

Olema Creek Tributary Culvert Replacement Project

MARIN COUNTY, CALIFORNIA
CALTRANS DISTRICT 4
STATE ROUTE 1 – MRN PM 24.67
EA 4S780; Project ID 0400020145

DRAFT Initial Study with Proposed Negative Declaration



Prepared by the
California Department of Transportation

April 2016



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INITIAL STUDY WITH PROPOSED NEGATIVE DECLARATION

04 - MRN - 1

MRN - 1 - 24.7

EA 4S780
ID 0400020145

Dist. - Co. - Rte.

P.M. - P.M.

E.A.

Project title:	Olema Creek Tributary Culvert Replacement Project
Lead agency name and address:	California Department of Transportation 111 Grand Avenue, Oakland, CA 94612
Contact person and phone number:	Eric DeNardo, Environmental Branch Chief (510) 286-5645
Project location:	On State Route 1, 1.8 miles south of Olema, Marin County within boundaries of the Golden Gate National Recreation Area
General plan description:	Transportation
Zoning:	Transportation
Other public agencies whose approval is required (e.g. permits, financial approval, or participation agreements): CEQA Responsible Agencies are denoted with an *:	<ul style="list-style-type: none"> • Biological Opinion from the U.S. Fish and Wildlife Service • Programmatic Biological Opinion from the National Marine Fisheries Service • Access Permit from the National Parks Service • Lake and Streambed Alternation Agreement from the California Department of Fish and Wildlife* • Clean Water Act 404 Nationwide Permit from the U.S. Army Corp of Engineers • Clean Water Act 401 Water Quality Certification from the North Coast Regional Water Quality Control Board* • California State Lands Commission* • California Transportation Commission* • State Historic Preservation Office*

Additional copies of this document, as well as technical studies this document relies on, are available for review at the district office, 111 Grand Avenue, Oakland, CA 94612.


Stefan Galvez-Abadja
Chief, Office of Environmental Analysis
Caltrans, District 4

04/25/2016
Date

Project Information

Project Location

The California Department of Transportation (Caltrans) is proposing the Olema Creek Tributary Culvert Replacement Project (the project) on State Route (SR) 1 in rural Marin County, California, at Post Mile (PM) 24.7, which is approximately 1.8 miles south of the town of Olema (see vicinity map in Figure 1 and SR 1 photos in Figures 2 and 3).

Project Goal

Caltrans proposes to remove and upgrade an undersized and failing drainage system while re-establishing the natural hydrologic regimen¹ that existed before the construction of the roadway embankment, and to restore the creek's function as a salmonid foraging stream. Additionally, this project would meet California Senate Bill 857 (SB 857) which requires that projects programmed after January 1, 2006, to include remediation in the project design if any fish barrier exists; and new projects to be constructed will not create new barriers to fish.

The proposed project involves the removal of the two undersized 24-inch-diameter culverts beneath SR 1 that currently convey intermittent flows from an unnamed tributary of Olema Creek, and constructing a cast-in-place or precast, reinforced concrete, bottomless culvert. Incidental features will include wing walls, reinforced concrete parapets, Midwest Guardrail System (MGS), cable railing, and wildlife fencing.

Existing Conditions

The project area lies within the Coastal Range that borders California's coastline north of San Francisco in Marin County. The specific area is the Olema Valley within which the Golden Gate National Recreational Area (GGNRA) lies to the east of SR 1. The terrain is undulating grassy hillsides with ravines of mixed conifers, deciduous trees and coastal oak trees. The project involves the crossing of an Olema Creek tributary traversing SR 1 from east to west.

Over the course of the years, ponding and sediment deposition have occurred upstream of the culvert and the roadway profile, directly above the culverts, has settled 7 inches. This is because the existing culverts are corroded, cracked, failing, and undersized; therefore,

¹ Hydrologic regimen is the changes over time in the rates of flow of rivers and in the levels and volumes of water in rivers, lakes, reservoirs, and marshes. The hydrologic regime is closely related to seasonal changes in climate.

they create conditions that pose a risk of eroding the embankment on the upstream side (eastside) and from within. The upstream side of the culverts has a cracked concrete headwall (see Figure 4). At the culvert outfall, due to scour there is also a 4-foot drop that has become a barrier to fish passage on this historical salmonid stream (see Figure 5).

At this location, the existing roadway traverses a constructed embankment up to 24 feet in height and 70 feet wide over two culverts that convey tributary storm runoff towards Olema Creek. There are two 80-foot-long, 24-inch-diameter existing culverts; of these, the first 15 feet is made of corrugated metal pipe and the remainder is vitrified clay pipe. There is an elevation difference of approximately 5 feet between the upstream and downstream ends of the culverts. The existing roadway on the embankment is two 12-foot-wide lanes with no shoulders.

Project Description

Proposed Project

The project will replace the existing culverts with a 44-foot-long, cast-in-place (CIP) and/or precast reinforced concrete box (RCB) natural bottom culvert that is approximately 30 feet wide on its interior and approximately 36 feet wide on its exterior. The CIP RCB natural bottom culvert will require soilnail wingwalls in each quadrant extending perpendicularly from the culvert opening to retain the existing embankment slope until the wingwalls meets the existing ground. The soil nail wingwall lengths will vary from approximately 19 feet to 27 feet in length (see the project General Plan No. 1 and Layout Plan L-1 in Appendix E, Project Plans). The visible wingwall heights will vary from approximately a maximum 21 feet on the eastside to 17 feet on the westside. These wingwall lengths and heights are preliminary and subject to revision.

The new culvert will support a roadway with two 12-foot-wide lanes and two 4-foot-wide shoulders, meeting the requirements of the Caltrans Highway Design Manual, Table 302.1 and Section 307.2, for rural roadways. MGS will be installed at the roadway edge of shoulder at a distance of 16 feet from centerline, and parapet walls will be installed at 6 feet beyond the shoulder which will extend from the ends of the culvert to contain the fill material and shoulder backing at the ends of the culvert and wing walls.

The project will remove the existing embankment, culverts, and headwall. An estimated 1,500 cubic yards of non-native embankment material will be removed. Once the culvert is in place, the tributary channel slopes will be generally graded at a 20:1 ratio within the culvert. Clearance inside the culvert from flow line to top of culvert will be approximately 12 feet high on the east side and 14.5 feet high on the west side. A cattle

exclusion fence (that is friendly for wildlife movement) will be installed on the eastern side just beyond the culvert opening and within State right-of-way (right-of-way) and will run up the embankments to join with existing fencing.

Although no additional right-of-way is needed, a temporary construction easement (TCE) will be required for an area measuring approximately 0.22 acre (see Layout Plan L-1 in Appendix E), located on the northbound (east) side of SR 1, immediately outside of the SR 1 right-of-way. The TCE is primarily required to access the underside of the culvert for removal of the embankment material and the existing culverts, but a small area will only be disturbed during regrading to match existing topography (see General Plan No. 1 and Layout Plan L-1 in Appendix E). The TCE is within the GGNRA, which is managed and operated by National Park Service (NPS).

A temporary access road up to 15 feet wide will need to be installed from the roadway down to the bottom of the embankment in order to excavate the embankment, remove the existing culverts, and construct the culvert. The access road is designed to avoid removing two mature coast live oak trees. Gravel may be added to this access road to improve traction. The temporary access roadway will be removed and restored to match existing topography following project construction. The access road within the TCE will be used as a ramp to allow access to excavators, loaders, and dump trucks for excavation. The excavated material will be loaded onto trucks from the north east side of the TCE to haul the material away. Top soil may be preserved to use when restoring disturbed areas after construction.

Where necessary, vegetation within the project limits will be cleared by hand. (The project limits refers to the project footprint, which includes all areas within state right-of-way that will be used for project construction, staging, and access, as well as TCE areas directly impacted by construction activities). Approximately 37 to 58 trees of varying age and trunk diameter will be removed. Attempts to minimize tree removal will include trimming in lieu of removal wherever possible. The removal of trees in the TCE is necessary to create a clear path for construction equipment, haul trucks, and contour grading to restore the channel around the unnamed tributary.

Construction Phasing and Staging

Trees within State right-of-way that are within the project limits and conflict with project construction will be cut and removed down to the stumps between September 1 and October 15th, one year ahead of construction. No grubbing will occur during this time period.

Construction will occur between July 1 and October 15th. This window is designed to avoid both the time of year when protected wildlife is most active and the wet season when construction activities in the creek would have a higher likelihood of impacting areas downstream. The daily construction work period will generally extend from 7 a.m. to 7 p.m.

Construction would be phased, beginning with auger borings for the RCB culvert-wall abutment. This will occur through the existing roadway in one lane at a time, requiring one-lane traffic flow through the project area for approximately 1 week on each side, but avoiding weekend periods (see Stage Construction Plan SC-1 in Appendix E). Once abutments are poured and cured, a temporary bridge surface will be installed on one lane at a time. Once complete, the bridge will allow excavation to occur under the roadway with uninterrupted traffic flow. Excavation would occur from the temporary access road on the east side of the roadway, with material loaded directly into the truck haulers to be removed without requiring stockpiling. Once the excavation is complete, the culvert, lid and wingwalls will be installed. Finally, new road base material and asphalt concrete will be placed above the culvert before regrading and revegetation will occur. More details for each stage are described below.

Conceptual stage construction will be as follows:

1. A one-way reversing temporary signal system will be installed during allowed lane closure hours. The travel lane will be protected from construction activities with a K rail barrier. The signal system will be implemented during construction activities that require lane closures such as mobilization, pile construction, temporary bridge construction, and demobilization. Please see the Traffic Management section below for details.
2. The two culvert abutments will be built in one half (lane) of the roadway at a time. H-Piles will be installed from the existing roadway during a single lane closure. A crane-mounted auger will drill 30-inch-diameter holes, place H-piles into the holes, and backfill with concrete. Any groundwater encountered during H-Pile auguring and pile construction will be dewatered, temporarily stored in tanks onsite and allowed to settle sediment from water before drained into local tributary in controlled flows.
3. The soilnail wingwalls would consist of treated timbers and cast-in-place or precast concrete walls, and the culvert sides and lid would be either cast-in-place and/or precast reinforced concrete or a combination thereof. This construction could include

the use of cement trucks, backhoes, dump trucks, and cranes. At this time, equipment staging would be within the TCE or shoulder staging areas.

4. It is anticipated that an approximately 80-foot-long temporary bridge will be installed on one lane at a time upon the newly cured abutments. Once both sides are installed, the temporary bridge will allow traffic to flow uninterrupted while excavation and construction of the culvert occurs below.
5. Once the temporary bridge is in place over both lanes of the roadway, a diversion of the creek waters will be installed in case summer rains occur and then the embankment will be excavated and the culvert and wingwalls constructed. The existing embankment will be excavated and the existing pipe culverts removed. Excavation would use a backhoe among other equipment to pull the embankment out from underneath the temporary bridge and load directly into a haul truck without requiring stockpiling.
6. MGS will be installed at either side of the roadway. In addition, to protect the public and maintenance crews, cable railing will be constructed behind the MGS and attached to the top of the wingwalls.
7. The temporary bridge will be removed one lane at a time to allow for backfill around and over the culvert lid, and new asphalt concrete (AC) pavement will be poured one lane at a time. Thus the traffic management and temporary signal system will be reinstated for a temporary period (approximately 5 days). Also, one-night of full road closure may be necessary to lay final asphalt.
8. The temporary signal system will be removed and both lanes opened to public traffic.
9. Side slopes from the flow line within the culvert will be graded and contoured to match existing terrain.
10. The temporary access road will be removed and restored.
11. Replanting and hydroseeding will occur immediately following final contour grading using locally sourced plant material as described below in the Restoration section. There will be a minimum three-year plant establishment period; this will entail routine watering and occasional plant replacement if necessary.

Traffic Management

To construct the culvert, one lane of traffic will remain open Monday through Friday. On weekends (Saturday and Sunday) both lanes of the roadway will remain open from noon to 6 p.m.; otherwise, the roadway may be reduced to one lane only, with managed traffic flow. Construction area signs will be placed throughout the project limits with the first one at approximately 1,100 feet in each direction from the culvert construction limits. Flaggers will be used during the initial mobilization and demobilization. The reversing one-way traffic control system mentioned above will be the predominant form of traffic control. This will be accomplished by using a temporary traffic control signal system with reversing one-way traffic (per California Manual on Uniform Traffic Control Devices [MUTCD] Typical Application 12, 2014 edition). The travel lane will be protected from construction staging lane with a K-rail barrier.

The signal system will be powered by a gas generator and include the installation of temporary poles and back-up generators between the signal heads on each end over a length of 1,100 feet; the temporary poles will be spaced approximately 150 feet-200 feet apart. The temporary signal system will consist of approximately eight 12-inch to 18-inch-diameter, 30-foot-long temporary wood poles buried 6 feet deep to carry temporary overhead power lines; these will be placed adjacent to the roadway within State right-of-way. One generator will be stored at one end of the signal system to provide a back-up power source for the temporary signal system. Conduit will be trenched to a length of up to 75 feet from a pole to the generator at each end within the State right-of-way. The temporary signal system, including power poles, will be adjusted within State right-of-way to avoid any Environmentally Sensitive Areas. The temporary signal system will include bicycle loop detectors and/or push buttons for bicyclists.

Stormwater System

During construction, erosion of non-native material into the tributary will be prevented using Best Management Practices including, but not limited to:

- Perimeter control methods (fiber rolls and silt fences) will be placed along the downhill side of haul roads and around excavated areas.
- Temporary stockpiling of embankment material will be avoided; however, native topsoil will be preserved to be re-applied within the project footprint following construction activities and before revegetating.

- During excavation, a combination of coffer dam and flexible culvert will be placed upstream of the construction area limits as a temporary diversion system to prevent soil from entering the stream while excavation is conducted up to the point that culvert removal is necessary.

A permanent drainage system consisting of between 3 to 5 drainage inlets and one downdrain will be constructed at the northwestern quadrant for roadway drainage. The downdrain outlet will terminate prior to reaching the tributary channel with features to prevent scour from the outflow. Roadway surface water will drain by allowing water to sheet flow to the roadway edges where dikes will direct flow to overside drainage features and into the channel.

Utilities

In the project's construction footprint, an AT&T overhead utility line that is in conflict with construction equipment movement will be temporarily relocated by AT&T prior to construction. AT&T will restore the poles to their original locations after construction is completed.

Restoration

After project construction has been completed, all disturbed areas will be contoured to conform to the surrounding landscape and restored by a combination of compost application, re-vegetation with native plants, and hydroseeding with an appropriate native seed mix. If possible, depending on soil investigation to be conducted during design, native topsoil material will be stockpiled onsite and reused as topsoil to encourage native material and vegetation growth. Impacted roadside ditches and associated riparian vegetation for the project will be replanted. More information on specific avoidance and minimization measures are located in Appendix F.

