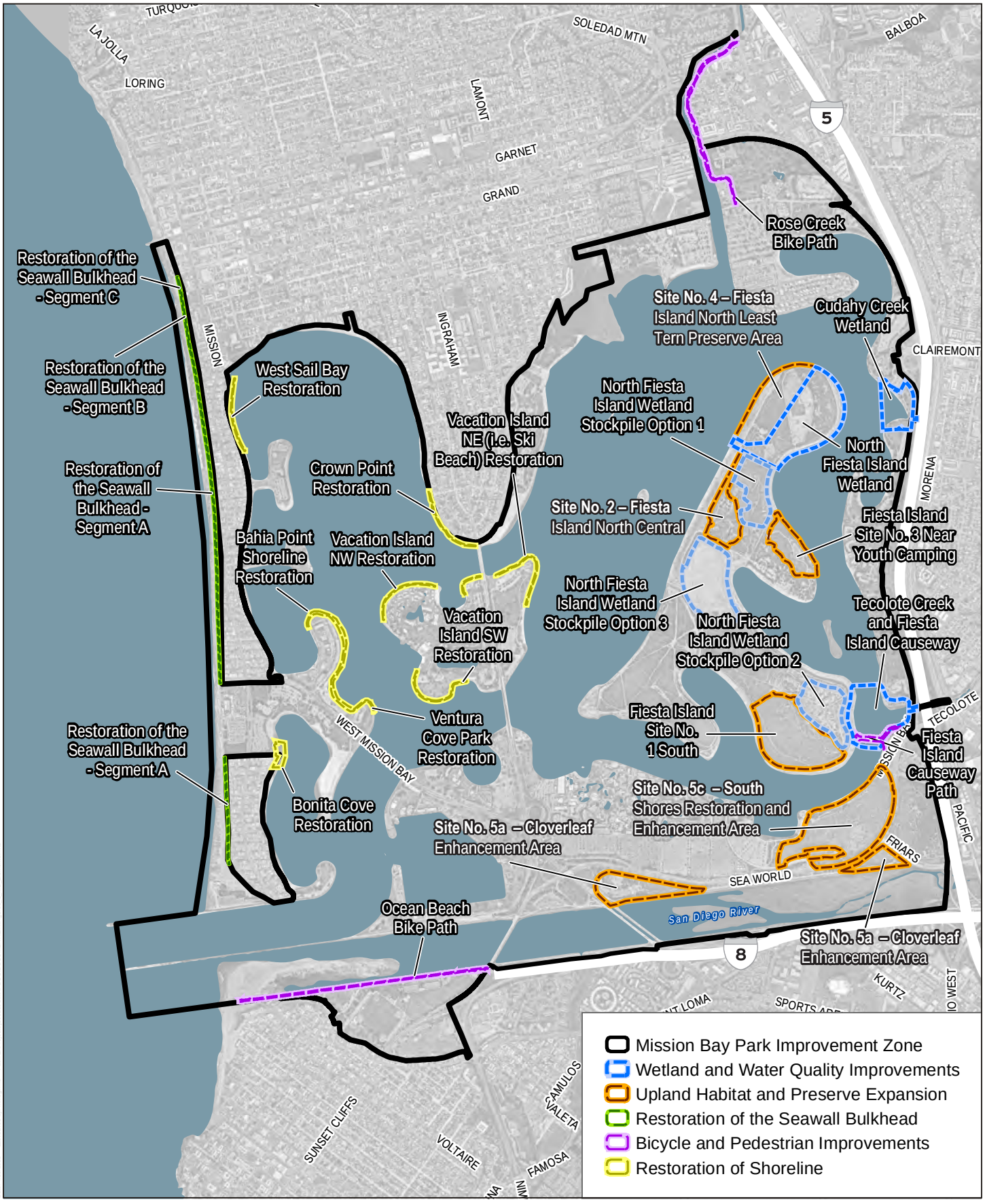

SOURCE: SANGIS 2023

0 900 1,800 Feet

FIGURE 2

Improvements Program - Elements Overview

Mission Bay Park Improvements Program

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1.2 Mission Bay Park Improvement Fund

Revenue generated from lease agreements within Mission Bay Park is deposited into the Mission Bay Park Improvement Fund, with allocations to identified projects determined by the Oversight Committee. Specifically, Section 55.2(11)(b) of the City Charter states:

> Subject to the City of San Diego's State law obligations as a trustee of tidelands within Mission Bay Park, Mission Bay Park Lease Revenues up to the threshold amount in each fiscal year shall be deposited into the San Diego General Fund and may be used for any municipal purpose, including but not limited to, police, fire, streets, sewers, water delivery, roads, bridges, and operation of parks. All Mission Bay Park Lease Revenues in excess of the threshold amount shall be allocated in the City of San Diego budget to two distinct funds. Thirty five percent (35%) of the Mission Bay Park Lease Revenues in excess of the threshold amount, or three million five hundred thousand dollars ($3,500,000) whichever is greater, shall be allocated to the San Diego Regional Parks Improvement Fund that solely benefits the San Diego Regional Parks and sixty-five percent (65%) of the Mission Bay Park Lease Revenues over the threshold amount, or the remainder of those revenues if less than 65% is available after the allocation to the San Diego Regional Parks Improvement Fund, shall be allocated to the Mission Bay Park Improvement Fund that solely benefits the Mission Bay Park Improvement Zone. The threshold amount shall be $23 million beginning fiscal year 2010 and ending fiscal year 2014. The threshold amount shall be $20 million beginning fiscal year 2015 and shall remain $20 million thereafter.

The Improvement Fund is intended to fund the restoration of wetlands and wildlife habitat, as well as deferred maintenance projects within the Improvement Zone, consistent with the MBPMP. These types of projects are prioritized to ensure the long-term health and viability of Mission Bay Park. As park infrastructure continues to age and be worn down by use, addressing deferred maintenance is key to restoring park amenities to their intended condition so they can continue to be used as an asset to the park and the City. The restoration of wetlands within Mission Bay Park has been a priority for park users since the adoption of the MBPMP in 1994. Intense development within the Mission Bay Watershed after the creation of Mission Bay Park has contributed to declining water quality within Mission Bay. Along with stormwater enhancements identified through deferred maintenance, wetland restoration is an essential component of improving water quality in Mission Bay for park users and wildlife alike. The passage of Proposition C and Measure J and the adoption of Section 55.2 to the City Charter affirm this priority and the City's commitment to improving the water quality in Mission Bay. By restoring the park and its amenities, Mission Bay Park can continue to be the center of aquatic recreation and a destination for visitors in San Diego for future generations.

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1.3 Purpose

The Improvements Program is intended to fulfill the priorities for Mission Bay Park as outlined in the City Charter by addressing issues related to water quality and water circulation improvements, habitat improvements, and visitor-serving improvements as mandated by San Diego voters through the passing of Proposition C in 2008 and Measure J in 2016. Wetland and water quality improvements are focused within several specific areas. A Preliminary Engineering Report (PER) was completed for each of these location-specific elements and analyzed for its short- and long-term impact on the environment through a PEIR. Section 55.2 of the City Charter outlines several activities that should be implemented within the Improvement Zone, so to maximize efficiency, the Improvements Program Environmental Impact Report (EIR) was prepared. Consistent with Section 15168 of the CEQA Guidelines, the PEIR is intended to analyze the Improvements Program holistically to streamline future permitting and approval processes for the future authorization of individual program components. The analysis is both project level for certain site-specific components and program level for broader elements. A PEIR is beneficial as it provides an analysis, including a comprehensive cumulative analysis, of several proposed, related actions to be authorized at a later time. The PEIR provides a more exhaustive consideration of environmental effects and alternatives in light of the whole program of activities, which allows the City to ensure consideration of all cumulative impacts, consider broad alternatives, and program-wide mitigation measures. This offers efficiencies for future decision makers to ensure all effects have been considered and reduces the need for a future project-specific EIR. The purpose of the Implementation Framework is to provide a framework for future implementation under the Improvements Program and associated PEIR.

1.4 Purpose of the Preliminary Engineering Reports

Creation of PERs for the Improvements Program took into consideration local, state, and federal environmental regulations, MBPMP policies and directives, and site-specific restoration design strategies, including the analysis of novel techniques for Mission Bay Park, such as a living shoreline (oyster reef). Each PER can help City staff and decision makers assess the level of risk in moving forward with a particular project and can provide clarity on the feasibility of completing a project that achieves the intended objectives. Each PER created for the Improvements Program included similar components: scope of work/general project description, drawings, feasibility analysis of constructability, risk assessment of project constraints, project conflict coordination/evaluation, construction cost estimate, estimated project schedule, and an analysis of project consistency with applicable City standards. Additionally, each PER analyzed surrounding drainage and stormwater infrastructure conditions to identify potential stormwater improvements and best management practices (BMPs) that could be incorporated with the proposed site improvements to further enhance water quality.

Additional information compiled and considered during the preparation of the PERs includes utilities relocation needs, Americans with Disabilities Act (ADA) and Title 24 compliance, geotechnical conditions, maintenance and monitoring requirements, hydrologic, hydraulic, and tidal modeling, existing topography and bathymetry, historical imagery, and feasibility. Each PER is available as an Appendix to the EIR, and Figure 2 presents locations.

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1.5 Goals and Objectives

The following Improvements Program objectives are consistent with the priorities established in Section 55.2 of the City Charter:

1. Improve Mission Bay Park through wetland expansion, water quality improvements, and the protection and expansion of eelgrass beds as identified in the MBPMP.
2. Identify inadequate and failing shorelines within Mission Bay Park, and prioritize shoreline restoration treatments, including restoration of beach sand and stabilization of erosion control features.
3. Expand endangered or threatened species preserves and upland habitats in areas identified in the MBPMP, including on North Fiesta Island, along the levee of the San Diego River floodway, and other opportunity areas.
4. Implement deferred maintenance projects, including but not limited to, maintenance and regular replacement of recreational and public safety facilities, to the benefit of park users.
5. Assess deficiencies and gaps in the existing bicycle and pedestrian circulation network to improve overall circulation, safety, and enjoyment of bicyclists and pedestrians in Mission Bay Park.
6. Increase Mission Bay Park's resiliency to climate change through the implementation of seawall enhancements, shoreline treatment restoration, and adaptive wetland restoration.
7. Restore the seawall bulkhead on Oceanfront Walk to a condition no less than the quality of restoration previously performed in 1998 from Thomas Street to Pacific Beach Drive or to conditions as may be required by historic standards.

The primary goal of the Improvements Program is to restore and enhance Mission Bay Park to ensure its long-term viability for future generations as San Diego's centerpiece for aquatic recreation.

1.6 Relation to Other Recent City of San Diego Initiatives

The Improvements Program is consistent with and geographically overlaps with several other adopted and ongoing City of San Diego initiatives. The following sections describe those initiatives in further detail and how they relate to the Improvements Program.

1.6.1 City of San Diego General Plan

The City of San Diego's General Plan was unanimously adopted by the San Diego City Council on March 10, 2008, and significantly "refreshed" in the 2024 Blueprint SD amendment. Blueprint SD is a proactive effort to create an equitable and sustainable framework for growth to support current and future San Diegans. Blueprint SD identifies areas for more homes and jobs that are connected to convenient and affordable options to walk, bike, and ride transit to meet daily needs, in order to help fulfill the requirements of our growing city while making progress toward our climate goals. The General Plan contains 11 elements that guide the City's growth over the next 20+ years (City of San Diego 2024).

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Several policies within the General Plan call for the expansion of access to recreation areas, especially for non-motorized transportation, and restoration of the natural environment. The Improvements Program will help implement the General Plan by providing infrastructure improvements for walking, biking, and rolling to Mission Bay Park. These improvements will both help fulfill some segments of the proposed bikeways around Mission Bay Park, as described in the Mobility Element, and provide greater access to a Resource-Based Park, as described in the Recreation Element. Furthermore, the restoration of native habitat will help further the goals of the Conservation Element.

1.6.2 Mission Bay Park Master Plan

The MBPMP serves as the guiding planning policy document for all of Mission Bay Park, and its fundamental goal is to identify new recreation opportunities and plan for the continuing development of the park that will sustain the diversity and quality of recreation while protecting and enhancing Mission Bay's environmental resources for future generations to enjoy. The MBPMP outlines goals and objectives to support a balanced management approach of the park's land and water resources, public recreation, and the operation of bay-serving commercial businesses. Goals and objectives of the MBPMP cover land and water use, environment, access and circulation, economics, and aesthetics and design (City of San Diego 2021a).

The Improvements Program is consistent with the goals, recommendations, and objectives in the MBPMP. In recent years, while the Improvements Program was developed, the City adopted amendments to the MBPMP, including revised concept land use plans for Fiesta Island (adopted in 2021, certified in 2023) and De Anza Cove (adopted in 2024, certification pending). These plans revised the land use designations within these areas of Mission Bay Park and, in the case of the De Anza Cove amendment, completed a recommendation in the original 1994 MBPMP for the De Anza Cove Special Study Area. A forthcoming General Development Plan (GDP) for De Anza Cove is the planned next step to bring that project to fruition.

The recommendations for Fiesta Island in the Improvements Program are in line with the revised land use plan for Fiesta Island. The North Fiesta Island wetland restoration site, the Fiesta Island North Least Tern Preserve, Tecolote Creek wetland restoration site, and the three upland restoration sites were identified in the certified Fiesta Island Concept Plan. The preliminary design work and environmental analysis done for these sites through the Improvements Program bring these projects closer to implementation.

CLOVERLEAF CALIFORNIA LEAST TERN DESIGNATED BREEDING HABITAT RELOCATION

The Cloverleaf Upland Habitat Expansion and Preservation Primary Engineering Report (PER) Site 5a includes redesignation of California Least Tern (CLT) Preserve, in accordance with the 2021 Mission Bay Park Master Plan (MBPMP), from the Cloverleaf Uplands Restoration Site to an alternative site. In lieu of continued management at the Cloverleaf site as outlined in the Mission Bay Natural Resources Management Plan (NRMP), protection of least tern breeding habitat is

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proposed at the San Diego River Mouth Estuary including the western portion of Southern Wildlife Preserve.

As discussed in the MBPMP, the 1990 Mission Bay Natural Resources Management Plan (NRMP) identifies four of the Least Tern preserves to remain: on the north shore of the San Diego River Channel near Sea World Drive, by the Ingraham Street "cloverleaf", the tip of Mariner's Point, FAA Island in Fiesta Bay, and the northern peninsula of Fiesta Island also known as Fiesta Island North. The MBPMP proposes that Stony Point in Fiesta Island be preserved to provide CLT habitat but that the Cloverleaf site at the intersection of Sea World Drive and Ingraham Street should be abandoned and replaced at other locations.

Redesignation of the CLT designated breeding site to the San Diego River Estuary including the western portion of the Southern Wildlife Preserve would be implemented as part of the future project-specific permit application for the Cloverleaf Upland Habitat Expansion and Preservation Preliminary Engineering Report (PER) Site 5a or completion of the update to the Mission Bay NRMP, whichever occurs first.

MISSION BAY LOCAL COASTAL PROGRAM

The California Coastal Act established a Coastal Zone boundary and mandated that all jurisdictions within that boundary prepare a Local Coastal Program. The entire project area is located within the Coastal Zone. The MBPMP and the Pacific Beach and Ocean Beach Community Plans, as well as the Mission Beach Precise Plan, include planning and development standards to protect, preserve, and enhance California's coastal resources. The MBPMP incorporates coastal issues that have been identified by and for the community and develops policies and recommendations to address those issues (City of San Diego 2021a). The consistency of the Improvements Program is designed to improve coastal resources consistent with the applicable Coastal policies.

1.6.3 Mission Bay Park Natural Resources Management Plan

The NRMP is included as Appendix E of the MBPMP. The intent of the NRMP is that no net reduction of wildlife habitat is allowed, and that the overall quality of habitat will be improved, which is matched with the intent of the Improvements Program. Additionally, the NRMP not only recognizes the presence of natural resources, but also provides for the protection, enhancement, and management of these resources. The NRMP ensures consideration of Mission Bay's sensitive biological resources during the planning and development of projects and planning efforts within Mission Bay Park.

1.6.4 Climate Resilient SD

The Climate Resilient SD Plan is the City's first-ever climate change adaptation and resiliency plan. It builds upon the City's Climate Action Plan, providing strategies to be better prepared to respond to and recover from climate change events, including extreme heat, sea level rise (SLR), wildfires, flooding and drought. It includes five main goals which are connected and informed communities, resilient and equitable city, protection of historical and tribal cultural resources, thriving natural environments, and maintenance of critical City infrastructure (City of San Diego 2021b). Ensuring the resiliency of Mission Bay Park for the enjoyment of future generations was a key objective in the development of the Improvements Program. Program elements were designed and sited with the

effects of climate change and SLR in consideration. Proposed improvements, such as shoreline restoration and improvements to the seawall bulkhead, will improve the resiliency of the environment in the face of predicted SLR, ensuring that future generations can continue to enjoy the coastal resources in Mission Bay Park. The Improvements Program is consistent with Climate Resilient SD.

1.6.5 Multiple Species Conservation Program

The City is a participating jurisdiction in the Countywide San Diego Final Multiple Species Conservation Program (MSCP), a comprehensive, regional long-term habitat conservation program designed to provide permit issuance authority for take of covered species to the local regulatory agencies. The MSCP addresses habitat and species conservation within approximately 900 square miles in the southwestern portion of San Diego County. It serves as an approved habitat conservation plan pursuant to an approved Natural Communities Conservation Plan in accordance with the state Natural Communities Conservation Planning Act.

The MSCP establishes a preserve system designed to conserve large blocks of interconnected habitat having high biological value that are delineated in the City of San Diego as the Multi-Habitat Planning Area (MHPA). The City of San Diego MSCP Subarea Plan (City of San Diego 1997) encompasses 206,124 acres within the MSCP Subregional Plan area. The Subarea Plan is characterized by urban land uses with approximately three-quarters either built out or retained as open space/park system.

The City of San Diego MHPA is a "hard line" preserve developed by the City in cooperation with the wildlife agencies, property owners, developers, and environmental groups. The MHPA identifies biological core resource areas and corridors targeted for conservation, in which only limited development may occur (City of San Diego 1997).

The MSCP identifies 85 plants and animals to be "covered" under the plan (termed Covered Species). Many of these Covered Species are subject to one or more protective designations under state and/or federal law and some are endemic to San Diego. The MSCP seeks to provide adequate habitat in the preserve to maintain ecosystem functions and persistence of extant populations of the 85 Covered Species while also affording participating landowners "take" of MSCP Covered Species at the local level for development proposals that are determined to be compliant with the MSCP. The purpose of the MSCP is to address species conservation on a regional level and thereby avoid project-by-project biological mitigation, which tends to fragment habitat.

The North Fiesta Island wetland restoration, Fiesta Island North Least Tern preserve, Tecolote Creek wetland restoration, upland restoration Site #5a – Cloverleaf, upland restoration Site #5b - Triangle Restoration Area, and the Ocean Beach bike path improvements identified in the Improvements Program are located wholly or partially within the City's MHPA. Wayfinding improvements and deferred maintenance may also occur within or adjacent to the MHPA. Compliance with the MSCP Subarea Plan including the MHPA Land Use Adjacency Guidelines will be required during implementation of the Improvements Program and is discussed in further detail in Chapter 4, Implementation Procedures.

1.6.6 Bicycle Master Plan Update

The City of San Diego initiated the Bicycle Master Plan Update (BMPU) in 2024 to improve and grow a safe, connected, and convenient network for people on bicycles and micromobility users of all ages and abilities. The BMPU is a citywide effort that will result in an overarching update to the 2013 Bicycle Master Plan. The BMPU will refresh the City's bicycle facility recommendations and prioritization of active transportation projects to meet the City's Strategic Plan, General Plan, and Climate Action Plan goals with increased emphasis on equity and serving areas with the greatest needs. The Improvements Program has identified proposed improvements at the Rose Creek bike path, Fiesta Island Causeway, and the Ocean Beach bike path, which are all identified as existing facilities in the 2013 Bicycle Master Plan and in the State of the Network report (Fehrs & Peers 2025) released for the BMPU in March 2025. Future implementation of improvements at these bike paths would conform with the BMPU once adopted by the City, anticipated in 2026.

1.6.7 City of San Diego Draft Coastal Resilience Master Plan

The Draft Coastal Resilience Master Plan is an implementation action of Climate Resilient SD and identifies potential nature-based solutions that allow the City to adapt to the impacts of SLR for locations along San Diego's coastline, including concept-level designs for six locations in the City. The purpose of the Coastal Resilience Master Plan is to prepare the City to adapt to SLR through the implementation of nature-based solutions where feasible. The main objectives are (1) prioritizing nature-based climate change solutions wherever feasible, consistent with Climate Resilient SD Policy TNE-3, (2) addressing the effects of SLR and coastal flooding while leveraging additional co-benefits of nature-based solutions, (3) protecting and enhancing critical coastal habitat and associated wildlife from the impacts of climate change, (4) protecting and enhancing recreational opportunities, (5) protecting historical/archeological/tribal cultural resources and incorporating Indigenous Knowledge into resilience efforts and adaptation strategies, and (6) increasing coastal access for all, especially Communities of Concern.

The Improvements Program seeks to implement these objectives whenever possible. In particular, the Coastal Resilience Master Plan proposes two concepts for Mission Beach: a sand dune concept (D-1) for Mission Beach, bounded by Ventura Place to the north and San Fernando Place to the south, and a perched beach concept (D-2) which swaps out grass at Mission Beach Park for a perched sand beach. These improvements would be contiguous with the seawall bulkhead improvements on Mission Beach identified under the Improvements Program. It should be noted that the Coastal Resilience Master Plan is a draft and has not been adopted by the San Diego City Council. As such, it is subject to changes in the future.

1.6.8 City of San Diego South Shores General Development Plan

The South Shores area of Mission Bay Park is an approximately 91-acre site located on the northern San Diego River levee between the San Diego River to the south and Fiesta Island to the north. Interstate 15 bounds the area to the east, and SeaWorld San Diego bounds the area to the west. Existing facilities and land use within South Shores include a boat launch, restroom, parking lot, walking paths, a gazebo, beach, and natural habitat areas. South Shores Park is also home to the Silent Electric

Flyers of San Diego, a radio-controlled aircraft flying club. South Shores is also the site of a former landfill operated from 1952 to 1959, which underlies much of the South Shores land area. The City initiated work on a revised GDP for South Shores in Fall 2023 to identify new amenities and maximize land use of the undeveloped areas of South Shores Park. Two community workshops were held, one in 2023 and one in 2024 to seek feedback from the public on suggested amenities and land use designations to be refined in a draft GDP. Potential amenities identified for the South Shores area include retaining the existing facilities, expanding bike and walking paths, additional restrooms, a new boat and ski club building (as recommended in the approved De Anza Cove amendment), a secondary vehicle entrance at Friars Road, habitat/open space areas, expanded beach, additional pavilion/picnic space, and open grass areas. The South Shores GDP is funded through the Improvement Fund, and recent concerns from the Oversight Committee regarding the feasibility of constructing an approved GDP, considering limitations posed by the closed landfill, have slowed progress on the GDP.

The Improvements Program recommends upland restoration within approximately 52 acres of the currently undeveloped portions of the South Shores area. This recommendation is based on maximizing the habitat restoration potential within the South Shores area. As the PER only analyzed a conceptual restoration design, additional analysis will be needed prior to implementation on what additional measures and/or design features will need to be implemented to prevent impacts from the landfill's hazardous materials on the surrounding environment, particularly water quality. As progress on the GDP continues, the public will have an opportunity to consider the recommendations of the Improvements Program to maximize habitat restoration within South Shores while retaining the existing developed area. If the public is in favor of incorporating the recommendations of the Improvements Program into the South Shores GDP, the PER and draft habitat restoration plans can serve as the baseline for a revised draft GDP. If any habitat restoration areas are retained in the draft GDP, the PER and draft habitat restoration plans can serve as the basis of design for these areas.

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Core Program Elements

The City of SAN DIEGO

2 Core Program Elements

The identification of core Program elements was guided by the priorities identified by City Charter Section 55.2 and mandated by San Diego voters. Section 55.2(c)(1) of the City Charter directs the City to authorize and proceed with projects to address the identified priorities in a specified order, unless a situation arises as defined in Section 55.2(c)(2) that would allow multiple projects to proceed concurrently. The order in which core program elements are discussed in the following chapter is consistent with the order of implementation directed by the City Charter. The first priority identified in Section 55.2(c)(1) is the restoration of navigable waters within Mission Bay Park and elimination of navigational hazards (City Charter Section 55.2[c][1][A]). This effort was completed by the City in 2018. This Program addresses the remaining priorities in this City Charter Section (B-E).

PER's have been prepared for all core Program elements and provide additional detail on the recommendations for each element including equipment needs, preliminary cost estimate to construct, dimensions and cross-sections, and data on existing conditions. This chapter provides a summary of the primary components and recommendations from the PER's. The full PER for each element can be found in Appendix X of the Implementation Framework.

2.1 Wetland Restoration and Water Quality Improvements

The purpose of the wetland restoration element is to improve water quality in Mission Bay while also providing expanded wildlife habitat areas that will offer enhanced aquatic recreation opportunities. Wetland restoration is a proven method of improving water quality by restoring the natural filtering processes that occur when water flows through transitional wetland vegetation. Restoring wetlands to improve water quality and expanding coastal habitats has been a priority for Mission Bay Park for over 20 years.

A similar approach was taken for the design of all the wetland restoration sites, consisting of North Fiesta Island, Cudahy Creek, and Tecolote Creek (and Fiesta Island Causeway) (see Figure 3, Wetlands and Water Quality Improvement Elements). An analysis of water levels, primarily tides with episodic stormflows, was done with a 2D numerical model developed by the U.S. Army Corps of Engineers called AdH. The model quantifies high and low water levels over time and space and specifies water circulation patterns, as well as the elevation ranges required for each marsh habitat type that can serve as the basis for preliminary grading plans. Hydrologists can then collaborate with wetland biologists to design transitional habitat types that provide the habitat diversity that maximizes water quality and wildlife benefits consistent with the intended outcome. The PER drawings consist of preliminary grading and concept plans with cross-sections including earthwork quantities, potential staging, stockpiling, ingress/egress, and elevation ranges for each habitat type and desired areas; planforms of channels, marsh, and interior slopes in a configuration that meets City objectives.

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2.1.1 North Fiesta Island

PROJECT DESCRIPTION

The MBPMP identifies North Fiesta Island as one of several locations for the restoration of tidal wetlands, which balance the need for mitigation, water quality, flood control, aquatic recreation, and public safety (City of San Diego 2021a). North Fiesta Island represents the northern reach of Fiesta Island and is situated in East Mission Bay (see Figure 3) and located adjacent to three other major wetland restoration projects. A CLT Preserve is adjacent to the site to the north, and to the south of the site is a kelp drying and sand maintenance/storage area. Fiesta Bay surrounds both the east and west sides of the site and is a recreational and open water area with public beaches for swimming, wading, and water sports. The beach area is popular for picnics and dog runs.

PRELIMINARY DESIGN PROJECT COMPONENTS

The proposed project would enhance ecological function and habitat diversity on approximately 77 acres of North Fiesta Island through strategic site grading to restore wetland habitats and wetland hydrology, including several channels, as well as cross-channel bridge accesses and fencing. By lowering the interior high elevations, the project would convert existing non-native upland areas into a range of salt marsh habitat types. The grading design introduces a primary west–east tidal channel and several secondary north–south channels, which will distribute tidal waters and nutrients throughout the marsh system (Figure 4, North Fiesta Island Wetland). These hydrologic modifications will support a gradient of habitats, including subtidal eelgrass beds, mudflats, low, mid, and high marsh and also include a transitional wetland area to accommodate marsh migration under future SLR.

Improved water quality is a key benefit of the proposed wetland restoration. Portions of Mission Bay circulation and upland runoff from Fiesta Island will be directed into the restored wetland, supporting sediment capture, infiltration, and filtration. The newly created tidal channel connecting the east and west sides of the island will reduce water residence times and improve flushing, enhancing circulation in Mission Bay. Such hydrologic improvements are expected to bolster the health of eelgrass beds, support fisheries, and enhance food sources for species like the endangered CLT and other shorebirds that rely on microbenthic invertebrates.

To facilitate access, two bridges are proposed: one connecting the CLT Preserve to Fiesta Island Road for maintenance only, and another seasonal public bridge along the east side of the road. The bridges will span the new main channel and connect North Fiesta Island to Central Fiesta Island, with public access permitted outside the CLT breeding season on the east and restricted access for researchers and maintenance on the west.

To prevent unauthorized access, a chain-link fence no higher than 6 feet high would be installed around the CLT Preserve and restored wetland areas.

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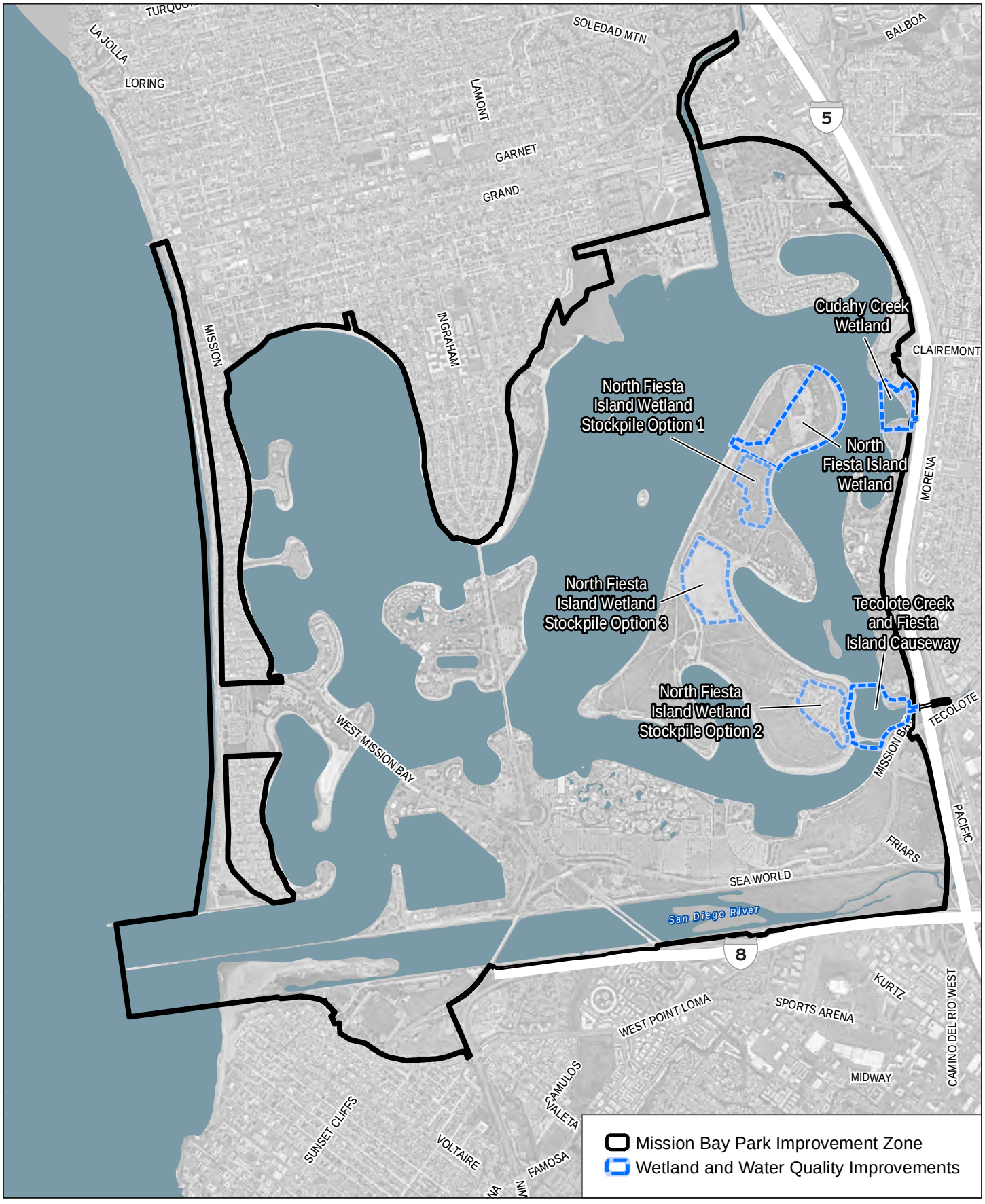

SOURCE: SANGIS 2023

0 900 1,800 Feet

FIGURE 3

Wetlands and Water Quality Improvement Elements

Mission Bay Park Improvements Program

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LEGEND

WETLAND ELEV RANGE (FEET, NGVD) HABITAT

- -6.0 – -3.8 ..... SUBTIDAL / EELGRASS
- -3.8 – 1.2 ..... MUDFLAT
- 1.2 – 2.0 ..... LOW MARSH
- 2.0 – 3.8 ..... MID MARSH
- 3.8 – 4.4 ..... HIGH MARSH
- 4.4 – 6.4 ..... TRANSITIONAL
- 6.4 – 18.0 ..... UPLAND

NOTES

1. All Elevations Are In Reference To Ngvd 29 Vertical Datum.
2. Construction Phasing Summary:
   Phase 1: vehicular access road and future bridge connection
   To least tern preserve, least tern preserve work, grading/earth work
   Phase 2: sub-tidal channel connection to the bay. A portion of
   The new vehicular access road that connects the least tern
   Preserve to north fiesta road will be replaced with a bridge structure.
3. All construction slopes are 3:1 (feet horizontal : feet vertical)
   Unless otherwise noted.

