

Coastal Connections Conceptual Planning Study

SAN DIEGO ASSOCIATION OF GOVERNMENTS
CITY OF DEL MAR
NORTH COUNTY TRANSIT DISTRICT
CALIFORNIA COASTAL COMMISSION



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1. STUDY PURPOSE & OVERVIEW

This Coastal Connections Conceptual Planning Study assesses the opportunities and constraints of potential pedestrian access improvements for a 1.6-mile section of the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Railroad Corridor in the cities of Del Mar and San Diego.

This study followed the three-phase process shown in Figure 1-1 and described throughout this report, which is organized into five sections:

- Section 1 summarizes the study’s purpose, background, study area, and stakeholder engagement activities.
- Section 2 reviews the study area’s existing conditions and context.
- Section 3 establishes evaluation criteria and screens a wide range of potential access improvements.
- Section 4 describes and evaluates seven selected design concepts including a north-south trail and railroad crossings, with draft conceptual plans and summaries of expected benefits, costs, and potential tradeoffs of each concept.
- Section 5 discusses implementation considerations and next steps.

Figure 1-1: Study Process



BACKGROUND

Developed jointly by the San Diego Association of Governments (SANDAG), the City of Del Mar, the North County Transit District (NCTD), and the California Coastal Commission (CCC), this study identifies potential formal pedestrian connectivity improvements in and around the railroad corridor. It was initiated as a condition of the 2019 CCC approval of SANDAG’s Del Mar Bluffs Stabilization 4 project. CCC then approved the Del Mar Bluffs Stabilization 5 project in 2022 with a condition requiring construction of a north-south trail, a railroad crossing approved by the California Public Utilities Commission (CPUC), and a beach accessway with the consensus of the partner agencies above. Appendix A contains both CCC staff reports containing additional details.

Currently, many pedestrians enter railroad property in the study area, both to cross the railroad and to walk along the bluffs. This creates safety concerns for pedestrians and risks impacting passenger and freight rail services. This study seeks to improve public safety, minimize potential conflicts between railroad operations and pedestrian access, and minimize impacts to existing coastal resources including coastal bluffs. The results are intended to help inform the selection of specific projects, their design elements, and a regulatory strategy for successful implementation.

As described in Section 2, a related SANDAG study is focused on the long-term relocation of the railroad outside the study area, which would create additional opportunities for pedestrian access.

STUDY AREA

Shown in Figure 1-2 and Figure 1-3, the study area consists of about 1.6 miles of high coastal bluff along the southwestern edge of the City of Del Mar. It is bounded by two existing roadway crossings that provide both vehicular and pedestrian access:

- **Coast Boulevard (Mile Post 244.1):** Roadway at-grade crossing near Seagrove Park and Powerhouse Park. Contains a wayside horn as part of a train quiet zone.
- **North Torrey Pines Road (MP 245.7):** Roadway overcrossing near Torrey Pines State Beach and Los Peñasquitos Lagoon.

Figure 1-2: Study Area Map



Figure 1-3: Study Area Photo



STAKEHOLDER ENGAGEMENT

Appendix B contains the study outreach plan, containing key messages and further details on the activities summarized below. It was developed in collaboration with SANDAG’s Public Information Office.

Project Development Team (PDT)

The core project team consisted of SANDAG and consultants WSP and Villa Civil. To help monitor and guide the core project team, the project also included a Project Development Team (PDT) that met, generally monthly, throughout the entire study. The PDT included staff from SANDAG, the City of Del Mar, NCTD, and CCC.

Additional Stakeholders

The project team also met with the following stakeholder agencies and groups to receive additional input and feedback on potential mobility needs and design concept reviews:

- City of San Diego
- California Public Utilities Commission (CPUC)
- California State Parks
- Los Peñasquitos Lagoon Foundation

Del Mar City Council

The project team briefed the Del Mar City Council on October 4, 2021, and December 5, 2022, to receive input from the City Council and the public.



Community Open House & Public Comment Period

The project team and the City of Del Mar hosted a community open house event on December 7, 2022. An accompanying “virtual” open house was available online at the SANDAG and City of Del Mar websites for an eight-week comment period through January 31, 2023, featuring the same materials presented at the in-person open house.

Appendix B contains the comments received during the public comment period, including summary charts, the full comment database, and initial responses from the project team.

SANDAG Social Services Transportation Advisory Council (SSTAC)

The project team presented to the SSTAC on January 17, 2023, to receive feedback on the accessibility features of the potential conceptual designs.



2. EXISTING CONDITIONS ASSESSMENT

The existing conditions assessment is organized into the following sections:

- Physical conditions
- Community mobility
- Railroad operations
- Related projects in study area
- Prior recommendations for pedestrian access and bluff preservation

In addition to the maps contained in this report, the project also includes an [online basemap](#) showing the features described in this report and recent aerial imagery. Table 2-1 lists the key documents consulted by the project team during the study.

Table 2-1: Literature Review List

Author	Document	Year
CCC	Staff Report, Del Mar Bluffs Stabilization Project 5 Consistency Certification (<i>Appendix A</i>)	2022
CCC	Staff Report, Del Mar Bluffs Stabilization Project 4 Consistency Certification (<i>Appendix A</i>)	2019
CCC	Sea Level Rise Coastal Adaptation Planning Guidance for Critical Infrastructure	2021
CCC	Sea Level Rise Policy Guidance	2018
CPUC	General Order 75-D: Standards for Warning Devices for At-Grade Highway-Rail Crossings	2006
CPUC	General Order 164-E: State Safety Oversight of Rail Fixed Guideway Systems	2018
City of Del Mar/CCC	Local Coastal Program (LCP) Land Use Plan	1993-2022
City of Del Mar/CCC	LCP Implementing Ordinances	2001-2022
City of Del Mar/TRAC	The Railroad Advisory Committee (TRAC) Study	1995
City of Del Mar	Community Plan (General Plan) incl. 2019 Safety Element addressing bluffs & railroad	1976-2021
City of Del Mar	Climate Action Plan & 2020 Monitoring Report	2016-2020
City of Del Mar	Sea Level Rise Adaptation Plan (<i>not part of certified LCP</i>)	2018
City of Del Mar	Vulnerability & Risk Assessment incl. Addendum (<i>not part of certified LCP</i>)	2016-2018
City of Del Mar	Landscape Development Guidelines	1988
City of Del Mar	Parking Master Plan	2000
City of Del Mar	Vision 2020	2003



Author	Document	Year
City of Del Mar	Downtown Parking Management Plan	2015
City of Del Mar	Design Guidelines	2017
City of Del Mar	Complete Streets Policy	2017
City of Del Mar	Public Paths and Trails Map	2020
City of Encinitas	Montgomery Avenue Noise Study Wayside Horn Demonstration Acoustic Monitoring Report (<i>Appendix F</i>)	2017
Federal Railroad Administration	Train Horn Rule (49 CFR Part 222)	2005
LOSSAN Working Group	Final Report from the LOSSAN San Diego Regional Rail Corridor Working Group	2021
NCTD	Trespasser Risk Reduction Study & Conceptual Fencing Plan (WSP)	2021
NCTD	Geotechnical Review of Proposed Security Fencing – Del Mar Bluffs (Leighton)	2021
NCTD	Right-of-Way Fencing at Del Mar Draft Plans	2021
NCTD	Fence & Signage Layout (KTUA)	2021
NCTD	Board Policy No. 11: Real Estate	2012-2021
NCTD	Board Policy No. 18: Railroad Crossing Quiet Zones and Wayside Horn Systems	2021-2022
NCTD/SANDAG	Design Criteria for the LOSSAN Corridor in San Diego County	2017
SANDAG	Del Mar Bluffs Geotechnical Study (Leighton)	2001
SANDAG	Geotechnical Design Report for DMB4 (Leighton)	2018
SANDAG	Geotechnical Design Report for DMB5 (Leighton)	2020-2021
SANDAG	Del Mar Bluffs Stabilization 5 Project Study Report & 100% Plans	2020-2022
SANDAG	Del Mar Bluffs Stabilization 6 Project Study Report & 30% Plans	2020-2022
SANDAG	Infrastructure Development Plan for LOSSAN Rail Corridor in SD County	2018
SANDAG	San Diego Forward: The Regional Plan	2021
SANDAG/Caltrans	North Coast Corridor PWP/TREP	2014-2016
U.S. Access Board	ADA and ABA Accessibility Standards	2010-2014
U.S. Army Corps of Engineers	Encinitas-Solana Beach Coastal Storm Damage Reduction Project Integrated Feasibility Study	2012



PHYSICAL CONDITIONS

As shown in Figure 2-1, the study area is located primarily in the “South Beach” area of the City of Del Mar characterized by tall bluffs along the coast. The railroad right-of-way is a relatively flat, graded area mid-bluff between the western coastal bluffs and the eastern upper bluffs. The area contains a mix of natural bluff landforms and physical infrastructure of varying ages.

Figure 2-1: Study Area Context



Environmental & Geotechnical

The study area's western coastal bluffs are subject to wave action and experience routine erosion—typically through sudden, episodic events rather than continuously—at an average retreat rate of about 0.4-0.6 feet per year. The surface is underlain by a combination of fill soils and a sequence of sedimentary formational units:

- **Bay Point Formation (Quaternary):** This upper formation is reddish-brown, weakly indurated, highly erodible, soft sandstone and siltstone with moderate permeability.
- **Del Mar Formation (Eocene):** This lower formation is light gray to olive green, slightly fissile, cemented siltstone and claystone with very low permeability.
- **Torrey Sandstone Formation (Eocene):** Limited exposures along the southern portion of the study area.

Figure 2-2 shows a typical bluff face on which both the Bay Point and Del Mar formations are visible. In general, the Bay Point Formation is potentially more erodible than the Del Mar Formation. However, the Del Mar Formation has greater exposure to adverse wave attack and groundwater seepage.

Fronting the lower western bluffs is beach sand covering a wide, wave-cut platform in the Del Mar and Torrey Sandstone formations. The beach sand rises to an elevation of about +10 feet at the bluff toe. However, dynamic coastal shoreline processes greatly influence beach elevation and width on a seasonal basis. The bluff materials also are subject to weathering and erosional processes.

A more comprehensive description of the site surface conditions, geologic materials and groundwater conditions are available in the 2001 and 2018 geotechnical studies published by SANDAG and developed by Leighton (details in Table 2-1).



Landslides & Existing Infrastructure

The bluffs have been altered by a combination of landslides and built infrastructure. These activities have both exacerbated and controlled ground surface erosion as summarized below.

Landslides: Numerous landslides of widely variable sizes are located along the lower bluffs west of the railway tracks. These landslides have mainly been triggered by natural processes, primarily erosional forces from direct high wave attack, precipitation runoff, and groundwater seepage through the bluff face.

Seawalls: Several unstable landslide areas or filled zones along the coastal bluff toe have been mitigated with the use of engineered seawalls of various types, heights, and effectiveness. Recent railroad-related stabilization projects (see “Related Projects in Study Area” below) have installed heavy-duty galvanized steel soldier beams with drilled-shaft concrete foundations socketed into the competent Del Mar Formation, with pressure-treated wood lagging between the beams (Figure 2-3). Some older seawalls in the study area use reinforced concrete. The seawalls have been backfilled with both conventional compacted fill soils and soil-cement treated materials, with variable performance in these backfill areas.

Drainage: Numerous drilled horizontal drains of varying size and effectiveness have been installed within various landslide masses and just above the horizontally bedded contact of the Bay Point and Del Mar formations. Other relevant site features include networks of surface and subsurface drainage improvements such as stormwater inlets, conveyance pipes, concrete-lined channels, and discharge outlets at beach level.

Coastal Bluff Stabilization: As described in “Related Projects in Study Area” below, coastal bluff stabilization features include long intermittent series of deep, narrowly spaced, large diameter reinforced concrete drilled shafts along the west side of the railroad, with and without long tieback anchors. Additional, localized retention systems exist throughout the study area.





COMMUNITY MOBILITY

Outside the railroad right-of-way, the bluffs are designated as an open space location that is used by pedestrians for passive recreation and access to the adjacent beach and coastline. These unique coastal resources are a major attraction for both residents and visitors. Any new coastal access points in the community will attract that demand, drawing from the adjacent coastal access areas shown in Figure 2-1.

This section is organized into the following sub-sections:

- Pedestrian and roadway network
- Bluff usage: north-south movement
- Bluff usage: east-west movement
- Parking

Pedestrian & Roadway Network

As shown in the maps in Figure 1-2 and Figure 2-1, the study area is characterized by a grid-like roadway network east of the railroad corridor, with local roads carrying relatively low traffic volumes west of Camino Del Mar. Most of these local roads lack sidewalks, with pedestrian traffic typically using the sides of the roadways and sharing with low-speed, low-volume vehicular traffic.

The study area is largely comprised of the “South Beach” section of the Del Mar coast, with the railroad corridor and surrounding bluffs presenting greater challenges to coastal access than other nearby beaches. The adjacent coastal areas—“North Beach” and “Main Beach” in Del Mar, and Torrey Pines State Beach in San Diego—are both characterized by relatively low elevations and ample beach access points.

Bluff Usage: North-South Movement

North-south informal pedestrian activity in the study area is characterized by several common behaviors, as described below and mapped in Figure 2-5 through Figure 2-8 on the following pages and in the study’s [online basemap](#).

East of the railroad, popular movement patterns include:

- **11th Street to 10th Street:** Concrete drainage channel
- **10th Street to 8th Street:** Unimproved trail
- **8th Street to 7th Street:** Unimproved trail
- **7th Street to Sea Cliff Way:** Decomposed granite area alongside concrete drainage channel, used by pedestrians as an informal trail (Figure 2-4)
- **Sea Cliff Way to 4th Street:** Unimproved trail alongside concrete drainage channel
- **4th Street to ~700 feet South of 4th Street:** Unimproved trail extending to southern bluff edge

West of the railroad, popular movement patterns include:

- **Powerhouse Park to ~15th Street:** Unimproved trail along bluff edge
- **~15th Street to 11th Street:** Some pedestrian movement along rail bed
- **11th Street to 8th Street:** Unimproved trail along bluff edge
- **8th Street to 7th Street:** Some pedestrian movement along rail bed
- **7th Street to North Torrey Pines Road:** Unimproved trail along bluff edge

Figure 2-4: Decomposed Granite Adjacent to Drainage Facility, South of 7th Street



Bluff Usage: East-West Movement

East-west pedestrian activity in the study area is characterized by several common behaviors, as described below and mapped in Figure 2-5 through Figure 2-8 on the following pages and in the study’s interactive [online basemap](#):

- **East of Railroad:** Numerous streets and alleys end at the railroad right-of-way, providing multiple potential access points for pedestrians attempting to cross the corridor. The most common access points include 11th Street and 8th Street.
- **West of Railroad:** Steep bluffs prevent much east-west movement west of the railroad. However, over time pedestrians have made informal trails to access the beach near 11th Street, 8th Street/7th Street, and North Torrey Pines Road.

Parking

The study area contains the following parking resources:

- **On-Street Parking:**
 - On-street parking on most public roadways, including all numbered streets ending at the railroad right-of-way
 - No parking in alleys, which include all studied locations with “Lane” or “Way” suffixes (Sea Orbit Lane, Melanie Way, etc.)
- **Off-Street Parking:** The City of Del Mar has identified existing off-street parking areas available to the public at the following locations, mapped in in Figure 2-5 and Figure 2-6:
 - **Civic Center:** 1-2 blocks from 10th Street and 11th Street
 - **Del Mar Shores Park:** 1-2 blocks from 7th Street and 8th Street



Figure 2-6



Key Features

- Railroad Study Area
- Existing Roadway Crossing & Study Area Boundary
- Potential New Pedestrian Crossing
- Common Pedestrian Movement
- City Boundary

Land Ownership

- Railroad
- City of Del Mar
- State of California
- Street Right-of-Way
- Private



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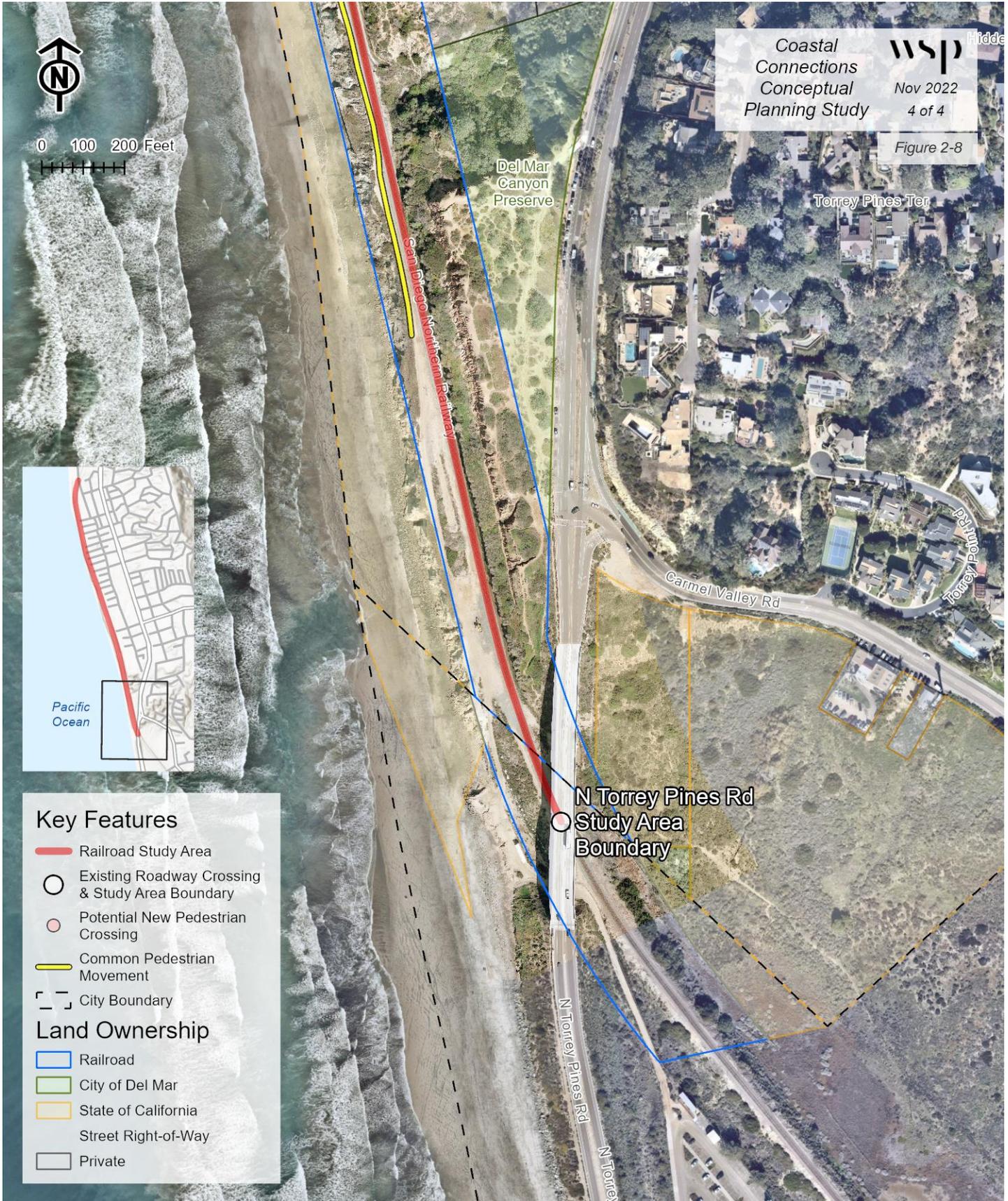
Figure 2-7

Key Features

- Railroad Study Area
- Existing Roadway Crossing & Study Area Boundary
- Potential New Pedestrian Crossing
- Common Pedestrian Movement
- City Boundary

Land Ownership

- Railroad
- City of Del Mar
- State of California
- Street Right-of-Way
- Private





RAILROAD OPERATIONS

The LOSSAN corridor is the nation’s second-busiest intercity passenger railroad corridor and is rapidly growing. The study area’s 1.6-mile section is served by the following operators:

- **Intercity Passenger Service:** Amtrak Pacific Surfliner connecting San Luis Obispo, Los Angeles, and San Diego.
- **Commuter Rail Passenger Service:** NCTD COASTER connecting Oceanside and San Diego (Figure 2-9).
- **Freight Service:** BNSF and subcontractor Pacific Sun, mostly operating in the overnight hours when passenger services are not running.

The study area’s 1.6-mile section is single-tracked, with maximum authorized speeds of 50 mph (north of MP 244.6) and 80 mph (south of MP 244.6). No double-tracking is planned in this section due to physical constraints. The nearest passenger stations are Solana Beach Station (2.3 miles north) and Sorrento Valley Station (3.5 miles south).

As shown in Table 2-2, the corridor is expected to accommodate a significant increase in passenger trains in the future, with service frequencies improving over time as capacity-enhancing capital projects are completed throughout the corridor.

