



Welcome to the second public meeting for Phase 2A of the Beach Boulevard Infrastructure Resiliency Project (BBIRP). Please sign-in and visit our stations where you can explore our BBIRP displays and engage with members of the team.

Meeting Purpose

- Provide details on Preliminary Design Process.
- Explain rationale on major design criteria and elements.
- Gather feedback and input on features and amenities.
- Provide opportunities for the public to engage with City staff and consultant team.

Meeting Format

| | |
|------------------|-------------------------------|
| 6:00 – 6:15 p.m. | Open House |
| 6:15 – 7:00 p.m. | Presentation |
| 7:00 – 8:00 p.m. | Open House |
| 8:00 p.m. | Next Steps and Adjourn |









Purpose

The purpose of the BBIRP is to replace the current seawall and outdated infrastructure while building climate resilience into one of the most vulnerable segments of the City’s shoreline.



Benefits

-  Protection of West Sharp Park from wave overtopping, coastal erosion, and sea level rise.
-  Secured public infrastructure of roads and underlying sewer mains, storm drains, and gas and electrical conduit.
-  Improved public access to the beach.
-  Protection of recreational use of the Promenade.

BBIRP PHASE 1 ALTERNATIVES IDENTIFIED AND SCORING CRITERIA

During Phase 1, the project team identified and evaluated multiple alternatives. These images represent the alternatives considered.



No project



Beach Nourishment



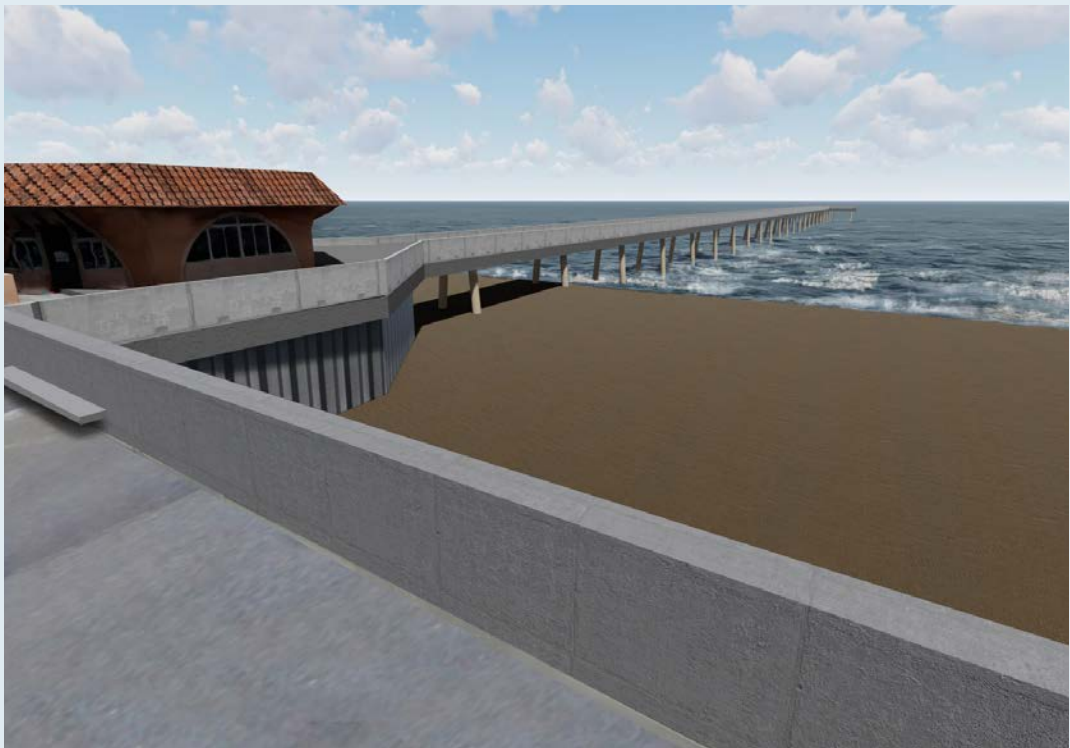
Seawall



Rock Revetment



Beach Nourishment with Sand Retention



Hybrid

Multi-Criteria Analysis (MCA)

The project team conducted a multi-criteria analysis (MCA) to evaluate these alternatives and identify a preferred concept. This included:

- Establishing 13 criteria organized into three categories: technical performance, financial, and environmental.
- Weighting of the categories and criteria to align with project objectives and public feedback.

Criteria and Relative Weighting

The table below demonstrates the 13 criteria utilized in the MCA and their relative weighting.

| Technical Performance (40%) | | Financial (30%) | | Environmental (30%) | |
|-----------------------------|-----|----------------------------|-----|---------------------------|-----|
| Flood Protection | 20% | Lifecycle costs | 70% | Marine Bio Resources | 20% |
| Erosion Protection | 20% | - Capital | | Terrestrial Bio Resources | 20% |
| Reliability | 20% | - Operations & Maintenance | | Visual Resources | 20% |
| Operability | 10% | - Decommissioning | | General Recreation | 20% |
| Constructability | 10% | - Mitigation | | Coastal Access | 20% |
| Sea Level Rise Adaptability | 20% | Grant Funding Potential | 30% | | |

MULTI-CRITERIA ANALYSIS SCORING AND RESULTS

Preferred Concept Design



Preferred Concept Design Features:

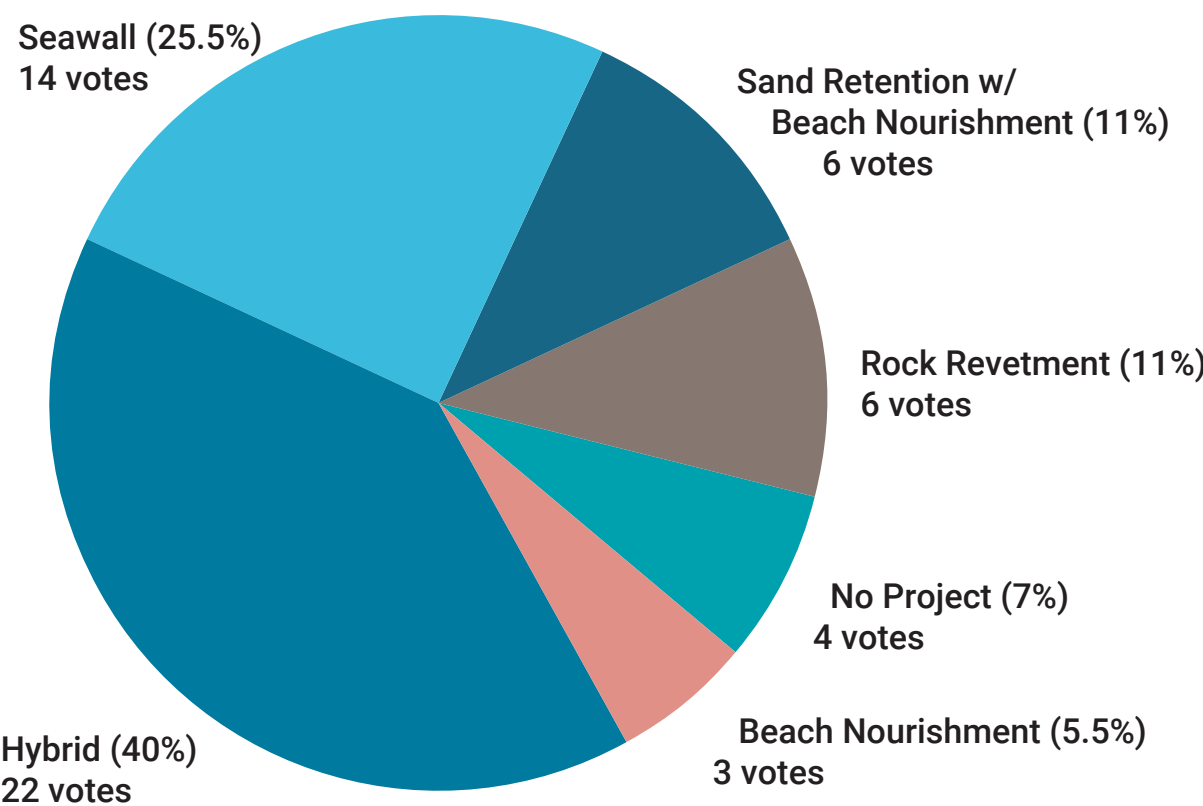
- Combines various strategies in order to gain structural, environmental, and access improvements while minimizing impacts associated from a single design approach.
- Developed to meet the design criteria without the sand in place. When sand is in place, it will provide a level of protection that is higher than the design criteria minimum.
- Rock scour protection allows structural components of the wall to be generally smaller than the standalone seawall alternative.

MCA Results

The Hybrid Alternative scored the highest as a result of:

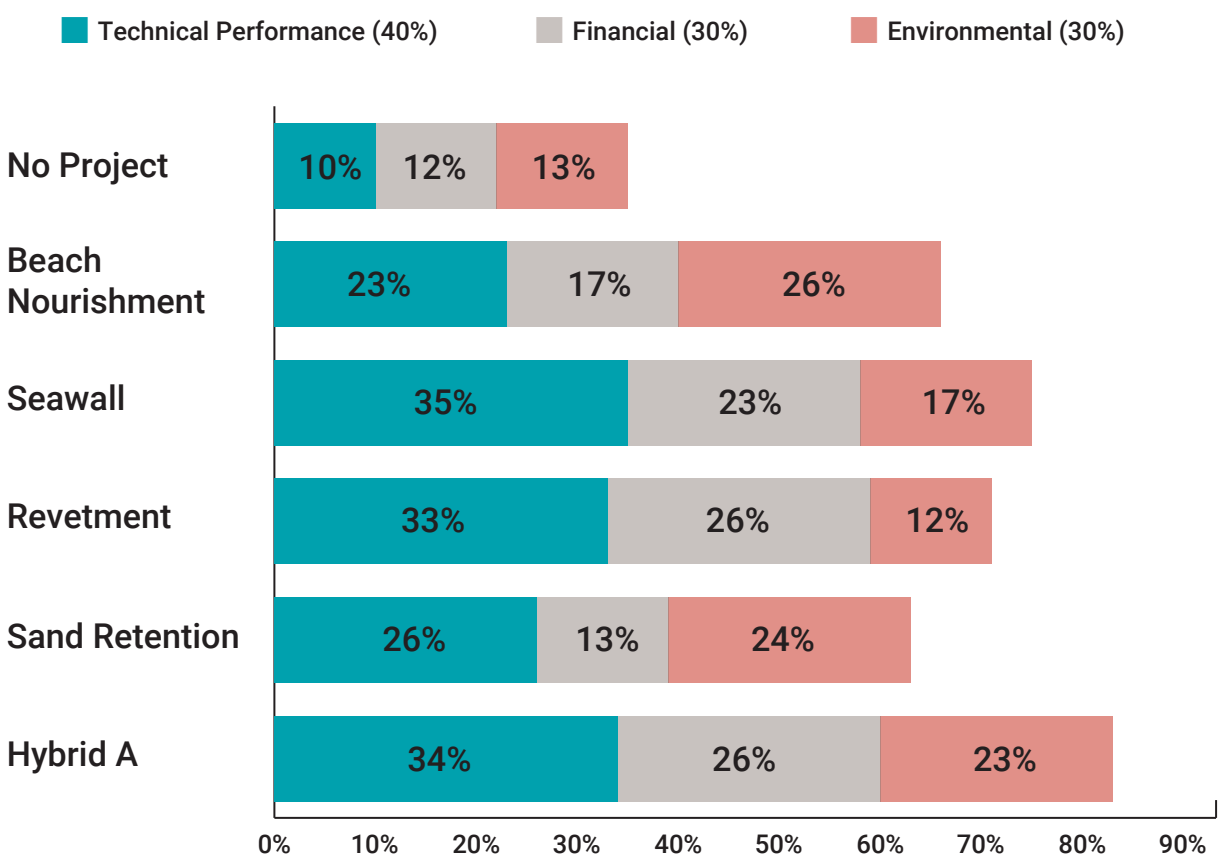
- Meeting BBIRP objectives.
- Alignment with technical performance, financial, and environmental considerations.
- Consistency with Pacifica’s Draft Local Coastal Land Use Plan policies.

4/29/21 Public Meeting Poll (55 Votes)



This graph shows the results of a poll conducted during the March 29, 2021 Phase 1 meeting in which attendees were asked to indicate their preference for the alternatives considered in the MCA.

BBIRP Multi-Criteria Analysis Scoring



This graph demonstrates how each alternative scored against the criteria considered in the MCA.





The BBIRP is a multi-year process that includes input from the community and stakeholders. Phase 1 of the Project concluded in June 2021 with City Council’s adoption of a preferred concept to replace the existing seawall. The Project is currently in Phase 2A, Preliminary Design, which aims to advance the shoreline protection concept as well as land-side features include landscaping, hardscaping, beach access and community amenities.

| 2020-2021 | Spring 2023 | Summer 2023 | Fall 2023 | Winter 2023/2024 | 2024 Onwards |
|--|-------------|---|--|---|--------------------------------------|
| PHASE 1: Preliminary Planning and Feasibility | PHASE 2A | | | | PHASE 2B |
| | | | | | PHASE 2C |
| | | | | | PHASE 3: Construction (Timeline TBD) |
| <div>Preferred concept design alternative identification</div> | | <div>Seawall Prelim Design</div> | <div>Draft 35% Plan</div> | <div>Final 35% Plan</div> <div>Notice of Preparation</div> | |
| | | <div>Public Meeting #1: Project overview, Phase 1 recap, initial design</div> | <div>Public Meeting #2: Features and Amenities</div> | <div>Public Meeting #3: Preliminary Design</div> <div>Public CEQA Meeting</div> | |
| | | Regulatory Agency Engagement | | | |
| | | Pop-ups and Online Engagement | | | |

Proposed activities subject to change

PHASE 2A: Preliminary Design

- Advance the shoreline protection concept through preliminary design development.
- Share technical design developments related to features of the shoreline protection concept, such as geometry, materials, rock revetment and natural shoreline infrastructure.
- Collect feedback on public features and amenities such as seating, access, landscaping, lighting, and signage.
- Prepare and publish a Notice of Preparation of an Environmental Impact Report to initiate scoping for environmental review.

PHASE 2B: Environmental Document (12-18 months)

- Prepare, publish, and respond to public comments on the draft Environmental Impact Report.
- Continue community and agency engagement.

PHASE 2C: Permitting and Final Design (12-18 months)

- Prepare and submit environmental regulatory agency permit applications.
- Update design package to address changes resulting from regulatory agency permit application review.





JANUARY 2023 STORM EVENT CONDITIONS AND IMPACTS

Summary

The storm event on January 5, 2023, was one of many events that reinforced the need for the BBIRP. A combination of high water levels and large, long period, waves produced extreme coastal flooding conditions. This resulted in impacts such as wave runup, overtopping of the seawall, and flooding of surrounding streets. Clean-up efforts were significant and included sand removal, replacing stationary trash cans, and repairing picnic tables and memorial benches. Public access was restricted for three weeks.



Wave runup and overtopping north of the Pacifica Municipal Fishing Pier



Waves over topping seawall south of the Pacifica Municipal Fishing Pier



Storm flooding from wave overtopping along southern Beach Blvd



Storm flooding from wave overtopping along side-streets off of Beach Blvd



Storm flooding from wave overtopping along Paloma Ave

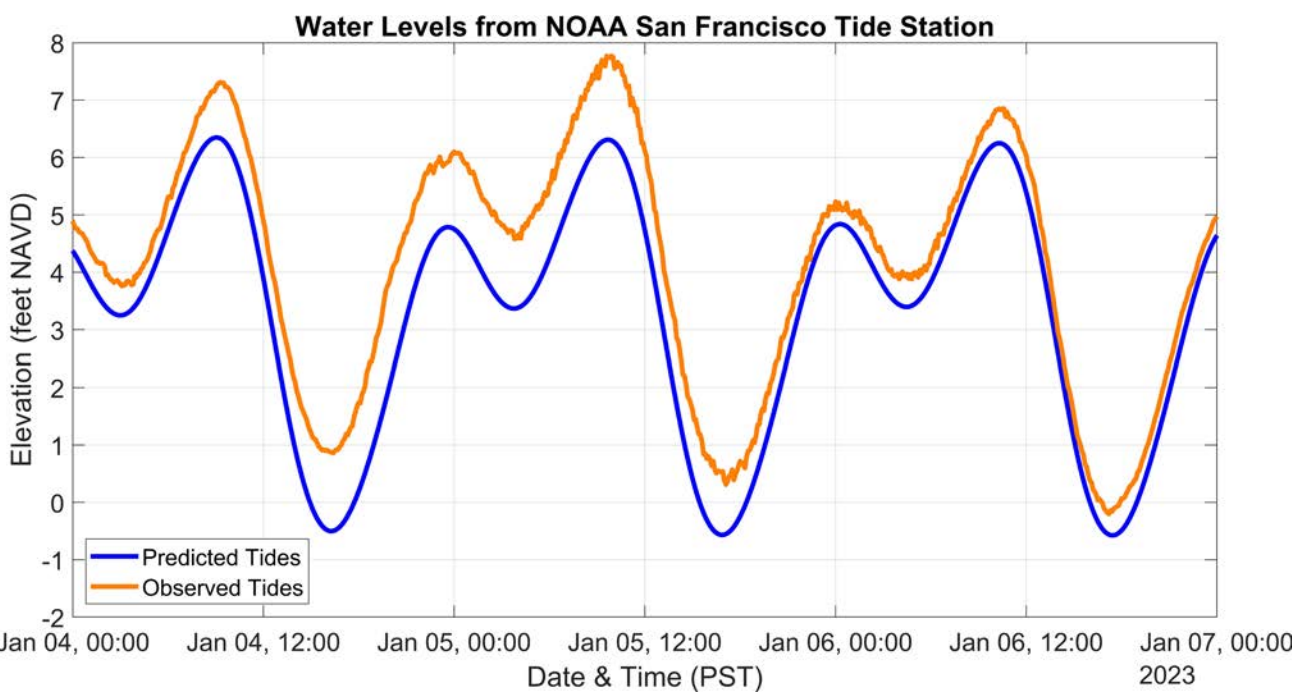


Clean up efforts along Clarendon Rd in the aftermath of the storm

Storm Event Conditions

These graphs show wave height, tide levels, and wave energy during the storm. The combination of these elements caused the significant impacts the City faced during and after the storm.

Water Level



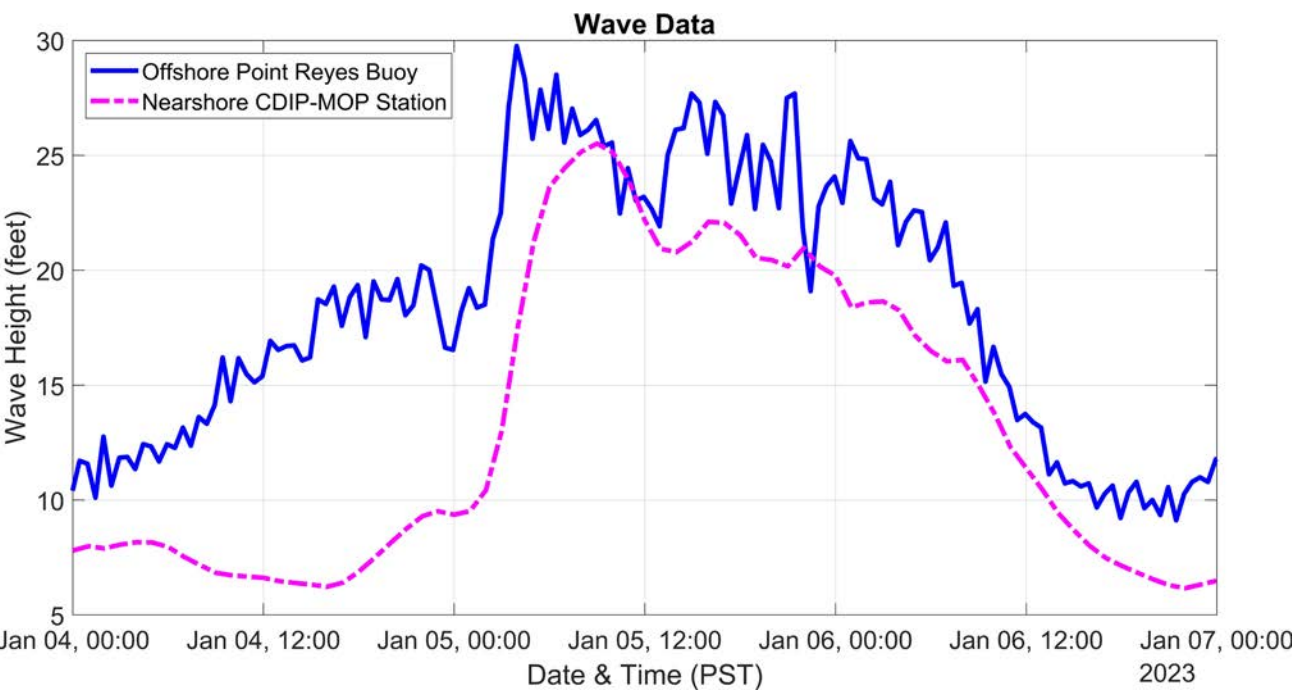
What this shows:

Observed (orange) and predicted (blue) tides at Golden Gate, San Francisco, indicate a storm surge of almost two feet.

