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Filed:	5/16/06
49th Day:	7/04/06
180th Day:	11/12/06
Hearing:	6/16/06
Staff Report:	6/1/06
Staff:	MF/Eureka

STAFF REPORT: REGULAR CALENDAR

APPLICATION NO.	**1-06-022**
APPLICANT:	**California Dept. of Transportation Caltrans, District 1, Eureka**
PROJECT LOCATION:	Highway 1, Ten Mile River Bridge, approx. 7 miles north of Fort Bragg, unincorporated Mendocino County
PROJECT DESCRIPTION:	Replace the Ten Mile River Bridge; demolish and remove the existing bridge.
RECOMMENDATION:	Approval with Conditions
MOTION & RESOLUTION:	Page 7
LOCAL APPROVALS:	None required.
OTHER APPROVALS RECEIVED:	State Lands Commission lease 1/6/06.

OTHER APPROVALS REQUIRED: California Department of Fish and Game: 1602 Streambed Alteration Agreement and California Endangered Species Act Biological Opinion Consistency Determination; Regional Water Quality Control Board: Section 401 Certification, National Pollutant Discharge Elimination System permit; Biological Opinion, U.S. Fish and Wildlife Service; Biological Opinion, National Oceanic and Atmospheric Administration's National Marine Fisheries Service; 404 Permit, Army Corps of Engineers.

STAFF SUMMARY

For a more expansive discussion of the background of this project and the associated timeline, see the combined staff report for Public Works Plan No. 1-06-PWP and Public Works Project No. 1-06-001-PWP, June 16, 2006 Agenda Items 5a and 6a, incorporated here by reference.

The California Department of Transportation (hereinafter "Caltrans", "applicant" or "permittee" depending on specific citations) has submitted an application for a coastal development permit for the proposed replacement of the Ten Mile River Bridge on Highway 1, north of Fort Bragg, in Mendocino County. The primary purpose of the project is to replace the aging, seismically unsafe bridge with a new, safer bridge.

Caltrans urgently requests an expedited Commission review of the remaining approvals that are pending, so that Caltrans can solicit bids for the construction of the last remaining seismic replacement bridge project statewide in the Coastal Zone.

The Commission previously reviewed the project and conditionally concurred with Federal Consistency Compliance Certification (CC-074-05) in November 2005 (revised findings adopted March 2006). Therefore, to expedite the final staff review of the project, the staff analysis relies on the pertinent adopted findings for CC-074-05 that are similarly applicable to the portions of the project (generally, the bridge) subject to CDP 1-06-22. Other, off-bridge elements of the project that are subject to the proposed Public Works Plan include approximately 2,000 linear feet of new, realigned highway to match the bridge to the existing highway, and an approximately 2,841-sq.-ft. turnout for parking located about 450 feet south of the bridge, west of the highway. (See staff report for items Fri 5a & 6a, June 16, 2006 Agenda).

The most important issues raised in this staff report are: 1) consideration of Caltrans' revised proposal for configuration of the pedestrian and paved shoulder components of the bridge (Caltrans presents an alternative design that does not completely follow the Commission's requirements in conditionally concurring with CC-074-05 but which the staff recommends that the Commission approve), 2) Marine resource protection: including hydroacoustic impacts to fish and marine mammals that may be caused by pile-driving, compensatory mitigation for residual impacts to fish that may be caused by pile-driving, eelgrass impact monitoring and mitigation, and water quality; 3) Permanent protection of the Coastal Trail corridor located on the new bridge; and 4). Final design consideration for bridge rails (staff recommends that an amendment to the proposed project be required for future Commission consideration of final bridge rail designs after further design development and review).

