CALIFORNIA COASTAL COMMISSION NORTH COAST DISTRICT OFFICE 1385 EIGHTH STREET, SUITE 130



NORTH COAST DISTRICT OFFIC 1385 EIGHTH STREET, SUITE 1 ARCATA, CA 95521 VOICE (707) 826-8950 FAX (707) 826-8960



1-21-0074 (Caltrans)

September 9, 2021

EXHIBITS

Exhibit 1: Regional Location Map

Exhibit 2: Project Vicinity Map

Exhibit 3: Excerpt from Applicant's Project Description and Proposed Mitigation Measures

Exhibit 4: Excerpts from Project Construction Plans

Exhibit 5: Proposed Project Layouts

Exhibit 6: Existing Conditions and Project Visuals

Exhibit 7: Habitat Maps

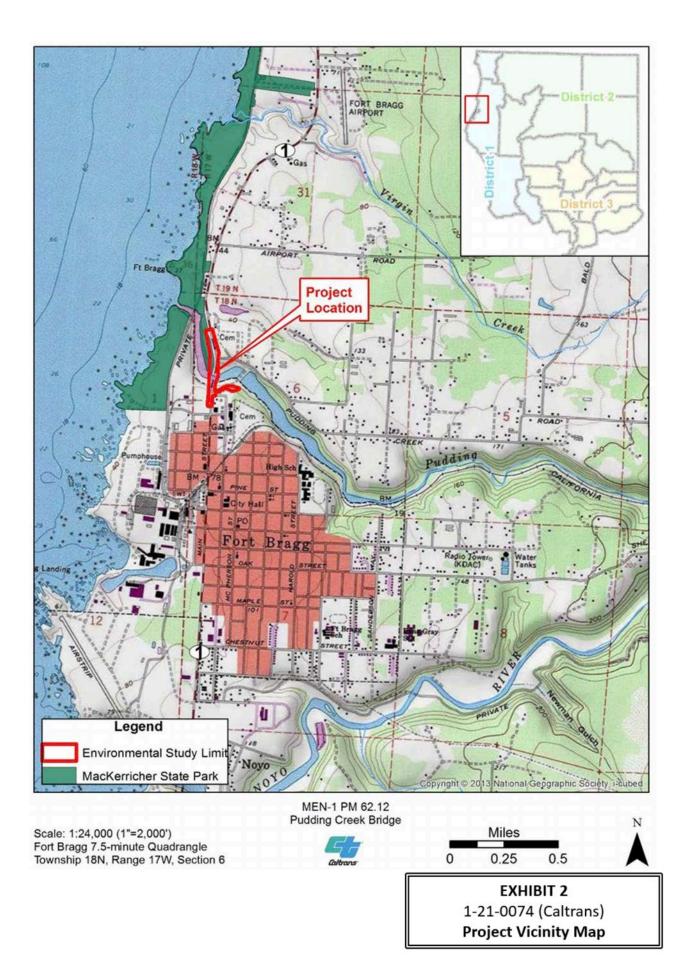
Exhibit 8: Draft Onsite Revegetation Plan (excerpt)

Exhibit 9: Hydroacoustic Memo Prepared by Commission Staff Ecologist

Exhibit 10: Map of Staging Area



EXHIBIT 1 1-21-0074 (Caltrans) Regional Location Map



Pudding Creek Bridge Widening Project Description

Project History

The California Department of Transportation (Caltrans) proposes to widen the bridge structure and upgrade the bridge railing of the Pudding Creek Bridge (Bridge No. 10-0158) on State Route (SR) 1 at post mile (PM) 62.12 in Mendocino County. The existing structure spanning Pudding Creek was built in 1959 and seismically retrofitted in 1998.

Caltrans is the lead agency under the California Environmental Quality Act (CEQA).

Project Description

The project proposes to widen the Pudding Creek Bridge symemetrically on both sides of the existing structure. The existing bridge is 41 feet wide, including two 12-foot-wide lanes, two 2foot-wide shoulders, two 6-foot-wide sidewalks, and two "see-through" concrete barrier rails. The bridge would be widened from 41 feet to approximately 59 feet to accommodate two 12foot-wide lanes, two 8-foot-wide shoulders, and two 6-foot-wide pedestrian walkways with pedestrian rails, and two upgraded vehicle barrier rails. The existing bridge length of approximately 321 feet would not change. Vehicle barrier rail would be upgraded to type ST-75 to meet current design standards. The rail type is "see-through" and galvanized and would be painted or stained. Pedestrian rails would be installed along both walkways at the edge of the bridge deck and would also be painted or stained to match the vehical barrier rails. New bridge lighting would be installed in the pedestrian rail. The lighting would be low to the ground and illuminate only the sidewalks and roadway. The roadway at the north and south approaches of the bridge would be widened to transition from the roadway to the widened structure. The roadway shoulders within the project limits would be widened to approximately 8 feet. Pavement delineation, such as striping and pavement markers, as well as signage, would be installed. The existing metal beam guardrail that transitions from the bridge would be replaced with a Midwest Guardrail System with steel posts.

New 6-foot wide sidewalks would be constructed on both sides of the highway from Pudding Creek Bridge south 430 feet (approximately 200 feet north of Elm Street) and north approximately 250 feet from the north end of the bridge along the west side of SR-1 and north approximately 150 feet from the north end of the bridge along the east side of SR-1. To accommodate roadway widening and sidewalk installation, a 150-foot-long, 2 to 4-foot high retaining wall would be constructed southeast of the bridge between PMs 62.04 and 62.07. The retaining wall would be located at the back of curb along the sidewalk. Wall design aesthetic treatment would match the existing wall at the junction of SR 20 and SR 1.

> EXHIBIT 3 1-21-0074 (Caltrans) Project Description & Proposed Mitigation Measures (excerpt)

The proposed project would modify existing drainage systems. South of the bridge, along the west side of the highway, the sidewalk curb and gutter would convey surface water as gutter flow. There is currently a low point at the northwest end of the bridge with no existing drainage facilities. To facilitate drainage, a drainage inlet (DI) would be placed at the low point (approximately PM 62.18) and a 1-foot-diameter corrugated steel pipe (CSP) would be installed through the abutment wingwall (which would outlet west of the bridge and eventually into Pudding Creek).

There are two existing culverts south of the bridge located at PMs 62.03 and 62.08 that convey water north towards Pudding Creek and run parallel to the roadway along the east side. The project proposes to replace and relocate the DIs at PMs 62.03 and 62.08. The CSP at PM 62.03 would be replaced with a longer 2-foot-diameter pipe that runs parallel to the roadway between the DI at PM 62.03 and PM 62.08. The new DI would be connected to the DI at PM 62.08 to capture water before reaching the curb ramp/sidewalk; this would require relocation of an existing utility pole. The project also proposes replacing the CSP at PM 62.08 (southeast corner of MEN 1 and E. Manzanita) with a 2-foot-diameter pipe with a flare end section (FES) which would convey runoff from the new DI at 62.08 under E. Manzanita to the existing ditch running parallel to SR 1. To capture gutter flow before it can flow onto the bridge, three curb inlets (passthroughs) along the sidewalk gutter are proposed on the southwest end of the bridge. The existing drainage scuppers on the bridge would be eliminated. Runoff would be directed off the bridge via gutter flow and through DIs on either side of the highway, discharging flow to the roadway embankment through 18-inch pipes with FESs at the outlet to reduce velocity and scour. A bioswale is proposed north of the bridge and along the west edge of the parking area. The bioswale would treat flow from the roadway runoff around the Pudding Creek Road intersection.

Most of the work would occur within the existing Caltrans right of way (ROW) and on SR 1; however, temporary construction easements would be required from four parcels and one fee parcel for stormwater treatment. To allow contruction access, placement of work pads, abutment widening and roadway widening, clearing and grubbing of upland and riparian vegetation would be necessary, including small trees, to allow for the swing radius of the crane. Existing vegetation would be preserved as much as possible within the work zone. Vegetated areas beyond the construction zone would be marked on the project plans as environmentally sensitive areas and designated with flagging or temporary high visibility fencing. All areas temporarily disturbed for access would be restored to pre-construction conditions by regrading the site and revegetating with native species upon completion of construction. Abutment 1 on the south end and Abutment 9 on the north end would be widened approximately 9 feet on the east and west sides of the existing structure to match the width of the new bridge and would have additional wingwalls. Two new precast prestressed girders would be placed on each side of the widened abutments and existing pier caps. Temporary work pads would be used to stage equipment, depending on which side of the bridge work is occurring. Construction would be phased to conduct work on the east or west side of the structure and then shift work to the opposite side of the structure. These areas would be cleared of vegetation, graded, and temporarily layered with rock. Construction would require the use of a crane, a pile driving hammer, and a hoe ram mounted on an excavator. To prevent runoff of contaminants, the work pad would be enclosed with temporary water pollution control BMPs.

The area around the abutments would be excavated to the bottom of the existing footings. The maximum depth of excavation would be approximately 12 feet. The footing of Abutment 1 extends 6 to 8 feet below the ground surface and is supported by a spread footing. Widening at Abutment 1 would be above the OHWM. The contractor would excavate with a hoe ram and bucket attachment approximately 6 to 8 feet down to the bottom of the existing spread footing. This activity would also be performed at Abutment 9 to prepare for driving piles using a pile driver before pouring concrete for the abutment footings and constructing the portion of the widened abutment and new wingwalls. The hoe ram would be used for a minimum of 2 hours and a maximum of 8 hours for up to 4 days.

The footing of Abutment 9 extends 4 feet below ground surface and is supported by H-piles. Hpiles would be used to widen Abutment 9, with four new piles installed at the two outside corners, for a total of 8 new piles. Pile driving would occur approximately 41 feet upslope from OHWM at Abutment 9. It is anticipated that the piles used would be approximately 10 to 14inches wide and 60 feet long. Piles would be driven to a depth of approximately 55 feet by a diesel impact hammer stationed on the roadway approach fill prism. Piles would require an average of 20 to 30 blows per foot to install in subsurface soils. The blow count at the beginning of each pile driving operation is expected to be significantly lower near the surface because the sandy substrate at the abutments would allow the weight of the driving hammer on the pile to sink the pile by several more feet. As the operation progresses, the blow count per foot would increase as the pile is driven deeper into the soil until the calculated average blow count per foot is reached. It is assumed that under suitable conditions (weather, equipment) up to four piles can be driven per day.

Once pile driving is complete at one side of an abutment, the operation (hammer, work pad) would be transferred to another quadrant. The transfer of equipment would likely occur at night to minimize impact on the traveling public and could take up to one full 8-hour nightshift. After

H-piles are driven at Abutment 9 and Abutment 1 is excavated to the bottom of the existing footing elevations, concrete would be formed and poured to construct abutment footings and wingwalls. Structural concrete would be placed around the widened abutments and the area would be backfilled and graded. The abutment fill slopes at the northeast and northwest corners of Abutment 9 would be constructed using geosynthetic reinforced embankment to minimize the footprint for the newly constructed fill slope and to keep the toe of the fill slope above OHWM. No in-water work would be required.

Prior to the start of deck work, containment measures would be installed to prevent any bridge deck materials and construction debris from entering Pudding Creek. The containment system may consist of a platform, net, tarp, or a combination of these items placed under the bridge. Water and vacuum systems would be used to minimize concrete dust. All waste (e.g., concrete, steel, asphalt, etc.) generated during construction would be disposed of at an approved Caltrans disposal site or would become property of the Contractor. Scaffolding would be installed along the outside edge of the structure and attached to the side of the bent cap as fall protection for the workers. The containment measures and scaffolding would be on the bridge deck and would not be placed in the creek.

Bridge deck widening requires removal of the existing sidewalk, bridge rails, asphalt concrete, and other bridge deck components. A crane would place the 32 precast, prestressed girders (16 on each side of the structure) on the widened abutments and existing piers. The crane would be placed on the work pads adjacent to the abutments depending on where work is occurring. Existing joint seals would be replaced and extended. A polyester concrete overlay would be placed on the bridge deck.