- Sand (Least Tern Preserve And Beach)
- Roadway
- Proposed Bridge
- Project Boundary
- Phase 1 Construction Boundary
- 5 Existing Contour
- 5 Proposed Contour
- Existing Road
- Existing Chain Link Fence
- Existing Fire Pit/Miscellaneous
- Existing Power Pole
- Proposed New Roadway
- California Coastal Commission Approved Boundary
- Temporary Fence For Least Tern Preserve

SOURCE: SANGIS 2023

0 275 550 Feet

FIGURE 4

North Fiestal Island Wetland

Mission Bay Park Improvements Program

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CONSTRUCTION APPROACH AND NEEDS

Construction activities will take place primarily in dry conditions and outside the avian breeding season using conventional earthmoving equipment, which is feasible even for the large volume of material to be excavated due to the site's relatively high elevation above groundwater. The average site elevation is approximately 11.2 feet National Geodetic Vertical Datum of 1929 (NGVD 29), while the proposed wetland's average elevation is +2.1 feet NGVD 29, well above the mean tide level of +0.43 feet NGVD 29, which approximates the groundwater level. Although some lower elevations occur near channel inverts, most excavation can occur without dewatering, allowing for increased efficiency and shorter construction durations compared to wet excavation methods. The total excavation volume is estimated at 762,500 cubic yards.

The design involves connecting the restored wetland to Mission Bay via open tidal channels, requiring bridging via pre-cast bridge structures to expedite installation while preserving ecological function. While bridges are the preferred option, another option includes culverts for consideration. Installation is estimated within the 6-month construction window.

Construction access would primarily occur via the Fiesta Island Causeway from East Mission Bay Drive. Land-based equipment will mobilize across the causeway, while water-based equipment may arrive either via the causeway or by barge from elsewhere in Mission Bay. The contractor will propose storage and staging areas, subject to City approval. These areas may be located on disturbed upland habitat adjacent to the site or on barges over water, ensuring flexibility in logistics while minimizing environmental impacts.

SEA LEVEL RISE CONSIDERATIONS

The North Fiesta Island Wetland Restoration project incorporates the most current SLR science as outlined in the State of California Ocean Protection Council Sea-Level Rise Guidance (OPC 2018). The potential impacts of SLR are particularly relevant to Mission Bay, where several low-lying areas have already been identified as vulnerable in the City's vulnerability assessment. These risks are carefully considered in the wetland restoration design, including the migration of existing wetland habitats either upward in elevation or inland, depending on the availability of suitable adjacent land and tidal influence. As part of the project's adaptive planning efforts, Still Water Levels under both current and future SLR scenarios have been modeled to understand changes in tidal elevation and their influence on habitat zones and public access. This information provides a foundation for designing resilient habitat systems that can persist and evolve in response to rising sea levels over the coming decades.

MAINTENANCE AND MONITORING REQUIREMENTS

Operations and maintenance will be essential for the long-term functionality of the restored wetlands. Key maintenance tasks are expected to include trash and debris removal, weed management in the transitional habitat areas and adjacent CLT Preserve, routine channel upkeep, perimeter fence repair, and ongoing SLR adaptive management. These maintenance actions should be carried out regularly to ensure that habitat functions are sustained at an optimal level for ecological success.

If culverts are used instead of bridges, they will require periodic inspection and maintenance to ensure that tidal flow is not obstructed. The frequency of inspection and cleaning will depend on specific site

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conditions, such as the accumulation of floating debris, biofouling by marine organisms like mussels, and potential vandalism. Annual inspections are recommended, with more frequent cleanings as needed. Maintenance should focus on ensuring clear culvert openings and continuous tidal exchange by monitoring water levels within the wetland. If marine biofouling interferes with water conveyance, it may be necessary to remove it manually or with power washing equipment. This is particularly important during the early phases of wetland restoration, when nutrient mobilization can lead to rapid biofouling growth. Over time, continued tidal flushing reduces nutrient levels and minimizes the persistence of fouling organisms.

A monitoring program should be implemented both before and after construction to document changes to baseline site conditions over time. This program should be integrated with ongoing research and restoration monitoring efforts in Mission Bay, including work conducted by local universities and in coordination with the Southern California Wetlands Recovery Project's Science Advisory Panel. Monitoring will be necessary for the life of the project and should include tracking tidal elevations, salt marsh biomass, water quality, and overall habitat distribution and condition.

In the event of degraded habitat conditions or compromised hydrology, corrective actions should be implemented through adaptive SLR management. Such actions may include localized grading, invasive species removal and native plant replanting, installation of predator control measures, or modifications to culvert infrastructure. Over time, additional strategies like thin-layer sediment augmentation may be needed to maintain appropriate elevation-to-tide relationships and preserve the desired diversity and functionality of marsh habitats.

2.1.2 Cudahy Creek Wetland

PROJECT DESCRIPTION

The Cudahy Creek Wetland Restoration Project is located along the eastern shoreline of Mission Bay in the City of San Diego, California, situated between Leisure Lagoon and Mission Bay Drive (see Figure 3). The project area, known as Cudahy Creek Cove, is an open water body measuring approximately 5 acres. This initiative proposes the restoration and creation of approximately 5.2 acres of salt marsh habitat within the cove, aligning with the goals of the MBPMP, which designates the Cudahy Creek region as one of three priority areas for tidal wetland restoration. As part of the project planning, hydrologic inputs into Cudahy Creek Cove are being considered, including flows from two stormwater systems. These inflows will inform the design of the restoration approach and support integration of the restored wetland into the surrounding landscape.

PRELIMINARY DESIGN PROJECT COMPONENTS

The Cudahy Creek Wetland Restoration Project involves a series of integrated design components aimed at improving water quality, restoring habitat, and enhancing public amenities within Mission Bay. Key features include the creation of low and mid salt marsh areas, a berm to separate the wetland from open water, oyster bags for slope stabilization and water filtration, and subtidal channels to manage tidal flows and stormwater (see Figure 5, Cudahy Wetland). The marsh areas are designed to treat both stormwater and bay water through natural filtration processes facilitated by wetland vegetation and soils. The oyster bags placed along the outer fill slope will aid in stabilization and serve ecological functions by fostering oyster growth, which contributes to nutrient removal and water

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clarity. While these bags may restrict some recreational activities in close proximity, their overall benefit to water quality supports aquatic ecosystems and recreational use more broadly. Public signage will help to ensure safety and foster environmental awareness.

The proposed subtidal channels connect two storm drain outfalls to Mission Bay and are designed to accommodate both tidal flows and stormwater runoff. The geometry of the channels, with a bottom width of 11 feet and 3:1 side slopes, allows for effective water conveyance and wetland inundation. During high tides, the channels will facilitate the inflow of bay water into the salt marsh, while during low tides, they will enable the outflow of water, promoting circulation essential to wetland health. Riprap stabilization is proposed at critical points, including the outlets and the channel's terminus at Mission Bay, to prevent erosion and maintain the integrity of the system. A combination of riprap and hydraulic modeling has been used to refine channel geometry, ensuring optimal stormwater routing and minimizing the need for additional armoring. The tidal dynamics, along with the channel configuration, are expected to enhance the treatment of runoff and provide significant water quality benefits.

The wetland restoration design incorporates approximately 3.3 acres of low salt marsh, 1.4 acres of mid salt marsh, and a 12-foot-wide transitional zone, with elevations strategically selected to optimize inundation and pollutant filtering. A 20-foot-wide berm at an elevation of 1.5 feet NGVD 29 serves as a structural and functional barrier to help retain water within the wetland system during moderate tidal events, thereby maximizing filtration. An additional low salt marsh is included on the berm itself. A gently sloped oyster bag area extends from the berm into Mission Bay, matching existing bathymetric conditions and supporting oyster habitat. The wetland is expected to be inundated about 27% of the time based on historical tidal data, allowing frequent interaction between bay and wetland waters. This interaction supports pollutant removal and ecological resilience, although specific pollutant removal rates for the Cudahy site will require further monitoring and analysis. Excavated soils from other Mission Bay projects may be repurposed to construct the wetland, further improving sustainability and habitat compatibility.

CONSTRUCTION APPROACH AND NEEDS

The construction of the Cudahy Creek Wetland Restoration Project is ideally scheduled during the dry season to minimize complications from rain events and stormwater discharges. This timing ensures drier ground conditions, which are essential for heavy machinery operations and material placement. Construction would also primarily occur outside the avian breeding season (January–September). Accessing the project site will require both land- and water-based equipment due to the project's proximity to Mission Bay. Barges will be necessary for work on the western side of the site, particularly the berm area and subtidal channel confluence, while land-based machinery will access the site via East Mission Bay Drive. Equipment and materials may be staged in an existing parking lot north of the site. The construction process involves importing approximately 58,000 cubic yards of soil, which would take an estimated 91 working days if performed efficiently.

Construction will rely on a range of heavy machinery tailored for both terrestrial and aquatic conditions. This includes scrapers, excavators, bulldozers, front-end loaders, off-road trucks, and a barge. To enhance construction efficiency and reduce costs, the project may coordinate with nearby Mission Bay restoration efforts, such as Tecolote Creek and North Fiesta Island. These projects can be grouped under a common contract to strategically balance cut and fill requirements across all sites. Specifically, the North Fiesta Island Wetland Restoration project offers a surplus of suitable material,

which can be redirected to Cudahy Creek. The efficient integration of these material sources would streamline construction and support the project's ecological objectives.

Post-construction efforts will focus on protecting the sensitive new wetland habitat through limited public access. Informative signage and fencing along the wetland perimeter will help restrict intrusion, such as trampling, and foster public understanding of the restoration effort. Ongoing maintenance will involve tasks such as trash and weed removal, signage upkeep, channel inspections, and adaptive management in response to SLR. Regular inspections, expected monthly or semi-annually, will assess vegetation health, sediment levels, and overall habitat condition. Although some sediment deposition is expected from urban runoff, calculations indicate that significant sediment accumulation would not occur for decades.

SEA LEVEL RISE CONSIDERATIONS

Salt marsh restoration at Cudahy Creek aims to establish a low salt marsh at elevations between 0.9 and 1.1 feet, providing a degree of resilience to SLR estimated between 0.6 and 0.8 feet. This elevation strategy is intended to accommodate moderate SLR while supporting the long-term viability of the marsh ecosystem.

The project evaluates two SLR scenarios for 2100: 3.6 feet (17% probability) and 7.0 feet (0.5% probability). Under 3.6 feet of SLR, the restored area would experience frequent tidal inundation, reducing low marsh habitat and increasing mudflat and subtidal areas unless adaptive measures are implemented. At 7.0 feet, nearly the entire site would convert to subtidal and mudflat habitat without intervention. Storm-driven sediment deposition may help offset some SLR effects, but actual accumulation depends on storm intensity, watershed erosion, and tidal timing. Long-term adaptive strategies such as regrading or thin-layer sediment additions may be necessary starting between 2050 and 2100 and continuing beyond, to sustain marsh elevation and ecological function at Cudahy Creek.

MAINTENANCE AND MONITORING REQUIREMENTS

Maintenance and monitoring are essential components to ensure the long-term success and ecological functionality of the Cudahy Creek wetland restoration. Regular operations and maintenance will focus on several key activities, including trash removal, management of public access through signage and barriers, weed control in transitional habitats, upkeep of tidal channels, and adaptive management in response to SLR. Maintenance inspections are expected to occur frequently, such as on a monthly basis, primarily to remove any trash and to assess the general health of the vegetation. More comprehensive inspections, including vegetation surveys and sedimentation assessments, may take place annually or biannually to monitor wetland conditions.

Sedimentation is anticipated within the restored wetland, but it is not expected to require routine removal since the system is designed to accommodate natural sediment accumulation from watershed runoff. Based on preliminary sediment calculations, approximately 710 cubic feet of sediment may be deposited annually in the 3.7-acre low salt marsh, translating to roughly 3 inches of sediment over 30 years. Maintenance to remove sediment would only become necessary if accumulation reaches about 1 foot, which could start to negatively impact wetland vegetation and function. The restoration design incorporates subtidal channels with widths intended to reduce sediment buildup and maintain efficient flood conveyance, thereby minimizing the risk of detrimental sedimentation.

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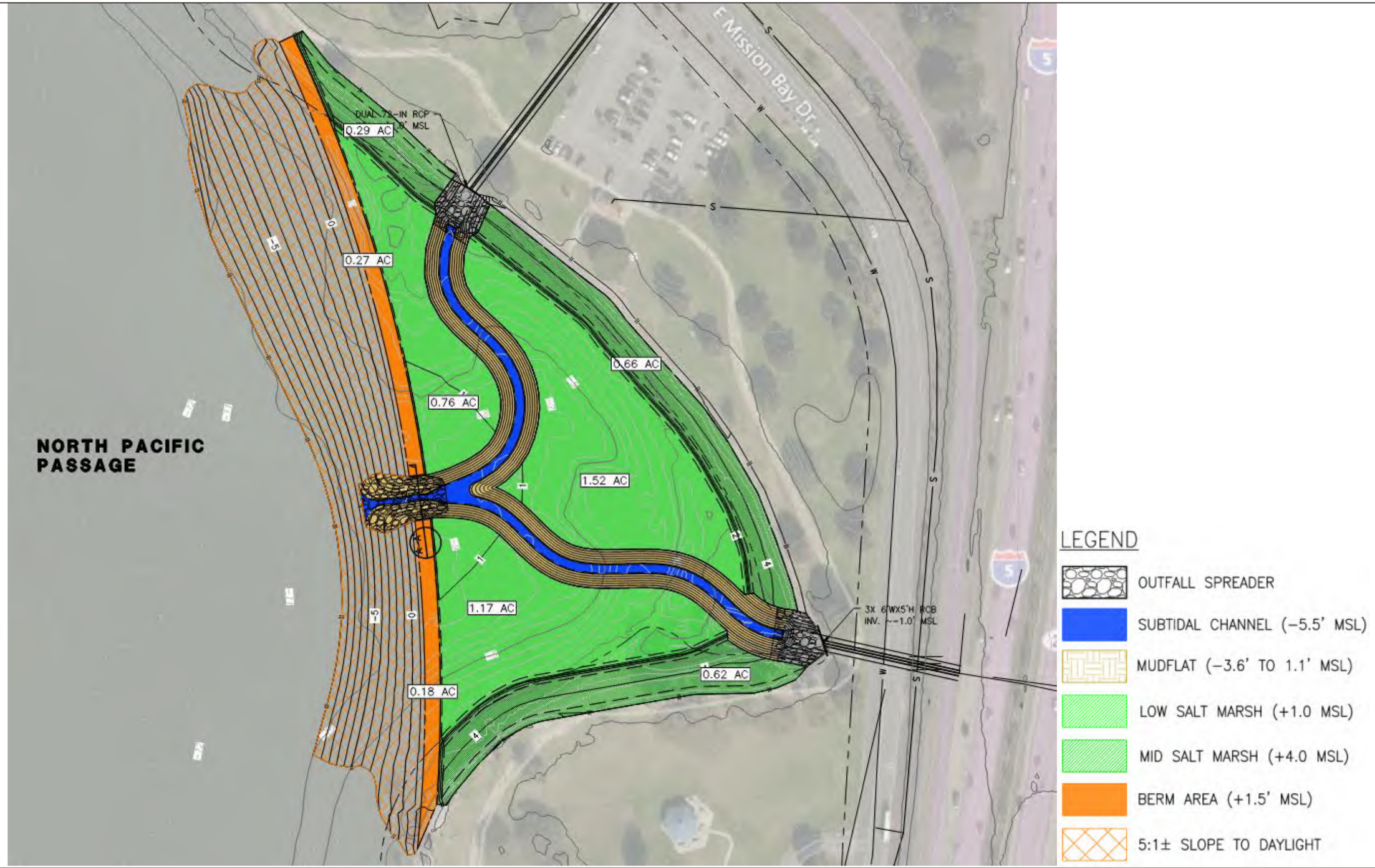

SOURCE: RICK Engineering. 2024. Preliminary Engineering Report Cudahy Creek (Leisure Lagoon) Wetland Restoration

FIGURE 5

Cudahy Wetland

Mission Bay Park Improvements Program

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A robust monitoring program will track the condition of the wetland before and after construction. This monitoring program should be coordinated with ongoing research efforts in Mission Bay and regional monitoring initiatives led by scientific advisory groups. Monitoring activities will focus on parameters such as tidal elevations, water quality, habitat condition, and species distribution, and should continue throughout the project's lifetime. Effective post-construction access control will reduce human disturbance, allowing plant communities to mature and reducing maintenance demands. If habitat degradation, hydrological changes, or sediment issues arise, adaptive management strategies—including minor grading, replanting, and adding thin layers of sediment—will be implemented to maintain suitable marsh elevations and support diverse habitat types despite evolving environmental conditions.

2.1.3 Tecolote Creek and Fiesta Island Causeway

PROJECT DESCRIPTION

The Tecolote Creek Wetland Restoration is part of the broader Mission Bay Park restoration efforts identified in the 2002 MBPMP Update, which calls for enhancing tidal wetlands to improve water quality, flood control, habitat, and recreation. Located at the southeastern edge of Mission Bay in San Diego (see Figure 3). The project aims to restore coastal salt marsh habitat and improve tidal circulation and water quality, especially in the eastern portion of the bay, which suffers from degraded conditions due to limited circulation and contaminant input from Tecolote Creek.

The restoration design includes reconfiguring the Fiesta Island Causeway, proposing an open channel or culvert connection to promote better tidal exchange. The project area is characterized by low-lying and upland artificial fill, with only narrow remnants of marsh habitat currently present. Restoration at Tecolote Creek would significantly enhance ecological function in an area now dominated by degraded urban runoff conditions. While listed in the City Charter priorities as two locations because of the overlap and direct interaction of these two components (Tecolote Creek and Fiesta Island Causeway), a single combined design PER was developed.

PRELIMINARY DESIGN PROJECT COMPONENTS

The proposed improvements include two primary components: the modification of the Fiesta Island Causeway to improve tidal circulation in Mission Bay and the restoration of approximately 12 acres of wetlands habitat at the mouth of Tecolote Creek (see Figure 6, Tecolote Creek Wetland [and Fiesta Island Causeway]). The current proposal recommends creating an open channel to establish a direct hydraulic connection between the north and south basins. The conceptual channel would be 20 feet wide at the base, with 3:1 side slopes and an invert elevation of -6 feet NGVD 29. A bridge, approximately 100 feet long and 60 feet wide, is proposed to span the channel and maintain vehicle access. Alternatively, a two-way culvert may be considered, but it is less favorable due to potential limitations in tidal flow, safety, and wildlife movement. If pursued, the culvert would match the same base and top elevations as the open channel and provide a maximum width of 20 feet.

In addition to the causeway modification, the project proposes wetland restoration by creating a coastal salt marsh habitat through earthwork in the Tecolote Creek mouth. Sediment excavated from existing slopes will be used to raise site elevations, converting subtidal and beach areas into a mix of salt marsh habitats ranging from subtidal zones to mudflats, low, mid, and high marshes.

These wetlands will be constructed along three shorelines of the Tecolote Creek Wetland, with a sloped gradient connecting to existing upland areas. Tidal hydrology will be driven by ocean tides, with water levels fluctuating accordingly, and seawater conveyance will support marsh diversity. Freshwater pulses from Tecolote Creek during stormflows will further enhance habitat diversity near the creek mouth. A specially designed bulbed area at the mouth of the creek will help retain freshwater and improve marsh habitat quality.

The proposed design introduces a 20-foot-wide open channel through the existing Fiesta Island Causeway, significantly improving tidal circulation between the Tecolote Creek Wetland and South Fiesta Island. This improvement reduces residence time in the wetland by approximately 6 days. This enhanced circulation is expected to improve water quality, potentially expanding eelgrass beds and supporting habitat for species such as the endangered CLT, as well as microbenthic invertebrates critical for shorebird foraging.

Extreme storm flood conditions were simulated to assess peak hydraulic impacts from a 100-year fluvial event under two scenarios: discharge occurring at the lowest and highest observed tides. Overall, the proposed wetland design improves tidal connectivity, reduces residence time, enhances water quality, and withstands extreme hydrologic events, while supporting robust intertidal habitat formation and long-term resilience.

CONSTRUCTION APPROACH AND NEEDS

Construction of the Tecolote Creek Wetland Restoration and Fiesta Island Causeway Project is anticipated to occur primarily in dry conditions outside the avian breeding season using conventional earthmoving equipment. Approximately 169,200 cubic yards of material will be placed into the proposed wetland footprint at the current location of the Tecolote Creek mouth and East Mission Bay. This fill could be sourced from the North Fiesta Island Wetland Restoration project, which has an estimated surplus of 315,000 cubic yards of material. Trucks would haul the material from the stockpile to the restoration site, where it would be placed by off-road trucks, bulldozers, front-end loaders, and excavators. The placement process would begin from the edges of the site and move inward. A turbidity boom would be installed along the western project boundary to prevent sediment disturbance in East Mission Bay. If necessary, an internal construction road network would be established, and excavation equipment would be positioned to redistribute the material and shape the site according to the proposed grading plans. With efficient work and daily delivery volumes reaching 2,500 cubic yards, the construction phase could take approximately 90 calendar days.

The bridge would be constructed using cast-in-drilled-hole piles, pre-cast concrete girders, and a cast-in-place concrete deck, and could be installed one segment at a time to maintain traffic access with the use of flaggers. Alternatively, culverts could be installed through excavation and placement, although they present hydraulic limitations and potential safety concerns. Construction equipment needed for the bridge or culvert installation would include a crane, drill rig, concrete pump, and additional excavators or dredging equipment.

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SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Tecolote Creek Wetland Restoration & Fiesta Island Causeway

FIGURE 6

Tecolote Creek Wetland (and Fiesta Island Causeway)

Mission Bay Park Improvements Program

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SEA LEVEL RISE CONSIDERATIONS

As sea levels increase beyond 3.6 feet, the site is expected to lose mid and high marsh zones, leading to a predominance of mudflat and subtidal habitats. Additionally, the performance of the proposed tidal culvert may diminish over time, as higher sea levels alter tidal exchange dynamics between the northern and southern portions of East Mission Bay. To guide planning, the project evaluates two SLR scenarios through the year 2100—3.6 feet and 7.0 feet, and expected shifts in habitat types under these SLR scenarios indicate clear trends toward habitat submergence and conversion.

Under the 3.6-foot SLR scenario, most of the project site would experience frequent tidal inundation. This would significantly alter the wetland's composition: high, mid, and low marsh habitats would decline, and mudflat and subtidal areas would expand. Without adaptive intervention, such as filling or elevating key portions of the site, the wetland would predominantly transform into a mudflat with remnant tidal channels. Although some vegetation could persist at the base of dune features, where elevations are naturally higher, allowing patches of vegetated marsh to survive. The dune areas are projected to shift into transitional wetland or upland habitat. In the more extreme 7.0-foot SLR scenario, nearly the entire site becomes submerged, with only narrow fringes of salt marsh remaining along earthen slopes. Without site elevation increases or engineered adaptation, the entire wetland is expected to transition into subtidal zones and extensive mudflats, significantly altering its ecological character and function.

To counter these impacts and preserve habitat diversity into the next century, several adaptation strategies are proposed. These include modifying the initial design to incorporate higher ground while reducing lower elevation zones, allowing the wetland to migrate upward over time. Another preferred method is thin-layer sediment augmentation, similar to the 2016 pilot project at Seal Beach Naval Weapons Station, which would raise marsh plains incrementally to maintain suitable elevation ranges for marsh vegetation. Alternatively, a muted tidal system with tide gates could be implemented to artificially control tidal influence, though this approach is less desirable due to its reliance on long-term structural maintenance. Regardless of the method, adaptive management will likely be necessary between 2050 and 2100, and potentially beyond 2100, to sustain the long-term viability of vegetated marsh habitat at Tecolote Creek Wetlands.

MAINTENANCE AND MONITORING REQUIREMENTS

Ongoing operations and maintenance will be essential to ensure the long-term ecological function and resilience of the restored Tecolote Creek Wetlands and the Fiesta Island Causeway culvert system. Routine activities will include trash and weed removal, particularly in transitional habitat areas, channel and culvert maintenance, and perimeter fence repairs. Additionally, adaptive management to respond to SLR will be critical over the life of the project. Maintenance efforts should be conducted on a regular basis to sustain high-functioning habitat conditions. The culvert at Fiesta Island Causeway, if installed, will require routine inspection to ensure it remains free of obstructions such as floating debris, mussel growth, or damage from vandalism. Annual inspections are recommended, with cleaning performed as necessary to maintain effective tidal flow and wetland hydrology.

If marine fouling communities (e.g., mussels or algae) develop inside the culvert, they may impede water flow and require removal. Cleaning may be conducted using hand tools or power washing, but only when necessary to preserve hydraulic function. During the early stages of wetland restoration,

nutrient mobilization can temporarily stimulate biofouling growth in culverts; however, ongoing tidal flushing typically reduces nutrient concentrations and the associated fouling. Monitoring for these conditions will be part of the adaptive management response. Proper function of the culvert, including verification of tidal connections and water level monitoring, should be documented to ensure long-term viability of the wetland's hydrologic regime.

A comprehensive monitoring program will also be necessary to track ecological conditions over time. This monitoring should be coordinated with existing wetland studies in Mission Bay, particularly those involving local universities and the regional framework developed by the Southern California Wetlands Recovery Project's Science Advisory Panel. Long-term monitoring elements may include tidal elevation measurements, water quality testing, habitat condition assessments, and habitat type mapping. If problems arise, such as compromised hydrology or loss of marsh vegetation, adaptive SLR management would be initiated. Adaptive strategies may involve minor grading, replanting, culvert modification, or thin-layer sediment augmentation to maintain suitable tidal elevations and support marsh diversity in the face of changing sea levels.

2.2 Shoreline Restoration

LOCATIONS AND PROJECT DESCRIPTIONS

This PER addresses 10 proposed shoreline restoration sites across Mission Bay. As part of the Improvements Program, eight sites were identified based on existing erosion issues, exposure to wave and tidal energy, and site-specific conditions. The PER provides conceptual alternatives and engineering recommendations tailored to each location. Restoration efforts are intended to address persistent erosion, adapt to SLR, and restore natural shoreline functions while supporting recreational and ecological uses.

The proposed shoreline restoration sites are distributed across Mission Bay and include the following eight locations (see also Figure 7, Shoreline Restoration Locations):

1. Bonita Cove
2. Ventura Cove Park
3. Vacation Island Southwest
4. Bahia Point
5. West Sail Bay
6. Crown Point
7. Vacation Island Northwest
8. Vacation Island Northeast

The conceptual design for each site was developed based on existing shoreline orientation, wave exposure, sediment conditions, recreational usage, and available space. Shoreline restoration techniques considered include traditional hard engineering (e.g., revetments, riprap, and seawalls), soft shoreline protection (e.g., beach nourishment), living shorelines (e.g., native vegetation and oyster reefs), and hybrid combinations of these methods.

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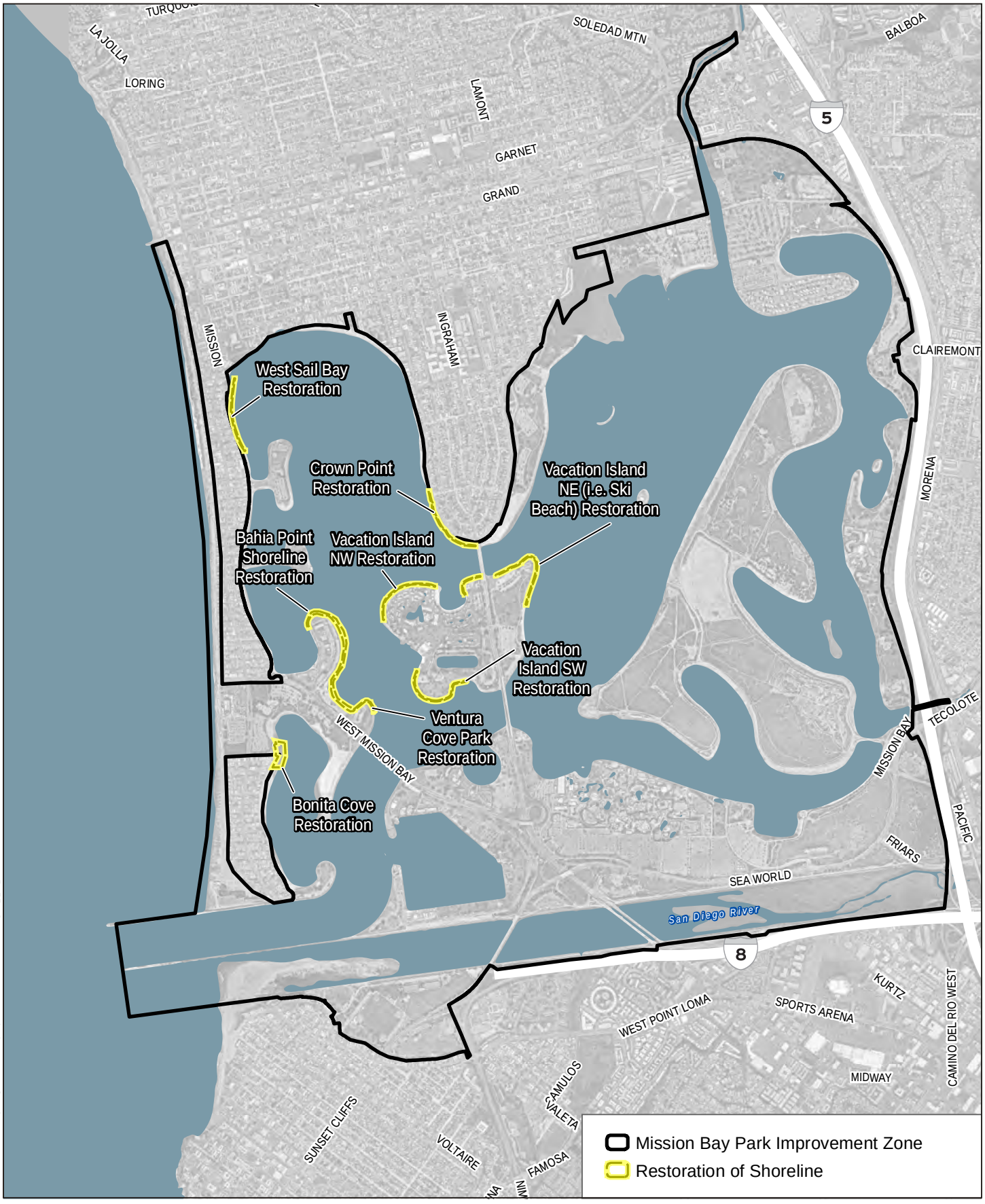

SOURCE: SANGIS 2023

FIGURE 7

Shoreline Restoration Locations

Mission Bay Park Improvements Program

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0 900 1,800 Feet

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PRELIMINARY DESIGN PROJECT COMPONENTS

Bonita Cove

Bonita Cove is located in the southwest corner of Mission Bay. It is an area composed of inland parks and residential parcels, existing and proposed recreational beaches, and open water. The shoreline in the northwest corner of Bonita Cove has historically eroded, especially in the area of the San Fernando Place headland.

The concept for Bonita Cove proposes to relocate the sidewalk and nourish the beach at the headland off San Fernando Place (Figure 8, Shoreline Restoration: Bonita Cove). Relocating the sidewalk up to 30 feet inland will alleviate the immediate coastal erosion threats of undermining infrastructure. A 100-foot-wide dry beach is proposed to advance the land at the San Fernando Place headland. If a large sand grain size can be identified for use in this project, the beach is expected to resist erosion for a longer period of time. This beach is anticipated to protect infrastructure and public access for years, but it will erode over time. In order to curb such erosion, a cobble berm is proposed at the toe of the beach nourishment. With the use of soft engineering materials, the berm is intended to lessen wave energy in a similar manner to a breakwater and hold the shoreline position in a similar manner to a revetment.

Ventura Cove Park

Ventura Cove Park is located on the western point north of the Mission Bay Drive bridge. This area has previously been armored; however, the armor only extends up to +2 to +3 feet NGVD 29. However, the rest of the park's shoreline remains exposed above +3 feet NGVD 29. Past research identified an approximate erosion rate of 4.6 feet per year at Ventura Cove, hypothesized to result from tidal currents and waves. Based on review of the available storm drain inventory data from the San Diego Geographic Information Source (SanGIS), the Ventura Cove Park restoration area has one storm drain outfall within its limits, however this storm drain is currently proposed for improvements as part of a separate effort by the City of San Diego and was therefore not analyzed as part of this project.

The Ventura Cove Park concept proposes to repair and improve the revetment at the shoreline (Figure 9, Shoreline Restoration: Ventura Cove). The riprap revetment would be repaired, and the crest would be raised to accommodate SLR. A footpath would be constructed parallel to the revetment crest to improve public access, with the added benefit of stabilizing the soil behind the revetment crest. This proposed concept includes oyster habitat improvements at the revetment toe, consisting of rocky substrate, oyster bags, and/or reef balls. In some cases, existing, undersized riprap can be reused for the creation of oyster habitat.

