COASTAL RAIL RESILIENCY STUDY

Initial Assessment
Updated Conceptual Reinforcement Areas

OCTA

Short- and Mid-Term Study Milestones

Initial Assessment

IMMEDIATE NEEDS

- Initiated: Nov ’23
- **Address immediate needs**
- Potential reinforcement areas identified: Dec ’23
- Release Report: Feb ’24

LISTENING SESSIONS ★

- Engage with a wide range of stakeholders with unique and diverse backgrounds and needs
- Obtain feedback from stakeholders and interest groups: winter ’24

The first step of the Coastal Rail Resiliency Study is to address the most vulnerable areas through the initial assessment (left).

The study then looks at protecting the rail line in place for up to 30 years (below).

These activities are occurring simultaneously.

Board – Board of Directors ★ – Current Phase

Short- and Mid-Term Solutions Up to 30 Years

PURPOSE & NEED/ EVALUATION CRITERIA

- Draft: spring ’24
- Informed by listening session feedback

DRAFT CONCEPT DEVELOPMENT

- Draft concepts: spring to fall ’24
- Obtain feedback from public, stakeholders and interest groups: fall ’24

REFINEMENT OF CONCEPTS

- Refined concepts: spring ’25
- Obtain feedback from public, stakeholders and interest groups: spring ’25

DRAFT FEASIBILITY STUDY REPORT

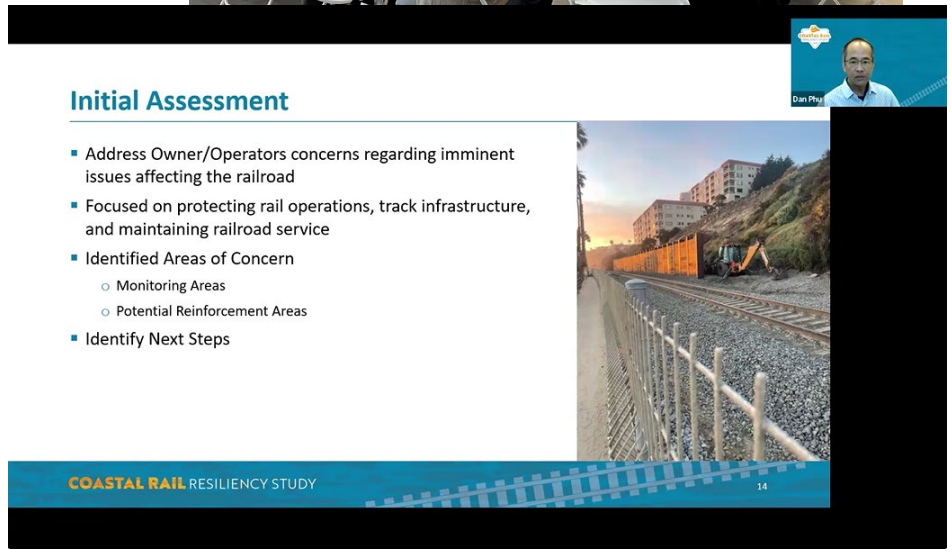
- Draft report: spring to summer ’25
- Obtain feedback from public, stakeholders and interest groups

FINAL FEASIBILITY STUDY REPORT

- Final report: fall ’25
- Present to Board / publish final report: fall ’25

Coastal Rail Resiliency Study / Initial Assessment Feedback To Date

- Consider other natural solutions (sand, living shoreline, etc.)
- Seek partnering opportunities (city, county, state, etc.)
- Integrate the previous work of others into the Study, as appropriate
- The need to follow the prescribed environmental processes
- Consider the impacts of armoring and its effects on coastal erosion
- Support for early, comprehensive, preventive action
- Obligation for OCTA to keep the railroad operational
- Continue coordinated streamlined communication of service disruption
- Concern regarding impacts to employee commute patterns and regional tourism
- Consult coastal and marine habitat experts