Table 2-2: Passenger Service Frequency (Minutes) in Peak (PK) & Off-Peak (OP) Periods

Service	Existing	LOSSAN Optimization Study Goals		
	2022	Near Term	Mid Term	Long Term
Intercity (Amtrak)	60 PK / 60 OP	60 PK / 60 OP	60 PK / 60 OP	60 PK / 60 OP
Commuter (NCTD)	40 PK / 60 OP	20 PK / 60 OP	20 PK / 20 OP	15 PK / 20 OP

Source: SANDAG; LOSSAN Rail Corridor Optimization Study (LOSSAN Rail Corridor Agency, 2021)



Figure 2-9: COASTER Train Passing Seagrove Park (NCTD)



RELATED PROJECTS IN STUDY AREA

The study area is the site of several concurrent multi-agency projects described below:

- SANDAG Del Mar Bluffs (DMB) stabilization projects
- NCTD proposed corridor fencing
- Long-term relocation of railroad

SANDAG Del Mar Bluffs (DMB) Stabilization Projects

This ongoing [series of projects](#) led by SANDAG seeks to stabilize the bluffs and protect against erosion. DMB Phase 4 was completed in 2020, and this study was initiated as mitigation for the project. Additional emergency stabilization work is currently underway south of 4th Street. DMB Phase 5 has been permitted and is expected to begin construction in 2023, and includes a condition from CCC requiring construction of a north-south trail, a railroad crossing approved by the California Public Utilities Commission (CPUC), and a beach accessway with the consensus of the relevant stakeholder agencies.

SANDAG is planning to include additional bluff stabilization elements in DMB Phase 6 which is currently in the design stage. To minimize potential conflicts with all planned bluff projects, the concepts developed in this study primarily considered the expected ultimate condition that would result following completion of DMB Phase 6.

East of the railroad, the proposed DMB Phases 5-6 contain the following key elements:

- **Seagrove Park to 10th Street:** Drainage channel and intermittent walls

West of the railroad, the proposed DMB Phases 5-6 contain the following key elements:

- **Seagrove Park to 11th Street:** Soldier pile-anchored seawall below 1.5:1 graded slope
- **8th Street to 7th Street:** Soldier pile-anchored seawall; some portions of 1.5:1 graded slope
- **4th Street to ~900 feet North of North Torrey Pines Road:** Soldier pile-anchored seawall

NCTD Proposed Corridor Fencing

NCTD is proposing to install right-of-way fencing in this section of the corridor to reduce pedestrian trespassing and associated safety incidents. The current proposed plan, dated October 2021, is available [on NCTD's website](#). The project is currently on hold due to related litigation filed in state court and with the federal Surface Transportation Board.

Long-Term Relocation of Railroad

SANDAG is currently preparing the [San Diego Regional Rail Alignment Study](#), a feasibility study for the long-term relocation of the LOSSAN corridor away from the Del Mar Bluffs. The study is expected to be completed in 2022 and is currently studying the two potential alignments shown in Figure 2-10. Additional portal locations for the proposed alignments will be examined further during the environmental phase of the rail realignment project.

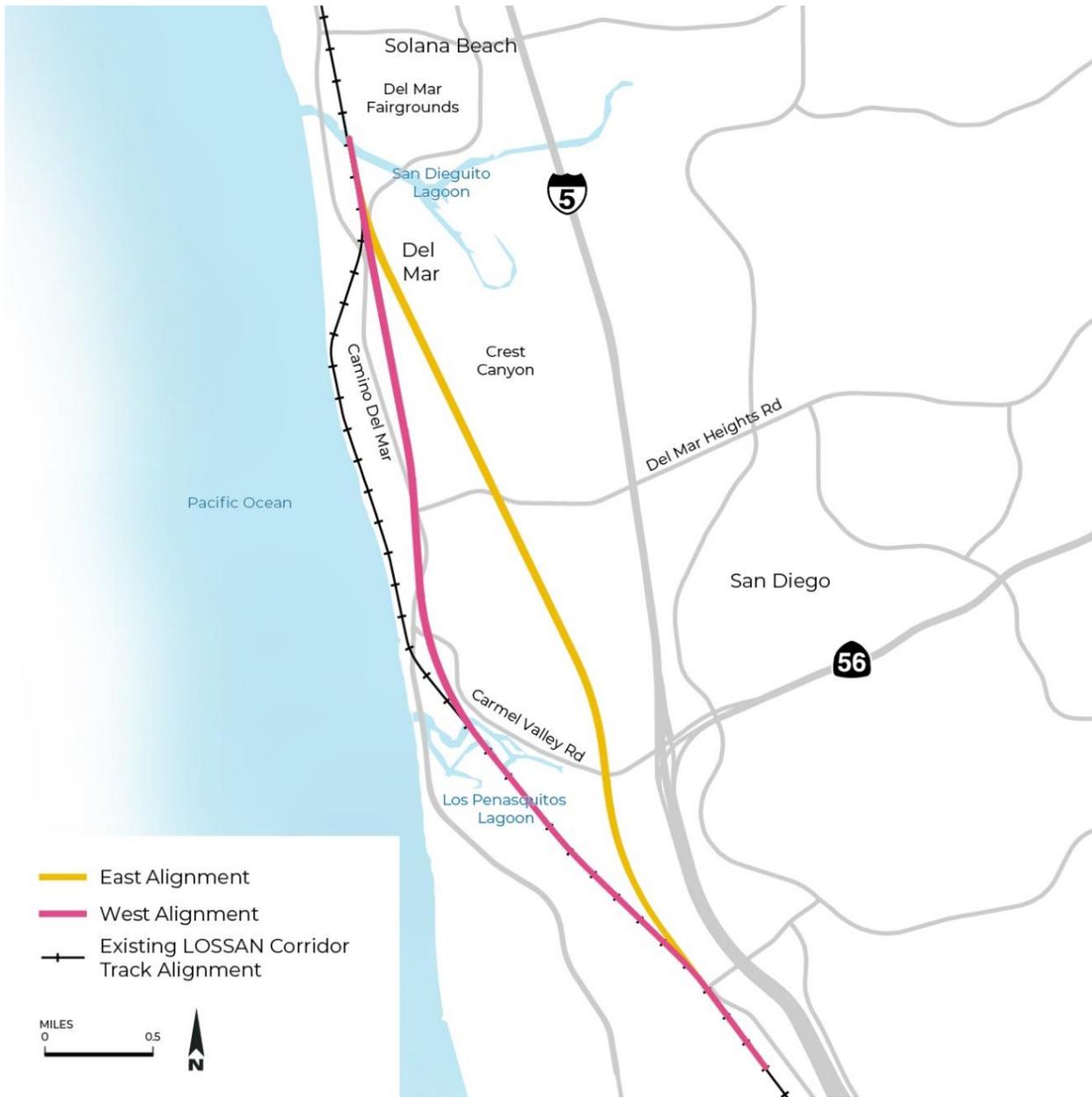
The rail realignment project is included in SANDAG's [Regional Plan](#) for implementation by 2035. In the state budget for Fiscal Year 2022-2023, the State of California approved \$300 million in new funding for the project. SANDAG expects to use the funding to complete preliminary planning and design work and then begin environmental review.

Once the railroad is relocated off the bluffs, stakeholder agencies will assess the study area's physical conditions and evaluate whether infrastructure on the bluffs may need to be removed to ensure public safety and return the bluffs to a more natural state.



The City of Del Mar's analyses of sea level rise, discussed below, recommends participation in regional efforts to relocate and remove railroad operations from the bluffs due to projected effects of sea level rise on the bluffs and existing railroad operations.

Figure 2-10: Alignment Alternatives, San Diego Regional Rail Alignment Study (SANDAG)





POLICIES & PRIOR RECOMMENDATIONS FOR PEDESTRIAN ACCESS & BLUFF PRESERVATION

The study area has been the subject of many prior plans, studies, and projects to improve pedestrian access and preserve the coastal bluffs.

City of Del Mar Community Plan (General Plan)

The City of Del Mar Community Plan, originally adopted in 1976, is the primary policy framework applicable to the study area. The document identifies the “south bluff” and adjacent beach as one of five major open space areas in Del Mar and includes a goal to preserve these features intact wherever possible. The plan also contains a policy to preserve open space areas that are too hazardous to justify permanent construction.

Balancing these goals, the Community Plan also recommends improving pedestrian access to coastal resources, including via new crossings at 11th Street and 4th Street:

Bluffs to Beach Access – It is recommended that rights-of-way be obtained and that steps and paved paths be developed down the bluffs to the beach near Seagrove Park, 11th Street, Fourth Street, and on both sides of the mouth of the San Dieguito River.

City of Del Mar Local Coastal Program (LCP)

As mapped in the preceding figures and the study’s [online basemap](#), most of the coastal bluffs are in parcels owned by the City of Del Mar. These areas are covered by Del Mar’s Local Coastal Program (LCP) which has been certified by CCC. The LCP contains policies to preserve and enhance natural resources while also prioritizing increased pedestrian access. Key policies include guidance to:

- Protect and preserve open space areas.
- Conserve the natural character of land, water, vegetative, and wildlife resources by ensuring future development minimizes the disturbance of existing or natural terrain and vegetation.
- Preserve fragile coastal bluffs as a visual resource and avoid risks to life and property associated with bluff failure and shoreline erosion.

Notably, the LCP generally prohibits grading, construction, and shoreline protection activities along coastal bluffs. The shoreline protection currently being constructed along the south bluff was permitted by CCC through a separate federal consistency certification process focused on protecting existing railroad operations along the bluffs. This is discussed further in Section 5.

Sea Level Rise Adaptation Planning

The City of Del Mar’s Sea Level Rise Adaptation Plan (2018) identifies a range of adaptation options to help property owners, including the City, to plan to minimize coastal bluff erosion and associated risks to people, property, and coastal resources. The City’s Coastal Hazards, Vulnerability and Risk Assessment (2016) and Addendum (2018) identified that the south bluff—including existing railroad operations on the bluff—is vulnerable to the effects of projected sea level rise.

The Railroad Advisory Committee (TRAC) Study

This 1995 study recommended rail corridor crossings at the following locations in the study area, based on a review of multiple criteria including potential environmental impacts, connectivity benefits, historic usage, and the favorability of existing grades:



- 11th Street
- 8th Street (added by City Council)
- Torrey Pines State Beach

11th Street

City staff noted the existence, in the late 1800s or early 1900s, of a rugged trail to the beach near 11th Street that was navigable by horse-drawn buggy.

10th Street

As shown in Figure 2-12 and Figure 2-13 from the San Diego Historical Society, a variety of pedestrian infrastructure has been constructed along the coastal bluffs for over a century, including a wooden trestle overcrossing at 10th Street. Remnants of the trestle crossing are still visible today at the end of 10th Street (Figure 2-13).

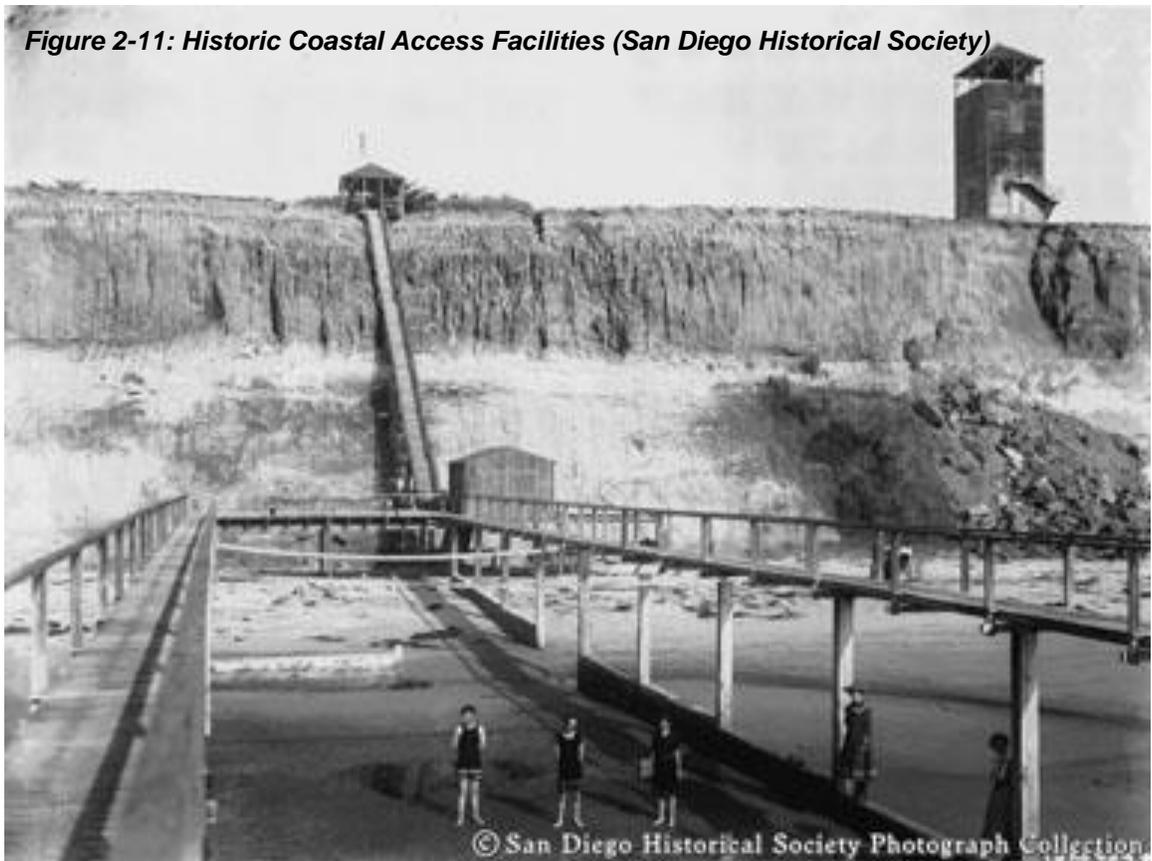


Figure 2-12: 10th Street Crossing (San Diego Historical Society)



Figure 2-13: Existing Remnants of 10th Street Crossing





3. IDENTIFICATION & SCREENING OF POTENTIAL CONCEPTS

Following the review of existing conditions, the project team worked with stakeholder agencies to identify and screen potential pedestrian improvements.

CANDIDATE CONCEPTS

The project team conducted extensive literature reviews and outreach to stakeholder agencies to identify a wide range of potential improvements in the study area. The proposed improvements fit into three broad categories: north-south trails, railroad crossings, and the Torrey Pines area.

North-South Trails

An important initial finding was that pedestrian movement in the study area includes not only east-west beach access, but also substantial north-south travel—in which pedestrians use the railroad corridor and adjacent bluffs as north-south accessways parallel to the beach. This finding led the project team to identify and screen potential concepts for north-south trails on both sides of the railroad.

Railroad Crossings

The project team assessed the feasibility of potential east-west railroad crossings at all street ends and alleys in the study area, as well as parts of the southern study area including Anderson Canyon and the vicinity of Torrey Pines State Beach. All potential crossings would include connections from the adjacent street end/alley to the beach.

The assessment of railroad crossings examined potential at-grade crossings, undercrossings, and overcrossings, with key findings summarized below.

- **At-Grade Crossings:** The CPUC generally prohibits new at-grade railroad crossings per [General Order 75-D](#). However, in several meetings with the project team, CPUC staff indicated that new at-grade crossings could receive discretionary approvals from CPUC on a case-by-case basis, as described in Section 5.
- **Undercrossings:** The project team found undercrossings may be feasible from an engineering perspective with prefabricated, rectangular concrete box culverts positioned just below the railroad ballast and bedding, similar to nearby crossings at Oceanside Harbor and San Elijo Lagoon. These generally would be supported by the competent Bay Point Formation atop a bed of leveling gravel, using construction methods summarized in Section 5. This process also would pose greater impacts to the bluffs than other types of railroad crossings, potentially creating conflicts with the City of Del Mar Community Plan, described further in Section 2.
- **Overcrossings:** While the project team found overcrossings may be feasible from an engineering perspective, they would pose substantial visual impacts, with railroad regulations requiring at least 26 feet of vertical clearance. The structural foundations would require heavily reinforced drilled concrete shafts. To minimize the structure height and associated visual impacts, ideal locations for overcrossings would be near 6th and 7th Streets, where the railroad is approximately 25-30 feet below the eastern bluffs.



Torrey Pines Area

To ensure a thorough understanding of pedestrian needs south of Del Mar, the project team conducted additional focused meetings with stakeholders representing the southern study area near Torrey Pines State Beach. These meetings included staff from the City of San Diego, California State Parks, and the Los Peñasquitos Lagoon Foundation. Appendix C contains a summary of potential projects in Torrey Pines area.

EVALUATION CRITERIA

Table 3-1 describes the evaluation criteria used in the screening of candidate concepts.

Table 3-1: Evaluation Criteria for Initial Screening

Criterion	Description
Engineering Feasibility, Bluffs & Right-of-Way (West Side)	West of the railroad, preliminary assessment of engineering feasibility; bluff conditions including erosion and sea level rise; potential development impacts from grading, walls, hardscape, and other project features; and the ability of the project footprint to remain within the public right-of-way.
Engineering Feasibility, Bluffs & Right-of-Way (East Side)	East of the railroad, preliminary assessment of engineering feasibility; bluff conditions; potential development impacts from grading, walls, hardscape, and other project features; and the ability of the project footprint to remain within the public right-of-way.
Pedestrian Connectivity & Coastal Access	The degree to which each concept would create connectivity benefits by creating new links and nodes in the pedestrian network, including neighborhood connectivity as well as coastal access.
Consistency with Existing Movement Patterns	Concepts should reflect and enhance existing movement patterns to the greatest degree possible within feasibility constraints, as these existing patterns generally reflect the most desired and direct paths of travel.
Consistency with Prior Facilities, Studies & Recommendations	Concepts should be informed by the prior facilities, studies, and recommendations for pedestrian access that have been developed in the past (see Section 2).
Parking Impacts	All concepts may draw additional visitors, particularly railroad crossings providing accessible routes to the beach. The study area contains on-street and off-street parking areas (see Section 2) which are closer to some concepts than others.
Regulatory Feasibility	All concepts will require consultation and/or approval from a wide range of regulatory and stakeholder agencies including the City of Del Mar, NCTD, SANDAG, CCC, and CPUC.
Visual Impacts	Potential visual impacts include pedestrian paths and associated structures, walls, grading, stairways, ramps, handrails, and shoreline protection. At-grade crossings also include fencing, gates, lights, and signal houses.



Criterion	Description
Noise Impacts	Short-term impacts during construction of all concepts; long-term noise impacts from at-grade crossings, which require audible warning systems at the crossing and are likely to require the routine sounding of train horns (see Section 5); and noise impacts associated with public use of the new accessways
Planning-Level Cost	Preliminary, rough-order-of-magnitude cost estimates for each concept in accordance with SANDAG format and assumptions for recent capital projects. (See Appendix D.)

INITIAL SCREENING & SELECTION OF CONCEPTS

The project team screened a wide range of potential concepts across the evaluation criteria described above to determine which concepts to advance to conceptual design. The results of the screening are summarized below. Appendix C contains the full screening matrix.

Advanced to Conceptual Design

In collaboration with stakeholder agencies, the project team selected seven candidate concepts to advance to conceptual design. These seven design concepts are further described and evaluated in Section 4:

- **Concept 1:** North-South Trail (East Side)
- **Concept 2:** At-Grade Crossing at 11th Street, Ramps & Stairs to Beach
- **Concept 3:** At-Grade Crossing at 11th Street, Stairs to Beach
- **Concept 4:** At-Grade Crossing at 7th-8th Streets, Ramps to Beach
- **Concept 5:** At-Grade Crossing at 7th-8th Streets, Stairs to Beach
- **Concept 6:** Undercrossing at 7th-8th Streets, Ramps to Beach
- **Concept 7:** Undercrossing at 7th-8th Streets, Stairs to Beach

Not Advanced to Conceptual Design

The initial screening found that the types of potential improvements listed below, while providing benefits, fulfilled fewer evaluation criteria than the seven concepts selected for advancement. Appendix C contains the full screening matrix and other information on these candidate concepts that were not advanced to conceptual design:

- **North-South Trail (West Side):** The varying widths and ongoing erosion of the western bluffs prohibit a continuous north-south trail, including some unstable sections that could pose safety concerns.
- **Railroad Overcrossings:** Any overcrossing concept would pose substantial visual impacts, with a required vertical clearance of 27 feet above the railroad, plus another 6-10 feet to the top of the crossing structure. West of the railroad, pedestrians would need to descend approximately 27 feet from the crossing to reach the bluff top, before descending another 60-65 feet to the beach—a total elevation change of approximately 90 feet that would require substantial switchback-style ramps and/or stairs to traverse. Given these impacts, the project team and stakeholder agencies agreed not to advance overcrossing concepts to conceptual design.



- **Railroad Crossings Connecting to Alleys:** Alleys are narrower than street ends and generally intended only to serve adjacent residential properties. As such, the project team determined street ends are the preferred connection points for any new railroad crossings.
- **Torrey Pines Area:** While stakeholder agencies suggested many beneficial concepts near Torrey Pines (summarized in Appendix C), there was broad agreement among stakeholder agencies that the selected concepts should focus on addressing the more critical mobility and safety issues in the northern study area along the Del Mar bluffs.