Why this matters:

Peak wave conditions coincided with peak high tide, increasing overtopping magnitude.

Wave Height



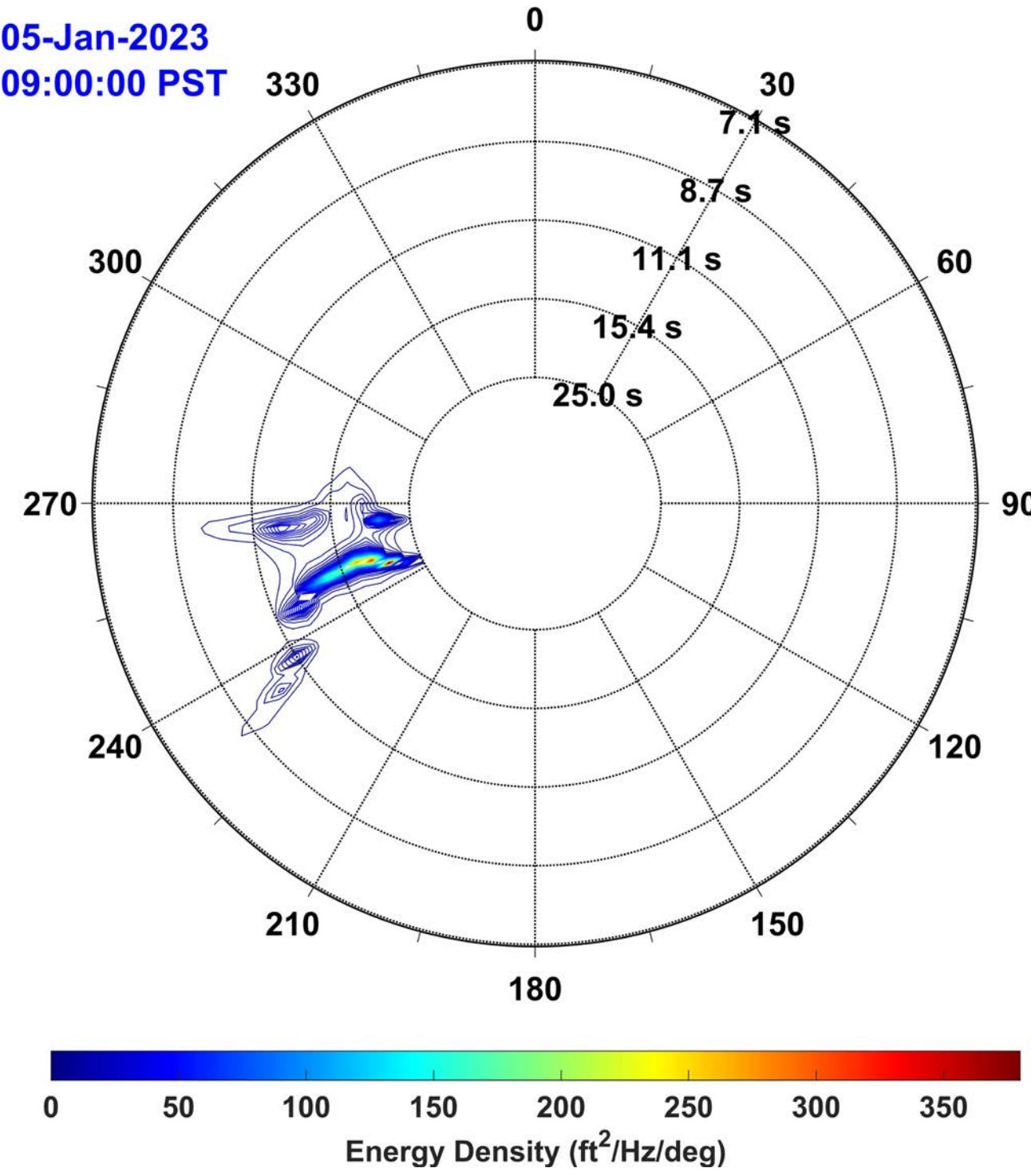
What this shows:

Wave height at offshore (blue) and nearshore (magenta) locations.

Why this matters:

According to the Coastal Data Information Program (CDIP) operated by Scripps Institute of Oceanography, the January 5, 2023, event was ranked among the top highest wave events observed since 2000. The top 20 wave events since 2010 had wave heights that ranged from 19 feet to almost 26 feet. The January 5, 2023, event was unique in that it wave height increased to over 25 feet at the onset of the storm with a sustained wave height greater than 20 feet, leading to greater impacts on the coast.

Directional Wave Spectra



What this shows:

As waves propagate across the ocean and reach beaches, they transport energy. Wave energy for the January 2023 storm is illustrated here with wave direction and wave period.

Why this matters:

The storm generated relatively long period waves which means they travel faster and convey more energy than shorter period waves. This resulted in higher wave runup and overtopping than normal storm conditions.





DESIGN CRITERIA

Design Life:
50-years

Design Event:
Extreme Storm Event
+
2 feet of SLR

Structural Analysis:

- Seismic Stability
- Erosion Protection

Tolerable Overtopping:
0.5-1 cfs/ft

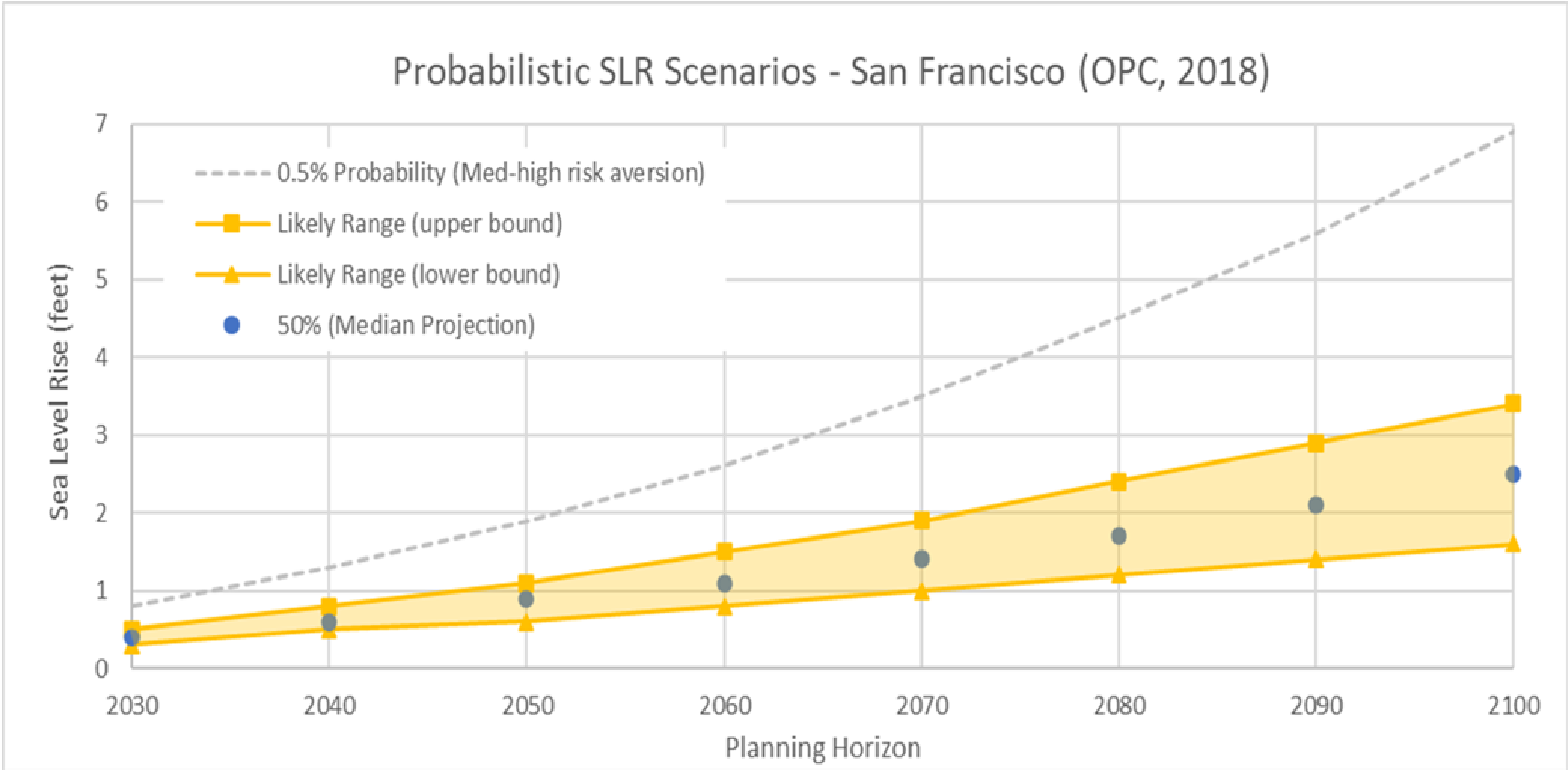
Sea Level Rise (SLR)

Design Criteria:

Design event has extremely low joint probability of exceedance over next 50 years (~0.5%)

Planning Criteria:

California Coastal Commission guidance to use 75-100 years and high-extreme SLR scenarios