Additional bridge work would include relocating a sewer force main and approximately 1,000 feet of a 10-inch water main which currently crosses Pudding Creek Dam, both utilities of which are owned by the City of Fort Bragg. The relocated sewer force main and water main would require the installation of concrete pedestals on the bridge. The existing 12-inch sewer force main is located on the west side of the bridge and would be relocated approximately 9 feet west to accommodate the widened bridge. Temporary bypass equipment for the sewer force main would be installed on the east side of the Pudding Creek Bridge to accommodate relocation of the existing water main. Approximately 600 feet of water main would be installed just outside of the east edge of SR 1 or within Manzanita Street and Pudding Creek Road. There are no other existing utilities that would interfere with construction of the project, and no new right of way or easements need to be acquired for the installation of the relocated water main. The existing water main that will no longer be in service would be abandoned in place. The contractor would cut

and cap the existing water main just north of the existing water valve in Manzanita Street, and just east of the existing water valve along the south side of Pudding Creek Road, across from the Fort Bragg Disposal/Waste Management facility. For that portion of the relocated water main off of the bridge structure, standard C900 High Pressure PVC would be used. The construction method for this portion of the relocated water main would primarily consist of standard trenching practices within or alongside existing roadways. The trench would generally be about 5 feet deep to allow for about 3-1/2 to 4 feet of cover. At each end of the bridge a flexible expansion joint would be installed inside a concrete box to allow for some movement of the water main without causing failure. The remaining approximately 400 feet of the relocated water main would be 10-inch welded steel and would be attached to the new pedestals on the widened bridge structure. There would be additional concrete footings, one on each side of the bridge, to support the relocated water main in the area between the flexible expansion joints and the first bridge pier. The welded steel water main would be placed on the newly added structural supports and footings on the east side of the Pudding Creek Bridge on SR 1. Galvanized, non-reflective rollers and pipe straps would be used to attach the 10-inch welded steel water main to the new pedestals via drilling and epoxying of State standard anchor bolts.

The contractor would use a temporary signal system or flagging for one-way, reversible temporary traffic control. When the temporary signal system is not in use, the contractor would be allowed to use flagging to control traffic between 7pm and 7am, Sunday through Thursday, and from 7pm Thursdays to 7am on Friday.

The contractor may request lane closures or full closures outside of the times listed in the contract for any number of reasons – they may be able to complete work sooner, they could have material deliveries with permit load restrictions, or other events that effect traffic volumes (pandemic, natural disaster, etc). These requests are evaluated by Caltrans on a case-by-case basis during project construction and are not predictable. It is anticipated that the work could require the road to be closed to all traffic as many as 15 times. The contract would allow the full closure to occur on a Sunday through Thursday between 10pm and 4am (up to 6 hours). The full closure would be utilized for any activity that would impact public safety due to the size of the work area, the type of equipment, or the handling of materials. Construction would occur 8 hours per day, 5 days per week. Day work could typically begin as early as 6:00 a.m. and end by 6:00 p.m. to allow flexibility for the contractor depending on the type of work being performed on any given day.

Project Objective (Purpose and Need)

The purpose of the project is to bring the Pudding Creek Bridge up to current design standards by widening the existing structure and upgrading the bridge rails. The rails on the structure have been identified as deficient with concrete spalls and exposed and corroded rebar. The structure appears on the list of eligible bridges for rail upgrades and is identified in the Structure Replacements and Improvement Needs Report (STRAIN). The existing shoulder width for the structure is two feet, which does not provide adequate room for disabled vehicles or maneuvers by a vehicle to avoid a collision, adequate shoulder width to accommodate bicycle traffic, or a separated walkway to accommodate pedestrians.

General Plan Description, Zoning, and Surrounding Land Uses

Pudding Creek Bridge is within the city of Fort Bragg. The project would not change the existing land use or zoning designations in the project area.

State Route 1 is classified as an "arterial" roadway in the City of Fort Bragg Coastal General Plan's Circulation Element. The Coastal General Plan Circulation Element discusses a need for "better pedestrian access across Fort Bragg's bridges." The following goals and policies are related to this project:

Goal C-9: Make it easier and safer for people to walk in Fort Bragg

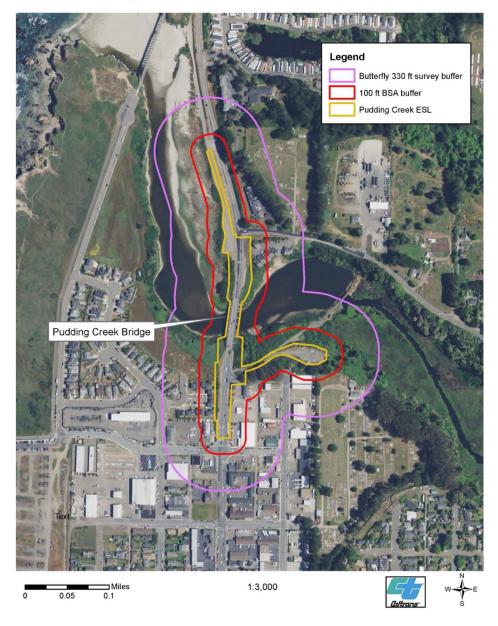
- Policy C-9.2: Require Sidewalks. Require a sidewalk on both sides of all collector and arterial streets and on at least one side of local streets as a condition of approval for new development.
- Policy C-9.3 Where feasible, incorporate pedestrian facilities into the design and construction of all road improvements.

The Inland General Plan Circulation Element also discusses a need for "better pedestrian access across Fort Bragg's bridges." The following goals and policies are related to this project:

Goal C-11: Make it easier and safer for people to walk in Fort Bragg.

 Policy C-11.1 Continuous Sidewalks: Require an uninterrupted pedestrian network of sidewalks, with continuous sidewalks along both sides of streets. New development shall provide sidewalks along project frontages to close gaps in the City's sidewalk network.

- Program C-11.1.1: Consider implementing the following funding sources for the purpose of installing sidewalks in existing developed areas of the City:
 - a) special benefit assessment districts; and/or
 - b) a low-interest revolving loan fund.
- Program C-11.1.2: Work with the Mendocino Council of Governments and Caltrans to construct pedestrian walkways over the Hare Creek and Pudding Creek Bridges. These facilities may qualify for Transportation Enhancement Activities (TEA) funding available through Mendocino Council of Governments (MCOG).
- Policy C-11.2: Where feasible, incorporate pedestrian and bicycle facilities into the design and construction of all road improvements.



Pudding Creek Bridge ESL with BSA and Butterfly Survey Buffer

Figure 2. Environmental Study Limits with Biological Study Area and Butterfly Survey Buffer

Permits and Approvals Needed

The following table indicates the permitting agency, permits/approvals and status of permits required for the project.

Table 1. Agency Approvals

Agency	Permit/Approval	Status The permit application would be submitted after final environmental document (FED) approval The permit application would be submitted after FED approval				
North Coast Regional Water Quality Control Board	401 Water Quality Certification					
U.S. Army Corps of Engineers	Letter of Permission pursuant to Section 10 of the Rivers and Harbors Act					
U.S. Fish and Wildlife Service	Section 7 Consultation for tidewater goby	Biological Opinion received on July 21, 2020				
National Marine Fisheries Service	Section 7 Consultation for coho salmon and steelhead trout	Letter of Concurrence received on September 15, 2020				
California Coastal Commission	Consolidated Coastal Development Permit	The permit application would be submitted after FED approval				
California Department of Fish and Wildlife	Section 1602 Lake or Streambed Alteration Agreement	The permit application would be submitted after FED approval				

Standard Measures and Best Management Practices Included in All Alternatives

Utilities and Emergency Services

UE-1: All emergency response agencies in the project area would be notified of the project construction schedule and would have access to State Route 1 throughout the construction period.

UE-2: Caltrans would coordinate with the utility providers before relocation of any utilities to ensure potentially affected utility customers would be notified of potential service disruptions before relocations.

Traffic and Transportation

TT-1: Pedestrian and bicycle access would be maintained during construction.

TT-2: The Contractor would be required to reduce any access delays to driveways or public roadways within or near the work zones.

TT-3: A Transportation Management Plan (TMP) would be applied to project.

Visual Aesthetics

VA-1: Riparian and wetland areas impacted by project construction would be replanted with regionally appropriate native plants.

VA-2: Any temporary access roads would be restored to a natural contour and revegetated with appropriate native plants. Plant species and locations would be developed by the project landscape architect and biologist.

VA-3: Alterations to the existing contours of any temporary construction staging areas created by the contractor would be graded to previous conditions and revegetated with appropriate native plants.

Cultural Resources

CR-1: If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find in consultation with the State Historic Preservation Officer.

CR-2: If human remains were discovered, State Health and Safety Code § 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 CA Public Resources Code (PRC) § 5097.98, if the remains were thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) who would then notify the Most Likely Descendent (MLD).

At this time, the person who discovered the remains would contact the Environmental Senior and Professionally Qualified Staff so they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC § 5097.98 would be followed as applicable.

Water Quality and Stormwater Runoff

WQ-1: The project would comply with the Provisions of the Caltrans Statewide National Pollutant Discharge Elimination System (NPDES) Permit (Order 2012-0011-DWQ), which became effective July 1, 2013, and the Construction General Permit (Order 2009-0009-DWQ).

Before any ground-disturbing activities, the contractor would prepare a Stormwater Pollution Prevention Plan (SWPPP) (per the Construction General Permit Order 2009-0009-DWQ) that includes erosion control measures and construction waste containment measures so that waters of the State are protected during and after project construction.

The SWPPP would identify the sources of pollutants that may affect the quality of stormwater; include construction site Best Management Practices (BMPs) to control sedimentation, erosion, and potential chemical pollutants; provide for construction materials management; include nonstormwater BMPs; and include routine inspections and a monitoring and reporting plan. All construction site BMPs would follow the latest edition of the *Storm Water Quality Handbooks: Construction Site BMPs Manual* to control and reduce the impacts of construction-related activities, materials, and pollutants on the watershed.

The project SWPPP would be continuously updated to adapt to changing site conditions during the construction phase.

Construction would likely require the following temporary construction site BMPs:

- Any spills or leaks from construction equipment (i.e., fuel, oil, hydraulic fluid, and grease) shall be cleaned up in accordance with applicable local, state, and/or federal regulations.
- Water would be removed by means of dewatering the individual pipe piles or cofferdams.
- Water generated from the dewatering operations would be trucked off-site to an appropriate facility, or treated and used on-site for dust control and/or discharged to an infiltration basin, or used to irrigate agricultural lands.
- Fiber rolls or silt fences would be installed.
- Existing vegetated areas would be maintained to the maximum extent practicable.
- Clearing, grubbing, and excavation would be limited to specific locations, as delineated on the plans, to maximize the preservation of existing vegetation.

- Vegetation reestablishment or other stabilization measures would be implemented on disturbed soil areas, per the Erosion Control Plan.
- Soil disturbing work would be limited during the rainy season.

WQ-2: The project would incorporate pollution prevention and design measures consistent with the 2003 Caltrans Storm Water Management Plan to meet Water Quality Objectives (WQOs). This plan complies with the requirements of the Caltrans Statewide NPDES Permit (Order 2012-0011-DWQ).

The project design would likely include the following permanent stormwater treatment BMPs:

- Vegetated surfaces would feature native plants and revegetation would use the seed mixture, mulch, tackifier, and fertilizer recommended in the Erosion Control Plan prepared for the project.
- Existing roadway and bridge drainage systems currently discharge stormwater to
 receiving waters through bridge deck drains and/or discharge to vegetated slopes adjacent
 to the highway facility. The current design for stormwater management, post
 construction, is to perpetuate existing drainage patterns. Stormwater would continue to
 sheet flow to vegetated slopes providing stormwater treatment in accordance with
 Caltrans NPDES Permit.

Hazardous Waste and Material

HW-1: Per Caltrans requirements, the contractor(s) would prepare a project-specific Lead Compliance Plan (California Code of Regulations [CCR] Title 8, § 1532.1, the "Lead in Construction" standard) to reduce worker exposure to lead-impacted soil. The plan would include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead-impacted soil.

Geology and Seismic/Topography

GS-1: The project would be designed to minimize slope failure, settlement, and erosion using recommended construction techniques and BMPS. New slopes should be revegetated to reduce erosion potential.

GS-2: In the unlikely event that fossils were encountered during project excavations, Caltrans Standard Specification 14-7 would be followed. This standard specification states that if

unanticipated paleontological resources were discovered at the job site, all work within 60 feet would stop, the area around the fossil would be protected, and the Resident Engineer would be notified.

Wetlands and Other Waters

WW-1: The contractor would be required to place temporary barrier fencing along the boundaries of all riparian, wetland or other environmentally sensitive areas (ESAs) adjacent to the project footprint.

Threatened and Endangered Species

TS-1: To protect the most vulnerable life stages of sensitive fish species that occur within the project area, in-stream work would be restricted to the period between June 15 and October 15. Construction activities restricted to this period include any work within the bed, bank or channel.

TS-2: A qualified contractor-supplied biologist would monitor in-stream construction activities. The biological monitor would be present during bridge demolition, hoe-ramming, drilling for bridge foundations, and concrete pours to ensure adherence to all environmental permit conditions.

TS-3: The pre-construction meeting with the contractor would consist of a briefing on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, construction site management, and how to identify and report regulated species within the project areas.