4. DESIGN CONCEPTS

This section describes the development and evaluation of the selected design concepts. It includes a summary of each concept with preliminary plans, cross-sections, cost estimates, and sample 3D renderings.

The design concepts are:

- **Concept 1:** North-South Trail
- **Concept 2:** At-Grade Crossing at 11th Street, Ramps & Stairs to Beach
- **Concept 3:** At-Grade Crossing at 11th Street, Stairs to Beach
- **Concept 4:** At-Grade Crossing at 7th-8th Streets, Ramps to Beach
- **Concept 5:** At-Grade Crossing at 7th-8th Streets, Stairs to Beach
- **Concept 6:** Undercrossing at 7th-8th Streets, Ramps to Beach
- **Concept 7:** Undercrossing at 7th-8th Streets, Stairs to Beach

DEVELOPMENT OF SELECTED DESIGN CONCEPTS

Upon selection of the seven concepts to advance, the development process began with initial conceptual engineering and planning activities to determine each concept's potential footprint and geometric requirements. This was an iterative process, supported by workshop-style design meetings with stakeholder agencies and multiple iterations of each concept. The results of this conceptual process are the preliminary plans and cross-sections shown in the following pages.

Upon completion of the initial plans, the project team developed rough-order-of-magnitude cost estimates for each design concept. These estimates, summarized in the following pages and detailed in Appendix D, use SANDAG's standard template and assumptions from similar capital projects.

The final step in the concept development process was development of sample 3D renderings that show what each design concept could look like if constructed. These 3D renderings focus on the western bluffs and were built from SANDAG's existing 3D model created for the Del Mar Bluffs Stabilization project.

EVALUATION OF DESIGN CONCEPTS

Following the development of each design concept, the project team evaluated the concepts to understand their relative benefits and costs.

Universal Benefits Shared by Selected Design Concepts

The seven design concepts that were advanced to conceptual design have the following common project features—which were evaluated as screening criteria during the initial selection of concepts described in Section 3—that will deliver benefits and improvements to existing conditions:

- **Pedestrian Connectivity & Coastal Access:** All concepts would improve pedestrian connectivity and access to coastal resources compared to existing conditions. As discussed in Section 5, CCC determined that the proposed improvements also would serve as mitigation for the expected impacts of the SANDAG Del Mar Bluffs Stabilization projects.
- **Consistency with Existing Movement Patterns:** All concepts are consistent with existing pedestrian movement patterns, including historic patterns of north-south travel parallel to the



railroad as well as common east-west beach access via unimproved trails near 11th, 8th, and 7th Streets described in Section 2.

- **Consistency with Prior Facilities, Studies & Recommendations:** All concepts are broadly consistent with the prior facilities, studies, and recommendations described in Section 2, including historic crossings, the 1995 TRAC study, and 2022 CCC approvals.
- **Safety:** All concepts would improve safety over existing conditions via the addition of legal crossings, accessways, and channelization fencing. All concepts will be designed to meet applicable safety standards, with the specific details to be determined in future phases by many regulatory and stakeholder agencies, as detailed in the implementation discussion in Section 5.

The project team’s evaluation of these additional criteria found no meaningful difference among the seven design concepts:

- **Beach/Sand/Tide Conditions:** All railroad crossing concepts would be bound on the west side by previously approved seawalls and would provide beach access through planned gaps in those seawalls, posing little or no new impacts to beach areas. To the extent that any crossing concepts would pose impacts, the expected impacts would be substantially similar across all crossing concepts. The north-south trail is east of the railroad and would have no impact to beach conditions.
- **Railroad Operations:** No long-term impacts to railroad operations are expected from any proposed concepts. For at-grade crossings, trains would have precedence and trigger the activation of pedestrian gates and warning systems when approaching.

Final Evaluation Criteria

Table 4-1 on the following page is an evaluation matrix that summarizes the project team’s evaluation of all seven design concepts. These final evaluation criteria, which were originally introduced in Section 3 during the initial screening process, capture the meaningful differences, benefits, and tradeoffs of the design concepts relative to each other:

- Development impacts: Western bluffs
- Development impacts: Railroad & east side
- Regulatory feasibility: Consistency with coastal & local policies
- Regulatory feasibility: CPUC requirements
- Regulatory feasibility: Accessibility design
- Parking impacts
- Visual impacts
- Noise impacts
- Planning-level cost



EVALUATION OF DESIGN CONCEPTS

Table 4-1: Evaluation of Design Concepts

Criterion	1: North-South Trail	2: At-Grade Crossing at 11 th St, Ramps & Stairs	3: At-Grade Crossing at 11 th St, Stairs	4: At-Grade Crossing at 7 th -8 th St, Ramps	5: At-Grade Crossing at 7 th -8 th St, Stairs	6: Undercrossing at 7 th -8 th St, Ramps	7: Undercrossing at 7 th -8 th St, Stairs
Development Impacts: Western Bluffs	N/A	Ramps & stairs more impactful together vs. either facility alone.	Stairs minimize impacts vs. ramps.	Ramps impactful vs. stairs.	Stairs minimize impacts vs. ramps.	Major excavation but shortens beach access trail vs. at-grade. Ramps impactful vs. stairs.	Major excavation but shortens beach access trail vs. at-grade. Stairs minimize impacts vs. ramps.
Development Impacts: Railroad & East Side	Minor impacts south of 8 th St. More grading & walls north of 8 th St.	At-grade minimizes impacts. Short, direct connection to 11 th St.	At-grade minimizes impacts. Short, direct connection to 11 th St.	At-grade minimizes impacts. Some impacts to connect to 7 th -8 th St.	At-grade minimizes impacts. Some impacts to connect to 7 th -8 th St.	Undercrossing & eastern access ramps pose largest impacts.	Undercrossing & eastern access ramps pose largest impacts.
Regulatory Feasibility: Consistency with Coastal & Local Policies	Improves community connectivity. Some impacts to eastern bluffs. No impacts to western bluffs.	Improves coastal access. At-grade crossing minimizes development. Western ramps & stairs impactful.	Improves coastal access. At-grade crossing & western stairs minimize development.	Improves coastal access. At-grade crossing minimizes development. Western ramps impactful.	Improves coastal access. At-grade crossing & western stairs minimize development.	Improves coastal access. Substantial development vs. at-grade crossing.	Improves coastal access. Substantial development vs. at-grade. Western stairs minimize impact vs. ramps.
Regulatory Feasibility: CPUC Requirements	CPUC coordination required.	CPUC must approve new at-grade crossings.	CPUC must approve new at-grade crossings.	CPUC must approve new at-grade crossings.	CPUC must approve new at-grade crossings.	CPUC coordination required.	CPUC coordination required.
Regulatory Feasibility: Accessibility Design	Meets ADA/CBC standards.	Meets ADA/CBC standards.	Meets ADA/CBC standards from street end to western bluff top.	Meets ADA/CBC standards.	Meets ADA/CBC standards from street end to western bluff top.	Meets ADA/CBC standards.	Meets ADA/CBC standards from street end to western bluff top.
Parking Impacts	Accessible path would attract automobile trips, with impacts spread across entire alignment.	Accessible ramps to beach may attract more automobile trips than concepts with stairs only.	Stairs to beach may attract fewer automobile trips than accessible ramps.	Accessible ramps to beach may attract more automobile trips than concepts with stairs only.	Stairs to beach may attract fewer automobile trips than accessible ramps.	Accessible ramps to beach may attract more automobile trips than concepts with stairs only.	Stairs to beach may attract fewer automobile trips than accessible ramps.
Visual Impacts	Low impacts south of 8 th St. Some impacts from grading & walls north of 8 th St.	Short connection to 11 th St minimizes eastern impacts. Ramps & stairs impact western bluffs.	Short connection to 11 th St minimizes eastern impacts. Stairs minimize impact to western bluffs.	Connections to 7 th -8 th St create eastern impacts. Ramps impact western bluffs vs. stairs.	Connections to 7 th -8 th St create eastern impacts. Stairs minimize impact to western bluffs.	Undercrossing ramps impact east side. Beach access ramps impact western bluffs, but shorter than at-grade.	Undercrossing ramps impact east side. Stairs minimize impact to western bluffs vs. ramps & shorter than at-grade.
Noise Impacts	Does not require audible warning systems or train horns.	At-grade crossings require audible warning systems and/or train horns.	At-grade crossings require audible warning systems and/or train horns.	At-grade crossings require audible warning systems and/or train horns.	At-grade crossings require audible warning systems and/or train horns.	Grade-separated crossings do not require audible warning systems or train horns.	Grade-separated crossings do not require audible warning systems or train horns.
Planning-Level Cost (See Section 4 & Appendix D)	\$9.6 million	\$10.2 million	\$5.7 million	\$9.2 million	\$5.7 million	\$12.8 million	\$7.0 million

CONCEPT 1: NORTH-SOUTH TRAIL

This 0.8-mile trail along the east side of the railroad provides an accessible route from Seagrove Park to 4th Street. Notable concept features include:

- **Accessible Paths:** All paths are designed to be six feet wide, feature ADA-compliant grades, and can utilize a special form of stabilized decomposed granite for an accessible surface. Some areas, especially north 8th Street, may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **Accessible Connections to All Street Ends:** Accessible connections to Seagrove Park and all numbered streets from 13th Street to 4th Street. These also may include optional connections to the railroad crossings proposed in Concepts 2-7, if implemented together.
- **8th Street Drainage Culvert with Fill:** As shown in the sample rendering in Figure 4-1, a relatively low-impact way to traverse the drainage infrastructure just north of 8th Street is to place the trail atop parts of the drainage culvert, supported by a wall that is partially covered by fill and landscaping.
- **9th Street Plaza:** This optional feature, shown in the sample rendering in Figure 4-2, could be added to street ends such as 9th Street to provide an additional amenity for public views.

Figure 4-3 through Figure 4-8 on the following pages are the full conceptual plans. Table 4-2 summarizes the cost estimate for the full trail, and Table 4-3 breaks the estimate into three segments to account for potential phased implementation. The full planning-level cost estimates are in Appendix D.

Figure 4-1: Sample Rendering, 8th Street Drainage Culvert with Fill, Concept 1



Table 4-2: Planning-Level Cost Estimate, Concept 1 Full (Full Estimate in Appendix D)

Cost Category	Full Trail: Seagrove Park to 4 th Street
Construction Contract Estimate	\$5.1 million
Design, Environmental & Support Costs	\$3.7 million
Total Project Cost Estimate (2022 Dollars)	\$8.8 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.8 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$9.6 million

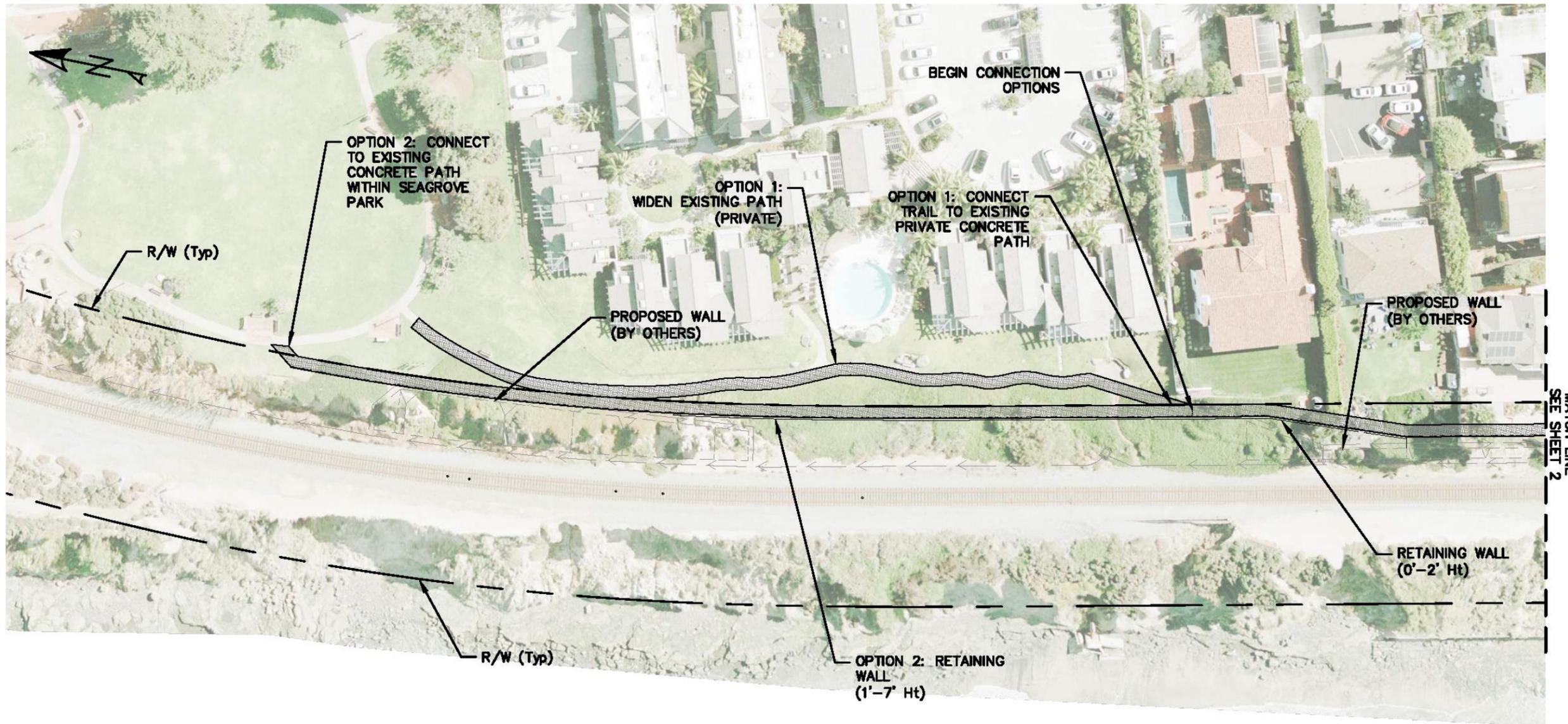
Table 4-3: Planning-Level Cost Estimate, Concept 1 by Segment (Full Estimate in Appendix D)

Cost Category	Segment A: Seagrove Park to 11 th Street	Segment B: 11 th Street to 8 th Street	Segment C: 8 th Street to 4 th Street
Construction Contract Estimate	\$2.3 million	\$2.0 million	\$1.6 million
Design, Environmental & Support Costs	\$1.7 million	\$1.5 million	\$1.2 million
Total Project Cost Estimate (2022 Dollars)	\$4.0 million	\$3.5 million	\$2.8 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.4 million	\$0.3 million	\$0.3 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$4.4 million	\$3.9 million	\$3.1 million

Figure 4-2: Sample Rendering, 9th Street Plaza, Concept 1



Figure 4-3

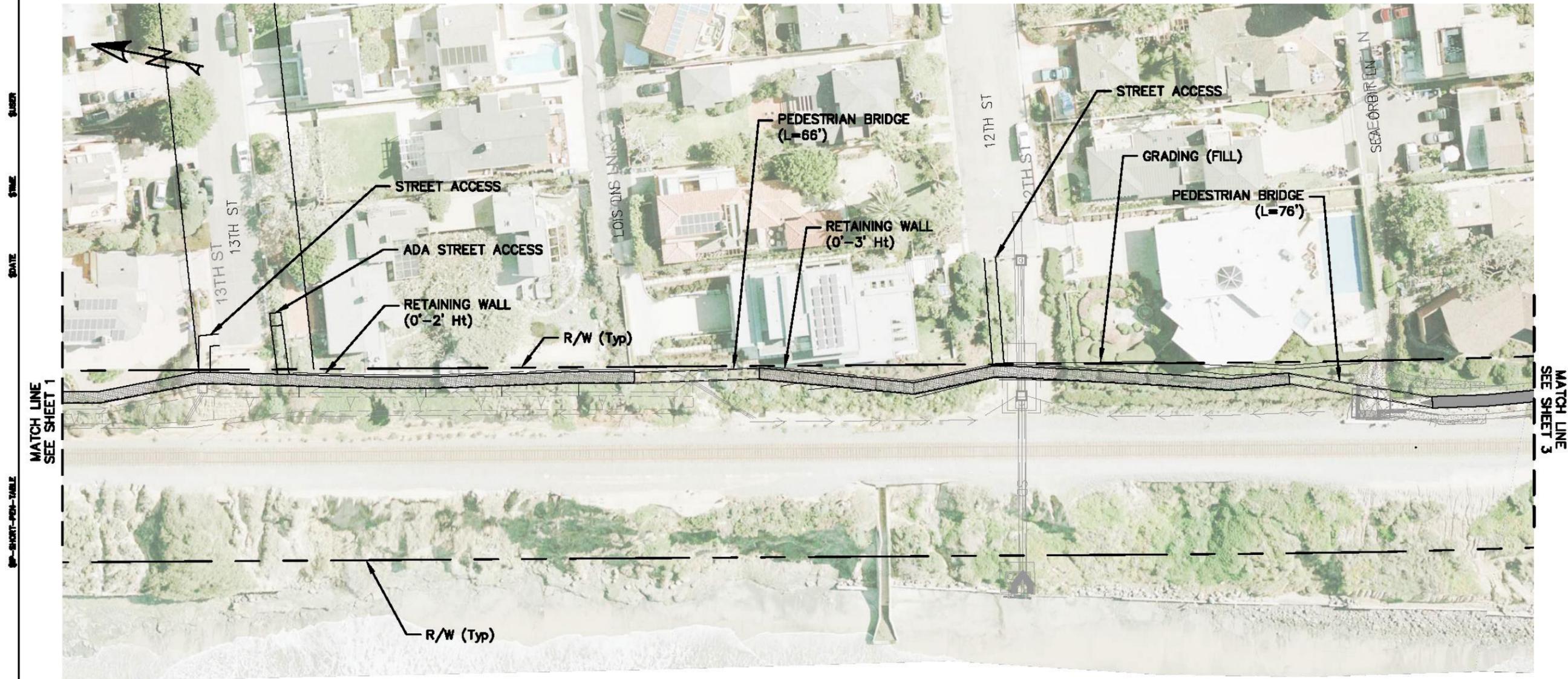


NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

 WSP USA Inc. 401 B STREET, SUITE 1000 SAN DIEGO, CA 92101 TEL: +1 619.338.0370 FAX: +1 619.338.0123	DESIGNED BY	DATE	 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	DEL MAR COASTAL CONNECTION EXHIBIT		SCALE
	DRAWN BY			N-S TRAIL SHEET 1 OF 6		1" = 50'
	CHECKED BY			SANDAG CONTRACT NO.		DRAWING NO.
	SANDAG					SHEET NO.