Vacation Island Southwest

The Vacation Island Southwest site is approximately 1,600 feet of shoreline armored with riprap and backed by bare soil, bonfire pits, and a footpath. Over 40% of the revetment is failing, losing upland soil, and is in need of repair. The crest elevation of the revetment varies over the site. Where the revetment is in good condition, the rock extends up to +5 to +6 feet NGVD 29. However, in the damaged areas, the rip rap only extends up to +3 to +4 feet NGVD 29. East of and adjacent to the

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site, the shoreline was repaired through revetment construction as a part of the Mission Bay Shoreline Protection Phase III.

Similar to previous adjacent repair, the Vacation Island Southwest concept proposes to repair and improve the revetment at the shoreline (Figure 10). The riprap revetment would be raised to accommodate SLR. The crest of the revetment would be buried by sand to create a recreational perched beach; the uplands behind the revetment would be improved with landscaping, benches, and improved bonfire facilities. The proposed concept includes oyster habitat improvements consisting of rocky substrate, oyster bags, and/or reef balls at the toe of the revetment. In some cases, existing, undersized riprap can be reused for the creation of oyster habitat.

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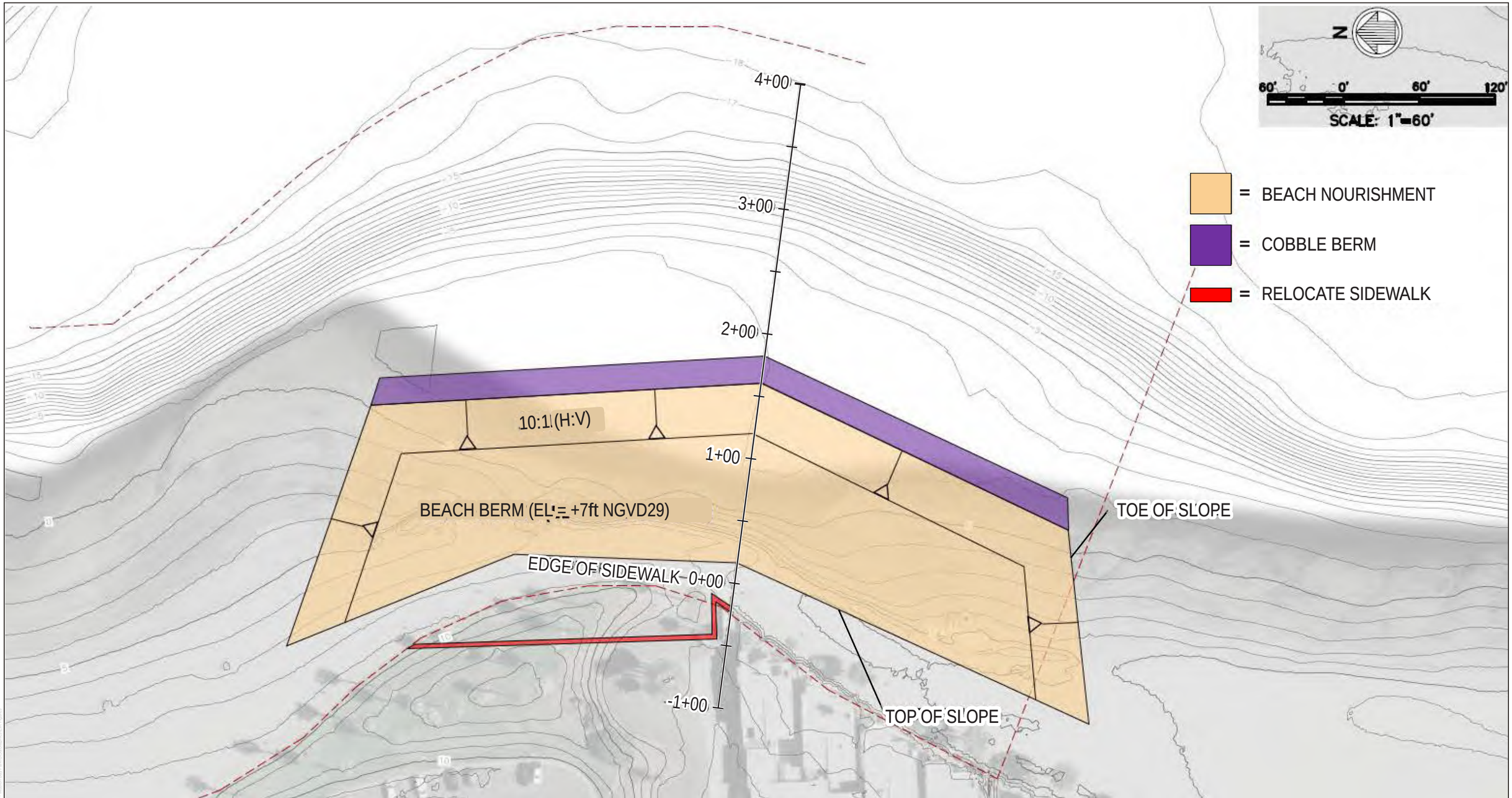

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 8

Shoreline Restoration: Bonita Cove

Mission Bay Park Improvements Program

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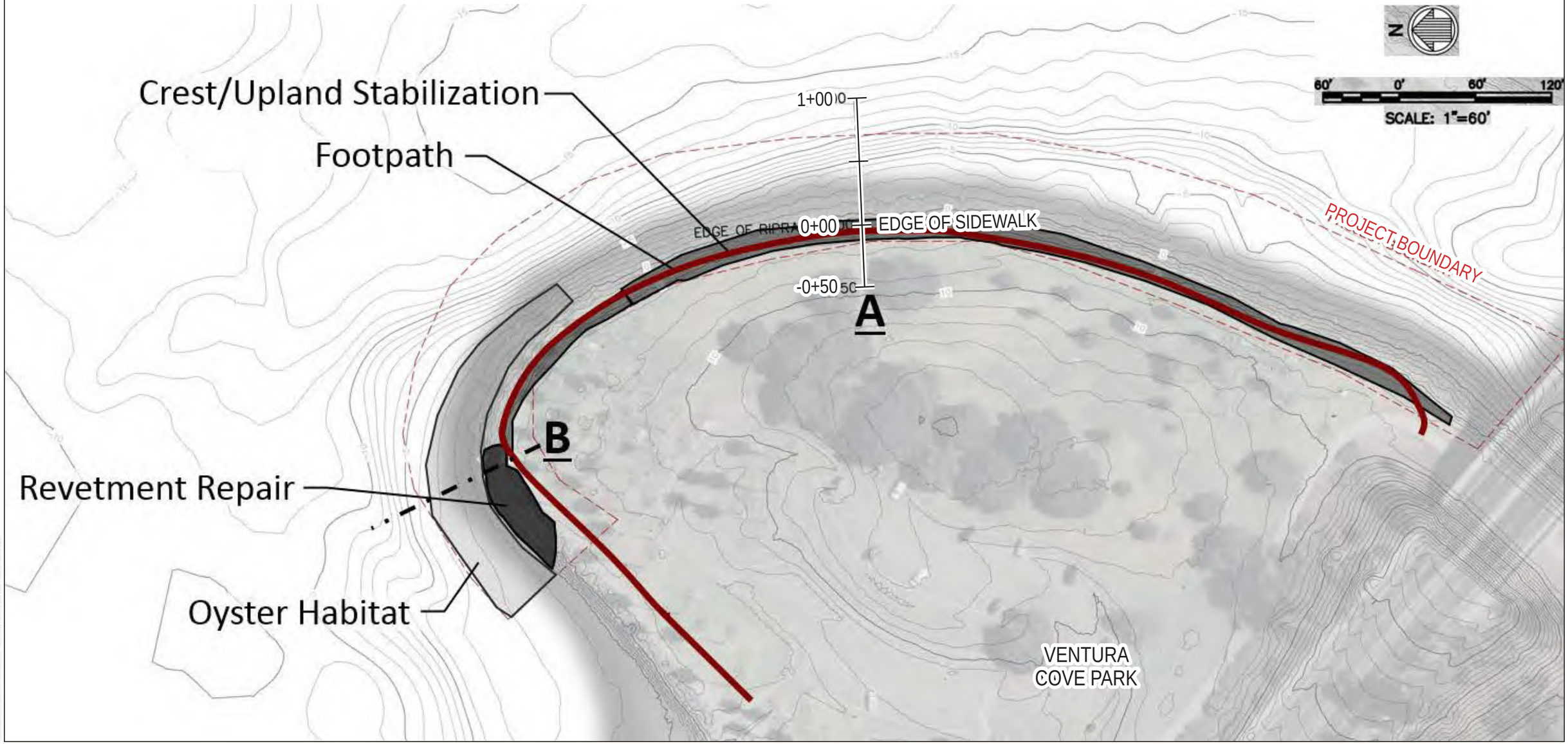

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 9

Shoreline Restoration: Ventura Cove

Mission Bay Park Improvements Program

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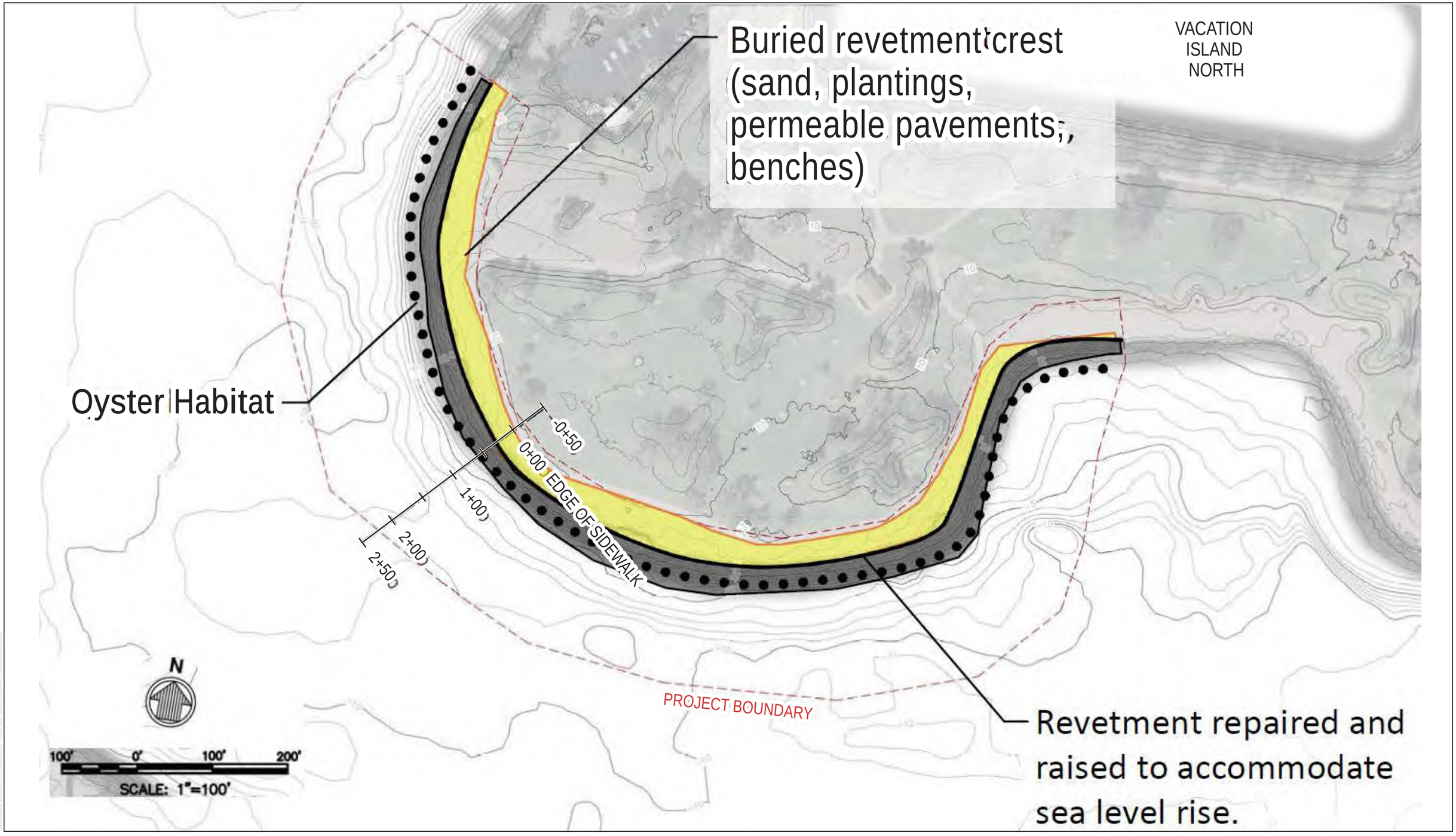

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 10

Shoreline Restoration: Vacation Island SW

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Bahia Point

Bahia Point is located in West Mission Bay, adjacent to the Bahia Hotel Resort, West Mission Bay Drive, Ventura Cove, and Ventura Cove Park. The restoration site was determined to encompass Bahia Point Beach and Ventura Cove Beach, an approximately 3,000-linear-foot strip of public space composed of parking lots, grassy park, and sandy beach along the entirety of the site. The shoreline is currently experiencing erosion and stormwater management issues and is projected to experience severe flooding under the projected SLR.

Key issues identified at the site are described below:

- Narrow beach along the northwest tip of Bahia Point. The upland park shows signs of minor erosion/undermining.
- Steep and narrow beach along the northeast tip of Bahia Point. Waves from West Sail Bay likely have caused severe erosion at this bay-facing point. Sediment alongshore transport is seen to occur persistently to the east and south.
- Steep and narrow beach along the east shore of Bahia Point. Sediment alongshore transport from the northeast point has built a wide, low-elevation beach that is accessible at low tide.
- The stormwater system, including storm drainpipes and non-engineered stormwater outlets, shows signs of damage, overflow, and beach erosion. The most severe issue is at the corner of Bahia Point and Ventura Cove beach, where backflow is directed to the beach and causing beach erosion. This is also the area where historic scarping has threatened to undermine the roadway (Gleason Road).

To improve beach conditions and provide stability to Bahia Point and Ventura Cove, the site concept proposes two simultaneous approaches, illustrated in Figure 11, Shoreline Restoration: Bahia Point, and described below:

1. Improve and Repair Site Conditions
    - Placing beach fill along the entirety of the shoreline to increase dry-beach widths. In addition to importing sandy material, the sand that has slumped from the beach into the bay may be reclaimed by excavating and placing the material at upland beach elevations. All work is proposed above the -2 feet NGVD 29 contour to minimize eelgrass impacts.
    - Installation of a cobble breakwater at the toe of the beach fill at the northern tip of Bahia Point. This placement could help retain sand in erosion zones while minimizing construction costs and eelgrass impacts.
    - Stormwater improvements across all outfalls.
        - Installation of flow dissipative features at three stormwater outlets in Ventura Cove Park and the parking lot.
        - Repair/replacement of the storm drain at the corner of Ventura Cove Beach and Bahia Point.
        - Repair and extension of two PVC stormwater outfalls along the eastern side of Bahia Point.
    - Vehicular beach access routes are to be incorporated to allow beach maintenance crews to perform their normal duties. Bollards are to be included to prevent the public from utilizing access routes. These routes will be located as follows:

- At the south end of Bahia Bay near the entrance to the Bahia Resort and beach parking lots, where equipment currently enters.
- Near the old restroom building at the north end of Bahia Point, by installing tire track pathways (using pavers) through the grass for wheeled front-end loaders. The idea is to have one accessway across the grass north of the restroom and a separate accessway across the grass south of the restroom.

2. A multiple groin pilot (test) project on the eastern side of Bahia Point, where the predominant sediment transport direction from north to south can be capitalized on to build a beach. The use of multiple small groins along the east shore of Bahia Point for sand retention is recommended as a pilot (test) project that can be modified if needed, or removed if unsuccessful, and/or replaced with permanent groins if successful. Specifics include:
   - The use of a northern groin composed of sheetpiles could be beneficial to the northeast shore by trapping sand that moves alongshore from the tip of Bahia Point. It would be positioned adjacent to the northern end of the resort. Its design would need to be short with a low crest height to allow sand to pass around and over the groin and continue moving south, while still creating a wider beach at the northern tip of the point. Sand should be placed on both sides of the groin to proactively nourish the beach during construction and prevent downcoast erosion impacts.
   - A second sheetpile groin may be needed to prevent losses of sediment and potentially further erosion downcoast of the north groin. The groin would also be designed as a short shoreline structure with a low crest elevation to allow continued sand transport into Ventura Cove Beach while still creating a wider beach along Bahia Point. Sand should be placed on both sides of the groins to proactively nourish the beach during construction and prevent downcoast erosion impacts. These pilot shoreline structures could be temporary, monitored, and "tuned" if needed or removed if unsuccessful. They could also become permanent structures if proven to be successful.
   - Two other groin locations are proposed to coincide with the footprint of stormwater outfall systems that require improvements. This provides the opportunity to build stormwater outfalls in conjunction with the groin, both protecting stormwater management infrastructure and reducing stormwater-related beach scouring.
   - As the results of shoreline structures may include other unanticipated effects, a pilot project is recommended to document and measure their effectiveness. The pilot project would include driving fiberglass, steel, or similar sheet piles into the beach, adding sand along each side of the groins, monitoring their performance for 1 year, and assessing their effectiveness for sand retention and any unintended secondary impacts. Sheet piles can be tuned and optimized (lowered and/or shortened) over the project to identify proper groin crest elevations and lengths to balance upstream sand retention with downstream sand transport to prevent erosion.
   - Following the monitoring period, the City can determine the need for permanent structures and work to replace the temporary sheet piles with rock structures if desired.

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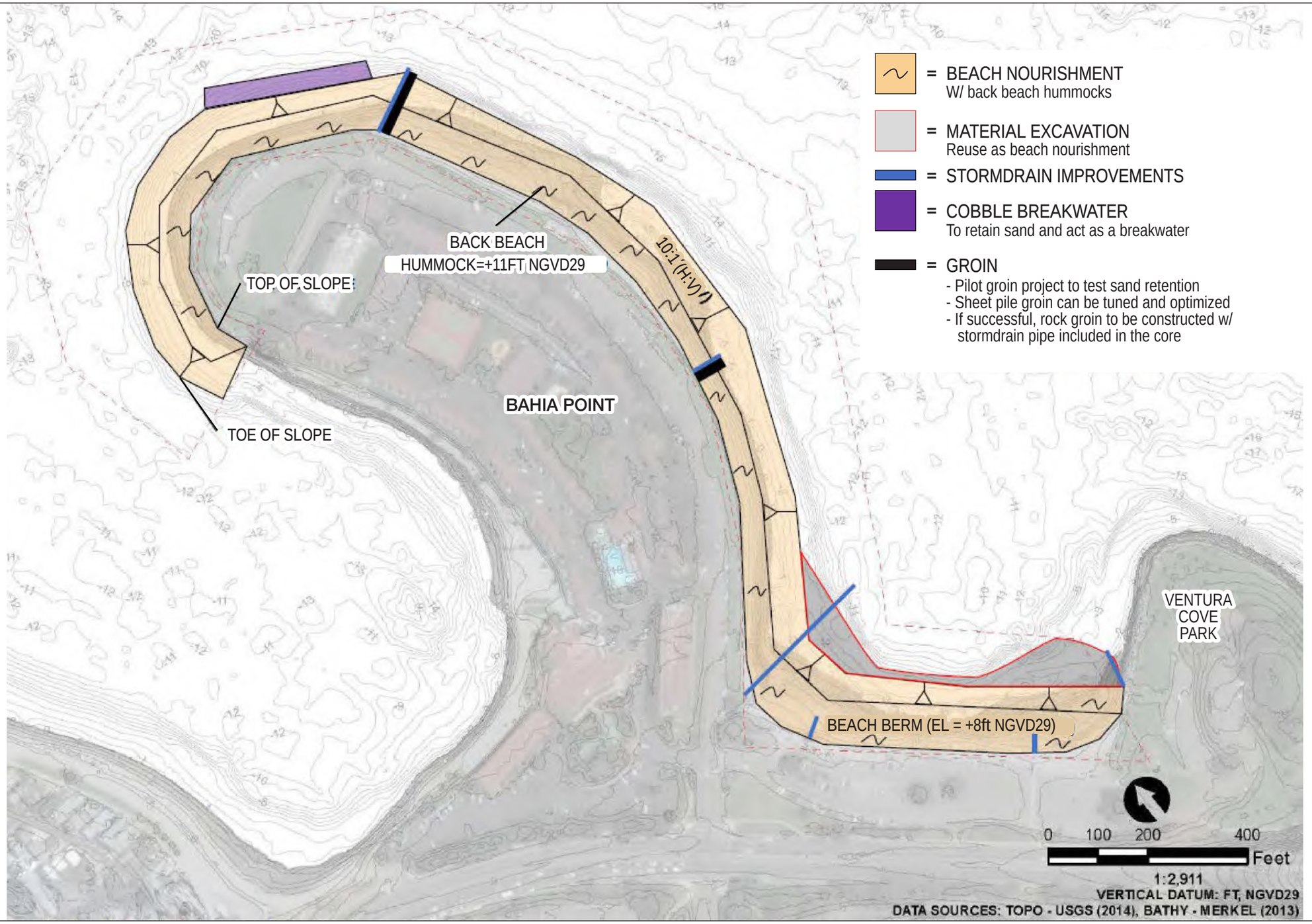

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 11

Shoreline Restoration: Bahia Point

Mission Bay Park Improvements Program

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West Sail Bay

The beach on the western shore of West Sail Bay has narrowed over time, and the erosion now threatens the bayside walk and increases the risk of flooding. According to December 30, 2017, aerials, at West Sail Bay, the narrowest beach width was approximately 45 feet. In 1964, West Sail Bay beach extended approximately 75 feet wide. During winter seasons, a sand berm is typically constructed along the western shore of West Sail Bay to combat flooding. At high tide, the existing beach width narrows to less than 20 feet in many places.

West Sail Bay was identified as a candidate for beach nourishment. Beach nourishment is proposed along approximately a 0.25-mile length, with a 100-foot-wide beach berm (Figure 12, Shoreline Restoration: West Sail Bay). The beach width at the narrowest location will expand from 20 to 100 feet at high tide. The beach berm is proposed to tie in with maximum beach heights at West Sail Bay; the beach nourishment maintains the general function and character of the existing shoreline. Beach nourishment will actively advance the shoreline into Mission Bay to protect land-based infrastructure from erosion and wave runup while expanding the sandy beach space for recreational users. Beach nourishment has the ability to be resilient to SLR; as the water level rises, the beach profile will retreat inland and rise in elevation. If a large sand grain size can be identified for use in this project, the beach is anticipated to resist erosion for a longer period of time. A wide beach can provide protection for several years, but will endure slow, continuous erosion and will need to be renourished in the future.

Crown Point

Crown Point, also known as Riviera Shores, has been the site of previous shoreline restoration focused on the design and construction of the Crown Point seawall, and beach fill strategically placed at the northern and southern areas of the seawall. However, Crown Point is currently vulnerable to coastal erosion and SLR, especially south of the Crown Point seawall. A coastal process known as "end effects" has caused increased wave erosion where the seawall transitions to the beach. Continuing south from this location, coastal erosion has threatened access and the existing public pathway.

The proposed concept for Crown Point is to construct shoreline protection extending from the southern end of the existing seawall approximately 150 feet to the southeast (Figure 13, Shoreline Restoration: Crown Point). The shore protection will follow the alignment of the bike path and gradually diminish in size and transition into the existing public beach. Shore protection will take the form of a seawall. The seawall would match the existing seawall design and create a seamless aesthetic and structural transition protection.

In accordance with the MBPMP Update (City of San Diego 2021a) recommendations to preserve "all natural bluff areas, especially Riviera and Crown Point Shores," the Crown Point concept targets a vulnerable reach and proposes a shoreline stabilization solution.

Vacation Island Northwest

Vacation Island Northwest currently suffers from shoreline erosion. The Mission Bay Hydrology Study prepared for the PEIR found that tidal currents travel north to this project site, and then rapidly change direction with hydraulic energy directed at the eroding shoreline (Moffatt & Nichol 2019).

Persistent erosion at this location, due to the shoreline position with respect to waves, currents, and sediment transport patterns, requires measures beyond sand nourishment to maintain a beach. The shoreline restoration concept at Vacation Island Northwest proposes the construction of two sand retention rock groins and beach nourishment (Figure 14, Shoreline Restoration: Vacation Island NW). The concept is intended to restore and stabilize the sandy beach along the northwest corner of Vacation Island. Coarse sand replenishment is intended to widen and elevate the beach. The nourished sand is retained with two rock groins constructed on either side of the nourishment footprint, capturing the bi-directional alongshore sediment transport.

Vacation Island Northeast (West of Ingraham Street and Ski Beach)

Two locations along Vacation Island Northeast were identified for restoration, located on opposite sides of Ingraham Street and accommodating different shoreline conditions and public uses.

WEST OF INGRAHAM STREET

West of the Ingraham Street bridge, the shoreline of the public park is a degraded rip rap shoreline, likely suffering from wave-induced erosion and potentially back-slope erosion from upland runoff. The adjacent beach at North Cove was identified to have an erosion rate of 5 feet per year between 1965 and 1979. Just south of the West of Ingraham Street project site, a shore protection revetment was designed and constructed in front of the existing Paradise Point Resort lodging. An approximately 200-linear-foot section was designed and repaired.

The West of Ingraham Street concept proposes to stabilize and restore the shoreline by repairing the rock revetment west of Ingraham Street. The revetment crest height is proposed to be raised above existing elevation to improve performance under SLR. A drainage ditch running along the crest of the revetment channelizes surface runoff and prevents erosion of the underlying soil (Figure 15, Shoreline Restoration: Vacation Island NE).

SKI BEACH

Ski Beach is located east of the Ingraham Street bridge at Vacation Island Northeast. Beach erosion limits recreational beach space, and wave action has caused upland erosion, with scarps having been carved out of the earthen fill material.

The concept for the Ski Beach shoreline restoration proposes beach nourishment around the entirety of the point, extending the beach approximately 100 feet from the current shoreline. If a large sand grain size can be identified for use in this project, the beach is expected to resist erosion for a longer period of time. At the toe of the beach nourishment, cobble material or small boulders would be constructed as a berm intended to lessen wave energy and hold the shoreline position. The cobble berm would be backfilled by beach nourishment, creating a wider public beach and providing additional shore protection (Figure 15). With the use of soft engineering materials, the berm is intended to lessen wave energy in a similar manner to a breakwater and hold the shoreline position in a similar manner to a revetment.

Construction of this concept is recommended to be monitored for beach erosion and sediment transport patterns to assess the feasibility of sand retention measures. Should sediment transport and losses be observed in this direction, potential future installation of a shore-perpendicular groin could be considered in a phasing strategy at the southern boundary of nourishment.

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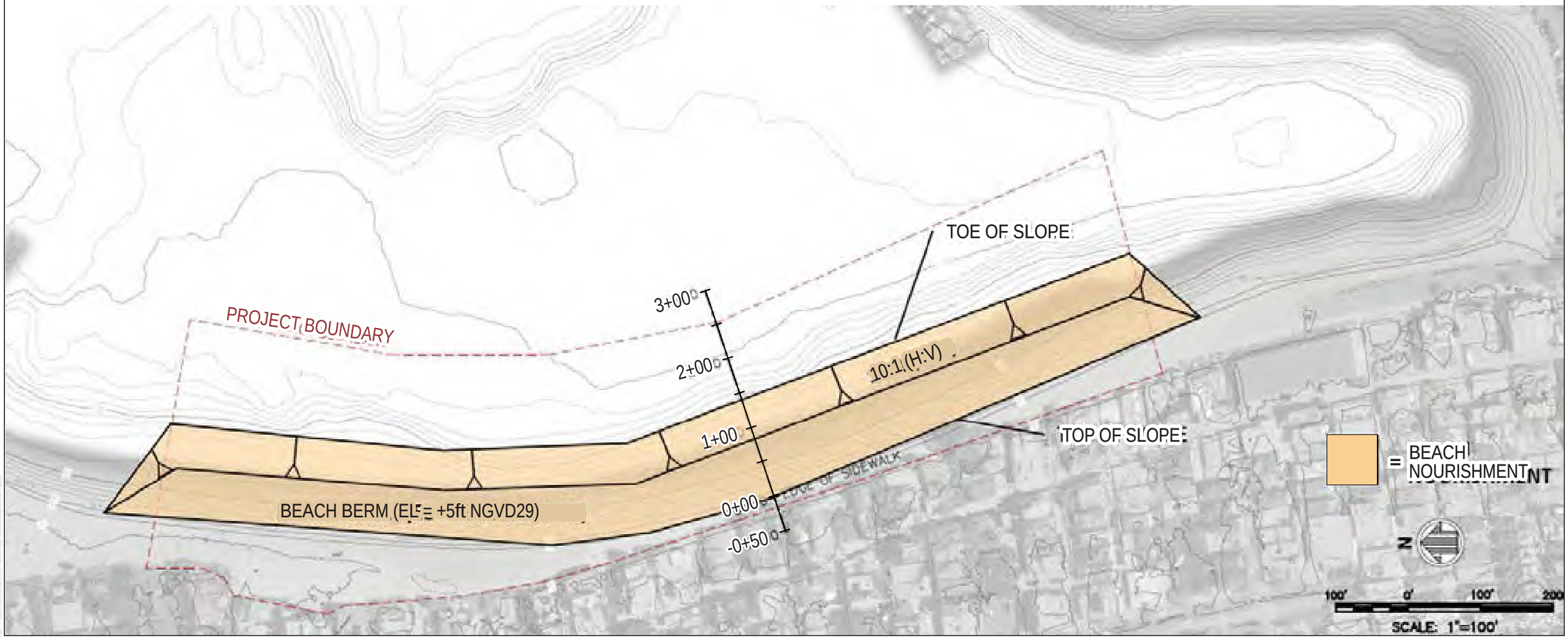

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 12

Shoreline Restoration: West Sail Bay

Mission Bay Park Improvements Program

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SOURCE: SANGIS 2023

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FIGURE 13

Shoreline Restoration: Crown Point

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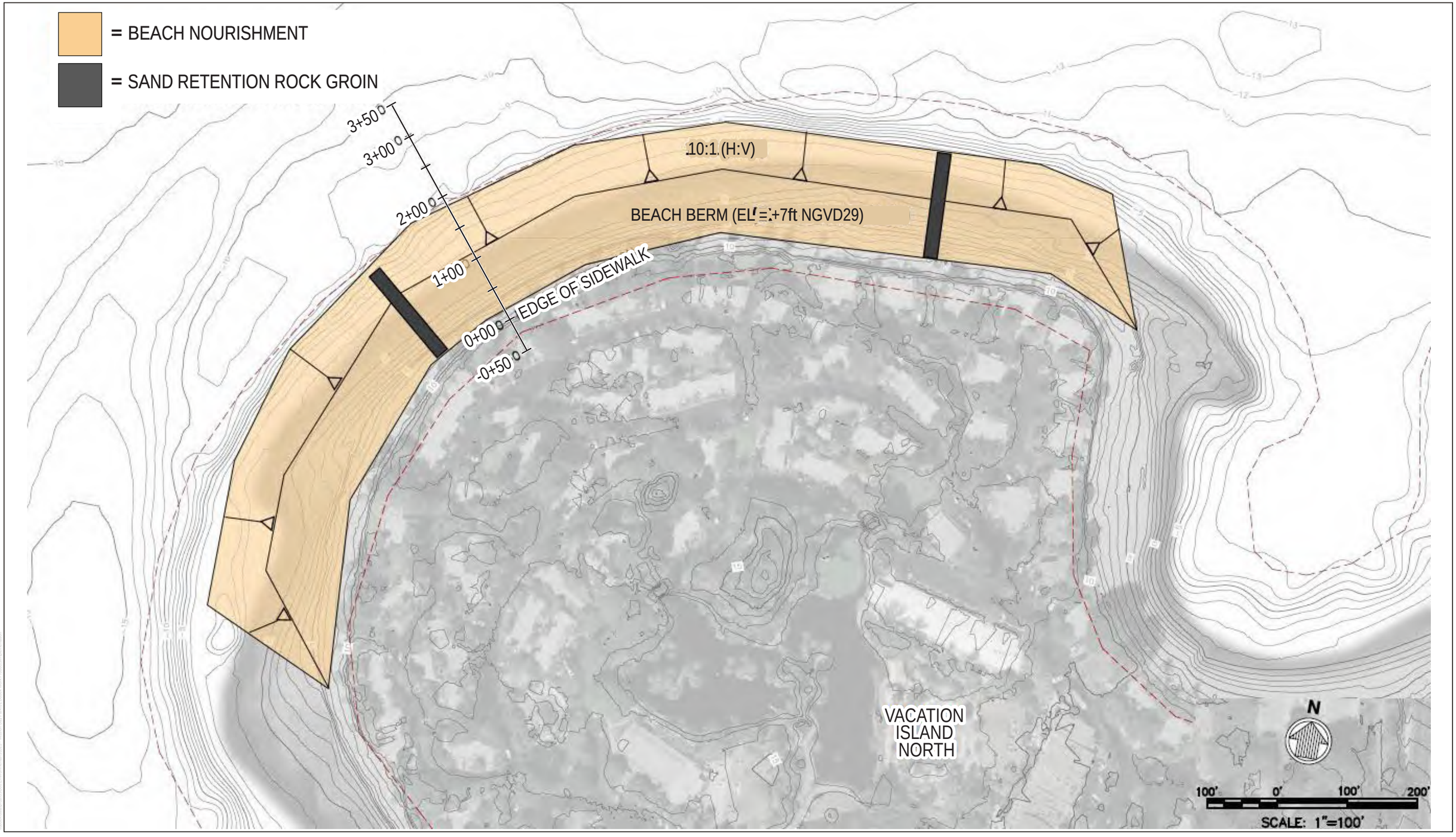

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 14

Shoreline Restoration: Vacation Island NW

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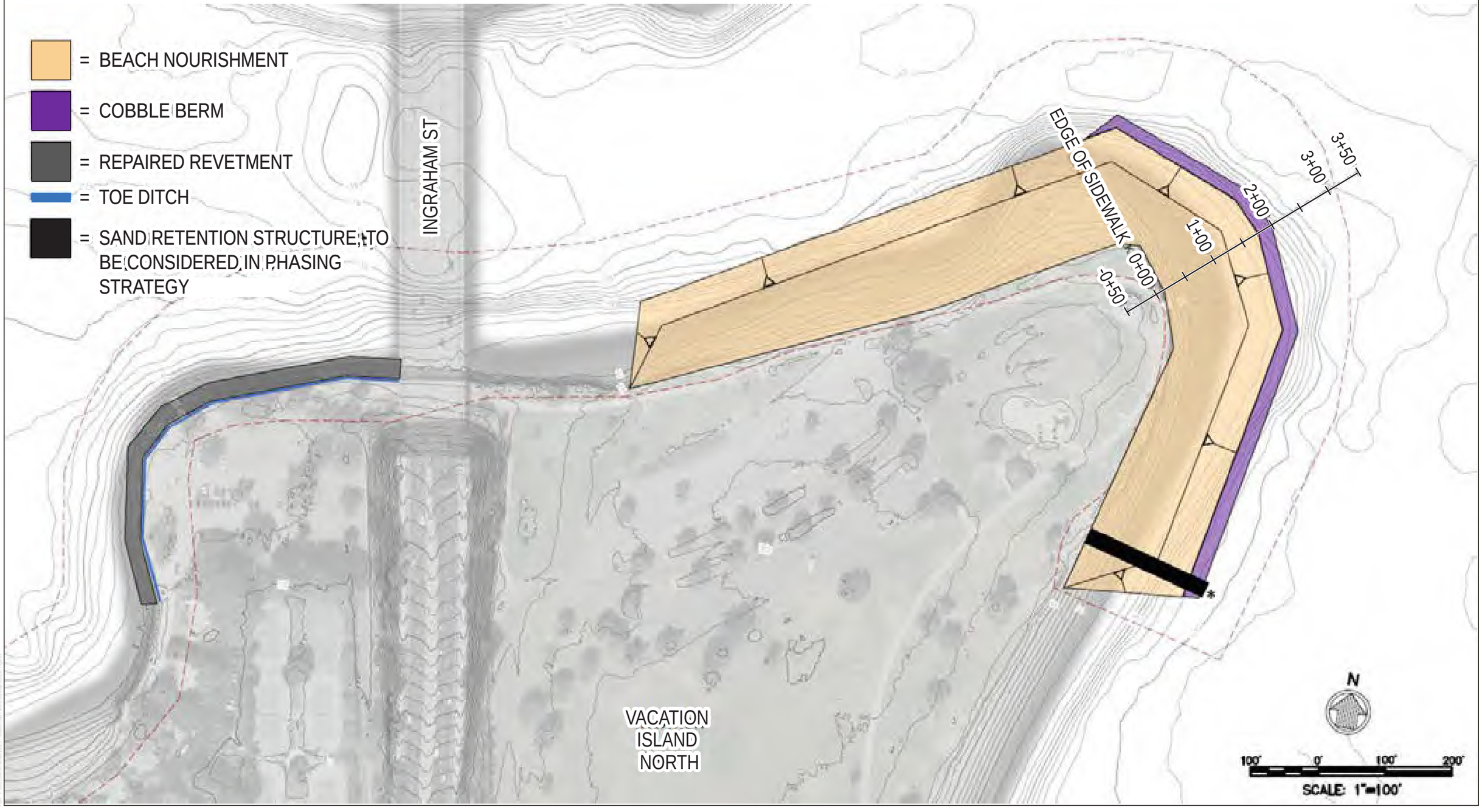

SOURCE: Moffatt & Nichol. 2021. Preliminary Engineering Report Mission Bay PEIR Restoration of Shoreline.