Environmental Setting

The project is in a rural coastal area of Marin County, California, on SR 1 (see Figure 1). The drainage that crosses under SR 1 in the project limits is an unnamed tributary to Olema Creek within the Coastal Mountain Range. The Olema Creek-Lagunitas Creek subwatershed is the largest watershed to drain into Tomales Bay, which lies approximately 6 miles from the project site. This tributary is covered with a riparian canopy cover dominated by the California Bay vegetation. The project area and greater vicinity are mostly undeveloped or rural, characterized by mixed evergreen forest and coast oak woodlands that are dominated by Douglas fir (*Pseudotsuga menziesii*), coast

live oak (*Quercus agrifolia*), box elder (*Acer negundo*), California Bay laurel (*Umbellularia californica*), and California buckeye (*Aesculus californica*).

A 24-foot-high-by-70-foot-wide constructed embankment covers two culverts that convey the unnamed tributary toward Olema Creek. The unnamed tributary traverses beneath SR 1 from east to west through two existing 24-inch-wide culverts towards its confluence with the main stem of Olema Creek approximately 0.25 mile downstream.

Elevations surrounding the project site range from approximately 145 to 225 feet above mean sea level. Open grasslands east and west of the project site show signs of active cattle grazing. A nearby private ranch which is leased from the NPS is located adjacent to the State Right of Way on the east side.

The project site also lies within the Olema Valley Ranch Historic District, which is eligible for the National Register for Historic Places (NRHP). The 13,472-acre Olema Valley/Lagunitas Loop Ranches Historic District consists of 19 ranches, primarily dairy, within Point Reyes National Seashore, which is managed by the NPS. The district was determined eligible for listing in the NRHP on May 20, 2008.

Biological field studies of the biological study area (BSA) for the proposed project were conducted beginning in 2012 and continued through 2015. The BSA consists of an approximately 250-foot radius surrounding the project limits, encompassing an area of approximately 11.7 acres. The BSA and associated vegetation types are shown on Figure 6. The results of these biological studies are discussed in the Biological Resources section of the attached California Environmental Quality Act (CEQA) Checklist.

Consistency with Existing Zoning Plans and Other Applicable Land Use Controls

The project is located on SR 1 in Marin County, and is therefore within the Marin Countywide Plan and the Marin County Local Coastal Program Land Use Plan. This project complies with the stated goals, guidelines, and recommendations of the county's plans, including recommendations for view preservation, the minimization of visual degradation of natural landforms, and the construction of roadways to minimize the impacts of roads on wetlands, streams, and scenic resources. Additionally, this project interacts with the GGNRA lands. The outcome of this project will also be consistent with the Olema Valley Referenced in the Point Reyes National Seashore General Management Plan, (NPS, 1980) which states that the management plan is intended, 'to protect marine mammals, threatened and endangered species , and other sensitive natural resources found within the seashore'.

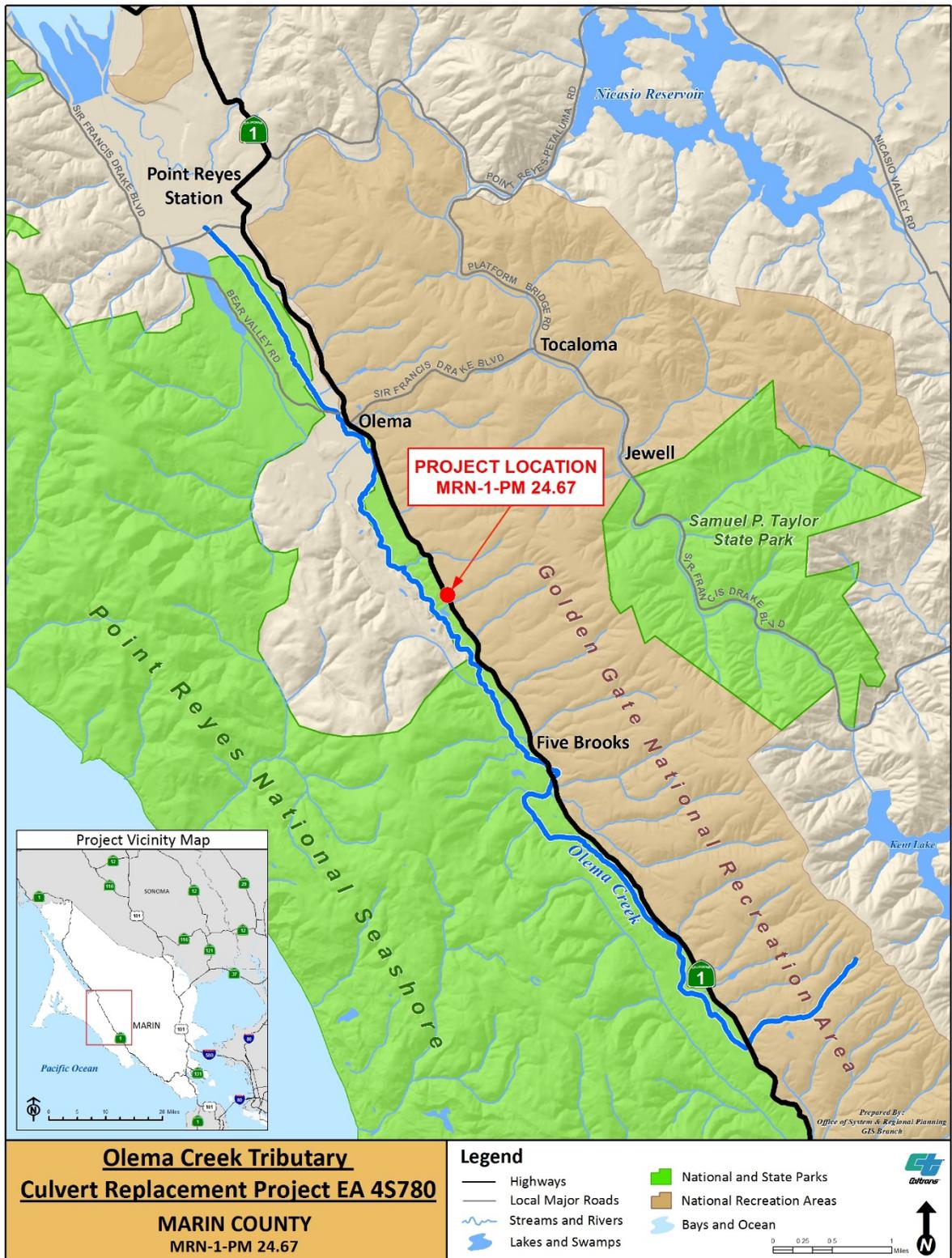


Figure 1. Olema Creek Tributary Culvert Replacement Vicinity Map



Figure 2. Existing Condition Looking Northbound Route 1



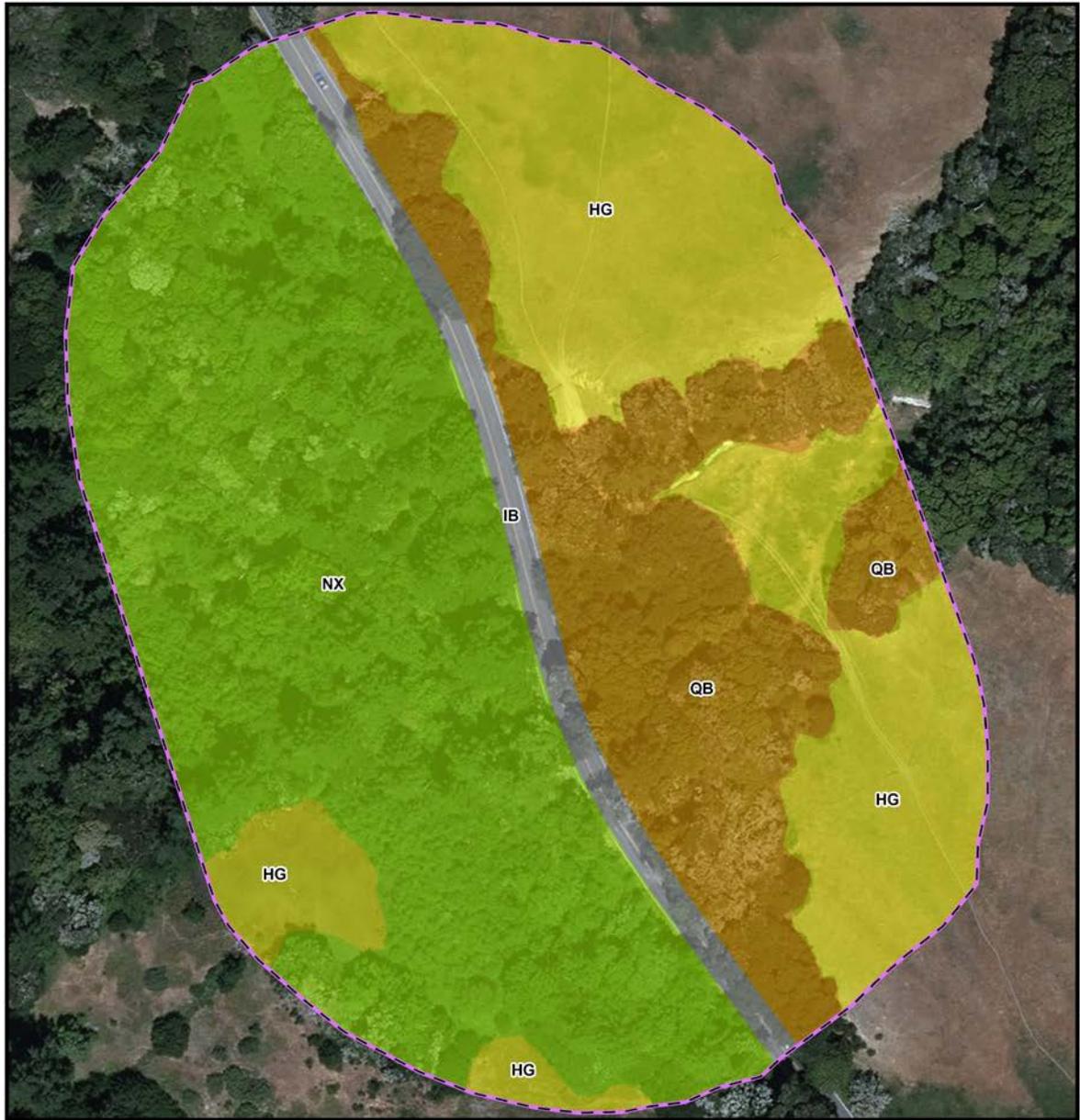
Figure 3. Existing Condition Looking Southbound Route 1



Figure 4. Upstream View (east side of SR 1) of Culvert with Failing Headwall



Figure 5. Downstream View (west side of SR 1) of Culvert with Ponding Feature



LEGEND

-  Biological Study Area (BSA) (11.7 Acres)
-  HG- Annual Grasses and Forbs
-  QB - California Bay
-  NX - Interior Mixed Hardwood
-  IB - Urban-related Bare Soil

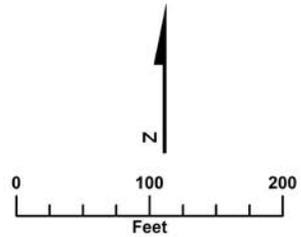


FIGURE 6
Biological Study Area and
General Vegetation
 Olema Creek Bridge Project
 State Route 1
 EA 4S780, MRN-1-Post Mile 24.65
 Marin County, California

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Figure 6. Biological Study Area and General Vegetation

A. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project.

Please see the checklist beginning on page 13 for additional information.

<input checked="" type="checkbox"/>	Aesthetics	<input checked="" type="checkbox"/>	Agriculture and Forestry	<input type="checkbox"/>	Air Quality
<input checked="" type="checkbox"/>	Biological Resources	<input checked="" type="checkbox"/>	Cultural Resources	<input checked="" type="checkbox"/>	Geology/Soils
<input checked="" type="checkbox"/>	Greenhouse Gas Emissions	<input type="checkbox"/>	Hazards and Hazardous Materials	<input checked="" type="checkbox"/>	Hydrology/Water Quality
<input type="checkbox"/>	Land Use/Planning	<input type="checkbox"/>	Mineral Resources	<input type="checkbox"/>	Noise
<input type="checkbox"/>	Population/Housing	<input type="checkbox"/>	Public Services	<input checked="" type="checkbox"/>	Recreation
<input checked="" type="checkbox"/>	Transportation/Traffic	<input checked="" type="checkbox"/>	Utilities/Service Systems	<input type="checkbox"/>	Mandatory Findings of Significance

B. DETERMINATION:

On the basis of this initial evaluation:

<input checked="" type="checkbox"/>	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
<input type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
<input type="checkbox"/>	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
<input type="checkbox"/>	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
<input type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: 	Date: 4/25/16
Printed Name: Stefan Galvez-Abadia	For:

Proposed Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

Caltrans proposes the Olema Creek Tributary Culvert Replacement Project (the project) to replace a failing culvert on SR 1 in rural Marin County, California, at PM 24.67, which is approximately 1.8 miles south of the town of Olema (see vicinity map in Figure 1 and SR 1 photos in Figures 2 and 3). The project involves removing two undersized 24-inch-diameter culverts that currently convey the flows from an unnamed tributary of Olema Creek, and constructing a 44-foot-long, bottomless culvert CIP that is approximately 30 feet wide on its interior and 36 feet wide on its exterior. The culvert will require soil nail wingwalls in each quadrant extending perpendicularly from the culvert opening until it meets the 2:1 embankment slope where the wingwalls will meet the existing ground.

The culvert will support a roadway with two 12-foot-wide lanes and two 4-foot-wide shoulders, meeting the requirements of the Caltrans Highway Design Manual, Table 302.1 and Section 307.2, for rural roadways. MGS will be installed at the roadway edge of shoulder at a distance of 16 feet from centerline, and parapet walls will be installed at 6 feet beyond the shoulder to contain the fill material and shoulder backing at the ends of the culvert and wing walls.

The project will remove the existing embankment, culverts, and headwall. An estimated 1,500 cubic yards of embankment material will be removed.

Construction (including vehicle access and construction equipment staging) will be maintained within the roadway and right-of-way, with the exception of an approximately 0.22-acre temporary construction easement to access and remove the embankment and culverts, followed by contouring and replanting the slopes for a more natural drainage channel.

The purpose of the project is to remove and upgrade an undersized and failing drainage system while re-establishing the balanced hydrologic regimen that existed before the construction of the roadway embankment, and to restore the creek's function as a salmonid foraging stream.

Determination

This proposed Negative Declaration (ND) is included with the Initial Study to give notice to interested agencies and the public that Caltrans intends to adopt an ND for this project. This proposed ND is subject to modification based on comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for this project and, pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the reasons described in the following paragraphs.

The proposed project would have no effect on agriculture, cultural resources hazardous waste, growth, land use, mineral resources, noise, public services, recreation, or traffic/transportation. The proposed project includes best management practices during construction such that the project results in a less than significant effects on aesthetics, air quality, biological and aquatic resources, hydrologic flow, water quality, and geologic resources. In addition, the project includes several avoidance and minimization measures (AMMs) during construction to address short-term potential effects during construction on hydrologic, water quality, sensitive habitats and special status species. These are listed in detail in Appendix F and include sensitive-species training, biological monitoring.

Following the implementation of AMMs, impacts of the proposed project on natural resources are considered minimal because, although this project will temporarily impact suitable breeding, dispersal, and upland habitat, it is ultimately likely to improve the environmental baseline for the California red-legged frog (CRLF), restore the previous fish passage for steelhead that had been disrupted by scour conditions at the existing culvert outfall, and not displace the northern spotted owl. Additionally, all disturbed areas onsite will be restored by replanting native trees and re-vegetation using an appropriate mix of native plants. No wetlands were identified within the project limits, and therefore, wetlands will not be impacted by the proposed project.