California Ocean Protection Council (OPC) Sea Level Rise Guidance (2018)
San Francisco Projections

| Time Horizon | Likely Range | | 1-in-20 Chance | 1-in-200 Chance | H++ Scenario Projection (feet) |
|--------------|--|-----|----------------------------------|------------------------------------|--------------------------------|
| | 66% probability SLR is between... (feet) | | 5% Probability Projection (feet) | 0.5% Probability Projection (feet) | |
| 2030 | 0.3 | 0.5 | 0.6 | 0.8 | 1.0 |
| 2050 | 0.6 | 1.1 | 1.4 | 1.9 | 2.7 |
| 2060 | 0.8 | 1.5 | 1.8 | 2.6 | 3.9 |
| 2070 | 1.0 | 1.9 | 2.4 | 3.5 | 5.2 |
| 2080 | 1.2 | 2.4 | 3.0 | 4.5 | 6.6 |
| 2100 | 1.6 | 3.4 | 4.4 | 6.9 | 10.2 |

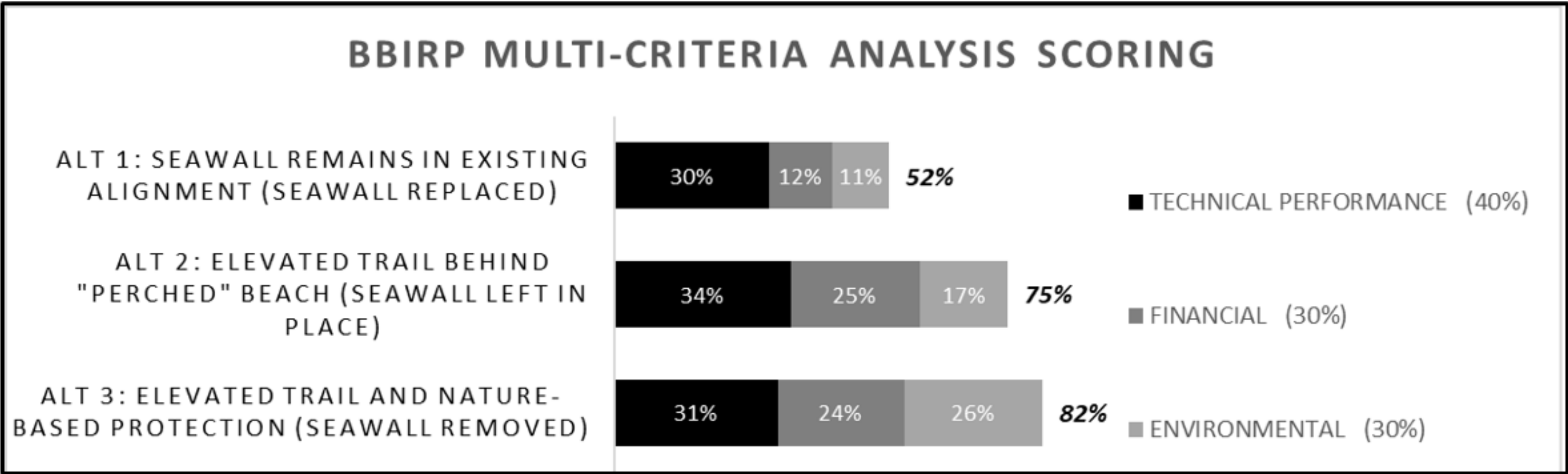
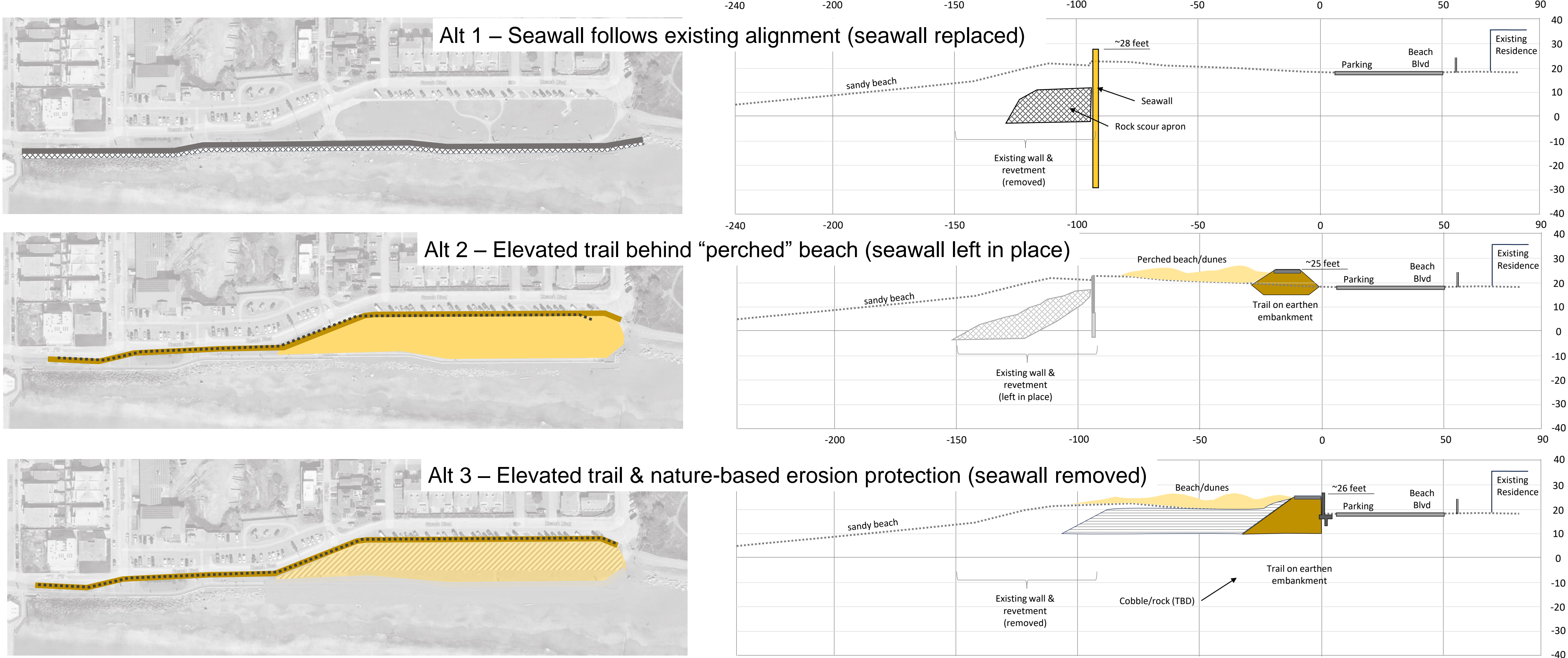


A Multi-Criteria Analysis (MCA) that utilized the same parameters as Phase 1, reviewed 3 alternatives for the South Wall Alignment.

Alternative 1: Seawall follows existing alignment (seawall replaced)

Alternative 2: Elevated trail behind “perched” beach (seawall left in place)

Alternative 3: Elevated trail & nature-based erosion protection (seawall removed)



| Technical Performance (40%) | |
|-----------------------------|-----|
| Flood Protection | 20% |
| Erosion Protection | 20% |
| Reliability | 20% |
| Operability | 10% |
| Constructability | 10% |
| Sea Level Rise Adaptability | 20% |

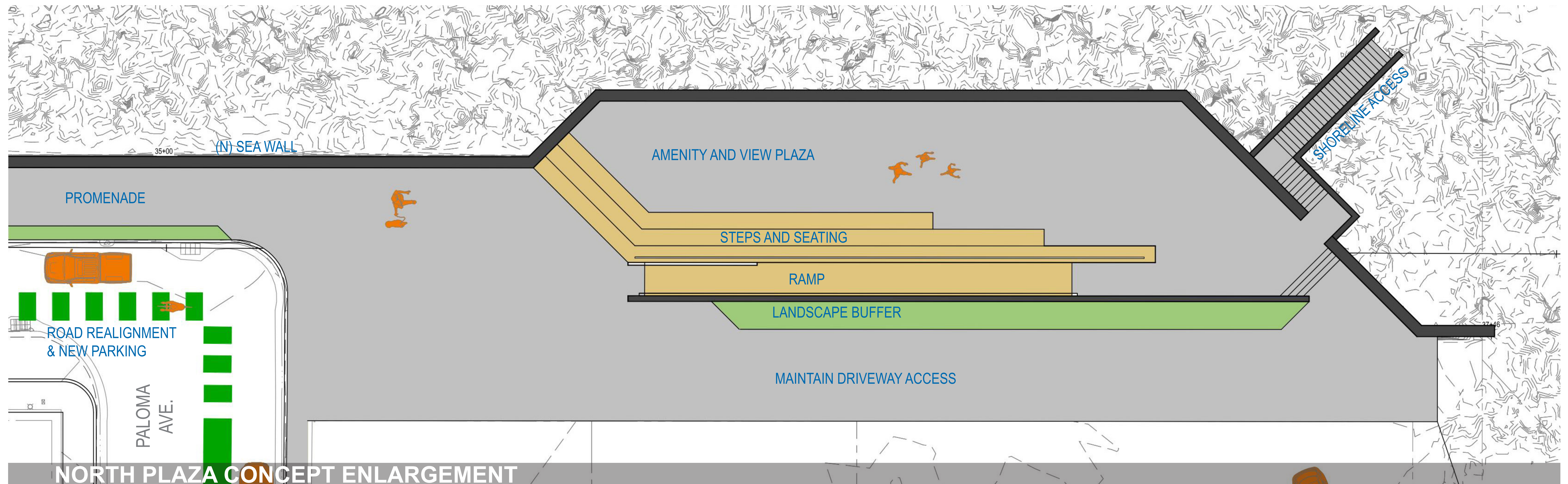
| Financial (30%) | |
|----------------------------|-----|
| Lifecycle costs | 70% |
| - Capital | |
| - Operations & Maintenance | |
| - Decommissioning | |
| - Mitigation | |
| Grant Funding Potential | 30% |