FIGURE 15

Shoreline Restoration: Vacation Island NE

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CONSTRUCTION APPROACH AND NEEDS

Construction of the proposed shoreline restoration projects is considered feasible, though specific methods will vary based on site conditions, project type, permitting, seasonal windows, contractor selection, and budget. To account for these variables, design and permitting should allow flexibility in construction approaches. Two main methods are anticipated: landside and waterside construction.

Landside construction, the more common method, uses standard equipment (e.g., backhoes, dump trucks, front-end loaders) operating in dry conditions. Site access would occur via regional highways and local roads, with larger equipment delivered during off-peak hours. Construction zones would be clearly marked to ensure safety, and staging areas would be located on site or nearby, avoiding sensitive habitats. Excavation would be performed with backhoes or clamshells, prioritizing the reuse of on-site material. For beach fill projects, sand would be delivered in large volumes via dump trucks, and wetland work would be timed for the dry season to minimize dewatering needs.

Waterside construction may be required for work at or below mean sea level. This method uses barges, hydraulic dredges, or excavators, supported by landside staging for crew and materials. Equipment and supplies would be transported from marine terminals like those in San Diego or Mission Bay, requiring coordination with the Port of San Diego. Construction zones in open water would be clearly marked to protect public use areas. If sand is sourced locally—such as from Mission Bay—hydraulic dredging may be used, with discharge pipes delivering material and silt curtains controlling turbidity.

Construction using either method would primarily occur during the dry season and outside the avian breeding season.

PROJECT-SPECIFIC CONSTRUCTION APPROACH

Each site within the Restoration of Shoreline project carries unique constraints and considerations, as detailed below.

Bonita Cove

At Bonita Cove, relocation of the existing sidewalk would require basic civil works and landscaping operations. Bonita Cove cobble berm and beach fill may be constructed from landside and/or waterside. Beach fill could be constructed by importing sand by dump truck, hydraulic dredge, or barge. The cobble berm may require the construction of a temporary access path for land-based equipment to access the site. Alternatively, cobble import and placement may take place with a barge and excavator.

Two existing stormwater outfall pipes will require permanent refurbishing in order to coexist with the proposed beach widths. Stormwater outfall pipes may be retrofitted to extend into the bay, being buried by nourishment activities in the upland area.

Ventura Cove Park

Ventura Cove Park revetment, oyster habitat, and concrete footpath construction may utilize landside or waterside construction. The equipment used may include excavators and barges, depending on the type of construction chosen. Project construction will have to ensure the protection of the existing revetment to the southwest.

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Vacation Island Southwest

Vacation Island Southwest revetment, oyster habitat, and perched beach construction may utilize landside or waterside construction. The equipment used may include excavators and barges depending on the type of construction chosen. Project construction will have to ensure the protection of the existing revetment to the east. Perched beach construction should ensure that all revetment voids are filled to avoid potential sinkholes during public use.

Bahia Point

Bahia Point beach nourishment construction is anticipated to be performed from the landside. Excavation of sand sources located just offshore will occur at the lowest tidal elevations, redistributing the sand along the upland shore. Additional fill material may occur from the landside through importing sand by dump truck or from the waterside by hydraulic dredge or barge.

The cobble berm may require the construction of a temporary access path for land-based equipment to access the site. Alternatively, cobble import and placement may take place with a barge and excavator.

The sand retention pilot project is anticipated to be constructed by driving sheetpiles into the sand from the landside using mechanized equipment. Such materials may be steel, fiberglass, or another alternative type of sheetpile. Sheetpiles may need to be "tuned" over time, whether that be adjusting the length or height to optimize the upcoast sand capture while minimizing impacts to downcoast beach widths.

Existing stormwater outfalls will require varied improvements. Stormwater improvements will require standard construction in the dry and permanent refurbishing in order to coexist with the proposed beach widths. Outfalls that do not discharge directly to the bay will be augmented with energy dissipators. The singular outfall pipe, which extends into Mission Bay, will require further investigation to identify the appropriate improvement. It is possible that the pipe may require flushing of sediment to reopen hydraulic connectivity to the bay, or lengthening to extend beyond the elevation where shoaling occurs. Additionally, several surficial cracks are apparent on the structure to be reconstructed. Additional cracks may be present in buried portions of the outfall. It may ultimately be necessary to entirely demolish, remove, and replace the existing catchment and outfall structure at the beach near the foot of Bahia Point (at Ventura Cove) with a new and more contemporary storm drainage device.

West Sail Bay

West Sail Bay beach nourishment construction will expand the public beach significantly into the Bay. Construction may occur from the landside through importing sand by dump truck or from the waterside by hydraulic dredge or barge.

Crown Point

The installation of the seawall would likely be constructed through landside excavation and placement. However, the construction of the Crown Point shoreline treatment may utilize landside or waterside construction. Depending on the construction approach, working in the "wet" versus "dry" will trigger specific construction BMPs. Working in the "wet," this could include the use of a silt

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curtain to reduce turbidity effects. Working in the "dry," this could include the construction of a temporary dike and dewatering activities.

Vacation Island Northwest

Vacation Island Northwest groin and beach fill construction may take place from the landside or the waterside. Construction activities must coordinate with and may be limited in access by the adjacent Paradise Point Resort and Spa. Anticipated limitations may include crew access and staging area availability due to a lack of public space and construction window limitations to reduce impacts to tourism.

Construction phasing requires groin construction to take place prior to beach fill. Groin construction will likely require beach excavation, depending on the existing beach height and width at the time of construction, and rock placement. Should the groin be constructed from the landside, the contractor would work toward the Bay, utilizing the partially constructed groin as an access way to continue bayward. Waterside groin construction would likely be constrained by barge depth limitations, as discussed in the waterside staging area and access. Beach fill could be constructed by importing sand by dump truck, hydraulic dredge, or barge.

Vacation Island Northeast

WEST OF INGRAHAM STREET

West of Ingraham Street, revetment construction will likely utilize landside construction with equipment such as excavators and dump trucks. Project construction will have to ensure the protection of the existing revetment to the south.

SKI BEACH

The Ski Beach cobble berm and beach fill may be constructed from landside and/or waterside. Beach fill could be constructed by importing sand by dump truck, hydraulic dredge, or barge. The cobble berm may require the construction of a temporary access path for land-based equipment to access the site. Alternatively, cobble import and placement may take place with a barge and excavator.

SEA LEVEL RISE CONSIDERATIONS

Two SLR projections (3.6 feet and 7.0 feet) were selected for Year 2100 that represent the 17% probability and 0.5% probability scenarios and are driven by coastal flooding that is expected to increase (progress inland) with a 100-year storm event in conjunction with SLR.

Designing the restoration of shoreline projects for SLR is important to the longevity of Mission Bay's shoreline, public access, habitat value, and protection of inland development. Design elevations can either be raised above predicted water levels or can be designed to be more easily adapted in the future as sea level rises. Designing and adapting for SLR is discussed regarding each proposed shoreline type:

- **Wetland Restoration:** Wetland vegetation distribution is directly dependent upon the elevation of a restored marsh relative to tidal elevations. The restored marsh is designed to incorporate habitat from low to high elevation, including subtidal, mudflat, low marsh, mid marsh, high marsh, transitional, and upland habitat. As sea level rises, these habitats will transform with their new elevation relative to the tides. For instance, high marsh will transform into mid

marsh under approximately 1 foot of SLR. The restored salt marsh habitat will likely transform with less high- and mid-low marsh and more mudflat with subtidal habitat. The wetlands may be adapted to SLR as follows. Without raising the elevation of the site by filling or implementing adaptation measures, the site would effectively become a mudflat with tidal channels. The exception is the transitional habitat area that becomes low marsh. When SLR causes significant habitat changes in the marsh, the site can be adapted by the following:

- Should sediment inputs from existing sources (creeks) be significant, the wetland may be able to capture sediment and rise in elevation as sea level rises. Accelerating rates of SLR reduce the potential for this natural process to occur as vegetative growth and sediment accretion may not be able to keep pace.
- Reconfiguring and/or raising the wetland plains above future high internal wetland water levels through thin-layer sediment additions. This will allow for mudflat and vegetated marsh habitat to persist.

While it is possible that these adaptation strategies may need to be implemented in the near term at some time between 2050 and 2100, they may also need to be repeated multiple times in the long term after 2100 as sea levels rise in the future.

- **Oyster Restoration:** Oysters can only survive within a narrow window of tidal elevations. The Pacific oyster and Olympia oyster together can occupy an elevation range of between 3 and 4 vertical feet, with the native Olympia oyster preferring the lower elevations. Preliminary design for oyster restoration in Mission Bay places oyster habitat between -2.3 and 1.0 foot NGVD 29 to promote maximum growth following construction. However, at such elevations, rapid SLR may begin to submerge oysters and limit their viable habitat areas. Therefore, the oyster habitat will need to adapt to SLR:
  - As a form of living shoreline, oyster reefs can naturally grow in elevation given the right conditions. Should the City's recommended SLR projections occur, natural reef growth is unlikely to keep pace with SLR.
  - Oysters can migrate naturally as well. Where high numbers of oysters exist, higher levels of spat and recruitment are likely to occur. Given that oysters have been known to settle in areas of rip rap within San Diego Bay, it is possible that oysters will recruit to the rip rap shorelines and migrate inland and upland as sea level rises (Merkel & Associates et al. 2015).
  - Oyster habitat can be artificially raised by the addition of oyster cultch, reef balls, rip rap, or other promising recruiting substrates. Depending upon the occurring rate of SLR, such substrates could be brought to oyster sites and mounted to the existing reefs to incrementally raise elevations. This adaptation measure may need to be repeated multiple times in the long term as SLR accelerates.
- **Beach Nourishment:** The beach nourishment bench (i.e., berm) is designed at a minimum elevation of +7 feet NGVD 29, which is above the projected Mean Higher-High Water (MHHW) line under 3.6 feet of SLR. Beach nourishment projects on the open coast typically last about 5 years, depending on fill volume, sediment grain size, and oceanographic conditions. It is likely that within the protected waters of Mission Bay, the life span of beach nourishment projects would exceed 5 years. However, it is unlikely that wide beach conditions would persist through the year 2100, especially given SLR projections and the historical evidence that wide beaches

within Mission Bay have eroded substantially since construction in the mid-1900s. Therefore, adaptive measures will be necessary and could include the following:

- Beach nourishment projects could be repeated multiple times as erosion and SLR begin to overwhelm the beaches. Nourishment design could be incrementally raised to keep pace with SLR.
- Vegetated sand dunes could be constructed on the inland side of a wide sandy beach to protect against the high SLR projection. Vegetated sand dunes offer a living shoreline form of coastal protection, by raising shoreline elevations to minimize inland flooding, capturing windblown sand, stabilizing sandy shorelines with rooted vegetation and installed fencing, and preserving a bank of sand in case of an extreme erosive event. Dunes are not proposed for the initial project construction to preserve the extensive beach access and viewshed, but as sea level rises and priorities shift toward flood control, sand dunes will contribute to creating an "exoskeleton" around the bay to buffer development from flooding, while maintaining the close proximity for the public to water access.

- **Cobble Berm:** A cobble berm crest elevation is designed at +4 feet NGVD 29. This is designed to be 1 foot above the existing MHHW elevation in order to maintain a level of wave protection during king tides, while limiting impact on the viewshed. As sea level rises, the cobble berm will likely require adaptation to maintain surface wave interactions during high tide. Adaptation could take the following forms:
  - Cobble berms could be adapted through the addition of cobble material placed on the 20-foot-wide berm crest. Maintaining the design slope of 4:1 (H:V), a maximum of 2.5 feet of elevation could be gained through cobble addition within the existing design footprint. Additional elevation could be gained through expanding the berm width. The addition of cobble material is anticipated to be of relatively low cost and high constructability. Cobble material could be sourced locally or from inland quarries. Cobble could be transported to the berm location across the beach by truck during low tide or by barge and offloaded by a backhoe during high tide.
  - Alternatively, should the cobble berm fail to provide adequate protection as a form of soft breakwater, the material could be repurposed by scraping onshore. The cobble could be reorganized as a foundation or "mattress" within the beach to provide a form of beach that is less erodible than sand. This foundation could be buried with additional sand to provide improved public access in the near term, while the cobble would tend to better hold its place in the face of SLR and storms. See Section 5.5.3 of the Shoreline Restoration PER for a discussion on the viability of cobble berms as a beach foundation.
- **Revetment:** Rock revetment crest elevations are designed at +10 feet NGVD 29, equivalent to 7 feet above the current MHHW line. Therefore, under 7 feet of SLR, rock revetment crests would provide protection for upland resources from tidal inundation. Should the rock revetment begin to be overtopped by storm surge and wave action, the 9-foot-wide crest can accommodate additional rip rap to raise the crest elevation up to 2 feet while maintaining a 3-foot-wide crest and a 1.5:1 (H:V) slope.
- **Groin:** The rock groin at Vacation Island Northwest is designed with a crest (i.e., bench) elevation of +8 feet NGVD 29, 5 feet above the current MHHW line. The rock groin can maintain a sandy beach up to +8 feet NGVD 29 in elevation, 1 foot above the current beach nourishment design, after which sediment transport will pass horizontally over the crest. Like beach nourishment design, the groin elevation can provide protection beyond the 3.6-foot SLR

projection. Should SLR reach 7 feet, the rock groin may need to be adapted to maintain a dry sandy beach. To do so, rip rap could be imported and placed atop the 10-foot-wide groin crest up to 2 feet while maintaining a 4-foot-wide crest and 1.5:1 (H:V) side slopes. An additional 2 feet in crest elevation would equate with the projected MHHW tide line at 10 feet NGVD 29 under 7 feet of SLR. It should be noted that due to the limited natural input of sediment to Vacation Island Northwest, occasional beach nourishment may also be necessary to maintain a dry sandy beach, especially should the groin be raised to accommodate SLR.

Bahia Point will be continually "tuned" in length and height to optimize performance. For example, additional sheetpiles could be driven alongside the initial pilot piles and installed at higher crest elevations to hold a beach at a higher elevation.

- **Seawall:** The seawall at Crown Point is intended to simply extend the existing design to the south and east to provide further horizontal protection. The existing seawall crest elevation is 7 feet NGVD 29, which can protect against tidal inundation within the 3.6-foot SLR projection. No change is proposed to this crest elevation. Should the 7-foot SLR projection occur, adaptation measures will be required. This may take the form of retrofitting the seawall with a raised cap, replacing the seawall with a larger structure, or implementing new shoreline management measures in coordination with the community.

MAINTENANCE AND MONITORING REQUIREMENTS

All maintenance of the improved shoreline structures would be conducted in accordance with the City's existing maintenance activities for the existing structures. No additional monitoring is proposed for shoreline structures.

For certain specific components, two post-restoration monitoring programs—a 5-year eelgrass monitoring program and a 5-year Olympia oyster reef monitoring program—will support broader efforts to improve water quality, enhance native biodiversity, and increase habitat complexity in Mission Bay.

The eelgrass monitoring program will follow the California Eelgrass Mitigation Policy (NOAA 2014). A reference site will be established to inform performance standards and enable comparisons with mitigation sites. Monitoring will occur at 6, 12, 24, 36, 48, and 60 months after planting to evaluate areal extent, spatial distribution, percent cover, and turion (shoot) density using vessel-based visual surveys and diver quadrat sampling. Success criteria will be measured against benchmarks set for each monitoring milestone. Underperforming areas may be replanted or modified unless declines are due to external factors. Adaptive management strategies—such as wave attenuation structures or sediment control—will be applied as needed. Results will be documented in reports submitted to National Oceanic and Atmospheric Administration Fisheries within 30 days of each event.

The Olympia oyster monitoring program will track restoration progress and inform adaptive management, though no formal success criteria apply. Baseline data will be collected pre-construction, with monitoring at 1, 3, 6, and 12 months in the first year, followed by annual surveys through Year 5. Metrics include reef footprint, height, colonized area, oyster density, size distribution, and associated filter-feeding species. Environmental conditions such as salinity, temperature, dissolved oxygen, and sedimentation will be monitored. Visual inspections will also document

sediment buildup, predation, and signs of disease. Adaptive responses may include shell addition, reef repositioning, or other measures to support long-term reef performance.

2.3 Upland Restoration

The development of the Upland Restoration PERs built off much of the information gathered during preparation of the wetland restoration PERs and followed a similar methodology, and followed a bay-wide assessment of upland restoration opportunities. Additional considerations included identifying plant palettes, ensuring site protection in high pedestrian traffic areas, ensuring protection of existing sensitive plant populations, potential hazardous materials, and coordination with the wildlife agencies regarding the establishment of habitat for the endangered CLT.

The City of San Diego is proposing a habitat restoration and enhancement project within Mission Bay Park consistent with the MBPMP and the Draft Fiesta Island Amendment (City of San Diego 2021a). The project aims to expand and preserve upland habitat areas to improve ecological function and support sensitive and listed species, such as the CLT. The effort is intended to complement ongoing recreational uses while fulfilling long-term conservation goals for the area.

Seven sites on Fiesta Island have been identified as potential upland habitat restoration and preservation areas (see also Figure 16, Upland Habitat Restoration and Preserve Expansion Locations):

- Site No. 1 – Fiesta Island South
- Site No. 2 – Fiesta Island North Central
- Site No. 3 – Fiesta Island near Youth Camping
- Site No. 4 – Fiesta Island Least Tern Preserve Area
- Site No. 5a – Cloverleaf Enhancement Area
- Site No. 5b – Triangle Enhancement Area
- Site No. 5c – South Shores Restoration and Enhancement Area

2.3.1 Fiesta Island South No. 1

PROJECT DESCRIPTION

Site No. 1, referred to as Fiesta Island South (see Figure 17), is located at the southern end of Fiesta Island between Fiesta Island Road and the existing sand replenishment maintenance area. The site is physically defined by a sand berm that parallels the entire length of Fiesta Island Road, enclosing the southern and western boundaries of the restoration area. Additionally, an east-side berm separates the potential habitat expansion site from both the sand replenishment maintenance area and a proposed soil stockpile area. These berms provide a degree of physical separation from adjacent land uses and help contain the site for restoration activities. The area presents opportunities for upland habitat restoration through native vegetation planting and invasive species control to enhance ecological value and support sensitive species habitat within the island's southern portion.

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PRELIMINARY DESIGN PROJECT COMPONENTS

Site No. 1 offers a valuable opportunity for upland habitat restoration, particularly Diegan coastal sage scrub, coastal strand, and southern coastal salt marsh vegetation. The site is currently disturbed and dominated by non-native species but supports several mature native laurel sumac shrubs, scattered Diegan coastal sage scrub vegetation, and a small population of Nuttall's lotus. The southeast corner of the site exhibits saline soils that support southern coastal salt marsh indicator species, such as woolly sea-blite and beach sun cup, suggesting potential for southern coastal salt marsh enhancement in low-lying areas. The project would focus on exotic species removal, native species re-establishment through container planting and seeding, and the creation of microtopography to support habitat diversity and promote ecological function.

The restoration design proposes Diegan coastal sage scrub in the interior of the site, coastal strand habitat on the surrounding berms, and enhancement of the salt marsh areas where appropriate. The existing laurel sumac would be preserved, and the Nuttall's lotus population would be protected and potentially expanded through focused habitat improvements and trail removal. To prepare the site, perimeter berms would be regraded to reduce slope steepness and sculpted to resemble natural dune formations. A temporary irrigation system sourced from the existing 10-inch water main along Fiesta Island Road would be installed to support initial plant establishment. Long-term maintenance would involve phasing out irrigation as plants become self-sustaining.

Due to the site's proximity to active and proposed recreational uses—such as trails, parking, and play areas—management of public access will be critical. The design anticipates the installation of fencing or natural barriers along trails to prevent encroachment into the restoration area. Recreational use may be accommodated through designated trail corridors around the perimeter, consistent with the Fiesta Island Concept Plan, but buffers will be required to protect sensitive resources. The site's designation as a Coastal Landscape (Natural Recreation) Area indicates that thoughtful integration of habitat restoration and low-impact recreation is essential to the long-term success and sustainability of this habitat enhancement effort.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

SOURCE: SANGIS 2023

0 900 1,800
Feet

FIGURE 16

Upland Habitat Restoration and Preserve Expansion Locations

Mission Bay Park Improvements Program

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Mission Bay Park Improvement Zone

Soil Sample Location

Informal Trails

Haul Route

Limits of Original Proposed Upland Habitat Expansion Preserve Areas (as identified in the Fiesta Island Concept Plan) (Expanded Habitat)

Existing Sand Replenishment Maintenance Area

Adjusted Expansion Area Restoration Treatments

Coastal Sage Scrub Restoration and Enhancement

Coastal Salt Marsh Enhancement

Coastal Strand Berm Revegetation

Potential Nuttall's acmispon Expansion Area

Vegetation Communities/Land Cover

BCH, Beach

DCSS, Diegan Coastal Sage Scrub

DEV, Urban/Developed

DH, Disturbed Habitat

OW, Open Water

SB, Shallow Bay

Special-status Plants

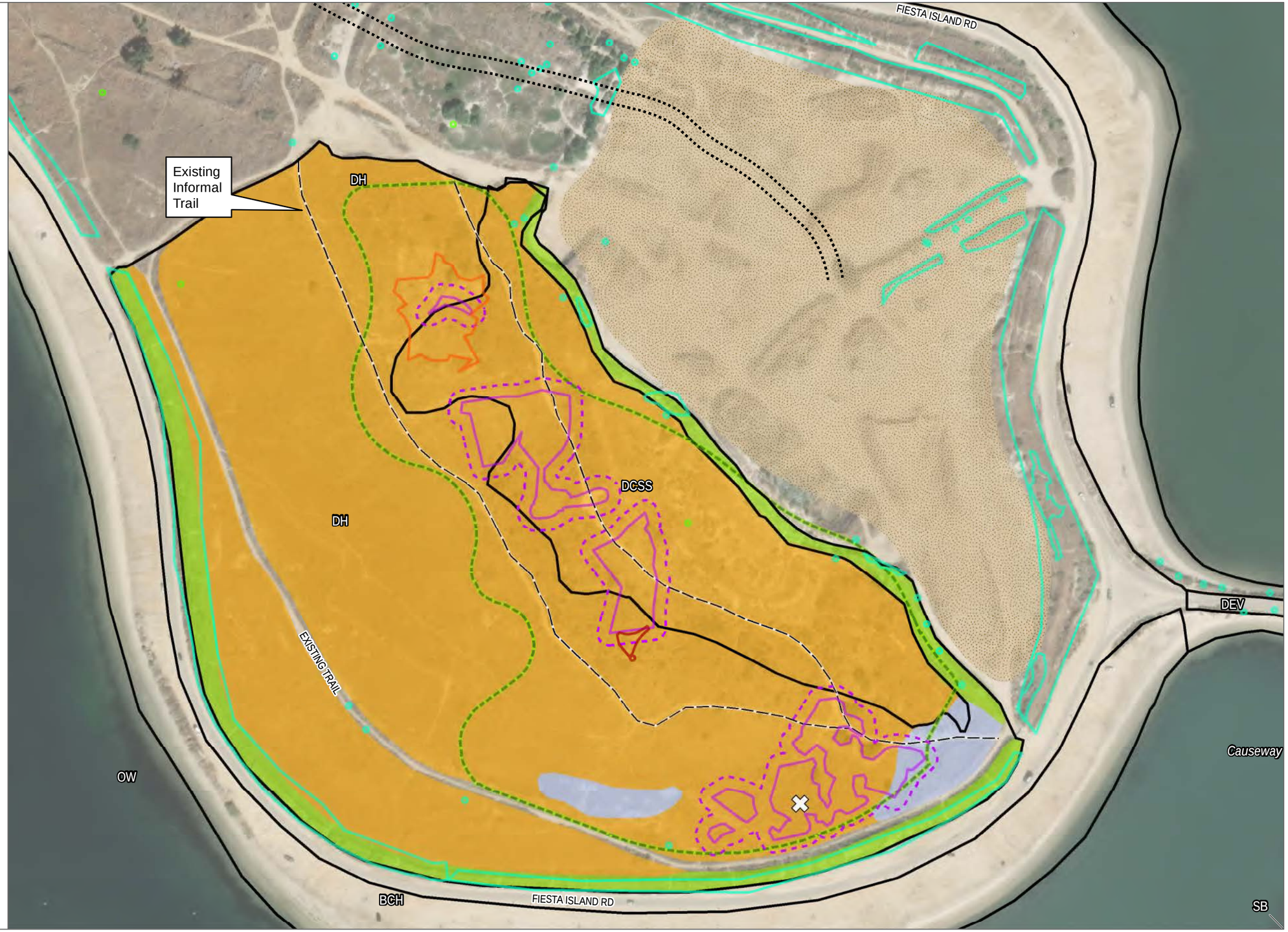
Lewis' evening-primrose

Robinson's pepper-grass

Coast woolly-heads

Woolly seablite

Nuttall's acmispon



SOURCE: ESRI 2024; City of San Diego 2018

0 100 200 Feet

FIGURE 17

Fiesta Island South -Site No. 1

Mission Bay Park Improvements Program

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MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

2.3.2 Fiesta Island North Central No. 2

PROJECT DESCRIPTION

Site No. 2, known as Fiesta Island North Central (see Figure 18), is located in the north-central portion of Fiesta Island, between the central connector road and the proposed North Fiesta Island Wetlands project area. The site is currently used informally for hiking and dog walking, featuring a network of informal trails that meander through patches of native and non-native vegetation across soft sandy soils. A low-elevation access point is situated along the west edge of the site, providing entry from a widened parking area off Fiesta Island Road. The site is bordered to the south by the section of Fiesta Island Road that bisects the island and to the west by the road running along the island's perimeter. To the north and east, the site adjoins areas dominated by dune habitat and southern foredune vegetation, interspersed with additional walking trails. According to the Fiesta Island MBPMP and Draft Amendment (City of San Diego 2021a), the areas north and east of this site are designated for sand management activities. Site No. 2 is proposed as a soil stockpile area, intended to provide source materials for the construction of the Tecolote Creek Wetlands and Cudahy Wetlands restoration projects.

PRELIMINARY DESIGN PROJECT COMPONENTS

The restoration approach for Site No. 2 prioritizes the establishment of southern foredune habitat, given the sandy soils, flat topography, and exposure to prevailing winds. Diegan coastal sage scrub is not recommended due to poor soil suitability. The site includes patches of native vegetation such as Brewer's saltbush, coast goldenbush, beach sun cup, and a small seasonal wetland area in the southwest that supports mule fat, willows, and occasional salt marsh species. These features provide a foundation for enhancement through invasive species removal and native planting. Habitat connectivity could be improved by extending foredune restoration onto the berm along Fiesta Island Drive and a disturbed strip outside the berm. A small, low-lying area with existing wetland characteristics near the site's center should also be preserved and enhanced.

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Given the current heavy public use and the presence of informal trails, successful restoration will require formalizing trail alignments around the perimeter and excluding access from the interior using fencing and interpretive signage. Foredune and coastal strand vegetation on and around the berm will create a defensible restoration block. The nearest water source is a municipal line approximately 1,600 feet away at the San Diego Youth Aquatic Center, which may be tapped for temporary irrigation during plant establishment. Coordination with planned sand replenishment activities and site users will be necessary to avoid conflicts and protect the long-term integrity of restored habitat.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of from four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

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- Mission Bay Park Improvement Zone
- North Fiesta Island Wetland Restoration Project
- Soil Sample Location
- Informal Trails
- Stockpile Area
- Haul Route
- Toe of Berm
- Limits of Original Proposed Upland Habitat Expansion Preserve Areas (as identified in the Fiesta Island Concept Plan) (Expanded Habitat)
- Road

Adjusted Expansion Area Restoration Treatments

- Site No.2 Boundary
- Coastal Sage Scrub Restoration and Enhancement
- Non-Tidal Coastal Salt Marsh Enhancement and Revegetation
- Coastal Salt Marsh/Wetland Revegetation and Enhancement
- Sand Import/Coastal Strand Revegetation and Least Tern Enhancement
- Southern Foredune Restoration and Enhancement
- Vegetation Communities/Land Cover
  - BCH, Beach
  - DCSS, Diegan Coastal Sage Scrub
  - DH, Disturbed Habitat
  - OW, Open Water
  - SF, Southern Foredunes
  - dSCSM, Disturbed Southern Coastal Salt Marsh

Special-status Plants

- Lewis' evening-primrose
- San Diego Viguiera
- Coast woolly-heads
- Decumbent goldenbush
- Red sand-verbena
- Woolly seablite
- Nuttall's acmispon

SOURCE: ESRI 2024; City of San Diego 2018

0 112.5 225 Feet

FIGURE 18

Fiesta Island North Central-Site No. 2

Mission Bay Park Improvements Program

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2.3.3 Fiesta Island Near Youth Camping No.3

PROJECT DESCRIPTION

Site No. 3, referred to as Fiesta Island Near Youth Camping (see Figure 19), is located at the northeast end of the Youth Camping facility. Access to this potential preserve expansion was limited due to locked gates and fencing; however, a visual reconnaissance was conducted from the northerly perimeter of the site along the fence line. According to the Fiesta Island Concept Plan, a portion of this youth camping area—extending along the northeast edge of the site up to the shoreline of Mission Bay—is designated as a habitat preserve. An existing maintenance access road or trail crosses through the site, providing potential access for restoration activities. The eastern boundary of the site reaches the beach along the bay, offering an important transition zone between upland and shoreline habitats. Restoration efforts at this location could include the removal of non-native vegetation and the establishment of native coastal plant communities to improve habitat connectivity and support sensitive species.