Caltrans has determined that this project will not result in cumulative impacts to the environment. This project is anticipated to result in an overall improvement of local environmental conditions because replacing the pipe culvert with a bottomless culvert will help to restore the tributary as a fish-passable channel and normal hydrological regime. Affiliated ecology will thereby be improved from current conditions.

On the basis of this study, Caltrans has determined that the proposed action, with the incorporation of the identified avoidance and minimization measures (see Appendix F), will not result in a significant effect.

Melanie Brent
Deputy District Director, Environmental Planning and Engineering
District 4
California Department of Transportation

Date

CEQA Environmental Checklist

04-MRN-001

24.7

4S780

Dist.-Co.-Rte.

P.M/P.M.

E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Caltrans prepared a Project Visual Impact Analysis (Caltrans 2016e). The findings of this analysis are presented herein. The bottomless culvert and railing design will be consistent with the visual quality of the highway corridor, and no scenic resources will be adversely affected by the proposed project. This project will improve the natural setting and habitat of the unnamed tributary to Olema Creek without visually degrading the SR 1 corridor.

Avoidance and minimization measures (AMMs) have been identified and can lessen visual impacts of the project's tree removal. This section describes additional AMMs to address specific visual impacts, which are also included in Appendix F. These will be designed and implemented with concurrence of the District Landscape Architect.

The primary means of minimizing potential project impacts to visual resources involves replanting the State right-of-way (right-of-way) and the temporary construction easement (TCE) area within the project limits. All disturbed areas will be revegetated following construction. Areas near the creek will be planted with native valley oak (*Quercus lobata*) trees with other native plants, as recommended by the project biologist and approved by the National Park Service (NPS) managing the Golden Gate National Recreational Area (GGNRA) lands. This planting, naturally irrigated by the creek tributary, will restore the disturbed area overtime.

The span of the bottomless culvert will allow maximum return of the natural tributary creek flow and minimize incising of the tributary so that the natural plant community can reestablish.

The visual impact attributable to the project would not be adverse even though viewer sensitivity to change is high along this portion of SR 1. This is because the project, as viewed by the public,

would ultimately cause a low degree of resource change that the casual observer would not readily recognize after replacement vegetation has become established in approximately 3 to 5 years. The visual character of the project site as viewed from the road after project construction and site restoration would be similar to the existing character of the highway corridor. Visual quality would not be diminished.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

No agricultural lands will be directly affected by the project. While the GGNRA is leased for grazing land, it is considered by the NPS, the agency of jurisdiction, that the lands are foremost park lands. Furthermore, the only TCE outside the state right-of-way is riparian vegetation used as shade for cattle and will not be permanently impacted. Areas impacted will be restored with native plant and tree species. This project will not result in the need to rezone, as the TCE outside of the state right-of-way will return to its current use following a short three- to four-month construction period.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The project will not increase traffic capacity and so it will not significantly affect air quality. It is exempt from the requirement of air quality conformity determination under 40 CFR 93.126. The construction season is anticipated to be less than 4 months with relatively few construction vehicles and equipment present. A gas generator will be used during periods of less than 5 consecutive days to manage one-way traffic conditions. Dust will be managed through best management practices (BMPs), but other construction air pollutants are expected to be minimal to negligible.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Caltrans prepared a Natural Environment Study for the Olema Creek Culvert Replacement Project (Caltrans 2016a). A summary of the findings of this analysis are presented herein. The biological study area (BSA) for the proposed project consists of an approximately 250-foot radius around the project limits, encompassing an area of approximately 11.7 acres. (The project limits refers to the project footprint, which includes all areas within state right-of-way that will be used for project construction, staging, and access, as well as TCE areas directly impacted by construction activities.) The BSA and associated vegetation types are shown on Figure 6 in the preceding Project Information section. Biological field studies of the BSA were conducted beginning in 2012 and continued through 2015. Protocol-level botanical survey occurred in July and August of 2013 and then April, May, July, and September of 2014; wetland delineations occurred in July through November of 2013 and again in mid-September of 2014; a wildlife habitat assessment occurred in July 2013; and tree surveys for trees with larger than 4-inch trunk diameter were recorded in April of 2015 using GPS. The methods for the botanical surveys followed the California Native Plant Society (CNPS) botanical survey guidelines (CNPS 2001), CDFW protocols for surveying special-status plants (CDFW 2009), and U.S. Fish and Wildlife Service (USFWS 1996) botanical survey guidelines for federally listed, proposed, and candidate plants. The biologists walked meandering transects spaced approximately 30 feet apart and surveyed all accessible natural areas within the BSA. The protocol-level surveys were floristic in nature; the biologists identified all plant species encountered during the surveys to the taxonomic level necessary to determine rarity. The goal of the protocol-level surveys was to locate, map, and census any special-status plant populations within the BSA.

Rainfall for the 2013, 2014, and 2015 survey periods was well below average, which may have limited plant germination and growth. Protocol-level surveys for state and federally listed wildlife species were not performed on behalf of this project. The potential for state and federally listed wildlife species to occur within the BSA was based on the evaluation of habitat suitability for target species during field surveys and the inference of presence. The field surveys were augmented through a review of authoritative databases (such as the CNDDDB) for species occurrences in the project vicinity, previous habitat assessment and reconnaissance-level site visits, and review of aerial photographs..

Interagency meetings were held in the field with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), NPS, and the North Coast Regional Water Quality Control Board (NCRWQCB). The National Park Service staff at Point Reyes provided mapping showing wetlands, rare plants and known northern spotted owl locations. Caltrans staff also presented the proposed project to NPS and solicited feedback.

The BSA consists of a currently active highway road prism within thick riparian canopy cover. Open grasslands east and west of the roadway show evidence of periodic cattle grazing regimes. The existing condition of the roadway within the project limits is a constructed embankment, up to 20 feet in height. No wetlands were identified within the project limits and therefore wetlands will not be impacted by the proposed project. However, 0.02 acre of other waters features is anticipated to be temporarily altered by the proposed project.

The segment of tributary within the proposed project limits is heavily disturbed and flows through a partially broken culvert inlet beneath the roadway (see photo in Figure 4). Riparian species, such as willow (*Salix* sp.) and box elder (*Acer negundo*) dominate creek bank brush vegetation at the project site. The project area and greater vicinity are mostly undeveloped or rural, characterized by mixed evergreen forest and coast oak woodlands that are dominated by Douglas fir (*Pseudotsuga menziesii*), coast live oak (*Quercus agrifolia*), California bay laurel (*Umbellularia californica*) and California buckeye (*Aesculus californica*). Open grasslands east of the roadway are composed of annual grasses. Habitats immediately surrounding the project footprint are within the Point Reyes National Seashore and managed by the NPS.

California Natural Diversity Database (CNDDDB; CDFW 2016) documentation for a 10-mile radius around the project footprint includes recorded locations of California red-legged frog (CRLF) (*Rana draytonii*) (federal threatened), California freshwater shrimp (CFS) (*Syncaris pacifica*) (federally endangered), California coastal steelhead (*Oncorhynchus mykiss*), northern spotted owl (NSO) (*Strix occidentalis caurina*) (federally listed), western pond turtle (WPT) (*Clemmys marmorata*) (California species of special concern), and migratory birds and bats.

For this project, rare plants include those that are in the California Native Plant Society's Inventory of Rare and Endangered Plants and/or are federally listed. No rare plants have been observed within the project footprint or within close proximity outside the project footprint.

The BSA is also known to support protected wildlife, including federally listed species, migratory birds, and state species of special concern. Federally listed species that either will be or have the potential to be impacted by the project include the CRLF, NSO, CFS, migratory birds, and Central California Coast steelhead (*Oncorhynchus mykiss*). Email exchange with NMFS on January 22, 2015 concludes that California coastal coho salmon (*Oncorhynchus kisutch*) is not present within the unnamed tributary, only potentially present within the Olema Creek and only on high flow rain years. Several species of bats are likely to inhabit the BSA for this project, whether for foraging, day- or night-roosting, or rearing of young. Each of the bat species occurring in the region could potentially forage in the vicinity of this project, though various species favor differing habitats and strata within habitats for foraging (Lacki et al. 2007, Johnson et al. 2007). Special-status bats with a potential to occur in the project vicinity include the western red bat (*Lasurus blossevillii*), Townsend's big-eared bat (*Corynorhinus townsendii*), and pallid bat (*Antrozous pallidus*) (Heady and Frick 2007). Each species is a State species of special concern, and the Townsend's big-eared bat is a candidate species for listing under the California Endangered Species Act. A formal bat survey was not conducted for the study area and no bat species were observed.

Impacts to Biological Resources

Direct impacts are project activities that are caused by or result from the proposed action; these include both impacts to aquatic habitat within the unnamed creek and impacts to terrestrial habitat. Within the unnamed creek, direct impacts would result from excavating the culverts and installing the natural bottom culvert. Additionally, by daylighting the culverted reach, approximately 0.02 acre aquatic habitat will be created.

Direct impacts to terrestrial habitat would result from a temporary access road, excavation of the road-fill embankment, associated vegetation removal, installation of the natural bottom culvert, and staging. Effects adjacent to the shoulders include cut and fill and the installation of Midwest guardrail and temporary traffic control elements. Of the upland impacts, approximately 0.25 acre will be recontoured to match the re-established riparian corridor and affected upland habitat will be revegetated. Approximately 0.04 acre of riparian habitat will be created by excavating the embankment, daylighting the channel for 80 feet, and contouring and revegetating the newly exposed banks. The following subsections highlight the potential impacts to special-status plants, animals, and wetlands and waters within the project limits. In addition to diverting the tributary in advance of construction, several avoidance and minimization measures (AMMs) and mitigation measures that will be implemented to minimize impacts to special-status species and protect the surrounding environment from project-related impacts are described in the following sections. Additionally, the list of proposed AMMs and mitigation measures is presented in Appendix F.

Wetlands and Waters and Critical Habitat

There is no designated critical habitat for NSO, CFS, and California steelhead fish within the BSA. The project vicinity does contain critical habitat elements for CRLF including non-breeding aquatic habitat, uplands habitat (riparian) and dispersal habitat. Within the BSA (250-foot radius surrounding the project footprint), wetland features that met the applicable wetland criteria in the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008) total 0.586 acre, and other waters total 0.768 acre. No wetlands were identified within the project limits and therefore wetlands will not be impacted by the proposed project. However, 0.02 acre of other waters is anticipated to be impacted by the proposed project.

The project footprint supports approximately 0.2 acre of riparian habitat, all of which fall under CDFW and NCRWQCB jurisdiction. The majority of the riparian vegetation within the right-of-way will be removed in preparation for this project. Riparian vegetation impacted during construction will be replanted, with trees replanted onsite to the maximum degree feasible. These indirect impacts would be avoided during construction, however, through implementation of the general avoidance and minimization measures (AMMs), such the use of silt fences or fiber rolls. In addition, implementation of hydroseeding and planting wetland and riparian plantings activities following ground-disturbing activities would reduce erosion and sedimentation from the upland areas post construction.

This project will ultimately enhance the riparian area of the unnamed tributary because the bottomless culvert will help return the natural water regime of the tributary creek channel rather than narrowing the channel into culvert pipes and will ultimately facilitate a more natural riparian habitat along the creek. Because of the diversity of vegetation and structural complexity found along streams and creeks, riparian corridors provide valuable habitat for wildlife. Riparian areas are important for providing food, nesting sites, shelter and space for wildlife movement. In general, riparian corridors support a greater abundance of wildlife than other adjacent habitats.

Offsite restoration and enhancement efforts to offset the temporal impacts to the riparian area of unnamed tributary of Olema Creek will be coordinated during the design and permitting phase of this project. Temporal impacts include the time it takes for the riparian vegetation to become reestablished following construction.

Special-status Plants within the Project Limits

No rare plants or special-status plants were observed within the area where construction activities will occur (that is, the project footprint/limits).

Special-status Animals within the Project Limits

Special-status animal species given further consideration with this project include the CRLF, CFS, NSO, WPT, bats (pallid bat, Townsend's big-eared bat, and western red bat), salmonids, and migratory birds. A complete list of special status species for the region is provided in appendix B of the Natural Environmental Study (Caltrans, 2016a). Caltrans prepared a Biological Assessment for the Olema Creek Culvert Replacement Project (Caltrans 2016b). A summary of the findings of the analysis is presented below.

California red-legged frog

A CRLF was spotted in the unnamed tributary of Olema Creek in the pools on the western side of the embankment in and beyond the project limits during the October 15, 2015 survey. There are numerous recent CNDDDB occurrences in the project limits (CDFW 2016); both the general project vicinity provide suitable breeding and dispersal habitat for CRLF per a reconnaissance-level habitat assessment in August 2013.

Pursuant to Section 7 of the federal Endangered Species Act, Caltrans concluded that this project may affect, and is likely to adversely affect, the CRLF. The proposed project will likely result in direct and indirect impacts on the CRLF and its habitat within the project footprint, as summarized in Table 1 and described in more detail below. Approximately 0.02 acre of seasonal drainage and a perennial plunge pool that provide aquatic non-breeding aquatic habitat would be temporarily impacted from the proposed project. Approximately 0.46 acre of direct temporary impacts and 0.06 acre of direct permanent impacts would result to CRLF upland dispersal habitat.

Table 1. Direct Impacts on California Red-Legged Frog

Habitat Types Impacted	Temporary Impacts (Acreage)	Permanent Impacts (Acreage)	Total Direct Impacts (Acreage) ¹
Non-breeding aquatic	0.02	0	0.02
Upland	0.46	0.06	0.51

1. Due to rounding, total does not equal sum of temporary and permanent impacts.

Impacts on approximately 0.02 acre of non-breeding aquatic habitat would result from excavating the existing culverts and installing the natural bottom culvert; however, these impacts will be restored through the re-contouring and revegetating. Additionally, by daylighting the culverted reach, approximately 0.02 acre of new non-breeding aquatic habitat will be created.

Direct impacts on approximately 0.54 acre of upland habitat would result from the temporary access road, excavation of the road-fill embankment, associated vegetation removal, installation of the natural bottom culvert, and staging. Of the upland impacts, approximately 0.25 acre will be recontoured to match the re-established riparian corridor and affected upland habitat will be revegetated. Approximately 0.04 acre of new riparian habitat will be created by excavating the embankment, daylighting the channel for 80 feet, and contouring and revegetating the newly exposed banks. These impacts will most likely be limited to individuals that are inhabiting or dispersing through uplands in the project footprint. It is possible that not all adverse impacts and potential for injury can be eliminated. For instance, harm, harassment, and other direct adverse impacts on individuals could result from capture and relocation of CRLF that are found during pre-construction and monitoring surveys of the proposed project footprint. Inadvertent direct injury and/or mortality of CRLF that are not found and relocated could occur if individuals are present in the footprint during construction activities.