TS-4: Artificial night lighting may be required. The use of artificial lighting would be temporary and of short duration and lighting would be directed away from the channel and focused specifically on the portion of the bridge actively under construction to reduce potential disturbance to sensitive species. To reduce the effects of artificial light on sensitive biological resources, use near watercourses would be limited to critical need (i.e., due to accelerated work schedule to meet permit deadlines or reaching a critical juncture in work at a time when it would be infeasible to stop construction.)

TS-5: Hydroacoustic monitoring would be conducted during any construction activities that could potentially produce impulsive sounds waves. Hoe-ramming or jackhammering associated with bridge demolition may be included. Hydroacoustic monitoring must comply with the terms and conditions of Federal Endangered Species Act (FESA) and California Endangered Species Act (CESA) consultations.

A hydroacoustic monitoring plan would be prepared prior to construction that addresses the frequency of monitoring, positions that hydrophones would be deployed, and techniques for gathering and analyzing acoustic data, quality control measures, and reporting activities.

Plant Species

PS-1: After all construction materials are removed, the project area would be revegetated. Replanting would be subject to a plant establishment period as defined by project permits, which would require Caltrans to adequately water plants, replace unsuitable plants, and control pests. Caltrans would implement a program of invasive weed control in all areas of soil disturbance caused by construction to improve habitat for native species in and adjacent to disturbed soil areas within the project limits.

PS-2: The contractor would be required to place temporary barrier fencing along the boundaries of all riparian, wetland or other environmentally sensitive areas to avoid impacts to sensitive habitats that occur adjacent to the project footprint.

Animal Species

AS-1: To protect migratory and nongame birds, their occupied nests and eggs, nestingprevention measures would be implemented. Vegetation removal would be restricted to the period outside of the bird breeding season (September 16 through January 31) or, if vegetation removal is required during the breeding season, a nesting bird survey would be conducted by a qualified biologist no more than one week prior to vegetation removal. If an active nest were located, the biologist would coordinate with the CDFW to establish appropriate species-specific buffer(s) and any monitoring requirements. The buffer would be delineated around each active nest and construction activities would be excluded from these areas until birds have fledged, or the nest is determined to be unoccupied.

AS-2: Partially constructed and unoccupied nests within the construction area would be removed and disposed of on a regular basis throughout the breeding season (February 1 to September 15) to prevent their occupation. Nest removal would be repeated weekly under guidance of a qualified biologist to ensure nests are inactive prior to removal.

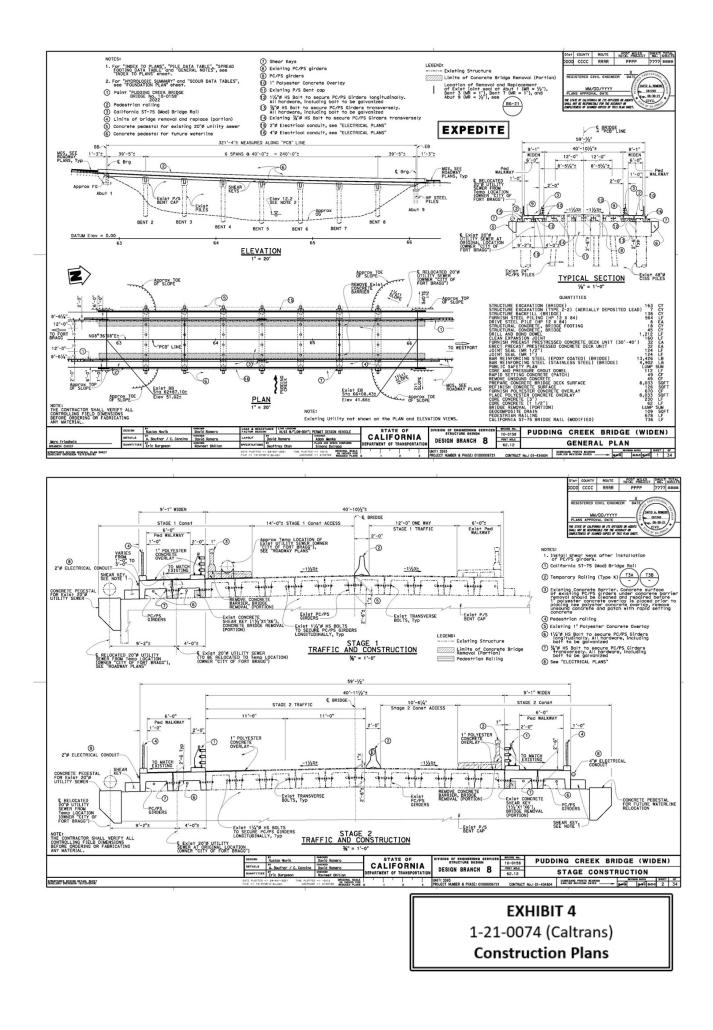
AS-3: Pre-construction surveys for active raptor nests within one-fourth mile of the project area would be conducted by a qualified contractor-supplied biologist within 15 days prior to the initiation of construction activities. Areas to be surveyed would be limited to those areas subject to increased disturbance because of construction activities (i.e., areas where existing traffic or human activity is greater than or equal to construction-related disturbance need not be surveyed).

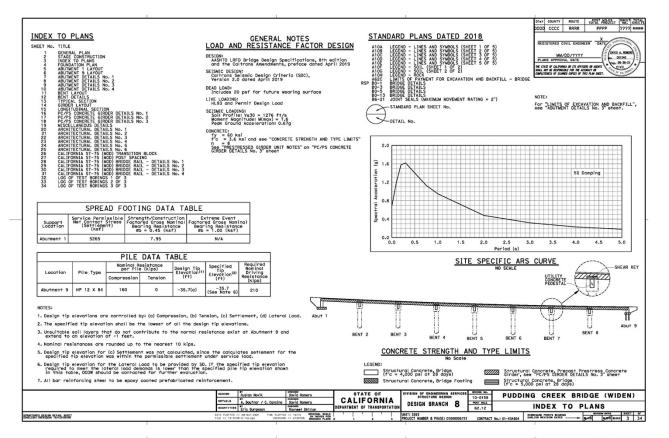
If any active raptor nests were identified, appropriate conservation measures (as determined by a qualified biologist) would be implemented. These measures may include, but are not limited to, establishing a construction-free buffer zone around the active nest site, biological monitoring of the active nest site, and delaying construction activities near the active nest site until the young have fledged.

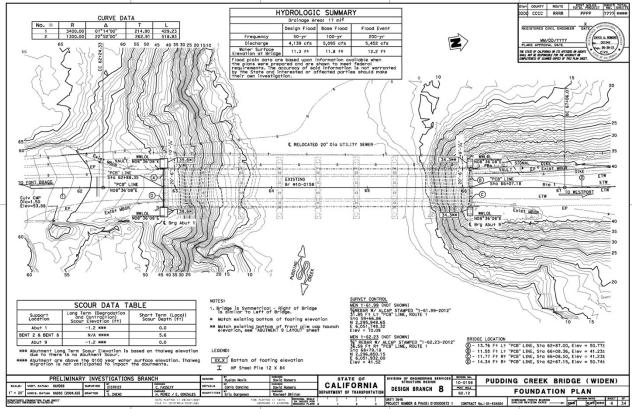
AS-4: Prior to any work within the banks of Pudding Creek within the BSA, the contractor would be required to provide to Caltrans for approval an Aquatic Species Relocation Plan. The plan would also include provisions for a pre-construction survey by a qualified biologist for Northern red-legged frog. Any frogs, tadpoles, and egg masses found during the initial survey would be netted by the biologist and relocated to suitable habitat downstream of the project area prior to conducting project activities within the banks of Pudding Creek within the BSA. The biologist would be present during all phases of in-stream construction to assist with frog relocation efforts as they arise.

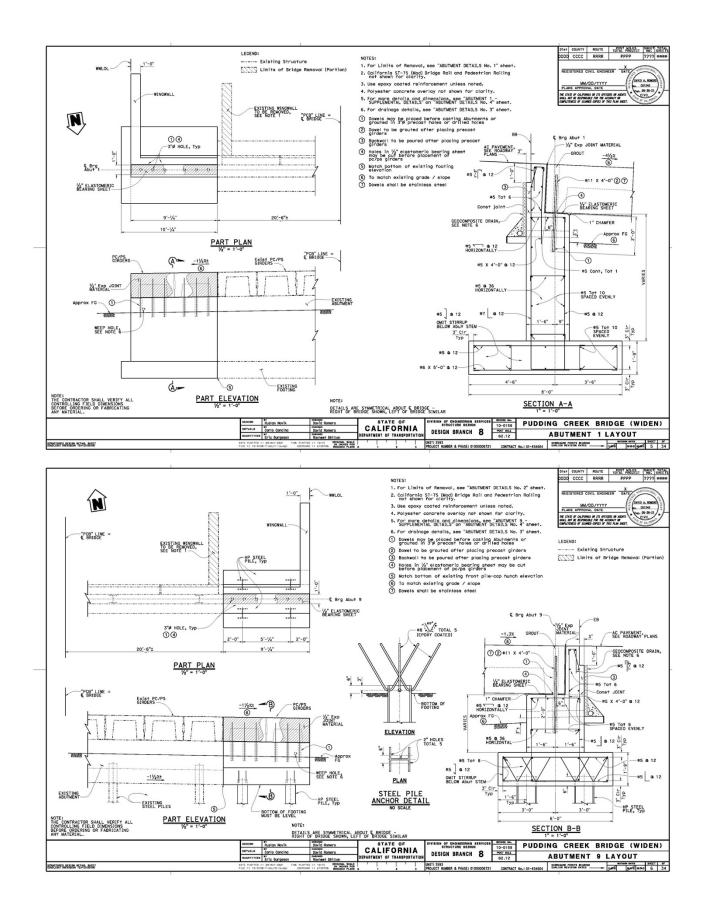
Invasive Species

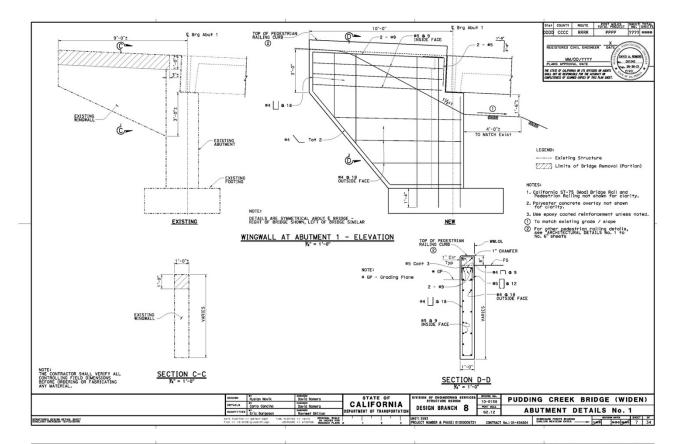
PS-1: After all construction materials are removed, the project area would be restored to a natural setting by grading, placing erosion control, and replanting. Replanting would be subject to a plant establishment period as defined by project permits, which would require Caltrans to adequately water plants, replace unsuitable plants, and control pests. Caltrans would implement a program of invasive weed control in all areas of soil disturbance caused by construction to improve habitat for native species in and adjacent to disturbed soil areas within the project limits.