PRELIMINARY DESIGN PROJECT COMPONENTS

Site No. 3 spans from the camping area to the shoreline of Mission Bay and includes a paved access road and trail system that currently bisects the area. While access is limited by fencing and locked gates, visual reconnaissance confirmed that the area is largely disturbed, supporting a mix of non-native weeds, ornamental plants, and scattered patches of disturbed Diegan coastal sage scrub. The site gently slopes from west to east, offering a natural transition zone between the upland camping area and the bay edge.

Restoration of Site No. 3 would involve the removal of exotic vegetation, grading to create low-profile dune features, and re-establishment of native plant communities, including Diegan coastal sage scrub, coastal strand, and enhancement of existing non-tidal coastal salt marsh. Importing approximately 21,000 cubic yards of sand is recommended to support dune formation, which would be stabilized with native vegetation to reduce wind erosion. To avoid conflicts with recreational users, access roads and trails through the site should be considered for removal or realignment, with fencing or signage used to delineate the preserve boundary. While not intended for least tern nesting, the restored dunes may attract the species opportunistically. The location adjacent to the youth camping facility also presents an opportunity for environmental education and interpretive signage.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

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Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

For Site No. 3, imported sand materials will also be sourced primarily from the Fiesta Island stockpiles. The soil and sand will be transported from these temporary stockpiles to the restoration area to support the creation of suitable coastal strand habitat conditions. Habitat restoration specialists will oversee material selection to confirm compatibility with revegetation goals. Staging areas on Fiesta Island and at site-adjacent locations will be used to store equipment and planting materials, ensuring streamlined construction and planting operations.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized in the maintenance program.

2.3.4 Fiesta Island North Least Tern Preserve No.4

PROJECT DESCRIPTION

Site No. 4, known as the Fiesta Island Least Tern Preserve Area (see Figure 20), is located at the northeast end of Fiesta Island. The existing CLT Preserve encompasses approximately 30 acres and is managed by the City of San Diego in coordination with the U.S. Fish and Wildlife Service (USFWS). It is surrounded by a chain-link fence, a sand berm, and a mile-long segment of Fiesta Island Road. Though once a productive nesting area, the site has experienced a significant decline in tern use and nest success since its peak in 2003, largely due to overgrown vegetation and predator intrusion. As a result, the City, in coordination with USFWS and the California Coastal Commission (CCC), is pursuing a reconfiguration of the preserve to improve its suitability as nesting habitat. Planned improvements include removal of the perimeter roadway, habitat grading to support tidal functions, and enhancement of sandy nesting areas with protective fencing and anti-perch features. Limited seasonal public access may be retained along a designated path, while the core preserve area would remain closed year-round to protect sensitive species.

- Mission Bay Park Improvement Zone
- Soil Sample Location
- Stockpile Area
- Haul Route
- Limits of Original Proposed Upland Habitat Expansion Preserve Areas (as identified in the Fiesta Island Concept Plan) (Expanded Habitat)

Adjusted Expansion Area Restoration Treatments

- Site No.3 Boundary
- Coastal Sage Scrub Restoration and Enhancement
- Non-Tidal Coastal Salt Marsh Enhancement and Revegetation
- Sand Import/Coastal Strand Revegetation and Least Tern Enhancement
- Vegetation Communities/Land Cover
  - BCH, Beach
  - DCSS, Diegan Coastal Sage Scrub
  - DEV, Urban/Developed
  - DH, Disturbed Habitat
  - OW, Open Water
  - SF, Southern Foredunes

Special-status Plants

- Lewis' evening-primrose
- Coast woolly-heads
- Red sand-verbena
- Woolly seablite

SOURCE: ESRI 2024; City of San Diego 2018

0 80 160 Feet

FIGURE 19

Fiesta Island Near Youth Campground-Site No. 3

Mission Bay Park Improvements Program

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- Mission Bay Park Improvement Zone
- North Fiesta Island Wetland Restoration Project
- Soil Sample Location
- CCC Approved Boundary
- Least Tern Nesting Habitat
- Vegetated Dune Feature
- Low Marsh
- Mid Marsh
- High Marsh
- Vegetation Communities/Land Cover
  - BCH, Beach
  - DH, Disturbed Habitat
  - OW, Open Water
  - dSCSM, Disturbed Southern Coastal Salt Marsh

Special-status Plants

- Lewis' evening-primrose
- Woolly seablite

SOURCE: ESRI 2024; City of San Diego 2018

0 90 180 Feet

FIGURE 20

North Fiesta Island Least Tern Preserve-Site No. 4

Mission Bay Park Improvements Program

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PRELIMINARY DESIGN PROJECT COMPONENTS

The goal of the proposed design concept is to replace the degraded and underperforming CLT Preserve with a reimagined and ecologically functional nesting area. This includes shifting the preserve to the western half of the subarea, where it will be bordered on three sides by open water, providing greater opportunities for CLT foraging and mating. The redesigned preserve would be approximately 28.8 acres in size, greatly exceeding the 4-acre minimum for viable CLT nesting, and designed to include a gently sloped sandy terrain, sparse vegetation for chick cover, and direct adjacency to a restored salt marsh estuary to increase prey availability.

The nesting habitat would consist of a relatively flat and westward-sloping surface, regraded and restored with imported coarse, light-colored sand mixed with crushed shell and other materials to discourage non-native vegetation. The area would remain sparsely vegetated along the dune margins (less than 5%–15% cover) and fitted with roof tiles to provide refuge for chicks. The dunes would be shaped into low, undulating forms along the eastern boundary to transition into the adjacent marsh while higher dunes to the north and south would serve as noise and visual buffers from surrounding public and recreational uses. These features aim to minimize edge effects and improve CLT nest success while maintaining critical viewsheds and access for site monitoring.

Predator and human access management would be central to the preserve's success. Anti-predator fencing with anti-perching features would be installed along the perimeter and extend into bay waters, paired with a 50-foot offshore buffer zone marked with buoys. A gated pedestrian and maintenance access system would cross the intertidal marsh via a camouflaged 12-foot-wide path that avoids introducing predator perches or visibility issues. Seasonal restrictions and interpretive signage would protect the site during the nesting season. The restored CLT habitat would work in concert with a planned coastal estuary to the east, creating a dynamic, resilient system that improves nesting outcomes, biodiversity, and public awareness. This design is guided by recommendations from USFWS, CCC, City, and scientific studies on CLT nesting ecology and predator mitigation.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

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Soil and sand material sourcing for Site No. 4 (CLT Preserve) will prioritize stockpiles at Fiesta Island, where imported sand and shell fragments will be temporarily stored before being transported to the site. Material selection for this site will be carefully reviewed and approved by habitat restoration specialists to ensure it meets the specific substrate requirements for least tern nesting habitat restoration. Irrigation equipment, soil amendments, plants, and seeds necessary for revegetation will be delivered as needed and stored in nearby staging areas to facilitate efficient site work.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

2.3.5 Cloverleaf Enhancement Area Site No. 5a

PROJECT DESCRIPTION

Site No. 5a, the Cloverleaf Enhancement Area (see Figure 21), is located at the west end of the San Diego River access road (old Sea World Drive), near Sea World Drive and West Mission Bay Drive. The site is adjacent to an existing CLT Preserve and is enclosed by chain-link fencing, with Torrey Pine trees lining the northern edge. The area is disturbed and overgrown with non-native vegetation, which could be removed and replaced with native coastal scrub to enhance habitat value.

A portion of the site was previously restored as a mitigation area for southern coastal salt marsh, and further restoration may be limited by existing permit restrictions. However, vegetation conditions have degraded due to invasive species, and enhancement through exotic species removal and native replanting is recommended. Although the site is not directly connected to the San Diego River wetlands due to a paved access road and rock-armored bank, upland habitat improvements would still support broader ecological goals.

The City's NRMP for Mission Bay Park is expected to be updated within the next 2 to 5 years and will include the relocation of the existing CLT nesting site. This update is anticipated to guide the siting and design of a new nesting area, and Site No. 5a may play a role in supporting these conservation goals. A 12-inch municipal water main beneath Sea World Drive may be used for temporary irrigation to help establish native vegetation.

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- Mission Bay Park Improvement Zone
- Existing Least Tern Preserve (To Be Modified)
- Previous Salt Marsh Mitigation Area (Modification and Enhancement)

Adjusted Expansion Area Restoration Treatments

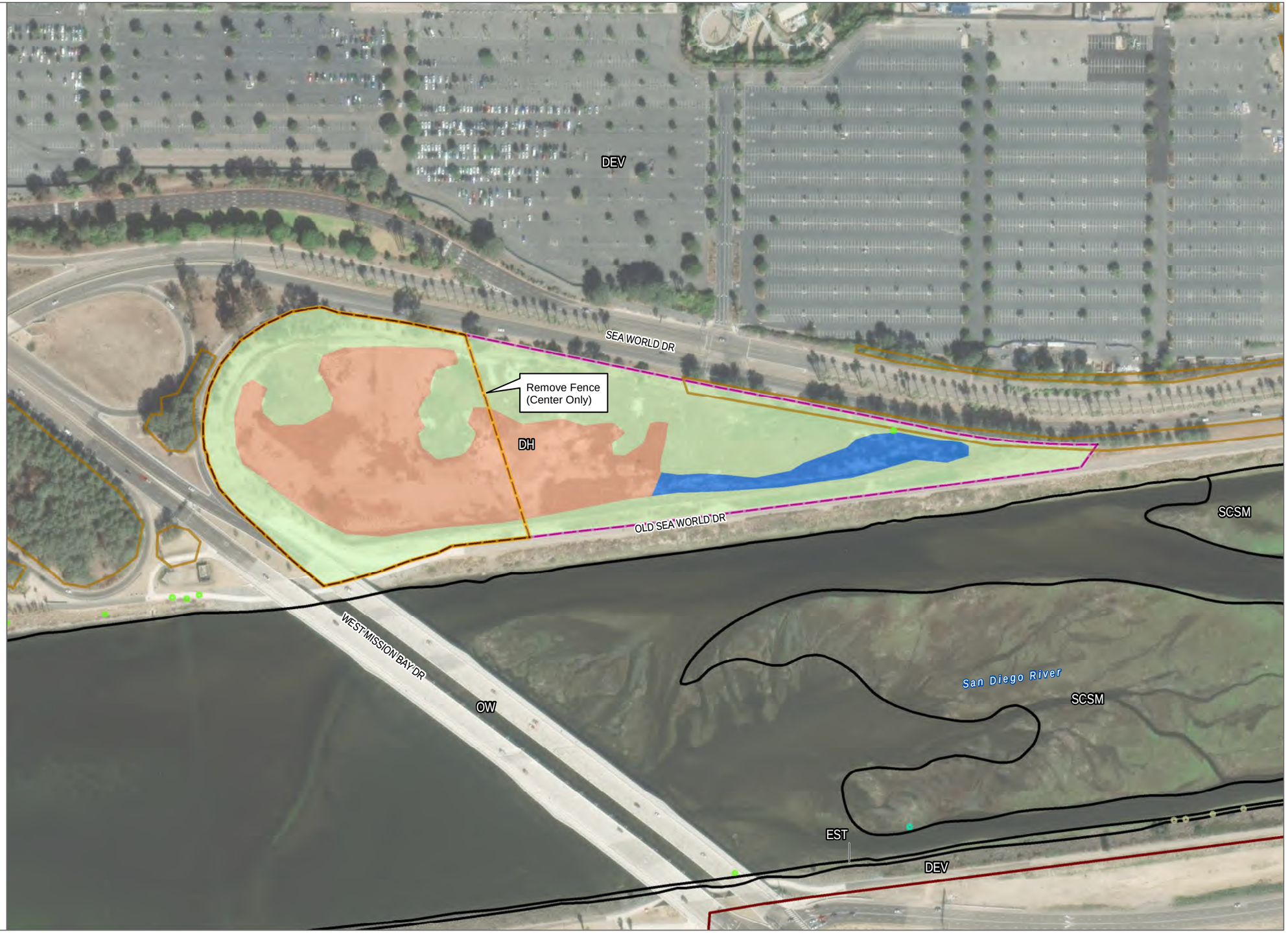
- Non-Tidal Coastal Salt Marsh Enhancement and Revegetation
- Coastal Strand Revegetation and Enhancement
- Sand Import and Coastal Strand Enhancement Revegetation (Least Tern Nesting Improvement)

Vegetation Communities/Land Cover

- DEV, Urban/Developed
- DH, Disturbed Habitat
- EST, Intertidal Estuary
- OW, Open Water
- SCSM, Southern Coastal Salt Marsh

Special-status Plants

- Lewis' evening-primrose
- Torrey pine
- Southwestern spiny rush
- Woolly seablite



SOURCE: ESRI 2024; City of San Diego 2018

0 120 240 Feet

FIGURE 21

Cloverleaf Enhancement Area-Site No. 5a

Mission Bay Park Improvements Program

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PRELIMINARY DESIGN PROJECT COMPONENTS

The Cloverleaf CLT Preserve at Site No. 5a is an approximately isolated site, bordered on three sides by roadways and fenced for protection, and currently supports disturbed habitat dominated by non-native vegetation. The restoration concept focuses on the eradication of invasive species and enhancement of native coastal strand vegetation to increase habitat quality. Restoration efforts will include expanding native vegetation buffers both within and outside the existing fence boundary, with special consideration for maintaining and enhancing the previously restored southern salt marsh mitigation area through exotic species removal and habitat improvements. The site's non-tidal hydrology, limited water influence, and periodic ponding areas with hypersaline soil conditions will guide the planting and grading design to support resilient coastal strand communities and potentially establish new populations of rare species such as Nuttall's lotus.

To improve substrate conditions for native vegetation establishment, areas of compacted soil and periodic water ponding will receive imported sand from Fiesta Island, creating microtopographic variation through mounding and grading. Approximately 52,982 cubic yards of coarse, sandy fill will be placed in 1- to 2-foot layers to provide a suitable growing medium that prevents waterlogging while enhancing natural drainage. This topographic complexity will help create diverse niches for coastal strand species and promote natural regeneration. The restoration design will also incorporate adaptive management strategies to control invasive species over time, monitoring vegetation success and soil salinity, ensuring long-term site resilience despite the site's isolation and limited hydrologic connection to the San Diego River wetlands.

Overall, this preliminary design concept aims to transform Site No. 5a into a functional and sustainable habitat area for coastal strand vegetation and associated wildlife, improving ecological connectivity where feasible, and providing habitat enhancements that complement the broader Mission Bay Park restoration efforts. While constrained by surrounding infrastructure and hydrology, strategic planting, soil amendment, and ongoing management will promote native biodiversity and support regional conservation goals.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

2.3.6 Triangle Enhancement Area Site No. 5b

PROJECT DESCRIPTION

Site No. 5b, known as the Triangle Enhancement Area (see Figure 22), is a disturbed area of Diegan coastal sage scrub vegetation located between Sea World Drive to the north, Friars Road to the east, and Old Sea World Drive and the rock-armored San Diego River bank to the south. Informal habitat restoration efforts were previously undertaken at this site by the San Diego Audubon Society.

The site supports moderately healthy Diegan coastal sage scrub habitat with a mix of southern foredune vegetation (Dudek 2025). Sensitive plant species, including Nuttall's lotus, have been observed on site, contributing to the habitat value. Despite prior restoration, the area is still impacted by non-native and invasive species and would benefit from further enhancement through exotic species removal, container planting, and seeding with native Diegan coastal sage scrub species.

While the site already offers ecological value due to its plant diversity and vegetation cover, the potential for mitigation credit would require additional coordination with resource agencies to determine if enhancement activities meet applicable criteria.

PRELIMINARY DESIGN PROJECT COMPONENTS

Although informal restoration efforts by the San Diego Audubon Society have improved native vegetation cover, including species such as Nuttall's lotus, Site No.5b remains impacted by reinvasion of non-native and exotic species, human disturbance, and unauthorized foot traffic. This area is constrained by its small size, surrounding roadways, and isolation from other native habitat patches, limiting opportunities for habitat expansion or connectivity. Vehicular noise and human activity are additional challenges to maintaining a functional and resilient native plant community.

The restoration approach for Site No. 5b emphasizes intensive non-native species eradication followed by active revegetation using container plants and native seed to enhance existing Diegan coastal sage scrub habitat quality. Management would focus on controlling invasive weeds, removing

trash and debris, and discouraging unauthorized trail use to reduce disturbance impacts. The City is encouraged to collaborate with local volunteer organizations, such as the San Diego Audubon Society, to implement these restoration and maintenance activities, ensuring community engagement and long-term stewardship. Although the site's isolated nature limits landscape-scale benefits, these enhancement efforts can increase local habitat value for sensitive native species and contribute to regional conservation goals.

Given the site's boundaries and existing vegetation, restoration will focus on optimizing native species composition and density within the existing footprint without expansion. Monitoring will be essential to track the persistence of sensitive species like Nuttall's lotus and to adapt management to emerging threats. While mitigation credit potential remains to be clarified with resource agencies, this enhancement project represents a valuable investment in improving the quality of Diegan coastal sage scrub habitat in a highly urbanized portion of the San Diego River corridor.

CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand

pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

2.3.7 South Shores Restoration Area Site No. 5c

PROJECT DESCRIPTION

Site No. 5c, the South Shores Restoration and Enhancement Area (see Figure 23), is located east of South Shores Park and bordered by Sea World Drive to the south and east, and Mission Bay to the north and west. This area serves as a major gateway into Mission Bay Park, providing access to Fiesta Island, surrounding parklands, and nearby coastal communities.

The site consists of disturbed Diegan coastal sage scrub and dune habitat, interspersed with non-native species. It contains the largest known population of Nuttall's lotus in Mission Bay Park, located centrally within the site.

The southern portion of the site overlays the former Mission Bay Landfill, while the northern portion appears to be outside the landfill boundary. Habitat enhancements could include exotic species removal, revegetation with native Diegan coastal sage scrub and dune species, and soil import to build dune topography. Overfilling the landfill cap could also help protect buried materials and introduce topographic variation to increase habitat diversity. The site's size and condition present a strong opportunity for upland habitat restoration that supports sensitive plant species and coastal ecosystem goals.

PRELIMINARY DESIGN PROJECT COMPONENTS

Site No. 5c, restoration would maximize native vegetation while protecting the central Nuttall's lotus population. The site's history of disturbance, non-native species presence, and limited grading options due to landfill constraints guide the design approach. The recommended restoration strategy focuses on targeted non-native species removal, site grading to introduce gentle topographic variation, and the import of approximately 95,477 cubic yards of sand from Fiesta Island to establish suitable substrate for coastal strand vegetation. The design will create low-profile dune features rising 2 to 4 feet above existing elevations to promote habitat diversity while maintaining visual access to the bay and minimizing sand drift onto roadways. Native species plantings and seedings will follow, supported by temporary irrigation for container plants, with direct seeding relying on seasonal rainfall. The central Nuttall's lotus population will be protected with limited disturbance, and opportunities for its expansion will be incorporated where feasible.

A lower-cost restoration alternative may focus solely on Diegan coastal sage scrub habitat without sand import, reducing project costs but potentially limiting habitat diversity. Throughout all approaches, the goal is to establish a resilient, self-sustaining native plant community that enhances regional biodiversity and complements recreational uses. The design balances ecological restoration with site constraints and community needs, advancing habitat restoration goals within the Mission Bay Improvement Zone.

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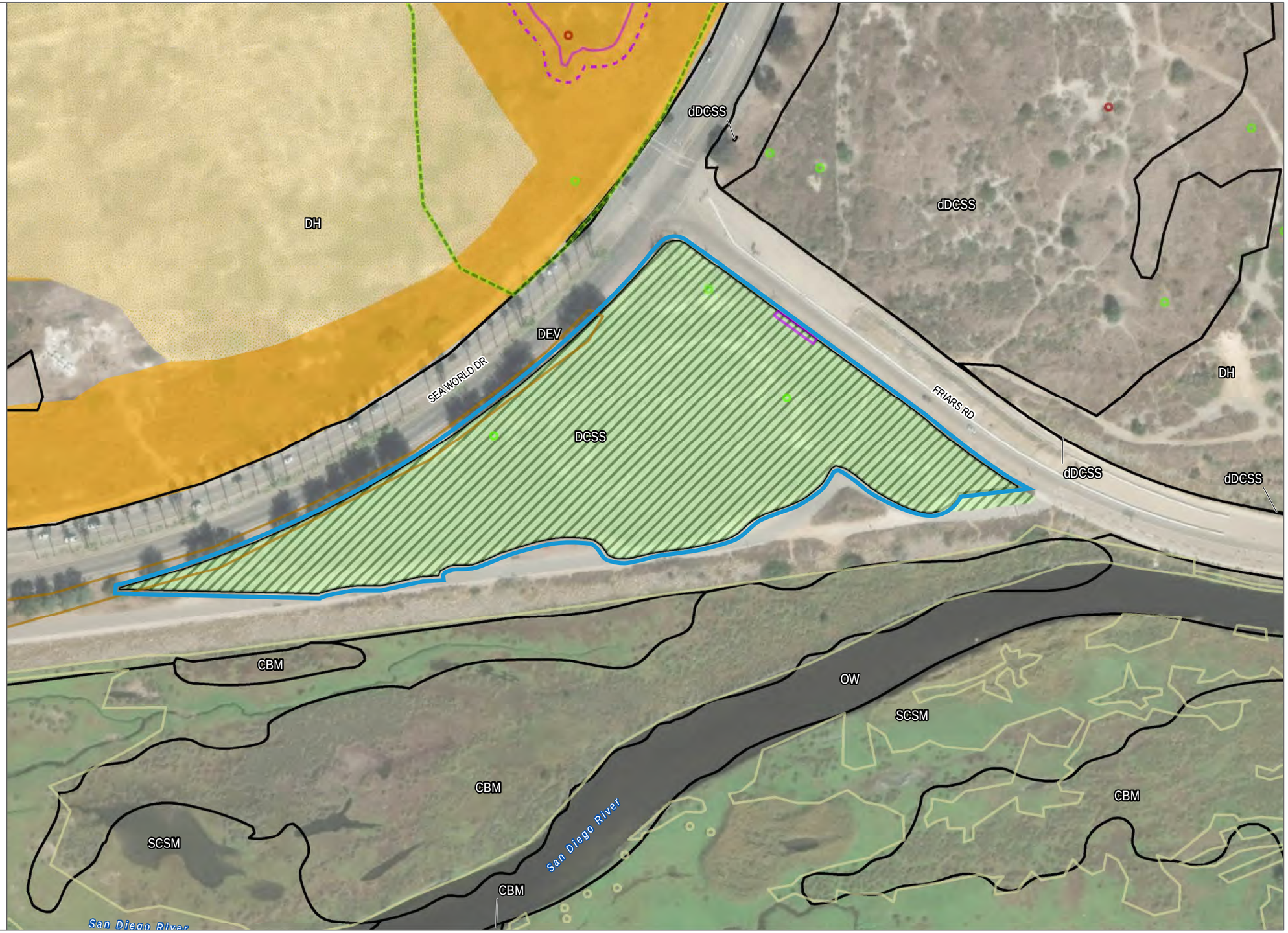
- Mission Bay Park Improvement Zone
- Limits of Original Proposed Upland Habitat Expansion Preserve Areas (as identified in the Fiesta Island Concept Plan) (Expanded Habitat)
- San Diego Audubon Society Revegetation Area (San Diego River/Sea World Dr. Site #3a)

Adjusted Expansion Area Restoration Treatments

- Site No. 5b
- Coastal Sage Scrub Restoration and Enhancement
- Sand Import/Coastal Strand Revegetation and Least Tern Enhancement
- Potential Nuttall's acmispon Expansion Area
- Vegetation Communities/Land Cover
  - CBM, Coastal Brackish Marsh
  - DCSS, Diegan Coastal Sage Scrub
  - DEV, Urban/Developed
  - DH, Disturbed Habitat
  - OW, Open Water
  - SCSM, Southern Coastal Salt Marsh
  - dDCSS, Disturbed Diegan Coastal Sage Scrub

Special-status Plants

- Lewis' evening-primrose
- Torrey pine
- Coast woolly-heads
- Southwestern spiny rush
- Nuttall's acmispon



SOURCE: ESRI 2024; City of San Diego 2018

0 75 150 Feet

FIGURE 22

Triangle Enhancement Area-Site No. 5b

Mission Bay Park Improvements Program

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- Mission Bay Park Improvement Zone
- Soil Sample Location
- Grading Contours
- Informal Trails
- Limits of Original Proposed Upland Habitat Expansion Preserve Areas (as identified in the Fiesta Island Concept Plan) (Expanded Habitat)
- San Diego Audubon Society Revegetation Area (San Diego River/Sea World Dr. Site #3a)

Adjusted Expansion Area Restoration Treatments

- Site No. 5c
- Coastal Sage Scrub Restoration and Enhancement
- Coastal Salt Marsh Enhancement
- Coastal Strand Berm Revegetation
- Sand Import/Coastal Strand Revegetation and Least Tern Enhancement
- Southern Foredune Restoration and Enhancement
- Potential Nuttall's acmispon Expansion Area
- Potential Nuttall's acmispon Expansion Area
- Vegetation Communities/Land Cover
  - BCH, Beach
  - CBM, Coastal Brackish Marsh
  - DCSS, Diegan Coastal Sage Scrub
  - DEV, Urban/Developed
  - DH (Rip-Rap), Disturbed Habitat
  - DH, Disturbed Habitat
  - OW, Open Water
  - SB, Shallow Bay
  - SCSM, Southern Coastal Salt Marsh
  - dDCSS, Disturbed Diegan Coastal Sage Scrub

Special-status Plants

- Lewis' evening-primrose
- Torrey pine
- Coast woolly-heads
- Southwestern spiny rush
- Woolly seablite
- Nuttall's acmispon

SOURCE: ESRI 2024; City of San Diego 2018

0 125 250 Feet

FIGURE 23

South Shore Restoration Area-Site No. 5c

Preliminary Engineering Report Mission Bay Park Upland Habitat Expansion and Preservation

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CONSTRUCTION APPROACH AND NEEDS

Construction activities for the restoration and enhancement projects—including weed eradication, fencing installation, grading, and revegetation—are ideally scheduled during the fall and winter months. This timing takes advantage of seasonal rainfall to support plant establishment and minimizes disturbance to sensitive wildlife, particularly avoiding the migratory bird nesting season from February 15 through September 15. Access to restoration sites varies by location, with Fiesta Island Road providing vehicular access and unpaved parking areas within Fiesta Island, while Sea World Drive, East Mission Bay Drive, and South Shores Parkway provide access to the San Diego River/Sea World Drive restoration sites. Informal parking exists near Old Sea World Drive, which is primarily used for recreational activities.

Heavy equipment required for grading and soil import includes dump trucks, scrapers, front-end loaders, backhoes, and water trucks. Equipment access points and staging areas will be designated near each site to facilitate efficient operations and material storage. Traffic control measures are expected to be minimal due to the limited scale of equipment movement. For hauling soil and sand materials, a two-way haul route is proposed along the middle of Fiesta Island to reduce conflicts with public circulation, with one unavoidable crossing at Fiesta Island Drive near the Youth Center requiring traffic control during hauling operations.

At Site No. 5c, a combination of imported sand and fertile soils will be temporarily stockpiled at Fiesta Island before transfer to the restoration site. Due to the site's larger scale and complex substrate needs—including sand for dune creation and fertile soil for vegetation—material sourcing will be closely coordinated and approved by habitat restoration specialists. Equipment, irrigation systems, plants, and seeds will be staged strategically near the site to support ongoing restoration and maintenance activities.

MAINTENANCE AND MONITORING REQUIREMENTS

The revegetation areas would be maintained and monitored for an initial 120-day period (i.e., 4 months). Subsequent to that, a 5-year maintenance and monitoring period would likely be required by the resource agencies, where appropriate. The 120-day maintenance would be done by the installation contractor. The long-term maintenance could be done by the installation contractor or by a different contractor per City direction and contracting coordination. Maintenance vehicles and the size of the maintenance crews will vary depending on the location being maintained. Crews are anticipated to be small, with likely no more than two trucks and a crew of four to eight laborers and one to two supervisors.

Maintenance and control of non-native exotic species will be an ongoing effort, based on seasonal conditions, and should target the most aggressive and invasive species first. A combination of hand pulling, vegetation thinning, and herbicide treatment should be implemented. Weed control should be done with the least environmentally impactful methods. Integrated pest management techniques should be utilized for maintenance.

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2.4 Seawall Improvements

LOCATIONS AND PROJECT DESCRIPTIONS

This PER proposes improvements to approximately 10,155 linear feet of the Mission Beach Seawall and boardwalk. This includes improvements to 9,780 linear feet of existing seawall and the addition of approximately 375 linear feet of new seawall between Thomas Avenue and Grand Avenue. The project area is divided into two primary reaches: the first extends from Balboa Court to San Fernando Place, and the second extends from Ventura Place to Grand Avenue (see Figure 24, Seawall – Overview, for the overall project location).

The project aims to address aging infrastructure, safety concerns, and functional improvements to the seawall and boardwalk. Proposed improvements include parapet replacement, a new wall segment, upgrades to existing beach access points, and the addition of a new vehicular beach access point. These improvements are being evaluated through conceptual design plans, rough order of magnitude cost estimates, and a feasibility report assessing design concepts and existing site conditions.

PRELIMINARY DESIGN PROJECT COMPONENTS

Several seawall improvements are included in this study and presented below. Improvements along three main segments of the wall were considered. The segments were grouped based on their structural cross-section.

- Segment A: Balboa Court to Pacific Beach Drive (excluding the wall in front of Belmont Park)
- Segment B: Pacific Beach Drive to Thomas Avenue
- Segment C: Thomas Avenue to Grand Avenue

In addition, several improvements to beach access infrastructure were studied:

- Beach Access Stairs (modify existing to be code-compliant)
- Beach Access ADA Ramp (convert existing stairs to ramp)
- Beach Access Driveway at Thomas Avenue for City equipment

The sand level adjacent to the boardwalk can drop more than 30 inches, meaning 42-inch-high fall protection must be provided on the west edge of the boardwalk for public safety. For this reason, the proposed typical parapet height is 42 inches, which will be 6 to 12 inches higher than the existing parapet.

The proposed parapet wall will be solid with no gaps, but will be formed with reveals to meet historic preservation requirements. Over time, the original lamp posts were taken down on the western side of the boardwalk (i.e., at the pilasters) and were moved to the eastern side of the boardwalk. The intent is to keep the boardwalk lighting as-is, so pilasters are not required for the replacement parapet. The new parapet will be required to be color-matched with the previous improvements.

New structures are typically designed for a 75-year service life. Design of the new structural components should take into account considerations such as materials, structural detailing, and long-term maintenance to provide the appropriate service life.

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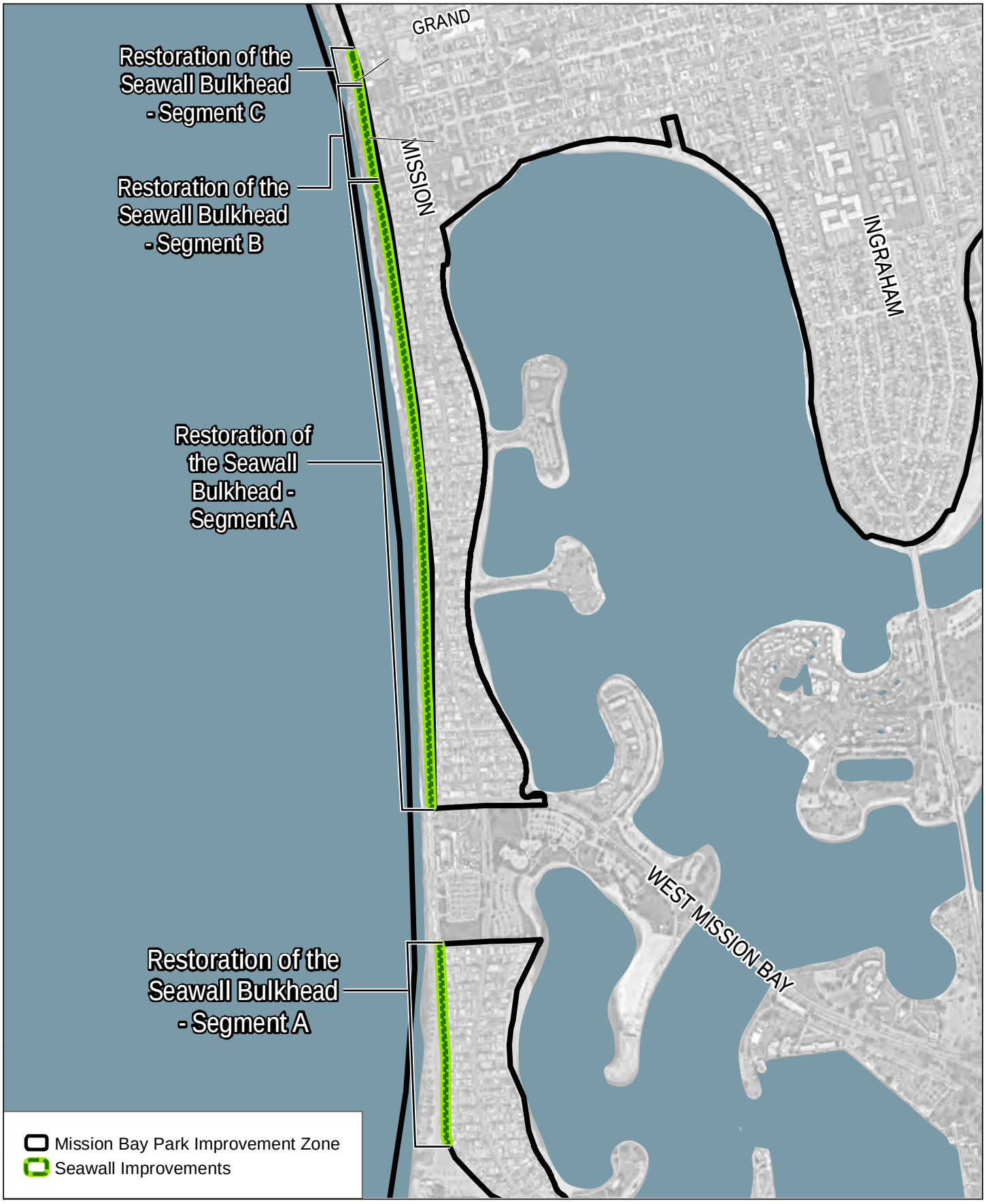

SOURCE: SANGIS 2023

FIGURE 24

Seawall - Overview

Mission Bay Park Improvements Program

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Segment A: Balboa Court to Pacific Beach Drive

Segment A runs from Balboa Court to Pacific Beach Drive. The segment in front of Belmont Park between San Fernando Place and Ventura Place was restored in 2015 and is not part of this project. The total length of Segment A within the limits of this project is approximately 8,760 feet. Along Segment A, the existing parapet would be replaced by a new 42-inch parapet. Void filling below the boardwalk is also addressed. The existing 30- to 36-inch parapet with a new 42-inch parapet, shown in Figure 25, Seawall – Segments A and B. In addition to providing the necessary fall protection, the increased parapet height would also provide SLR resiliency. The modified replacement-in-kind design would tie in with the overall look of the Mission Beach Boardwalk. This would provide resilience for SLR of up to between 6 and 12 inches, which is projected to occur sometime between 2030 and 2040 according to the 2018 State SLR Guidance or between 2040 to 2050 according to the 2024 Draft State SLR Guidance.

