Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) proposes to realign State Route (SR) 1 at Gleason Beach in Sonoma County (Figures 1-1 and 1-2) to maintain SR 1, which has been damaged by multiple erosive forces including severe storms in 1996 and later years. Caltrans is the lead agency under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

The Draft Environmental Impact Report (EIR)/Environmental Assessment (EA) (Caltrans 2015g) evaluated three Build Alternatives and one No-Build Alternative. From the original 21 Build Alternatives that were considered, only Alternatives 19A, 19B, and 20 remained under consideration in the Draft EIR/EA. This Final EIR/EA with Finding of No Significant Impact (FONSI) identifies a Preferred Build Alternative, Alternative 19A, as discussed below in Section 1.3.3. The proposed Gleason Beach Roadway Realignment Project (project) would construct a two-lane roadway along a new alignment eastward and inland of the current alignment between post miles (PMs) 15.1 and 15.7 of SR 1 in Sonoma County. The new alignment would consist of one 12-foot lane with a 4-foot paved and 4-foot unpaved shoulder in each direction. The new alignment includes an approximately 900-foot-long bridge spanning the Scotty Creek floodplain, planned for 49 feet in width, with one 12-foot lane and 6- to 8-foot shoulder in each direction. The bridge would also include a 6-foot-wide sidewalk in the southbound direction to accommodate pedestrian access as well as see-through barriers on both sides of the bridge. These shoulder dimensions would be wider than shoulders along existing SR 1. This realigned roadway would not increase roadway capacity.

The Preferred Build Alternative would realign the existing roadway eastward starting approximately 1,000 feet south of the beach area at Scotty Creek. As a reference point, the Preferred Build Alternative realigns the roadway 90 feet east of existing SR 1, and 440 feet west of the Gleason-Mann-Ballard Ranch (Assessor's Parcel Number [APN] 101-110-005). The distance from existing SR 1 to the new alignment would vary throughout the project limits. Figure 1-3 shows the location of the proposed improvements along SR 1 for the Preferred Build Alternative. A typical cross-section view of the proposed new SR 1 roadway alignment is shown in Figure 1-4, and a typical cross-section of the proposed new bridge over Scotty Creek is shown in Figure 1-5.

Legend

Project Location

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N

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Miles

FIGURE 1-1
REGIONAL LOCATION

Gleason Beach Roadway Realignment Project
Environmental Impact Report /
Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

Caltrans

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Legend

Environmental Impact Report / Environmental Assessment Study Area

USGS Quadrangles:
1) Duncans Mills
2) Bodega Head

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, NRCAN, METI, iPC, TomTom
Copyright:© 2013 National Geographic Society, i-cubed

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0 1,000 2,000
Feet

FIGURE 1-2
PROJECT LOCATION
Gleason Beach Roadway Realignment Project
Environmental Impact Report / Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

Caltrans

BAOFPP01 C:\PROJ\CALTRANS\666239_D4ENVONCALL2015-2018\TO6_GLEASONBEACH\GIS\MAPFILES\2016\EIR\MARCH\FIG1-2_PROJECT_LOCATION.MXD 3/9/2016 3:00:57 PM

The proposed project is within the Federal Transportation Improvement Program (FTIP) (VAR110005).

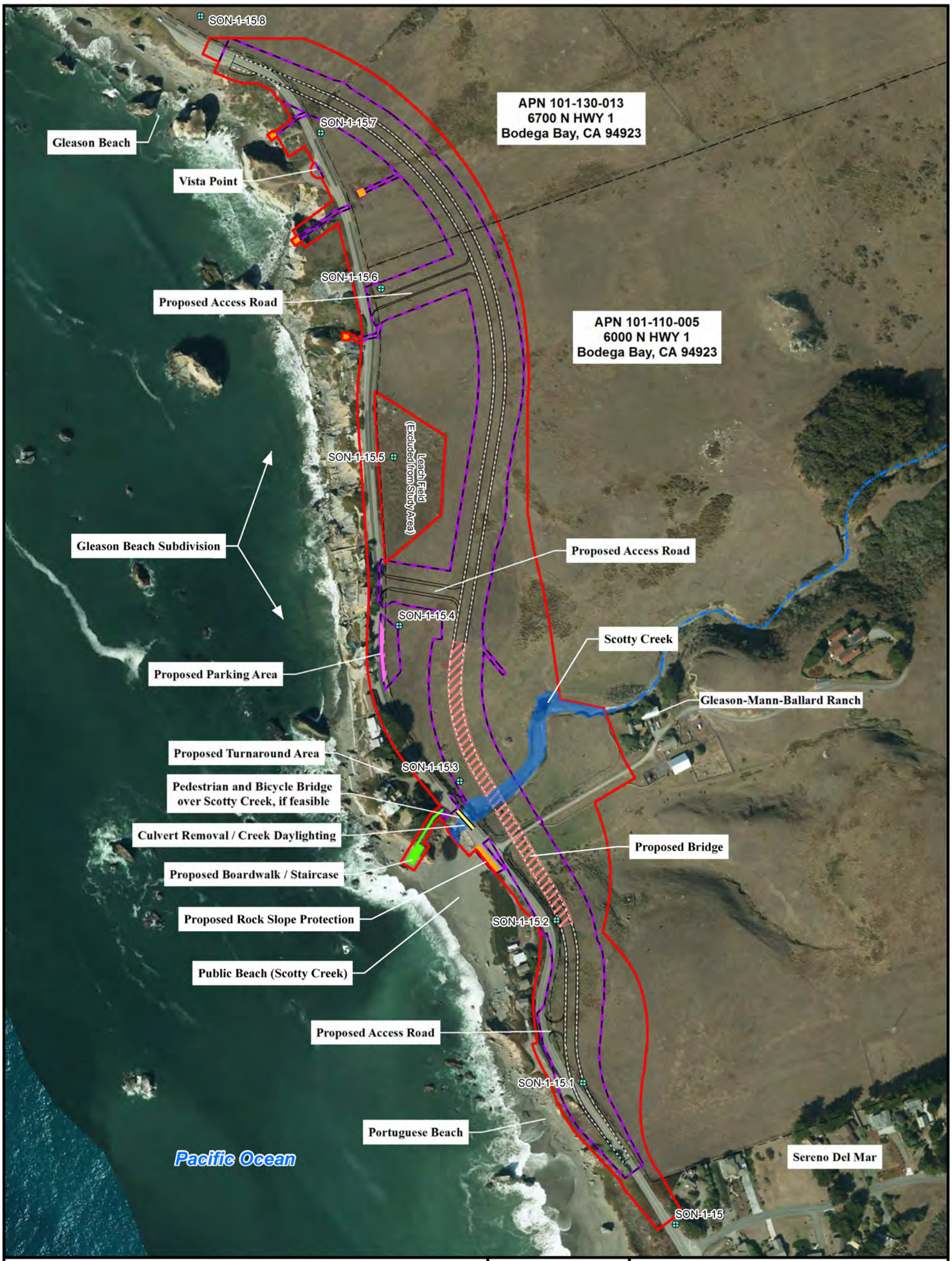
The 2014 State Highway Operation and Protection Program (SHOPP) (201.131) would fund this project in the 2017/18 Fiscal Year. The estimated construction cost is approximately $21,000,000 and right-of-way acquisition cost is estimated at $3,000,000.

1.1.1 Existing Facility

SR 1 is a 549-mile-long major north-south State highway that runs along most of the Pacific coastline, with long sections situated on coastal bluffs and others along beaches. Various portions of SR 1 are designated as either Pacific Coast Highway, Cabrillo Highway, Shoreline Highway, or Coast Highway. Its southern terminus is at Interstate 5 near Dana Point in Orange County and its northern terminus is at U.S. Highway 101 near Leggett in Mendocino County. SR 1 also runs concurrently with Highway 101 at some locations, most notably through a 54-mile stretch in Ventura and Santa Barbara Counties, and also across the Golden Gate Bridge near San Francisco. In Sonoma County, SR 1 is categorized as an Eligible California Scenic Highway (not officially designated as a California Scenic Highway).