OCTA – Orange County Transportation Authority

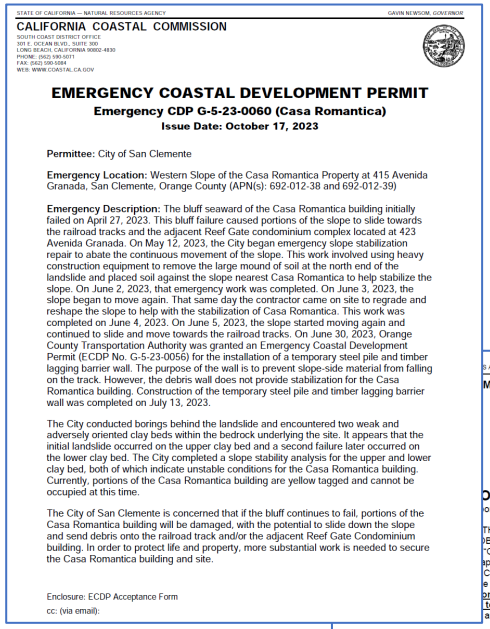
Regulatory Agencies Coordination

Coordinated with:

- California Coastal Commission
- United States Army Corps of Engineers
- San Diego Regional Water Quality Control Board

Discussed:

- Existing challenges with the railroad
- OCTA supportive of regional sand nourishment efforts
- Expedited permitting process to protect critical rail infrastructure and recreational resources
- Technical processes



STATE OF CALIFORNIA — NATURAL RESOURCES AGENCY GAVIN NEWSOM, GOVERNOR

CALIFORNIA COASTAL COMMISSION

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301 E. OCEAN BLVD., SUITE 300
LONG BEACH, CALIFORNIA 90802-4830
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EMERGENCY COASTAL DEVELOPMENT PERMIT

Emergency CDP G-5-23-0060 (Casa Romantica)

Issue Date: October 17, 2023

Permittee: City of San Clemente

Emergency Location: Western Slope of the Casa Romantica Property at 415 Avenida Granada, San Clemente, Orange County (APN(s): 692-012-38 and 692-012-39)

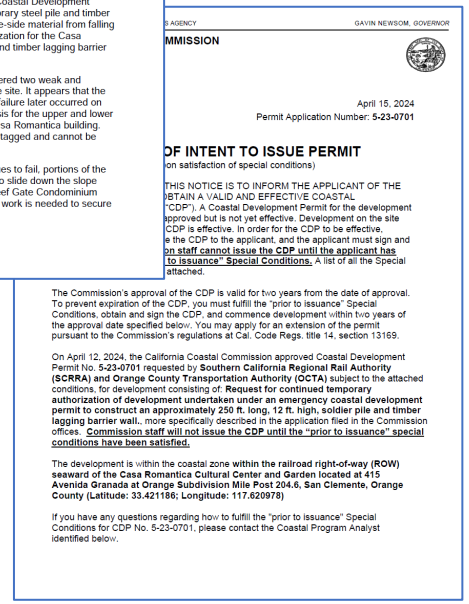
Emergency Description: The bluff seaward of the Casa Romantica building initially failed on April 27, 2023. This bluff failure caused portions of the slope to slide towards the railroad tracks and the adjacent Reef Gate condominium complex located at 423 Avenida Granada. On May 12, 2023, the City began emergency slope stabilization repair to abate the continuous movement of the slope. This work involved using heavy construction equipment to remove the large mound of soil at the north end of the landslide and placed soil against the slope nearest Casa Romantica to help stabilize the slope. On June 2, 2023, that emergency work was completed. On June 3, 2023, the slope began to move again. That same day the contractor came on site to regrade and reshape the slope to help with the stabilization of Casa Romantica. This work was completed on June 4, 2023. On June 5, 2023, the slope started moving again and continued to slide and move towards the railroad tracks. On June 30, 2023, Orange County Transportation Authority was granted an Emergency Coastal Development Permit (ECDP No. G-5-23-0056) for the installation of a temporary steel pile and timber lagging barrier wall. The purpose of the wall is to prevent slope-side material from falling on the track. However, the debris wall does not provide stabilization for the Casa Romantica building. Construction of the temporary steel pile and timber lagging barrier wall was completed on July 13, 2023.

The City conducted borings behind the landslide and encountered two weak and adversely oriented clay beds within the bedrock underlying the site. It appears that the initial landslide occurred on the upper clay bed and a second failure later occurred on the lower clay bed. The City completed a slope stability analysis for the upper and lower clay bed, both of which indicate unstable conditions for the Casa Romantica building. Currently, portions of the Casa Romantica building are yellow tagged and cannot be occupied at this time.