The project was first presented to the Commission pursuant to Federal Consistency staff review in November 2005. Commission staff presented the reason for undertaking Federal Consistency review prior to coastal development permit review at that time:

> "… The Commission and Caltrans staff agreed in February of this year to pursue federal consistency review for the entire project, with the objective to resolve all Coastal Act issues, and to simplify the subsequent Coastal Development Permits, and to assist Caltrans in meeting the review deadlines of state seismic retrofit legislation. That legislation expired at the end of June, but the consistency review process was continued, in order to bring the project to the Commission in a timely manner, given Caltrans' mandate to expedite replacement of the bridge."
>
> (From transcript of Commission hearing on Agenda Item No. 20b, November 16, 2005, attached to the staff report for June 16, 2006 Agenda Items 5a & 6a as Exhibit 4A)

The Commission conditionally concurred with Caltrans' Consistency Certification (CC-074-05) at the November 16, 2005 hearing (revised findings adopted March 10, 2006). The Commission required the proposed 8-ft-wide paved shoulders on the bridge to be revised to distribute the 8-ft width between 4-ft.-wide paved traffic shoulders and 4-ft.-wide paved pedestrian corridors on each side of the bridge, with the walkways separated from traffic by guard rails.

Caltrans also agreed at the November hearing to address the Commission's concerns regarding the visual elements of the various types of rails required for the project. A Commission subcommittee was re-activated at that time to examine the rail design issues and to report back to the Commission (the subcommittee has since met twice).

Caltrans has declined in the present proposal to implement the full range of revisions previously required by the Commission, citing Americans with Disability Act (ADA) requirements, safety, and the cost and time required to undertake the full redesign of the project that Caltrans has determined would be necessary. Instead, Caltrans proposes to construct 6-ft-wide paved outside shoulders on each side of the bridge, and one 5-ft.-wide walkway for the Coastal Trail on the west side of the bridge. The walkway would be separated from the traffic side by a guard rail (ST-10, 31 inches high, 18 inches wide). The outer rail would be the "picket" style pedestrian rail installed on the Noyo Bridge in Fort Bragg, which is 48 inches high. The outside rail on the east side would remain the ST-20 type of rail topped by an additional rail bar to achieve a 54-inch height (Caltrans states that this height is necessary for the safety of bicyclists).

Caltrans stated in the pending application, and specifically in the proposed Public Works Plan for the portion of the project presently in the Commission's appellate jurisdiction that a redesign of the project to incorporate the revisions previously required by the Commission in the context of the Commission's conditional concurrence in CC-074-05 would require:

> ***"… a complete redesign, resulting in a several million dollar increase in project cost, and the project would be delayed a minimum of three to five years…"***
>
> (PWP, April 2006, page 8)

Caltrans also states that the Federal Americans with Disabilities Act (ADA) requires the pedestrian sidewalk to be a minimum of five feet wide and that no design exceptions will be made.

Though Caltrans tentatively proposes to reduce the paved shoulders from the previously proposed 8-foot width, Caltrans has not fully committed to this change, noting that such a revision is contingent upon the Commission's expedited approval of the subject project (see except from PWP, page 8, item 3 below, and Exhibit 1A) and apparently reserving the right to revert to the 8-foot-width if the contingency of expedited Commission approval is not met:

> *" …There are four main reasons why Caltrans would develop a design exception for six-foot shoulders, but cannot approve an exception for four-foot shoulders:*
>
> *1) There is a significant (approximately 44%) reduction in expected collision rates when six-foot shoulders are used as compared to four-foot shoulders.*
>
> *2) The six-foot shoulder is a significant improvement over a four-foot shoulder for both vehicular and non-motorized traffic traversing the bridge. For example, a typical bicyclist is 30 inches wide. Four-foot shoulders provide a bicyclist less than one foot on either side between the bridge railing and vehicle lane.*
>
> ***3)*** *Given the urgency of this safety seismic bridge project,* ***a design exception for six-foot shoulders would be approved only if the project could be permitted and constructed with minimal delay.*** (Emphasis added)
>
> *4) Increased environmental impacts due to the larger support columns required for a wider bridge.*

Caltrans therefore has <u>provisionally</u> revised the proposal previously considered by the Commission and presently proposes to install a new bridge at the Ten Mile River crossing with the following dimensions and features, and other project elements:

<u>Total bridge width</u>:	approximately 45 feet
<u>Traffic lanes</u>:	two/12-ft.-wide[1]
<u>Paved shoulders</u>:	two/6-ft.-wide, 54-inch-high ST-20 rail, east side only
<u>Walkway</u>:	one/5-ft.-wide, west side, with 1.6-ft.-high inside ST-10 guard rail, 48-inch-high "picket style" pedestrian outer rail
<u>Bridge Lighting:</u>	none proposed
<u>Off-Bridge:</u>	reduced total length of paved shoulders tapering to point of conformity with existing highway
<u>Replacement Parking:</u>	turnout parking, entrance 445 feet south of new bridge

[1] According to the California Department of Motor Vehicles, a typical passenger car is 6 feet wide. DMV indicates that a typical logging truck is 8 feet wide, the maximum vehicle width permissible without a special wide-load permit and the use of flags, pilot cars, etc.