Grading, clearing, and grubbing of upland areas could result in indirect impacts from increased

erosion and sedimentation, and adversely impact the unnamed creek and, potentially, Olema Creek downstream. These indirect impacts would be avoided in the short term, however, through implementation of the general AMMs (see the Hydrology and Water Quality section IX for a discussion and in this IS and the summary table of measures in Appendix F). In addition, hydroseeding and wetland and riparian plantings would reduce erosion and sedimentation from the uplands in the longer term.

Removing the culvert is also anticipated to affect the fluvial sediment and flow regime, leading to an elevational drop in the upstream channel, and downstream export of coarse material from the depositional reservoir upstream. Upstream floodplain deposits may also be transported downstream as the channel laterally migrates. Over time, the upstream floodplain may evolve into a terrace, characterized less by seasonal flooding and more likely become a feature of the new active channel area.

Indirect beneficial effects of the project on CRLF include reduced mortality from road crossings since the new culvert will allow for 30 feet of lateral clearance beneath the roadway that can be used by CRLF as a wildlife crossing. This reconnected riparian corridor effect may increase gene flow amongst populations of CRLF that are documented on either side of the roadway (CDFW 2016).

Through consultation with the USFWS, Caltrans does not propose any compensatory mitigation for CRLF, because this project incorporates measures to avoid and minimize impacts to CRLF and is anticipated to improve the environmental baseline within the project footprint.

California freshwater shrimp

California freshwater shrimp were not observed during biological surveys, and the stream at the project site is too intermittent to support CFS. But the project limits do provide habitat features, such as undercut banks or shallow pools, that are suitable for the shrimp. The habitat quality of Olema Creek that CFS would need to migrate through in order to reach the project site during sufficient flow conditions is known to be of marginal quality. Therefore, the unnamed tributary to Olema Creek is within the potential range of CFS; however, it is relatively unlikely that the species is established in the project limits and BSA.

During embankment excavation and culvert removal this project may directly affect 0.002 acres (6 linear feet) of CFS habitat. This temporary affect to the pool adjacent to the culvert outlet represents 0.8 percent of the habitat downstream of the culvert within the project footprint. Indirect impacts of grading, clearing, and grubbing of upland areas could result in indirect impacts from increased erosion and sedimentation, and adversely impact the unnamed creek and, potentially, Olema Creek. Erosion and sedimentation avoidance measures are noted in the Hydrology and Water Quality section of Appendix F. Long-term beneficial effects are anticipated as a result of re-establishing the riparian corridor, restoring the fluvial sediment and flow regime, daylighting habitat, and increasing wildlife passage, potentially resulting in improved gene flow amongst CFS populations.

The measures for protecting CRLF, CFS, and WPT listed in Appendix F will adequately avoid and minimize impacts to CFS.

Northern spotted owl

Potential direct effects of the project to NSO include loss of suitable roosting, dispersal, and foraging habitat, as well as temporary noise and visual disturbance within potentially occupied habitat within the project footprint during construction that may harm or harass NSO. However, according to the CNDDDB (CDFW 2016), the nearest recorded occurrence of NSO is located approximately 0.44 mile east of the project in a forested area that is at a higher elevation than the project site. The next nearest occurrences are located 0.9 mile southwest of the project in a forested area that has a higher elevation than the project site; 1.1 miles northeast of the project at a location that is separated from the project over a ridge and into a forested valley; and another cluster of occurrences approximately 2.0 miles southeast of the project, across a grassland, over a ridge and into a forested valley.

Appropriately sized trees and habitat for NSO were not located during surveys of the BSA. Due to nearby (2 miles or less) occurrences, NSO may appear within the project limits as an overhead migrant. All nesting territory is expected to be beyond the range of effects that could be caused by the proposed construction activities (USFWS 2015). This means that construction noise would be attenuated to below adverse nor harassment levels before reaching observed NSO locations.

The project is not expected to increase traffic or traffic-related noise levels along the roadway; indirect effects to NSO prey base and foraging are anticipated to be negligible because of the limited amount of habitat affected in relation to surrounding areas and the revegetation plans after construction is complete. Based on the potential presence of NSO within the project limits and pursuant to Federal Highway Administration (FHWA) guidance, Caltrans has determined that project activities are likely to not adversely affect the continued existence of NSO.

Construction of the project will result in impacts to forest/woodland habitat that is potential NSO foraging and dispersal habitat. A conservative estimate of 37 to 59 trees may need to be removed. Long-term temporary effects to the approximately 0.22 acre of forest/woodland (referred to as “long-term temporary” because of the period of time needed for tree reestablishment [approximately 10 to 20 years or more]) will be addressed by restoration planting plan. No NSO nesting tree is anticipated to be affected. No NSO designated critical habitat will be affected and therefore no mitigation is proposed beyond the avoidance and minimization measures listed in Appendix F.

Western pond turtle

No WPT surveys were conducted for the project; however, suitable breeding and foraging habitat is present during high flows. The CNDDDB documents two extant WPT occurrences within 5 miles of the project site. The nearest occurrence was dated 2004 and is located approximately 3.3 miles north of the project site. The second occurrences, dated 1996, is located approximately 3.9 miles east of the project site.

WPT has a moderate potential to be present within the project limits during construction activities. However, with appropriate AMMs, such as preconstruction surveys and environmentally sensitive area fencing installed prior to construction, the likelihood of negatively impacting WPT is low. Appendix F presents measures that will protect WPT in addition to CRLF and CFS.

Special-status bats

Special-status bats with a potential to occur in the project vicinity include the western red bat (*Lasurus blossevilli*), Townsend's big-eared bat (*Corynorhinus townsendii*), and pallid bat (*Antrozous pallidus*) (Heady and Frick 2007). Each species is a State species of special concern, and the Townsend's big-eared bat is a candidate species for listing under the California Endangered Species Act. Formal surveys have not been conducted for bats for this project. None of the species have been observed in the BSA. However, suitable habitat for each species was found within the BSA.

There will be some loss of potential roosting habitat, but the surrounding area is forested and offers alternative roosting options. Because of the cryptic nature of day-roosting by bats, any trees that may provide roosting habitat (such as large snags or trees with cavities) should be removed using the two-phase method of removing limbs from the tree on the afternoon of the first day and stumping the tree on the following day. This technique allows any bats that may be using the trees to leave of their own volition; they are then unlikely to dayroost in or near any trees from which the limbs were removed (Caltrans 2014). Implementation of the proposed project would result in a long-term improvement of riparian habitat for bats. Therefore, no compensatory mitigation is proposed.

Salmonids

According to CNDDDB, steelhead are known to occur downstream 0.1 mile in Olema Creek and are present in Lagunitas Creek, approximately 1.8 miles to the east of the Project. Lagunitas Creek and Olema Creek join approximately 3 miles north of the project limits. Juvenile steelhead

have been observed within the unnamed creek during the project site visit (July 31, 2012). Fish spotted within the project limits appeared to be stranded in the plunge pool directly below the two culverts, because the culverts present a current fish passage barrier for upstream migration.

As mentioned in the above discussion of CRLF and CFS, the approximately 0.02 acre of seasonal drainage and plunge pool that provides habitat for steelhead would be temporarily impacted from the proposed project. Caltrans anticipates steelhead to be present and potentially directly impacted during construction. If steelhead happen to be present during construction, then Caltrans will implement a NMFS- and CDFW-approved fish rescue and relocation plan. Construction is scheduled during the summer and fall, when the creek will be dry to mostly dry, beginning on July 1 and ending on October 15. Conducting work within the proposed in-water work window will minimize the likelihood of potential salmonid mortality.

If there is a need for dewatering when this project goes to construction and fish are found to be present, Caltrans will implement a fish relocation plan that will need to be approved by the NMFS and CDFW. Individual steelhead may need to be handled to relocate the fish out of harm's way, away from the project site. The existing programmatic biological opinion (PBO) between NMFS and Caltrans addresses the potential take of steelhead during construction and detailed list of mitigation measures involving the replacement of culverts. Steelhead-specific BMPs are specified in the PBO regarding culvert replacement.

After construction of the new culvert, sedimentation is expected to travel downstream and impact portions of Olema Creek. Although sedimentation run-off could indirectly negatively impact steelhead present downstream, NMFS has expressed that overall the impacts to the system would be beneficial by opening the fish passage barrier at the project site (NMFS email dated October 1, 2012), restoring hydrologic connectivity, and allowing natural redistribution of sediment through the crossing, which would improve habitat for salmonids downstream. Overall, the proposed project is self-mitigating and will open the fish passage barrier from Olema Creek to the unnamed tributary. No compensatory mitigation is proposed for long-term operations, because measures to avoid and minimize project impacts to salmonids are in place (Appendix F) and implementation of the proposed project would result in a long-term improvement of fish passage within this tributary.

Species of Special Concern and Protected Migratory Birds

The oaks, willows, Douglas fir trees, and riparian areas of the unnamed tributary have a high potential to support nesting migratory birds. The majority of migratory birds are protected by the Migratory Bird Treaty Act (MBTA). The California yellow warbler (*Setophaga petachia*), Cooper's hawk (*Accipiter cooperii*), Loggerhead shrike (*Lanius ludovicianus*), Long-eared owl (*Asio otus*), Northern harrier (*Circus cyaneus*), and the Sharp-shinned hawk (*Accipiter striatus*) are protected by the federal MBTA and are considered State species of concern by CDFW. These species are residents of riparian woodlands, open habitats interspersed with shrubs and small trees, riparian woodland near meadow edges, grassland habitats, all of which occur within the BSA. The white-tailed kite (*Elanus leucurus*) is also protected by the federal MBTA and is considered to have "fully protected" status by CDFW. This species is found in rolling foothills and valley margins with scattered oaks, river bottomlands, and marshes next to deciduous woodland. While none of the above mentioned birds have been observed in the BSA, suitable nesting habitat for each species is present within the BSA. Measures have been incorporated into this project to avoid the take of migratory birds and their nests (Appendix F).

The MBTA prohibits the take of migratory birds and their nests. Construction, anticipated to occur within the period of July 1 through October 15th, overlaps with some of the typical bird nesting season, which in California generally runs from February 1 to August 31. Caltrans will remove the majority of the vegetation in the project footprint outside the nesting season (September 1 through October 15th) to avoid potential conflicts with the migratory bird nesting season. Trees within Caltrans' right-of-way will be removed 1 year prior to construction to minimize the potential for roosting in areas where construction would occur. Any remaining vegetation will be removed within the TCE and associated construction areas prior to commencing construction to allow for

sufficient space for construction vehicles and staging.

Caltrans will implement pre-construction surveys to ensure that no project activities occur within 50 feet of nesting migratory birds and 300 feet of nesting raptors. If these species are present, this project could potentially result in the removal of suitable nesting substrate within the project footprint and may disrupt breeding individuals nesting in nearby areas during the breeding season.

Birds in the general project area may be impacted by construction-related noise. The maximum noise level of construction equipment used on site would be approximately 110 decibels (dB) at 50 feet from the source, although more typical maximum noise levels will be around 90 dB at 50 feet. Such equipment might include a vibratory or impact pile driver. At this time, Caltrans is planning to auger the H-piles through the existing embankment to construct the sides of the bottomless culvert. This will avoid potential physical harm of birds from pile-driving-related noise blasts of up to 140 dB at zero feet or 72 hours of continuous exposure to levels above 110 dB. If deemed necessary, noisy construction activities would be limited to occurring outside nesting season; therefore no injury to birds is anticipated as a result of construction-related noise. With construction noises of 90 dB and no obstructions, the noise would attenuate to ambient levels between 800 and 1,600 feet away from the project site. Therefore, birds and other wildlife within 1,600 feet may be subject to potential disturbance from construction-related noise from this project. The majority of heavy construction will be limited to the roadway and adjacent state right-of-way, except when excavating the embankment area.

Invasive Species

Caltrans will comply with Executive Order 13112. This Order is provided to prevent the introduction of invasive species and to provide for their control to minimize the economic, ecological, and human health effects. In the event that noxious weeds are disturbed or removed during construction-related activities, the contractor will be required to contain the plant material associated with these noxious weeds and dispose of them in a manner that will not promote the spread of the species. Caltrans will implement a non-standard special provision to require the cleaning and decontamination of all equipment brought into the construction area and any vehicles and equipment used on multiple construction sites. Temporary construction best management practices that incorporate vegetation may also introduce invasive species. This will be addressed by requiring certification that seeds and plants used for revegetation are free of invasive species. At the request of NPS, topsoil from the project footprint will be stored and returned to the extent possible and any supplemental topsoil material needed will be obtained through permit from nearby resources within GGNRA or park lands as appropriate and available to reduce to introduction of new species and enhance the possibility of maintaining the same native species.

Avoidance, Minimization, and/or Mitigation Measures

Appendix F provides a comprehensive list of AMMs for described impacts. As an overview, Caltrans will restore all disturbed areas on site, including the riparian area of the unnamed tributary creek and the ditches that line the roadway. Upland areas impacted during the project will be reseeded with a native seed mix. A restoration plan will be developed in cooperation with the USFWS, CDFW, and NPS.

The natural bottom culvert will greatly improve fish passage at the project location and create more space for wildlife passage beneath the roadway. Overall, this project is anticipated to result in a net environmental benefit, because there will ultimately be more natural riparian corridor supported by a natural water flow regime following construction.

AMMs that will be implemented during this project to reduce impacts to the local environment include worker environmental awareness training, the delineation of work areas with high-visibility fencing to prevent construction equipment encroachment into sensitive areas, minimization of night-time work, only removing the minimum amount of vegetation necessary to complete the project, and water quality BMPs.

Additional specific requirements for special-status species or habitat restoration will be addressed in permitting. All avoidance and minimization measures will be incorporated into the bid package and the construction contract.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Caltrans prepared the Section 106 Review of the Olema Creek Culvert Replacement Project (Caltrans 2016c). A summary of the findings of this analysis are presented herein. No historic structures have been identified in the immediate vicinity of the project. A record search of the Northwest Information Center and Caltrans databases was conducted on February 23, 2013. Historic maps and aerials have also been studied. An archaeological pedestrian survey was conducted on September 5, 2013 and November 20, 2014 and an Extended Phase I testing was carried out on May 6, 2015. The Area of Potential Effects (APE) contained one previously determined eligible built resource, the 13,472 acre Olema Valley/Lagunitas Loop Ranches Historic District. The district was determined eligible for listing in the National Register of Historic Places (NRHP) on May 20, 2008. The district nomination only covered resources owned or managed by NPS; thus State Route 1 was not specifically called out as a contributing or non-contributing resource. NPS has requested that SR 1 within the project limits (PM 24.4/25.0) be treated as eligible for listing in the NRHP as a contributor to the historic district for the purposes of this project.

The project location is adjacent to the Truttman Ranch, a contributor to the Historic District. The APE comprises only a small portion of the district. The TCE outside of Caltrans right-of-way within GGNRA is 0.22 acre. Although the road is considered a contributor to the district for the purposes of this project, no other contributing elements of the district are located within the project limits. Because of this, no adverse project effects are anticipated to the Olema Valley/Lagunitas Loop Ranches Historic District.

Based on documentary research, a pedestrian survey, and extended Phase I testing, it is not anticipated that construction activities would encounter or disturb buried cultural resources. The project limits appear to have a low sensitivity for buried cultural resources. No further archaeological studies are necessary.