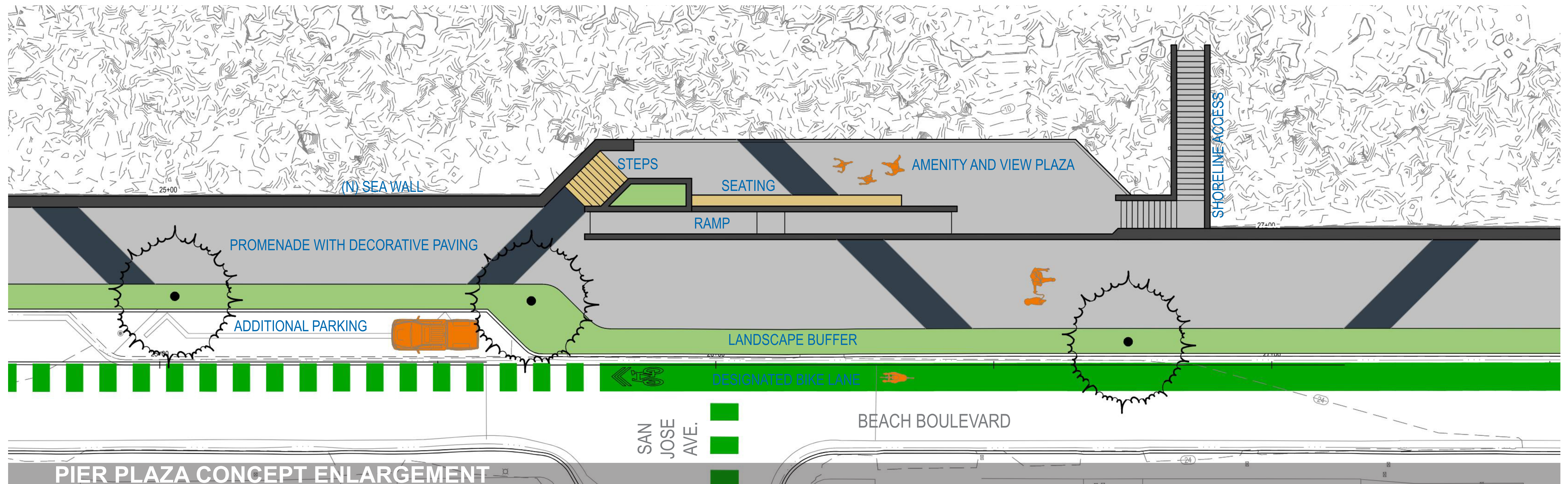
| Environmental (30%) | |
|---------------------------|-----|
| Marine Bio Resources | 20% |
| Terrestrial Bio Resources | 20% |
| Visual Resources | 20% |
| General Recreation | 20% |
| Coastal Access | 20% |

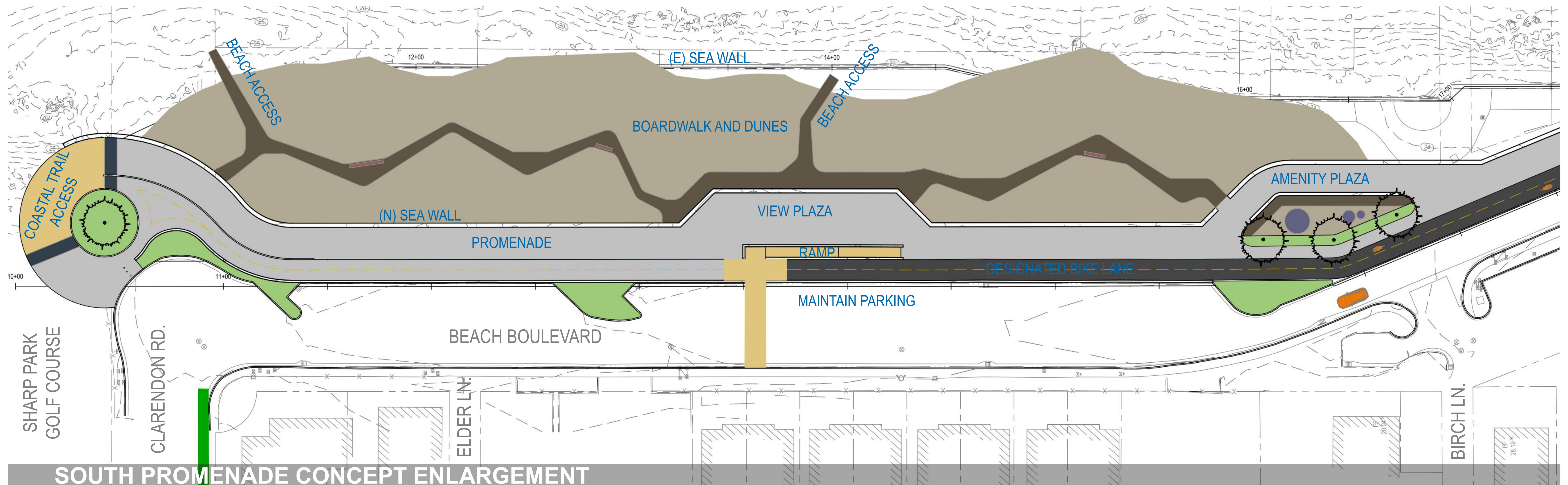
Recommended Alignment

Recommended to pursue Alternative 3- Elevated trail & nature-based erosion protection (seawall removed)

- Removal of existing wall, alignment of new protective feature inland along Beach Blvd. provides:
 - Reduction of visual impacts compared to existing alignment with increased height
 - Likely preferred by regulatory agencies and funding entities
 - Increased continuous beach and dunes
 - Elevated trail and nature-based protective components
 - New paths and accessways to beach
 - Financially less burdensome
 - Reduces future complications and nuisance from relic infrastructure
- Continuing to evaluate feasibility of other options









Architectural Precedent



Proposed Civic Center



Envisioned Palmetto & Montecito



Proposed Sharp Park Library



Proposed Sharp Park Library



Beach Boulevard
INFRASTRUCTURE RESILIENCY PROJECT



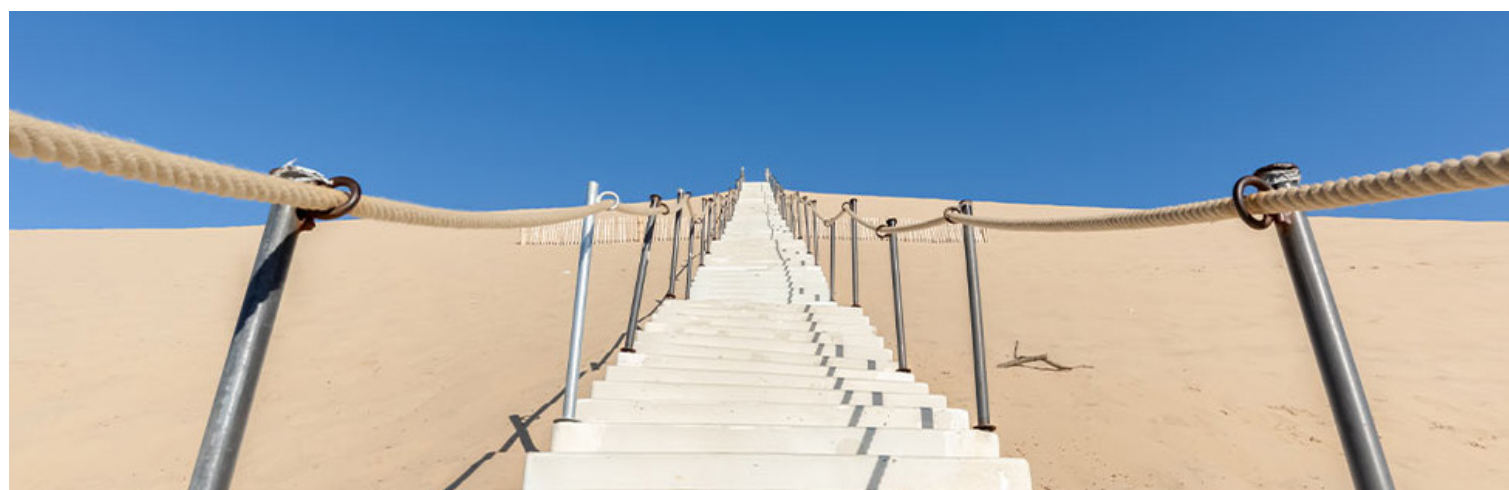
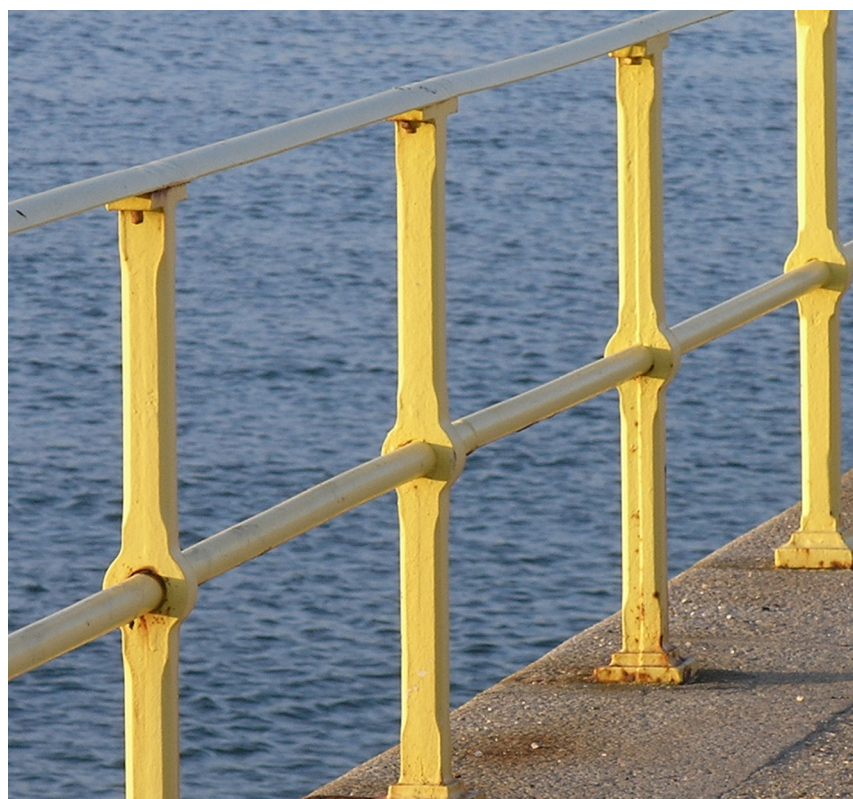
Bohemian Coastal

SHARE YOUR FEEDBACK! We are seeking your feedback on your preference for materials and overall visual character and theme for furnishings and amenities. Please see additional instructions below!