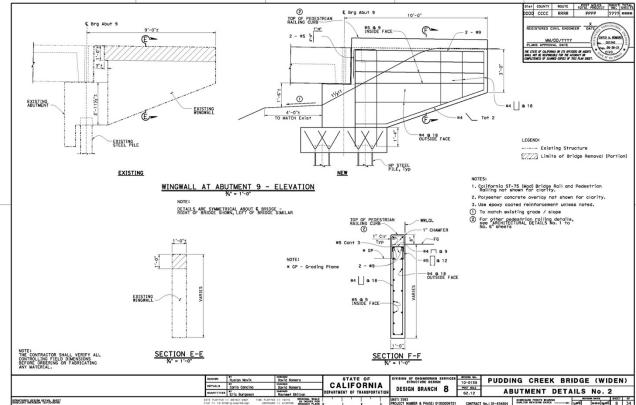


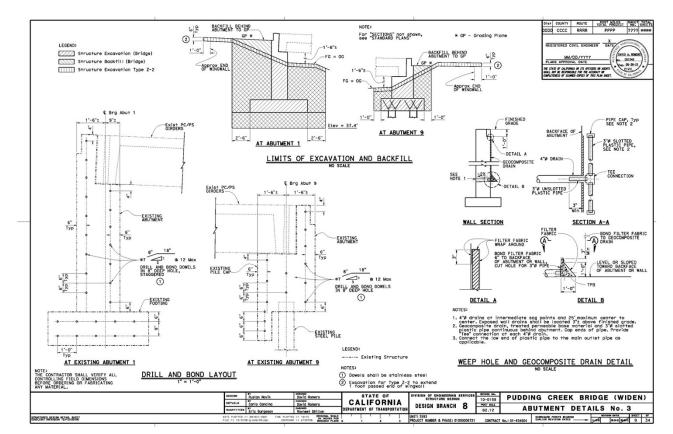


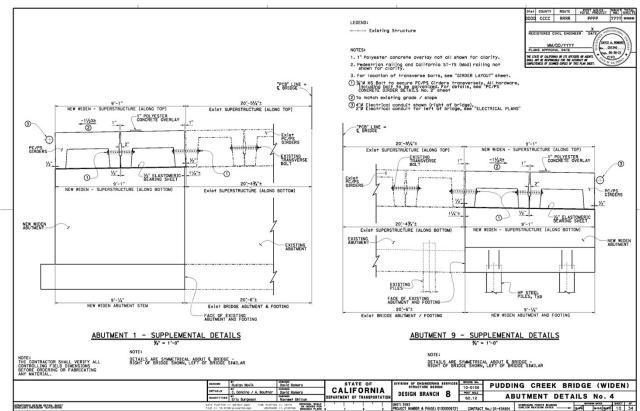


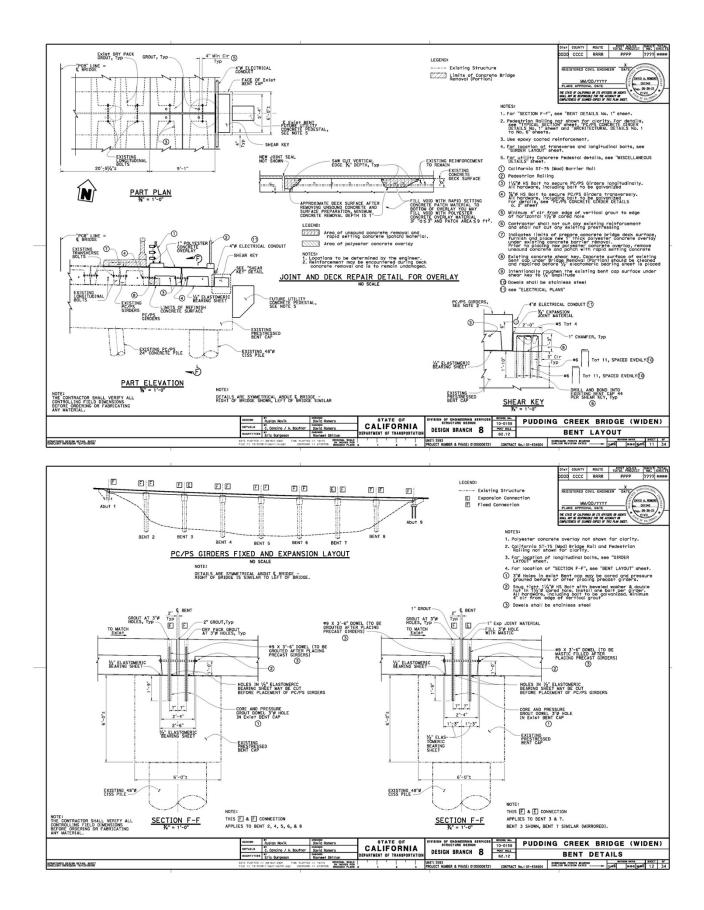


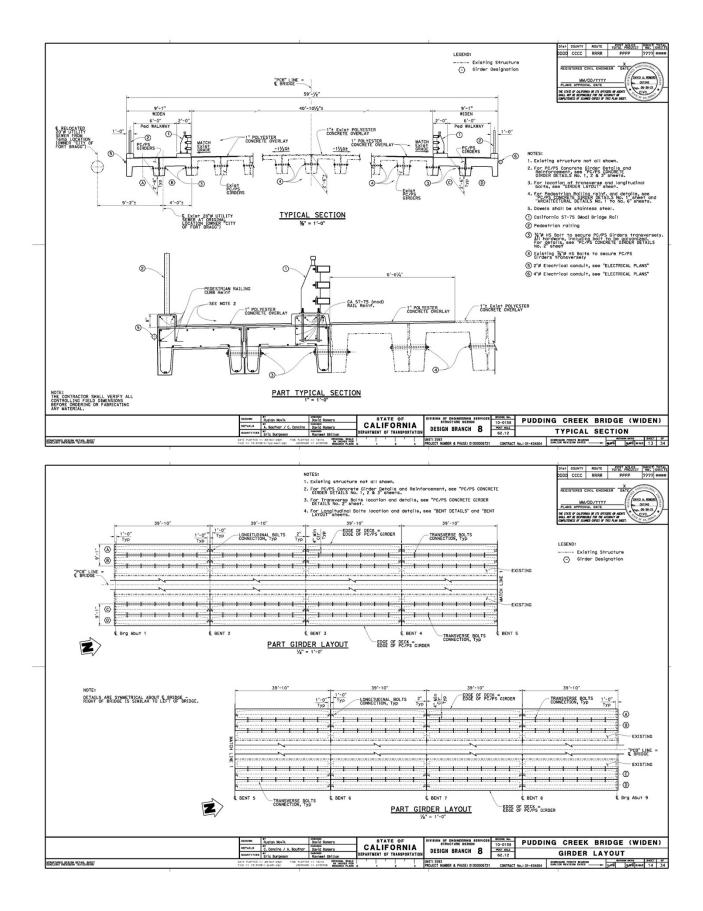


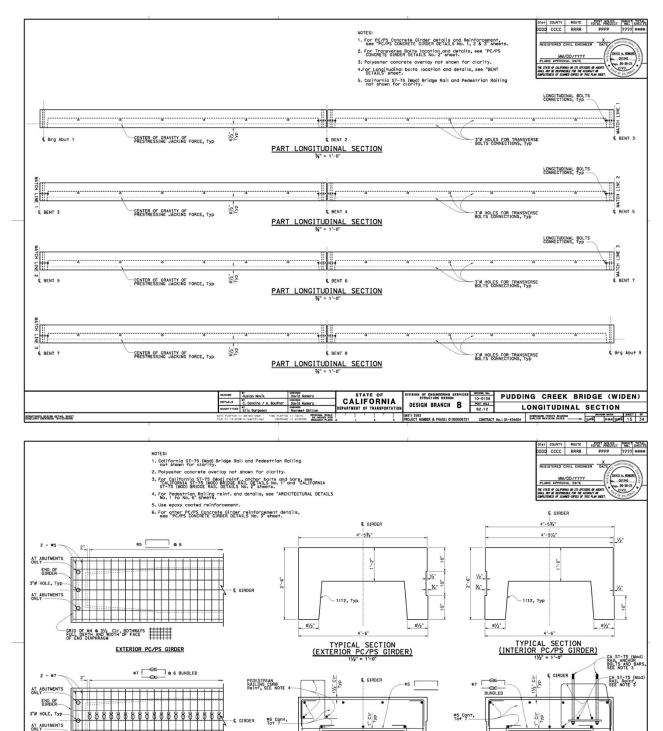












Typ #4 GRID OF #4 @ 31/2 CIr, BOTHWAYS INTERIOR PC/PS GIRDER TYPICAL REINFORCEMENT (EXTERIOR PC/PS GIRDER)

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TYPICAL REINFORCEMENT (INTERIOR PC/PS GIRDER) PLAN PUDDING CREEK BRIDGE (WIDEN) Rusian Novík Davíd Romero Ry C. Cancino / A. Bournar Davíd Romero V ceceso V CALIFORNIA N OF ENGINEERING STRUCTURE DESIG DESIGN BRANCH 8 10-0158 POST MILE 62.12 PC/PS CONCRETE GIRDER DETAILS No. 1 ric Burges NER, 9543-88

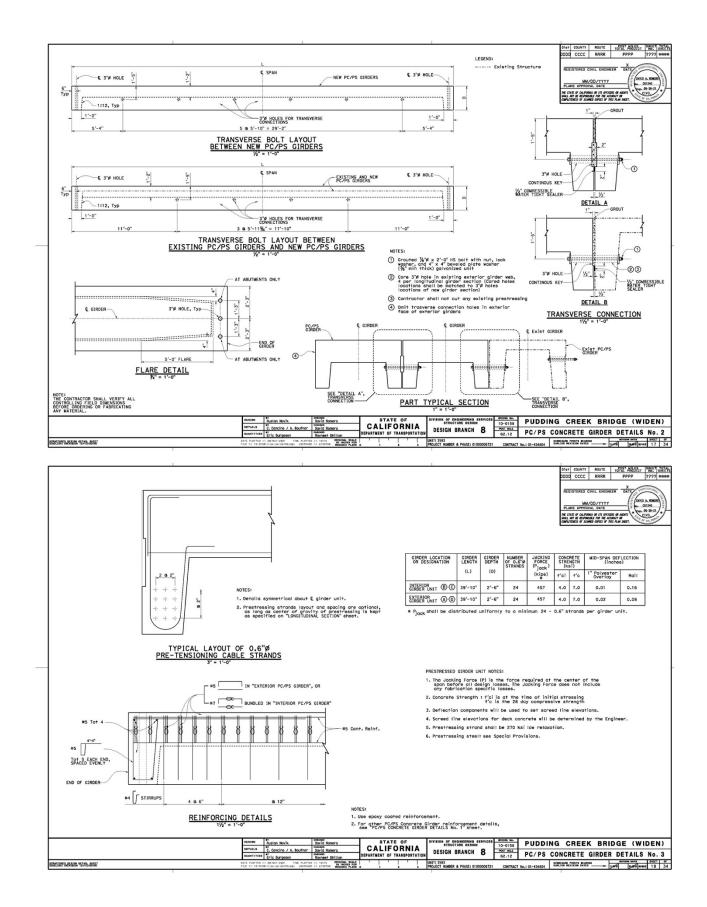
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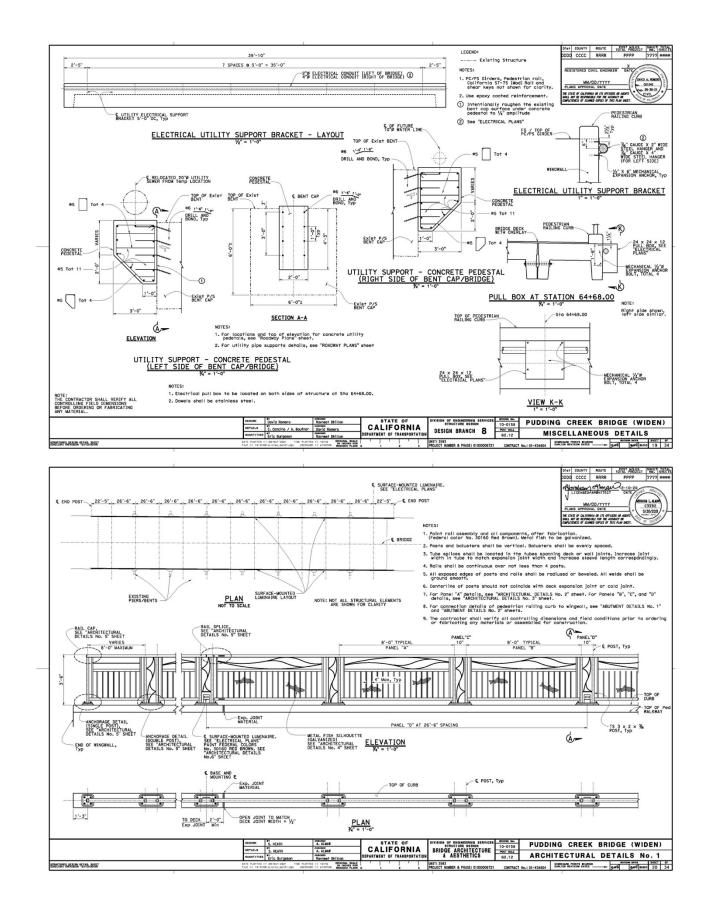
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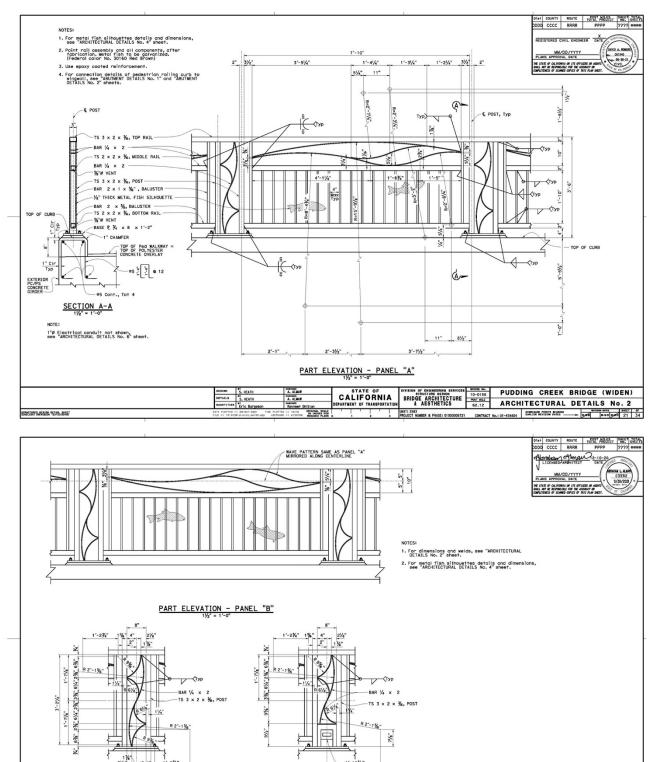
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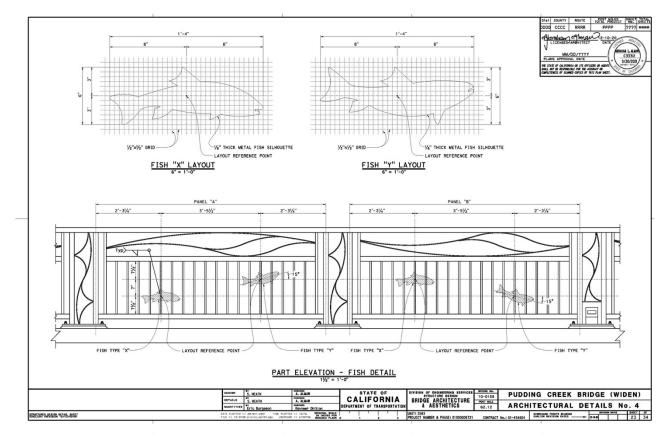
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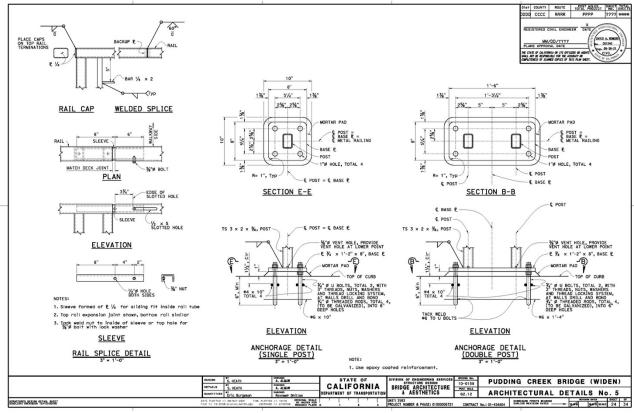