Figure 4-4

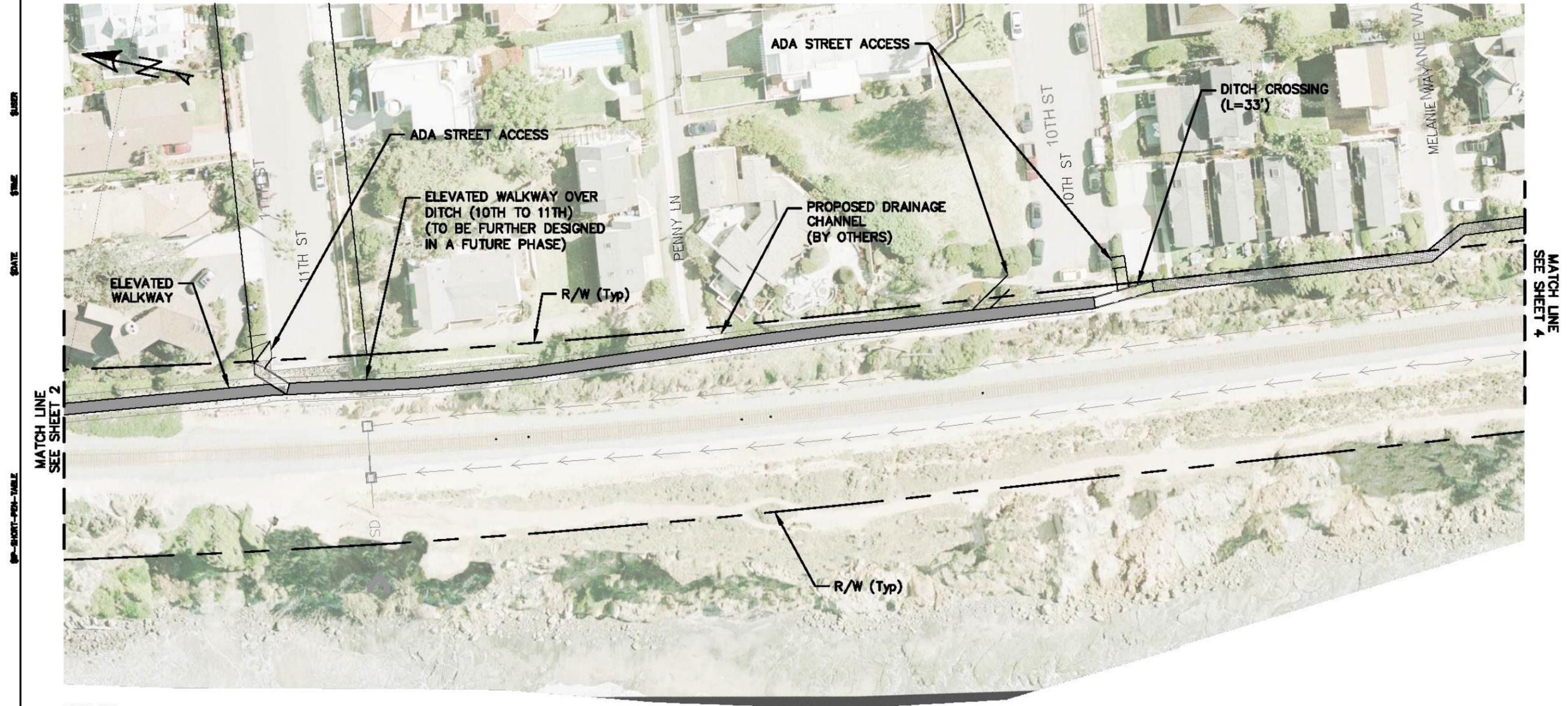


NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

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	CHECKED BY				DRAWING NO.	SHEET NO.
	SANDAG					

Figure 4-5

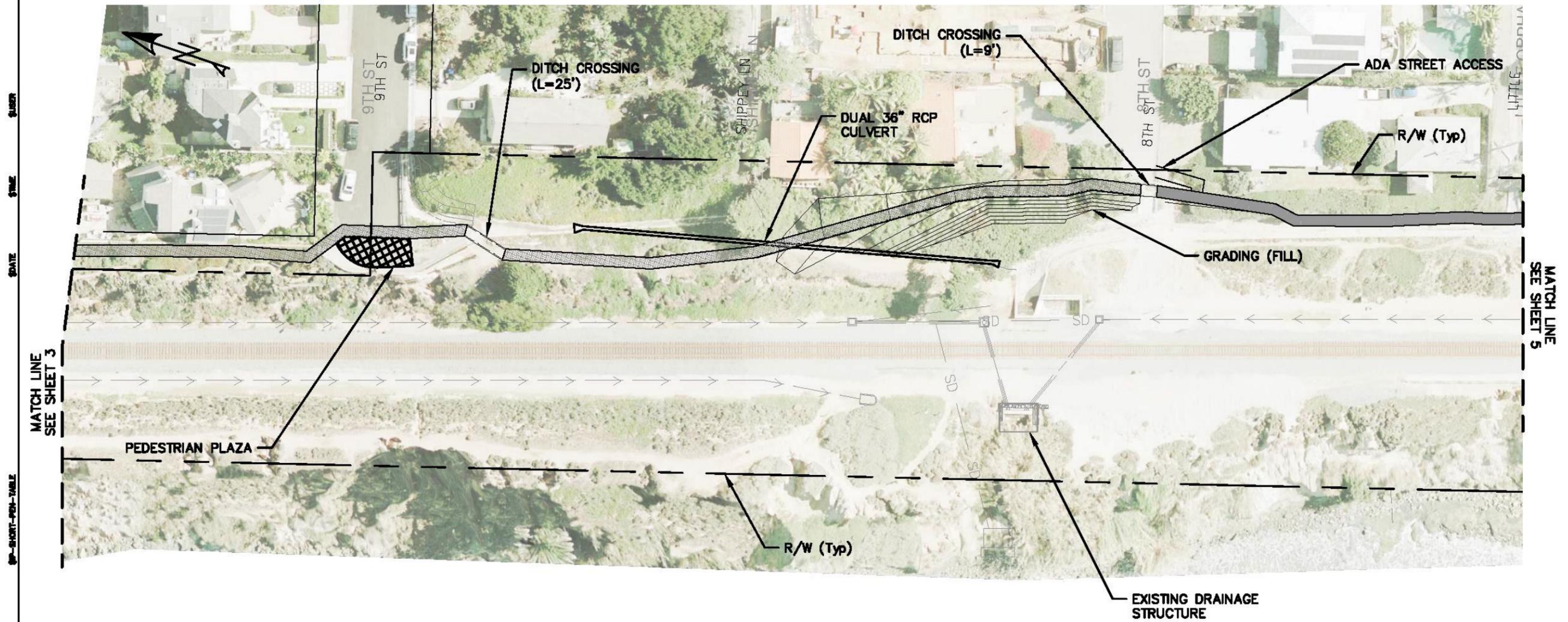


NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

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	CHECKED BY				DRAWING NO.	SHEET NO.
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Figure 4-6

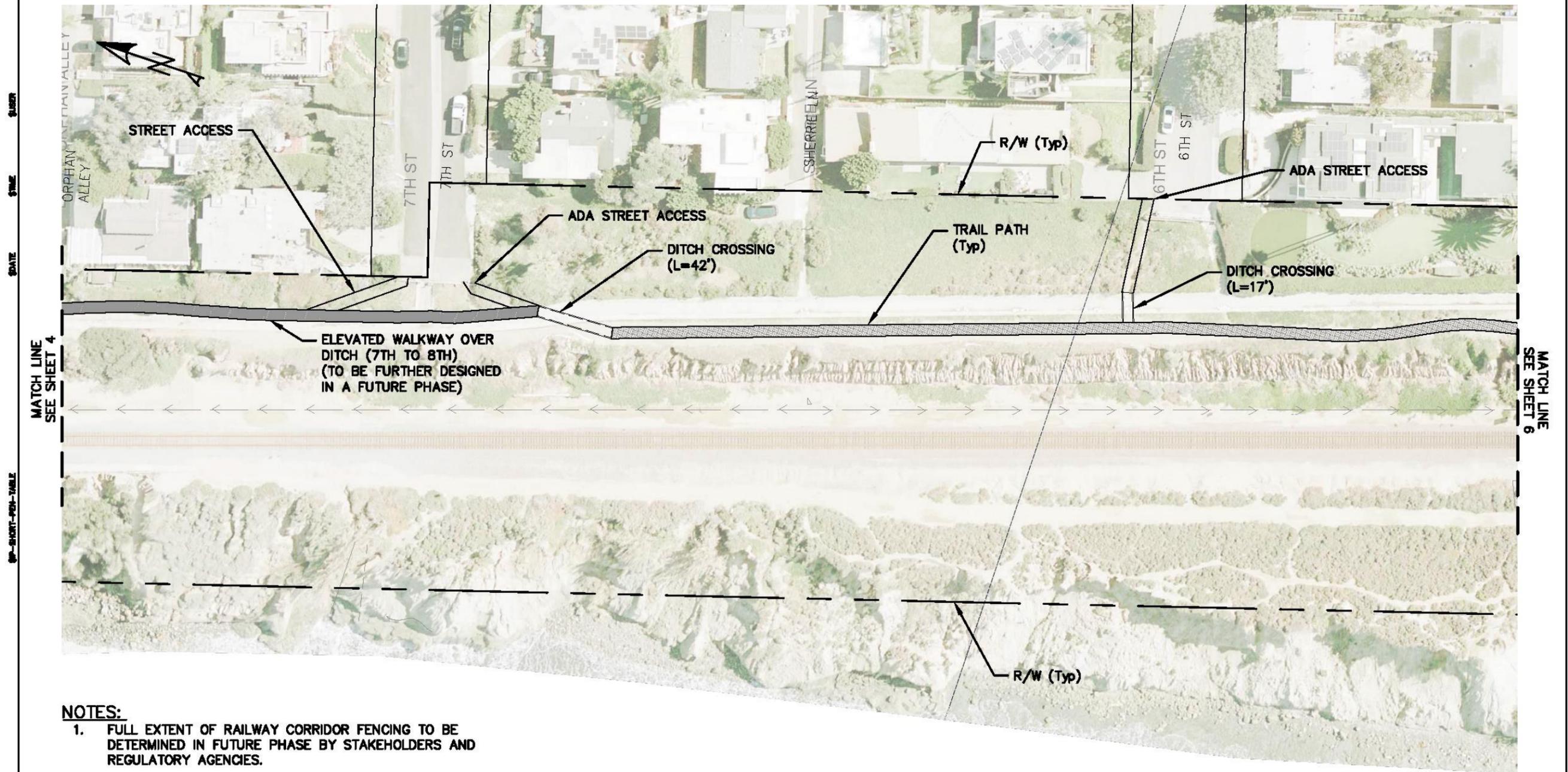


NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

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	CHECKED BY				DRAWING NO.	SHEET NO.	
	SANDAG						

Figure 4-7



NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

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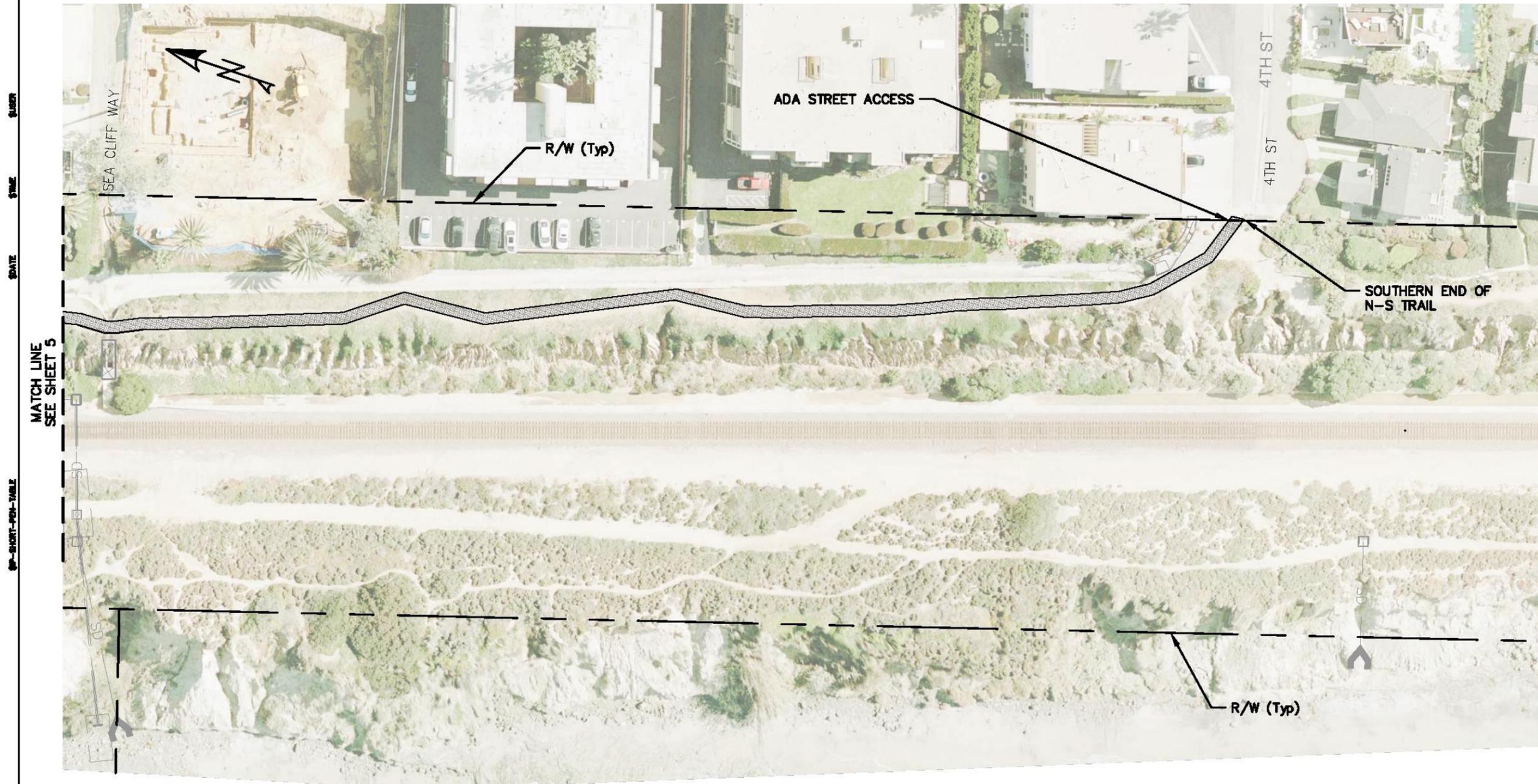
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DEL MAR COASTAL CONNECTION EXHIBIT	
N-S TRAIL SHEET 5 OF 6	

SCALE	1" = 50'
SANDAG CONTRACT NO.	
DRAWING NO.	SHEET NO.

Figure 4-8



NOTES:

1. FULL EXTENT OF RAILWAY CORRIDOR FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
2. IMPROVEMENTS FOR DRAINAGE AND FOR ELEVATED WALKWAY OVER DRAINAGE CHANNEL TO BE ANALYZED, DESIGNED AND DETAILS DETERMINED IN A FUTURE PHASE.
3. RETAINING WALL TYPES TO BE DETERMINED IN A FUTURE PHASE.

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SCALE	1" = 50'
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DRAWING NO.	SHEET NO.

CONCEPT 2: AT-GRADE CROSSING AT 11TH STREET, RAMPS & STAIRS TO BEACH

This at-grade railroad crossing takes advantage of existing east-west movement patterns and a large area of artificial fill on the western bluffs north of 11th Street. Notable features include:

- **Natural Stairs:** Designed to match the existing informal paths along the bluffs, natural stairs are graded into the terrain using timber or stone, as pictured in the sample photos in Figure 4-11. Steeper portions may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **Accessible Paths & Ramps:** All paths except natural stairs, including the ramps on the western bluffs, feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface.
- **View Overlook:** On the western bluff top, a view overlook is a new amenity that would be accessible from 11th Street and optionally Concept 1, North-South Trail.
- **At-Grade Railroad Crossing:** Located near the end of 11th Street and includes:
 - **Gates, Lights & Bells:** Standard safety features per CPUC requirements.
 - **Safety Fencing:** Full extent to be determined in collaboration with CPUC, CCC, NCTD, and City of Del Mar.
 - **Signal House:** Requires NCTD access and parking from the end of 11th Street.
- **Connection to 11th Street:** Accessible path from 11th Street connects to the existing network. This also features an optional connection to Concept 1, North-South Trail.

Figure 4-9 is a sample rendering, Figure 4-10 shows a typical cross-section looking north, and Figure 4-12 on the following page is the full conceptual plan. Table 4-4 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

Table 4-4: Planning-Level Cost Estimate, Concept 2 (Full Estimate in Appendix D)

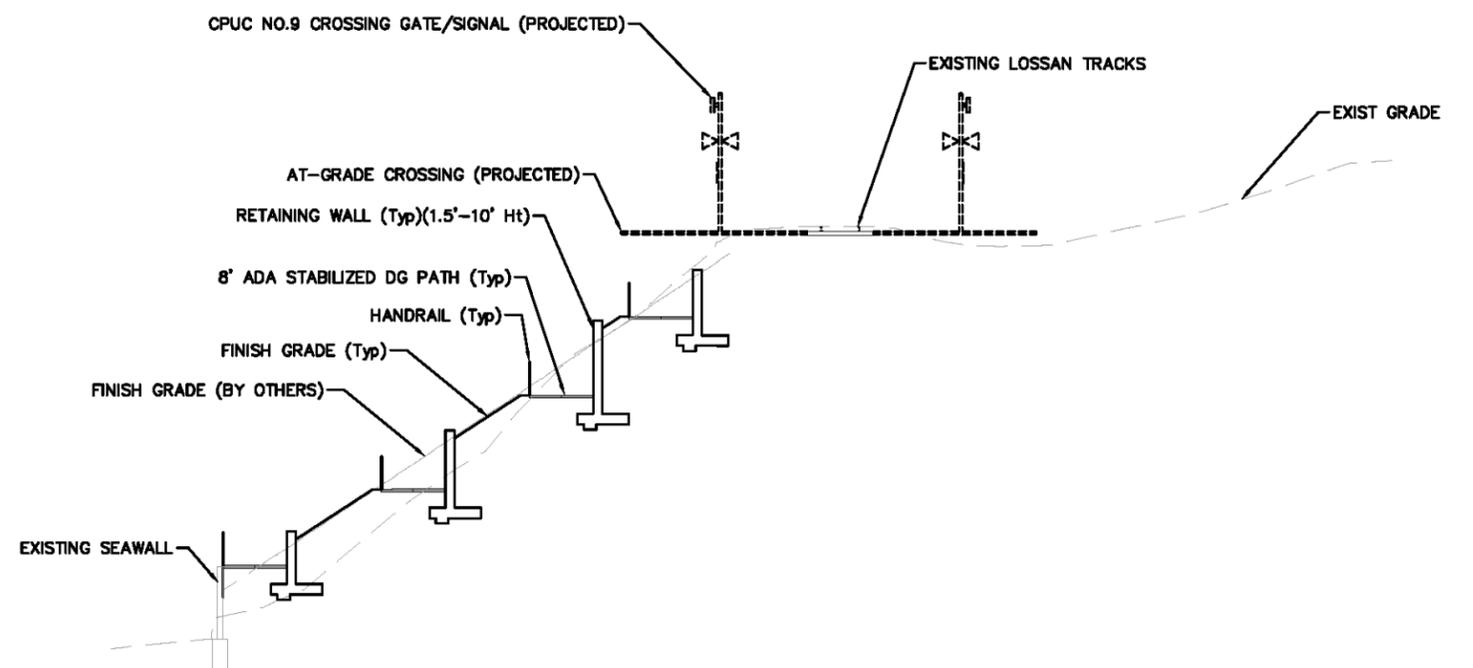
Category	Estimated Cost
Construction Contract Estimate	\$5.4 million
Design, Environmental & Support Costs	\$3.9 million
Total Project Cost Estimate (2022 Dollars)	\$9.3 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.9 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$10.2 million

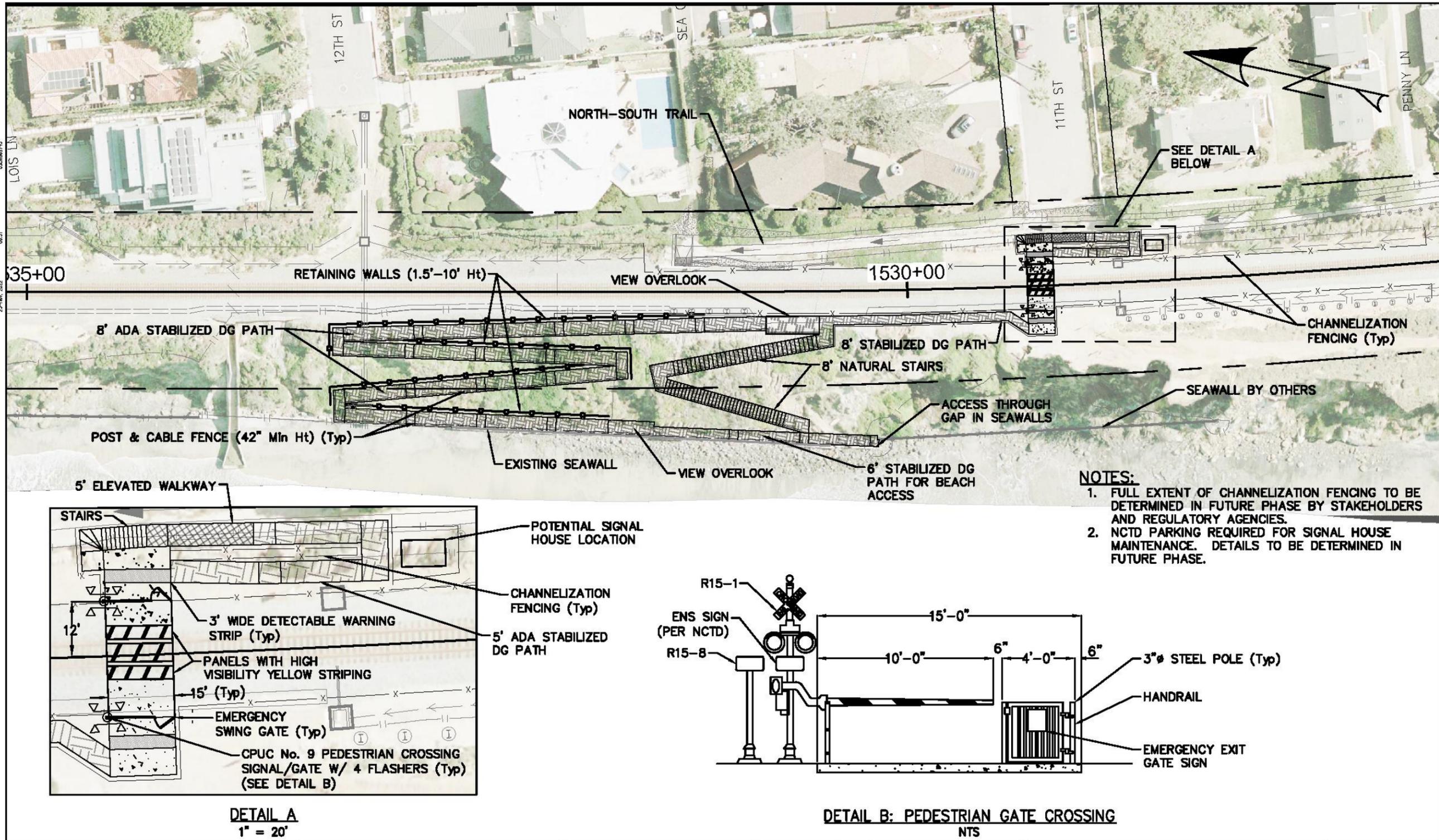
Figure 4-11: Sample Photos of Natural Stairs



Figure 4-9: Sample Rendering, Concept 2

Figure 4-10: Typical Cross-Section Looking North, Concept 2





- NOTES:**
1. FULL EXTENT OF CHANNELIZATION FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
 2. NCTD PARKING REQUIRED FOR SIGNAL HOUSE MAINTENANCE. DETAILS TO BE DETERMINED IN FUTURE PHASE.