To Obtain Further Information:

North Coast District:
For further information about this report or the public works plan process, please contact Melanie Faust, at the letterhead address and telephone number.

Federal Consistency Unit:
For further information about the previous Consistency Certification (CC-074-05), contact San Francisco Headquarters: (415) 904-904-5200, Larry Simon. For further information about the acoustic trauma associated with in-water construction, contact Mark Delaplaine, Federal Consistency Unit Supervisor at the same location and telephone number.

Statewide Caltrans Liaison Program:
For further information about the Commission's Statewide Caltrans Liaison program, or the Commission's "Road's Edge" Subcommittee that continues to review design options for the rail elements of the Ten Mile River Bridge, contact Tami Grove at the Central Coast District Office, Santa Cruz: (831) 427-4863, or Sheila Mone, (Intergovernmental Resource Partnering Program Chief, Caltrans) at (916) 653-8746.

To Submit Public Comments:

Public comments concerning this staff report may be provided to the North Coast District Office at the letterhead address. Please note that Commission staff cannot guarantee receipt of comments transmitted electronically.

Availability of environmental information:

All environmental information relied on by the Commission and its staff is available for review at the above-referenced Eureka Office of the California Coastal Commission. Caltrans prepared an Initial Study/Draft Proposed Mitigated Negative Declaration dated March 2006 and released April 3, 2006 (the document is attached to the staff report for June 16, 2006 Commission Hearing Item Fri 5a and 6a, as Exhibit 6A) that had not been finalized at the time of publication of this report.

Related Permits:

Federal Consistency Certification No. CC-074-5 (Caltrans): Conditional Commission Concurrence with Consistency Certification prepared by Caltrans, November 16, 2006, revised findings adopted March 10, 2006.

June 16, 2006 Agenda Item Fri 9b: CDP Amendment Application No. A-1-MEN-98-017-A2 (Perry/Smith). Note: Caltrans seeks an amendment to the subject permit to remove 3 acres of non-prime agricultural land from an otherwise deed-restricted area for preservation of agricultural land, to construct the Ten Mile Bridge project.

June 16, 2006 Agenda Item Fri 5a & 6a: Public Works Plan 1-06-PWP and Specific PWP Project PWP 1-06-01: Note: the Ten Mile Bridge project traverses areas of Mendocino County's certified Local Coastal Program at each end of the proposed project and the bridge traverses the Commission's retained coastal development permit jurisdiction in the middle. Caltrans seeks Commission certification of a Public Works Plan and Project for the portion presently located in the area of the County's LCP.

Previous related permits: CDP 1-00-032 (Caltrans): regular permit for geotechnical planning surveys of the Ten Mile Bridge area, required as follow-up for Emergency CDP No. 1-00-031-G, granted by the Executive Director on July 7, 2000, and processed as an emergency because Caltrans invoked the 15-day permit review turnaround then available to the agency under the since-expired seismic retrofit legislation (Senate Bill 805). Geotechnical study including drilling 14 borings to characterize subsurface formations for Ten Mile Bridge design; Mendocino County Emergency Permit EM 5-00 for geotechnical study borings in the Commission's appellate jurisdiction (Mendocino County certified LCP) related geotechnical test borings outside of the area CCC retained permit jurisdiction.

1A. Regional Map and Project Plans (copy of reduced set prepared by Caltrans).

2A. (1) Hydroacoustic Monitoring Plan for Ten Mile River Bridge, dated January 30, 2006, submitted by Caltrans, and (2) previous memorandum to Caltrans by Illingworth & Rodkin, Inc., dated September 16, 2005 with previous draft plan.