The proposed project site is located in central coastal Sonoma County just south of Gleason Beach[2] between the coastal towns of Bodega Bay and Jenner (junction with SR 116). The existing SR 1 segment at Gleason Beach parallels the Pacific coast on the western side and is bounded by flat open ranch areas on the eastern side. This segment of SR 1 is not on any major interregional network, but provides access from the San Francisco Bay area to recreational areas, including Sonoma Coast State Beaches, along the Pacific coast. It is an important connector between local residents, visitors, and businesses near Gleason Beach, is the only road connecting several coastal communities, and is critical for access of emergency services to these areas.

[2] The small community of houses along SR 1 on the eroding bluff within the project area is known as the Gleason Beach subdivision. (The "project area" refers to the project footprint, or the area that encompasses all direct and indirect, temporary and permanent effects of the proposed project, including all areas of construction activity, equipment staging areas, and temporary construction easements—identified as the "Project Area" on Figure 1-3.) Sonoma Coast State Park includes a beach named Gleason Beach that is immediately north of the project area, as shown on Figure 1-3. The beach within the project area where Scotty Creek empties into the ocean, and where a public beach access staircase is proposed as part of this project, is sometimes locally referred to as "Gleason Beach" but is in fact an unnamed beach that is not a part of the Sonoma Coast State Park (State Parks 2014).



LEGEND

- Environmental Impact Report / Environmental Assessment Study Area
- Project Area
- Parcels
- Scotty Creek
- Scotty Creek
- Proposed Bridge
- Post Miles
- Proposed Parking
- Proposed Boardwalk / Staircase
- Proposed Rock Slope Protection
- Roadway Realignment
- Proposed Coastal Trail

Note:
Coastal trail alignment is conceptual only

Imagery Source:
Sonoma County 10-11-2013

N

0 250
Feet

Caltrans

FIGURE 1-3
ALTERNATIVE 19A PROPOSED PROJECT ACTIVITIES
Gleason Beach Roadway Realignment Project
Environmental Impact Report / Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

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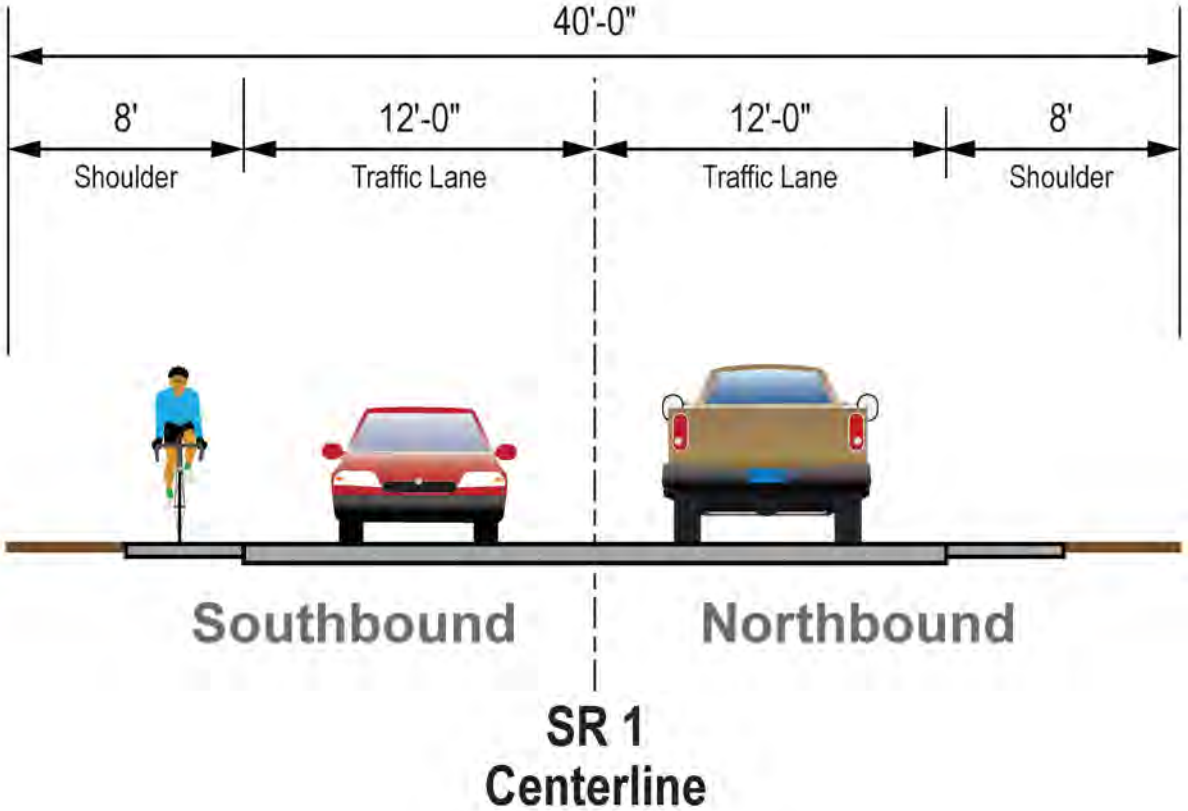

FIGURE 1-4
PROPOSED ROADWAY CROSS-SECTION
Gleason Beach Roadway Realignment Project
Environmental Impact Report/
Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

Caltrans

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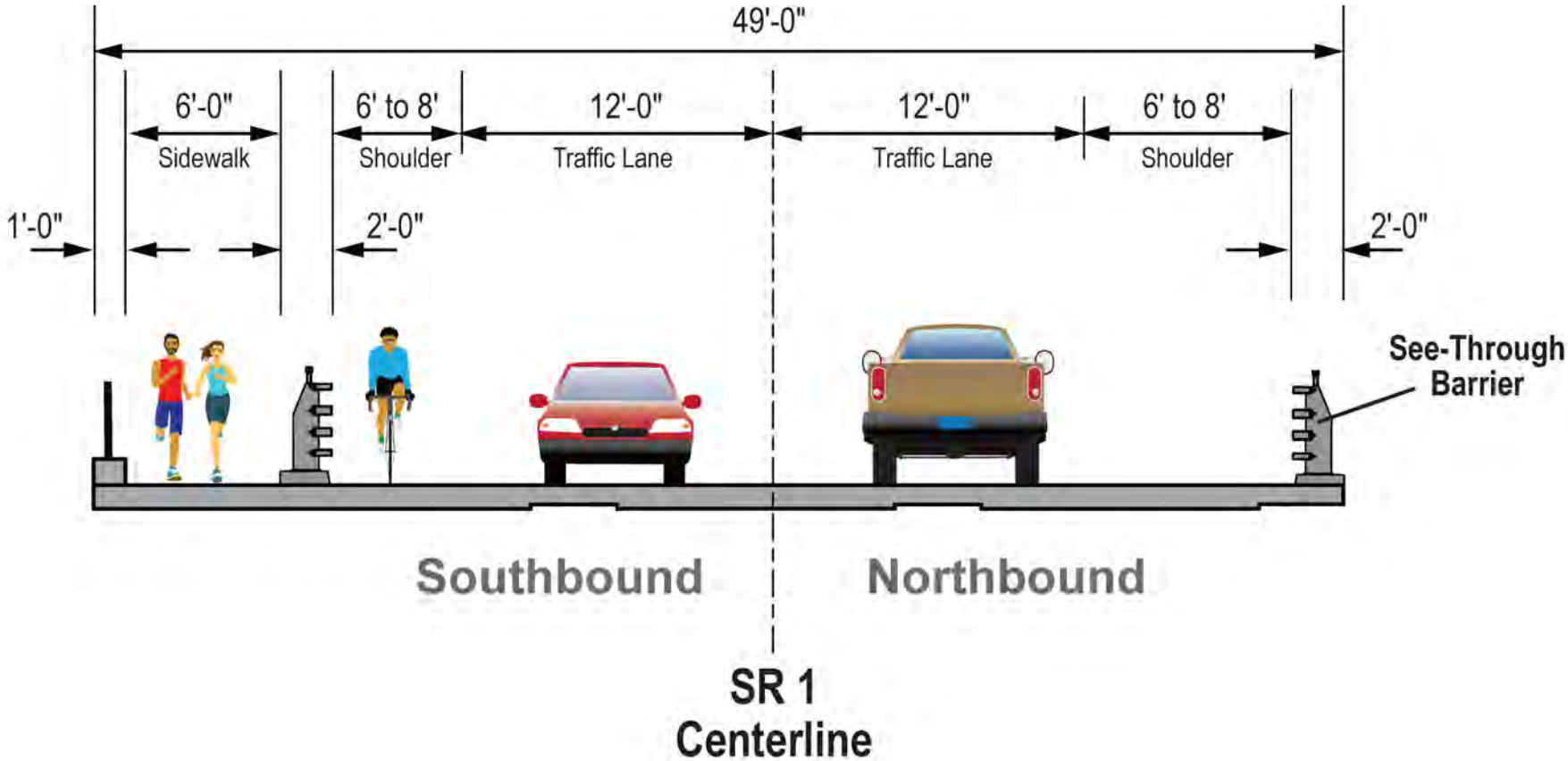