In the unlikely event that cultural resources are discovered during construction, all earth-moving activity within and around the immediate discovery area would cease until a Caltrans qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to California Public Resources Code Section 5070.98, if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission who would then notify the Most Likely Descendent.

California State Lands Commission has jurisdiction over all abandoned archaeological sites and historic or cultural resources. If any cultural resources are discovered during construction of the

proposed project, the Assistant Chief Counsel of the California State Lands Commission will be consulted.

The Native American Heritage Commission was contacted to request a search of the Sacred Lands File for sacred lands or other cultural properties of significance to Native Americans within or near the APE. No sacred lands were identified in the project APE.

Culturally significant plants that are identified in the project footprint will be included in the seed mix used for onsite re-vegetation purposes. These include native plants such as blackberry (*Rubus* spp.), coyote brush (*Baccharis pilularis*), and yarrow (*Achillea millefolium*).

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Non-native fill material would be excavated to return the tributary channel to reflect more natural conditions. This would expose a build-up of sediment from years of the stream being in a culvert too small to convey natural sediment. Excavation for installation of the new natural bottom culvert will expose a prism of fine sediment that has accumulated on the upstream side of the culvert. Contour grading will maintain a 2:1 to 4:1 ratio along disturbed areas. After construction, the tributary will adjust its vertical grade to the level west of the culvert, and fine sediment accumulated on the east side of the culvert will be carried out into Olema Creek. No work is planned to re-grade the creek, and no maintenance of the creek will be performed. Permanent upper bank erosion control measures will include restoration planting and hydro-seeding with native seed mixture. While the tributary will be diverted during construction, additional measures such as silt fences will be used during construction to keep sediment out of the tributary in the TCE. Temporary erosion control measures may also include bonded fiber matrix, and hydroseeding with native seed mixture.

The proposed project is located within the Alquist-Priolo Earthquake Fault Zone for the San Andreas fault and is designed according to Caltrans standards to withstand shaking from an earthquake on the fault and potential fault rupture. The project as proposed will not further expose the public to hazards from fault rupture, strong ground shaking, or other seismic hazards. The proposed project will not further expose the public to hazards from shrinking or swelling soils, erodible soils, landslides, or other geologic hazards. The proposed project will not impact any sensitive geologic or paleontological units.

Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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VII. GREENHOUSE GAS EMISSIONS: Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas (GHG) emissions and climate change is included in the body of the environmental document. While Caltrans has included this good faith effort to provide the public and decision-makers as much information as possible about the project, Caltrans determined that in the absence of further regulatory or scientific information related to GHG emissions and California Environmental Quality Act (CEQA) significance, it is too speculative to make a determination of significance regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels)².

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing travel activity,

² http://climatechange.transportation.org/ghg_mitigation/

3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively.³

Regulatory Setting

State

Assembly Bill 1493 (AB 1493), Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order (EO) S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to 1) year 2000 levels by 2010, 2) year 1990 levels by 2020, and 3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (CARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391) Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Federal

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis.⁴ FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and

³ http://www.fhwa.dot.gov/environment/climate_change/mitigation/

⁴ To date, no national standards have been established regarding mobile source GHGs, nor has U.S. EPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the “National Clean Car Program” and EO 13514 - Federal Leadership in Environmental, Energy and Economic Performance.

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

U.S. EPA’s authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and EPA’s assessment of the scientific evidence that form the basis for EPA’s regulatory actions. U.S. EPA in conjunction with NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.⁵

The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, U.S. EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary U.S. EPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama’s 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

Project Analysis

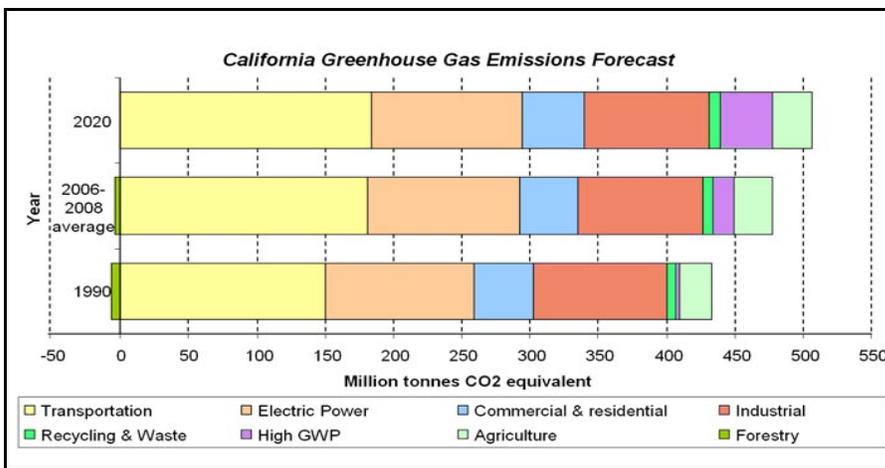
An individual project does not generate enough GHG emissions to significantly influence global

⁵ <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>

climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.⁶ In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Figure 7. California Greenhouse Gas Forecast



Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

The Department and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, the Department has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.⁷

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays resulting from construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic

⁶ This approach is supported by the AEP: Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

⁷ Caltrans Climate Action Program is located at the following web address:
http://www.dot.ca.gov/hq/tp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

The purpose of this project is to remove and upgrade an undersized and failing drainage system while re-establishing the balanced hydrologic regimen that existed before the construction of the roadway embankment, and to restore the creek's function as a salmonid foraging stream.

It involves the removal of the two undersized 24-inch-diameter culverts that currently convey intermittent flows from an unnamed tributary of Olema Creek, and constructing a concrete, bottomless culvert. Incidental features will include wing walls, reinforced concrete parapets, Midwest Guardrail System (MGS), cable railing, and wildlife fencing. Construction emissions will be unavoidable, but there will likely be long-term GHG benefits associated reduced maintenance and improved operation through smoother pavement surfaces.

CEQA Conclusion

Although construction emissions are unavoidable and are expected to be minimal, the proposed project will not increase capacity and is not expected to result in additional operational CO₂ emissions. However, Caltrans has determined that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following sections.

Greenhouse Gas Reduction Strategies

The Department continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies the Department is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO₂ reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 8 The Mobility Pyramid.



Figure 8. Mobility Pyramid

The Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. The Department works closely with local jurisdictions on planning activities, but does not have local land use planning authority. The Department assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; the Department is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the U.S. EPA and ARB.

The Department is also working towards enhancing the State’s transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State’s long-range transportation plan to meet California’s climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California’s future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State’s transportation needs.

Table 2 summarizes the Departmental and statewide efforts that the Department is implementing to reduce GHG emissions. More detailed information about each strategy is included in the [Climate Action Program at Caltrans](#) (December 2006).

Table 2. Climate Change/CO₂ Reduction Strategies						
Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings Million Metric Tons (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17

Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort	Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC	Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services	Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team	Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries	2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs	Goods Movement Action Plan	Not Estimated	Not Estimated
Total				2.72	18.18

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)⁸ provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

According to the Department's Standard Specifications, the contractor must comply with all local Air Pollution Control District's (APCD) rules, ordinances, and regulations for air quality restrictions which would reduce the GHG emissions and potential climate change impacts from the project.

Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

⁸ http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011⁹, outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks .

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop The California Climate Adaptation Strategy (Dec 2009)¹⁰, which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report¹¹ to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.

The range of uncertainty in selected sea level rise projections.

A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.

A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states

⁹ <http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

¹⁰ <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>

¹¹ *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at http://www.nap.edu/catalog.php?record_id=13389.

infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data.

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The proposed project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

This project will not impact or disturb known hazardous material sites. Previous investigations have indicated the presence of aerially deposited lead next to the edge of pavement in this area which is characteristic of roadways. Soils along the ditches of the roadway are not anticipated to contain lead in concentrations that pose a hazard or trigger regulatory action. Thermoplastic striping and excess construction materials would be removed and disposed of in compliance with standard Caltrans procedures. Additionally, a site investigation involving both soil and groundwater testing will occur prior to grading and grubbing the construction area.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Caltrans prepared a Water Quality Study for the Olema Creek Culvert Replacement Project (Caltrans 2016d). A summary of the findings of this analysis are presented herein. The project would add less than 0.1 acre of new impervious area to the existing roadway. A downdrain/overside will be constructed at the northwest corner of the bottomless culvert for roadway drainage. This involves a concrete receptacle for roadway ditch drainage connecting to a corrugated pipe that extends into the stream below. This project will need to treat all runoff from new and reworked pavement. Biofiltration strips and bioretention swales are the preferred treatment technologies. Roadway surface water will be allowed to sheet flow to the planted fill material placed above the culvert and beyond the roadway surface. It will then infiltrate or flow into a side-drain where the water will be treated before allowed to enter into the creek. There are areas abutting the traveled way with gentle slopes where treatment may be possible. The project limits may need to be expanded to find areas to treat.

During construction, this project would disturb approximately 0.8 acre of soil area, which requires compliance with the Water Pollution Control Program (WPCP) section of Caltrans Standard Specifications. Soil erosion will be minimized since construction is proposed during typically-dry weather, summer months. Sediment from construction will be minimized by the use of Caltrans' construction best management practices for stormwater, including a system of silt fences that will be used to keep sediment out of the creek during slope grading in the TCE area. Temporary erosion control measures may also include bonded fiber matrix, and hydro-seeding with native seed mixture.

A temporary creek diversion is necessary to allow for construction. The unnamed tributary of Olema Creek affected by the proposed project is the confluence of two smaller tributary streams immediately to the East of the project limits, each requiring its own creek diversion prior to project construction. The creek diversion will consist of two coffer dams in the TCE and a conduit conveying the creek through the existing double culvert to the outfall on the west side. The choices of coffer dam materials are a gravel bag berm, a sheet piling wall, or an AquaDam (a large balloon filled with water). Since there is a vertical drop at the outfall no coffer dam is necessary on the west side of the project. As the contractor removes more of the embankment the culvert will daylight. The contractor will be able to push the culvert and creek diversion several feet to the north or south if necessary to finish removal of the embankment. Once the new culvert is complete, the creek diversion and cofferdams will be removed. The fleet of trucks removing soil will necessitate street sweeping at construction entrances to limit soil being transported to roadway drainage systems.

The hydraulics engineers defined and quantified the floodplain impacts for the proposed replacement culvert, and the conclusion was that the elevation of the proposed culvert lid is fundamentally higher than the 100-year floodplain. The water surface elevation would not overtop the proposed height of the culvert for both the 50-year and 100-year flood events, which would pass within the capacity of the bottomless culvert.

The best available science was utilized to determine if sea level rise (SLR) would affect the existing floodplain near the bridge site and impact the proposed structure. The maximum SLR projections without any future reduction in greenhouse gas emissions from today's levels were used to establish a range of locally-relevant future water levels and shoreline change.

The State of California Sea Level Rise Guidance Document provides guidance for incorporating SLR projections into planning and decision making for projects in California. This document was developed by the Coastal and Ocean Working Group of the California Climate Action Team in response to Governor Schwarzenegger's Executive Order S-13-08, issued on November 14, 2008, which directed state agencies to plan for sea-level rise and coastal impacts. That executive order also requested the National Research Council (NRC) to issue a report on SLR to advise California on planning efforts.

The final report from the NRC, *Sea-Level Rise for the Coasts of California, Oregon, and Washington*, was released in June 2012. The Sea-Level Rise Guidance Document has been updated with the scientific findings of the 2012 NRC report. The intent of this guidance document is to inform and assist state agencies as they develop approaches for incorporating SLR into planning decisions with the most recent and best available science, as published in the 2012 NRC report.

Projections of future sea level rise from the National Research Council's 2012 report on SLR state that south of Cape Mendocino from the year 2000-2100 the SLR is projected to be between 16.56 and 65.76 inches. Basin-wide satellite images and site survey data were used as a baseline to determine potential effects to the existing floodplain near the Olema Creek Tributary project site. The project site is located 5.5 miles upstream of Tomales Bay, and east of the coastal mountains from the Pacific Ocean. The analysis demonstrates that the highest forecasted SLR of 66 inches for the year 2100 should not impact the tailwater elevation used in the current bridge design model and can be discounted as not a significant impact to this project design. The volume of discharge by the watershed is not enough to increase the tailwater far enough upstream to the point that SLR will impact the culvert nor the roadway.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Olema Valley portion of the GGNRA lands is are managed under NPS' Point Reyes National Seashore management plan (NPS, 1980), This project complies with the stated goals, guidelines, and recommendations Point Reyes National Seashore management plan as well as Marin County's plans, including recommendations for view preservation, the minimization of visual degradation of natural landforms, and the construction of roadways to minimize the impacts of roads on wetlands, streams, and the scenic resources. No land use impacts will result from this project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

There are no documented mineral resources within the project limits. No impacts on mineral resources will result from this project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Operation of the Project would not introduce new noise or increase ambient noise levels because it does not add capacity or change the potential speed of the roadway. As such, it does not qualify as type 1 under the Code of Federal Regulations (23 CFR 772) and the Caltrans Traffic Noise Analysis Protocol. Construction noise would be temporary. There are no human sensitive receptors within the area and therefore no noise impact will occur to noise-sensitive land uses; however, construction noise can disturb migratory bird nesting and foraging activities. Noise limits will be directed by the onsite biological monitor based on time of year and presence of nests. See more discussion under Section IV, Biological Resources, in the subsection concerning migratory birds.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The project will not add capacity or change access. No additional residential or commercial right-of-way is required to construct this project. As such, no displacements will occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

To maintain the flow of traffic during construction, Caltrans will prepare a Traffic Management Plan consistent with California Manual on Uniform Traffic Control Devices (MUTCD), 2014 edition guidelines code 6H-3 recommendation for rural roadway construction. The traffic control plan will ensure accessibility through the project area for vehicles associated with essential services. One lane of traffic will be maintained throughout the construction period and two lanes will be maintained during weekend peak traffic periods. No other project impact will affect public services.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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XV. RECREATION:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Under the terms of a current administrative agreement, the superintendent of NPS at Point Reyes, who has management authority over the Point Reyes National Seashore, also has operational authority over the Olema Valley portion of GGNRA north of the Bolinas-Fairfax Road. As long as this agreement is in effect, the NPS headquarters in Bear Valley will continue to be the center of operations for Olema Valley as well as the seashore and as such, the Olema Valley of the GGNRA is managed by the Point Reyes National Seashore Management Plan. (NPS, 1980). The Point Reyes National Seashore has the following goal and objectives for managing the natural resources:

“To identify, protect, and perpetuate the diversity of existing ecosystems which are found at Point Reyes National Seashore and are representative of the California seacoast.

- To protect marine mammals, threatened and endangered species, and other sensitive natural resources found within the seashore.

- To enhance knowledge and expertise of ecosystem management through research and experimental programs relating to wildlife, prescribed burning techniques, exotic plant and animal reduction, regulation and control of resource use, and pollution control.”

The change of the roadway and the TCE would require access and easement permission on GGNRA lands in the Olema Valley from the managing agency, which is the NPS. This portion of the GGNRA is managed for grazing and open space viewing from the roadway. There are no trails or off-road access points near the project site. However, because the GGNRA lands remain open to the public, the TCE affects lands considered a Section 4(f) resource.