3A. Eelgrass Mitigation and Monitoring Plan (revised), dated March 17, 2006, prepared by Caltrans.

4A. (1) Chart describing paved shoulder widths/accident rates, submitted via email by Caltrans and forwarded to North Coast District Staff with related explanation by the Commission's Statewide Caltrans Liaison, Tami Grove, May 29, 2006; (2) Undated data sheet on accident statistics for Ten Mile Bridge submitted via e-mail by Caltrans Intergovernmental Liaison Program Chief, Sheila Mone, on May 17, 2006 – prepared by Caltrans showing revised accident statistics for the Ten Mile River Bridge, also forwarded to District staff by Caltrans Liaison staff.

5A. Caltrans memorandum prepared by David Melendrez, Chief, North Region Office of Environmental Engineering – North, dated April 13, 2006

6A. Caltrans memorandum prepared by Lisa Embree, Associate Biologist, Caltrans Environmental Branch E2, dated April 30, 2006.

7A. Revisions to project description made by Caltrans, dated April 12, 2006.

8A. Outline of studies /pile driving and effects on fish (from "Effects of Sound on Fish" (Hastings & Popper, Caltrans, January 28, 2005)

9A. Sound metrics explanation.

10A. *Interim Criteria* for Injury of Fish Exposed to Pile Driving Operations: A White Paper (Popper, Carlson, Hawkins, Southall, and Gentry, May 15, 2006)

ABOUT EXHIBIT REFERENCES:

To expedite review of the project, the adopted findings for CC-074-05 approved by the Commission on March 10, 2006 are incorporated below where applicable and are set forth in **Arial bold** font for the reader's convenience. Exhibit references from the adopted findings are numbered 1, 2, 3, etc. Therefore, to distinguish these exhibits from the new exhibits attached hereto, the new exhibits for this report are numbered 1A, 2A, 3A, etc. In addition, the exhibits to the report for June 16, 2006 Agenda Items Fri 5a and 6a, for the remaining portion of the Ten Mile Bridge project that traverses the area proposed for inclusion in a new Public Works Plan may be of interest to the reader of this report (the adopted findings for CC-074-05 and the hearing transcript for the November 15, 2006 hearing on CC-074-05, are attached to that report as Exhibits 3A and 4A, respectively, for example). Finally, Caltrans prepared one complete set of the reduced project plans in color. These were attached to the staff report for items 5a and 6a, as Exhibit 5A. A black and white copy of the plans is attached as an exhibit to this staff report.

JURISDICTION AND STANDARD OF REVIEW:

Although the proposed bridge replacement and associated Highway 1 realignment are one project, the physical project is bisected by the boundary between the coastal development permit jurisdiction of the Commission and Mendocino County.

This application seeks Coastal Commission authorization for the portions of the project that are within the area of the Commission's retained jurisdiction. These areas include areas subject to the public trust. Therefore the standard of review the Commission must apply to the project is the Chapter 3 policies of the Coastal Act.

I. MOTION, STAFF RECOMMENDATION, AND RESOLUTION

The staff recommends that the Commission adopt the following resolution:

Motion: I move that the Commission approve Coastal Development Permit No. 1-06-022 pursuant to the staff recommendation.

Recommendation**:** Staff recommends a **YES** vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of the majority of the Commissioners present.

Resolution to Approve Permit:

The Commission hereby approves a coastal development permit, subject to the conditions specified below, for the proposed development on the grounds that, as conditioned, the development will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgement. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable amount of time. Application for extension of the permit must be made prior to the expiration date.

3. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director of the Commission.