The City of San Clemente is concerned that if the bluff continues to fail, portions of the Casa Romantica building will be damaged, with the potential to slide down the slope and send debris onto the railroad track and/or the adjacent Reef Gate Condominium building. In order to protect life and property, more substantial work is needed to secure the Casa Romantica building and site.

Enclosure: ECDP Acceptance Form

cc: (via email):



S AGENCY GAVIN NEWSOM, GOVERNOR

MMISSION

April 15, 2024

Permit Application Number: **5-23-0701**

OF INTENT TO ISSUE PERMIT

on satisfaction of special conditions)

THIS NOTICE IS TO INFORM THE APPLICANT OF THE
BTAIN A VALID AND EFFECTIVE COASTAL
"CDP"). A Coastal Development Permit for the development
pproved but is not yet effective. Development on the site
CDP is effective. In order for the CDP to be effective,
e the CDP to the applicant, and the applicant must sign and
**on staff cannot issue the CDP until the applicant has
to issuance" Special Conditions.** A list of all the Special
attached.

The Commission's approval of the CDP is valid for two years from the date of approval. To prevent expiration of the CDP, you must fulfill the "prior to issuance" Special Conditions, obtain and sign the CDP, and commence development within two years of the approval date specified below. You may apply for an extension of the permit pursuant to the Commission's regulations at Cal. Code Regs. title 14, section 13169.

On April 12, 2024, the California Coastal Commission approved Coastal Development Permit No. **5-23-0701** requested by **Southern California Regional Rail Authority (SCRRA) and Orange County Transportation Authority (OCTA)** subject to the attached conditions, for development consisting of: **Request for continued temporary authorization of development undertaken under an emergency coastal development permit to construct an approximately 250 ft. long, 12 ft. high, soldier pile and timber lagging barrier wall.**, more specifically described in the application filed in the Commission offices. **Commission staff will not issue the CDP until the "prior to issuance" special conditions have been satisfied.**

The development is within the coastal zone **within the railroad right-of-way (ROW) seaward of the Casa Romantica Cultural Center and Garden located at 415 Avenida Granada at Orange Subdivision Mile Post 204.6, San Clemente, Orange County (Latitude: 33.421186; Longitude: 117.620978)**

If you have any questions regarding how to fulfill the "prior to issuance" Special Conditions for CDP No. 5-23-0701, please contact the Coastal Program Analyst identified below.

Updated Initial Assessment Approach

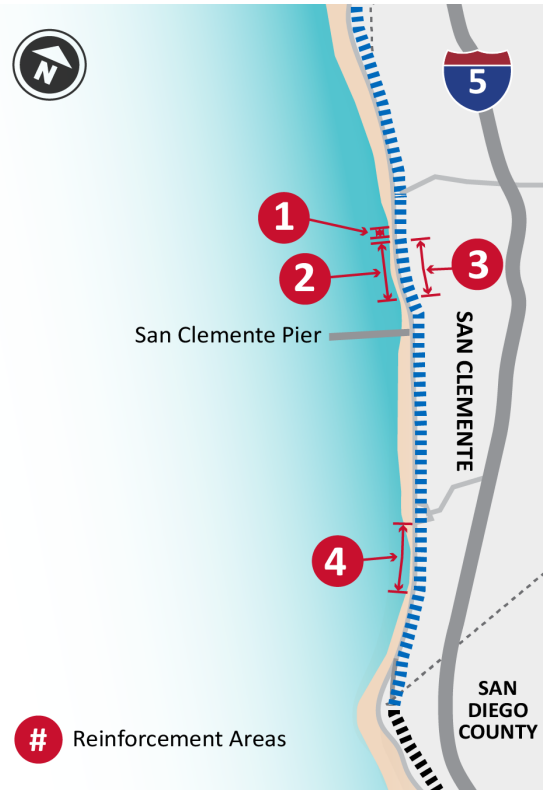
- Address imminent threats to avoid interruptions to rail operations
- Identify and address areas most vulnerable to seaward beach erosion and wave impacts
- Identify and address areas most vulnerable to inland slope failure
- Consider potential environmental impacts and permit requirements
- Incorporate public and agency input
- Establish reasonable implementation timelines

Multi-Benefit Solution: Provide necessary reinforcement to protect and preserve rail infrastructure, which includes sand nourishment to offset potential impacts.