FIGURE 1-5
PROPOSED BRIDGE CROSS-SECTION
Gleason Beach Roadway Realignment Project
Environmental Impact Report/
Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

At the proposed project site, SR 1 is a conventional highway, an approximately 22-foot-wide, two-lane facility with 0- to 2-foot shoulders and 11-foot lanes. SR 1 crosses Scotty Creek at PM 15.30 over the existing 32-foot-long and 21-foot-wide bridge over Scotty Creek, which was built in 1956 and widened in 1959. The bridge consists of two standard double-reinforced-concrete box culverts with flared wing walls and grade-control structure, concrete aprons on both sides, and approximately 10 feet of fill, plus a roadway pavement section. Three storm drain culverts are located within the project limits at PMs 15.52, 15.59, and 15.68.

Existing public utilities located within the project limits include water, sewer (septic systems and a leach field), telephone, electric, gas, and cable line infrastructure.

Existing Traffic. The two-way annual average daily traffic in the year 2014 was 4,430 vehicle trips, and the forecasted 20-year, two-way annual average daily traffic is 5,200 vehicle trips in the year 2034 (Caltrans 2007). Caltrans conducted a speed check for the 2007 Project Study Report (PSR) and identified that the current prevailing speed at the project location is 44 miles per hour (mph) (Caltrans 2007).

1.1.2 Project Background and History

Near Gleason Beach, SR 1 is located on eroding coastal bluffs. Following damage to SR 1 by storms in 1996 and subsequent winters, Caltrans conducted site investigations in 1998 and 2003. A study conducted in 2012 in the vicinity of Gleason Beach revealed that the rate of historical coastal erosion in this area is 1 foot per year and could increase to approximately 1.5 feet per year by 2050 and 4.6 feet per year by 2100 due to sea level rise (Caltrans 2015f). Portions of the roadway are vulnerable to coastal erosion due to ocean wave action along the coastline (Caltrans 2014g). In addition to coastal erosion, SR 1 through the community of Gleason Beach is being undermined by sources such as groundwater seepage and surface water runoff (Caltrans 2015f), which have eroded the coastal bluffs and portions of the roadway within the project limits. Caltrans constructed a retaining wall in the proposed project area in 2004, but the section of roadway adjacent to the retaining wall could be undermined by future coastal erosion (Caltrans 2015f). Recent storms have degraded the roadway further leading to ongoing emergency repair work per Caltrans Director's orders. The adjacent sections of highway are also vulnerable to coastal erosion in future years.

The coastal bluffs at the proposed project location support homes that were built side-by-side beginning in the 1930s. Storms have eroded these bluffs so severely in the

past 15 years that some homes have fallen down the face of the bluffs and other homes are at risk. As of January 2015, 10 of the 21 original homes immediately north of Scotty Creek within the project limits have been demolished. Of the remaining 11 homes, one is condemned and one has been declared hazardous.

Evidence of the effects ocean wave action has had on the coastline in the Gleason Beach community is visible in Photographs 1-1 through 1-4.

Photograph 1-1: Coastline bluff erosion and pavement failure (Photo taken March 9, 2010)

Photograph 1-2: Exposed foundation piles of a house removed from the coastal bluff (Photo taken March 9, 2010)

Photograph 1-3: Pavement failure along southbound SR 1 (Photo taken March 2016)

Photograph 1-4: Exposed utilities along southbound SR 1 (Photo taken March 2016)

1.2 Purpose and Need

1.2.1 Project Purpose

The purpose of this project is to protect SR 1 from coastal erosion while maintaining SR 1's long-term regional and local connectivity for the surrounding communities.

1.2.2 Project Need

Along the Gleason Beach section of SR 1 in Sonoma County, coastal bluff erosion is threatening the stability of the highway. The historical coastal bluff erosion rate at the locations adjacent to the project site is about one foot per year. Efforts at preserving the roadway in place using piles are expected to be only temporarily effective, due to the continual erosion of the coastline. No stabilization measures, including piles, can stave off erosive effects along the coastline. In addition, several seawalls installed at the toe of the bluff are still in place, resulting in an uneven coastline unsuitable for constructing an engineered revetment (i.e., structure to protect and stabilize the cliff face).

1.2.3 Independent Utility and Logical Termini

Logical termini for a project are defined as rational end points for transportation improvements. These rational end points should facilitate a thorough review of the environmental effects. A project with independent utility is defined as improvements that are usable and provide a reasonable expenditure even if no additional transportation improvements are made in the area.

Federal Highway Administration (FHWA) regulations (23 Code of Federal Regulations [CFR] 771.111[f]) require that the action evaluated (project):

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made); and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The project limits extend from SR 1 PMs 15.1 to 15.7. The proposed project has independent utility in and of itself, providing a long-term physically stable segment of SR 1 by relocating it several hundred feet inland, thus protecting it from erosion resulting from severe storm wave action. The viability of SR 1 in this area of the Sonoma coast would be preserved by relocating this segment of SR 1. The expense required to implement the project would ensure connectivity of SR 1 with points north and south of the project limits.

1.3 Project Description

The proposed project is located in a rural coastal area in unincorporated Sonoma County, California, between PMs 15.1 and 15.7, immediately southeast of Gleason Beach, and would move SR 1 several hundred feet inland. The project location is approximately 5 miles north of Bodega Bay, California, and is within the Duncans Mills U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The proposed project crosses the Scotty Creek channel.

The proposed project would construct a two-lane roadway and a bridge spanning Scotty Creek to provide a long-term physically stable segment of SR 1. The design of the alignment would provide the same level of capacity for SR 1 users as the existing

alignment, preserve scenic views for SR 1 users, and avoid as many sensitive areas as possible. Once the project is completed, traffic would be diverted to the new roadway.

As noted above, the new SR 1 alignment would consist of one 12-foot lane with a 4-foot paved and 4-foot unpaved shoulder in each direction. The bridge portion of the alignment is planned to be 49 feet wide with one 12-foot lane and a 6- to 8-foot shoulder in each direction. The bridge would also include a 6-foot-wide sidewalk in the southbound direction to accommodate pedestrian access, with see-through barriers on both sides of the bridge comprising the remaining approximately 3 feet of alignment width. The new roadway would replace the current alignment and would provide the same level of capacity for SR 1 users as the existing alignment. The new proposed alignment is wider than the existing approximately 22-foot-wide alignment and would require embankment cut and fill. The new bridge structure spanning the Scotty Creek floodplain would be approximately 900 feet long.

The existing box culverts and grade-separation structure at Scotty Creek would be removed along with portions of the existing adjacent roadway and the creek daylighted (i.e., returned to a more natural open channel after having previously been confined within the culverts). The proposed project would also include three access roads to connect sections of the existing SR 1 alignment to private residences, a public access parking pad, one vehicle “turnaround” area on existing SR 1, and a boardwalk and stairway providing public access to the beach. Existing rock slope protection (RSP) around the headwall outlet of Scotty Creek would be repaired and replaced as needed with RSP or other feasible shoreline protection. The RSP installation would extend south along existing SR 1 to protect the roadway, access to a private driveway, and public beach access. The RSP would help stabilize the existing roadway against erosive forces. The proposed RSP would be located almost entirely on Caltrans right-of-way, with a minor encroachment onto private land. The proposed RSP would not encroach onto the public beach.