4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

1. COMMISSION REVIEW OF FISH INJURY AND ACOUSTIC MONITORING

A. WITHIN NINETY (90) DAYS AFTER COMMISSION APPROVAL OF COASTAL DEVELOPMENT PERMIT 1-06-022, or within such additional time as the Executive Director may grant for good cause, Caltrans shall submit a copy of the final acoustic monitoring plan to the Commission for review at a regularly scheduled public hearing; and

B. The plan shall include a description of how the acoustic footprint will be determined, what equipment/personnel efforts to observe or detect fish reactions to pile

driving are proposed, the length of time and number of sound measurement replicates that will be consecutively collected to adequately characterize the sound footprint and maximum hydroacoustic impact generated by project activities, how Caltrans proposes to adequately monitor hydroacoustic affects on fish if visibility is impaired (such as by weather, available light, or turbidity), what criteria will be used for fish injury thresholds, and how such criteria, and fish injury, will be measured. The acoustic footprint monitoring shall provide adequate data point locations (including several hydrophone locations between the proposed 10 meter and 100 meter locations) sufficient to adequately characterize the acoustic footprint. In addition, if sonar monitoring of fish behavior during pile-driving is required by state and/or federal agencies, the method and equipment used to conduct such monitoring, and the means of describing and reporting the results shall be included in the Acoustic Monitoring Plan; and

C. Project activities that may result in hydroacoustic impacts shall not commence until the Commission has considered the proposed final plan at a regularly scheduled public hearing, which shall be scheduled as soon as practicable after Caltrans submits the final plan. Caltrans agrees to incorporate into the plan any additional reasonable, prudent measures that the Commission requests for the purpose of collecting sufficient information about the affects of pile driving on the fish that inhabit the Ten Mile River.

2. COMMISSION REVIEW OF FISHERIES HABITAT MITIGATION/ ENHANCEMENT PLAN

A. WITHIN NINETY (90) DAYS AFTER COMMISSION APPROVAL OF COASTAL DEVELOPMENT PERMIT 1-06-022, or within such additional time as the Executive Director may grant for good cause, Caltrans shall submit to the Commission a preliminary plan for compensatory mitigation of adverse impacts to fish in the Ten Mile River that are reasonably anticipated through the assessments of state and federal agencies in rendering "Biological Opinions"(or other analyses) applicable to the proposed project. The plan shall include details of the proposed mitigation, including the location, scope of work, objectives, cooperating partners, timeline for completion, and means of verifying project success. The Commission shall consider the preliminary mitigation plan at the earliest practicable hearing following submittal of the plan by Caltrans; and

B. To the extent that fish habitat enhancement project(s) are proposed to satisfy mitigation obligations, the projects shall benefit the habitat of the affected species proportionally to the impacts sustained by each; and

C. The Plan shall require mitigation of coho and chinook salmon, northern California steelhead trout, and tidewater goby habitat commensurate with the level of unmitigated residual adverse impact on these species determined likely at the anticipated impact threshold (the impacts that would occur if the project does not exceed the expected peak sound pressure threshold); and

D. The Plan shall include a further requirement that if the acoustic footprint monitoring establishes that, or ongoing monitoring document that adverse effects would be more extensive than predicted, additional mitigation commensurate with the level of

additional impact shall be required. For example, if the initial assumption will be a defined estimate of numbers of fish exposed to a particular decibel level, and the actual acoustic footprint monitoring shows the footprint exceeds the predicted footprint, additional noise reduction strategies and/or offsite mitigation may be required; and

E. Upon completion of all project activities that may generate hydroacoustic impacts, Caltrans shall submit to the Commission a final report (together with the final acoustic monitoring report required by Special Condition 3 below), estimating the extent of adverse impacts of project activities deemed to have exceeded the levels originally predicted on the four fish species listed above, at any life stage of these species present during pertinent project activities. Caltrans shall describe proposed mitigation in the form of specific habitat improvement projects for the affected species in a manner reasonably proportionate by species and degree of adverse effects sustained, including a timeline to accomplish the proposed mitigation, and the method of verifying successful completion. Alternatively, Caltrans may propose payment of compensatory fees commensurate with the level of impact to some or all of these species, in an amount deemed reasonable by the Commission. Such fees, if required, shall be collected and distributed in accordance with the Commission's direction for projects that would provide direct benefits to the habitat of the affected species within or as close as is feasible to the Ten Mile River or its watershed. In reviewing the proposed mitigation, the Commission shall assign the greatest benefit to projects that provide in-kind, in-location habitat mitigation that benefits the species affected by the Ten Mile River Bridge construction, in preference to projects that provide in-kind but offsite mitigation, with declining value based on increasing distance from the impact site, and shall finally assign the least value to out of kind mitigation; and

F. Caltrans shall submit the final mitigation proposal not later than sixty (60) days after project completion, and the Commission shall consider the final mitigation proposal at the earliest practicable hearing following submittal of the plan by Caltrans.