Initial Assessment Purpose and Need

- Four reinforcement areas were identified in December 2023
- Potential solutions need to be in place or substantially underway by fall 2024 ahead of next storm season
- Potential solutions evaluated at a conceptual level considering different materials, performance, costs, methods, and schedule

Area	Location (MP)	Challenge	Updated Potential Solutions
1	203.80 – 203.90	Ongoing deterioration of existing riprap protection	Rock (repair existing riprap) and sand nourishment
2	204.00 – 204.40	Erosion - no beach at high tide and direct wave attack damaging existing riprap protection	Rock (repair existing riprap) and sand nourishment
3*	204.00 – 204.50	Steep bluffs with high potential for failure that could impact the rail infrastructure	Catchment wall
4	206.00 - 206.67	Near San Clemente State Beach - erosion exposing areas of limited to no riprap protection	Engineered rock revetment and sand nourishment



*The inland slope experienced a failure in late January 2024 within a portion of Area 3, resulting in a passenger rail shutdown for approximately two months

Preliminary concepts; assumptions are subject to change as more information becomes available.

MP – Mile Post

Reinforcement Areas 1 & 2: Updated Potential Solution

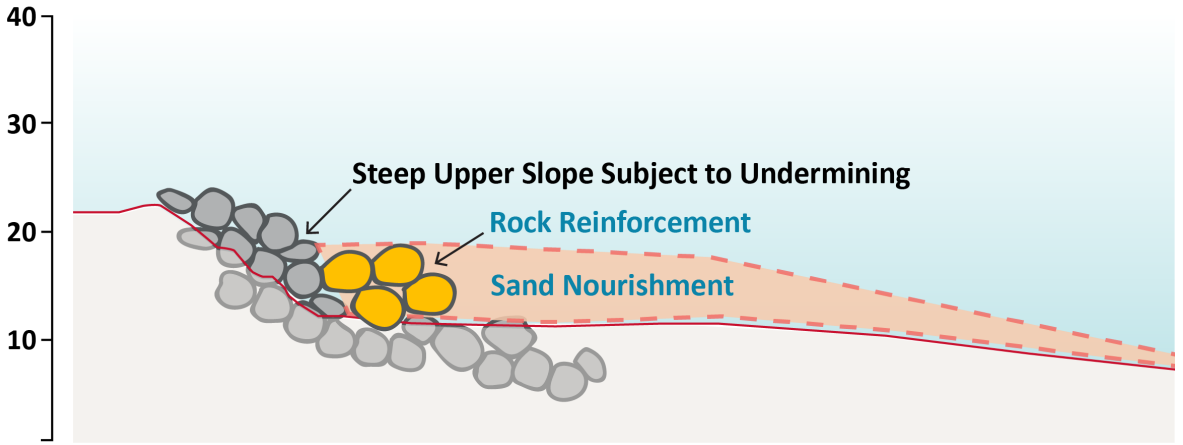
Existing Condition:

MP 203.80 – 203.90 and 204.00 – 204.40

Potential Solution:

Rock (repair existing riprap) and sand nourishment

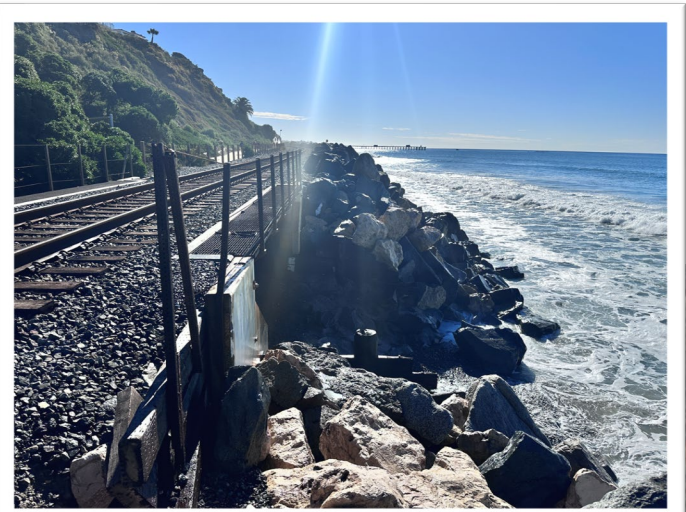
- Place 2-ton to 6-ton rock gradation
- Minimize rock encroachment on the beach
- Sand nourishment to add approximately 50-ft-wide beach fronting rock
- Prioritize eroded and over-steepened areas
- Locations based on LiDAR survey and on-the-ground evaluation



Preliminary concepts; assumptions are subject to change as more information becomes available.