Figure 4-12

 401 B STREET, SUITE 1650 SAN DIEGO, CA 92101 RELATIVE BORDER SCALE IS IN INCHES	 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	DESIGNED BY	DATE	DEL MAR COASTAL CONNECTION EXHIBIT CONCEPT 2: AT-GRADE CROSSING 11TH ST RAMPS & STAIRS TO BEACH	SCALE
		DRAWN BY			
		CHECKED BY			SANDAG CONTRACT NO.
		SANDAG			DRAWING NO. SHEET NO.
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CONCEPT 3: AT-GRADE CROSSING AT 11TH STREET, STAIRS TO BEACH

This at-grade railroad crossing takes advantage of existing east-west movement patterns and a large area of artificial fill on the western bluffs north of 11th Street. Notable features include:

- **Natural Stairs:** Designed to match the existing informal paths along the bluffs, natural stairs are graded into the terrain using timber or stone, as pictured in the sample photos in Figure 4-15. Steeper portions may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **Accessible Paths:** All paths except the natural stairs feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface.
- **View Overlook:** On the western bluff top, a view overlook is a new amenity that would be accessible from 11th Street and optionally Concept 1, North-South Trail.
- **At-Grade Railroad Crossing:** Located near the end of 11th Street and includes:
 - **Gates, Lights & Bells:** Standard safety features per CPUC requirements.
 - **Safety Fencing:** Full extent to be determined in collaboration with CPUC, CCC, NCTD, and City of Del Mar.
 - **Signal House:** Requires NCTD access and parking from the end of 11th Street.
- **Connection to 11th Street:** Accessible path from 11th Street connects to the existing network. This also features an optional connection to Concept 1, North-South Trail.

Figure 4-13 is a sample rendering, Figure 4-14 shows a typical cross-section looking north, and Figure 4-16 on the following page is the full conceptual plan. Table 4-5 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

Table 4-5: Planning-Level Cost Estimate, Concept 3 (Full Estimate in Appendix D)

Category	Estimated Cost
Construction Contract Estimate	\$3.0 million
Design, Environmental & Support Costs	\$2.2 million
Total Project Cost Estimate (2022 Dollars)	\$5.2 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.5 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$5.7 million

Figure 4-15: Sample Photos of Natural Stairs



Figure 4-13: Sample Rendering, Concept 3

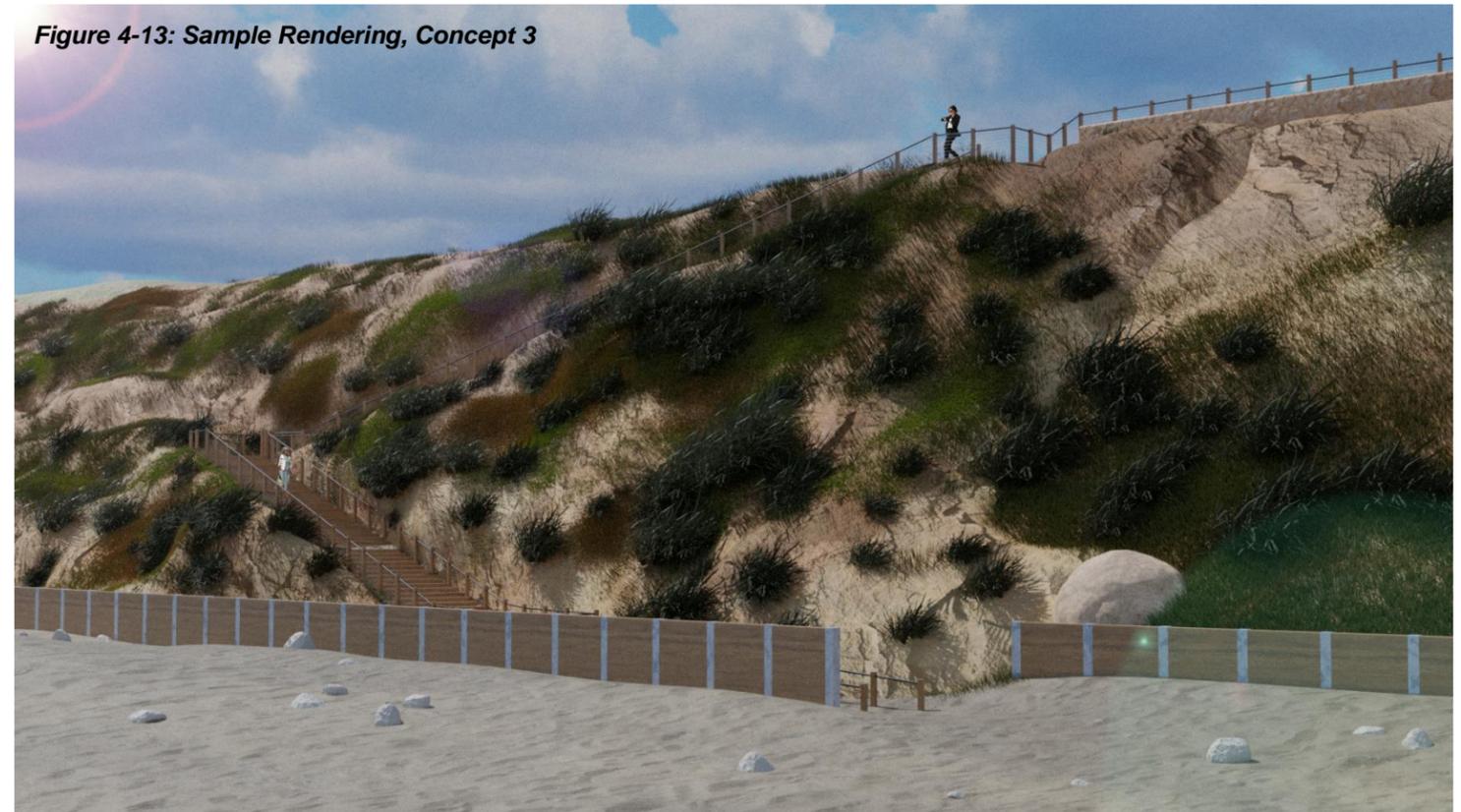
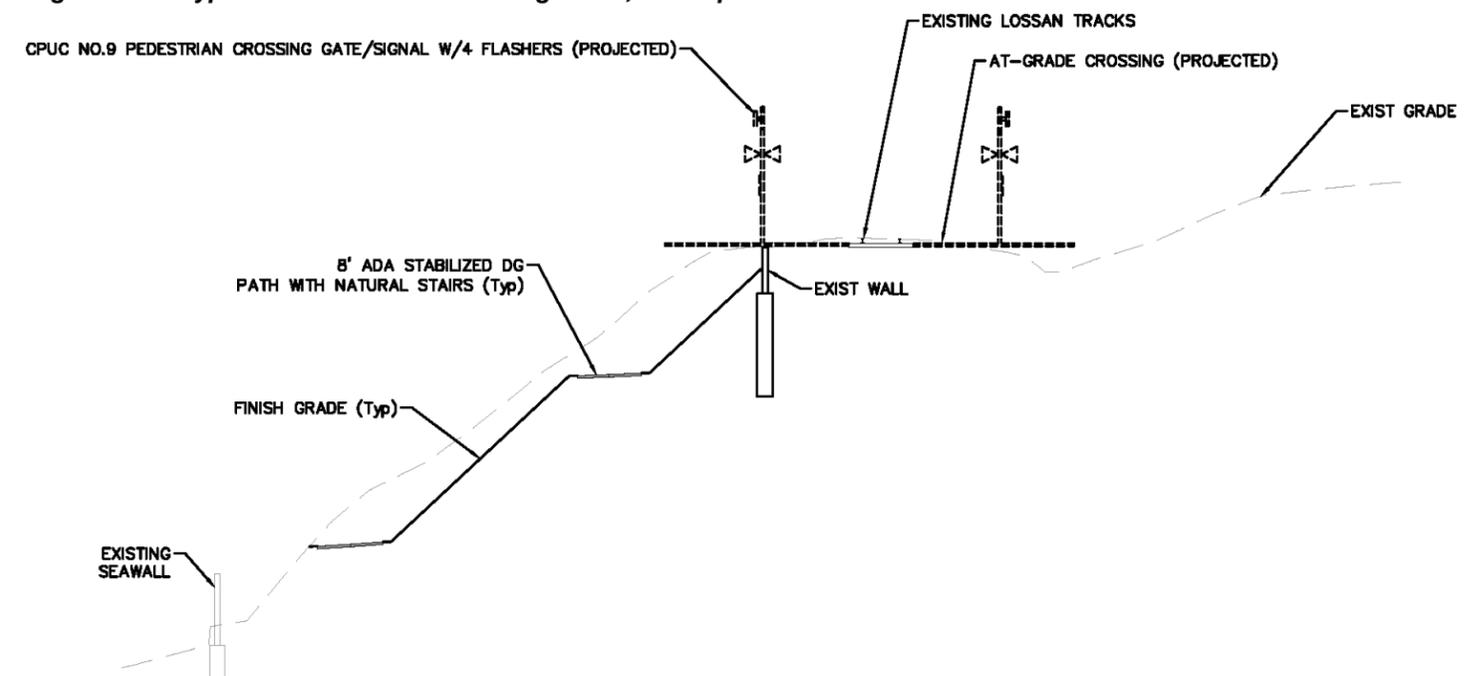
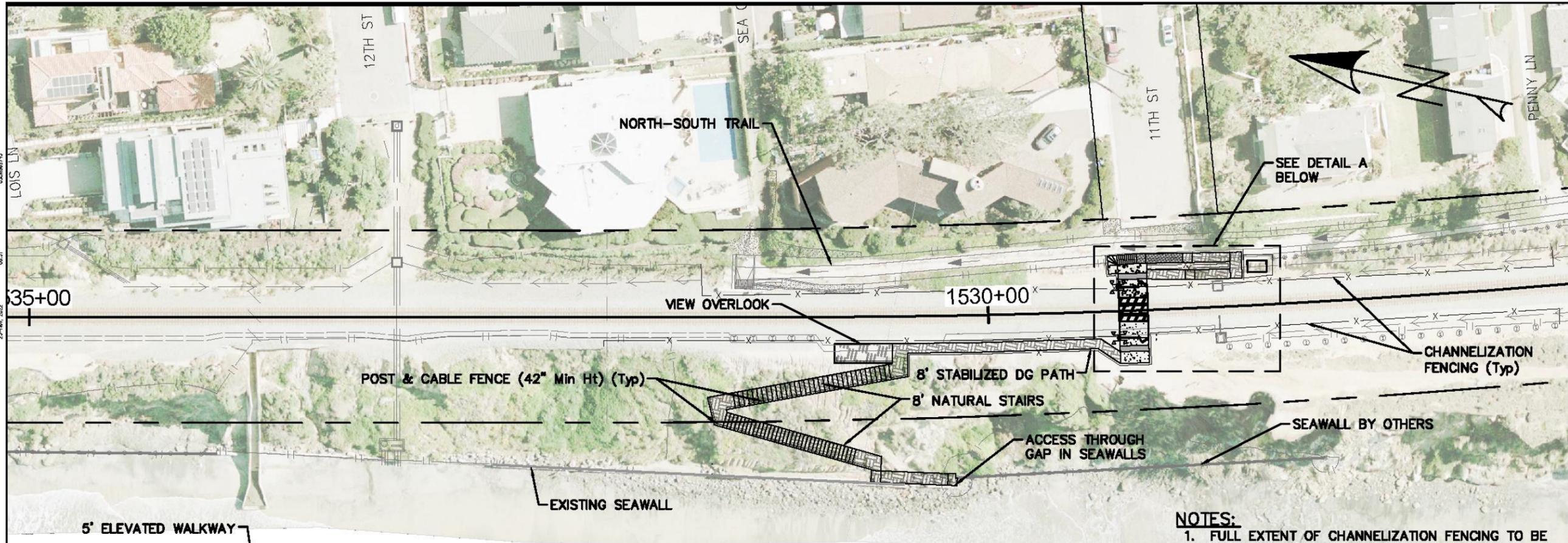
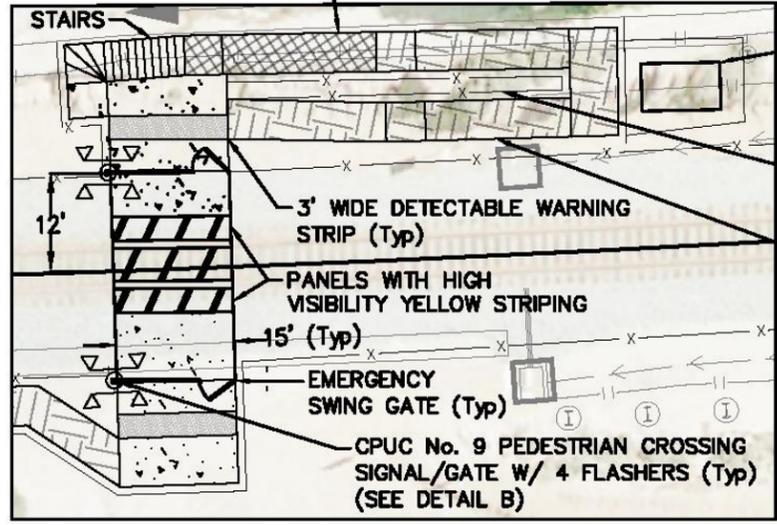


Figure 4-14: Typical Cross-Section Looking North, Concept 3

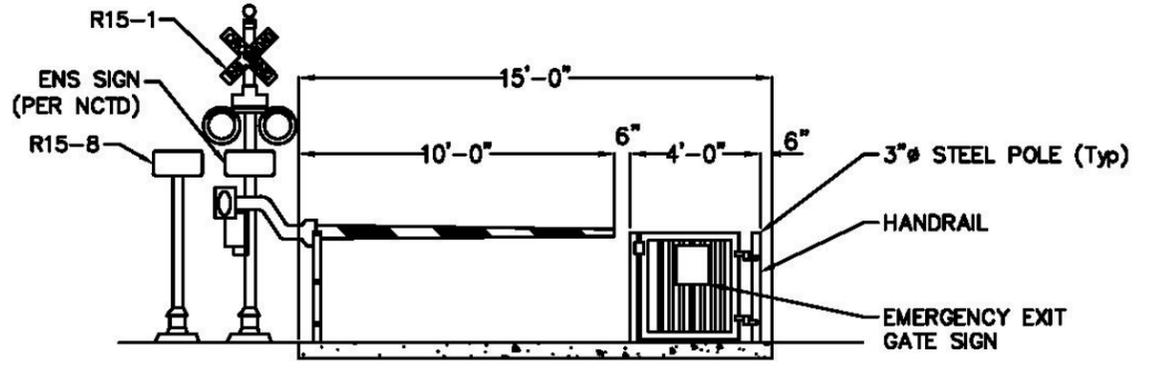




- NOTES:**
1. FULL EXTENT OF CHANNELIZATION FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.
 2. NCTD PARKING REQUIRED FOR SIGNAL HOUSE MAINTENANCE. DETAILS TO BE DETERMINED IN FUTURE PHASE.



DETAIL A
1" = 20"



DETAIL B: PEDESTRIAN GATE CROSSING
NTS

<p>Figure 4-16</p>		DESIGNED BY _____ DATE _____ DRAWN BY _____ CHECKED BY _____ SANDAG		DEL MAR COASTAL CONNECTION EXHIBIT	SCALE 1" = 50' SANDAG CONTRACT NO. _____
	401 B STREET, SUITE 1650 SAN DIEGO, CA 92101 RELATIVE BORDER SCALE 15 IN INCHES		SANDAG 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	CONCEPT 3: AT-GRADE CROSSING 11TH ST STAIRS TO BEACH	DRAWING NO. 1 SHEET NO. 1

CONCEPT 4: AT-GRADE CROSSING AT 7TH-8TH STREETS, RAMPS TO BEACH

This at-grade railroad crossing takes advantage of existing east-west movement patterns near 7th and 8th Streets. Notable features include:

- **Accessible Paths & Ramps:** All paths except natural stairs, including the ramps on the western bluffs, feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface. Ramps on the bluffs may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **View Overlook:** On the western bluff top, a view overlook is a new amenity that would be accessible from 7th Street and optionally Concept 1, North-South Trail).
- **At-Grade Railroad Crossing:** Located near the end of 7th Street and includes:
 - **Gates, Lights & Bells:** Standard safety features per CPUC requirements.
 - **Safety Fencing:** Full extent to be determined in collaboration with CPUC, CCC, NCTD, and City of Del Mar.
 - **Signal House:** Requires NCTD access and parking from the end of 7th Street.
- **Connections to 7th & 8th Streets:** Accessible path from 8th Street and natural stairs near 7th Street (sample photos in Figure 4-19) connect to the existing network. These also feature optional connections to Concept 1, North-South Trail.