3. SUBMITTAL OF ACOUSTIC MONITORING REPORTS.

Upon commencement of pile-driving, Caltrans shall timely submit monthly monitoring summaries, annual monitoring reports, and a final monitoring report prepared for NOAA Fisheries, and or any similar reports to be prepared for the U.S. Fish and Wildlife Service and the California Dept. of Fish and Game, to the Executive Director for review.

4. REVISED MARINE MAMMAL MONITORING PLAN.

In accepting Coastal Development Permit 1-06-022, Caltrans agrees to revise the Marine Mammal Monitoring Plan dated March 2006 to require that the Executive Director receive timely copies of all reports generated, and to include the requirement that construction may not commence in the event of reduced visibility (i.e., the observer must be able to see the required distance, or pile driving may not commence until visibility has improved and the observer can verify that the area is clear of marine mammals). Caltrans shall submit a copy of the revised plan to the Executive Director prior to commencement of in-water construction activities.

5. REVISED EELGRASS MITIGATION AND MONITORING PLAN

PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit a revised Eelgrass Mitigation and Monitoring Plan for review and approval of the Executive Director. The revised Plan shall include a) pre- and post-construction surveys to establish the extent of temporary impacts on eelgrass coverage, if any, resulting from the deployment of casing shells around the trestle piles and/or the installation of the trestle piles over time during project operations (in addition to surveys already proposed for the temporary impacts of shading); b) success criteria for regrowth of temporarily-affected eelgrass habitat detected through the comparative surveys; c) success criteria for regrowth of eelgrass replanted where cofferdam excavations occurred; d) mitigation proposal to replant eelgrass at a minimum ratio of 1.2:1 if approved success criteria are not met as determined by the results of the subject surveys or, if surveys conducted one year after final trestles were removed indicates that eelgrass has not grown back in the area affected by temporary trestle pile installation, Caltrans shall replant eelgrass in these areas at a minimum ratio of 1.2:1; e) follow-up monitoring and adaptive management measures, milestones, and final success criteria to ensure that performance standards resulting in the net gain of eelgrass habitat asserted by Caltrans in seeking approval of CDP 1-06-022 are met. The revised plan shall at a minimum incorporate the guidance of the Southern California Eelgrass Mitigation Policy for acceptable success criteria in assessing eelgrass transplant success.

6. PERMIT OBLIGATIONS

In accepting the Commission's approval of Specific PWP Project 1-06-001, Caltrans agrees and accepts that:

A. If the approved project will be contracted out for implementation, it is Caltrans' responsibility to ensure that the relevant bidding documents include the requirement that the contractor and any employees, subcontractors, agents, or other representatives of the contractor or contractors who are responsible for constructing any portion of the project, shall undertake such activities in full compliance with the project approved pursuant to CDP 1-06-022, including all terms and conditions imposed by the Commission in approving the permit. It shall be Caltrans' responsibility to ensure that the bidding documents contain special provisions necessary to incorporate all requirements imposed by the Commission or other state or federal agencies with regulatory authority over the project. It shall also be Caltrans' responsibility to ensure that the winning bid for the construction of the proposed project is adequate to ensure that the selected contractor has taken into consideration and provided for the full cost of compliance with all requirements imposed by the Commission pursuant to the Commission's approval of CDP 1-06-022, as well as all requirements of other state and federal agencies. A copy of the adopted findings for CDP 1-06-022 shall be provided to Caltrans subsequent to final Commission action, and a complete copy of the adopted findings and final plans approved by the Executive Director shall be attached to the bidding documents by Caltrans for reference by potential bidders.