The TCE would be required for the embankment removal using an area approximately 122 feet long, and varying from 37 feet to 60 feet wide to access and excavate under the culvert and load material in haul trucks without requiring spoil piles. Construction activities within the TCE would be less than one season (under 120 days) and considerably less than the total construction period. The excavation may overlap 2 months of the wildlife breeding and migratory bird nesting periods.

Following construction, all affected areas will be graded and restored with native topsoil and plant material. Replanted trees will not return to full natural canopy growth for 10 to 20 years. No recreational features or activities will be temporarily or permanently affected. Since the management of the GGNRA is under the NPS’ Point Reyes National Seashore Management plan. The plan emphasizes the restoration and preservation of sensitive habitat, avoidance and minimization measures are consistent with those proposed for water quality and biological resources as listed in Appendix F.

The long-term impacts are beneficial and consistent with the Management Plan for the GGNRA.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

State Route 1 is a conventional highway. Presently there are no existing pedestrian facilities along or nearby the project limits. Although no bicycle-specific facilities are provided as part of this project, the project will construct 4-foot shoulders on the bottomless culvert structure per AASHTO standards. These shoulders will accommodate bicyclists and will be an improvement over current conditions as the current roadway has no shoulders. The proposed barrier railing, Type ST-20S, meets the minimum height required for bicycle railing.

There will be short periods of managed one-way traffic when setting piles for CIP bottomless culvert and for placing culvert lid and roadway paving, but construction will maintain two-way traffic during weekends.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The project proposes alterations to existing drainage facilities and will add less than 0.1 acre of additional impervious area. To avoid erosion and sediment into the creek, a downrain/overside will be constructed at the northwest corner of the culvert for roadway drainage. This involves a concrete receptacle for roadway ditch drainage connecting to a corrugate pipe that extends into the stream below. The down-drain outlet will terminate at the tributary channel with features to prevent scour from the outflow. Surface water will drain by allowing water to sheet flow to the vegetated areas along the roadway, through treatment areas and then flow into a side-drain to the creek.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Caltrans' application of best management practices, the re-establishment of vegetation in kind, and incorporation of minimization measures into project will result in beneficial long-term effects and no residual impacts from this project that can contribute to cumulative impacts.

Appendix A: References

California Department of Fish and Wildlife (CDFW) (formerly the California Department of Fish and Game). 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Available online at:

https://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf. November 24.

_____. 2016. Wildlife and Habitat Data Analysis Branch. California Natural Diversity Database (CNDDDB). RareFind 5. Electronic database. Sacramento, California. Available online at:
<http://www.dfg.ca.gov/biogeodata/cnddb/maBSAnddata.asp>. Accessed on January 6, 2016.

California Department of Transportation (Caltrans). 2016a. *Natural Environment Study for the Olema Creek Culvert Replacement Project*. District 4 Office of Biological Studies and Permits, Oakland, CA. April.

_____. 2016b. *Biological Assessment of the Olema Creek Culvert Replacement Project*. District 4 Office of Biological Studies and Permits, Oakland, CA. April.

_____. 2016c. *Section 106 Review of the Olema Creek Culvert Replacement Project. (Historic Property Survey Report (HPSR), Archaeological Survey Report (ASR), Extended Phase I Report (XPI), and Finding of Effect (FOE))*. District 4 Office of Cultural Resources, Oakland, CA. March.

_____. 2016d. *Water Quality Study for the Olema Creek Culvert Replacement Project*. Office of Environmental Engineering, Oakland, CA. April.

_____. 2016e. *Olema Creek Culvert Replacement Project. Project Visual Impact Analysis*. District 4 Office of Landscape Architecture, Oakland, CA. January.

California Native Plant Society (CNPS). 2001. *CNPS Botanical Survey Guidelines*. Originally published December 9, 1983; Revised June 2, 2001. Available online at: http://cnps.org/cnps/rareplants/pdf/cnps_survey_guidelines.pdf.

- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Available online at: <http://www.wetlands.com/regs/tlpge02e.htm>.
- Heady III, P. A. and W. Frick. 2007. *Final Report for the Bat Assessment Survey for Aetna Springs Resort Property*. Central Coast Bat Research Group, Report to LSA Associates, Inc., Pt. Richmond, CA.
- Johnson, J. S., M. J. Lacki, and M. D. Baker. 2007. "Foraging Ecology of Long-legged Myotis (*Myotis volans*) in North-central Idaho." *Journal of Mammalogy* 88(5):1261-1270.
- Lacki, M. J., S. K. Amelon, and M. D. Baker. 2007. "Foraging ecology of forest bats and the implications for conservation and management." Pages 83-127 in Lacki, M. J., H. P. Hayes, and A. Kurta, editors. *Bats in Forests: conservation and management*. Johns Hopkins University Press. 329 pages.
- National Park Service (NPS). 1980. *Point Reyes National Seashore General Management Plan EA*. September.
- United States Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. U.S. Army Corps of Engineers Engineer Research and Development Center. Vicksburg, Mississippi. Available online at: <http://www.usace.army.mil/CECW/Documents/cecwo/reg/trel08-28.pdf>.
- U.S. Fish and Wildlife Service (USFWS). 1996. *Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants*. Sacramento, CA.
- _____. 2015. USFWS Species Data, Northern Spotted Owl. Available online at: <http://www.fws.gov/oregonfwo/species/data/northernspottedowl/>. Accessed December 8, 2015.

Appendix B: Notice of Intent to Adopt a Negative Declaration

This notice will be made available following public and agency review.

Appendix C: Notice of Determination

This notice will be made available following public and agency review.

Appendix D: List of Preparers

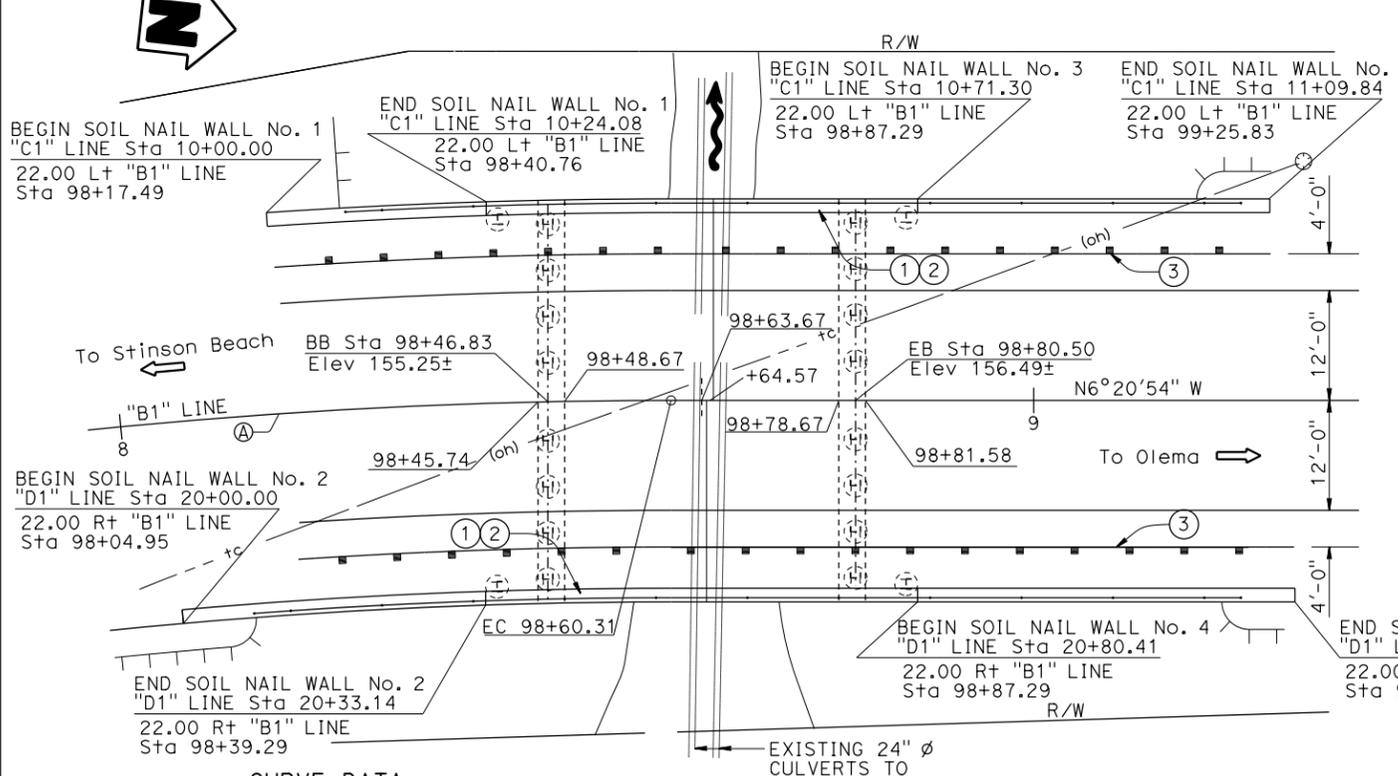
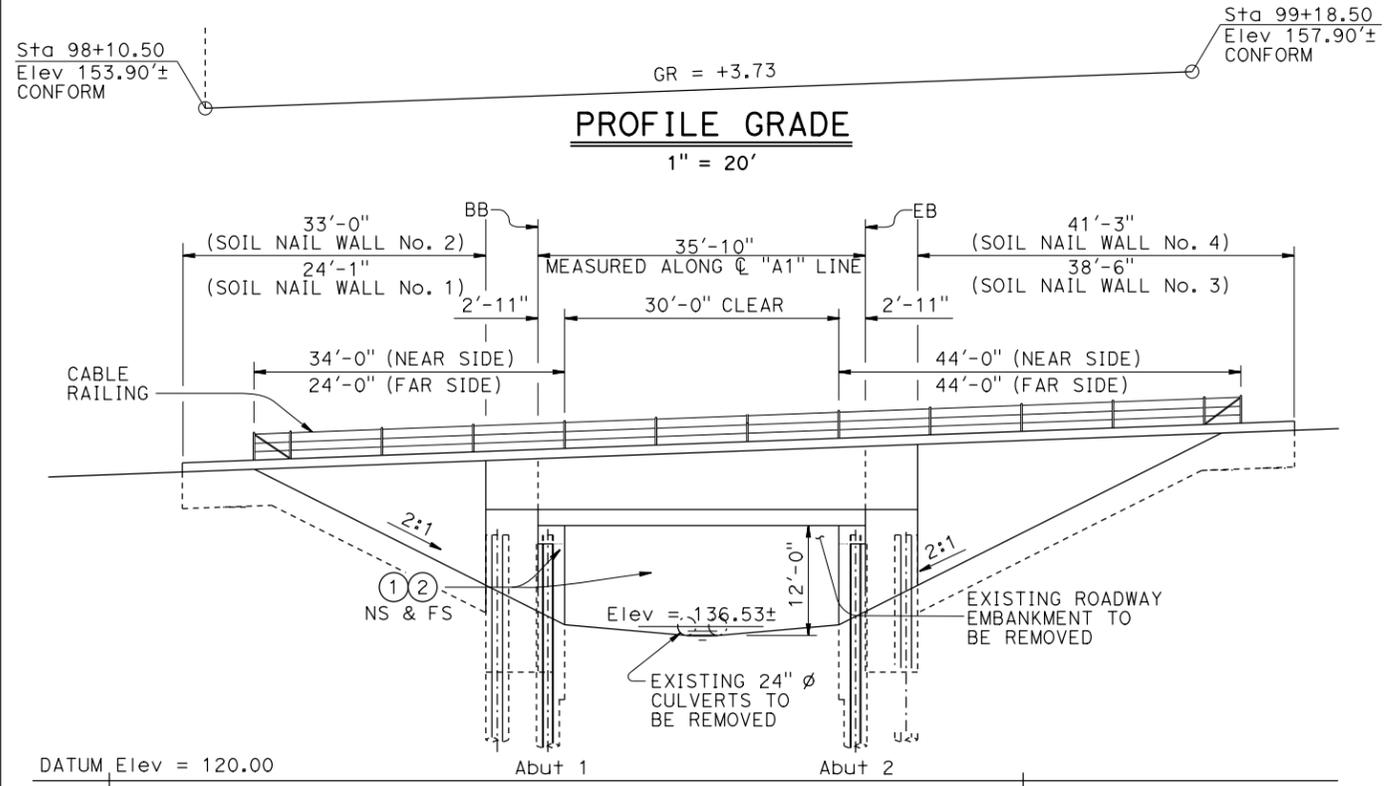
Aguilera, Peter	Caltrans District 4 Office of Environmental Engineering
Alemayehu, Erica	Caltrans District 4 Office of Environmental Engineering
Boyer, Ray	Caltrans District 4 Office of Environmental Analysis (HAZ)
Cotroneo, Rachel	CH2M HILL Environmental Biologist
DeNardo, Eric	Caltrans District 4 Office of Environmental Analysis
Rivas, Yolanda	Caltrans District 4 Office of Environmental Analysis
Rose, Kathryn	Caltrans District 4 Office of Cultural Studies
Hartman, Lindsay	Caltrans District 4 Office of Cultural Studies
Jannusch, Chris	Caltrans District 04 Office of Biological Studies and Permit
Ketelsen, Jodi	CH2M HILL Environmental Planner
Lindsay, Susan	Caltrans District 4 Office of Landscape Architecture
Lutz, Philip	Caltrans District 4 Office of Landscape Architecture
MacCarthy, Arnica	Caltrans District 4 Office of Environmental Analysis
Malamud-Roam, Frances	Caltrans District 04 Office of Biological Studies and Permits
Vivian, Lindsay	Caltrans District 04 Office of Biological Studies and Permits
Pedaballi, Siddareddy	Caltrans District 4 Office of Environmental Engineering
Schierenbeck, Frances	Caltrans District 4 Office of Cultural Studies
Sojourner, Anna	Caltrans District 4 Office of Environmental Engineering (Hydraulics)
Velez, Fernando	Caltrans District 4 Office of Environmental Engineering
Weinberg, Daniel	CH2M HILL Environmental Biologist
Weller, Jonathan	Caltrans District 4 Office of Environmental Analysis (WQ)