Reinforcement Areas 1 & 2: Location

Preliminary concepts; assumptions are subject to change as more information becomes available.



MP 203.80

MP 204.40

Area 1

Area 2

ROCK REINFORCEMENT

- Approximately 7,000 tons of 2-ton to 6-ton rocks

SAND NOURISHMENT

- Sand nourishment to create approximately 50-foot-wide beach between MP 203.80 and 204.40
- Approximately 240,000 cubic yards of sand needed

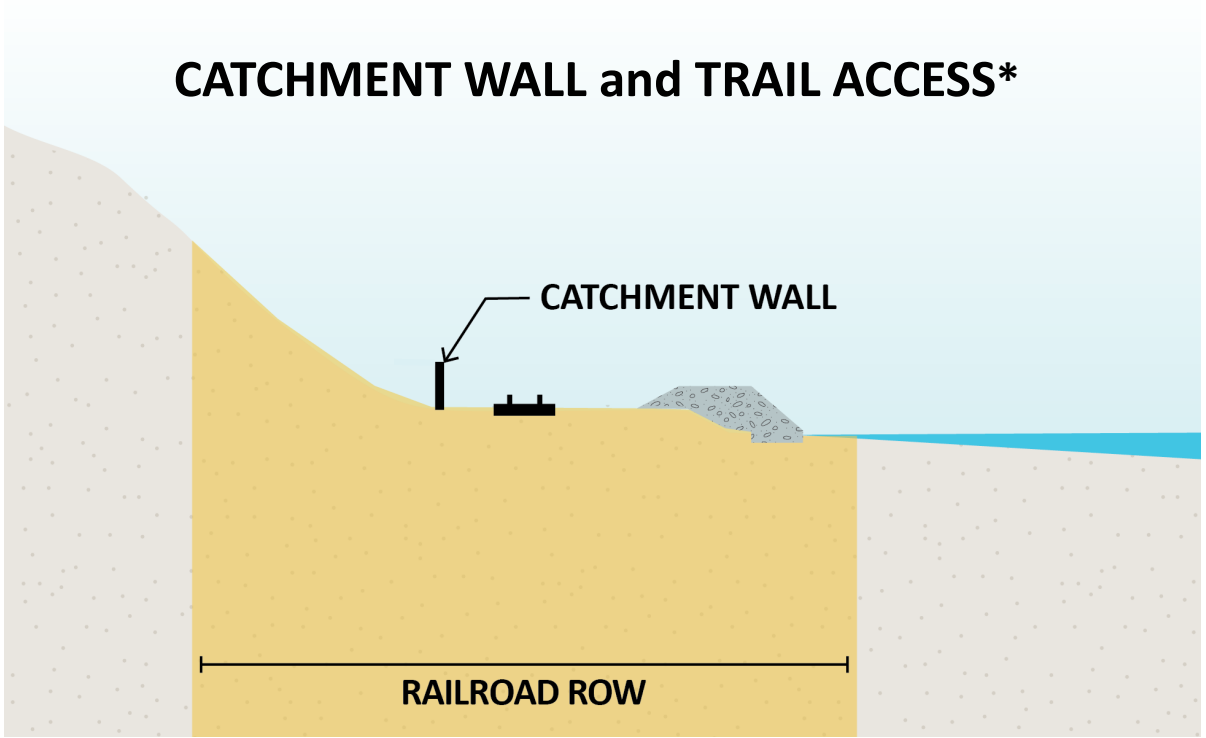
Reinforcement Area 3: Updated Potential Solution

Existing Condition:

MP 204.00 – 204.50

Steep bluffs with a history of failure and high potential for additional movement that could impact the railroad infrastructure.

Potential Solution:



*Extend existing catchment wall. OCTA will work with the City of San Clemente to maintain and restore trail access.

Preliminary concepts; assumptions are subject to change as more information becomes available.