Where the new alignment crosses the Scotty Creek channel, a new bridge and abutments would be constructed. The maximum height of the structure over existing ground would be 28 feet. See-through bridge rail would be constructed at the edge of the bridge structure to preserve views for SR 1 users. The bridge elevation of 28 feet was designed at a height to account for projected water elevations and sea level rise during a 50-year event plus freeboard. The height of the bridge also accounts for driveway access under the bridge to the Gleason-Mann-Ballard ranch property. Refer

to Section 3.2.6 for a discussion of Climate Change and Sea Level Rise assessment for the proposed project.

The proposed project would also accommodate pedestrian and bicycle access along the proposed SR 1. Currently, the California Coastal Trail (CCT), which is coincident with SR 1 within the project limits, consists of a network of public trails for walkers, bicyclists, and others along the 1,200 California coastline. Near Gleason Beach, pedestrians and bicyclists share the roadway with vehicles or use the shoulders. Project implementation would provide enhanced recreational access, given that the widened shoulders of the new SR 1 and the sidewalk provided on the new bridge would be available to bicyclists and pedestrians, respectively, traveling through the proposed project area.

Caltrans is coordinating with the California Coastal Commission and Sonoma County to enhance public access while meeting the purpose and need of the project. Since the circulation of the Draft EIR/EA, Alternative 19A has been identified as the Preferred Build Alternative and has undergone further refinement of project details. Project details include construction of a pedestrian and bicycle bridge over Scotty Creek, if feasible, that would connect the northern and southern remnants of SR 1 following removal of the box culverts. Caltrans will also explore the feasibility of providing a footpath in between the pre-existing SR 1 and proposed SR 1 in the next phase of the project.

Caltrans has also continued to provide residents and stakeholders with project updates. An informational flier was mailed to residents of Bodega, Bodega Bay and Jenner in March 2016 and a public outreach meeting was conducted on April 12, 2016 in Bodega Bay to provide residents and other stakeholders with project updates. Caltrans will continue to coordinate with all related entities as it further refines the project during the next phase project phase.

The remnant alignment of SR 1 could be used as an alternate bicycle and pedestrian route through the proposed project area, reachable over the new access roads until a time when coastal erosion is extensive enough that the remnant alignment is no longer usable. To maintain coastal access to the beach for vehicle users, a parking pad would be constructed north of Scotty Creek and adjacent to the existing roadway. In addition, a boardwalk and stairway structure would be constructed to provide beach access from the remnant SR 1 alignment. Upon completion of the new SR 1 alignment, the remnant alignment would continue to be owned and managed by

Caltrans (subject to future discussions with Sonoma County and other agencies), and Caltrans would continue to provide right-of-way access.

1.3.1 Project Alternatives

Throughout the planning process, several alignments were identified as capable of meeting the goal to protect the highway from bluff erosion through the year 2100, while addressing the purpose and need of the project.

Three Build Alternatives and one No-Build Alternative were under consideration in the Draft EIR/EA (Caltrans 2015g). The No-Build Alternative would retain all the existing facilities unchanged (see the No-Build Alternative subsection below), and none of the project features described under the Build Alternatives would be constructed.

This section describes design features that are common to the Draft EIR/EA Build Alternatives and those specific to each alternative.

For additional information on the alternatives screening process that identified the Build Alternatives from among the 21 design alternatives initially considered, see Section 1.3.4, Alternatives Considered but Eliminated from Further Discussion Prior to the Draft EIR/EA (Caltrans 2015g).

COMMON DESIGN FEATURES OF THE BUILD ALTERNATIVES

Construction of Road Surfaces and Ancillary Facilities

All three Build Alternatives that were evaluated in the Draft EIR/EA (Alternatives 19A, 19B, and 20) would include laying down a new roadbed and spanning the Scotty Creek channel with a bridge. The northern portion of the alignment would follow an 850-foot-radius curve designed for a maximum design speed of 50 mph, with the bridge and southern portion of the alignment designed for a speed of 40 mph. The existing SR 1 roadway would be widened for a vehicle turnaround near the location of the existing culverts over Scotty Creek. All alternatives would include a 12-foot lane with 6- to 8-foot wide shoulders in each direction. Drainage systems (e.g., cross culverts) would be constructed where needed at cut slopes, fill slopes, and retaining walls. The three alternatives would also include construction of three access roads to connect to the old alignment, a boardwalk (including stairway) providing access from the existing SR 1 alignment to the beach, providing a turnaround and a dedicated parking pad. The bridge structure would span the Scotty Creek channel, and the existing box culverts and grade-separation structure at Scotty Creek would be

removed. Removing the box culvert and grade-separation structure is expected to improve the flow of Scotty Creek and thus have a beneficial effect upon the creek.

To construct the new pavement section, the path of the new alignment would be cleared and grubbed, and a bulldozer with a scraper and a compactor would be used to excavate or fill the original ground as necessary. Excavation depth for the pavement section would be up to 2 feet from the proposed finished roadway surface. The structural section would be built up by placing pavement structural sub-base and base layers (combinations of graded rock and sand) along the new alignment. These base layers would be overlain with hot-mix asphalt, and each layer would be compacted after application. A shallow section of existing asphalt concrete adjoining the new structural section would be removed and replaced with new asphalt concrete at the same time to make a smoother join.

The existing roadway alignment that would remain may have existing pavement removed and replaced with new hot-mix asphalt, depending on its condition. This may be completed by grinding down the pavement surface by a maximum of 3 inches using a grinder, and resurfacing with an asphalt concrete mixture. The resurfacing sections would extend to PM 15.7, where a barrier to motor traffic would be located.

Bridge

A new bridge would be constructed where the new alignment crosses the Scotty Creek channel and would free span the channel. The bridge would consist of up to eight spans, each span supported by columns with pile footings. The maximum height of the structure over existing ground would be 28 feet. Both the northbound and southbound lanes would be 12 feet wide with 6- to 8-foot-wide shoulders. Abutments connecting the structure to the pavement section would be constructed at both ends. Abutments and bridge columns would be on pile footings with a maximum depth of 70 feet.

The bridge would be constructed using cast-in-drilled-hole (CIDH) piles. For CIDH piles, holes 10 feet in diameter would be drilled using a rig-mounted auger. Structural steel would be placed in the holes and the holes would be filled with concrete to cast the column footings. Forms would be placed around the structural steel, extending out of the footings and filled with concrete to construct the abutments and columns. The roadway section would be pre-cast or cast in place onto the base sections and barrier rail mounted. With the construction of the new SR 1 bridge, the existing box culverts would be removed.

Grading and Fill

The roadway would be graded and filled to varying degrees depending on the location. Engineered fill and/or native material would be installed using dump loaders and compactors. Where space allows, the final 18 inches of fill would be stockpiled native topsoil or imported topsoil, to which erosion control and hydroseeding with an appropriate seed mix would be applied. Slopes would be designed to be 2:1 or flatter.

Box Culvert/Bridge Removal

The existing box culverts and grade-control structure on the existing SR 1 alignment at Scotty Creek would be removed. The box culverts are a pair of double-reinforced-concrete boxes; a grade-control structure is an earthen, wooden, or concrete structure used to prevent gully development and bed erosion. They are typically built on minor streams or part of a dam spillway to pass water to a lower elevation while controlling the energy and velocity of the water as it flows through the area. Before removal, a temporary water diversion structure, which may include a cofferdam and bypass pipe, would be installed. In addition to the box culverts, portions of the existing roadway would be removed to the maximum extent possible while maintaining the stability of the roadway, which would remain open to traffic through project construction.