The existing parapet would be demolished to the top of the concrete pile cap. The new parapet would be cast-in-place concrete and would be dowelled into the existing pile cap through vertical reinforcing bars. The existing sheet pile wall and tie-back system is assumed to be adequate to carry the loading from the new parapet and would remain as-is.

Temporary fencing along the length of boardwalk would be used to allow a portion of the boardwalk width to remain open during construction. Work is assumed to be performed from the beach side to minimize disruptions along the boardwalk. The duration of construction is estimated to be 11 months.

A second potential component to restoring the existing seawall in Segment A is filling the voids below the existing walkway. The voids are the result of sand passing through the joints in the sheet piles over the years, when the beach sand levels have dropped. The primary area of concern for voids is between Nantasket Street and Pacific Beach Drive, a stretch of wall approximately 4,000 feet in length.

There are two components to addressing the voids under the sidewalk:

1. Fill the voids
2. Seal the joints between sheet piles to prevent future voids from occurring

The void repair strategy would be to core holes in the sidewalk and fill the voids with grout. Note that additional voids along the boardwalk may be present. The Geotechnical Recommendations report goes on to note that this method would not remediate breaches in the seawall that are causing the voids to occur, and future voids should be expected to form. In order to prevent future voids from occurring, significant additional work would be required to seal the joints between the sheet piles. This could be done as described in the Geotechnical Recommendations report by removing the walkway pavement and excavating the wall backfill to locate breaches, then injecting a grout mix to fill the breaches. Another option would be to seal the joints from the front face of the wall by excavating the front face of the wall down to the lowest known scour elevation, installing a plastic sheet pile and waler system on the front face of the wall and filling the annular space with grout to seal the joints. Further analysis for repairing the seawall in this manner is beyond the scope of this study. The rough order of magnitude cost estimate considers the temporary void repair as a standalone item, not necessarily completed at the same time as the concrete parapet replacement. If the temporary void repair work were to occur at the same time as the parapet replacement, there would be efficiencies in mobilization, traffic control, and temporary fencing that would result in cost savings.

Segment B: Pacific Beach Drive to Thomas Avenue

SEGMENT B: PARAPET REPLACEMENT

Segment B runs from Pacific Beach Drive to Thomas Avenue and is approximately 1,020 feet in length (Figure 25). This segment of the seawall was reconstructed in 2000 and has a different structural system than the Segment A wall. However, the proposed parapet will match the 42-inch parapet proposed for Segment A, and the scope of work will be similar.

Segment C: Thomas Avenue to Grand Avenue

A proposed new segment of wall, approximately 375 feet in length, was studied between Thomas Avenue and Grand Avenue. No wall currently exists along this stretch of boardwalk, with K-rail separating the beach from the sidewalk. A temporary sand berm is typically constructed during winter months to protect this segment of the boardwalk. A parking lot is adjacent to the boardwalk on the east side.

Five light poles located along the west edge of this segment of the boardwalk would need to be relocated to construct the new wall. It is assumed the light poles would be mounted on the new parapet.

The existing 13-foot-wide Segment C boardwalk is proposed to be widened by 5 feet to a total width of approximately 18 feet. This would align the new wall segment with the approximate location of the existing K-rail. At the north end of Segment C, the new wall would tie in at the front edge of the existing flatwork for the shower near the lifeguard station. The added width would provide congestion relief in this heavily trafficked pedestrian area.

NEW WALL

The new wall along the 375-foot length of Segment C, shown in Figure 26, would be supported on a spread footing. In order for the wall to remain stable, the City would be required to maintain a minimum sand elevation, similar to a requirement of the 2015 Belmont Park project, which was used as guidance for this study. The City would likely need to continue constructing sand berms each winter season to maintain this sand level. Construction of the wall would require closure of the boardwalk in order to provide the necessary clearance for wall footing excavation. It is assumed that the adjacent parking lot could be used as a temporary pedestrian traffic detour during construction.

Pedestrian Beach Access Improvements

Pedestrian beach access along Segments A and B is currently provided by “pop-out” stairways at 14 locations, shown in Figure 27, Seawall – Pedestrian Access, ADA Ramp, and Driveway. The existing stairs are non-code-compliant due to the insufficient top landing width and lack of fall protection and handrail.

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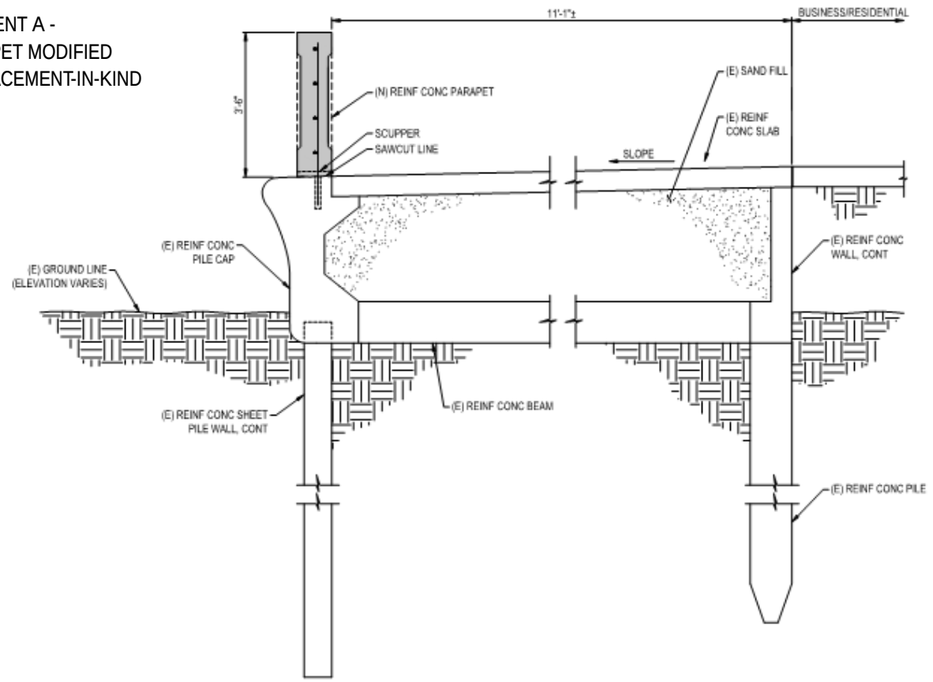
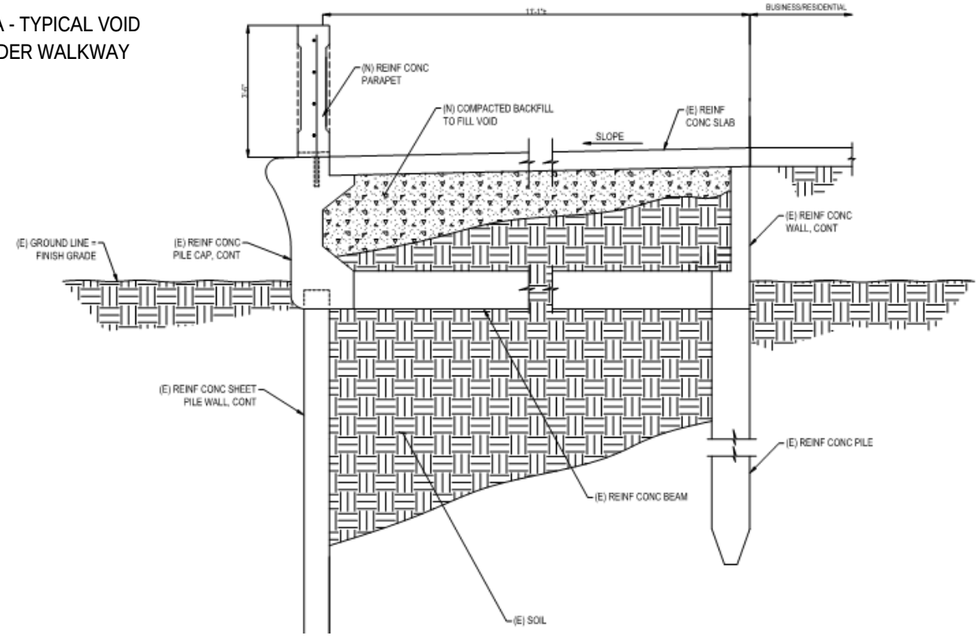
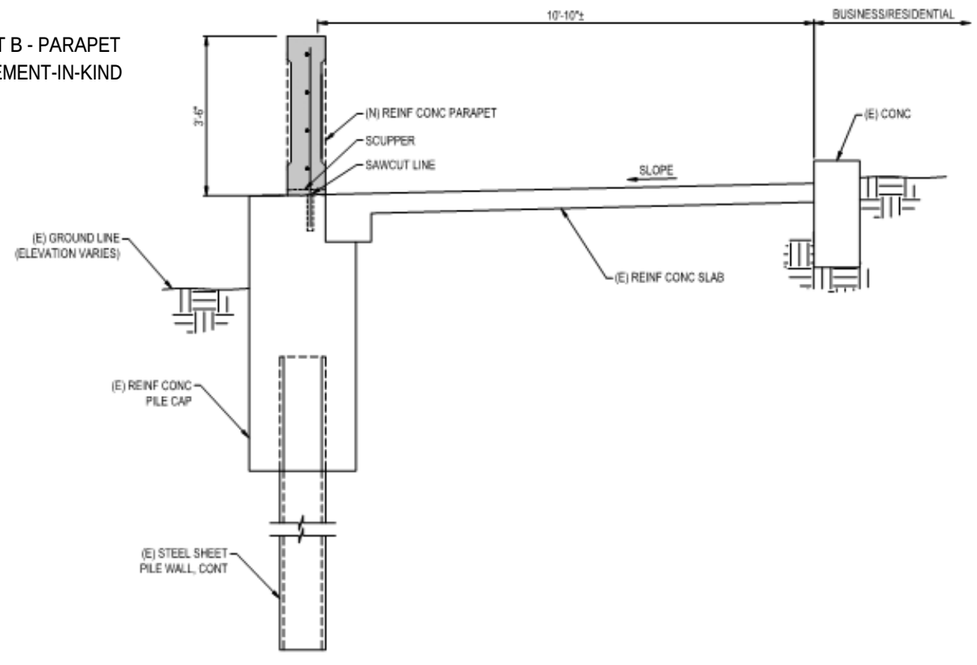
SEGMENT A -
PARAPET MODIFIED
REPLACEMENT-IN-KIND



SEGMENT A - TYPICAL VOID
REPAIR UNDER WALKWAY



SEGMENT B - PARAPET
REPLACEMENT-IN-KIND



SOURCE: Moffatt & Nichol 2024 Preliminary Engineering Report Mission Bay Park Improvement PEIR Mission Beach Seawall Improvements Feasibility Study

FIGURE 25

Seawall - Segments A and B

Mission Bay PEIR

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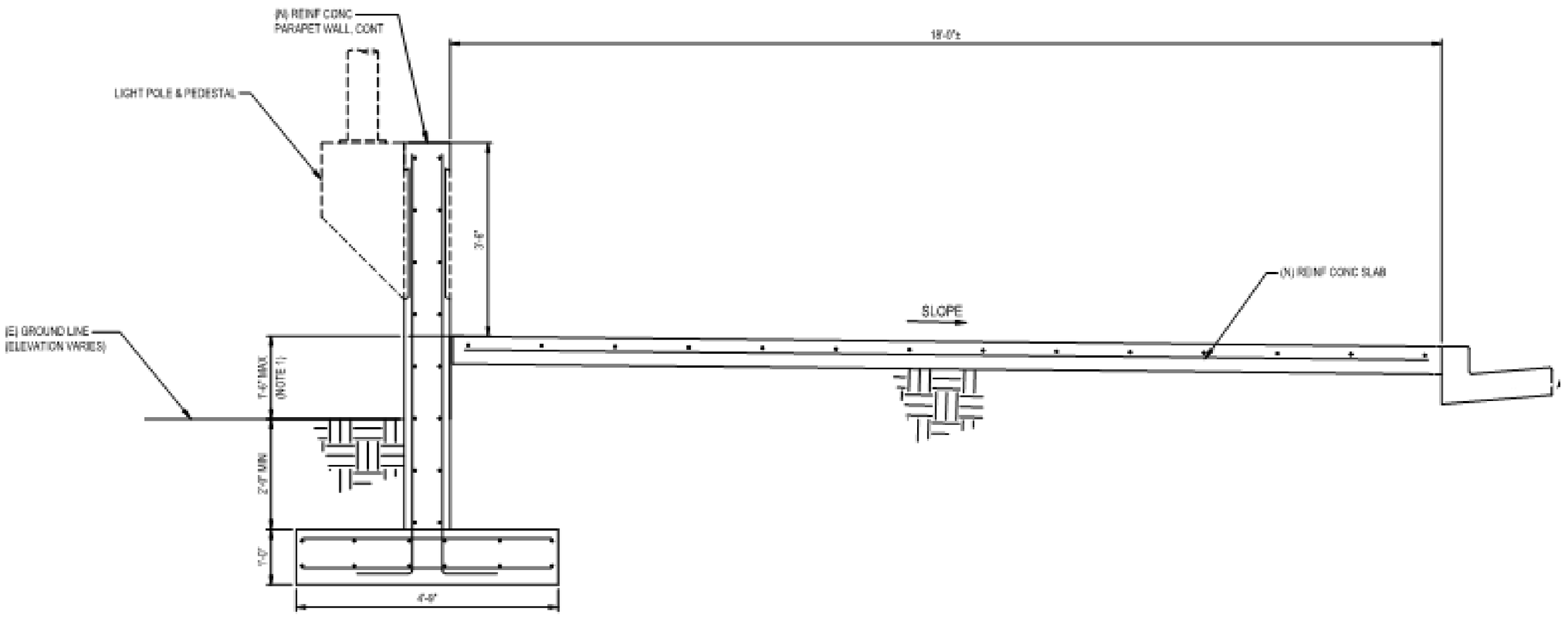

SOURCE: Moffatt & Nichol 2024 Preliminary Engineering Report Mission Bay Park Improvement PEIR Mission Beach Seawall Improvemen

FIGURE 26

Seawall - Segment C

Mission Bay Park Improvements Program

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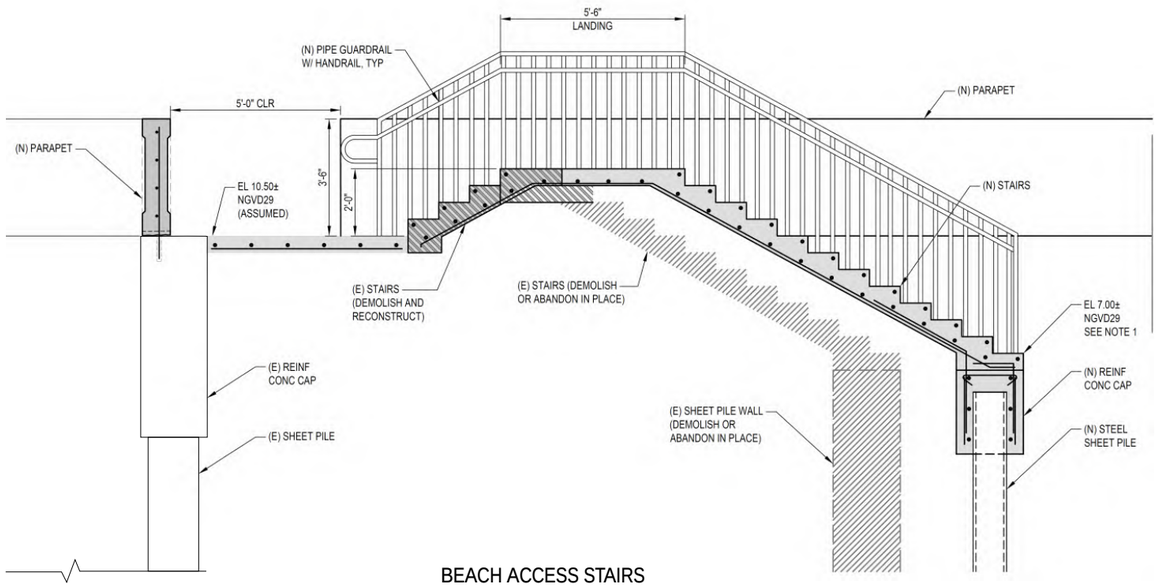
EXISTING PEDESTRIAN BEACH ACCESS LOCATIONS WITHIN PROJECT LIMITS



BEACH ACCESS STAIRS

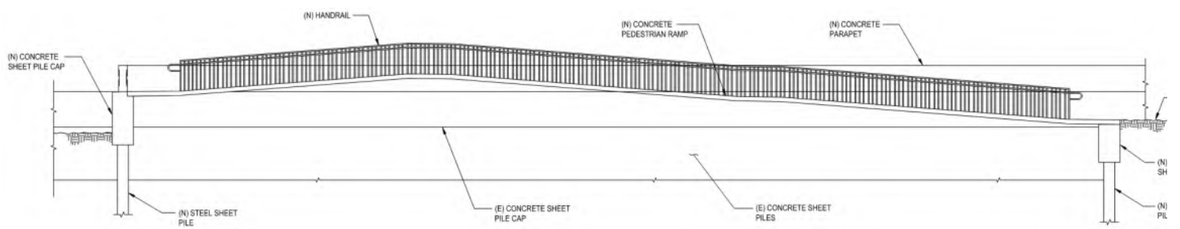


FIGURE 4-10. BEACH ACCESS ADA RAMP

SOURCE: Moffatt & Nichol 2024 Preliminary Engineering Report Mission Bay Park Improvement PEIR Mission Beach Seawall Improvements Feasibility Study

FIGURE 27

Seawall - Pedestrian Access, ADA Ramp, and Driveway

Mission Bay PEIR

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Two replacement options were studied: (1) Beach Access Stair and (2) Beach Access ADA Ramp. Following this study, the City intends to seek recommendations from an ADA consultant regarding which of the 14 existing stair locations should be reconstructed with stairs versus ramps.

The typical existing stairs rise 2 feet higher in elevation than the boardwalk before descending to the beach, which provides additional coastal protection to the boardwalk. The proposed stair and ramp configurations presented in this study will rise 2 feet before descending to provide the same level of protection as currently provided.

After a major storm event, such as an El Niño storm, the beach sand levels have the potential to drop several feet, which creates a fall hazard at the beach access locations. A picket guardrail with handrail is proposed for both stair and ramp alternatives, with the guardrail rising 2 feet above the parapet at the peak to provide the necessary fall protection. The see-through guardrail is proposed as it will provide some visibility as opposed to a solid parapet wall.

BEACH ACCESS STAIRS

Many of the existing stairways would likely be replaced with new, code-compliant stairways. Stair treads, width, landings, and railings would be designed to comply with the City of San Diego 2018 Standard Drawing SDM-118.

The existing sheet piles supporting the stairs are assumed to be concrete in Segment A and steel in Segment B, and could remain in place to support the new stairs. The stairs would rise 2 feet before descending to match the existing configuration. At the end of the stairway, an "L"-shaped segment of new sheet pile wall with a concrete cap would be constructed to lengthen the stairway to meet code requirements. The proposed stairs would descend to approximately EL 7.00 (NGVD 29), which is assumed to match the elevation of the bottom of the existing stairs.

Each existing beach access location would be closed during construction; however, the boardwalk could remain partially open. The existing parapet along the stair pop-out would be demolished and reconstructed similar to the parapet replacement discussed in Segment A and Segment B. The new stairs would tie into the boardwalk parapet, and thus the replacement of the boardwalk parapet must occur prior to reconstruction of the stairs.

BEACH ACCESS PEDESTRIAN RAMP

The second beach access alternative studied is an ADA-compliant pedestrian ramp (Figure 27) that would replace the existing beach access stairs at locations determined by the City. The ramp would slope at 1:13 (7.69%) maximum and provide landings for every 30-inch rise per the City of San Diego 2018 Standard Drawing SDM-115. The ramp would also have a picket guardrail with a handrail for fall protection. The proposed ramp would rise 2 feet before descending to provide the same level of coastal protection currently provided.

The proposed bottom landing would be approximately 3 feet below the top of the boardwalk. This is assumed to be near the same elevation where the current stairs terminate, and is the lowest the ramp can descend before requiring an additional landing.

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A new sheet pile wall and pile cap would be constructed to extend the existing pop-out to the necessary length for the ramp. The new sheet pile wall for the stairway would tie into the existing sheet pile wall. The existing stairs would be demolished and replaced by the ADA ramp. The parapet along the existing segment of the stair pop-out would be demolished and replaced. The new ramp would tie into the boardwalk parapet; therefore the replacement of the boardwalk parapet must occur prior to construction of the ramp. Aesthetically, the parapet wall for the ramp would look the same as the new parapet wall proposed for the boardwalk.

Beach Access Driveway at Thomas Avenue

A 75-foot-long driveway is proposed at Thomas Avenue to provide beach access for City equipment, shown in Figure 27. The City anticipates the driveway would need to accommodate a 60-kip loader and provide a minimum 15-foot clear width. The driveway would be constructed parallel to the existing boardwalk at the north end of Segment B. The driveway would descend to competent material at approximately elevation 1.0 (NGVD 29).

The City does not intend for this driveway to be used by the public; therefore, it would not need to meet ADA ramp requirements. Because there is currently no shoreline protection provided, the driveway does not need to rise 2 feet before descending (as required for the pedestrian beach access locations). The driveway would be supported by two new steel sheet pile walls with concrete caps, which would run parallel to the existing seawall. A structural concrete slab would span between the sheet piles. On the beach side, a parapet would be constructed to provide consistency with other segments of the seawall. On the boardwalk side, a new parapet would be constructed on top of the existing seawall as part of the Segment B work. The new parapet on the existing seawall (Segment B) would not tie in directly with the driveway, meaning the driveway could be constructed before or after the Segment B work is completed.

CONSTRUCTION APPROACH AND NEEDS

The proposed Mission Beach Seawall improvements will involve extensive mobilization and staging to support equipment and crew access. Construction access will be provided via major highways (I-5, I-8, and Pacific Coast Highway) and local roads such as Grand Avenue, Mission Boulevard, Sea World Drive, and West Mission Beach Drive. Heavy construction equipment will typically be transported during off-peak nighttime hours (9 p.m. to 6 a.m.) to reduce traffic disruptions. Staging areas, both on and off-site, will be selected to minimize community and environmental impacts. On-beach staging is preferred for proximity and access, but is subject to permitting and available beach width. Work will primarily be conducted from the beachside of the seawall, and construction fencing will segment off active areas approximately 1,000 feet long by 40–50 feet wide to ensure public safety while maintaining boardwalk and beach access.

The construction process will include mobilization, demolition of existing seawall components, and installation of new features. Mobilization will involve transporting equipment such as excavators, cranes, and forklifts. Demolition will occur from the beach side, with concrete debris stockpiled and hauled to recycling facilities. Access constraints on the land side (due to adjacent private property) make beach access critical for both demolition and new construction. New wall segments will be built using concrete delivered to street-accessible points and pumped via slick lines to the seawall footprint.

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Contractors will be required to comply with National Pollutant Discharge Elimination System permits and implement a stormwater pollution prevention plan using BMPs such as vegetation preservation, dust control, sandbag barriers, and temporary storm drains. The construction footprint will be managed to minimize erosion, protect public health and safety, and reduce impacts to nearby residences and beachgoers. Construction will also require coordination with local stakeholders to address concerns related to work hours, noise, lighting, and access.

SEA LEVEL RISE CONSIDERATIONS

Two SLR projections (1.6 feet and 4.9 feet) were selected that represent the 5% probability scenario for the years 2050 and 2100 and are driven by coastal flooding that is expected to increase (progress inland) with a 100-year storm event in conjunction with SLR.

Flooding

Vulnerability of the existing wall to flooding was based on results from the Coastal Storm Modeling System (CoSMoS). CoSMoS coastal flooding projections indicate high exposure to flooding in Mission Beach for an SLR of 4.9 feet. The timeframes for SLR of 4.9 feet are estimated to occur between 2080 and 2090 for a medium-high risk scenario according to the 2018 Guidance, and between 2100 and 2110 under the 2024 Guidance under the intermediate-high SLR scenario.

The project is anticipated to be encroached upon by tidal and storm flooding under 1.6 feet of SLR. Under the 4.9-foot SLR scenario, water levels corresponding to a storm with a recurrence period of 100 years result in flooding both seaward (i.e., flooding from the ocean) and landward (i.e., flooding from Mission Bay) of the wall. Since the upland development backing the wall becomes exposed to flooding from the Bay, the purpose of a seawall is defeated with 4.9 feet of SLR. It is assumed that other adaptation strategies will be implemented before this condition is reached; therefore, development of a replacement wall concept was targeted to better accommodate, but not to be able to completely protect against SLR of 1.6 feet.

Wave Overtopping

Functionality of the existing and proposed replacement wall was evaluated in terms of wave overtopping discharges. Wave overtopping is a function of the wall crest elevation, the incident wave height, and the water depth in front of the wall.

Overtopping rates are typically quantified in a volumetric rate per length of structure (e.g., cubic feet per second per foot of wall). Overtopping rates of 3.0 cubic feet per second per foot during extreme storm events generally provide an acceptable balance between structural safety, economics, and aesthetics. Although overtopping discharges for Segment A, replacement-in-kind, are higher than the established threshold functionality, resiliency to SLR is enhanced compared to the existing seawall.

MAINTENANCE AND MONITORING REQUIREMENTS

All maintenance of the improved and new seawall segments would be conducted in accordance with the City's existing maintenance activities for the existing seawall. No additional monitoring is proposed.

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2.5 Bike and Pedestrian Improvements

LOCATIONS AND PROJECT DESCRIPTIONS

The Mission Bay Bicycle and Pedestrian Path Improvements project is a proposed and aimed at enhancing some of the park's most used and preferred recreational facilities. As outlined in the MBPMP the park's bicycle and pedestrian paths serve a wide range of users, including cyclists, joggers, in-line skaters, skateboarders, strollers, wheelchair users, and casual walkers. The MBPMP identifies several recommendations for improving these facilities, with one key area of focus being the "Completion of Bicycle and Pedestrian Paths and Bridges." This includes finalizing planned bike and pedestrian paths, adding sustainable lighting, improving signage, and repairing surface conditions.

To inform the proposed improvements, a systematic review of the existing bicycle and pedestrian facilities within the park was conducted. Based on this assessment, four priority improvement areas were identified for further evaluation and the development of preliminary design: (1) Ocean Beach Bike Path, (2) Rose Creek Bike Path, (3) Fiesta Island Causeway, and (4) Rob Field Gateway [since removed from Improvements Program as another project has enveloped this]. These improvement areas are collectively referred to as the Mission Bay Bicycle and Pedestrian Path Improvements. The general location of the proposed improvements is shown in Figure 28, Pedestrian and Bike Improvements.

PRELIMINARY DESIGN PROJECT COMPONENTS

Pavement Section, Cross Slopes, and Facility Width

ROSE CREEK BIKE PATH

The Rose Creek Bike Path requires the removal and replacement of the existing bike path. The existing nonstandard bike path requires replacement and widening due to poor pavement conditions. The path will be 16 feet wide with a 2% cross-slope. The Rose Creek Bike Path alignment follows the existing bike path alignment to minimize impacts to the adjacent properties (Figure 29). An alternative alignment may be desirable if the current adjacent land uses and leaseholds change over time. Rose Creek improvements are consistent with exhibit PB-5 of the Pacific Beach portion of the City of San Diego Pedestrian Master Plan (City of San Diego 2015). The MBPMP recommends widening the Rose Creek Bike Path and providing lighting.

FIESTA ISLAND CAUSEWAY

The Fiesta Island Causeway (Figure 30) includes separate trails for pedestrians and bicyclists, including 6-foot bike lanes on either side of the roadway and a 16-foot multi-use trail. All of this will have a 2% maximum cross-slope and will be asphalt concrete or Portland Cement Concrete. The pathway should include one or more crosswalks to allow beach access from the parking lot.