Appendix E: Project Plans

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Mrn	1			

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

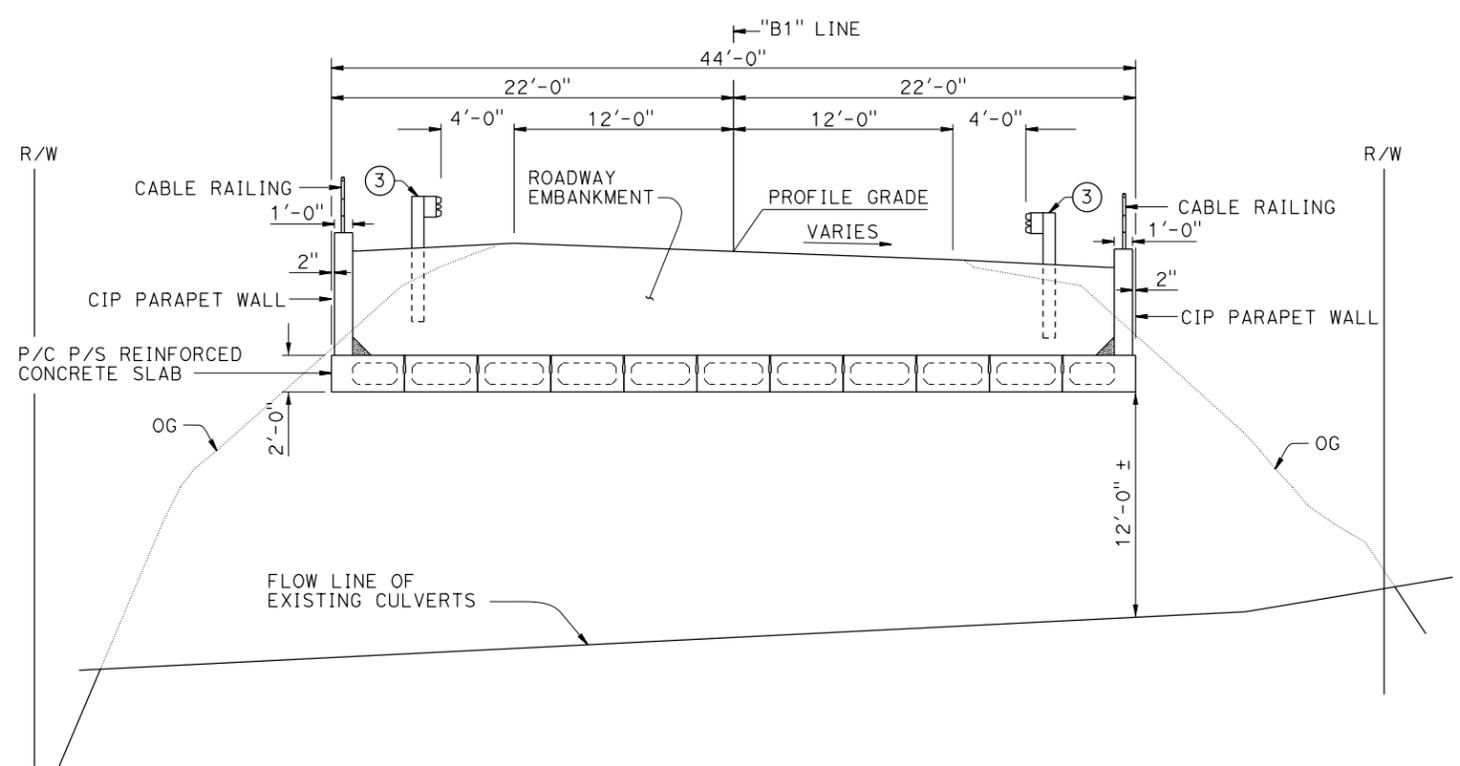


CURVE DATA

No.	R	Δ	T	L
(A)	630.00	22°25'38"	124.90	246.60

PLAN
1" = 10'

QUANTITIES



TYPICAL SECTION
1" = 5'

NOTES:

- ① Paint "Br No. 20-0120"
- ② Paint "OLEMA CREEK BRIDGE"
- ③ MGS, See "ROADWAY PLANS"

- 1. For traffic controls, see "Road Plans"
- 2. For construction staging, see "TYPICAL SECTION" sheet.
- 3. For "GENERAL NOTES", "INDEX TO PLANS", "STANDARD PLAN LIST" and "PILE DATA TABLE" see "INDEX TO PLANS" sheet

DESIGN ENGINEER

DESIGN	BY P. Lutz	CHECKED	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE
DETAILS	BY P. Lutz	CHECKED	LAYOUT	BY Phil Lutz
QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 9

BRIDGE NO.	27-0120
POST MILE	24.7

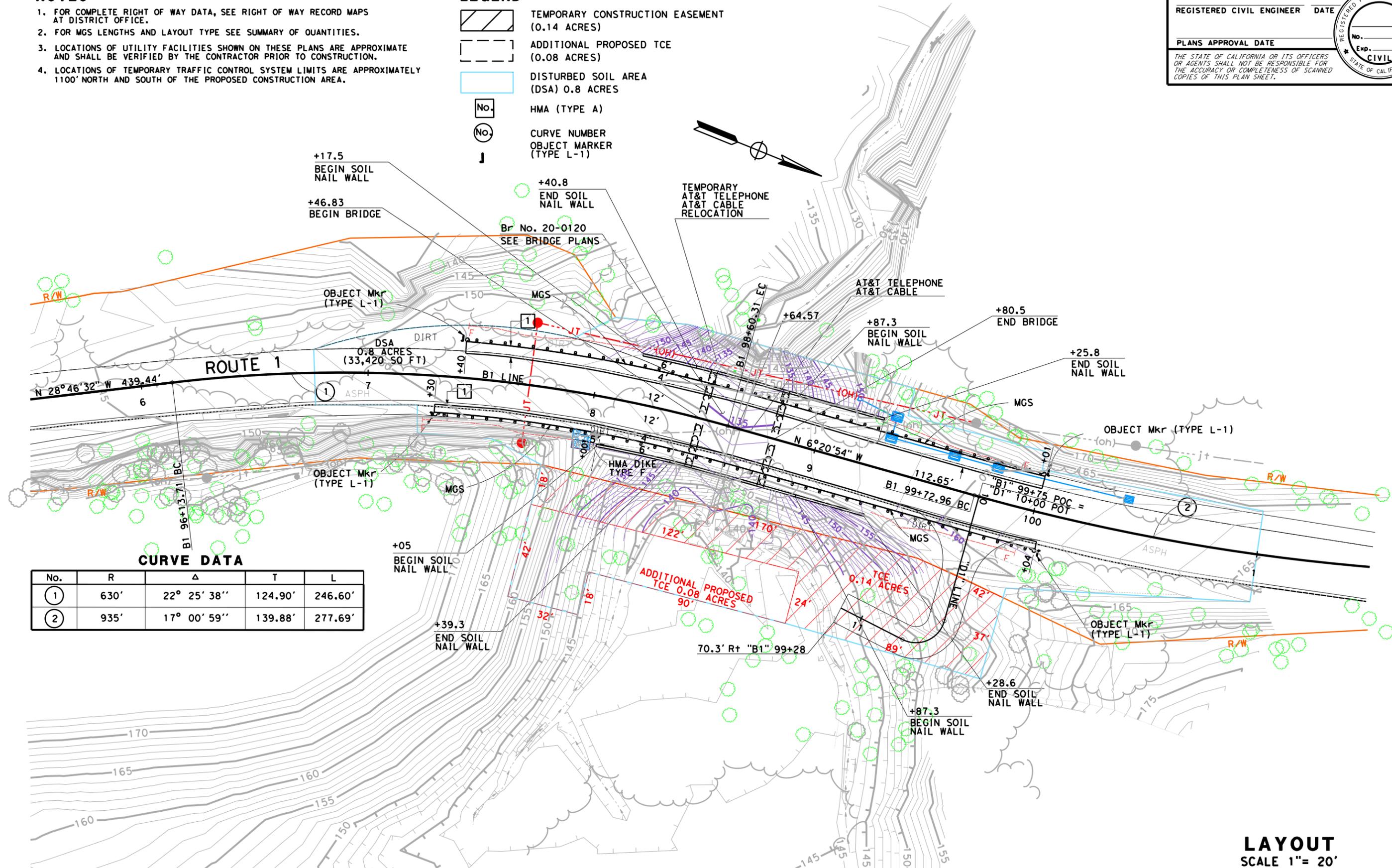
OLEMA CREEK TRIBUTARY, PM 24.7
GENERAL PLAN No. 1

NOTES:

1. FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR MGS LENGTHS AND LAYOUT TYPE SEE SUMMARY OF QUANTITIES.
3. LOCATIONS OF UTILITY FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. LOCATIONS OF TEMPORARY TRAFFIC CONTROL SYSTEM LIMITS ARE APPROXIMATELY 1100' NORTH AND SOUTH OF THE PROPOSED CONSTRUCTION AREA.

LEGEND:

- TEMPORARY CONSTRUCTION EASEMENT (0.14 ACRES)
- ADDITIONAL PROPOSED TCE (0.08 ACRES)
- DISTURBED SOIL AREA (DSA) 0.8 ACRES
- HMA (TYPE A)
- CURVE NUMBER
- OBJECT MARKER (TYPE L-1)



CURVE DATA

No.	R	Δ	T	L
①	630'	22° 25' 38"	124.90'	246.60'
②	935'	17° 00' 59"	139.88'	277.69'

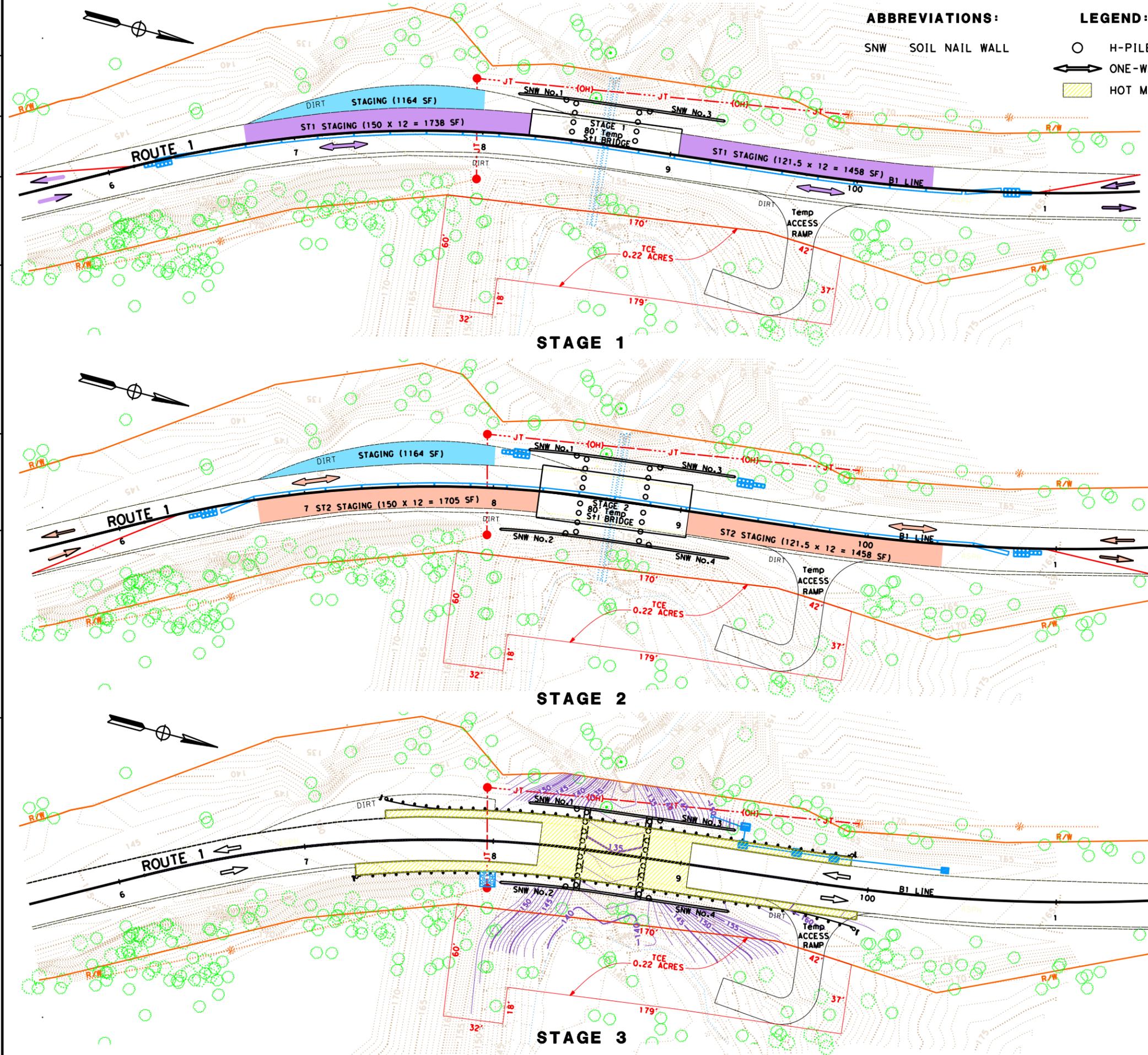
APPROVED FOR LAYOUT WORK ONLY

LAYOUT
SCALE 1" = 20'

L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 DESIGN
 FUNCTIONAL SUPERVISOR: ARLISSA PANG
 CHECKED BY: PETER AGUILERA
 CALCULATED/DESIGNED BY: ERICA ALEMAYEHU
 REVISOR: PETER AGUILERA
 DATE: _____

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CDOT
 DESIGN



ABBREVIATIONS:
 SNW SOIL NAIL WALL

LEGEND:
 ○ H-PILES
 ⇄ ONE-WAY REVERSING TRAFFIC
 ▨ HOT MIX ASPHALT CONCRETE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Mtn	1	24.7		

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



STAGE 1

1. INSTALL CONSTRUCTION AREA SIGNS AND Temp SIGNAL SYSTEM
2. PLACE Temp STRIPING, K-RAIL, AND CRASH CUSHIONS
3. CONSTRUCT TEMPORARY ACCESS RAMP
4. INSTALL CULVERT ABUTMENT PILES.
5. INSTALL WEST SOIL NAIL WALLS.
6. CONSTRUCT SB TEMPORARY S+I BRIDGE

STAGE 2

1. SWITCH TRAFFIC: PLACE Temp STRIPING, K-RAIL, AND CRASH CUSHIONS
2. INSTALL CULVERT ABUTMENT PILES.
3. INSTALL EAST SOIL NAIL WALLS.
4. CONSTRUCT NB TEMPORARY S+I BRIDGE

STAGE 3

1. Exc EMBANKMENT M+I UNDER BRIDGE(INCLUDES Temp SHORING), REMOVE HEADWALL, AND CULVERTS
2. CONSTRUCT CULVERT (INCLUDING PARAPET & CABLE RAILING)
3. REMOVE SB Temp S+I BRIDGE
4. BACKFILL SB Conc CULVERT
5. PAVE HMA SB ROADWAY (NOT SHOWN, SEE LAYOUT)
6. REMOVE NB Temp S+I BRIDGE
7. BACKFILL NB Conc CULVERT
8. PAVE HMA NB ROADWAY (NOT SHOWN, SEE LAYOUT)
9. REMOVE Temp STRIPING, K-RAIL, CRASH CUSHIONS, AND Temp SIGNAL SYSTEM
10. RESTRIPE ROADWAY
11. CONTOUR GRADE EMBANKMENTS AND SHAPE CHANNEL

STAGE 4 (NOT SHOWN)

1. APPLY EROSION CONTROL MEASURES
2. REMOVE TEMPORARY ACCESS PATH & RESTORE EXISTING
3. INSTALL METAL BEAM GUARDRAIL (SHOWN IN STAGE 3 FOR VISUAL PURPOSES ONLY)

STAGE CONSTRUCTION
 SCALE 1" = 5'

Appendix F: Avoidance and Minimization Measures

Appendix F: Avoidance and Minimization Measures

Caltrans has incorporated numerous avoidance and minimization measures (AMMs) into the proposed project to avoid and minimize the impacts of this project on special-status species, migratory birds, and protected resources that may occur in the project limits. Special-status species known to occur or with a potential to occur in the project limits include the California red-legged frog (CRLF), steelhead trout, and migratory birds. Measures taken to minimize the likelihood of direct impact of federally listed species (CRLF, California freshwater shrimp [CFS], and northern spotted owl [NSO]) have been identified through consultation with the USFWS pursuant to Section 7 of the federal Endangered Species Act. Proposed avoidance measures include conducting construction activities during specific work windows to avoid the time of year when protected species is most active, worker education awareness training, and species surveys of the project limits ahead of construction. Caltrans has also developed other measures to avoid impacts to species of special concern as part of the proposed project. The final biological opinion may add specific measures that would ultimately be incorporated into the contractor’s bid package. The list below is categorized by resource type/species and includes a general overview of the most important and applicable measures.