In addition, an existing slipout along existing SR 1 from the Scotty Creek culverts to 145 feet south undermines the toe of the embankment slope and creates a vertical drop of about 8 to 12 feet deep on the western (southbound) side of the roadway. Some of the existing RSP around the headwall outlet of Scotty Creek has been buried in sand or washed away. The compromised RSP would be repaired or replaced with other feasible shoreline protection. If addressed by repairing the RSP, this would be done by excavating the loose slide material at the bottom of the slide, excavating a 5-foot-deep shear key to increase the sliding resistance of the slope, and backfilling with 2.0- and 0.5-ton RSP over RSP fabric, with a side slope of 1.5:1. The existing shoulder area would be repaved to direct the surface runoff away from the slipout area. As noted above, the RSP installation would extend south along existing SR 1 to protect against erosive forces.

Drainage

Drainage systems (e.g., cross culverts) would be constructed where needed at cut slopes, fill slopes, and retaining walls. Three 36-inch pipe culverts would be constructed and would cross under the proposed roadway. The lengths of the culverts would vary, and temporary effects would result from installation (Table 1-1).

Table 1-1 Drainage Features

Parameter	Size of Drainage Features		
	PM 15.60	PM 15.65	PM 15.70
Length	90 feet	200 feet	120 feet
Permanent Drainage Features Area	270 ft^2/0.006 acre	600 ft^2 /0.014 acre	360 ft^2/0.008 acre
Temporary Construction Area	130 ft^2/0.003 acre	130 ft^2/0.003 acre	130 ft^2/0.003 acre

Note:
Temporary drainage feature would be in place only during project construction period.
ft^2 = square feet

The diameters of the existing culverts, located at PMs 15.52, 15.59, 15.68, vary from approximately 8 to 10 inches. The new culverts would be 36 inches or smaller in diameter and constructed of metal, plastic, or concrete with joints constructed to minimize or eliminate leakage and separation. These culverts would convey surface runoff and groundwater from coastal drainages to the bluff face; downdrain pipes would be constructed to convey water into the ocean. If slope conditions allow, the downdrain pipes would be buried approximately 1 foot below ground. Otherwise, the downdrain would be anchored to the slope with metal stakes and cables. If changes in direction are necessary and cannot be accomplished with standard pipe elbows, drainage inlets would be constructed within the shoulder of the existing southbound roadway until a downdrain could be constructed. Once reaching the bottom of the bluff, the downdrains would discharge over native rock.

Construction of pipe culverts would be accomplished by excavating and backfilling as necessary using an excavator to provide a firm and uniform ground surface for placement of the culverts, to place the culverts, and to backfill to the required elevation for the roadway.

For the areas where the new alignment would be constructed on embankment fill, stormwater would sheet-flow to the edge of the roadway where it would flow along an asphalt concrete dike until captured by one or a series of drainage inlets attached to a downdrain that would convey it to a drainage ditch at the toe of the slope. Drainage structures include drainage inlets, pipes, pipe culverts, and rock energy dissipaters (structures used to dissipate energy of water flowing through a culvert, used to reduce erosive force of water) that would be constructed at the outfall end of the downdrain.

To slow coastal erosion at the downdrain location, downdrains would be installed at locations where discharge is currently allowed to run down the bluff. (See Figure 2-3

in Chapter 2 for locations of proposed downdrain features.) The downdrains would extend to the toe of the bluff and would have rock slope protection or other energy dissipation improvements to minimize the erosion of the beach at the toe as well as the bluff itself.

Guardrailing

Midwest Guardrail System barrier rail would be placed along both sides of the roadway edge at the beginning and end of the new bridge over Scotty Creek and along the access road to the Gleason-Mann-Ballard Ranch. The bridge portion of the proposed SR 1 roadway would have a see-through barrier rail. See-through barrier would also be placed

Utilities

Approximately six utility poles would be relocated to an alignment outside the embankment fill or cut slopes. Underground utilities (electric, gas, telephone, television, cable, sewer, and water) serving the homes at Gleason Beach would require relocation. Affected areas would include the northern and southern conforms, the existing box culverts at Scotty Creek, and the access roads where they conform to the existing roadway. Trenches for the relocated underground utilities would be about 5 to 15 feet deep and up to 4 feet wide.

Right-of-Way Requirements

The existing right-of-way along SR 1 does not accommodate the three Build Alternatives, and Caltrans would therefore need to acquire additional right-of-way for the proposed new SR 1 alignment, as well as temporary construction easements. The land to be acquired for any of the three Build Alternatives is held by multiple owners and is zoned for agricultural use. The proposed property acquisition is not in an area where there are existing structures or improvements. No displacement of any residences or businesses would be required. Refer to Section 2.1.4, Community Impacts, for a complete discussion of the impacts to the local community that would result from these right-of-way acquisitions.

Construction Scheduling

Project construction is currently scheduled to begin as early as June 2018 and is anticipated to last approximately 240 working days. Work along Scotty Creek would be conducted only under dry weather conditions to minimize effects to biological resources. Work would be limited to daylight hours each day, and SR 1 would remain open during the entire period of construction activities.

Staging and Environmentally Sensitive Areas

The project areas analyzed in this Final EIR/EA with FONSI encompass areas needed for construction, such as areas for staging, stockpiling of construction materials, construction equipment, and vehicle parking. The contractor could use all areas of the new alignment where the new pavement structural section, new embankment fill, and/or new drainage ditches would be constructed, as well as areas of the existing alignment not needed by local traffic, subject to Caltrans standard specifications, permit conditions, and the terms of the project Stormwater Pollution Prevention Plan (SWPPP). Some areas within the project area would be designated and flagged as environmentally sensitive areas (ESAs), which the contractor may not enter.

UNIQUE FEATURES OF BUILD ALTERNATIVES

Build Alternative 19A

Alternative 19A (see Figure 1-3) would construct a 3,700-foot roadway and have its southern terminus 1,000 feet to the south of the existing Scotty Creek Bridge. The new bridge section would be approximately 900 feet long and planned as 49 feet wide, including a 12-foot-wide lane and a 6- to 8-foot-wide shoulder in each direction and a 6-foot-wide sidewalk in the southbound direction, with see-through barriers making up the remainder of the width. The existing box culverts and grade-control structure on the existing SR 1 alignment at Scotty Creek would be removed and in its place, a pedestrian and bicycle bridge would be built over Scotty Creek, if feasible. Beginning from the south, the new alignment would proceed as follows: the new SR 1 would begin veering away from the existing SR 1 right-of-way at a point just north of the Carmet neighborhood and immediately east of Portuguese Beach. Almost immediately after it would fully separate from the existing alignment, the southern-most access road would be built, connecting the new SR 1 with existing SR 1. Continuing north, the new bridge structure would begin just past the southern-most Gleason Beach houses proceeding north in a gentle S-shape, then passing over the Gleason-Mann-Ballard Ranch entrance road and touching down east of the proposed automobile parking area. From this location and to the northern end of the new SR 1, Alternative 19A follows the same alignment as Alternatives 19B and 20.

Build Alternative 19B

Alternative 19B (see Figure 1-6) would construct a 3,800-foot roadway and have its southern terminus 1,200 feet to the south of the existing Scotty Creek Bridge. The new bridge section would be 900 feet long. Beginning from the south, the new alignment would proceed as follows: the new SR 1 would begin veering away from the existing SR 1 right-of-way at a point just north of the Carmet neighborhood and

immediately east of Portuguese Beach. Almost immediately after it would fully separate from the existing alignment, the southern-most access road would be built, connecting the new SR 1 with existing SR 1. Continuing north, the new bridge structure would begin just past the southern-most Gleason Beach houses proceeding north, then would pass over the Gleason-Mann-Ballard Ranch entrance road and touch down east of the proposed automobile parking area. From this location and to the northern end of the new SR 1, Alternative 19B follows the same alignment as Alternatives 19A and 20.