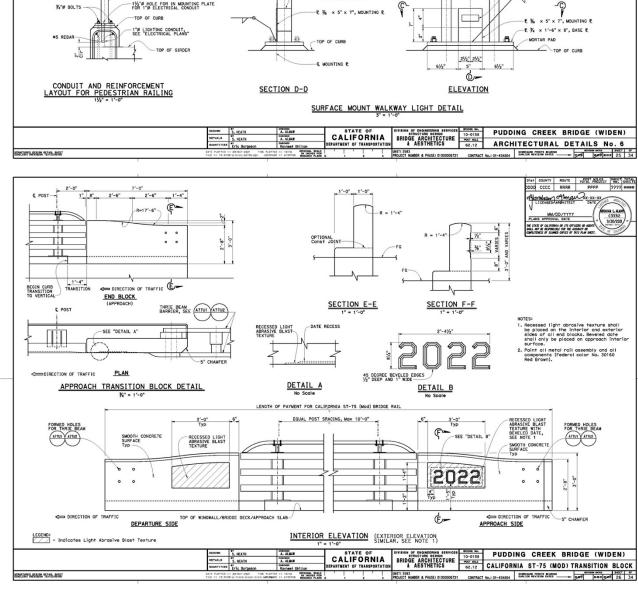


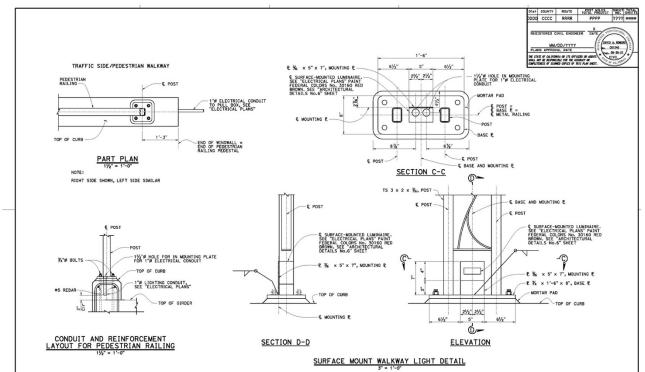


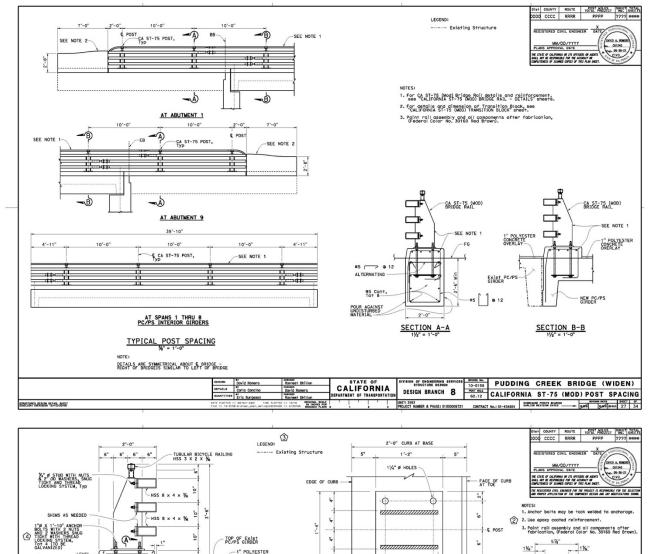
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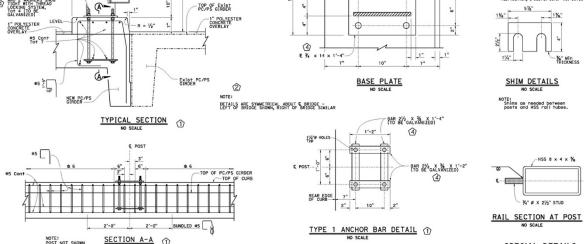












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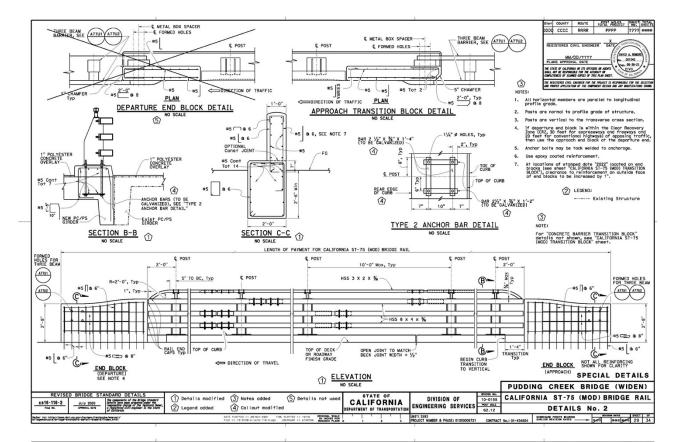
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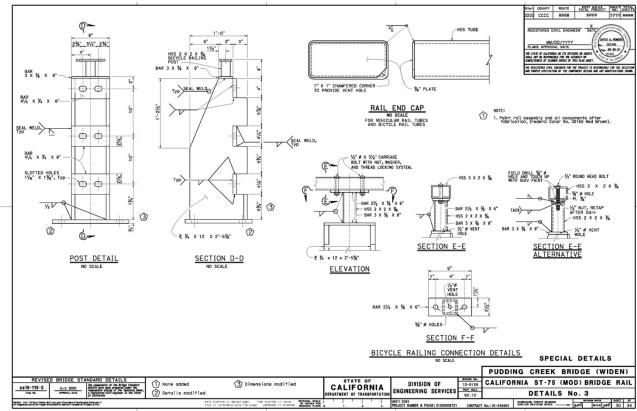
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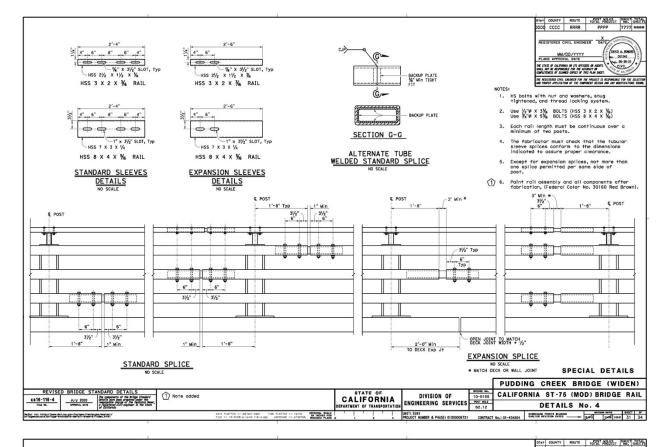
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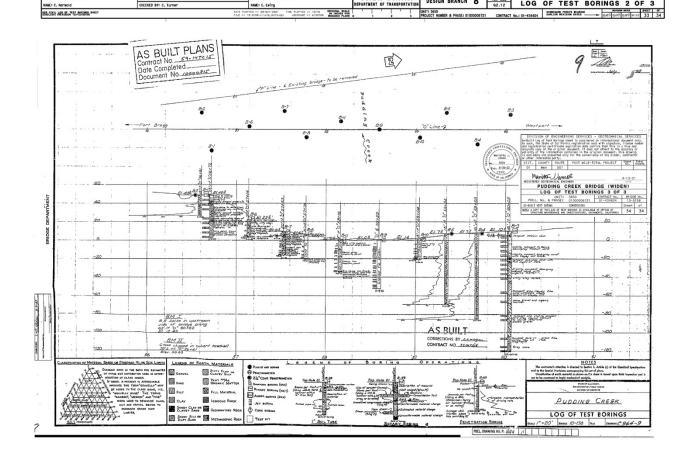