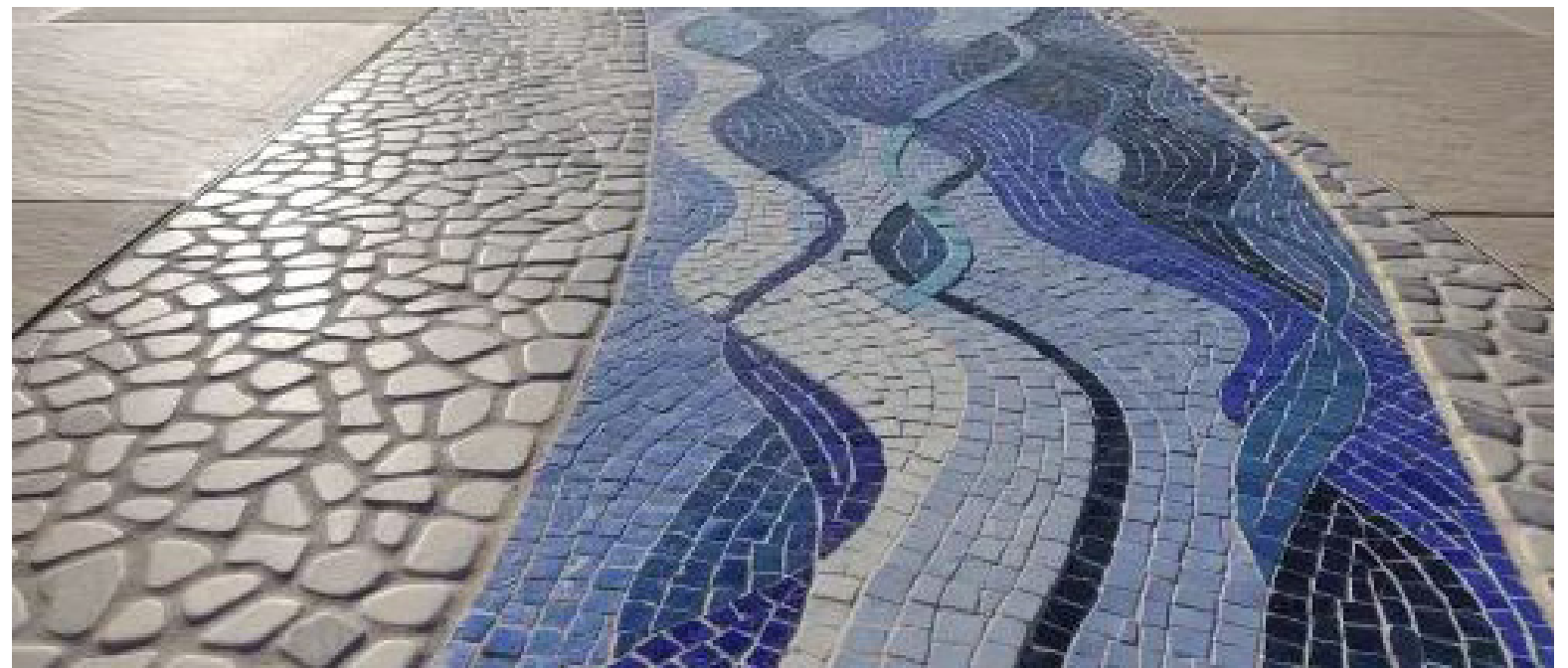
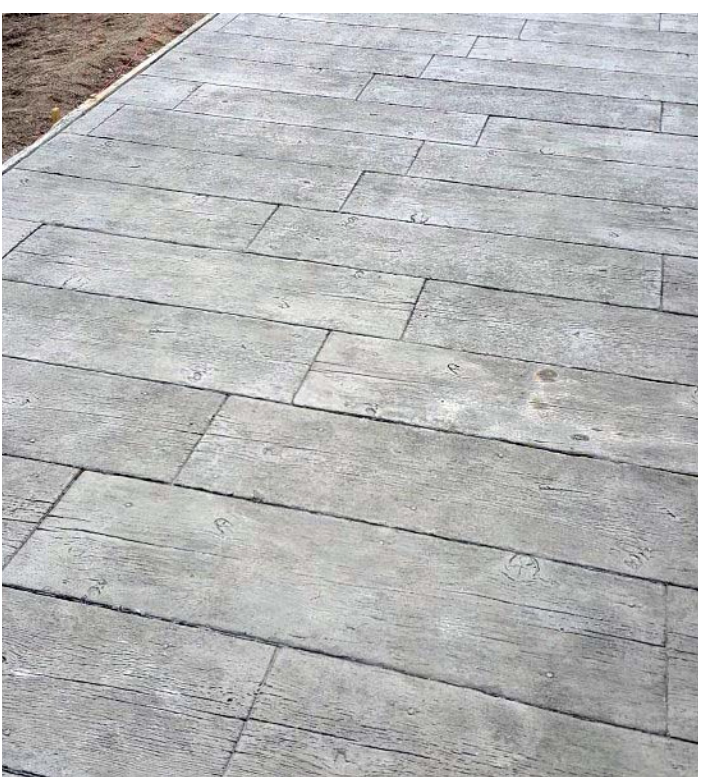
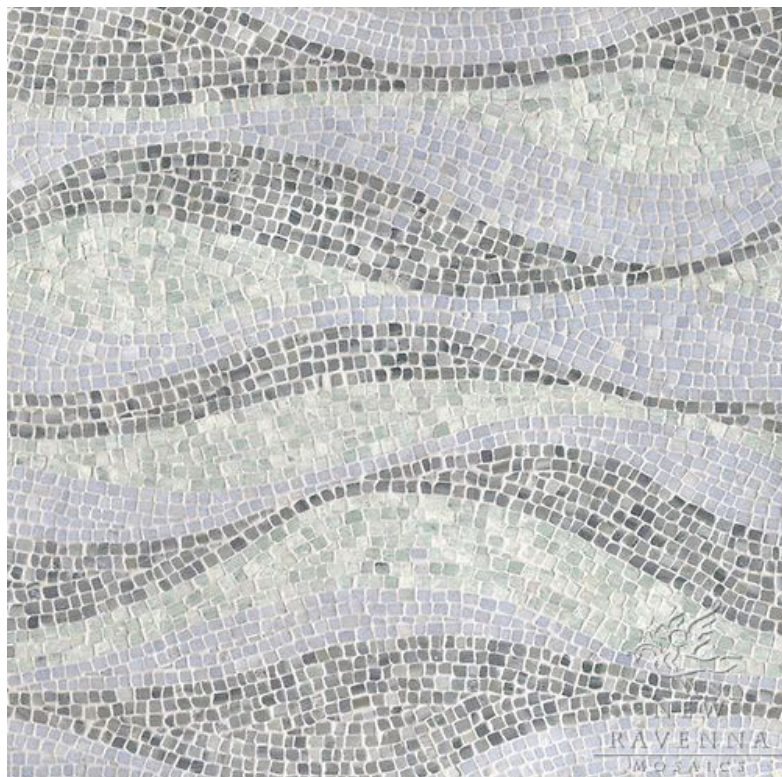
SITE FURNISHINGS