Build Alternative 20

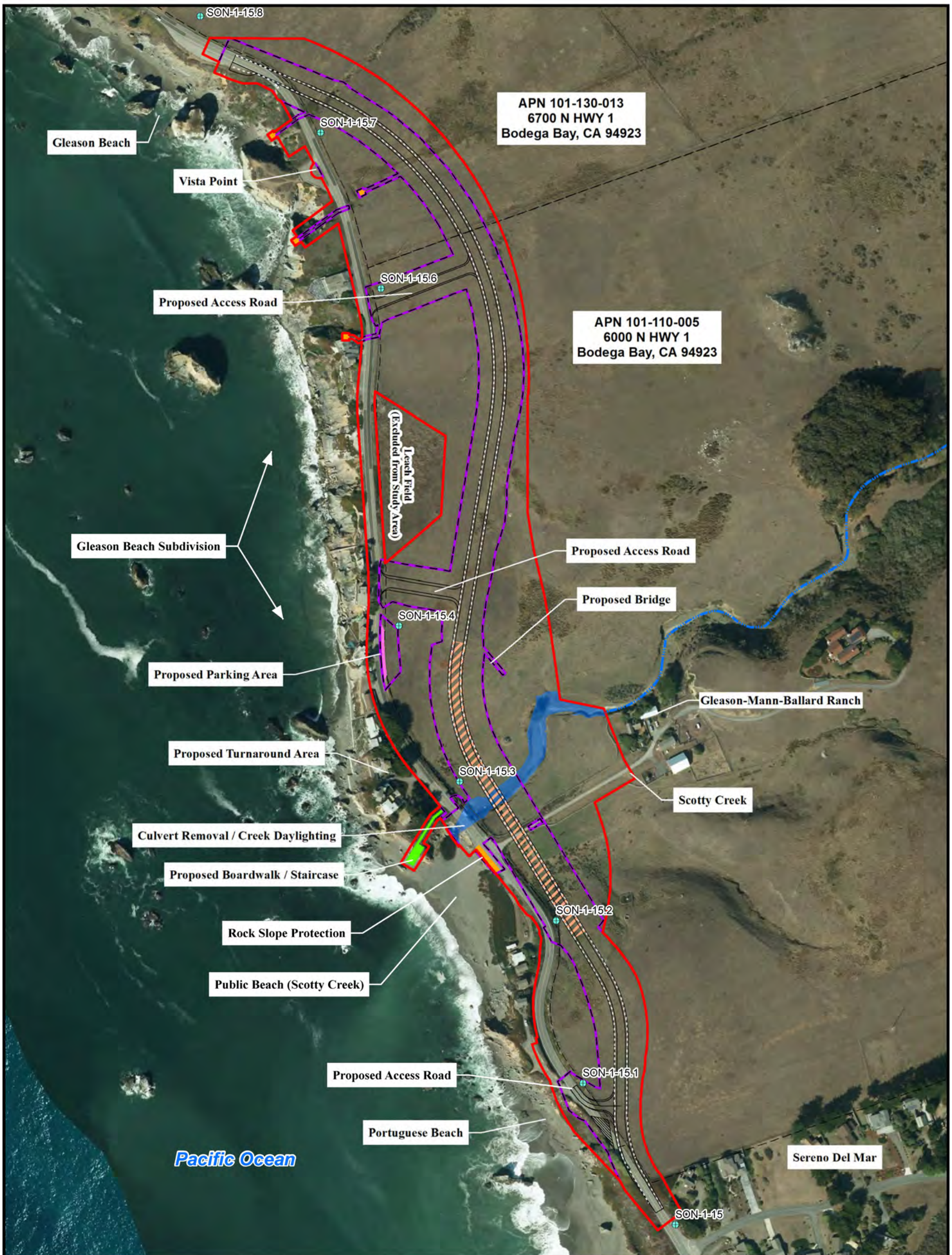
Alternative 20 (see Figure 1-7) would construct a 3,000-foot roadway and have its southern terminus 500 feet to the south of the existing Scotty Creek Bridge. The new bridge section would be 750 feet long, and at the Gleason-Mann-Ballard Ranch, extends the farthest east of the three. Beginning from the south, the new alignment would proceed as follows: the new SR 1 would begin veering away quickly from the existing SR 1 right-of-way at a point just east of the southern-most Gleason Beach houses. Upon touching down east of the proposed parking area, the alignment from this location to its northern end would be the same as Alternatives 19A and 19B.

For Alternative 20 only, along the southern-most access road, one retaining wall would be constructed at the location shown on Figure 1-7, to retain embankment fill. For illustrative purposes, Figure 1-8 provides a photograph of a retaining wall design that would be constructed as part of this alternative.

NO-BUILD ALTERNATIVE

Under the No-Build Alternative, no reconstruction of SR 1 through the project area would occur. To ameliorate the effects of continued erosion on SR 1, it is likely that other measures, such as installation of retaining walls, would be needed to maintain the viability of this segment of SR 1. These projects would be the subject of separate environmental review. These projects would only delay, not permanently prevent, the inevitable loss of additional coastline. The loss of coastline and the associated loss of SR 1 would affect the ability of local residents, businesses, and visitors to reach their destinations. In this case, no action per the No-Build Alternative would result in adverse environmental effects. In addition, the No-Build Alternative would not result in beneficial effects of the proposed project, including daylighting of Scotty Creek.

The No-Build Alternative is the baseline for comparing environmental effects of the Build Alternatives under NEPA and CEQA.



LEGEND

- Environmental Impact Report / Environmental Assessment Study Area
- Project Area
- Parcels
- Scotty Creek
- Scotty Creek
- Bridge
- Post Miles
- Proposed Parking
- Proposed Boardwalk / Staircase
- Rock Slope Protection
- Roadway Realignment
- Proposed Coastal Trail

Note:
Coastal trail alignment is conceptual only

Imagery Source:
Sonoma County 10-11-2013

N

0 250
Feet

Caltrans

FIGURE 1-6
ALTERNATIVE 19B PROPOSED PROJECT ACTIVITIES
Gleason Beach Roadway Realignment Project
Environmental Impact Report / Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

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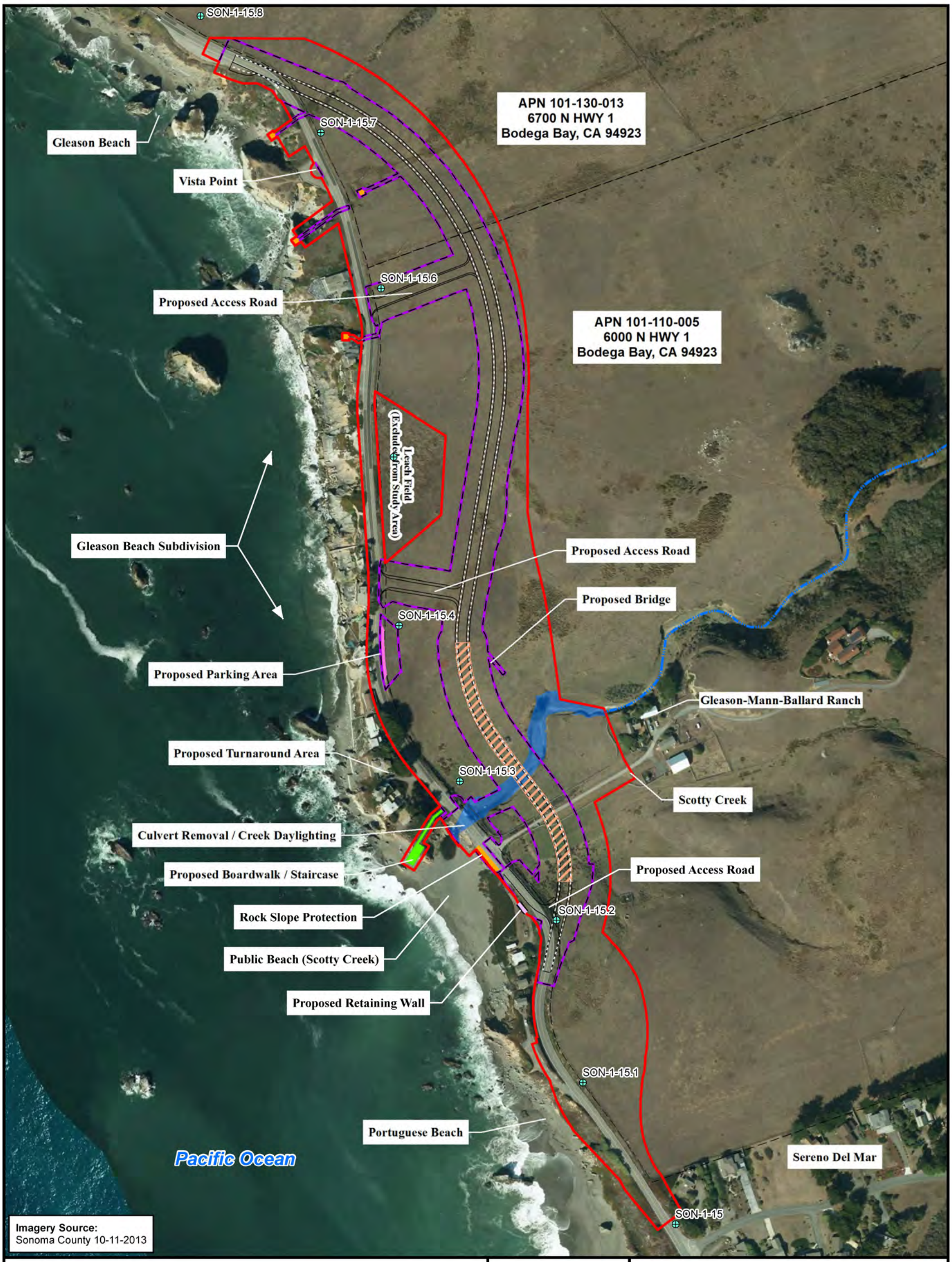