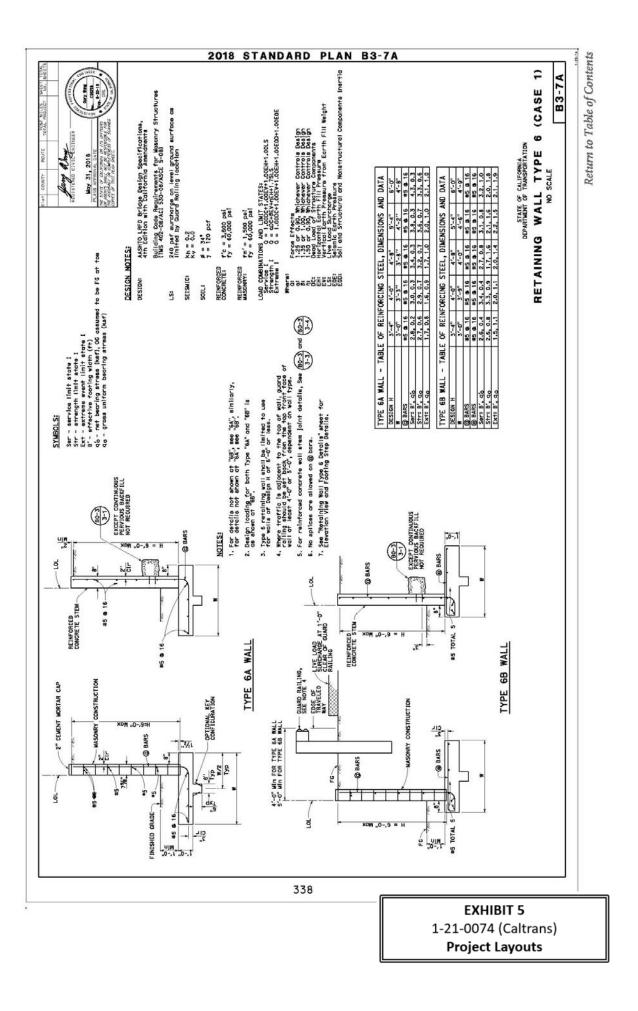


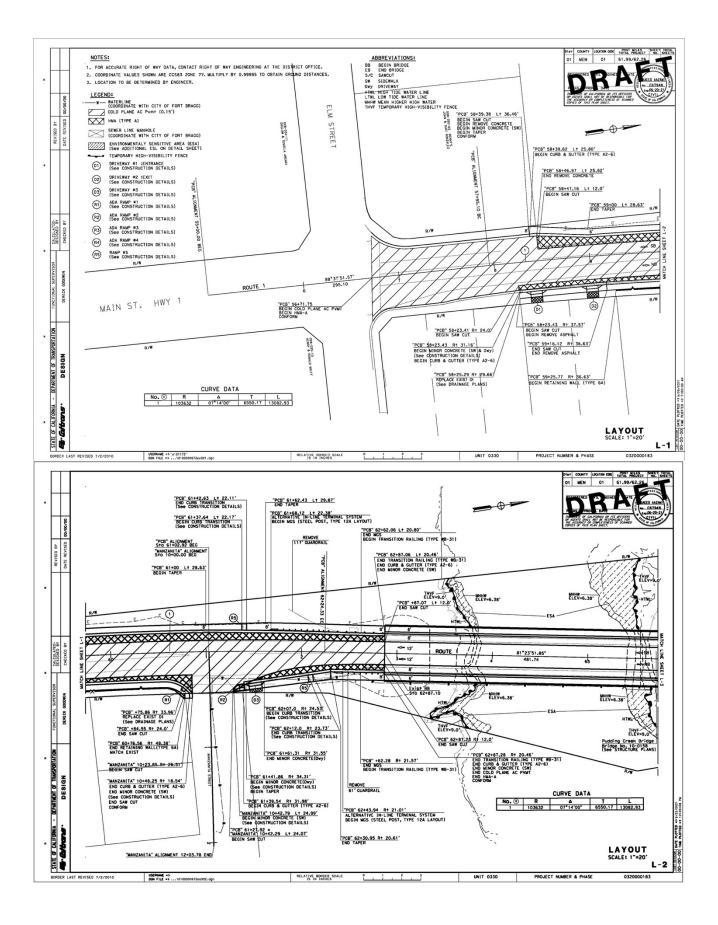


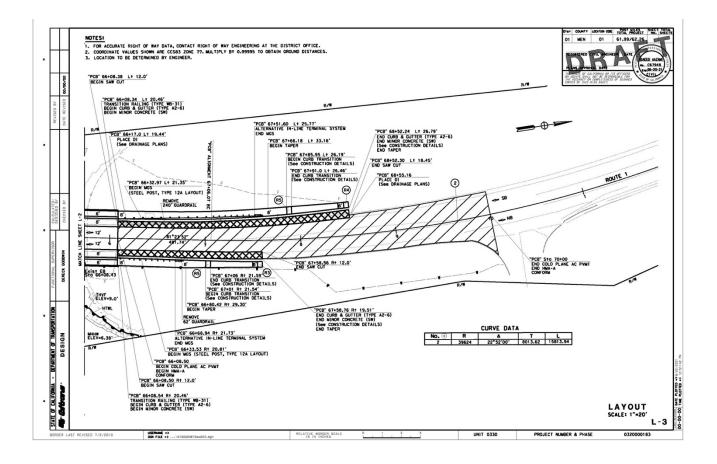
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-20	2211.4	-dense.										-20
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10	12211.4	Poorly-graded -brown; wet.	SAND (SP); very der	ise; brown to dark gray brown; mol	ist; fine SAND	few subangular GRAV	EL; rootlets.			the rock grain See 2018 Stand	a size and beda dard Plans A10	ing specing.
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scenic area, the changes in visual character would be considered negative. Subsequently, resource change (changes to visual resources as measured by changes in visual character and visual quality) for the Pudding Creek Bridge project location would be *negatively very low*.



Photo 9a: Existing view of Pudding Creek Bridge looking southwest



Photo 9b: Proposed view of Pudding Creek Bridge looking southwest

Visual Impact Assessment for Pudding Creek Bridge Widening & Rail Upgrade

Page 9

EXHIBIT 6 1-21-0074 (Caltrans) Existing Conditions/Visuals



Photo 3: View of Pudding Creek Bridge looking northeast toward Pudding Creek



Photo 4: View of Pudding Creek Bridge looking north

The project corridor south of the project area is linear and travels through small city urbanization. The Route is characterized as coastland with intermittent views of the Pacific Ocean between commercial, highway visitor commercial, industrial and residential properties, as determined by the Fort Bragg Coastal and City Land Use Zoning Codes. The Central Business District is approximately 0.5 miles south from the bridge. There is minimal landscaping along the roadway frontage. North of the project site, SR

Visual Impact Assessment for Pudding Creek Bridge Widening & Rail Upgrade



Photo 10a: Existing view of Pudding Creek Bridge looking south



Photo 10b: Proposed view of Pudding Creek Bridge looking south

Visual Impact Assessment for Pudding Creek Bridge Widening & Rail Upgrade



Photo 11a: Existing view from Pudding Creek Bridge looking northwest



Photo 11b: Proposed view from Pudding Creek Bridge looking northwest

Visual Impact Assessment for Pudding Creek Bridge Widening & Rail Upgrade



Photo 12: Proposed view from Pudding Creek Bridge looking northwest

SUMMARY

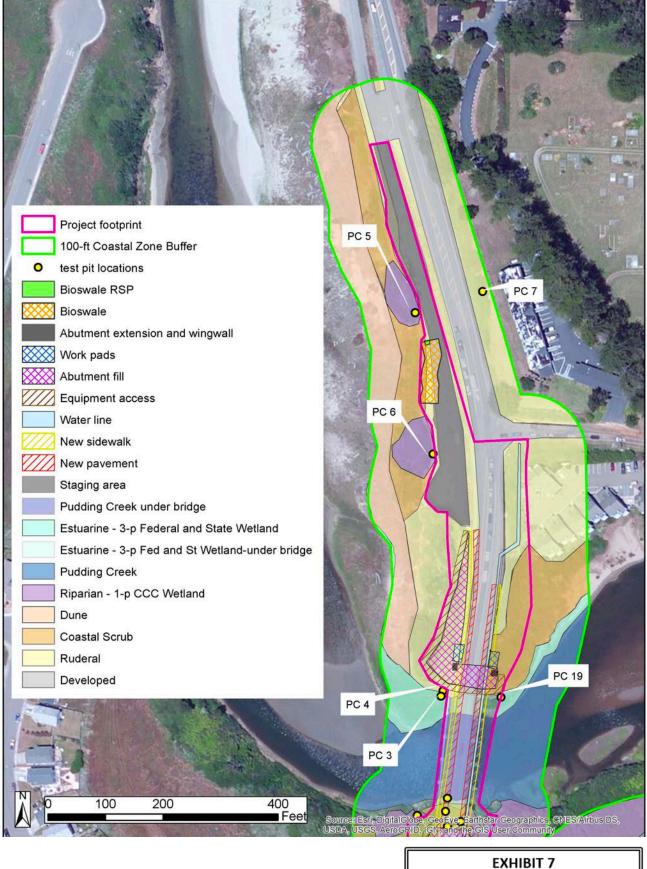
It is anticipated that the project would not result in a high negative change to visual quality. The average change in visual quality is a *very low positive* change. Scenic views would be maintained, and bridge upgrades would ultimately enhance the visual quality of the bridge due to more architecturally interesting and context appropriate railings and additional separated pedestrian walkways. It is anticipated that the project would not result in a high negative change to visual character. The average change in visual character is *negatively very low*. This is primarily due to the increased presence of the highway and structure within the surrounding environment, as well as vegetation removal that would lead to non-typical changes at the project site. Overall, the character of the proposed project would be somewhat compatible with the character of the existing corridor, but changes are anticipated to be seen collective-ly as a low decrease in rural character. Subsequently, the average resource change of the Pudding Creek Bridge project location is *negatively very low*.

VIEWERS AND VIEWER RESPONSE

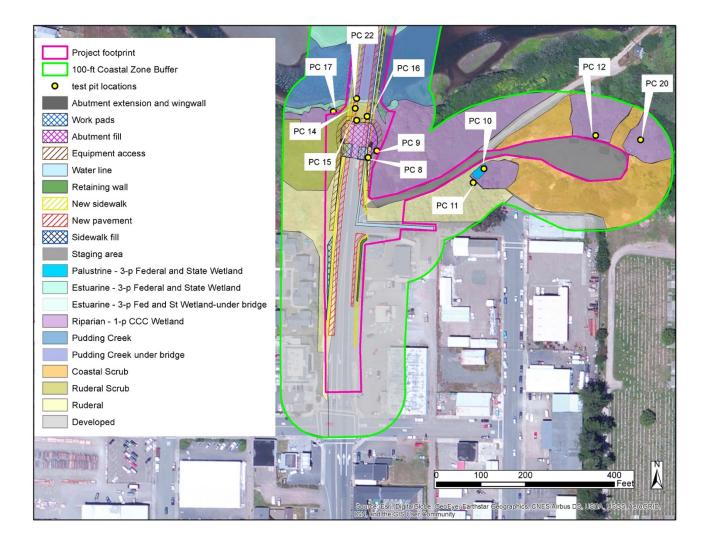
The population affected by the project is composed of *viewers*. Viewers are people whose views of the landscape may be altered by the proposed project---either because the landscape itself has changed or their perception of the landscape has changed. There are two major types of viewer groups for highway projects: highway neighbors and highway travelers. Each viewer group has their own particular level of *viewer exposure* and *viewers sensitivity*, resulting in distinct and predictable visual concerns for each group which help to predict their responses to visual changes.

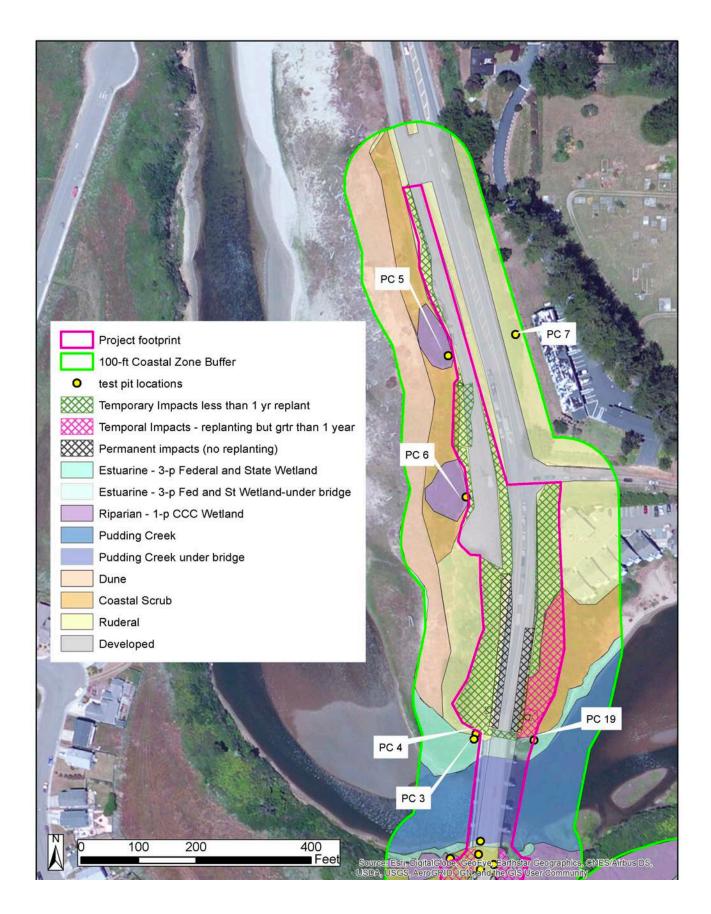
Neighbors (people with views to the proposed project) and travelers (people with views from the proposed project) would not be substantially adversely impacted by the proposed project.