ROW - Right-of-Way

Reinforcement Area 4: Updated Potential Solution

Existing Condition:

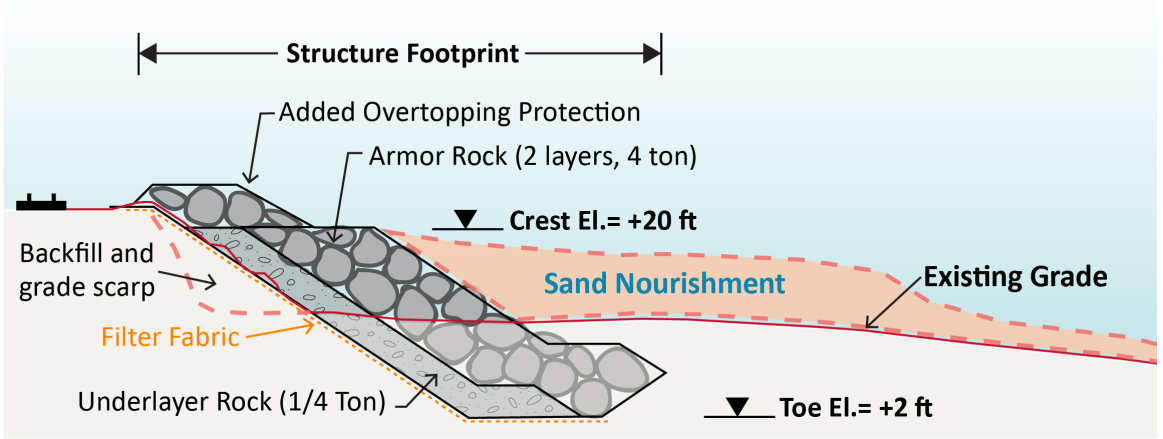
MP 206.00 - 206.67

Near San Clemente State Beach - erosion exposing areas of limited to no riprap protection.

Updated Potential Solution:

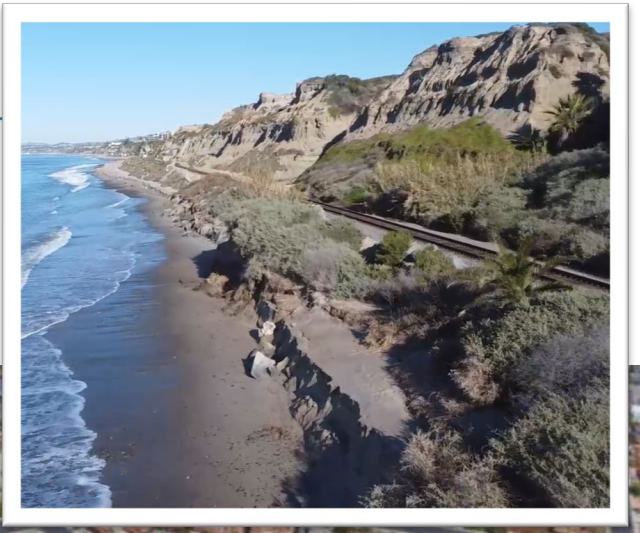
Engineered rock revetment and sand nourishment

- Place geotextile filter fabric
- Place approximately 1/4-ton rock gradation for underlayer
- Place approximately 4-ton rock gradation
- Create approximately 80 to 100-foot-wide beach through sand nourishment fronting engineered rock revetment
- Locations based on LiDAR survey and on-the-ground evaluation



Preliminary concepts; assumptions are subject to change as more information becomes available.

Reinforcement Area 4: Location



Preliminary concepts; assumptions are subject to change as more information becomes available.