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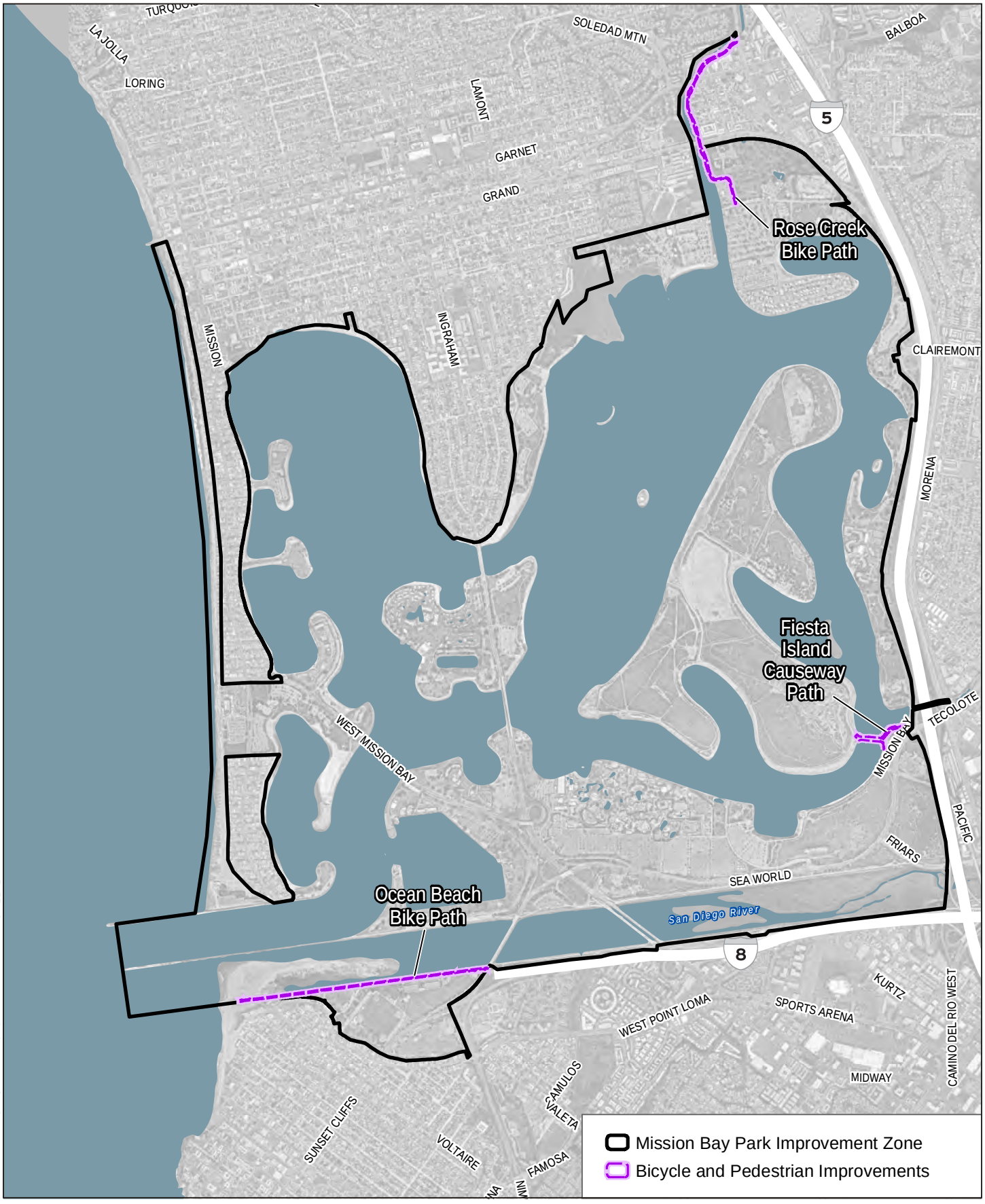

SOURCE: SANGIS 2023

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FIGURE 28

Pedestrian and Bike Improvements

Mission Bay Park Improvements Program

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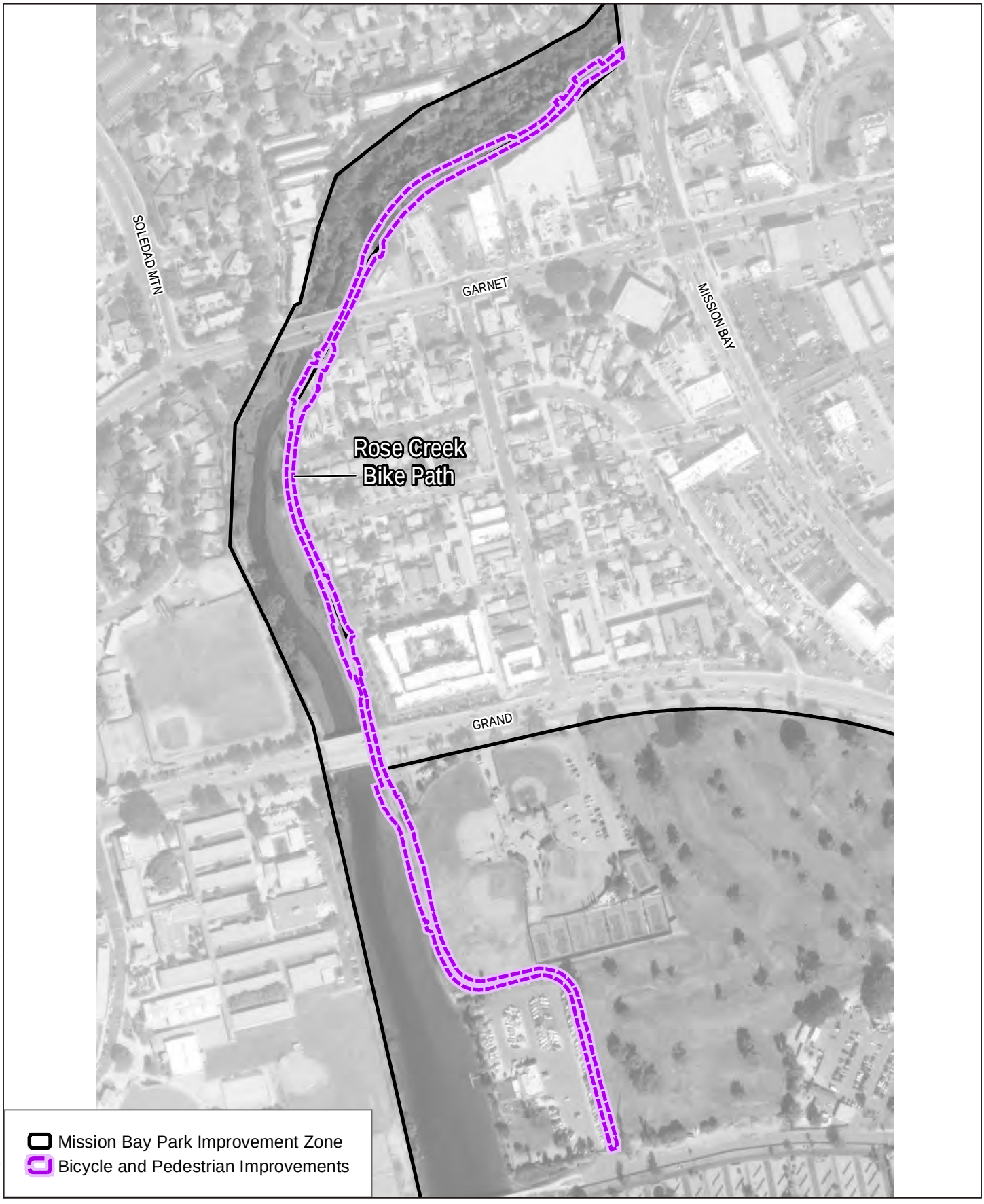

SOURCE: SANGIS 2023

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FIGURE 29

Rose Creek Path

Mission Bay Park Improvements Program

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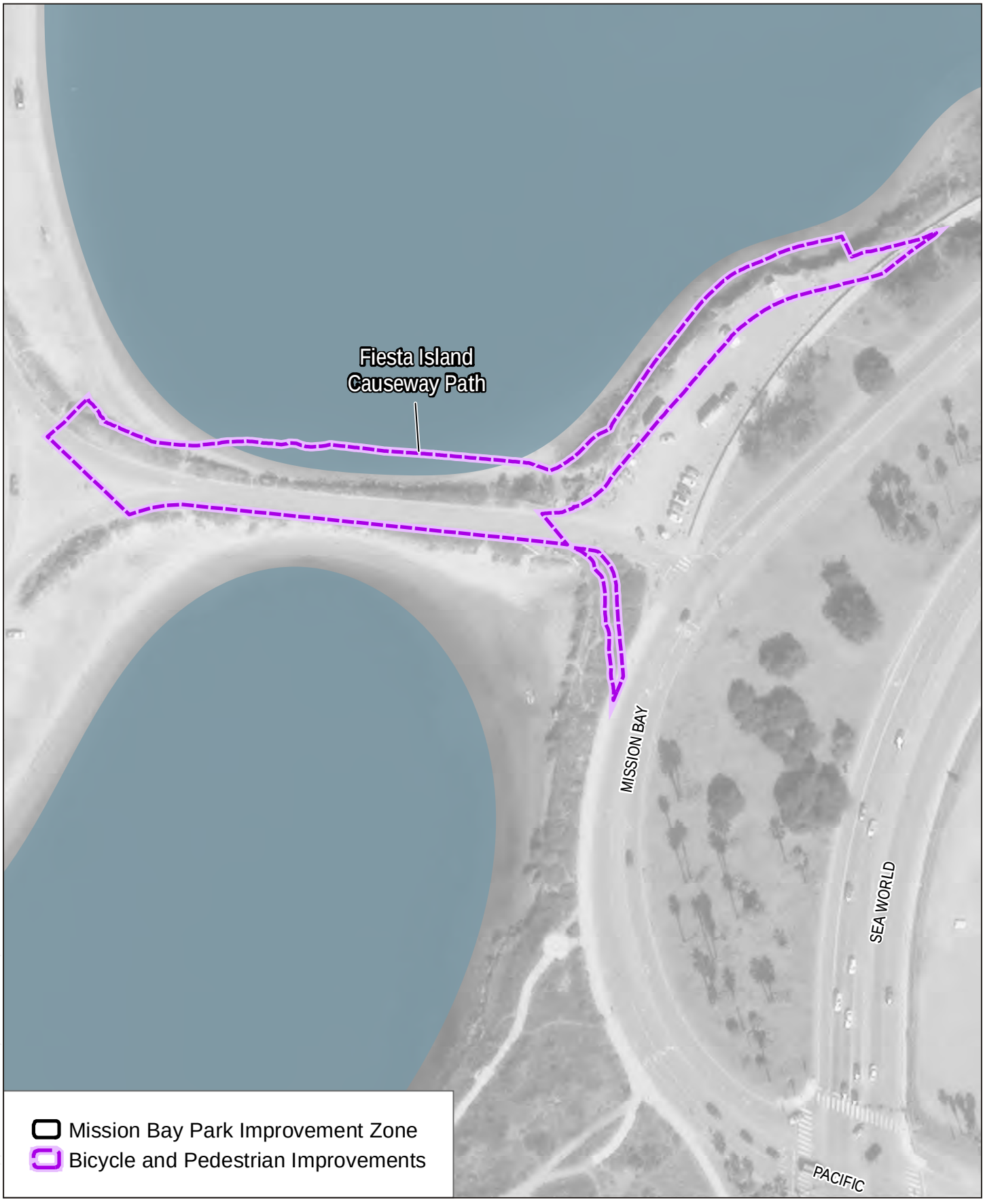

SOURCE: SANGIS 2023

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FIGURE 30

Fiesta Island Causeway Path

Mission Bay Park Improvements Program

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The Fiesta Island Causeway improvements are shown in accordance with the MBPMP – Fiesta Island Amendment (City of San Diego 2021a), including widening of the causeway to provide a pedestrian and a multi-use path adjacent to the roadway. The improvements are not in conflict with the Fiesta Island Mobility Assessment (City of San Diego 2018a). Planned improvements as part of this document for Fiesta Island Road along the causeway include two bike lanes and two travel lanes, a concrete barrier, and fill on the north side of the causeway for a multi-use trail. No widths are specified in Cross Section E of the Mobility Assessment.

The MBPMP Fiesta Island Amendment includes an alternative for a roundabout at Fiesta Island Road, which may conflict with the improvements of this PER. Additionally, the Tecolote Creek Wetland Restoration and Fiesta Island Causeway PER shows improvements to the wetland areas, which may conflict with the improvements of this PER. Further coordination between the two projects will avoid conflict.

OCEAN BEACH BIKE PATH

The Ocean Beach Bike Path (Figure 31) includes the removal and replacement of the existing bike path pavement due to sub-standard widths and poor pavement conditions. The path will have a 2% cross-slope and 16-foot width (10-foot bike path, and two 2- and 4-foot shoulders), consistent with the preliminary design recommendations outlined in the San Diego River Trail Enhancement Plan (San Diego River Trail Project). The typical section for this project is shown below. According to the proposed trail section in the San Diego River Trail Project a pavement section of 3-inch asphalt concrete over 9-inch crushed aggregate base will be used on the bicycle path and decomposed granite on the shoulders. The Ocean Beach Bike Path should be designed in coordination with the San Diego River Trail Project to have matched connectivity points. This includes the connection from the Ocean Beach Bike Path to the eastbound bike path as users exit from the Sunset Cliffs Boulevard Bridge. The Preliminary Drawings show this connection as was recommended in the San Diego River Trail Enhancement Plan. The Ocean Beach Bike Path is not intended to interfere with any of the design recommendations outlined in the San Diego River Trail Project.

A 1-foot hinge was proposed atop the levees at the Ocean Beach Bike Path due to the vertical drop from the top of slope to the toe of the levee, up to 12 feet in height. While this bike path is included in the PER and identified in initial assessment, because of overlapping activities now forecast this component is not anticipated to be implemented under the Improvements Program.

Vertical Clearance

Among the three proposed improvement areas, only the Rose Creek Bike Path presents vertical clearance constraints. The proposed design includes lowering the existing bike path to achieve the minimum required vertical clearance of 8 feet (per Caltrans Highway Design Manual Section 1003.1[3]) beneath the Garnet Avenue and Grand Avenue bridges. This adjustment ensures safe and comfortable clearance for cyclists and pedestrians, particularly under existing structures where headroom is limited.

Fencing and Pedestrian Railing

New or replacement fencing and pedestrian railing are included in several locations to enhance safety and separate users from vehicles, slopes, and waterways.

- **Rose Creek Bike Path**: Existing chain-link fencing on both sides of the path will be removed and replaced where disturbed. Pedestrian railing under the Garnet and Grand Avenue bridges will also be replaced as part of the path widening. Additionally, new protective railing will be installed along steep embankments between Garnet Avenue and Mission Bay Drive.
- **Fiesta Island Causeway**: A new pedestrian railing will be installed along the north side of the causeway to separate users from the adjacent bay and vehicle traffic.
- **Ocean Beach Bike Path**: No fencing or pedestrian railing is proposed in this segment, as it is not deemed necessary for user safety.

Retaining Walls and Concrete Barriers

Retaining walls and barriers are included where necessary to support the new path alignments and protect adjacent properties or path users.

- **Rose Creek Bike Path:** A gravity retaining wall (City Standard Drawing C-09) is proposed along the eastern edge to stabilize grading and avoid encroachment onto adjacent properties. This wall will support the expanded path footprint and help manage slope transitions.
- **Fiesta Island Causeway:** Improvements include a masonry retaining wall with a mounted pedestrian railing on the north side. A concrete barrier (K-rail) will separate the shared-use trail from vehicular lanes, providing clear demarcation and added safety.
- **Ocean Beach Bike Path:** Retaining walls and concrete barriers are not proposed. Slopes and existing terrain conditions in these areas do not necessitate structural support at this time, though minor grading will be undertaken to meet pathway standards.

Design Standards and Americans with Disabilities Act Compliance

All four improvement areas are being designed in compliance with the Caltrans Highway Design Manual (2020), the City of San Diego Street Design Manual (2017), and the ADA Standards for Accessible Design (U.S. Department of Justice 2010). The goal is to ensure safe, universally accessible facilities for users of all ages and abilities.

- **Rose Creek Bike Path**: While the northern terminus at Mission Bay Drive includes a stairway that does not meet ADA requirements, alternate ADA access is anticipated via the future Rose Canyon Bike Path, currently under construction. Side street crossings at Magnolia Avenue and Figueroa Boulevard will include new ADA curb ramps and bike access points. The proposed alignment smooths sharp curves and maintains a minimum 90- to 100-foot radius to meet Caltrans standards.
- **Fiesta Island Causeway**: No ADA or design conflicts are expected. Connections to existing walkways have been reviewed and designed to meet ADA-required slopes and grades.
- **Ocean Beach Bike Path**: The proposed improvements meet ADA standards. Tie-ins with existing paths were reviewed for grade compliance, and improvement limits were adjusted where necessary to ensure accessibility.

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SOURCE: SANGIS 2023

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Feet

FIGURE 31

Ocean Beach Path

Mission Bay Park Improvements Program

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Water Quality

The project's compliance with the City of San Diego's Storm Water Standards (2018b) was evaluated to determine pollutant control requirements. Under these standards, projects that create or replace 2,500 square feet or more of impervious surface and discharge directly to an environmentally sensitive area must implement pollutant control measures. For projects not discharging to an environmentally sensitive area, the threshold is 5,000 square feet. However, new or retrofit bicycle paths may be exempt from structural controls if designed to be hydraulically disconnected from paved streets or if runoff is directed to adjacent vegetated or permeable areas.

Across the four bike paths evaluated—Ocean Beach Path, Rose Creek Path, and Fiesta Island Causeway—approximately 160,056 square feet of new impervious area would be introduced. Of these, the Ocean Beach Path qualifies for exemption due to its hydraulic disconnection. Nonetheless, the project implements a strategic combination of biofiltration BMPs and treatment swaps to maximize water quality benefits, with the Ocean Beach Path generating the majority of water quality credits to offset areas where BMPs are not feasible due to physical constraints.

CONSTRUCTION APPROACH AND NEEDS

The proposed sites will need to consider rerouting existing users during construction, as discussed below.

Rose Creek Bike Path

Due to the length of the Rose Creek Bike Path and the lack of convenient bicycle and pedestrian alternatives on the adjacent streets, the project is proposed to be phased.

Phase 1 is the section from the Mike Gotch Memorial Bridge and Path to the Grand Avenue Bridge. A possible detour for path users is to travel west along the Mike Gotch Memorial Bridge and Path to the intersection of Pacific Beach Drive and Olney Street, then travel north on Olney Street (which has a sidewalk and no posted bicycle facilities) to Grand Avenue. The user would travel east on Grand Avenue (which has a Class II bike lane and sidewalks) to the signalized intersection at Figueroa Boulevard, and proceed west to the Grand Avenue Bridge, utilizing the ramp to the Rose Creek Bike Path leading north.

Phase 2 is the section from the Grand Avenue Bridge to the Garnet Avenue Bridge. A possible detour for path users is to travel east on Grand Avenue (which has Class II bike lanes and sidewalks) to the intersection with Figueroa Boulevard. The user will then travel north on Figueroa Boulevard, west on Magnolia Avenue, and north on Bond Street (which has sidewalks and no posted bicycle facilities) to Garnet Avenue. The Rose Creek Bike Path is accessed via a ramp a short distance to the west.

Phase 3 is the section from the Garnet Avenue Bridge to the terminus at Mission Bay Drive. A possible detour for path users is to travel west on Garnet Avenue, north on Pico Street, east on Bluffside Avenue and south on Mission Bay Drive to the terminus of the Rose Creek Bike Path. All of these streets have sidewalks, except Mission Bay Drive. None of these streets has posted bicycle facilities.

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Fiesta Island Causeway

The retaining wall will be the first item of construction, which can be constructed outside of the existing bicycle, pedestrian, and vehicular travel ways. The new pavement section can be constructed in an accelerated fashion in approximately 5 days. During that time, bicycle access to the island will be restricted at night and open during the day with the use of a flagger due to the limited paved width available.

Ocean Beach Bike Path

From the east end of the Ocean Beach Bike Path at Sunset Cliffs Boulevard pedestrians can travel to the Gateway Connection at the intersection of Sunset Cliffs Boulevard and West Point Loma Boulevard. This requires a short section of travel within a parking lot, which is not favorable, or on the dirt/grass adjacent to the parking lot. Pedestrians would then travel west along West Point Loma Boulevard until they reached the beach.

Cyclists can travel along the Class II bike lane on Sunset Cliffs Boulevard to West Point Loma Boulevard, a Class III bike route with "sharrows" to reach the beach.

SEA LEVEL RISE CONSIDERATIONS

Two SLR projections (3.6 feet and 7.0 feet) are estimated by the Year 2100. These thresholds represent the 17% probability and 0.5% probability scenarios under a high emissions scenario and are driven by coastal flooding that is expected to increase (progress inland) with a 100-year storm event in conjunction with SLR. There is a low probability that SLR could exceed 7.0 feet by the end of the century (OPC 2018). All analyses have been referenced to the NGVD 29 datum. The potential effects of SLR on each bike path project are discussed below:

Rose Creek Bike Path

The lowest elevation of the Rose Creek Bike Path is at the south end and is approximately 9 feet above sea level, therefore SLR is not anticipated to be a risk to the project.

Fiesta Island Causeway

The lowest elevation of the Fiesta Island Causeway is in the middle of the causeway and is approximately 7 feet above sea level; therefore, SLR is not anticipated to be a likely risk to the project.

Ocean Beach Bike Path

The lowest elevation of the Ocean Beach Bike Path is at the west end and is approximately 13 feet above sea level, therefore SLR is not anticipated to be a risk to the project.

MAINTENANCE AND MONITORING REQUIREMENTS

All maintenance of the improved and new bike/pedestrian paths would be conducted in accordance with the City's existing maintenance activities of the existing bike/pedestrian paths throughout Mission Bay. No additional monitoring is proposed.

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3

Additional Program Elements

The City of SAN DIEGO

3 Additional Program Elements

The additional program elements discussed in the following sections (Deferred Maintenance and Signage and Wayfinding Update) are included in the Improvements Program because they address important priorities identified in City Charter Section 55.2. These elements were analyzed and improvements identified in the Deferred Maintenance PER and the Signage and Wayfinding Update, similar to the core program elements. Conceptual design plans were not prepared due to the standard design specifications of many of the facilities proposed for improvements and the low level of complexity needed to implement any of the identified improvements. Additionally, many of the improvements identified in these elements would not trigger the need for subsequent environmental analysis or CEQA documentation and are not likely to require development or regulatory permits. Lastly, implementation of any of the improvements identified for these elements could occur at several different locations bay-wide. Specific asset locations have been identified in these elements; however, the improvements recommended could take place at any similar asset within the Improvement Zone. For these reasons, these elements are discussed distinctly from the core program elements.

3.1 Deferred Maintenance

Deferred maintenance includes necessary maintenance on an asset that has been deferred or delayed due to a constraint. If an asset requires maintenance that has been deferred and continues to degrade over time, necessitating additional improvements to resolve the deficiency, the deferred maintenance project may require a Capital Improvements Program Project. The City and many regulatory agencies have separate documentation and approval processes for implementing Capital Improvements Program projects and deferred maintenance projects. This distinction is discussed further in detail in Chapter 4.

Per Charter Section 55.2(c)(1), deferred maintenance projects that are also Capital Improvements within the Mission Bay Park Improvement Zone may be recommended by the Mission Bay Park Improvement Fund Oversight Committee and approved by the City Council, such as, but not limited to:

- Completion of bicycle and pedestrian paths and bridges as identified in the MBPMP
- Installation of sustainable lighting in the Mission Bay Park Improvement Zone
- Installation of signage and landscaping at points of entry to Mission Bay Park and the South Shores
- The repair, resurfacing and restriping of parking lots within the Mission Bay Park Improvement Zone
- The repair of playgrounds and comfort stations
- The restoration of the seawall and bulkhead on Oceanfront Walk to a condition no less than the quality of restoration previously performed in 1998 from Thomas Street to Pacific Beach Drive or to conditions as may be required by historic standards

Some of the priorities identified in this section of the City Charter have been included as core Program elements as described above, including the Bike and Pedestrian Improvements and the

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Seawall Improvements elements. To address the other priorities described as deferred maintenance in this section of the City Charter, the Deferred Maintenance PER and the Signage and Wayfinding Update were prepared. Improvements identified as deferred maintenance were assessed and analyzed in the Deferred Maintenance PER and the findings and recommendations are summarized in the following sections.

3.1.1 Assessed Infrastructure and Amenities

A field assessment was conducted in 2020 to assess the inventory of City assets within Mission Bay Park. The Deferred Maintenance PER study area encompassed approximately 3,500 acres within Mission Bay Park. The Park was divided into 13 distinct study areas: Bonita Cove and Mariners Point; Hospitality Point; Crown Point; Mission Point; Dana Landing, Sunset Point and Hyatt Islandia; Robb Athletic Field; De Anza; Playa Pacifica and Tecolote Shores; Ski Beach, North Cove and Vacation Isle; Dusty Rhodes Park; South Shores, San Diego River North and San Diego River Walks; El Carmel Point and Santa Clara Point; Ventura Point and Bahia Point; and Fanuel Street Park. Fiesta Island and the northern portion of De Anza Cove were not studied in the PER due to the separate land use plan updates that were in process for these sites at the time the PER was developed and uncertainty regarding which assets would be retained in the revised plans. Several asset types were recorded within Mission Bay Park, including furnishings, major site systems, comfort stations, and observation area points. Furnishings are identified as individual City-owned assets (e.g., trash receptacles, picnic tables) that are intentionally placed by the City to provide benefit to the general public. Major site systems are maintained spaces characterized by a specific square footage that often provide a specific use to the public (e.g., parking lots, basketball courts, baseball fields, etc.). Observation area points do not fall into any of the aforementioned categories and were documented observations of assets in the field, including open grass areas, native plant areas, fire pit storage areas, etc. The following is a list of assets that were assessed as part of the Mission Bay Park Deferred Maintenance study.

FURNISHINGS

- Barbeque Grills – Free-standing metal box-style barbeques with adjustable metal grill
- Benches – Primarily concrete or metal benches, some with backrests
- Bike Racks – Metal racks, often stylized in the shape of a bicycle with the Mission Bay logo
- Drinking Fountains – Metal or concrete fountains. Some are free-standing, and some are affixed to comfort stations
- Fire Pits – Square concrete structures, approximately 1.5 feet high, with a footprint of approximately 4 feet by 4 feet
- Fitness Stations – Varying structures, primarily wood frame or metal, used for exercise purposes
- Gazebos – Metal structures on concrete pads providing overhead protection
- Hot Coal Disposals – Concrete boxes approximately 4 feet high with a footprint of approximately 2 feet by 2 feet. A metal grate is present on many, just below the opening
- Lifeguard Towers – Plastic towers with metal legs and stairs featuring panoramic windows with shutters
- Lighting – Site lighting varies from ornamental lights along promenade walkways to parking lot lights

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- Picnic Tables – Concrete tables with adjoining benches. Some have shorter benches on one side to promote accessibility
- Playground Equipment – Varying metal, wood, concrete, and plastic structures are often grouped together. Examples include swing sets, slides, and climbing structures
- Signage – Primarily wood and plastic educational signs; however, some traffic signs were noted if they were in significantly bad condition
- Storm Drain Structures – Any asset relating to the drainage of the park and surrounding areas. This includes curb inlets, area catch basins, and outflow pipes
- Sports Field Equipment – Equipment consisting of basketball hoops, volleyball nets, baseball/softball backstops, and other items specifically intended for use with sports
- Trash/Recycling Receptacles – Concrete bins approximately 1.5 feet in diameter and 4 feet high, occasionally with domed plastic lids. Temporary and movable metal trash cans were not considered in this effort
- ADA Facility – Pedestrian ramps, stalls, and any non-compliant paths of travel identified in the field
- Other – This marker was used to identify locations of asset observations outside of other categories. This included walls, statues, and locations of slope stabilization issues, potholes, and severe root damage.

MAJOR SITE SYSTEMS

- Parking Lot Areas – Asphalt-surfaced, dirt or gravel parking areas, sometimes with lighting. Roots, surface damage, and other defects have been noted as "other" furnishings.
- Playground Areas– Clustered areas of playground equipment, typically surfaced with sand or soft synthetic material. Assets have been noted as "Playground Equipment" furnishings
- Sports Areas – Areas including volleyball courts, basketball courts, and baseball/softball fields. Associated equipment has been noted as "Sports Field Equipment" furnishings.
    - Baseball/Softball – Fields set up for baseball/softball with associated backstops, cages, dugout benches, and bases
    - Open Fields – Areas intentionally open and maintained for recreational use. Small, non-maintained areas adjacent to parks were not included in this study
    - Basketball – Courts with asphalt concrete pavement, striping, and hoops
    - Racquetball/Handball – Courts with asphalt concrete pavement, striping, and concrete backstop wall
    - Tennis – Courts with sealed surface, striping, and nets/poles

COMFORT STATIONS

- Generally, concrete block structures with restroom facilities, storage closets, and some with showers. Field assessment of comfort stations was limited to observations on the condition of the building exteriors. Comfort stations were assessed in detail as a part of the Facility Condition Assessment Report prepared by Alpha in 2017 (see PER Section 2.6.2).

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OBSERVATION AREA POINTS

- Includes miscellaneous field observations that do not fall into other categories, including planting areas, open grass areas, fire pit storage areas, and lifeguard storage areas.

Lighting and storm drain structure assessments were limited to general exterior condition. The field assessment was performed during daylight hours, and no assessment of the lighting illumination was completed. The field assessment was performed during dry weather conditions; therefore, no assessment of the operation or adequacy of storm drain facilities was completed. Field assessments on underground facilities were not performed.

3.1.2 Assessment Methodology and Results

To make condition assessments, asset classifications were created, with the applicable descriptor being applied to every observed asset/facility in the dataset. The keywords Good, Necessary, and Critical were chosen to represent the hierarchy of conditions that can also be roughly equated to the urgency of attention for each item. The qualifiers for each of the three categories are summarized below:

Good – The asset is intact, structurally sound and performing its intended purpose with no cosmetic imperfections.

Necessary – The asset is intact and performing at intended level but exhibits signs of wear and tear. The asset is not considered a potential safety concern. This includes, but is not limited to, assets featuring cracked concrete, minimally exposed rebar, rust, and cosmetic damage such as chipped paint or graffiti.

Critical – Assets that potentially pose a safety concern, and those assets that are not performing their intended purpose. These assets exhibit conditions including, but not limited to, exposed rebar, bent metal or significant rust.

In addition to the field assessment, supplemental information was reviewed and considered for inclusion in the analysis. After making condition assessments of all assets observed in 2020, it was found that overall, **66% of assets studied in Mission Bay Park are in Good condition, 34% of assets are in Necessary condition, and less than 1% are Critical.** The top three study areas with deferred maintenance needs by total count of assets include (1) De Anza, Playa Pacifica, and Tecolote Shores, (2) Ski Beach, North Cove, and Vacation Isle, and (3) Crown Point. Note that the field assessment for this PER was completed in 2020, and the PER does not consider improvements that have been implemented within Mission Bay Park since the assessment, including the new playgrounds and amenities that were installed at Tecolote Shores in 2022 and 2023.

3.1.3 Maintenance Strategy and Prioritization

A maintenance strategy is recommended to target high-need areas and optimize the budget for deferred maintenance. The maintenance strategy intends to prioritize assets into various maintenance strategy tiers and timeframes of action, based on the condition assessment. While the condition assessment classifications intend to categorize assets by performance level, the

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maintenance strategy will further assist City staff in budgeting for deferred maintenance tasks based on urgency level.

To determine maintenance priority levels, a maintenance strategy was designed. Table 4-1 in the PER lists strategy categories by order of priority. The first priority is to immediately replace Critical condition items, and Necessary items with very high consequences of failure and those currently not performing at their intended level, such as non-compliant ADA facilities. The second priority is to replace, within a 1- to 2-year timeframe, those assets with structural deficiencies that seem more cost-effective to replace rather than repair (e.g., are missing a major component, would require numerous repairs, or have extensive deficiencies). The third priority is to repair within a 1- to 2-year timeframe any remaining assets with structural deficiencies. The fourth priority is to repair cosmetic deficiencies to maintain the Park's aesthetic. And finally, listed as priority five, the City should continue to perform standard routine maintenance on the asset. Most Park assets (67%) are at the lowest priority level, requiring only standard routine maintenance.

The locations with the most numerous high-priority needs are (1) De Anza, Playa Pacifica and Tecolote Shores, (2) Ski Beach, North Cove, and Vacation Isle, and (3) Bonita Cove and Mariners Point. De Anza has several non-compliant ADA facilities, a gazebo/bandstand that is recommended to be replaced, five parking lots recommended to be replaced, and several furnishings recommended to be replaced. Ski Beach similarly has several non-compliant ADA facilities, playground equipment recommended to be replaced immediately, and five parking lots recommended to be replaced within the next 1 to 2 years. Bonita Cove has numerous non-compliant ADA facilities, and a hot coal disposal recommended to be replaced immediately.

The asset types with the most numerous high-priority needs are (1) ADA facilities – 163 total, (2) parking lots – 16 total (3) "other" furnishings (potholes, landscaping, curb, etc.) – 10 total, (4) picnic tables – six total, and (5) playground equipment – six total. See the PER for additional information and the detailed raw data from the deferred maintenance assessment.

3.1.4 Water Quality Opportunities

Deferred maintenance improvements present opportunities to incorporate water quality improvements for Mission Bay consistent with the priorities identified in City Charter Section 55.2. Many of the impervious areas around Mission Bay do not have water quality treatment, and opportunities for water quality improvements were assessed as part of the Deferred Maintenance PER. These opportunities were determined primarily at existing roads and parking lots within Mission Bay Park and consist of implementing biofiltration basins within existing infrastructure. To assess the potential for water quality improvements, the drainage patterns and locations of existing storm drain systems were evaluated using available City storm drain inventory (2020) and 2014 LiDAR topography GIS data (Appendix X). The result of this effort identified 72 potential locations where biofiltration basins may be incorporated into parking areas and access roads around the Park. See the exhibits in the PER (Appendix D) for the locations of potential water quality improvements and their associated drainage areas. The configuration and location of the biofiltration basins were determined based on drainage patterns of the parking lots and roads and proximity to existing storm drain systems. Basin locations were strategically placed adjacent to existing storm drains to allow for connections to the existing storm drains. A typical biofiltration basin cross-section, assumed for costing and preliminary design, is provided in the PER (Appendix D). During final engineering, each biofiltration basin will

need to be designed in detail, and the cross-sections will need to be configured for each specific basin. These water quality improvements are likely to require development review as they would be considered to go beyond the scope of maintenance.

3.2 Signage and Wayfinding Update

3.2.1 Purpose and Need

The Improvements Program included an evaluation of existing signage in Mission Bay Park and proposed updates, including a revised design and wayfinding considerations. Existing signage within the Park was designed and installed over 30 years ago, and considering Mission Bay Park's role as a visitor and tourist destination in San Diego, there is a desire to refresh the design and signage to reflect Mission Bay Park's continued role in San Diego's future. Goals of the proposed signage improvements include:

- Increased visibility of Mission Bay Park as a regional resource for residents and visitors
- Improved visitor orientation with the Park through the use of upgraded signage and new directories
- Improved traffic circulation and visitor safety

3.2.2 Design

The MBPMP identifies the Park as a series of "parks within a park." Using this theme as a guide, the design team has developed a color-coded approach to the signage concepts and identified distinct park areas to help orient visitors to their location within the Park. The 12 color-coded "parks within a park" recommended to be grouped under the same-colored signage are: West Mission Bay, Sail Bay, Vacation Island, Quivira Basin, Robb Field/Dusty Rhodes Park, Fiesta Island, Crown Point, De Anza, Rose Creek, South Shores, East Mission Bay, and River Park.

Different types of signage serve different functions; some are intended to distinguish a notable place, add aesthetic value to a neighborhood, provide directions, orient passers-by, and provide information, including educational information. The design team identified six design styles for improved signage in Mission Bay Park. These include an entryway monument, walkway directory/interpretive sign panel, walkway directory, roadway wayfinding signage, large-format information panel, and small-format information panels. Figure 32 includes conceptual designs of these signs that were developed with public input.

3.2.3 Concept Map

Figure 33 provides an overview of the recommended neighborhood groupings ("parks within a park") and the color palette chosen for color-coding each area.