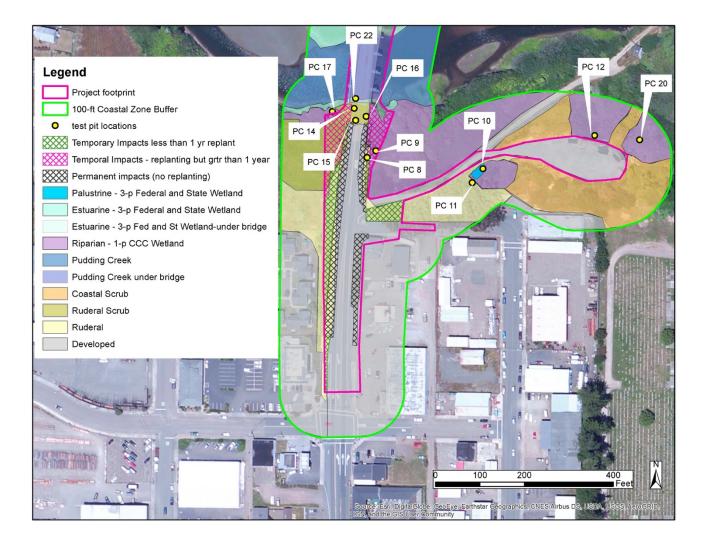
Visual Impact Assessment for Pudding Creek Bridge Widening & Rail Upgrade



1-21-0074 (Caltrans) Habitat Map







ONSITE REVEGETATION PLAN

for the

PUDDING CREEK BRIDGE WIDENING AND RAIL UPGRADE PROJECT



Mendocino County, State Route 1, Post Miles 61.99/62.26 EA 01-43480 / EFIS 0100000672

July 2021



Prepared By:

Jonathan Lee, Revegetation Specialist North Region Environmental (707) 492-0047

Robert Meade, Senior Environmental Planner North Region Environmental

(573) 619-4518

Approved By:

Date: _____

Date: _____

EXHIBIT 8 1-21-0074 (Caltrans) Draft Onsite Revegetation Plan

1) Applicant and Contacts

- a) Permit applicant, owner of revegetation site, and party with financial responsibility for completing revegetation work:
 - i. California Department of Transportation (Caltrans)
- b) Permitting agency requiring revegetation:
 - i. California Department of Fish and Wildlife (CDFW)
 - ii. California Coastal Commission (CCC)

c) Contacts:

i.	Revegetation Specialist: Jonathan Lee	
	1656 Union Street, Eureka, CA 95501	(707) 492-0047
ii.	Project Biologist: Tracy Walker	
	1656 Union Street, Eureka, CA 95501	(707) 815-6503
iii.	Project Manager: Frank Demling	
	1656 Union Street, Eureka, CA 95501	(707) 572-0685

2) Project Location

The California Department of Transportation (Caltrans) proposes the Pudding Creek Bridge Widening and Rail Upgrade Project (hereafter project), which spans Pudding Creek. The project is located on State Route (SR) 1, between post miles (PMs) 61.99 and 62.26, in the city of Fort Bragg in Mendocino County (Appendix A—Figure 1).

3) Construction Activities and Anticipated Impacts

a) Construction Activities

The project proposes bridge widening, rail replacement, and pedestrian/bicycle path placement for the Pudding Creek Bridge (Bridge No. 10-0158), PM 62.12, on State Route 1 in Mendocino County. Structure widening would entail abutment widening, new wingwall construction at the abutments, removing the existing bridge sidewalks and barriers, installing new PC/PS inverted U-shaped girders to accommodate the additional bridge width, installing new barrier rail and pedestrian rail, and installing a new deck drainage system. A 15-foot-wide by 40-foot- long temporary access road and a 20-foot-wide by 20-foot-long temporary work pad would be constructed in each quadrant of the bridge for abutment work.

b) Anticipated Impacts

Anticipated impacts to Coastal Wetlands from proposed construction activities would include temporary and Temporal Loss of Function impacts totaling 0.095 acre.

Temporal Loss of Function impacts are those where restoration would occur more than one year later than when impacts began, however the area is restorable. Temporal Loss of Function impacts are anticipated due to construction of the access road to the bridge. The area of construction impacts include vegetation classified as Coastal Wetlands, which is proposed to be cut, and the area graded for temporary access roads. Areas affected by temporary and Temporal Loss of Function impacts would be offset by onsite restoration and in kind at a 4:1 ratio upon completion of construction.

Actual permanent impacts, which are impacts that are not restorable, are also anticipated for Coastal Wetlands. These impacts would occur where the bridge abutment will be expanded into an arroyo willow (*Salix lasiolepis*) thicket, which is classified as a Coastal Wetland. The footprint of these permanent impacts is small, being approximately 0.009 acre. Permanent impacts would be offset in kind at a 4:1 ratio by the re-establishment of an arroyo willow thicket and Coastal Wetland on the opposite side of the road of the existing Coastal wetland vegetation on the south end of the bridge (see Quad 3 under Proposed Revegetation Areas).

4) Revegetation Goals

The revegetation goals include (1) initiate restoration of the temporarily affected riparian vegetation by allowing trimmed woody vegetation to resprout and replanting with self-sustaining, native plants that are appropriate to the region and habitat at Quads 1 and 2, (2) re-establish an arroyo willow Coastal Wetland on the south side of the bridge in Quad 3 at a 4:1 mitigation ratio for Temporal Loss of Function and Permanent Impacts, and (3) create conditions where invasive plant cover is less than or equal 2% invasive plant coverage (Cal-IPC "High" rated species).

Hereafter, the revegetation work at Quads 1, 2 and 3 will be referred to as revegetation areas.

5) Summary of Revegetation Activities

Revegetation activities will include:

a) Erosion Control

If ground disturbance occurs, upon completion of construction, a permanent erosion control seed mix using regionally-appropriate native species and a non-persistent annual grass (i.e., common barley, *Hordeum vulgare*) will be hydroseeded in bare soil areas. Erosion control measures are specifications managed by Construction and Landscape Architecture and by Maintenance after construction is complete and are not considered part of the revegetation success criteria.

b) Plant Species and Quantities

Revegetation will be conducted using California native, regionally- and habitatappropriate native plant species. Plant material may include locally collected and outgrown bareroot stock, container stock, and salvaged material. The anticipated species of plant material to be utilized are presented below in Table 1, with species and quantities intended to closely resemble what is currently present. In addition, natural vegetation recruitment (volunteers) and resprouting native vegetation will be incorporated into planting considerations, revegetation goals, and may contribute to achieving the success criteria. Actual species and quantities to be used for initial planting and replanting will be determined by commercial availability, natural recruitment, resprouting vegetation, site conditions at the time of planning and planting, and other factors. If vegetation is cut at ground level prior to construction, then resprouting vegetation will be protected from herbivory and monitored for continued survival and reestablishment. If roots of vegetation are removed prior to construction, then native, regionally- and habitat-appropriate plants will be installed, maintained, and monitored.

Table 1. Potential planting palette for onsite riparian revegetation and re-establishment areas, based on existing species observed

Scientific Name / Common Name	Quantity of Plants Needed at Initial Planting	Approximate Planting Densities
Woody Species		
Baccharis pilularis ssp. consanguinea / Coyote Brush		1
Ceanothus thyrsiflorus / California Lilac		8 to 12 ft on
Frangula californica / Coffeeberry		
Lonicera involucrata var. ledebourii / Twinberry		center,
Rubus parviflorus / Thimbleberry	prior to	depending on average height
Rubus spectabilis / Salmonberry	and width at	
Rubus ursinus / California Blackberry		maturity
Salix lasiolepis / Arroyo Willow		
Salix sitchensis / Sitka Willow		
Herbaceous Species		
Polystichum munitum / Western Sword Fern	To be determined prior to construction 3 to 4 ft. on center	
Heracleum lanatum / Cow Parsnip		

c) Proposed Revegetation Areas

Proposed revegetation will occur in three quadrants of the Pudding Creek Bridge (see Appendix A—Figure 2 for a map of the anticipated revegetation and re-establishment areas).

Quad 1: This restoration area consists of primarily ruderal non-native vegetation along the coastal bluff. The area slowly transitions towards coastal dune habitat on the western fringe of the Caltrans right of way (ROW). Moisture conditions in this area will allow for establishment of a variety of woody and herbaceous coastal riparian plant species, including willows (FACW), twinberry (FAC), and thimbleberry (FACU). Restoration in Quad 1 will provide 0.208 acre towards the 4:1 mitigation ratio for Temporal Loss of Function impacts. An additional 1.102 acre of viable restoration planting space exists at this location and can be used to create a buffer of invasive weed removal around the planting area, or to address potential changes in construction impacts. Only the 0.208 acre of planting area will be held to success the criteria. Total size of Quad 1: 1.31 acre.

Quad 2: This restoration area consists of an Arroyo willow stand and is classified as a Coastal 1-parameter wetland. The site is north facing and has mesic soil conditions along with a layer of herbaceous native plants that thrive in mesic conditions. Current species include arroyo (FACW) and Sitka willow (FACW), rough hedgenettle (FACW), stinging nettle (FAC), thimbleberry (FACU), and twinberry (FAC). Invasive plant cover, at approximately 5% cover, is relatively low for being close to development. Invasive plants rated as "High" by Cal-IPC are primarily shaded out by the willow canopy, however there is a presence of Himalayan blackberry and other ruderal non-native species where there are gaps in the canopy. Revegetation in this area will only cover the areas disturbed by construction to avoid further disturbance of the surrounding Coastal Wetland vegetation. Invasive plants outside the immediate planting area will be removed to the extent feasible to provide a buffer for restoration plantings. Restoration in this area will provide 0.07 acre towards the 4:1 mitigation ratio for Temporal Loss of Function impacts. A total of 0.07 acre would be restored at Quad 2.

Quad 3: This restoration area's vegetation cover is predominantly Himalayan blackberry with some poison-hemlock (FAC) on the margins. Due to historical land use, this area's vegetation type was likely converted from a willow dominated Coastal Wetland to ruderal non-native plant cover. The soil, aspect, and moisture conditions are approximately the same as Quad 2. All Himalayan blackberry from Quad 3 will be removed and then densely replanted with willow stakes and other appropriate coastal riparian plant species in order to best match the adjacent plant composition of Quad 2, as this best approximates the original native plant cover of this area. After successful plant establishment, approximately 0.036 acre of this restoration area will serve to mitigate in kind at a 4:1 ratio for the 0.009 acre of permanent impacts to the Coastal Wetland located in Quad 2 and will offset any net loss of Coastal Wetlands. To alleviate concerns about adjacent invasive vegetation encroaching the re-

established willow patch, a 10-foot strip inside the western ROW boundary will be used for a "weed buffer zone". Only the 0.138 acre inside the "weed buffer zone" will count towards mitigation acreage and be held the success criteria. After accounting for the 0.036 acre for Coastal Wetland impacts, the remaining 0.102 acre of this area will contribute to the 4:1 mitigation ratio for Temporal Loss of Function impacts. Total size of Quad 3: 0.2 acre.

To account for safety and maintenance, tree planting will occur outside of the "clear recovery zone"—which is a required 20-foot, tree-planting setback from the white fog line on the traveled road surface. Plantings within the clear recovery zone will consist of herbaceous species and shrubs. The exact location for installing each plant within revegetation areas will be determined in the Design phase by a Caltrans Revegetation Specialist and/or Landscape Architect and will be included in construction contract documents (i.e., plans). Additionally, to avoid potential conflicts with tall vegetation and bridge maintenance and inspection, taller tree species that could reach the height of the bridge deck will be installed with on-center spacing that is at least 20 feet from the drip line of the bridge, or the minimum spacing requested by the Caltrans Maintenance and Structures Inspector. Shorter trees, shrubs, and herbaceous plants may be installed under and closer to the bridge.

d) Planting and Maintenance Contract and Duration

Revegetation planting and maintenance, including watering, weeding, and protecting resprouting native vegetation and volunteers, will be contracted to and performed by the California Conservation Corps (CCC), with oversight by a Caltrans Revegetation Specialist, for the duration of the 5-year maintenance and monitoring period. Revegetation is anticipated to begin as soon as trimmed willows begin to resprout during construction, however initial planting is slated to begin the rainy season following the end of construction activities, which will denote the start of the 5-year maintenance and monitoring period. Total time until anticipated reestablishment will be the length of construction activities plus the time from construction until the first rainy season, and the 5-year maintenance and monitoring period.

e) Cultural/Tribal Resources

The Caltrans Revegetation Specialist has coordinated with the Senior Archaeologist. The Senior Archaeologist confirmed that cultural resources would not be impacted by revegetation activities.

6) Implementation and Maintenance Schedule

- a) Planting will occur within approximately one year from completion of construction. To minimize plant stress, container plants will be installed at a time when plants are dormant (i.e., typically November-March). Replacement planting, if needed, will occur during the dormant season, generally a year after the initial planting.
- b) Watering will be conducted during the first two dry seasons following each planting (typically mid-May through October or November, approximately every other week), and/or any extensive dry period during the first two years following initial planting and replanting.
- c) Weeding will be conducted via hand and/or mechanical methods prior to and during the monitoring period to help installed and native volunteer and resprouting plants successfully establish. Weeding will occur within all revegetation areas and any adjacent areas within Caltrans ROW, where feasible, to maximize ecological success of the restoration efforts.
- No herbicides or fertilizers will be used on-site throughout the maintenance and monitoring period.