Figure 4-17 is a sample rendering, Figure 4-18 shows a typical cross-section looking north, and Figure 4-20 on the following page is the full conceptual plan. Table 4-6 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

Table 4-6: Planning-Level Cost Estimate, Concept 4 (Full Estimate in Appendix D)

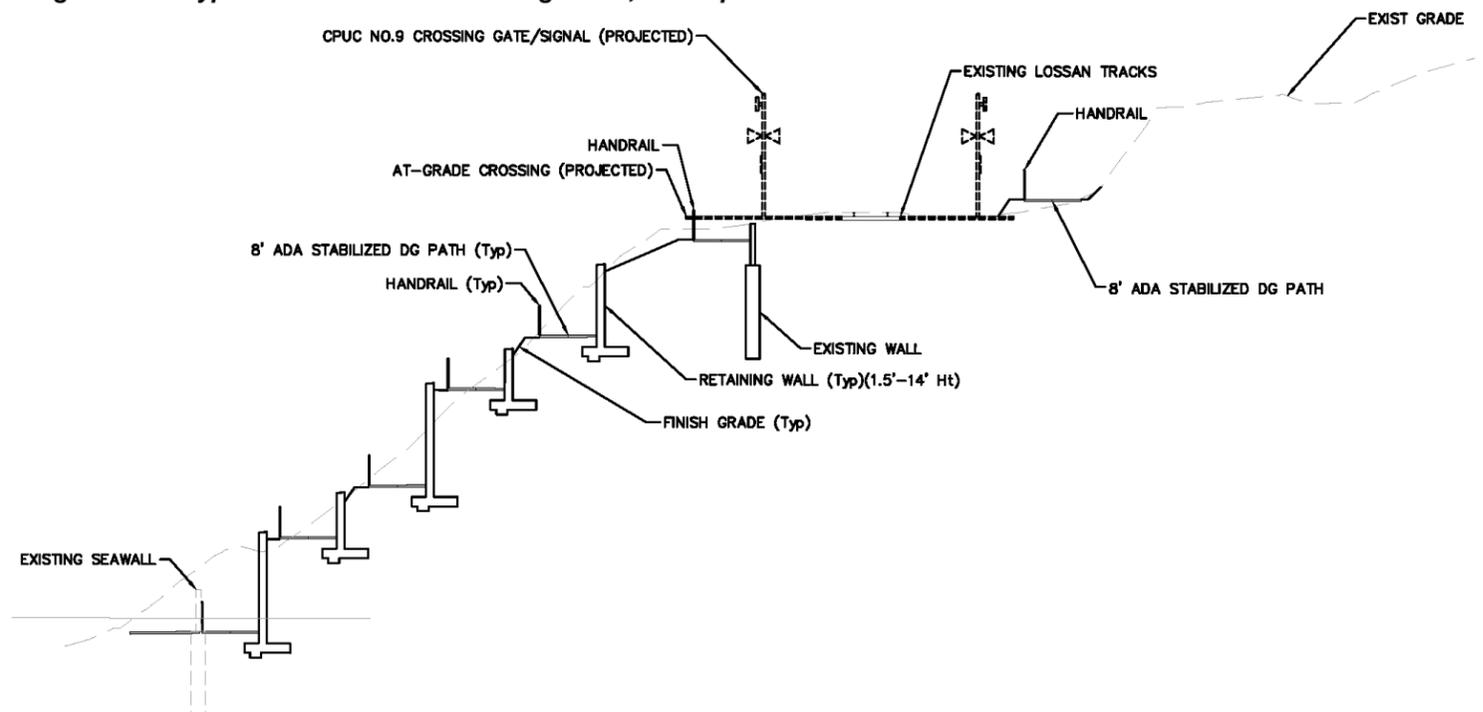
Category	Estimated Cost
Construction Contract Estimate	\$4.9 million
Design, Environmental & Support Costs	\$3.5 million
Total Project Cost Estimate (2022 Dollars)	\$8.4 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.8 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$9.2 million

Figure 4-19: Sample Photos of Natural Stairs



Figure 4-17: Sample Rendering, Concept 4

Figure 4-18: Typical Cross-Section Looking North, Concept 4



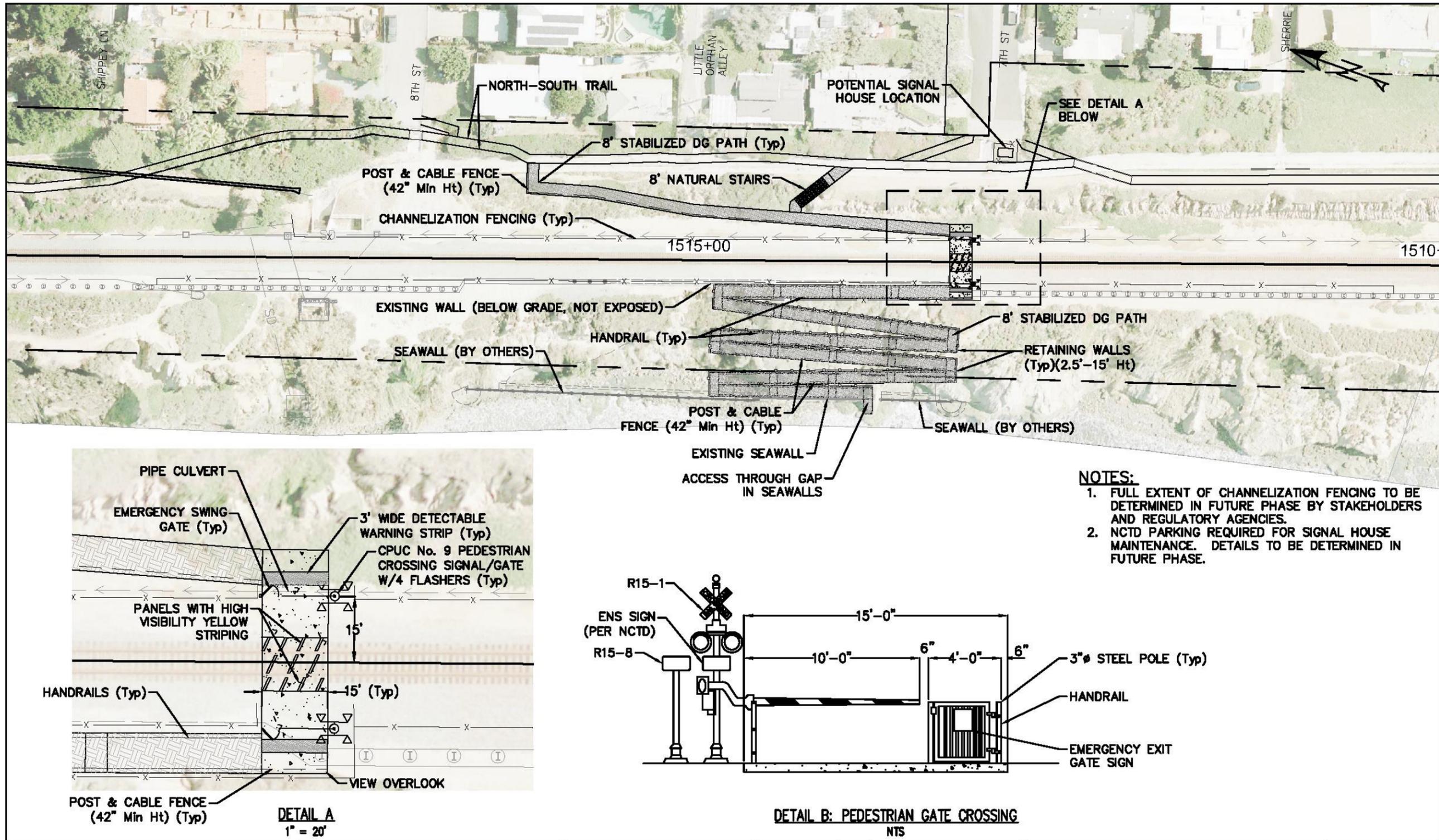


Figure 4-20

 401 B STREET, SUITE 1650 SAN DIEGO, CA 92101 RELATIVE BORDER SCALE 15 IN INCHES	DESIGNED BY DRAWN BY CHECKED BY SANDAG	DATE 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	DEL MAR COASTAL CONNECTION EXHIBIT CONCEPT 4: AT-GRADE CROSSING 7TH AND 8TH ST RAMPS TO BEACH	SCALE 1"=60' SANDAG CONTRACT NO. DRAWING NO. SHEET NO. 1 1



CONCEPT 5: AT-GRADE CROSSING AT 7TH-8TH STREETS, STAIRS TO BEACH

This at-grade railroad crossing takes advantage of existing east-west movement patterns near 7th and 8th Streets. Notable features include:

- **Natural Stairs:** Designed to match the existing informal paths along the bluffs, natural stairs are graded into the terrain using timber or stone, as pictured in the sample photos in Figure 4-23. Steeper portions may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **Accessible Paths:** All paths except the natural stairs feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface.
- **View Overlook:** On the western bluff top, a view overlook is a new amenity that would be accessible from 7th Street and optionally Concept 1, North-South Trail.
- **At-Grade Railroad Crossing:** Located near the end of 7th Street and includes:
 - **Gates, Lights & Bells:** Standard safety features per CPUC requirements.
 - **Safety Fencing:** Full extent to be determined in collaboration with CPUC, CCC, NCTD, and City of Del Mar.
 - **Signal House:** Requires NCTD access and parking from the end of 7th Street.
- **Connections to 7th & 8th Streets:** Accessible path from 8th Street and natural stairs near 7th Street connect to the existing network. These also feature optional connections to Concept 1, North-South Trail.

Figure 4-21 is a sample rendering, Figure 4-22 shows a typical cross-section looking north, and Figure 4-24 on the following page is the full conceptual plan. Table 4-7 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

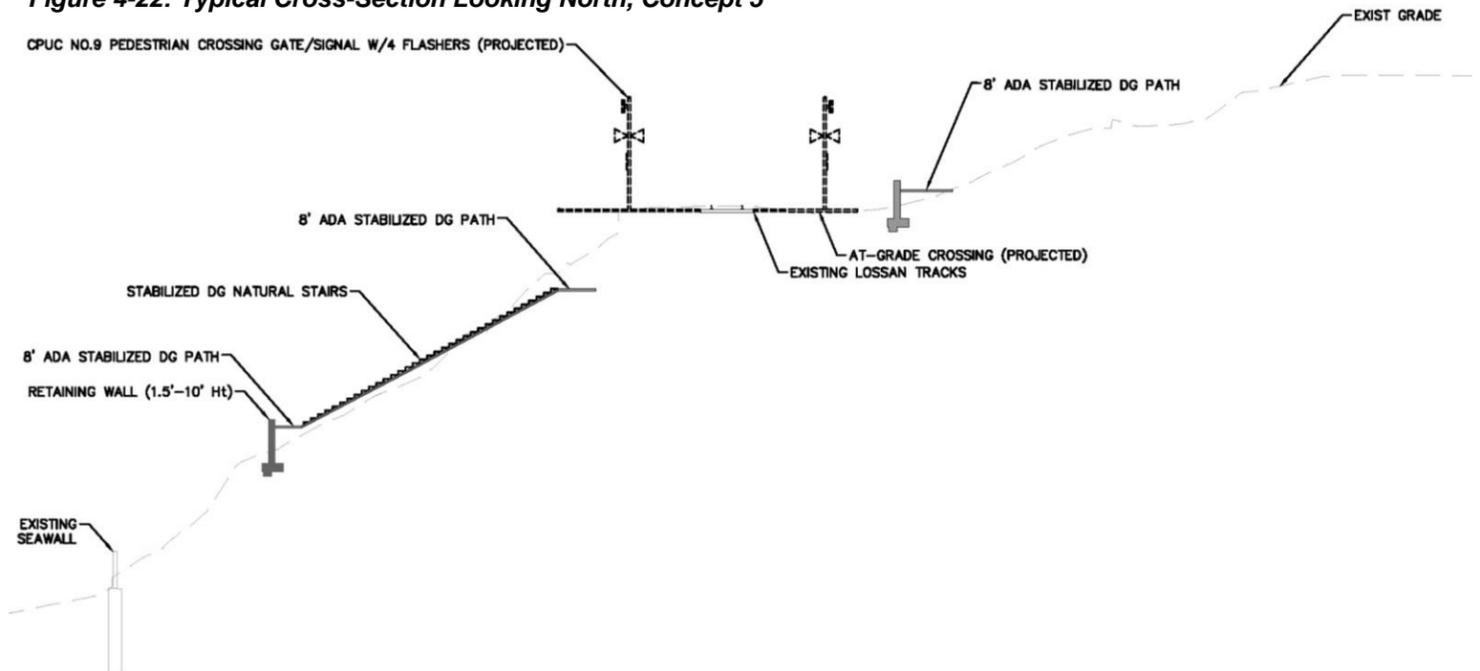
Table 4-7: Planning-Level Cost Estimate, Concept 5 (Full Estimate in Appendix D)

Category	Estimated Cost
Construction Contract Estimate	\$3.0 million
Design, Environmental & Support Costs	\$2.2 million
Total Project Cost Estimate (2022 Dollars)	\$5.2 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.5 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$5.7 million

Figure 4-23: Sample Photos of Natural Stairs



Figure 4-22: Typical Cross-Section Looking North, Concept 5



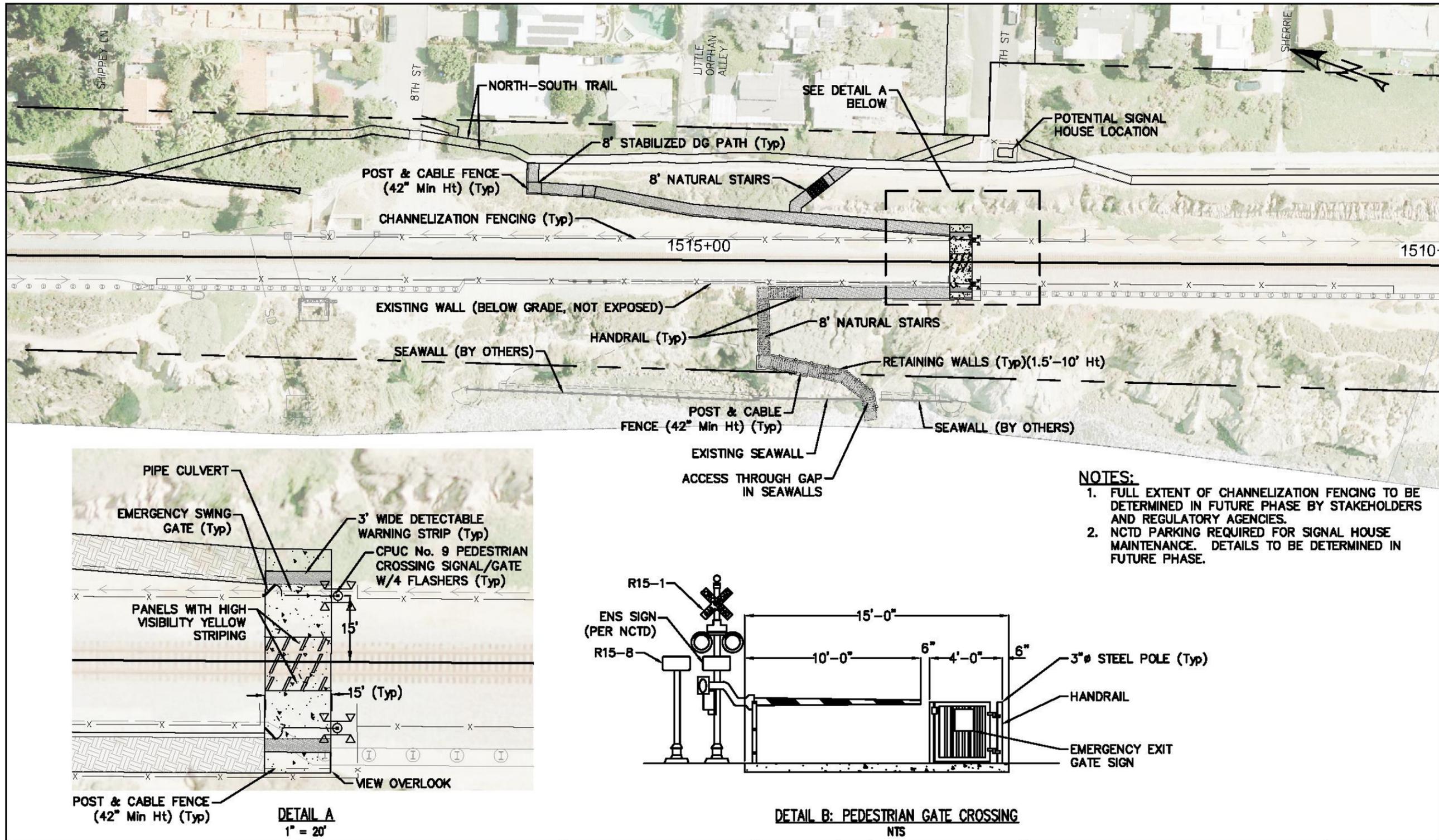


Figure 4-24	<p>401 B STREET, SUITE 1650 SAN DIEGO, CA 92101</p> <p>RELATIVE BORDER SCALE 15 IN INCHES</p>	DESIGNED BY DATE	<p>401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900</p>	DEL MAR COASTAL CONNECTION EXHIBIT	SCALE 1"=60'
		DRAWN BY CHECKED BY SANDAG		CONCEPT 5: AT-GRADE CROSSING 7TH AND 8TH ST STAIRS TO BEACH	SANDAG CONTRACT NO. DRAWING NO. SHEET NO. 1 1

CONCEPT 6: UNDERCROSSING AT 7TH-8TH STREETS, RAMPS TO BEACH

This railroad undercrossing takes advantage of existing east-west movement patterns near 7th and 8th Streets, while reducing or eliminating some of the most impactful features of at-grade crossings including CPUC special approval, safety fencing, and noise impacts (described in Section 5). Notable features include:

- **Accessible Paths & Ramps:** All paths, including the ramps on the western bluffs, feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface. Ramps on the bluffs may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **View Overlook:** Located at the western end of the undercrossing, a view overlook is a new amenity that would be accessible from 7th Street and optionally Concept 1, North-South Trail.
- **Railroad Undercrossing:** A prefabricated, 8-foot by 10-foot rectangular concrete tunnel would be positioned just below the railroad ballast and bedding.
- **Connection to 8th Street:** Accessible path from 8th Street connects to the existing network. This also features an optional connection to Concept 1, North-South Trail.

Figure 4-25 is a sample rendering, Figure 4-26 shows a typical cross-section looking north, and Figure 4-27 on the following page is the full conceptual plan. Table 4-8 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

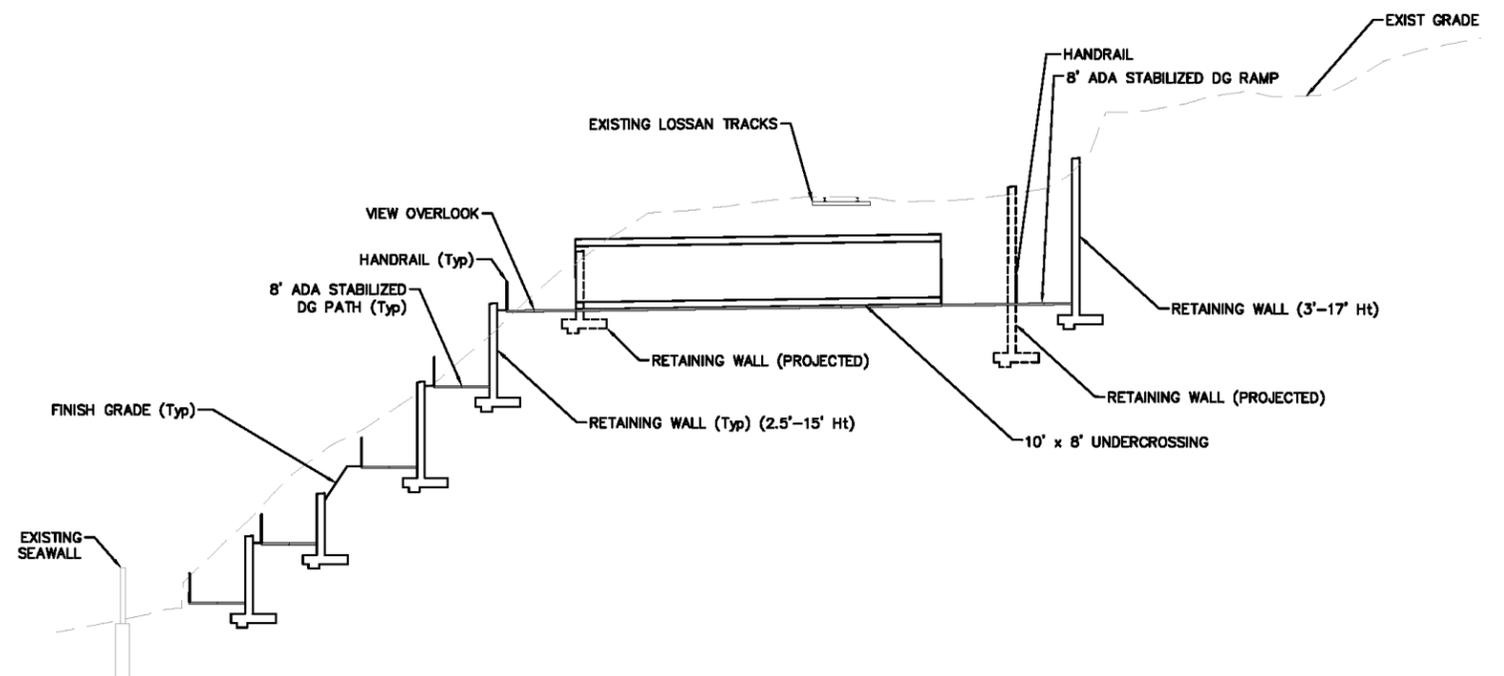
Table 4-8: Planning-Level Cost Estimate, Concept 6 (Full Estimate in Appendix D)

Category	Estimated Cost
Construction Contract Estimate	\$6.8 million
Design, Environmental & Support Costs	\$4.9 million
Total Project Cost Estimate (2022 Dollars)	\$11.7 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$1.1 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$12.8 million