RAILING / FENCE



PAVING / SURFACES

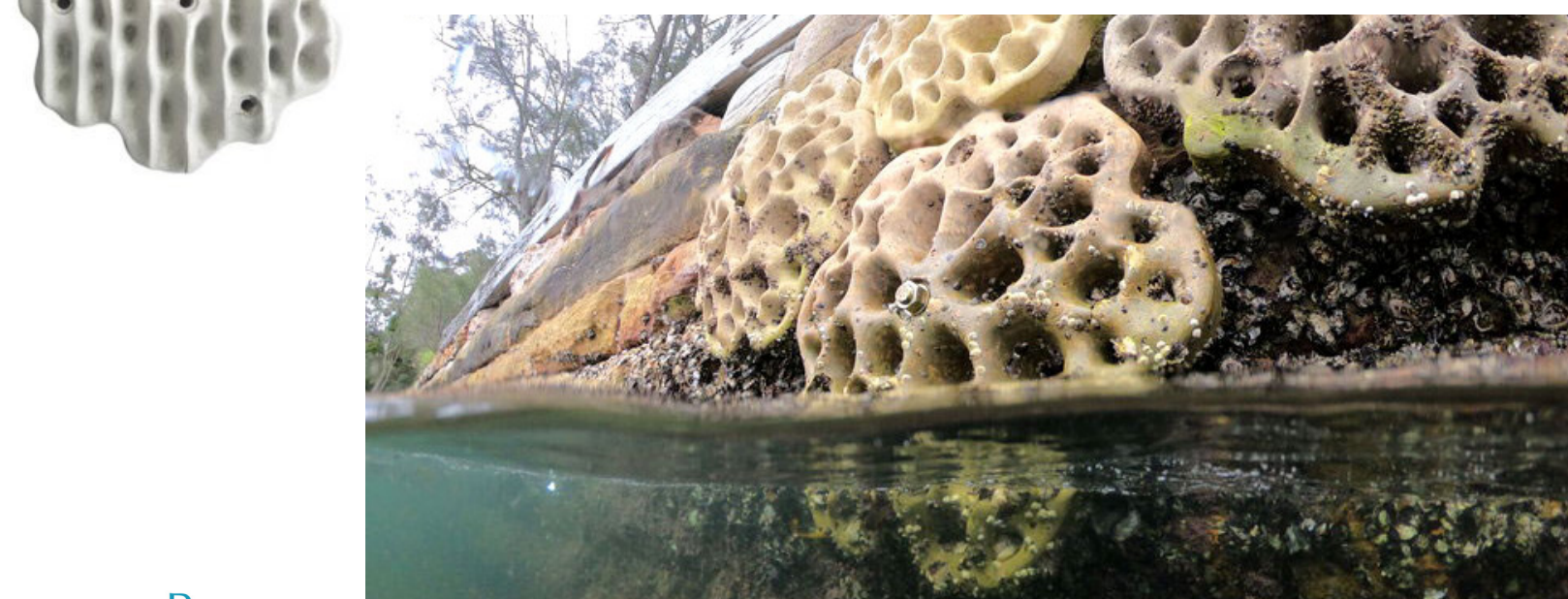
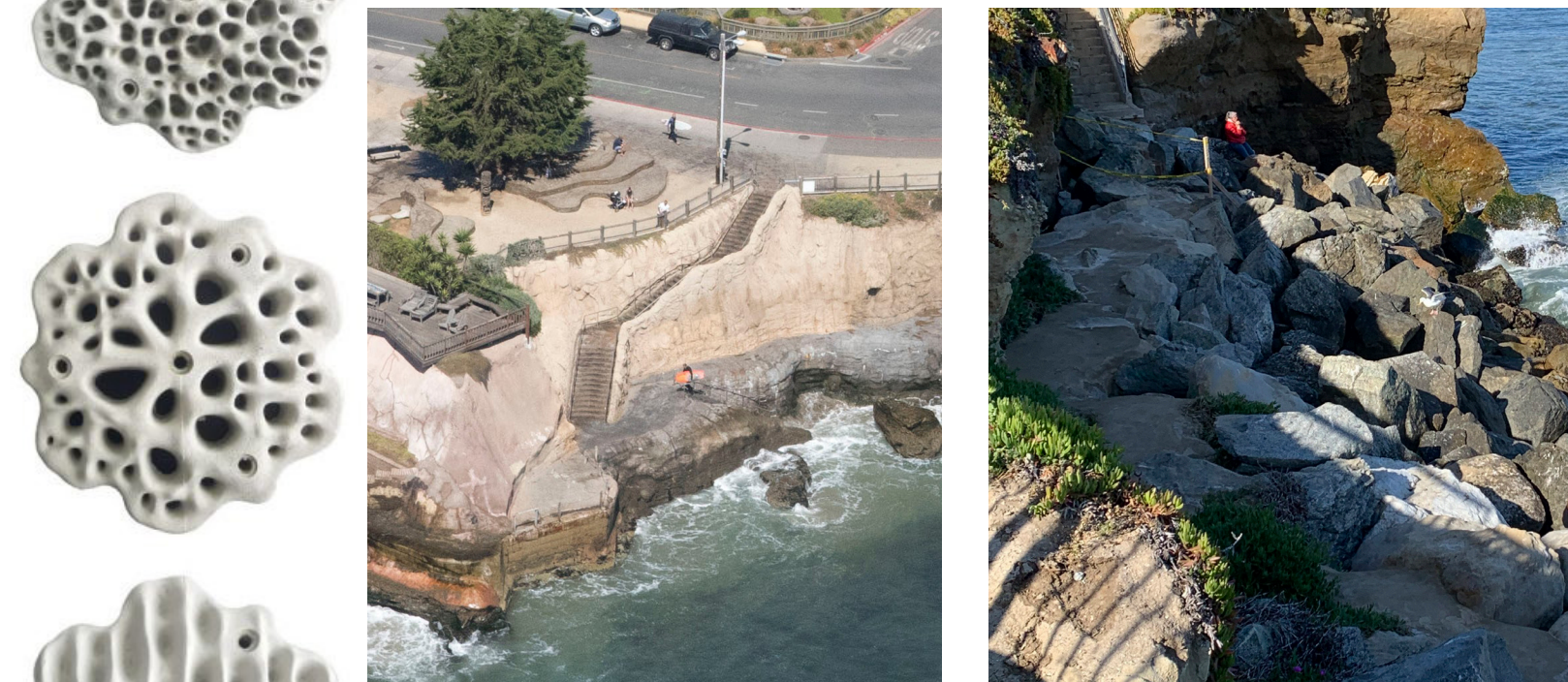




Bohemian Coastal

SHARE YOUR FEEDBACK! We are seeking your feedback on your preference for materials and overall visual character and theme for furnishings and amenities. Please see additional instructions below!

WALL MATERIALS

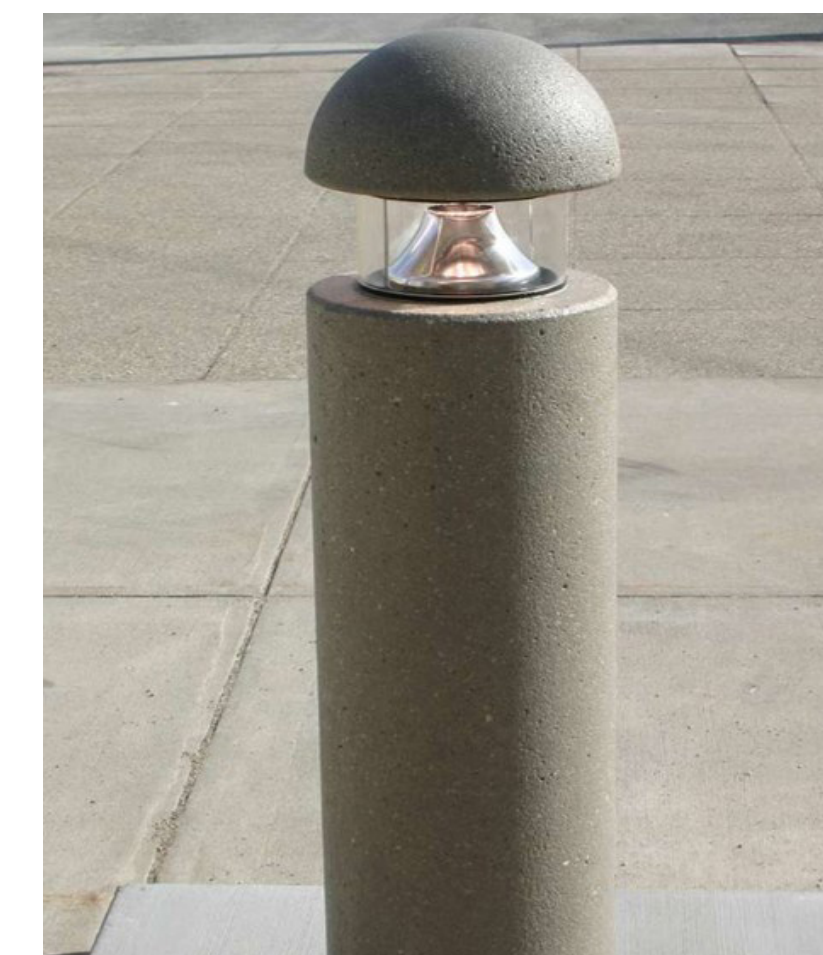


Beach Boulevard
INFRASTRUCTURE RESILIENCY PROJECT

ART INSTALLATIONS



LIGHTING OPTIONS



SIGNAGE



1. Please collect seven dots and place them next to your preferred theme for each category (column).
2. All dots can be placed next to one theme or divided amongst the three themes.
3. Examples were chosen to provide 'feel' for each theme; however, if you really like a specific example, please note it with a stickynote