LEGEND

- Environmental Impact Report / Environmental Assessment Study Area
- Project Area
- Parcels
- Scotty Creek
- Scotty Creek
- Bridge
- Post Miles
- Proposed Parking
- Proposed Boardwalk / Staircase
- Rock Slope Protection
- Roadway Realignment
- Proposed Retaining Wall
- Proposed Coastal Trail

Note:
Coastal trail alignment is conceptual only

Imagery Source:
Sonoma County 10-11-2013

N

0 250
Feet

Caltrans

FIGURE 1-7
ALTERNATIVE 20 PROPOSED PROJECT ACTIVITIES
Gleason Beach Roadway Realignment Project
Environmental Impact Report / Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

BAOFPP01 C:\PROJ\CALTRANS\666239_D4ENVONCALL2015-2018\TO6_GLEASONBEACH\GIS\MAPFILES\2016\EIR\JUNE\FIGS-7_ALT20_PROPOSED_PROJECT_ACTIVITIES.MXD CARCHER 6/16/2016 4:14:12 PM

FIGURE 1-8
TYPICAL RETAINING WALL DESIGN
Gleason Beach Roadway Realignment Project
Environmental Impact Report/ Environmental Assessment
State Route 1
Post Mile 15.1-15.7, EA 0A0200
Sonoma County, California

1.3.2 Final Decision Making Process

This Final EIR/EA with FONSI incorporates input from comments that were received on the Draft EIR/EA from the public and reviewing agencies and identifies the preferred project alternative. The responses to comments received on the Draft EIR/EA are presented in Section 4.3.3, Public Comments and Responses to Comments. Changes that were made to the Draft EIR/EA are denoted with a vertical line in the left margins of this Final EIR/EA with FONSI.

Caltrans has determined that this Final EIR/EA with FONSI adequately and accurately discusses the need, environmental issues, and effects of the proposed project as well as appropriate avoidance, minimization, and/or mitigation measures to offset these effects, and provides sufficient evidence and analysis to determine that an Environmental Impact Statement is not required. If the decision is made to approve the project, a Notice of Determination will be filed with the State Clearinghouse in compliance with CEQA, and Caltrans will issue a FONSI in compliance with NEPA. A Notice of Availability of the FONSI will be filed with the State Clearinghouse in compliance with Executive Order (EO) 12372.

1.3.3 Identification of the Preferred Build Alternative

After evaluation of the benefits and effects of the Build Alternatives analyzed in the Draft EIR/EA, Caltrans has identified Build Alternative 19A as the Preferred Build Alternative because it meets the project purpose and need and it is the Wetlands Only Practicable Alternative. See Section 1.3.4 for an overview of all the project alternatives studied. Final identification of the Preferred Build Alternative (the Build Alternative presented in this Final EIR/EA with FONSI) occurred after the public review and comment period, as described above.

Avoidance, Minimization, and/or Mitigation Measures

The Preferred Build Alternative includes a number of measures that are considered part of the project design that would avoid and minimize effects, to the maximum extent possible, to sensitive species and their habitats within the project study limits. These measures include biological monitoring, worker environmental awareness training, prevention of wildlife entrapment, wildlife exclusion fencing, pre-construction surveys, and other specific measures that would be implemented prior to and during construction activities, and would be included as part of the special provisions of the bid package for the project. These measures are described in full detail in Chapter 2, Avoidance, Minimization, and/or Mitigation Measures, and in

Appendix F (Avoidance, Minimization and/or Mitigation Summary) of this Final EIR/EA.

1.3.4 Alternatives Considered but Eliminated from Further Discussion Prior to the Draft EIR/EA

ROCK SLOPE PROTECTION REVETMENT

An RSP revetment would consist of large diameter (greater than 6 feet), heavy (8-plus tons) rocks placed in a shear key at the toe of the bluff. This revetment would lessen the impact of wave action on the bluff and provide support for existing SR 1 through the project limits. Similar systems have been installed along coastal highways and have performed well; however, this particular location is not well suited for mitigation using an RSP revetment (Caltrans 2015e).

SR 1 ranges in elevation from 45 feet to almost 75 feet along the impacted area, which is about 750 feet in length. Several homes along this stretch of roadway have been destroyed or have been deemed uninhabitable. Many of the properties contained improvements such as sea walls that are still wholly intact in place or are in pieces at the toe of the bluff. This has created an uneven local coastline that is unsuitable for constructing an engineered revetment. Existing improvements would have to be completely removed to construct a shear key. Without this shear key, the revetment would be unstable and wave action would work to undermine the toe.

In addition, the current top of bluff is as close as 30 feet from the high tide line. Storm surges routinely produce wave action that affects the top of bluff. This would require a revetment that is nearly to the top of the bluff. This would place the toe of any proposed revetment within the surf zone. This is not a constructible solution. Furthermore, wave energy along this stretch of coast, while not calculated here, appears based on existing damage to be large enough to make even a large RSP revetment unstable. Future effects due to climate change have not been calculated, but it can be assumed that any sea level rise would negate any positive short-term effects a revetment may provide (Caltrans 2015e).

As an RSP revetment will not mitigate the effects from ongoing and future wave erosion, and it is not a suitable alternative to support the roadway, this alternative has been removed from further consideration.

RETAINING WALL

Retaining walls have been used on SR 1 to support the roadway in locations where it has been undermined due to landslide activity. However, in this area, coastal erosion

removes significantly more material and much faster than terrestrial landslides. A segmental pile wall (soldier piles evenly spaced with arching soil in the intervening space) currently lies along the shoulder of southbound SR 1 within the project limits. This was installed as a temporary measure to provide short-term support for the roadway. Erosion has been severe enough that the piles are exposed along much of its length (Caltrans 2015e).

An anchored CIDH or soldier pile wall could be constructed along the entire length of the failed bluff. The cliff face would need to be evened out to construct the wall. Wall construction would also require drilled holes to be filled with a rebar cage or H-beam and concrete at regularly spaced intervals. The intervening space would be filled with lagging of either concrete or wood with an additional concrete facing. Post-tensioned ground anchors would be installed under the roadway to support the wall face.

Due to the height of a soldier pile wall, multiple rows of anchors would be required. However, any wall that goes down to the beach will become undermined by erosion and it is not certain what type of protection system (such as an RSP revetment) would be needed or could work. Because of the infeasibility of construction, the expense that such an undertaking would entail, and the extreme improbability of the granting of a Coastal Development Permit from the California Coastal Commission (CCC) for such construction, this alternative has been excluded from further consideration.