B. After the contract is awarded, Caltrans shall ensure that the contractor(s), subcontractor(s), or other parties selected by Caltrans or otherwise designated to implement any portion of the project approved pursuant to CDP No. 1-06-022, are fully informed of, and continuously comply with, the obligations set forth in the adopted findings referenced in Subparagraph A above. Caltrans shall ensure that a complete copy of the adopted findings is maintained on the job site at all times and that each contractor undertaking any portion of the development authorized herein has a copy of the adopted findings upon execution of the contract for the subject project.

C. All activities associated with performing the development authorized pursuant to CDP 1-06-022 shall at all times be undertaken in full accordance with the terms and conditions imposed by the Commission in conditionally approving CDP 1-06-022. It shall at all times be Caltrans' responsibility to fully ensure such compliance by any party to whom Caltrans assigns the right to construct or undertake any part of the activities authorized herein.

D. Any proposed changes to the approved project shall be reported to the Executive Director. No changes to the approved project shall occur without a Coastal Commission-approved amendment to CDP 1-06-022, unless the Executive Director determines that no amendment is legally required.

7. CONSTRUCTION RELATED REQUIREMENTS

In accepting the Commission's approval of CDP 1-06-022, Caltrans agrees that its representatives, agents, employees, contractors, and the contractor's agents, officers, and employees, or subcontractors shall comply with the following construction-related requirements for any portion of the proposed project that is located within the area that is subject to CDP 1-06-022:

A. No construction materials, debris, graded soils, or waste shall be stored or placed within the Ten Mile River corridor including streambed or banks, or adjacent riparian areas, or other areas where it may enter the Ten Mile River or other coastal waters, whether directly or indirectly; and

B. No machinery shall be allowed at any time in the Ten Mile River corridor except as specifically required to install the in-water support piles and other structures approved herein, or to undertake monitoring or barge-based activities; and

C. Staging and storage of construction machinery, materials, equipment, fuel, or any other material, or storage of debris or graded material, shall not take place within sensitive habitat areas that shall be identified and marked in the field by a qualified biologist prior to commencement of construction and as often as needed thereafter to continuously maintain the identification of sensitive site areas; and

D. Demolition of the existing bridge or roadbed shall not be undertaken through the use of explosives, and no portion of the bridge deck or other structures to be demolished may be dropped to the ground below the demolition activities. Support trestles and other equipment or materials shall be utilized to capture such debris which shall thereafter be removed directly from the trestle deck for disposal; and

E. Demolition and disposal of debris, and all construction activities shall at all times be undertaken in a manner that does not result, whether directly or indirectly, in

discharge to coastal waters, including the Ten Mile River channel (top of bank to top of bank, including banks, gravel bars and wetted channel) of dust, rubble, debris, chemicals, concrete (wet or dry), grout, fuel, waste material of any kind, or construction materials of any kind; and

F. All debris, materials, equipment, vehicles, staging and storage features, concrete washout areas, fueling location, and any other material or temporary feature associated with project construction shall be removed immediately after project completion and the affected area returned to preconstruction conditions or restored in accordance with other special conditions set forth herein, as applicable; and

G. All waste material or excess graded material generated by demolition or construction shall be removed from the construction site and disposed of in an upland area outside of the coastal zone where such materials may be lawfully disposed and will not be discharged into waters tributary to coastal waters if the disposal is proposed in the coastal zone; and, not less than thirty (30) days prior to commencement of activities that will result in debris or wastes subject to such disposal, Caltrans shall submit evidence to the Executive Director's satisfaction that all necessary, final coastal development permits have been obtained and that the activities proposed will not adversely affect coastal resources. If disposal is undertaken within the coastal zone, it shall be in a manner and at a location that is not visible from public viewing areas, does not displace agriculture, or affect sensitive habitat or species, or occupy wetlands or wetland buffers. Caltrans shall keep complete written records of the kind, volume, and location of any disposal of materials generated by the subject project activities and shall provide an interim report of such disposal annually, and a final report and complete copy of these records within thirty (30) days of project completion, to the Executive Director; and