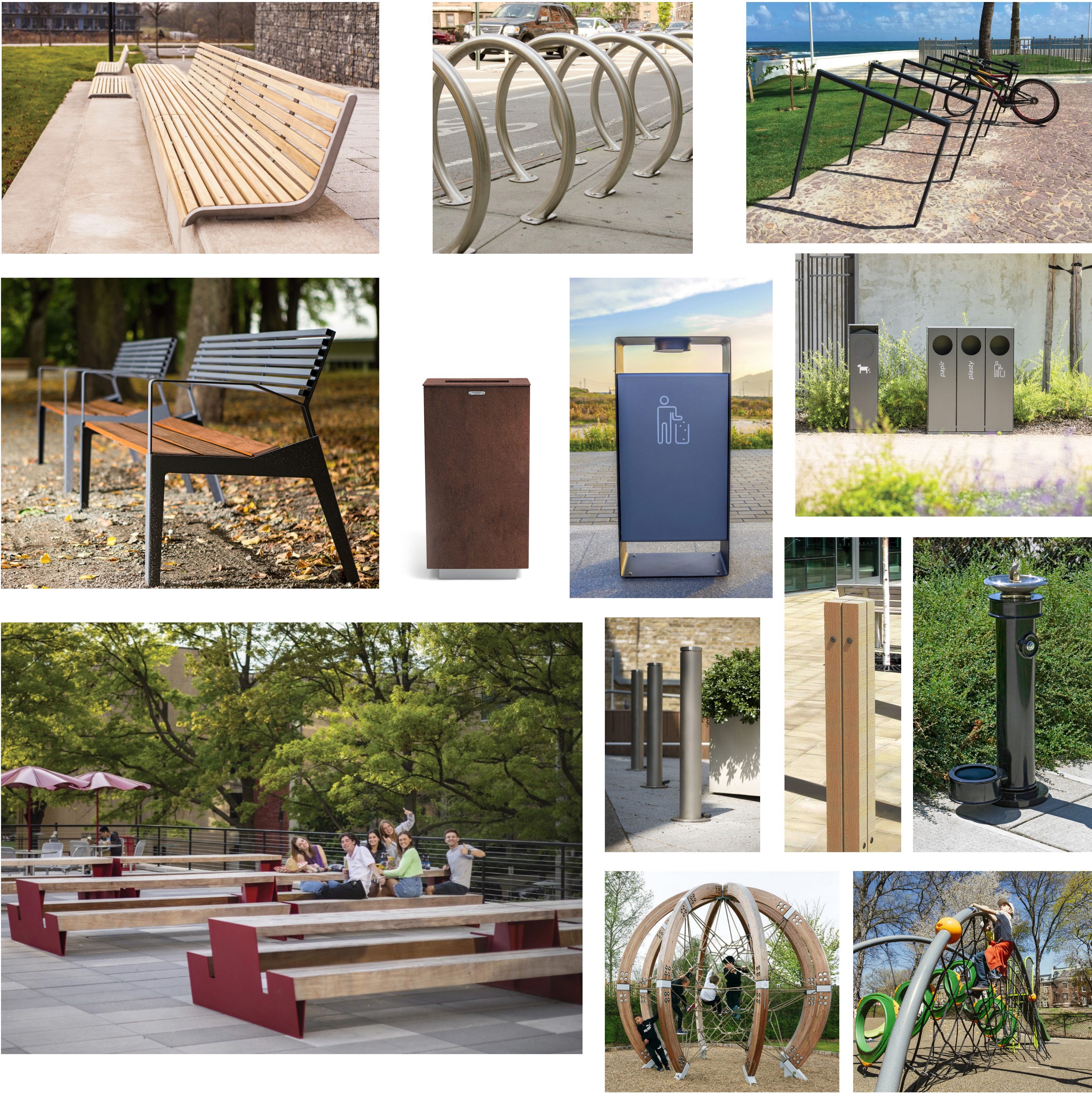
CityofPacifica.org/beachresiliency →



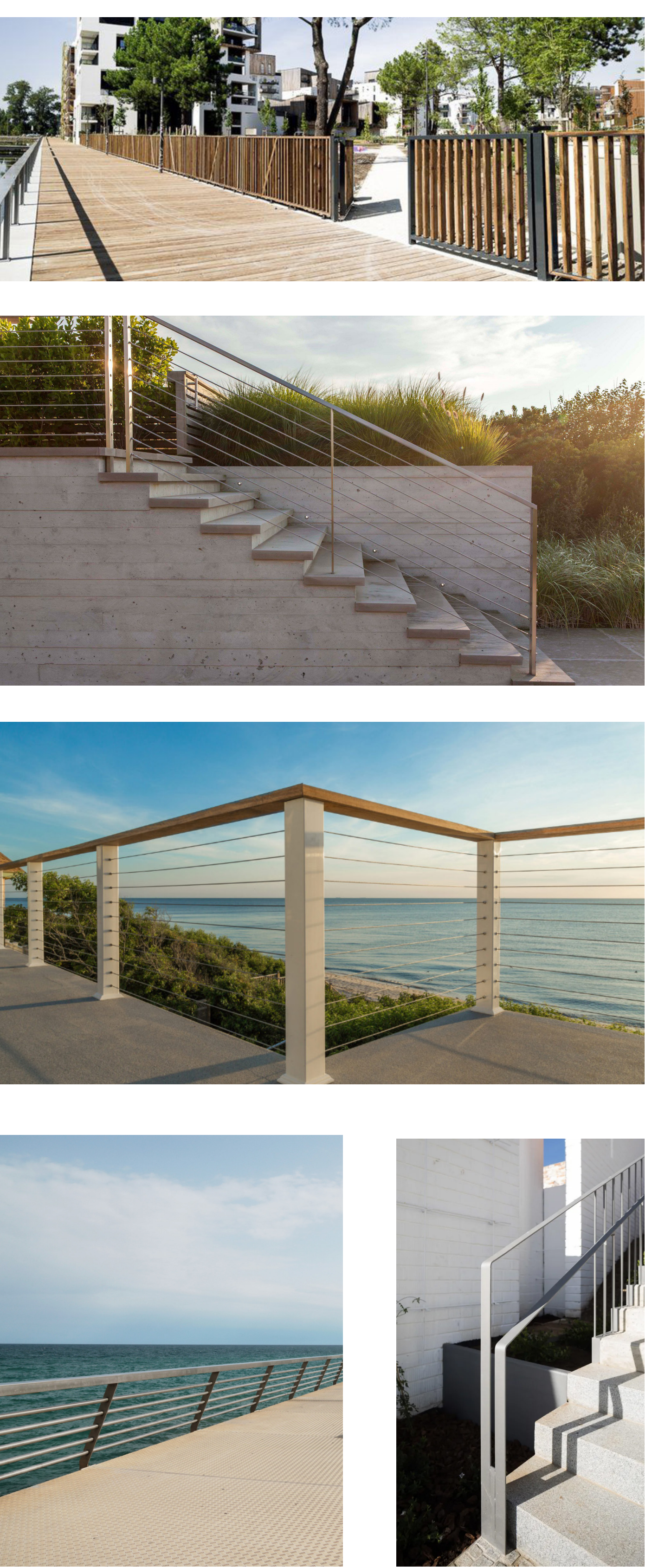
Modern

SHARE YOUR FEEDBACK! We are seeking your feedback on your preference for materials and overall visual character and theme for furnishings and amenities. Please see additional instructions below!

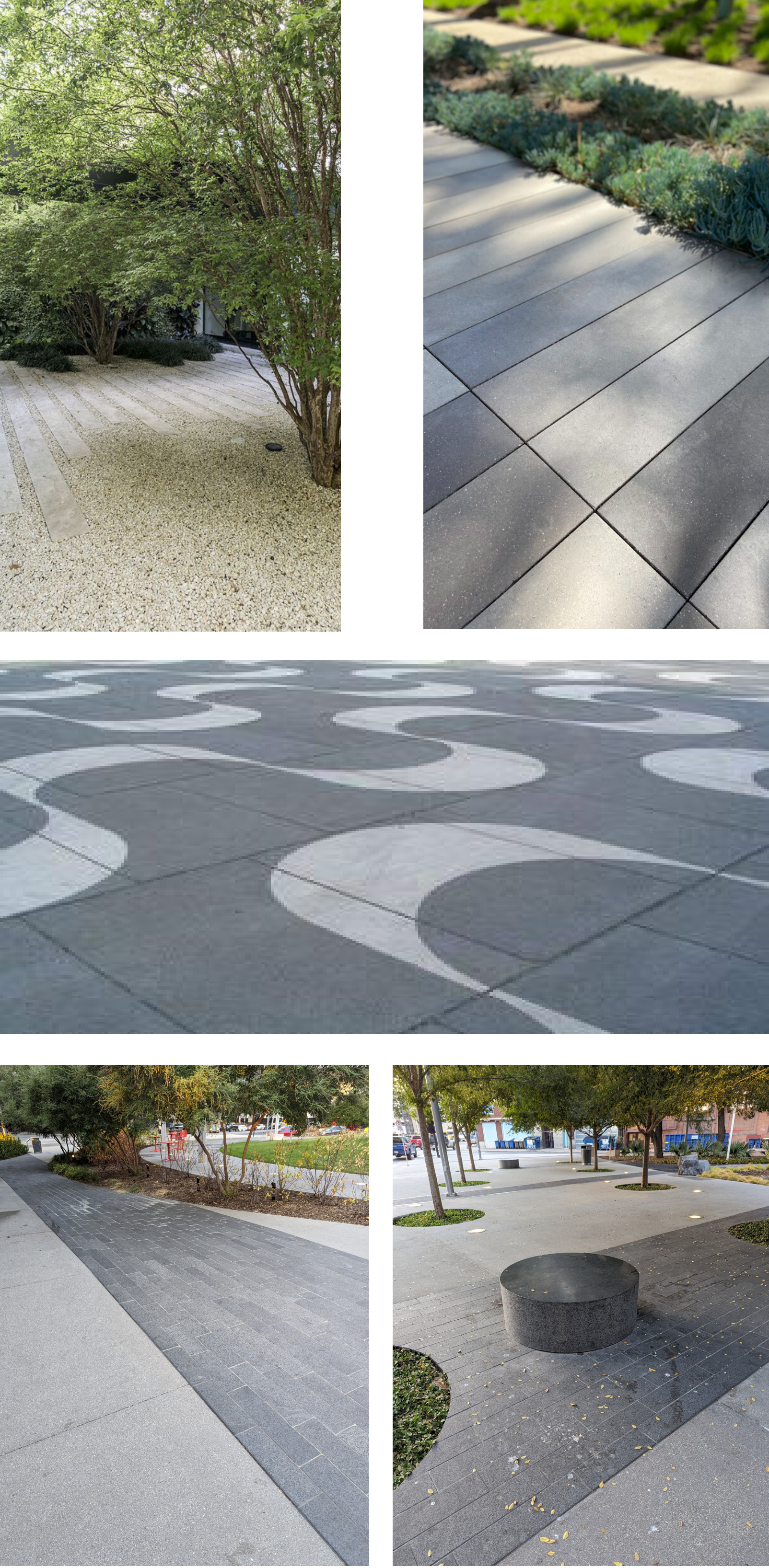
SITE FURNISHINGS



RAILING / FENCE



PAVING / SURFACES



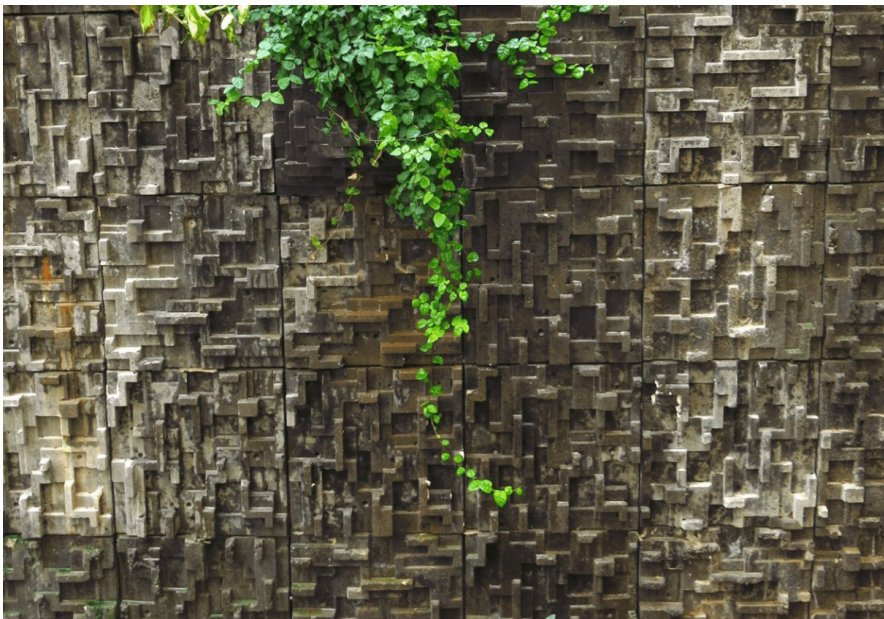
1. Please collect seven dots and place them next to your preferred theme for each category (column).
2. All dots can be placed next to one theme or divided amongst the three themes.
3. Examples were chosen to provide 'feel' for each theme; however, if you really like a specific example, please note it with a stickynote



Modern

SHARE YOUR FEEDBACK! We are seeking your feedback on your preference for materials and overall visual character and theme for furnishings and amenities. Please see additional instructions below!

WALL MATERIALS



ART INSTALLATIONS



LIGHTING OPTIONS



SIGNAGE



1. Please collect seven dots and place them next to your preferred theme for each category (column).
2. All dots can be placed next to one theme or divided amongst the three themes.
3. Examples were chosen to provide 'feel' for each theme; however, if you really like a specific example, please note it with a stickynote