MP 206.00

MP 206.67

Area 4: MP 206.00 - 206.67

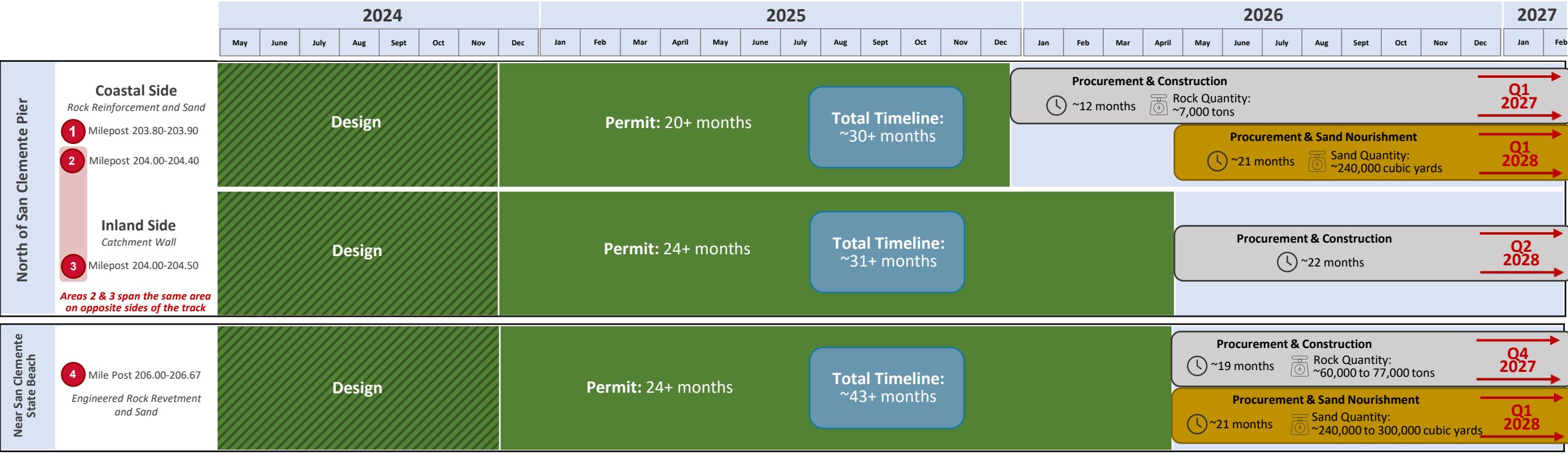
ROCK REINFORCEMENT

- Approximately 60,000 to 77,000 tons of rock

SAND NOURISHMENT

- Sand nourishment to create approximately 80 to 100-foot-wide beach between MP 206.00 and 206.67
- Approximately 240,000 to 300,000 cubic yards of sand

Coastal Rail Resiliency Study: Initial Assessment Estimated Project Timeline (typical permit process)



Rock & Wall: ~67,000 to 84,000 tons; ~$183-195 million

Sand Nourishment: ~480,000 to 540,000 cubic yards; ~$64-145 million

Total Estimated Cost: ~$247-340 million

Design | Permit | Rock Reinforcement Procurement & Construction | Sand Procurement & Nourishment by Dredge

Key Assumptions

Environmental Compliance & Permitting:

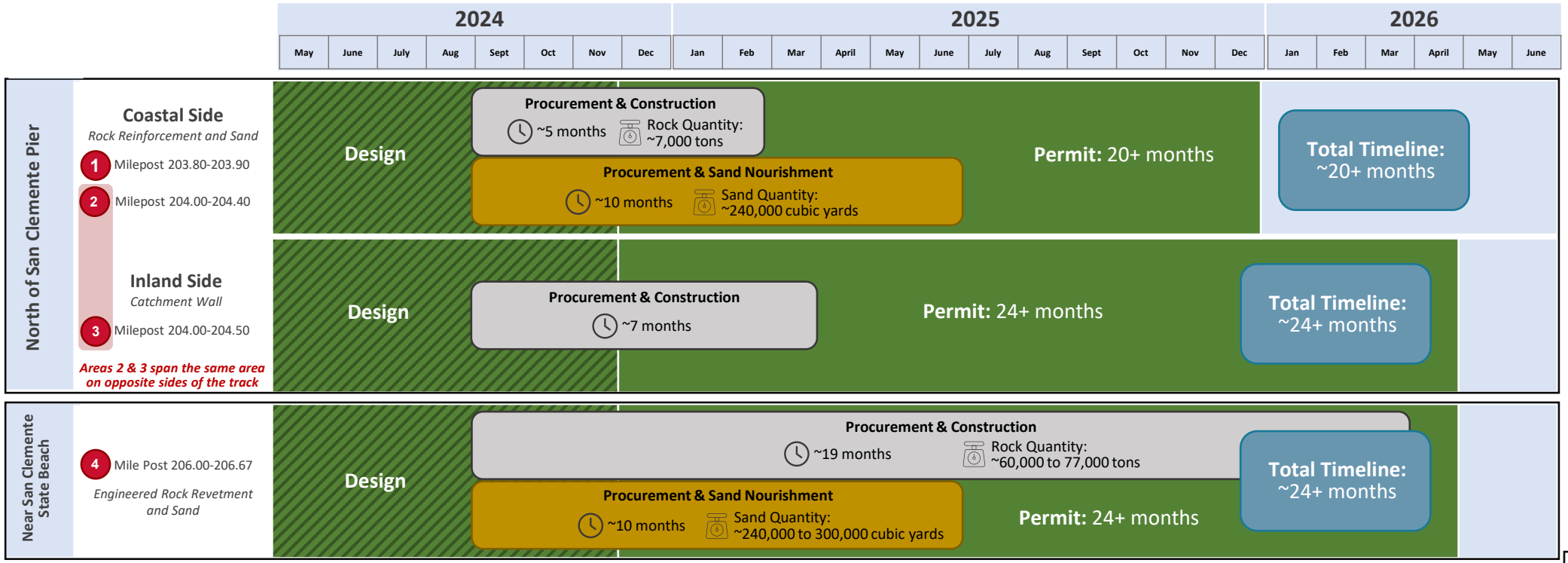
- Assumes all work qualifies under the California Environmental Quality Act emergency provisions and National Environmental Policy Act Categorical Exclusion
- California Coastal Commission
  - A Coastal Development Permit would require completed permitting process prior to work beginning
  - All work assumes advance coordination with Coastal Commission on appropriate permit process.
- U.S. Army Corps of Engineers
  - Anticipates requirement of a Nationwide Permit 13