Revised Entryway Monument

Revised Walkway Directory/ Interpretive Sign Panel

Revised Walkway Directory

Revised Roadway Wayfinding Signage

Revised Large Format Information Panel

Revised Small Format Information Panels

SOURCE: Dudek 2019

0 125 250 Feet

FIGURE 32

Signage Design Concept

Mission Bay Park Improvements Program

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SOURCE: Dudek 2019

0 125 250 Feet

FIGURE 33

Signage Parks witin a Park Map

Mission Bay Park Improvements Program

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4

Implementation Procedures

Mission Bay Park Improvements Program:
Implementation Framework

The City of SAN DIEGO

4 Implementation Procedures

The following chapter details the future activities and regulatory approvals needed to implement the Improvements Program. Environmental effects of the recommended improvements have been assessed in the Improvements Program EIR. The next stages of development, which overlap in their timing, are final design and regulatory approvals. Final design development will identify the details required for construction bid and contracting. Regulatory approvals will ensure compliance with the PEIR and applicable laws and regulations.

City staff should utilize this Implementation Framework as a guide for how to streamline the future implementation of projects consistent with the Improvements Program as funding becomes available. Although this Implementation Framework does not prescribe the timing or order of planned improvements within the Program, it does identify where efficiencies can be gained if specific PERs are developed in sequence. For example, one component of the Uplands Habitat Restoration PER, the Least Tern Preserve at Fiesta Island North, does not necessarily need to be accomplished prior to the North Fiesta Island Wetlands PER. However, there are benefits to completing these two North Fiesta Island components prior to other wetland and water quality PERs, as they would result in surplus Mission Bay-based material available for use at other PERs locations, reducing the need to purchase and import fill material.

Additionally, Section 55.2(c)(1) of the City Charter states that identified priorities should be authorized in a specified order, subject to Section 55.2(c)(2) which allows for projects to proceed concurrently under certain conditions. The order in which identified Program elements should proceed consistent with the order specified in the City Charter is summarized below:

1. Wetland Restoration and Water Quality Improvements
2. Shoreline Restoration
3. Upland Restoration
4. Seawall Improvements
5. Bike and Pedestrian Improvements
6. Deferred Maintenance
7. Signage and Wayfinding Update

Projects that propose to use funding through allocation from the Improvement Fund are approved by the Oversight Committee, which also maintains the priority project list for funding. The public has opportunities to attend Oversight Committee meetings to share their input and recommendations. The Parks and Recreation Department determines during the annual budgeting process which projects are recommended for funding, and which projects are prioritized through their annual work plan.

4.1 Final Design Procedures

The completion of the final design and approval requirements for individual elements identified in the Improvements Program will generally follow the project delivery and milestone system outlined below.

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4.1.1 30% Design

The purpose of the 30% design phase is to gain buyoff on preliminary geometry including horizontal and vertical alignments, prepare a rough project footprint, and understand key constraints and major design issues before advancing to detailed engineering. The 30% design plan set typically includes a title sheet, location and key map, base files including a field survey, mapping of right-of-way linework and easement linework, mapping of any environmentally sensitive areas, a utility base map prepared using any available as-builts and facility maps, plan view layouts including existing and proposed roadway alignments, proposed geometry for major improvements including curb, gutter, sidewalk, green infrastructure locations, etc., preliminary grading limits, proposed and existing vertical roadway profiles, typical roadway sections, and preliminary signing and striping. Preliminary notes and callouts will include horizontal and vertical geometry, any major horizontal utility conflicts, environmental constraints, any preliminary easements or right-of-way acquisitions that may be required, and conceptual staging areas. Preliminary hydraulic and hydrologic reports, an opinion of probable construction cost, and a draft specifications outline is typically also submitted during the 30% design phase in addition to the project plans.

4.1.2 60% Design

The purpose of the 60% milestone phase is to develop the design to show viable constructability, address agency comments and refine the layout. The plan set is expanded in this phase to include any applicable sheets such as traffic control, construction staging plans, detailed signing and striping plans, signal modification plans, lighting sheets, landscape and irrigation plans, construction detail sheets, grading detail sheets for green infrastructure, driveways, curb ramps, headwalls, etc., earthwork cross-sections, project impact area and right-of-way impact sheets, and conceptual water pollution control plans and details. The opinion of probable construction cost is updated, and the draft specifications package is prepared. If a Site Development Permit is required, the process typically begins once the 60% package is completed.

4.1.3 100% Design

The 100% level of the submittal package includes complete plans, opinion of probable construction costs, specifications, and a signed DS-560. The package is biddable and buildable, pending final agency or permit approvals. Any technical documents have been updated per any agency comments, and the final versions are incorporated into the plans. Utility relocations and/or adjustment plans are coordinated with external utility companies. The environmental permitting process and easement acquisition process are nearing completion, with final right-of-way acquisitions and easements shown on the plans. Technical specifications and provisions have been completed at this stage, and the project's opinion of probable construction cost is ready for final review.

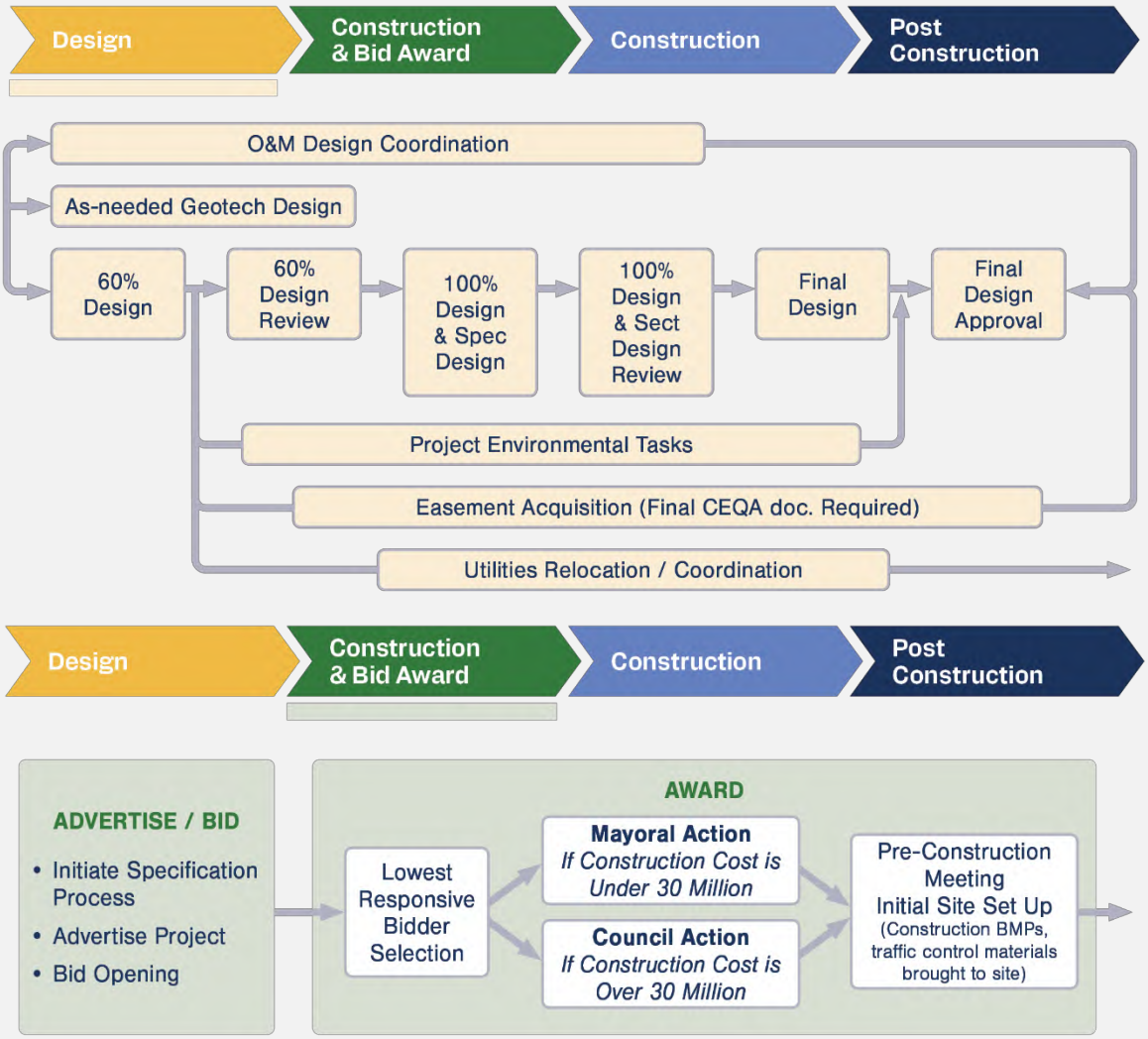
4.1.4 Advertise/Bid and Award/Construction

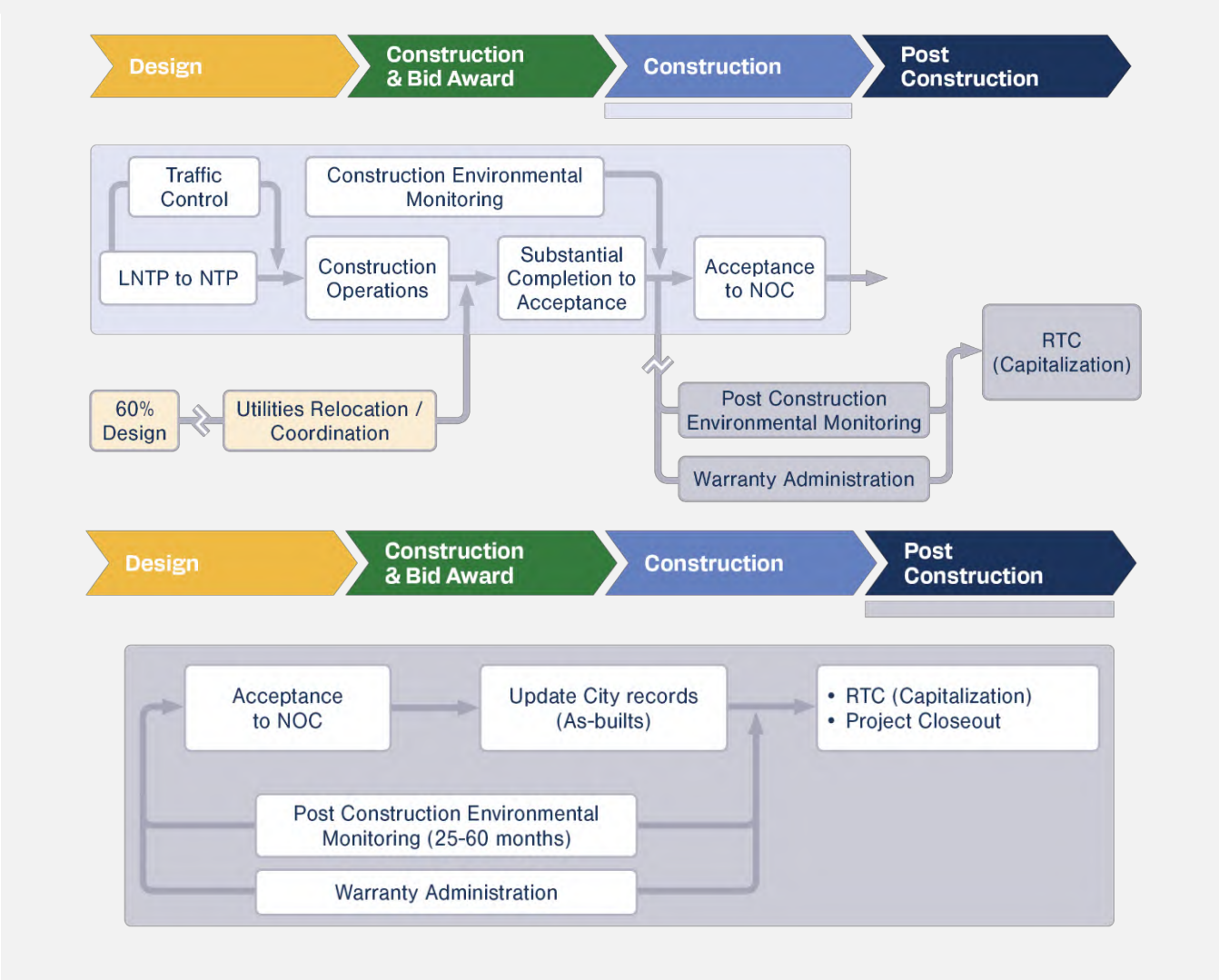
The purpose of the bid and award phase is to procure a qualified contractor to construct the project. Following bid and award, a contract is executed, a Notice to Proceed is issued, and a pre-construction meeting is held. Construction would then be initiated with physical work in the field (grading, paving, utilities, structures, etc.), coordination with utilities and agencies for field adjustments and

relocations as needed, and inspections to verify compliance with contract requirements. Environmental monitoring is also conducted to verify compliance with environmental requirements. After construction, the City will update as-builts and its asset management system, and improvements will move into operations and maintenance phases, in coordination with the Parks and Recreation Department. Improvements with habitat restoration components may include an extended maintenance and monitoring period to ensure successful and self-sustaining habitat conditions prior to handoff to the Parks and Recreation Department for ongoing operations and maintenance.

The flowchart below visually outlines the final design and project delivery procedures (Exhibit 1).

Exhibit 1. Final Design and Project Delivery Procedures.





4.2 Subsequent Environmental Review and Documentation

Final design may result in changes to proposed improvements compared to the understanding and assumptions used to develop this Implementation Framework, the Mission Bay Park Improvements Program, and its associated PEIR. As part of the design review process, compliance with CEQA will be confirmed by City staff, either through consistency with the Improvements Program EIR or through a subsequent or separate CEQA document and process. In accordance with Section 15168 of the CEQA Guidelines, later activities in the Program must be examined in the light of the Program EIR to determine whether an additional environmental document must be prepared. A subsequent or supplemental CEQA document is required if any of the conditions pursuant to Section 15162 of the CEQA guidelines are met, generally: If new significant impacts are identified, there is a substantial increase in the severity of previously identified significant impacts, or new information is available that would change the conclusions related to significance or mitigation (i.e., an alternative or

mitigation measure found not to be feasible initially is in fact feasible, but the project proponents decline to adopt the mitigation measure or alternative). An Addendum to the PEIR would be prepared if some changes to a future project are necessary but none of the conditions in Section 15162 are met. If a future project under the Improvements Program would have effects that were not examined in the PEIR, a new Initial Study would need to be prepared leading to either an EIR or Negative Declaration. In this situation, a tiered EIR may be prepared consistent with Section 15152.

Specifically regarding the Deferred Maintenance PER and Signage and Wayfinding Update, the recommendations included in these elements reflect the needs and improvements identified at the time the Improvements Program was developed consistent with the priority projects identified in Section 55.2(c)(1) of the City Charter. Since the identification of these priorities, the Oversight Committee has overseen the priority project list that is recommended for funding through the Improvement Fund. This priority project list should also be considered when identifying deferred maintenance projects for future funding, as needs and priorities can change over time. Projects identified by the Oversight Committee since the adoption of Section 55.2 to the City Charter and into the future may be considered deferred maintenance, or deferred maintenance that requires a Capital Improvements Program. Any future deferred maintenance project identified as a priority that is consistent with the Deferred Maintenance element of the Improvement Program may utilize the Program EIR to facilitate authorization of the project consistent with Section 15168 of the CEQA Guidelines. Alternatively, many of the improvements recommended in the Deferred Maintenance PER and Signage and Wayfinding Update likely qualify for a Categorical Exemption under Sections 15300 to 15332 of the CEQA Guidelines. Any deferred maintenance project recommended for implementation under the Program in the future that is not exempt under CEQA may utilize the Program EIR consistent with Section 15168.

4.3 Regulatory Permit Authorizations Needed

The following section outlines the various regulatory permit authorizations that would be needed for the implementation of Improvements Program elements. The approvals for all Program elements include, are summarized in Table 1 below.

Table 1. Program Elements Anticipated Regulatory Approvals

Applicable Regulation/ Permit and Issuance Agency	Applicability to Implementation Framework	Potential Permit Types
Site Development Permit(s), City of San Diego	Generally required for site improvements; generally not required for routine maintenance activities	SDP. Approval process may follow several process, but Process Capital Improvements Program/Public Project–Two is most common
Coastal Development Permit(s), City of San Diego	Generally required for site improvements in the Coastal Overlay Zone and within an approved City Local Coastal Plan. Approval is typically concurrent with SDP	—

Table 1. Program Elements Anticipated Regulatory Approvals

Applicable Regulation/ Permit and Issuance Agency	Applicability to Implementation Framework	Potential Permit Types
Construction Permits, City of San Diego	Required where site improvements trigger additional specific construction-related permits	Sign, Traffic, Grading, Right of Way, etc. Approval is typically concurrent with SDP
Sign Permit, City of San Diego	Required for the installation or modification of any sign except for those exempted by the San Diego Municipal Code (SDMC)	Sign Permit
Neighborhood Use Permit (NUP), City of San Diego	Required for the installation of a neighborhood identification sign or for the implementation of a comprehensive sign plan	NUP
Coastal Development Permit(s), California Coastal Commission	Generally required for site improvements in the Coastal Overlay Zone and outside an approved City Local Coastal Plan, Staff review applications, and recommend a decision to be approved by CCC	Exemption or CDP
Clean Water Act Permit(s); Section 404, 33 USC Section 1344, U.S. Army Corps of Engineers	Required for dredge/fill within waters of the U.S.	These are typically issued as a single permit under both regulations, where applicable. Potential permit types include Nationwide, Regional General, Individual Permit/Letter of Permission
Rivers and Harbors Section 10 Permit(s), Section 10, 33 USC Section 403, U.S. Army Corps of Engineers	Required for dredge/fill within navigable waters of the U.S. (generally tidal waters up to Mean High Water)	
Rivers and Harbors Section 408 Permission(s), Section 10, 33 USC Section 408, U.S. Army Corps of Engineers	Required for modification of a USACE improvement (e.g., Ocean Beach Bike Path is on top of the San Diego River Levee, constructed by USACE)	408 Permission
Magnuson-Stevens Fishery Conservation and Management Act, as amended in 1996 (Public Law 104-267), consultation with the U.S Army Corps of Engineers	Required as part of the USACE permit review process, where activities may affect managed fisheries or Essential Fish Habitat (e.g., eelgrass)	Completed by USACE as part of Section 404/10 permit review (or other federal agency, if applicable)
National Historic Preservation Act of 1966 (NHPA), Section 106 Consultation with State Historic Preservation Officer/Tribal Historic Preservation Office,	Required as part of the USACE permit review process, where activities may affect historic properties.	Completed by USACE as part of Section 404/10 permit review (or other federal agency, if applicable)

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Table 1. Program Elements Anticipated Regulatory Approvals

Applicable Regulation/ Permit and Issuance Agency	Applicability to Implementation Framework	Potential Permit Types
conducted by the lead Federal Agency		
Endangered Species Act, 16 USC Sections 1531-1544 Section 7 Consultation with USFWS, conducted by the lead Federal Agency	Required as part of the USACE permit review process, where activities may affect federally listed species or designated critical habitat.	Completed by USACE as part of Section 404/10 permit review (or other federal agency, if applicable)
Streambed Alteration Agreement, Section 1602 of the California Fish and Game Code, California Department of Fish and Wildlife	Required for alteration of lake or streambed (e.g., Rose Creek, Tecolote Creek, San Diego River)	Standard, Long-term, Routine Maintenance Agreement (may be combined with an Incidental Take Permit (ITP) in a Restoration Management Permit for certain projects)
California Endangered Species Act Section 2081 Incidental Take Permit, California Department of Fish and Wildlife (CDFW)	Required for take of state-listed species not covered by existing take permit (e.g., MSCP Subarea Plan)	ITP or Consistency Determination (if federal take permit is issued)
Water Quality Certification under Section 401 of the Clean Water Act, Regional Water Quality Control Board (RWQCB)	Required for dredge/fill within waters of the State	Water Quality Certification and Waiver of Waste Discharge Requirements (typically issued concurrently) or Waste Discharge Requirement
Waste Discharge Requirement under the state Porter-Cologne Water Quality Control Act, RWQCB	Required for the discharge of waste within the waters of the State	
Authority to Construct/Permit to Operate for any dredge, San Diego Air Pollution Control District (APCD)	Required to operate new commercial or industrial equipment emitting air contaminants (e.g., construction equipment)	Authority to Construct Permit for IC Non-Emergency Engines

Anticipated regulatory permits needed to implement improvements identified in the Program are summarized below. The actual permit requirements will be determined by the regulatory agencies at the time that applications are submitted or specific consultations occur. If a permit is indicated as "not anticipated," consultation with that regulatory agency may still be recommended to confirm permit applicability (e.g., are proposed avoidance measures sufficient to ensure no listed species take would occur). In addition, the application for regulatory approval may include one specific improvement or may be programmatic and cover multiple planned improvements, in an effort to streamline the review and approval process. For example, the U.S. Army Corps of Engineers may

authorize multiple planned improvements or phasing through a Regional General Permit or Individual Permit with a Letter of Permission process that requires subsequent notification and verification but reduces future permit review timelines and requirements. Similarly, the programmatic permits may be sought from agencies, including the CCC, that may identify compliance requirements for a set of activities that occur over several years.

4.3.1 Wetland and Water Quality Improvements

Table 2 summarizes the anticipated regulatory permits applicable to the implementation of the Wetland and Water Quality Improvements element.

Table 2. Wetland/Water Quality Improvements Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits		
	North Fiesta Island Wetland Restoration	Tecolote Creek Wetland Restoration	Cudahy Creek Wetland Restoration
USACE Section 404 of the CWA, Section 10 of the Rivers and Harbors Act	404/10	404/10	404/10
USFWS, Endangered Species Act; NOAA Fisheries, Magnuson-Stevens Fisheries Act	IC	IC	IC
CCC, California Coastal Act	CDP FCC	CDP FCC	CDP FCC
CDFW, Section 1602 of the CFGC	N/A	N/A	N/A
CDFW, California Endangered Species Act	N/A	N/A	N/A
RWQCB, Section 401 of the CWA, Porter-Cologne Water Quality Control Act	401 Cert.	401 Cert.	401 Cert.
City of San Diego, Land Development Code	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction
SDAPCD, various air quality regulations	ATC	ATC	ATC

Legend: USACE= United States Army Corps of Engineers; CWA= Clean Water Act; USFWS= United States Fish and Wildlife Service; NOAA= National Oceanic Atmospheric Administration; CCC= California Coastal Commission; CDFW= California Department of Fish and Wildlife; RWQCB= Regional Water Quality Control Board; SDAPCD= San Diego Air Pollution Control Board; CDP= Coastal Development Permit; FCC= Federal Consistency Certification; SDP= Site Development Permit; ATC= Authority to Construct; N/A = Not Anticipated; NOI = Notice of Intent; IC= Informal Consultation

4.3.2 Upland Restoration

Anticipated regulatory permits needed to implement the upland restoration improvements identified in the Program are summarized in Table 3 below.

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Table 3. Upland Restoration Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits						
	FI 1- South	FI 2- North Central	FI 3- Youth Camping	FI 4- CLT Preserve	SWD 1- Cloverleaf	SWD 2- South Shores	SWD 3- Triangle
USFWS, Endangered Species Act; NOAA Fisheries, Magnuson-Stevens Fisheries Act	N/A	N/A	N/A	IC	N/A	N/A	N/A
CCC, California Coastal Act	CDP	CDP	CDPFCC	CDPFCC	CDP	CDP	CDP
CDFW, California Endangered Species Act	N/A	N/A	N/A	N/A	N/A	N/A	N/A
USACE Section 404 of the CWA, Section 10 of the Rivers and Harbors Act	N/A	N/A	404/10	404/10	N/A	N/A	N/A
RWQCB, Section 401 of the CWA, Porter-Cologne Water Quality Control Act	N/A	N/A	401 Cert.	401 Cert.	N/A	N/A	N/A
RWQCB, Construction General Permit	NOI	NOI	NOI	NOI	NOI	NOI	NOI
CDFW, Section 1602 of the CFGC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of San Diego, Land Development Code	SDP Construction	SDP Construction	SDP Construction	SDP Construction	SDP Construction	SDP Construction	SDP Construction

Legend: USFWS= United States Fish and Wildlife Service; CCC= California Coastal Commission; CDFW= California Department of Fish and Wildlife; CDP= Coastal Development Permit; FCC= Federal Consistency Certification;; SDP= Site Development Permit; SHPO= State Historic Preservation Office; THPO= Tribal Historic Preservation Office; NHPA= National Historic Preservation Act; MOA= Memorandum of Agreement; PA= Programmatic Agreement; N/A= Not Applicable; IC= Informal Consultation

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4.3.3 Shoreline Restoration

Anticipated regulatory permits needed to implement the shoreline restoration improvements identified in the Program are summarized in Table 4 below.

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Table 4. Shoreline Restoration Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits							
	Bonita Cove	Ventura Cove Park	Bahia Point	West Sail Bay	Crown Point	Vacation Island NW	Vacation Island NE	Vacation Island SW
USACE Section 404 of the CWA, Section 10 of the Rivers and Harbors Act	404/10	404/10	404/10	404/10	404/10	404/10	404/10	404/10
USFWS, Endangered Species Act; NOAA Fisheries Magnuson-Stevens Fisheries Act	IC	N/A	N/A	N/A	N/A	IC	IC	N/A
CCC, California Coastal Act	CDP FCC	CDP FCC	CDP FCC	CDP FCC	CDP FCC	CDP FCC	CDP FCC	CDP FCC
CDFW, Section 1602 of the CFGC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CDFW, California Endangered Species Act	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RWQCB, Section 401 of the CWA, Porter-Cologne Water Quality Control Act	401 Cert.	401 Cert.	401 Cert.	401 Cert.	401 Cert.	401 Cert.	401 Cert.	401 Cert.
RWQCB, Construction General Permit	NOI	N/A	NOI	N/A	N/A	N/A	NOI	N/A
City of San Diego, Land Development Code	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction

Legend: USACE= United States Army Corps of Engineers; CWA= Clean Water Act; USFWS= United States Fish and Wildlife Service; NOAA= National Oceanic Atmospheric Administration; CCC= California Coastal Commission; CDFW= California Department of Fish and Wildlife; RWQCB= Regional Water Quality Control Board; CDP= Coastal Development Permit; FCC= Federal Consistency Certification; SDP= Site Development Permit; N/A= Not Applicable; IC= Informal Consultation

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4.3.4 Seawall Improvements

Anticipated regulatory permits needed to implement the seawall improvements identified in the Program are summarized in Table 5 below.

Table 5. Seawall Improvements Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits		
	Seawall Segments A-C	Pedestrian Beach Access	Beach Access Driveway
CCC, California Coastal Act	CDP FCC	CDP FCC	CDP FCC
City of San Diego, Land Development Code	SDP CDP Construction	SDP CDP Construction	SDP CDP Construction

Legend: USACE= CCC= California Coastal Commission; CDP= Coastal Development Permit; FCC= Federal Consistency Certification; SDP= Site Development Permit

4.3.5 Bike/Pedestrian Improvements

Anticipated regulatory permits needed to implement the bike/pedestrian improvements identified in the Program are summarized in Table 6 below.

Table 6. Bike/Pedestrian Improvements Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits		
	Rose Creek Bike Path	Fiesta Island Causeway	Ocean Beach Bike Path
USACE Section 404 of the CWA, Section 10 and Section 408 of the Rivers and Harbors Act	404/10	404/10	408
SHPO/THPO, Section 106 NHPA	Consultation/MOA/PA	N/A	N/A
USFWS, Endangered Species Act; NMFS, Magnuson-Stevens Fisheries Act	IC	IC	N/A
CCC, California Coastal Act	CDP FCC	CDP FCC	CDP FCC
CDFW, Section 1602 of the CFGC	LSA	LSA	N/A
CDFW, California Endangered Species Act	N/A	N/A	N/A

Table 6. Bike/Pedestrian Improvements Anticipated Regulatory Permit Applicability

Regulatory Authority	Anticipated Permits		
	Rose Creek Bike Path	Fiesta Island Causeway	Ocean Beach Bike Path
RWQCB, Section 401 of the CWA, Porter-Cologne Water Quality Control Act	401 Cert.	401 Cert.	N/A
RWQCB, Construction General Permit	NOI	NOI	NOI
City of San Diego, Land Development Code	SDP Construction	SDP Construction	SDP Construction
SDAPCD, various air quality regulations	ATC	ATC	ATC

Legend: CDP= Coastal Development Permit; FCC= Federal Consistency Certification; SDP= Site Development Permit; ATC= Authority to Construct; MOA= Memorandum of Agreement; PA= Programmatic Agreement; N/A= Not Applicable; IC= Informal Consultation

4.3.6 Deferred Maintenance Approval Procedures

Deferred maintenance improvements identified in the Improvements Program may be exempt (30610[d] of the California Coastal Act) or require a Coastal Development Permit from the CCC, and other construction permits issued by the City, as applicable, based on the location and scope of the maintenance work. For example, any activity impacting the public right-of-way may require a right-of-way permit or traffic permit based on the scope and duration of work. The installation of biofiltration basins, as described in the water quality improvements identified in the Deferred Maintenance PER, may require a Site Development Permit.

4.3.7 Signage Improvements Approval Procedures

A Sign Permit is required for the installation or alteration of any sign, except for signs specifically exempted in SDMC Section 129.0803. Depending on the final design, location, and implementation process of a sign improvement identified in the Improvements Program, sign improvements proposed under the Improvements Program may be required to obtain a sign permit. Per the SDMC, a Neighborhood Use Permit (NUP) is required for the approval of a comprehensive sign plan.

4.4 Environmental Protocols

The Mission Bay Park Improvement Program Implementation Framework includes Environmental Protocols (EPs) to avoid, minimize, and reduce impacts to the environment. Additional mitigation measures are detailed in the Mitigation, Monitoring and Reporting Program within the PEIR. As part of the City's Site Development Permit/Coastal Development Permit review and approval process, implementation of EPs will be detailed in terms of the responsible party for implementation, compliance monitoring, timing, and documentation.

EPs include requirements to confirm resources (e.g., sensitive species) that may be affected by construction and that required regulatory permits have been obtained (EP-BIO-1); construction plans and specifications conform with the City's Landscape Standards (EP-BIO-2), Stormwater Standards (EP-WQ-1), the MHPA Land Use Adjacency Guidelines (EP-LU-1), and that implementation will conform to the City's Standard Specifications for Public Works Construction (the "Whitebook") (EP- AQ-1; EP-SW-1; EP-CUL-1;….).

4.5 Mitigation Approach

Several regulatory agencies are expected to issue permits for implementation of the Improvements Program and require compensatory mitigation for permanent or temporary impacts to habitat. The regulatory agencies are expected to recognize the benefits to water quality and habitat restoration that would result from implementation of the Improvements Program and are therefore anticipated to consider portions of the Program as providing compensatory mitigation. Compensatory mitigation may be recognized by the City, U.S. Army Corps of Engineers, California Department of Fish and Wildlife, Regional Water Quality Control Board, and/or USFWS for three levels of impacts: mitigation may (1) offset impacts from implementation of the restoration project itself (e.g., temporary loss of habitat); (2) offset impacts for other project within the Improvements Program; and/or (3) offset impacts from projects that are separate from the Improvements Program. Mitigation determinations will be made based on review of permit applications with design drawings and Conceptual Habitat Restoration and Management Plans (CHRMPs) as part of the subsequent project-specific environmental review pursuant to CEQA. For proposed restoration sites, draft CHRMPs are included for the Tecolote Creek, North Fiesta Island, and Cudahy Creek wetlands restorations, as well as Uplands Restoration, Eelgrass and Oyster Restoration, as an appendix to the PEIR.

The CHRMPs provide parameters and guidelines for the implementation, monitoring, and maintenance of habitat restoration projects to ensure their benefits to water quality and wildlife are established and retained in perpetuity. The CHRMPs describe the procedures and requirements for the establishment of the restoration/mitigation site to be deemed complete, contingent on the approval by the regulatory agencies. The standard timeframe required for a mitigation site to be deemed established is 5 years. Recommendations for monitoring, maintenance, and reporting during the 5-year period are described in the CHRMPs for each restoration site. Standard maintenance activities required for a successful restoration/mitigation site include, but are not limited to, weed and pest control, plant replacement, supplemental watering, trash removal, erosion and sedimentation control, and fencing and signage maintenance.

At the end of the fifth year of maintenance and monitoring, a final annual monitoring report will be submitted to the regulatory agencies, including an evaluation of mitigation program success. The resulting final monitoring report and on-site verification by the City and resource agencies would determine whether the requirements and performance standards of the mitigation program have been achieved. Successful mitigation will be considered to have been achieved when the restoration area is self-sustaining without supplemental irrigation or any substantial remedial activities for a minimum of 2 years.

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Following approved completion of the mitigation site implementation, long -term habitat management funding would be incorporated into the Parks and Recreation Department's annual maintenance work program for Mission Bay Park, directed by the MBPMP and NRMP. Pending permit reviews and mitigation determinations by the regulatory agencies as part of the subsequent project-specific environmental review pursuant to CEQA, additional details regarding ongoing habitat management may be identified in final CHRMPs or through updates to the MBPMP and/or NRMP to meet regulatory requirements. Trash removal, invasive species management, and fencing and signage improvements when needed are standard maintenance activities completed by Parks and Recreation staff. Additional measures are proposed for the long-term habitat management of the Fiesta Island North CLT Preserve to ensure the success of this endangered species' nesting activities in the restored habitat. The current CLT Preserve is being managed by the City and USFWS in coordination with environmental organizations such as the San Diego Bird Alliance, and this partnership is expected to continue for the long-term management of the restored CLT Preserve. Detailed conceptual project design features and measures intended to protect the preserve, including access controls, can be found in the Uplands Restoration PER.

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