Figure 4-25: Sample Rendering, Concept 6

Figure 4-26: Typical Cross-Section Looking North, Concept 6



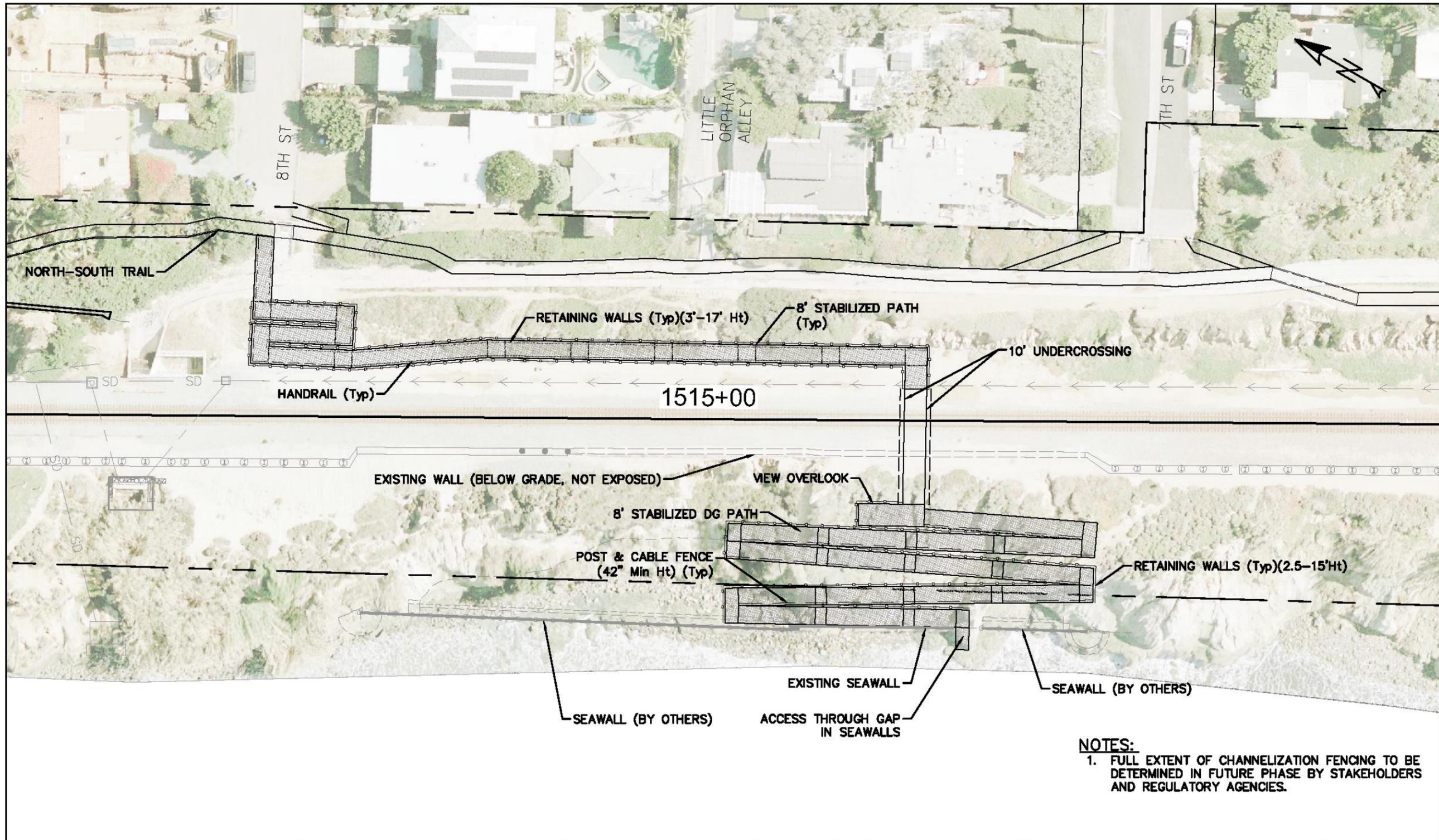


Figure 4-27	 401 B STREET, SUITE 1650 SAN DIEGO, CA 92101 RELATIVE BORDER SCALE IS IN INCHES	DESIGNED BY DRAWN BY CHECKED BY SANDAG	DATE 	 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	DEL MAR COASTAL CONNECTION EXHIBIT	SCALE 1"=40' SANDAG CONTRACT NO.
					CONCEPT 6: UNDERCROSSING 7TH AND 8TH ST RAMPS TO BEACH	DRAWING NO. SHEET NO. 1 1

CONCEPT 7: UNDERCROSSING AT 7TH-8TH STREETS, STAIRS TO BEACH

This railroad undercrossing takes advantage of existing east-west movement patterns near 7th and 8th Streets, while reducing or eliminating some of the most impactful features of at-grade crossings including CPUC special approval, safety fencing, and noise impacts (described in Section 5). Notable features include:

- **Natural Stairs:** Designed to match the existing informal paths along the bluffs, natural stairs are graded into the terrain using timber or stone, as pictured in the sample photos in Figure 4-30. Steeper portions may require retaining walls, some of which may be below grade and/or covered with fill and landscaping to reduce visual impacts.
- **Accessible Paths:** All paths except the natural stairs feature ADA-compliant grades and can utilize a special form of stabilized decomposed granite for an accessible surface.
- **View Overlook:** Located at the western end of the undercrossing, a view overlook is a new amenity that would be accessible from 7th Street and optionally Concept 1, North-South Trail.
- **Railroad Undercrossing:** A prefabricated, 8-foot by 10-foot rectangular concrete tunnel would be positioned just below the railroad ballast and bedding.
- **Connection to 8th Street:** Accessible path from 8th Street connects to the existing network. This also features an optional connection to Concept 1, North-South Trail.

Figure 4-28 is a sample rendering, Figure 4-29 shows a typical cross-section looking north, and Figure 4-31 on the following page is the full conceptual plan. Table 4-9 summarizes the cost estimate, with the full planning-level estimate in Appendix D.

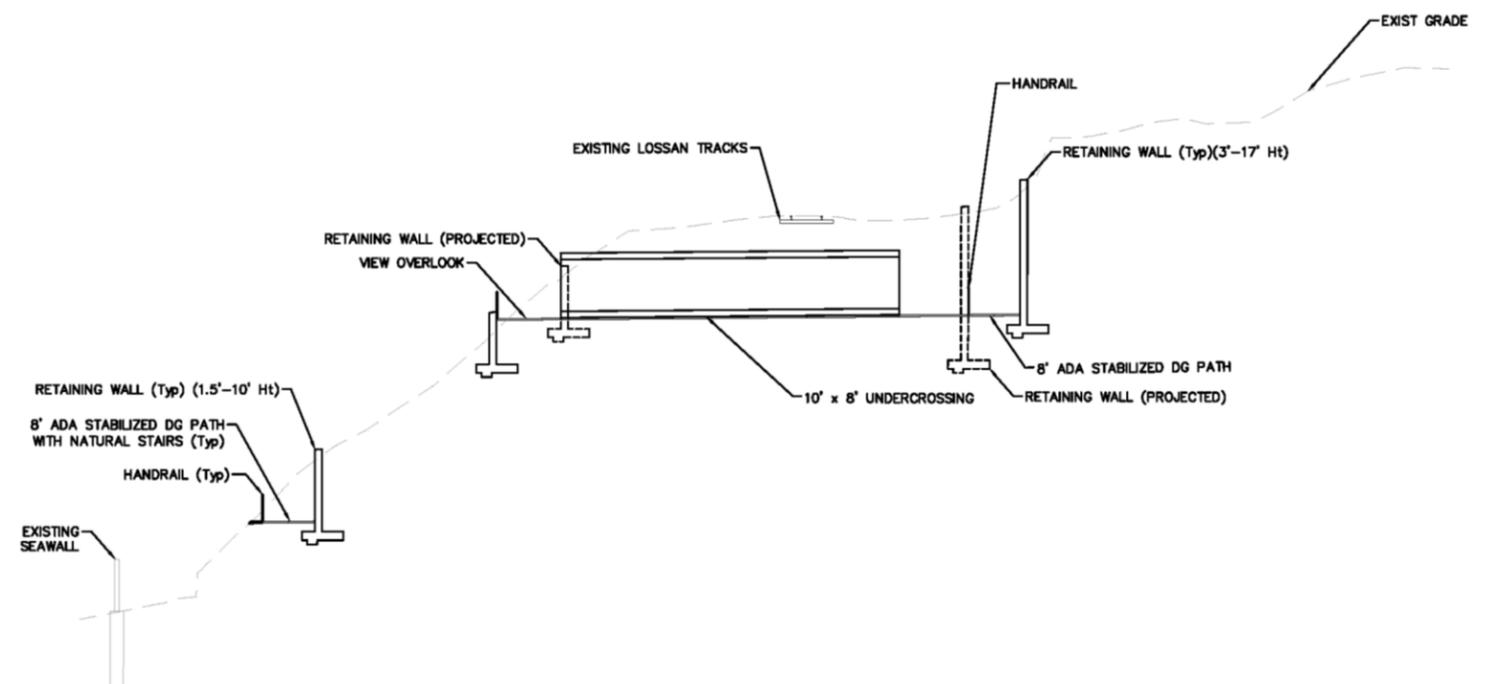
Table 4-9: Planning-Level Cost Estimate, Concept 7 (Full Estimate in Appendix D)

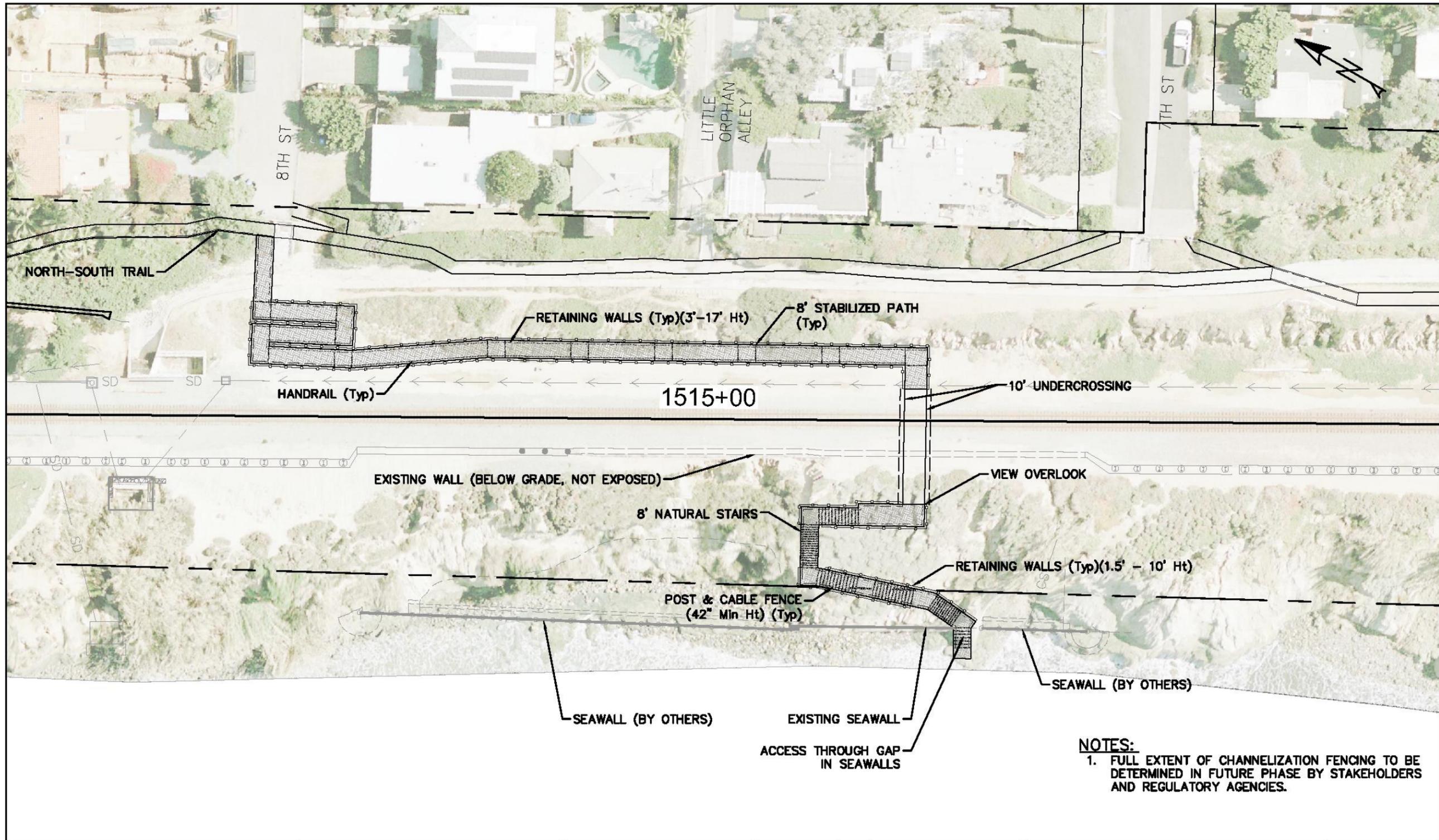
Category	Estimated Cost
Construction Contract Estimate	\$3.7 million
Design, Environmental & Support Costs	\$2.7 million
Total Project Cost Estimate (2022 Dollars)	\$6.4 million
Estimated Cost Escalation to 2023-2027 Years of Expenditure	\$0.6 million
Total Project Cost Estimate (Year of Expenditure Dollars)	\$7.0 million

Figure 4-30: Sample Photos of Natural Stairs



Figure 4-29: Typical Cross-Section Looking North, Concept 7





NOTES:
 1. FULL EXTENT OF CHANNELIZATION FENCING TO BE DETERMINED IN FUTURE PHASE BY STAKEHOLDERS AND REGULATORY AGENCIES.

Figure 4-31	 401 B STREET, SUITE 1650 SAN DIEGO, CA 92101	DESIGNED BY _____ DATE _____ DRAWN BY _____ CHECKED BY _____ SANDAG	 401 B STREET, SUITE 800 SAN DIEGO, CA 92101-4231 (619) 699-1900	DEL MAR COASTAL CONNECTION EXHIBIT CONCEPT 7: UNDERCROSSING 7TH AND 8TH ST STAIRS TO BEACH	SCALE 1"=40' SANDAG CONTRACT NO. _____ DRAWING NO. SHEET NO. 1 1
	RELATIVE BORDER SCALE IS IN INCHES 				



5. IMPLEMENTATION STRATEGY

This section discusses a wide range of implementation considerations for the design concepts developed in this study. It is organized into the following categories:

- Right-of-way, NCTD approval, maintenance, and liability
- California Coastal Commission (CCC) approval
- California Public Utilities Commission (CPUC) approval
- Environmental reviews
- Audible safety systems for at-grade crossings
- Accessibility design
- Constructability
- Next steps and funding

RIGHT-OF-WAY, NCTD APPROVAL, MAINTENANCE & LIABILITY

The seven design concepts recommended for advancement are mostly located within public rights-of-way and do not require the use of any private property. The northern terminus of the north-south trail reaches Seagrove Park through a public access easement located on private property.

As mapped in Figure 2-5 through Figure 2-8 and in the study's [online basemap](#), the public parcels in the study area are divided among several agency owners:

- Street rights-of-way owned by the City of Del Mar
- Railroad parcels owned by NCTD
- Western bluffs owned by the City of Del Mar

NCTD Right-of-Way Approval

NCTD approval is required for any construction or other work in its right-of-way. This is governed by [NCTD Board Policies](#) No. 11 (Real Estate) and No. 18 (Railroad Safety and Community Enhancement Projects) as well as the scope of work for the SANDAG DMB Phase 5 project.

The NCTD railroad right-of-way contains some private encroachments in which adjacent property owners have installed landscaping or small structures on NCTD property, most notably in the areas between Seagrove Park and 9th Street. With the concurrence of NCTD, the project team presumed that any private encroachments in the NCTD right-of-way would be removed if needed to construct the design concepts developed in this study.

Maintenance & Liability Agreements

Any projects located within the railroad right-of-way will require future agreements with NCTD for the City of Del Mar to assume responsibility for ongoing maintenance. NCTD Board Policy No. 18 and the scope of work for the SANDAG DMB Phase 5 project recommend that liability and maintenance for any coastal access or recreational improvements in the NCTD right-of-way should be the responsibility of the City of Del Mar. These details will require additional collaboration and consensus among the stakeholder agencies.



Some elements of railroad crossings will require specific maintenance activities to be conducted by NCTD. This includes the need for NCTD parking, most likely at adjacent street ends, to facilitate inspection activities. This will require further coordination with the City of Del Mar for use of the street right-of-way.

- **At-Grade Crossings:** Monthly inspections of signal house and at-grade crossing facilities such as gates, lighting, and other safety systems.
- **Undercrossings:** Annual inspections of undercrossing infrastructure and supporting structural elements.

CALIFORNIA COASTAL COMMISSION (CCC) APPROVAL

Approval of Proposed Concepts via Federal Consistency Certification

As noted in the study background in Section 1, the proposed design concepts were included as conditions of the SANDAG DMB Phase 5 project, which CCC approved in June 2022 under the federal consistency certification process. The CCC staff report, available in Appendix A, provides additional details on the review of proposed concepts.

At the time of CCC’s approval action in June 2022, the proposed concepts in this study were still under development in preliminary draft form. While some of the more complex concepts (such as the ADA-compliant ramp system) were not advanced or refined enough to allow for a full analysis at the time, CCC approved a concept for a north-south trail, a concept for an at-grade crossing at the end of 7th or 11th Street, and stairs at 11th Street as part of the federal consistency certification. To account for potential modifications or refinements to the design concepts as they proceed through development process, the staff report explains:

As established through Commission review of past projects under Section 930.65 that involved modifications to previously reviewed consistency certifications, the Commission would consider if the change would cause the project to have an effect on any coastal use or resource substantially different than originally described and, as a result, would no longer be consistent with the Coastal Act. If the change is determined to not be substantially different and is still consistent with the Coastal Act, the project and proposed change could proceed. If the change is determined to be substantially different and no longer consistent with the Coastal Act, Commission staff would work with SANDAG to identify modifications or alternatives that could be implemented to achieve consistency and then bring them to the Commission for its consideration.

North Coast Corridor Public Works Plan/Transportation & Resource Enhancement Program (PWP/TREP)

The [North Coast Corridor PWP/TREP](#) is a 40-year plan for the entire transportation corridor between Oceanside and San Diego that includes railroad double-tracking, infrastructure improvements on Interstate 5, and bicycle and pedestrian projects. It was developed jointly by SANDAG and Caltrans, approved unanimously by CCC in 2014, and updated in 2016.

The PWP/TREP acts as a programmatic CCC permitting document for a suite of corridor projects including railroad and freeway improvements, bicycle and pedestrian projects, and environmental mitigation and preservation. While the pedestrian improvements proposed in this study were not specifically included in the PWP/TREP, they also pose no conflicts to any planned PWP/TREP improvements.



This study and the PWP/TREP both share a similar goal to improve multimodal mobility in the corridor in an environmentally sensitive manner. The PWP/TREP also provides general guidance from CCC on multimodal improvements in the corridor including policies, design/development strategies, and implementation measures that could inform future permitting and implementation of the concepts developed in this study.

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) APPROVAL

The CPUC regulates the safety and operations of railroads statewide, including review and approval of most physical and operational modifications. The project team met with CPUC staff three times throughout the study to review design and implementation requirements and will continue consultation through future project development activities.

All seven design concepts developed in this study will require consultation and approval by CPUC due to their proximity to the railroad, with the proposed at-grade crossings undergoing the highest level of review as detailed below.

Approval of At-Grade Crossings

The CPUC generally prohibits new at-grade crossings. [General Order 75-D](#) explains that “the Commission’s policy is to reduce the number of at-grade crossings on freight or passenger railroad mainlines in California.” Approval of new at-grade crossings therefore will require approval by CPUC as part of a discretionary decision process, with commissioners basing their review on site-specific factors, including an assessment of CPUC’s at-grade crossing fencing requirements.

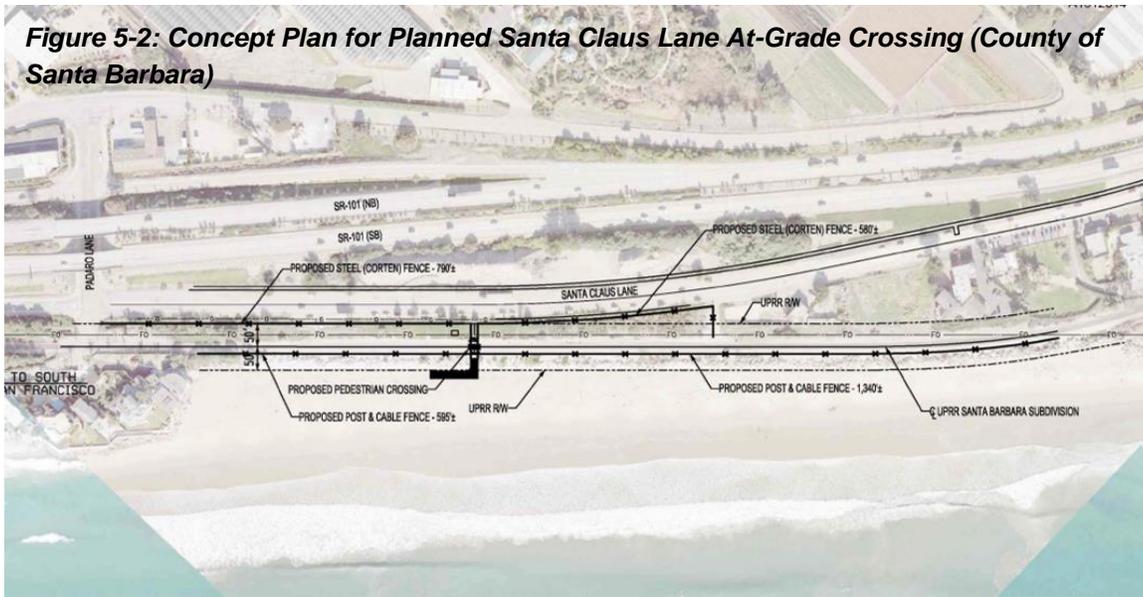
[General Order 164-E](#) provides additional guidance, including completion of a safety evaluation called a Rail Crossing Hazard Analysis Report (RCHAR) to assess the benefits and risks of proposed railroad crossings. CPUC staff reported that the critical questions in evaluating any proposed crossing projects include:

- What are the actual safety issues in the project area?
- Will the proposed condition be safer than the existing condition?
- Are there other special considerations such as engineering or environmental constraints?