7) Monitoring Methods, Success Criteria, and Reporting

a) Monitoring Methods and Schedule:

- i) Photo points: Prior to construction, reproducible photo points will be established in the revegetation areas. Photo points will visually indicate native plant survival and re-establishment over the five years of monitoring. Photo points may be reestablished prior to planting to account for changes in the landscape due to construction and to provide the best view of revegetation areas.
- ii) Survival counts of native woody riparian plants in all planted areas: Census monitoring will be conducted after initial planting to assess establishment of native plants in the revegetation areas (frequency discussed below). Installed, volunteer, and resprouting native woody riparian plants that are alive during monitoring will be counted, by species. Establishment of volunteer and resprouting native species will be included in the total plant count since these plants indicate revegetation is successfully occurring and the site is selfsustaining. Additionally, presence of volunteer and resprouting native plants will

affect whether and how much replanting is needed, since overplanting is a concern.

- iii) Invasive species cover: Ocular measurement of invasive species vegetation cover within the project area will be conducted by a Revegetation Specialist annually during the 5-year monitoring and maintenance period. Only percent cover from invasive species rated as "High" by California Invasive Plant Council (Cal-IPC) will be counted towards the success criterion for invasive plant cover. This will be used to evaluate weeding efforts towards maintaining an invasive species cover of less than or equal to 2%, as requested by the CCC.
- iv) Schedule: Caltrans will monitor annually. Survival counts and invasive species cover will be monitored to assess progress toward the success criteria and to identify remedial or adaptive management measures that may be required. Photo monitoring will also occur annually. First year monitoring may take place in the same calendar year as the initial planting as long as installation occurs before March 1st. First year monitoring may also occur in the same calendar year as initial planting if growing conditions at the planting site are suitable for planting after March 1st (e.g., plants are dormant) and plants appear to be successfully establishing near the end of the first growing season. If the first monitoring occurs at least one year after planting, it will occur between May and the end of summer. Final monitoring in Year 5 will assess whether the success criteria have been met.

b) Success Criteria

- i) Year 5 success criterion, as required by the CCC:
 - In all three revegetation areas, at least 85% of the number of installed woody plants will be alive in Year 5. Survival counts will include any natural recruitment.
 - (2) In all three revegetation areas, cover of Cal-IPC rated "High" invasive species will be less than or equal to 2% by Year 5.

c) Revegetation monitoring reports

- *Revegetation monitoring reports for Years 1, 2, 3, and 5* will be submitted to all agencies requiring submission of revegetation monitoring reports. Monitoring reports will include a summary of monitoring results, discuss whether the revegetation areas appear to be on a trajectory toward meeting the success criteria, and will include any proposed remedial measures to help ensure success.
 Monitoring reports will also include photo points. The final monitoring report will discuss whether the success criterion was met and whether remedial actions are needed, or revegetation is considered complete.
- ii) *Revegetation monitoring data and photos for Year 4* will be saved to the project file and made available upon request.

8) Remedial Measures

If the success criteria are not met, the Revegetation Specialist will assess potential reasons and develop remedial measures or adaptive management strategies to correct issues. Caltrans will coordinate with the permitting agencies that require revegetation and reporting to discuss success criteria issues, propose solutions, and determine the best course of action.

Any remedial measures that are implemented will be discussed in monitoring report(s).

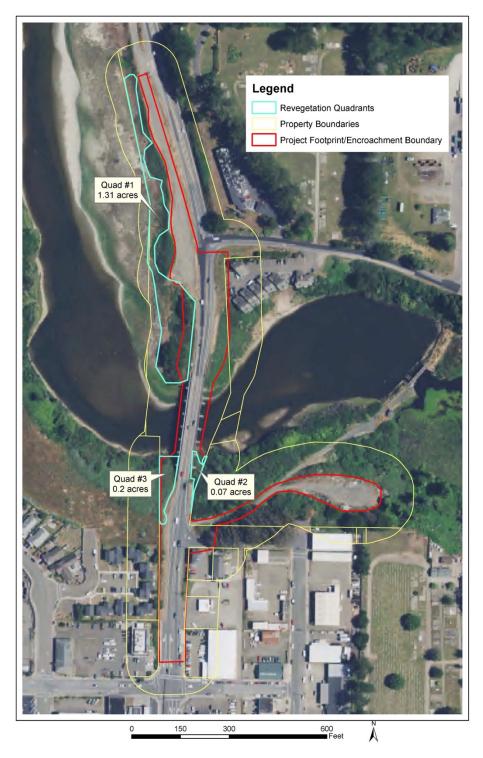


Figure 2. Potential Revegetation Areas

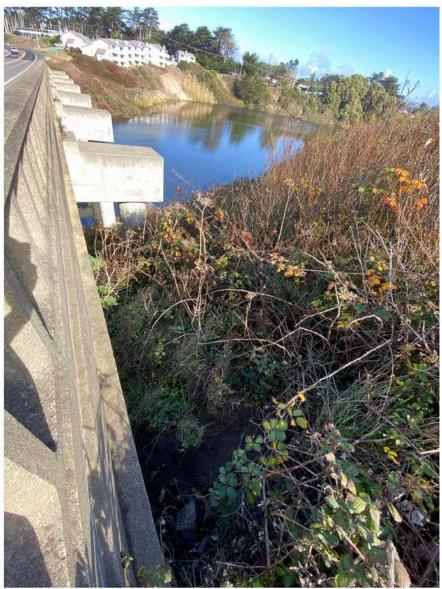


Photo 1. View of southeast quadrant of Pudding Creek Bridge, standing on the south bank looking north. Date of Photo: November 19, 2020.



Photo 2. View of southwest quadrant of Pudding Creek Bridge, standing on the south bank looking southwest. Date of Photo: November 19, 2020



Photo 3. View of northwest quadrant of Pudding Creek Bridge, standing on the north bank looking east. Date of Photo: November 19, 2020

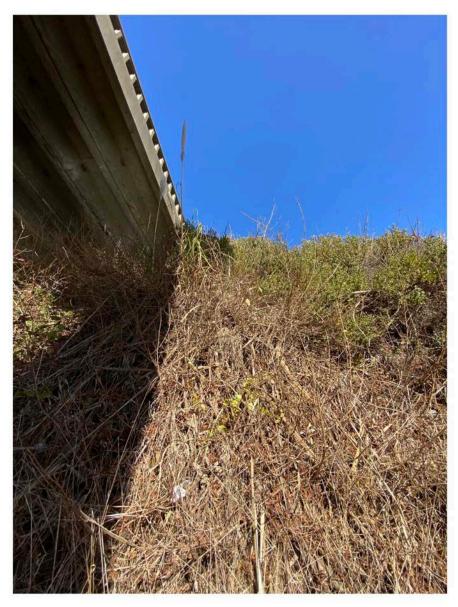


Photo 4. View of northeast quadrant of Pudding Creek Bridge, standing on the north bank looking north. Date of Photo: November 19, 2020

CALIFORNIA COASTAL COMMISSION

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GAVIN NEWSOM, GOVERNOR

MEMORADUM

FROM:	John D. Dixon, Ph.D., Ecologist
TO:	Amber Leavitt, Transportation Program Analyst

SUBJECT: Pudding Creek Bridge Widening and Rail Upgrade Project

DATE: June 28, 2021

Documents reviewed:

Caltrans. November 2015. Technical guidance for assessment and mitigation of the hydroacoustic effects on fish. Prepared by ICF International and Illingworth and Rodkin, Inc. (Authors: D., Oestman, R., Reyff, J., Pommerenck, K. and B. Mitchell.).

Caltrans. April 2020. Pudding Creek Bridge Widening and Rail Upgrade Project. Natural Environment Study. Fort Bragg, CA. 01-MEN-1 Post Mile 62.12, EA 01-43480 / EFIS 0100000672.

Caltrans. October 2020. Pudding Creek bridge widening and rail upgrade project. Initial study with Negative Declaration. Mendocino County, California. District 1-MEN-1 (Post Mile 62.12), EA 01-43480 / EFIS 0100000672.

Coey, R. (National Marine Fisheries Service). September 15, 2020. Letter to L. Walker (Caltrans) re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Pudding Creek Bridge Widening and Rail Upgrade Project (01-43480).

Everson, D. (U.S. Fish and Wildlife Service). July 21, 2020. Letter to L. Walker (Caltrans) re: Formal consultation for the Pudding Creek Bridge Widening and Rail Upgrade Project, Mendocino County, California (Caltrans EA: 01-43480).

Goertner, J.F., M.L. Wiley, G.A. Young, and W.W. McDonald. 1994. Effects of underwater explosions on fish without swimbladders. NSWC TR 88-114. Naval Surface Warfare Center. Silver Springs, MD.

Popper, A.N. and fourteen others. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1. New York: Springer, and Acoustic Society of America Press. 73 pages.

Popper, A.N. and A.D. Hawkins. 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Fish Biology 94:692-713.

Popper, A.N., A.D. Hawkins, and M.B. Halvorsen. 2019. Anthropogenic Sound and Fishes. A technical report dated February 2019 prepared by ICF for the Washington State Department of Transportation. 155 pages.

In 2004, Caltrans coordinated with the Federal Highway Administration and the Departments of Transportation in Oregon and Washington to establish a Fisheries Hydroacoustic Working Group that included representatives from NOAA Fisheries, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and the U.S. Army Corps of Engineers. The Working Group was supported by a panel of experts in hydroacoustics and fish biology. In 2008, the members of the Working Group signed the "Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities."

EXHIBIT 9 1-21-0074 (Caltrans) Hydroacoustic Memo The Interim criteria for injury to fish are a Peak Sound Pressure Level of 206 dB re 1 μ Pa or a Cumulative Sound Exposure Level of 187 dB re 1 μ Pa for fish 2 grams and larger and a Cumulative Sound Exposure Level of 183 dB re 1 μ Pa for fish less than 2 grams. The peak SPL is seldom reached, so pile driving is generally constrained by the cumulative SEL. The Commission has required that the dual criteria be applied to most pile driving projects within the Coastal Zone.

There is recent evidence that both hydroacoustic thresholds are overly conservative (Popper, A.N., et al. 2014, Popper, A.N., et al. 2019, Popper, A.N. and A.D. Hawkins, 2019) The 2008 Interim criteria to which the various agencies agreed were based on a literature review through 2005, much of which was "gray literature" that had not been subject to peer review and that suffered from poor experimental design. In 2009, NOAA Fisheries convened a panel of fifteen international experts to review the evidence for the impacts of anthropogenic underwater sound on fish. This group reviewed the literature through 2013 and developed a new set of guidelines for the effects of pile driving on fishes and turtles. The guidelines were published in 2014 (Popper, et al. 2014). The lead author, Dr. Art Popper, was also one of the principal scientists upon whose work the 2008 Interim Agreement was based. Recently, Dr. Popper and two other authors of the 2014 Guidelines extended the literature review through mid-2018 and presented their scientific assessment in a technical report commissioned by the Washington Department of Transportation (Popper, et al. 2019). They summarized the pertinent scientific literature and recommended that the peer-reviewed 2014 Guidelines be adopted because they reflect the best available science. This work is also summarized in Popper and Hawkins (2019). The more recent studies indicate that injury to fish with a swim bladder occurs when either the peak SPL or the cumulative SEL is greater than 207 dB1. Fish without a swim bladder, such as tidewater gobies, are thought to suffer injury when the peak SPL is greater than 213 dB or the cumulative SEL is greater than 219 dB.

In the case of Pudding Creek, Caltrans has proposed to use the injury threshold of 187 dB SEL(cum) for all fish species, including the tide water goby (Caltrans, October 2020). The rationale presented is that non-swimbladder fish like gobies are far more resistant to injury than swimbladder fish of the same size (Goertner, et al., 1994) and that the 2014 recommended threshold for injury to fish < 2 g that do not have a swimbladder is 219 dB. The Hydroacoustic Monitoring Plan will require that impact hammer activities cease if the measured sound pressure levels approach the 187 dB cumulative SEL threshold (Caltrans 2020). Goertner, et al. (1994) concluded that "…if precautions are taken to avoid injury to swimbladder fish in test programs, there is little likelihood that fish without bladders will be injured." At Pudding Creek I think that it is reasonable to assume that it is unlikely that tidewater gobies will suffer barotrauma using the 187 dB threshold.

The National Marine Fisheries Service (2020) concurs with Caltrans that the proposed action is not likely to adversely affect the listed species or designated critical habitats, and the U.S. Fish and Wildlife Service (2020) determined that the project will not jeopardize the continued existence of the tidewater goby.

¹ The 207 dB threshold is for fish with a swim bladder involved in hearing. The threshold is 210 dB if the swim bladder is not involved in hearing.