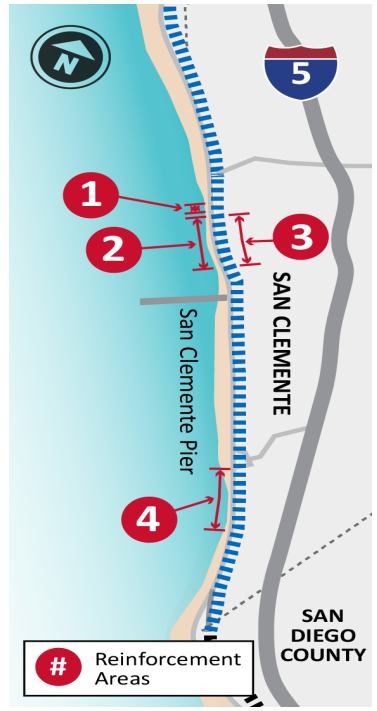
Construction & Sand Nourishment:

- Catchment wall construction timeline assumes no sensitive species, habitat, and/or aquatic resources that require additional permitting
- Sand nourishment schedule assumes OCTA can procure sand via dredging by fall 2026
- Assumes ~480,000 to 540,000 cubic yards of sand nourishment through one cycle, pending permits, dredge, and borrow source availability

Schedule and cost are preliminary and subject to change

Coastal Rail Resiliency Study: Initial Assessment Estimated Project Timeline (expedited permit process)





Rock & Wall: ~67,000 to 84,000 tons; ~$155-185 million

Sand Nourishment: ~480,000 to 540,000 cubic yards; ~$55-125 million

Total Estimated Cost: ~$210-310 million

Key Assumptions

Environmental Compliance & Permitting:

- Assumes all work qualifies under the California Environmental Quality Act emergency provisions and National Environmental Policy Act Categorical Exclusion
- California Coastal Commission
  - All work assumes advance coordination with Coastal Commission on appropriate permit process.
- U.S. Army Corps of Engineers
  - Assumes Regional General Permit (RGP 63) for sand nourishment
  - Nationwide Permit 13 (if applicable, adds a minimum of 6 months)

Construction & Sand Nourishment:

- Catchment wall construction timeline assumes no sensitive species, habitat, and/or aquatic resources that require additional permitting
- Sand nourishment schedule assumes OCTA can procure sand via dredging by fall 2024, otherwise timeline requires a minimum of one to two more years for next available dredger scheduled in the area
- Assumes ~480,000 to 540,000 cubic yards of sand nourishment through one cycle, pending permits, dredge, and borrow source availability

Schedule and cost are preliminary and subject to change