REALIGNMENT ALTERNATIVES EXCLUDED FROM FURTHER CONSIDERATION

Realignment Further Inland than the Build Alternatives

Caltrans reviewed the possibility of realigning the roadway further inland than the range of alternatives analyzed in the Draft EIR/EA. Moving the roadway incrementally eastward from the location of the Draft EIR/EA Build Alternatives would potentially require the removal of the Gleason-Mann-Ballard Ranch, a historic property under CEQA, and would potentially require multiple bridges and other structures to traverse the increasingly hilly terrain. It would also potentially require the routing of SR 1 through Carmet, which would have adverse community effects. In general, it would require far greater right-of-way acquisition than the Draft EIR/EA Build Alternatives. Environmental effects were assumed to be correspondingly greater. For these reasons, these alternatives were dismissed from further consideration.

Alternatives for Realignment West of the Gleason-Mann-Ballard Ranch

Overall, 21 Build Alternatives for realignment west of the Gleason-Mann-Ballard Ranch were considered and all but three (evaluated equally in the Draft EIR/EA) were rejected. Table 1-2 documents the 18 Build Alternatives that were eliminated from further consideration, providing a brief description of the alternative and the reason it was eliminated from further consideration.

Table 1-2 Build Alternatives for Realignment West of the Gleason-Mann-Ballard Ranch Eliminated Prior to the Draft EIR/EA

Alternative	Description of Alternative	Reason Alternative Was Rejected
1	Roadway structure built over Scotty Creek only.	Large amounts of new embankment in the Scotty Creek channel would result in hydraulic and environmental concerns.
2	Roadway structure built over the channel, except for Gleason-Mann-Ballard Ranch house driveway, which would connect to SR 1 via an embankment.	Large amounts of new embankment in the Scotty Creek channel would result in hydraulic and environmental concerns. Superseded by Alternative 3.
3	Revision to Alternative 2, providing elevated structure along entire realignment. Raises structure profile to allow ranch house driveway to pass underneath it.	Superseded by Alternative 4.
4	Revision to Alternative 3, aligning part of roadway toward ocean, farther away from bend in Scotty Creek, to address creek scouring concern.	Superseded by Alternative 5.
5	Revision to profile of Alternative 4, which modified shoulder widths on structure.	Superseded by Alternative 6.
6	Revision of Alternative 5, with an access road running parallel to SR 1 realignment, without replacement of Scotty Creek culverts.	Culvert would remain and the parallel access road embankment would be situated within the channel.
7	Revision of Alternative 6, with replacement of Scotty Creek culverts, and all access to SR 1 provided by one roadway at southern end of project.	Culvert would be replaced but not removed. Superseded by Alternative 13.
7M	Revision of Alternative 7, adding an access road at northern end of project.	Culvert would be replaced but not removed. Northern access road not required.
8	Realignment begins north of Gleason-Mann-Ballard Ranch driveway. Only structure would be replacement of Scotty Creek culverts.	Culvert would be replaced but not removed, and would place fill within the channel. Superseded by Alternative 9.
8M	Revision to Alternative 8, adding access road at northern end of project.	Culvert would be replaced but not removed, and would place fill within the channel. Northern access road not required.

Table 1-2 Build Alternatives for Realignment West of the Gleason-Mann-Ballard Ranch Eliminated Prior to the Draft EIR/EA

Alternative	Description of Alternative	Reason Alternative Was Rejected
9	Revision of Alternative 8, extending length of roadway structure to avoid wetland area and placement of fill.	Culvert would be replaced but not removed. Superseded by Alternative 14.
10	Revision of Alternative 7, connecting Gleason-Mann-Ballard driveway and access road to new roadway structure using retaining walls creating four-legged intersection.	Culvert would be replaced but not removed. Superseded by Alternative 15.
11	Revision to Alternative 7, lengthening new roadway structure to see if costs lowered.	Culvert would be replaced but not removed.
12	Revision to Alternative 10, lengthening new roadway structure to see if costs lowered.	Culvert would be replaced but not removed.
13	Revision of Alternative 7, slightly modifying roadway geometrics.	Culvert would be replaced but not removed.
14	Revision to Alternative 9, slightly modifying roadway geometrics.	Culvert would be replaced but not removed. Superseded by Alternative 16.
15	Revision to Alternative 10, slightly modifying roadway geometrics.	Culvert would be replaced but not removed. Superseded by Alternative 17.
16	Revision to Alternative 14, extending roadway structure further south, having a driveway go underneath SR 1. Removal of Scotty Creek culverts.	Determined not feasible/practical as, due to nearby adjacent driveways, cannot raise profile for a driveway without affecting access to other houses. Would require extending structure much further south, and hillside across from houses would have to be removed for driveway access under SR 1, resulting in increased costs. Other alternatives would result in fewer environmental effects.
17	Revision to Alternative 15, based on revised erosion study line. Would relocate ranch access road away from the beach, connecting it directly to SR 1. Removal of Scotty Creek culverts.	Ranch access road embankment in channel. This alternative would have resulted in greater effect to coastal wetlands.
18	Revision of Alternative 14, based on revised erosion study line and flood elevations. Extended alignment further south, following existing alignment over four private driveways.	Does not facilitate provision of a safe facility for motorists, due to uncomfortable design speed of less than 35 mph through beginning design curves.

Transportation System Management and Transportation Demand Management Alternatives

A discussion of Transportation System Management (TSM) and Transportation Demand Management alternatives is not required because the project area is in a rural area and no nearby urban centers with a population of over 200,000 are nearby. Thus,

TSM strategies such as transit, ridesharing, ramp metering, auxiliary lanes and other measures would not meet the purpose and need and are not necessary to increase the capacity/efficiency of SR 1.

1.4 Permits and Approvals Needed

Table 1-3 shows the permits, reviews, and approvals required for project construction. See also Table 4-1 in Chapter 4 for a list of various permitting agencies and coordination meetings regarding the proposed project.

Table 1-3 Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Status
National Marine Fisheries Service (NMFS)	Biological Opinion	Issued on October 18, 2013.
U.S. Army Corps of Engineers (USACE)	Nationwide Permit (anticipated) (CWA Section 404)	When NEPA/CEQA clearance is received, permit application will be submitted.
U.S. Fish and Wildlife Service (USFWS)	Amended Biological Opinion	Issued on May 24, 2016.
California Department of Fish and Wildlife (CDFW)	Lake and Streambed Alteration Agreement (CFGC Section 1602)	When NEPA/CEQA clearance is received, permit application will be submitted.
California Department of Fish and Wildlife (CDFW)	Incidental Take Permit	When NEPA/CEQA clearance is received, permit application will be submitted.
California Coastal Commission (CCC)/Sonoma County	Coastal Development Permit under the Sonoma County Local Coastal Program/CCC	When NEPA/CEQA clearance is received, permit application will be submitted. An amendment to the Local Coastal Program would be required.
North Coast Regional Water Quality Control Board (RWQCB)	Water Quality Certification (CWA Section 401)	When NEPA/CEQA clearance is received, permit application will be submitted.
State Historic Preservation Officer (SHPO)	National Historic Preservation Act (NHPA) Section 106 and California Register of Historical Resources (CRHR) PRC Section 5024 Memorandum of Agreement	Issued on May 25, 2016.
California Coastal Conservancy	Section 4(f) *De Minimis* concurrence	Received on May 16, 2016.
California Department of Parks and Recreation	Section 4(f) *De Minimis* concurrence	Received on April 24, 2016.

Table 1-3 Permits, Reviews, and Approvals Required for Project Construction

Agency	Permit/Approval	Status
Natural Resources Conservation Service (NRCS)	Farmland Conversion Impact Rating Form AD-1006	Received on May 6, 2016.
California Department of Conservation (CDC)	Land Conservation (Williamson) Act	Caltrans will continue to provide the CDC notice as required by the Land Conservation Act.