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/or Mitigation Measures
<p>Hydrology and water quality</p>	<ol style="list-style-type: none"> 1. All runoff from new and reworked pavement will be treated with biofiltration strips and/or bioretention swales. 2. Soil erosion will be minimized since construction is proposed during typically-dry weather, summer months. Sediment from construction will be minimized by the use of Caltrans’ construction best management practices for stormwater, including a system of silt fences that will be used to keep sediment out of the creek during slope grading in the temporary construction easement (TCE) area. Temporary erosion control measures may also include bonded fiber matrix, and hydro-seeding with native seed mixture. 3. To avoid impacting unnamed tributary during construction, a creek diversion will be installed consisting of two coffer dams in the TCE and a conduit conveying the creek through the existing double culvert to the outfall on the west side. The choices of coffer dam materials are a gravel bag berm, a sheet piling wall, or an AquaDam (a large balloon filled with water). 4. During soil hauling, street sweeping at construction entrances to limit soil being transported to roadway drainage systems.
<p>General Avoidance and Minimization Measures</p>	<ol style="list-style-type: none"> 1. As a first order of work, the project footprint will be delineated with temporary, high-visibility wildlife exclusion fencing to prevent the encroachment of construction personnel and equipment into sensitive areas during construction activities and to prevent the inadvertent encroachment of the California red-legged frog (CRLF) into the project footprint. The fencing will be removed only when all construction equipment is removed from the job site. 2. High-visibility, environmentally sensitive area fencing or markers may be

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/ or Mitigation Measures
	<p>used elsewhere within the project limits to protect certain trees and plants, if possible, and will identified later in the design phase of the project.</p> <ol style="list-style-type: none"> 3. Vegetation will be cleared only where necessary; grubbing will be minimized to the greatest extent practicable. Efforts will be taken to minimize impacts to well-established vegetation, particularly within the riparian habitat where feasible. 4. Any vegetation that is within the cut-and-fill line or is growing in locations where permanent structures will be placed or on the embankment to be excavated, will be cleared. In all other areas where vegetation will be cleared, it will be cut above soil level to allow vegetative reproduction following construction. 5. This project will be in compliance with the MBTA and will avoid impacts to the extent feasible during the February 1 to August 31 nesting season. If work must occur during the nesting season, the following measures will be taken: <ul style="list-style-type: none"> • No more than 3 days prior to construction or any vegetation clearing, the project area will be surveyed for migratory and non-game birds, and their nests. • Should any active nests be found, appropriate no-work buffers will be applied, including a 50 foot buffer for any nesting passerine birds and a 300 foot buffer for nesting raptors. • Any nesting migratory birds or nongame birds near the project footprint will be regularly monitored for signs of disturbance; work will be avoided in such areas until all birds have fledged. 6. Onsite construction will be constrained to occur during the driest time of year, when the creek is anticipated to have its lowest flows, starting on July 10 and ending on October 15. This practice is mainly to protect the CRLF, NSO, CFS, and CCS, as this window avoids the time period when these species are most active or are thought to be potentially present. Work in the creek will be limited to when the creek is dry or mostly dry, as much as practicable. 7. The Douglas-fir (<i>Pseudotsuga meniesii</i>) on the embankment will be cleared using a truck-mounted crane operated from the roadway and hand tools and may be placed in the channel per consultation with a fluvial geomorphologist, provided to the National Park Service (NPS) or removed from the construction site; no construction vehicles will be permitted below the ordinary high water mark downstream of the culvert outlet or in the creek's surface waters. Protective measures will be implemented to prevent excavation material from falling into the creek. 8. Grubbing will be limited to the embankment that will be excavated or within the cut/fill line. Vegetation removal will be done by hand. 9. All construction personnel will attend an environmental education program delivered by a U.S. Fish and Wildlife Service (USFWS)-approved biologist prior to working on the project site. The program will include an explanation of how to best avoid the incidental direct impact of listed species. The field meeting will include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis will be placed on the importance of the habitat and life stage requirements within the context of project maps showing areas where avoidance and minimization measures are to be implemented. The program will include an explanation of applicable federal and state laws protecting endangered species as well as the importance of compliance with Caltrans and various resource agency

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/or Mitigation Measures
	<p>conditions.</p> <ol style="list-style-type: none"> 10. Project-related vehicle traffic will be restricted to established roads and construction areas. Project vehicles will observe a 15-mile-per-hour speed limit while in the project limits, except on the current highway. 11. Dust control measures will be implemented. These will consist of regular truck watering of construction access areas and disturbed soil areas, including the use of organic soil stabilizers, if required, to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. In addition, for disturbed soil areas, the use of an organic tackifier to control dust emissions blowing off of the right-of-way or out of the construction area during construction will be included in the construction contract. Watering guidelines will be established to avoid any excessive run-off that may flow into contiguous areas. Any material stockpiles will be watered, sprayed with tackifier, or covered to minimize dust production and wind erosion. Dust control will be addressed during the environmental education session. 12. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once daily from the project footprint. 13. Dedicated fueling and refueling practices will be designated as part of the approved Storm Water Pollution Prevention Plan (SWPPP). Dedicated fueling areas will be protected from storm water run-on and will be located at least 50 feet from downslope drainage facilities and water courses. Fueling must be performed on level-grade areas. Onsite fueling will only be used when and where it is impractical to send vehicles and equipment off-site for fueling. When fueling must occur onsite, the contractor will designate an area to be used subject to the approval of the Resident Engineer (RE) representing Caltrans. Drip pans or absorbent pads will be used during onsite vehicle and equipment fueling. 14. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 ft from any downstream riparian habitat, aquatic habitat, culvert, or drainage feature. 15. Any and all non-hazardous dredge/fill material produced as a result of removing the existing embankment and constructing the new abutments will either be reused and fully contained within the project limits or will be properly disposed of offsite. 16. All areas that are temporarily affected during construction will be revegetated with an assemblage of native species as appropriate. 17. To reduce the spread of invasive, nonnative plant species and to minimize the potential decrease of palatable vegetation for wildlife species, Caltrans will comply with Executive Order 13112. This Order is provided to prevent the introduction of invasive species and to provide for their control to minimize the economic, ecological, and human health effects. In the event that noxious weeds are disturbed or removed during construction-related activities, the contractor will be required to contain the plant material associated with these noxious weeds and dispose of them in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the areas within the project footprint should be covered to the extent practicable with heavy black plastic solarization material until the end of the project. 18. At the request of NPS, topsoil from the area will be stored and re-applied

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/or Mitigation Measures
	<p>within the project limits following construction to the extent possible, and any supplemental topsoil material will be obtained through permit from nearby resources within GGNRA or park lands as appropriate and available to reduce to introduction of new species and enhance the possibility of maintaining the same native species.</p> <p>19. All disturbed areas outside the state right-of-way will be restored to meet in-kind ecological habitat values. This includes contouring disturbed areas to conform to the surrounding landscape and restored by a combination of compost application, re-vegetation with native plants, and hydroseeding with an appropriate native seed mix, watering and monitoring re-establishment of plants throughout a minimum 3-year plant re-establishment period.</p>
<p>California red-legged frog (CRLF), California freshwater shrimp (CFS), and western pond turtle (WPT)</p>	<ol style="list-style-type: none"> 1. A USFWS-approved biologist will be onsite to monitor all construction activities that could reasonably result in the direct impact of CRLF, CFS, or WPT (e.g., work within the creek bed, grubbing). The biologist will conduct a pre-construction survey for CRLF, CFS and WPT ahead of any ground disturbing activities. The qualifications of the biologist(s) will be presented to the USFWS for review and written approval prior to ground-breaking at the job site. 2. The approved biologist will have the authority to halt work through coordination with the resident engineer in the event that a CRLF, CFS, NSO or WPT is discovered within the project footprint. The resident engineer will ensure construction activities remain suspended in any construction area where the qualified biologist has determined that a potential direct impact of CRLF, CFS, or NSO could occur. Work will resume once the animal leaves the site voluntarily, is removed by the biologist(s) to a release site using USFWS-approved handling techniques, or is determined to not be being harassed by construction activities. If direct impact occurs, the biologist(s) will notify the USFWS contact by telephone and email within 1 working day. 3. Nighttime work will be avoided to the maximum extent practicable. Should nighttime work need to be conducted, all lighting will be directed downward and toward the active construction work area. 4. If pumping is used for dewatering, intakes will be completely screened with wire mesh no larger than 0.2 inch to prevent animals from entering the pump. 5. If necessary, rodenticides and herbicides will be used in the project footprint in such a manner as to prevent primary or secondary poisoning of the CRLF, CFS, NSO, or WPT and the depletion of vegetation upon which they depend. All uses of such compounds will observe label and other restrictions mandated by the U.S. Environmental Protection Agency, and California Department of Food and Agriculture, and other appropriate state and federal regulations. 6. To prevent the inadvertent entrapment of the animals, all excavated, steep-walled holes or trenches more than 1-ft deep will be covered at the close of each working day by plywood or similar materials. If it is not feasible to cover an excavation, one or more escape ramps constructed of earthen fill or wooden planks shall be installed. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If, at any time, a trapped listed animal is discovered, the biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or the USFWS will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and email within 1 working day.

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/or Mitigation Measures
	<p>7. Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.</p> <p>8. No pets or firearms, except those used by law enforcement personnel, will be permitted into the action area.</p> <p>9. If requested, before, during, or upon completion of groundbreaking and construction activities, Caltrans will allow access by USFWS personnel into the project footprint to inspect the project and its activities. Caltrans requests that all agency representatives contact the resident engineer prior to accessing the work site and review and sign the Safe Work Code of Practices, prior to accessing the work site for the first time.</p> <p>Reporting</p> <p>10. Injured CRLF, CFS or WPT will be cared for by a USFWS-approved biologist or a licensed veterinarian, if necessary. Dead individuals of any special-status animal will be preserved according to standard museum techniques and held in a secure location. The USFWS will be notified within one working day of the discovery of a death or an injury to CRLF/CFS/WPT resulting from project-related activities or if a CRLF/CFS/WPT is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a United States Geological Survey (USGS) 7.5-minute quadrangle and other maps at a finer scale, as requested by the USFWS, and any other pertinent information.</p> <p>11. Caltrans will submit post-construction compliance reports prepared by the biologist to the USFWS within 60 calendar days following completion of project activities or within 60 calendar days of any break in construction activity lasting more than 60 calendar days. This report will detail (1) dates that relevant project activities occurred; (2) pertinent information concerning the success of the project in implementing avoidance and minimization measures for listed species; (3) an explanation of failure to meet such measures, if any; (4) known project effects on the CRLF, CFS, or WPT, if any; (5) occurrences of incidental direct impact of any listed species; (6) documentation of employee environmental education; and (7) other pertinent information.</p>
Northern spotted owl (NSO)	<p>1. Tree removal will be restricted to the non-nesting season for NSO.</p> <p>2. No more than 3 days prior to construction or any vegetation clearing, a USFWS approved Biological Monitor will survey the project area for NSO and their nests, regardless of the time of year.</p> <p>3. If nesting NSO are observed, or if NSO individuals are observed, specific measures developed as part of Section 7 consultation will be implemented, including the implementation of no-work buffers around any active nests.</p> <p>4. Construction activities that cannot be completed during the non-nesting season and will be restricted to late nesting season.</p>
Migratory birds	<p>1. In compliance with the MBTA, Caltrans will avoid direct impact of active nests. To the extent feasible, tree and vegetation removal activities will be restricted to the non-nesting season (September 1 – February 1). No more than three days prior to any construction activities, regardless of time of year, a Caltrans biologist will conduct pre-construction nest surveys. If active nests are found, the biologist will work with CDFW to establish appropriate no-work buffers.</p>

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures and/ or Mitigation Measures
	<ol style="list-style-type: none"> 2. Nest exclusionary devices may also be implemented prior to the nesting season to avoid impacting nesting birds. These may include sprinklers or high pressure hoses to remove non-raptor nests or installing devices in non-active nests (e.g., buoys) to exclude active use of the nest during the construction season. 3. Preconstruction and construction nest surveys will be conducted within the BSA for all bird species and, if special-status species are detected, Caltrans will consult with CDFW or USFWS as appropriate. Surveys will include at least one survey conducted one full breeding season prior to the beginning of construction. If bird nests are found, they will be avoided/buffered to the extent suggested by a qualified biologist to avoid direct impact of an active bird nest.
Salmonids	<ol style="list-style-type: none"> 1. If necessary, a fish relocation plan will be implemented to remove protected steelhead (<i>Oncorhynchus mykiss</i>) away from the project site consistent with the National Marine Fisheries Service (NMFS) Programmatic Biological Opinion (Caltrans 2016a; Appendix F of the Natural Environmental Study). This plan will be submitted to CDFW and NMFS for approval prior to project implementation. 2. A qualified biologist will conduct a preconstruction visual survey (i.e., bank observations). If listed species are observed during the surveys, and it is determined that they could be injured or killed by construction activities, a qualified project biologist will identify appropriate methods for avoiding direct impact, including exclusion where possible, and, if necessary, relocation of individuals that could be affected. 3. Construction is scheduled during the summer and fall, when the creek will be dry to mostly dry, beginning on July 1 and ending on October 15. Conducting work within the proposed in-water work window will minimize the likelihood of potential mortality. 4. BMPs will be implemented to avoid or minimize impacts on fish and wildlife species and their associated habitat, including Caltrans standard maintenance and construction site BMPs, listed in this table under "General Avoidance and Minimization Measures" as well as additional measures developed specifically for project actions to be identified in the NMFS Programmatic Biological Opinion. Per technical assistance with NMFS (October 15, 2015), Caltrans is anticipating using the Programmatic Biological Opinion (PBO) for consultation for CCS for this project.
Pallid bat, Townsend's big-eared bat, and western red bat	<p>Because of the cryptic (i.e., difficult to observe) nature of day-roosting by bats, any suspect trees (such as large snags or cavity trees) should be removed using the two-phase system of removing limbs from the tree on the afternoon of the first day and stumping the tree on the following day. This technique allows any bats that may be using the trees to leave of their own volition; they are then unlikely to day-roost in or near any trees from which the limbs were removed. In addition to this, it is recommended to the maximum extent practicable, that no work occur at dawn or dusk, when bats are most active. No bats will be handled as part of this project.</p>
Invasive species	<p>Caltrans will implement a non-standard special provision to require the cleaning and decontamination of vehicles and equipment brought into the construction area.</p>

Source: *Natural Environment Study for the Olema Culvert Replacement Project* (Caltrans, 2016)