CPUC staff have cited several specific concerns for at-grade crossings in nearby sections of the railroad corridor, including the high frequency and speed of trains, the curvature of the railroad tracks limiting visibility, and the history of safety incidents in the corridor.

Potential Precedent: Santa Claus Lane At-Grade Crossing

While CPUC policy generally prohibits new at-grade crossings, CPUC staff identified a recently approved at-grade crossing at Santa Claus Lane in Santa Barbara County that could serve as a model for potential at-grade crossing approvals in Del Mar. Located on the LOSSAN Rail Corridor near Carpinteria, the project has been permitted but is not yet constructed. Figure 5-1 shows the project location and current conditions, and Figure 5-2 is an excerpt from the approved concept plan. The proposed project includes fencing around the crossing on both sides of the railroad to control and channel pedestrian access.



As described by CPUC staff, factors in the Santa Claus Lane approval included:

- Grade separation study concluding that overcrossing and undercrossing options were infeasible (discussed below)
- Inclusion of channelization fencing on both sides of the railroad to control access
- Support from the railroad owner

CPUC staff also noted that the railroad in Santa Barbara County may have lower train volumes than Del Mar, which could be considered in the discretionary decision by commissioners. CPUC could also consider the temporary nature of the crossing in light of the plans to relocate the railroad off the bluffs, as discussed in Section 2 of this report.



Grade Separation & Safety Study for At-Grade Crossings

A major factor in CPUC approval of the Santa Claus Lane at-grade crossing was a grade separation study that evaluated options for potential overcrossings and undercrossings. CPUC staff specifically requested in its letter to applicants: “As part of considering and approving the construction of new at-grade crossing, the CPUC staff requires applicants to conduct a thorough study of a grade separation, exploring all practicable designs of pathways crossing under and over the railroad mainline track.”

The grade separation study for Santa Claus Lane is available in Appendix E and included the following elements:

- Landward and seaward field investigation/geotechnical studies data
- Concept geometrics
- Policy analysis
- Mean high tide study data
- CCC staff reports or other reviews
- Projected number of users
- Traffic data

The study concluded that an overcrossing was infeasible for several reasons, including CCC concerns about shoreline protective devices and visual impacts, and that an undercrossing was infeasible due to flooding concerns.

Many of the elements listed above have been fulfilled by this study, including preliminary field investigation, geotechnical review, concept geometrics, and policy analysis. To maximize efficiency, the information in this study could be supplemented with the additional technical items listed above, plus the CPUC-prescribed RCHAR safety evaluation described earlier, into a single “grade separation and safety study” that would occur at the beginning of the design process.

ENVIRONMENTAL REVIEWS

The access improvement project would be reviewed under the California Environmental Quality Act (CEQA), and potentially also the National Environmental Policy Act (NEPA) if federal funds are used. This process would include an initial review of potential environmental impacts under a variety of topic areas and may require technical studies where needed to substantiate those findings. The results of the environmental analyses also may prompt supporting mitigation measures.

The recently approved at-grade crossing at Santa Claus Lane received a Mitigated Negative Declaration under CEQA (available in Appendix E). This environmental review identified some potential impacts and sufficient mitigations to reduce those impacts below significant levels. The type of environmental document, determination of significance of impacts to resources and potential mitigation will be made by the appropriate CEQA and NEPA lead agencies.

AUDIBLE SAFETY SYSTEMS FOR AT-GRADE CROSSINGS

At-grade crossings require audible safety systems that would create noise impacts in the surrounding community. Per the federal [Train Horn Rule](#), a new at-grade crossing typically requires warning bells at the crossing itself, plus the sounding of train horns when trains approach the crossing from either direction, beginning one-quarter mile away.

One potential alternative to the routine sounding of train horns may be a wayside horn, which simulates the sound of train horns from a stationary location at the at-grade crossing itself. This would require one of the following additional regulatory approvals, either of which could be pursued separately, but are not requirements for the implementation of at-grade crossings:

- **Quiet Zone:** The Federal Railroad Administration (FRA) allows the creation of quiet zones that allow wayside horns in lieu of routine train horns. However, FRA regulations require quiet zones to be “bookended” on each side by vehicular crossings with quiet zone status. Attaining quiet zone status for pedestrian at-grade crossings in Del Mar therefore would require attaining quiet zone status for the roadway at-grade crossing at Sorrento Valley Road, located south of the study area in the City of San Diego.
- **Wayside Horn Waiver:** CPUC staff reported that the existing at-grade pedestrian crossings in San Clemente—one of which is pictured in Figure 5-3—received waivers from the Federal Railroad Administration (FRA) to implement wayside horns at the crossings in lieu of train horns, which are required by state law. However, CPUC staff also reported that FRA has made it clear that further waivers are highly unlikely, and that changing state law to allow wayside horns at pedestrian crossings would be the only way to remove the need for the FRA waiver. SANDAG or other stakeholder agencies may choose to pursue this option via the state legislature.

A recent study in Encinitas—the Montgomery Avenue Noise Study Wayside Horn Demonstration Acoustic Monitoring Report (2017), included as Appendix F—showed that wayside horns could reduce community noise impacts compared to train horns, with the sound from train horns traveling farther into the community and at a higher intensity. The study examined both 92-decibel and 80-decibel types of wayside horns, noting: “The current standards for wayside horns are applicable to roadway crossings and consist of 92 decibel horns. However, at similar pedestrian-only quiet zone crossings in San Clemente, the CPUC

Figure 5-3: At-Grade Crossing in San Clemente (SANDAG)





approved a modified wayside horn of 80 decibels.” For context, standard train horns are 96-110 decibels per the federal [Train Horn Rule](#). Other [federal research](#) estimates that motorcycles typically emit around 95 decibels, and gas-powered lawnmowers and leaf blowers typically emit around 80 decibels.

Regardless of the specific audible systems used, any new at-grade crossing in Del Mar could create new noise impacts in the community through warning bells, train horns, and/or wayside horns. Currently train horns are not sounded routinely in the area, with the nearby Coast Boulevard at-grade crossing using a wayside horn in lieu of routine train horns.

The at-grade crossing concepts developed in this study presume standard requirements for warning bells at the crossing and the routine sounding of train horns. The concepts do not include wayside horns or quiet zone elements because those elements are outside the scope of this study and are not requirements for the implementation of at-grade crossings. Additional approvals for wayside horns or other quiet zone elements could be pursued in the next phases of project development.

ACCESSIBILITY DESIGN

Design requirements for accessibility are governed by several laws and guidelines as summarized below. The design concepts advanced in this study include several accessibility options to help facilitate future design decisions by stakeholder agencies.

The Americans with Disabilities Act (ADA) requires new facilities to be designed to accommodate users with mobility impairments. Current [ADA Accessibility Standards](#) (2010) require new facilities to include ADA-compliant design unless it is “structurally impracticable,” which is defined as “the unique characteristics of terrain prevent the incorporation of accessibility features.” If full compliance with the 2010 ADA Accessibility Standards is determined to be structurally impracticable, compliance with the standards is required to the extent that it is not structurally impracticable. In that case, any portion of the facility that can be made accessible would be made accessible to the extent that it is not structurally impracticable.

While ADA does not make any explicit distinctions or exceptions for beach access trails or impacts to sensitive resources, a separate federal law, the Architectural Barriers Act (ABA) of 1967, does make these distinctions as detailed in Chapter 10 of the [ABA Accessibility Standards](#) (codified as Appendix D of [36 C.F.R. Part 1191](#)). Use of ABA design standards typically is limited to federal projects on federal lands, or federally funded projects in which ABA standards are explicitly prescribed by the funding source. The U.S. Access Board’s [Accessibility Standards for Federal Outdoor Developed Areas](#) explains:

The new provisions for trails, picnic and camping facilities, viewing areas, and beach access routes are not included in the Department of Justice’s (DOJ) 2010 ADA Standards and have no legal effect on state and local governments and private entities subject to DOJ’s ADA regulations. State and local governments and private entities may, however, use the provisions for guidance when designing trails, picnic and camping facilities, viewing areas, and beach access routes.

Although not binding regulations, the ABA standards could provide guidance for outdoor trails and accessways sited in areas with steep terrain or where other environmental laws may preclude full compliance with accessibility standards.

In this conceptual study, the project team found that that the seven design concepts are physically feasible from an engineering perspective, although they may pose a variety of potential impacts and challenges. Of note is the fact that the segment of sandy beach below



the bluffs in the project area is narrow and can be inundated with water during certain times of the day and more consistently during certain times of the year. The timing of inundation in this section of the beach is projected to worsen over time with projected sea level rise. In addition, potential changes to the visual character of the bluffs—including associated grading (beyond the grading that will be performed as part of the DMB5 Stabilization Project), retaining walls, and the potential modification of the topography of the bluffs—could present conflicts with coastal policies and potential permitting issues. These issues will be further evaluated in the next phase of project development.

The project team plans to present the concepts for public feedback on accessibility design considerations, including a presentation to SANDAG’s Social Services Transportation Advisory Council (SSTAC). The project team may consult the U.S. Department of Justice and/or any additional federal or state funding entities for additional guidance during future project development activities.

CONSTRUCTABILITY

The pedestrian improvements developed in this study present a range of constructability considerations, with a major factor being the degree to which construction requires access to the NCTD railroad right-of-way. This is summarized below, followed by a discussion of constructability considerations for the north-south trail and railroad crossings.

Railroad Access

As shown in the conceptual plans in Section 4, all proposed facilities have at least some elements in the NCTD railroad right-of-way, which at minimum will require a right-of-entry permit from NCTD to construct, as well as NCTD-approved flagging protection staff during construction activities. Additionally, all workers in the right-of-way will be required to complete NCTD’s federally mandated roadway worker protection (RWP) program.

NCTD requires that work in the railroad right-of-way be performed in a manner that limits impacts to train operations to the extent practicable. The railroad “foul zone” is defined by NCTD as within 25 feet of the nearest running rail. Any work in the foul zone should be performed such that it can be stopped and cleared of the tracks prior to a train entering the work limits. Equipment and workers may not be able to clear the foul zone in all cases when trains pass, but they must be cleared of the tracks and secured to prohibit movement.

As described in the following pages, most construction activities for the improvements developed in this study will fit into two categories with respect to railroad access:

- Some construction activities may require suspending railroad operations. This typically would occur during nighttime work periods or multi-day absolute work windows (AWWs) which are typically scheduled several times per year.
- Some project elements may be constructed primarily from adjacent street ends or beaches, with little or no entry into the railroad foul zone. All work in the NCTD right-of-way still will require a right-of-entry permit, flagging protection, and RWP.

NCTD provides additional guidance in the [Working Around the Rails](#) section of its website.

Constructability Considerations for North-South Trail

The north-south trail has varying constructability considerations depending on its surrounding context, which is shown in the conceptual plans in Section 4. For construction purposes, the 0.8-mile trail is divided into three potential construction areas described below.



Seagrove Park to 8th Street

The northern section of the north-south trail is highly constrained by the railroad and adjacent residential development. While the adjacent street ends and alleys will provide some access, construction of the full trail will require entry into the railroad corridor. This will require a right-of-entry permit, flagging protection, and RWP as described above.

Notable construction activities for the section from Seagrove Park to 8th Street will include materials delivery via street ends/alleys, materials staging—which is likely to require storage space within the railroad right-of-way—clearing vegetation, excavation, grading, constructing the path and supporting retaining walls, placing pedestrian bridges at Sea Orbit Lane and Lois Lane, and placing ditch crossings near 10th and 9th Streets. The walls, bridges, and ditch crossings likely will require construction via the railroad corridor and should be completed together, potentially during nighttime work periods or an AWW. Those elements also should be comprised of prefabricated, modular materials to the greatest degree possible.

8th Street Culvert Area

Just north of 8th Street, the north-south trail includes a proposed drainage culvert below graded fill, as shown in the conceptual plans and renderings in Section 4. This will require entry into the railroad corridor including right-of-entry permit, flagging protection, and RWP as described above. Mid-size equipment will be required to excavate and install the culvert, and these activities may enter the railroad “foul zone” resulting in operational impacts to the railroad.

Notable construction activities for the 8th Street culvert area will include materials delivery via street ends/alleys, materials staging—which is likely to require storage space within the right-of-way near 8th Street—clearing vegetation, excavating, placing the precast culvert, grading and fill, and constructing the path. The culvert should be comprised of prefabricated materials to the greatest degree possible.

8th Street to 4th Street

This southern section of the north-south trail is in a wider part of the NCTD railroad right-of-way, located farther east of the railroad tracks than the section north of 8th Street and situated along bluffs that ascend to the south. While construction will require right of entry, flagging protection, and RWP, it is sufficiently far from the railroad “foul zone” to avoid operational impacts.

Notable construction activities for the section from 8th Street to 4th Street will include materials delivery via street ends/alleys, materials staging—which is likely to require storage space within the right-of-way—clearing vegetation, grading, constructing the path, placing a timber walkway over the drainage facility between 7th and 8th Streets, and placing ditch crossings near 7th and 6th Streets. The ditch crossings should be comprised of prefabricated materials to the greatest degree possible. Compared to the section north of 8th Street, this southern section will require substantially less excavation and use of heavy equipment.

Constructability Considerations for Railroad Crossings

The proposed railroad crossings have distinct constructability considerations across three areas as described below, all of which are shown in the conceptual plans in Section 4.

Western Bluffs (All Crossings)

The proposed ramps, natural stairs, and retaining walls will require construction access from the beach side, similar to recent work conducted for SANDAG’s Del Mar Bluffs Stabilization projects. Substantial portions of the western bluffs are within the NCTD railroad right-of-way,



requiring at minimum a right of entry permit and RWP, with flagging protection required for initial construction along the bluff top. However, once the planned channelization fencing along the bluff top is installed, future work along the bluffs is not likely to require flagging protection given the access control provided by the fencing and the overall distance from the railroad “foul zone.”

Notable construction activities for the western bluffs will include materials delivery via beach; materials staging (which also is likely to require storage space on the beach); clearing vegetation; grading; constructing the path and supporting retaining walls; and constructing a beach access point at a planned seawall opening. The walls should be comprised of prefabricated, modular materials to the greatest degree possible. The natural stairs proposed in some concepts entail largely manual work, requiring less heavy equipment than other elements once the supporting retaining walls and grading activities are complete.

At-Grade Crossings & East Side Paths (11th Street & 7th-8th Streets)

Construction of the at-grade crossings will pose operational impacts to the railroad and should be done during nighttime work periods or an AWW. Construction of the east side paths will require a right-of-entry permit, flagging protection, and RWP as described above. Materials and equipment required to construct both the crossing and east side paths can be delivered via street ends or alleys.

Notable construction activities for the at-grade crossings and east side paths will include materials delivery via street ends/alleys; materials staging (which is likely to require storage space within the right-of-way); clearing vegetation; grading; constructing the east side path; constructing the signal house; installing channelization fencing; and constructing the crossing itself including required gates and warning devices.

Undercrossing & East Side Path (7th-8th Streets)

Construction of the undercrossing will pose operational impacts to the railroad and should be done during an AWW. Construction the east side path will require a right-of-entry permit, flagging protection, and RWP as described above. Both the undercrossing and east side path will require large equipment due to substantial excavation and construction activities. Materials and equipment can be delivered via street ends or alleys.

Notable construction activities for the undercrossing and east side path at 7th-8th Streets will include materials delivery via street ends/alleys; materials staging (which also is likely to require storage space within the right-of-way near 8th Street); clearing vegetation; substantial excavation (for both the undercrossing and east side path); grading; constructing the east side path and supporting walls; removing a section of railroad track; placing the precast box culvert via crane from 7th or 8th Streets atop a bed of leveling gravel; waterproofing the culvert walls; backfilling the area; and finally restoring, balancing, and welding the railroad tracks. The walls and box culvert should be comprised of prefabricated, modular materials to the greatest degree possible.

Potential Removal of Pedestrian Facilities After Railroad Realignment

As discussed in Section 2, SANDAG is currently studying options to realign the railroad away from the coastal bluffs as part of its [San Diego Regional Rail Alignment Study](#). Once the railroad is relocated off the bluffs, stakeholder agencies will assess the study area’s physical conditions and evaluate whether infrastructure on the bluffs may need to be removed to ensure public safety and return the bluffs to a more natural state.



NEXT STEPS & FUNDING

This final section summarizes the next steps required to advance the proposed concepts toward implementation. It concludes with a summary of potential funding sources for which the proposed improvements may be eligible.

Next Steps

Table 5-1 is a sample timeline of the expected milestones and next steps in the project development process. The preceding parts of Section 5 discuss many of the details associated with these implementation milestones.

Table 5-1: Sample Timeline of Next Steps

Milestone	Estimated Timeline & Notes
Conceptual Planning Study	<i>Complete (this study)</i>
Preliminary Design	
<i>Identification of Project Funding</i>	<i>In progress</i>
<i>Selection of Preferred Projects</i>	<i>In progress</i>
<i>Grade Separation & Safety Study</i>	3-6 months
<i>Accessibility Decisions</i>	3-6 months
<i>Preliminary Design (30%)</i>	6-12 months
<i>Community & Stakeholder Outreach</i>	6-12 months, concurrent with preliminary design activities
Environmental & Agency Reviews	
<i>CEQA/NEPA Review</i>	6-12 months, concurrent with preliminary design activities. NEPA required with federal funding
<i>CCC Approval of Draft Design</i>	Concurrent with CEQA/NEPA, plus 3-6 months
<i>CPUC Approval of Draft Design</i>	6-12 months, concurrent with environmental & agency reviews. <i>(Formal CPUC process typically begins at around 60% design.)</i>
<i>City of Del Mar Approval of Draft Design</i>	6-12 months, concurrent with environmental & agency reviews. Includes maintenance & liability agreements
<i>NCTD Approval of Draft Design</i>	6-12 months, concurrent with environmental & agency reviews. Includes maintenance & liability agreements
Final Design	6-12 months following preliminary design, environmental & agency reviews
Permit Issuance	3-6 months
Construction	2-3 years following final design & permits. <i>(Per CCC permit, construction should be 2 years and begin within 36 months of the DMB Phase 5 construction start, unless extended by CCC.)</i>



Potential Funding Sources

To help identify the approximate funding need, Section 4 summarizes the estimated cost of each design concept and Appendix D contains full rough-order-of-magnitude cost estimates. Table 5-2 summarizes several federal and state funding programs for which these projects may be eligible. In general, these funding programs tend to emphasize the following goals which align with current federal and state policy goals:

- Transportation infrastructure (active transportation and railroad)
- Transportation safety
- Climate resiliency and adaptation

Table 5-2: Potential Funding Sources

Program	Agencies	Coastal Connections Eligibility
Active Transportation Program (link)	California Transportation Commission & Caltrans	High. The proposed improvements would create new pedestrian facilities and increase access to coastal recreation opportunities, consistent with program goals.
Railroad Crossing Elimination Grant Program (link)	US DOT	Medium. While not strictly eliminating any existing railroad crossings, the proposed improvements would reduce hazards and increase safety in the railroad corridor, consistent with program goals.
Rebuilding American Infrastructure with Sustainability & Equity (RAISE) (link)	US DOT	Medium. While the proposed improvements are broadly consistent with RAISE goals, these competitive grants typically require cost-benefit analyses showing substantial benefits in quantifiable metrics such as time savings or emissions reduction, which are difficult to establish for small-scale pedestrian improvements. However, the potential safety benefits of the proposed improvements may be an opportunity to demonstrate grant competitiveness.
Clean California Local Grant Program (link)	Caltrans	Medium. The proposed improvements are consistent with one of the program's key goals, to "enhance public health, cultural connection and community placemaking by improving public spaces for walking and recreation."
Urban Greening (link)	California Natural Resources Agency	Low. The proposed improvements include native vegetation and beautification treatments which may be consistent with some program goals. Program is currently closed to new applications but should be monitored for potential additional rounds.



Program	Agencies	Coastal Connections Eligibility
Consolidated Rail Infrastructure & Safety Improvements (CRISI) (link)	Federal Railroad Administration (FRA)	<p>Low. Similar to RAISE, these competitive grants typically require cost-benefit analyses showing substantial benefits in quantifiable metrics such as time savings or emissions reduction. However, the potential safety benefits of the proposed improvements may be an opportunity to demonstrate grant competitiveness. The program is currently closed to new applications but should be monitored for potential additional rounds.</p>
Climate Resiliency & Adaptation Programs		<p>Low. These funding programs focus primarily on fortifying and adapting infrastructure against the effects of climate change. While this may be outside the scope of the proposed improvements by themselves, their eligibility may increase if the improvements are packaged with other LOSSAN corridor improvements aimed at addressing climate change impacts. These programs include:</p> <ul style="list-style-type: none"> — Climate Adaptation Planning Grants (link): California Governor’s Office of Planning & Research (OPR) — Promoting Resilient Operations for Transformative, Efficient & Cost-Saving Transportation (PROTECT) (link): US DOT & Federal Highway Administration (FHWA) — Building Resilient Infrastructure & Communities (link): Federal Emergency Management Agency (FEMA)