H. Fueling shall take place in a single designated offsite area that is set up to fully contain any potential spill without release outside of the designated area, and the designated area shall be equipped with all materials necessary to control and cleanup any spill that may occur. The designated area may not be located within the Ten Mile River corridor from top of bank to top of bank, or within 100 feet from top of bank on either side of the river. Only equipment that cannot be readily relocated to the designated offsite fueling location may be fueled in other areas of the site (cranes, large tracked vehicles only) and these shall be re-fueled only by a California Department of Fish and Game-certified over-water re-fueler, in a manner authorized in accordance with all requirements of the Department of Fish and Game and the Regional Water Quality Control Board, including but not limited to the requirement that such re-fueling be undertaken by a minimum of two crew members certified for such operations, with one on standby to shut off the flow of fuel and the other at the delivery point, in constant communication with each other, with full deployment of absorbent pads with sufficient capacity to absorb the maximum amount of fuel that could escape from the fueling hose before shutoff occurs in the event of equipment failure. No fueling of any kind may take place except during daylight hours and when visibility is sufficient for the re-fueling crew to maintain visual contact; and

I. Oil absorbent booms and/or pads shall be on site at all times during project construction. All equipment used during construction shall be free of oil and fuel leaks at all times, and where parked or operated over the river channel from top of bank to top of bank, oil pans or

other containment devices shall be continuously placed beneath such equipment to ensure that leaks that do arise will not enter the river environment; and

J. Cement shall be prepared and poured in a manner that will prevent discharges of wet cement into coastal waters including, but not limited to, placement of measures such as catch basins, mats or tarps beneath the construction area to prevent spills or overpours from entering coastal waters; and

K. Rinsate from the cleaning of equipment, including cement mixing equipment, shall be contained and handled only in upland areas and otherwise outside of any environmentally sensitive habitat area; and

L. Reporting protocols and contact information for the appropriate public and emergency services/agencies in the event of a spill shall be prominently posted on site at all times; and

M. All forms that may be utilized for wet concrete pours shall be grout-sealed, allowed to cure completely, and water-tested under the supervision of the monitoring biologist and resident engineer, to ensure complete seal before any wet concrete or other chemical treatments may be applied to the forms; and

N. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall provide to-scale plans showing the detailed limits and locations of any approved staging, fueling, or concrete washout area subject to the review and approval of the Executive Director before construction may commence, and it shall be Caltrans' responsibility to ensure that no other area of the site is used for these purposes at any time; and

O. No vegetation removal, including clearing, grubbing, limbing, trimming, or other disturbance of existing vegetation may occur between March 1 and August 31 of any year unless a qualified biologist provides a survey undertaken to the satisfaction of the Executive Director not less than ten (10) days prior to proposed commencement of such activities, demonstrating conclusively that no birds are nesting in the area that would be affected, and the results of the survey have been provided to the Executive Director's satisfaction not less than five (5) days prior to proposed commencement of such activities; and

P. No demolition activities shall be undertaken in an area of the site subject to CDP 1-06-022 that would disturb nesting birds or bats utilizing any portion of the existing bridge during the nesting season for nest building migratory birds March 1 through August 31, and sufficient bat boxes to provide alternative roosting sites for bats utilizing the existing bridge must be affixed to the new bridge as soon as feasible after construction but not less than three (3) months prior to the demolition of the existing bridge. Prior to demolition activities, a qualified biologist shall verify that no nesting or roosting species are using the old bridge, and if any roosting species are still using the bridge, the biologist shall relocate the affected species before demolition activities commence. A summary of the relocation activities shall be provided to the Executive Director prior to commencing demolition; and

Q. Caltrans and its designated representatives (which includes contractors and their representatives) shall undertake development at all times in accordance with the requirements set forth herein, and it shall be Caltrans' responsibility to oversee and to ensure such compliance by all parties undertaking any portion of the project authorized herein, at all times; and

R. No changes to these requirements may be approved without an amendment to CDP 1-06-022, unless the Executive Director determines that no amendment is legally required.

8. EROSION CONTROL AND REVEGETATION PLAN

A. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit, for the review and approval of the Executive Director, a final combined Erosion Control and Revegetation Plan for all areas disturbed by construction within the area subject to CDP 1-06-022, including disturbance necessary to construct bridge abutments and shoulders, temporary and relocated access roads, and approved staging, fueling, and concrete washout areas to the extent that these are located within the subject area of the project. The plan shall provide for both temporary and permanent erosion control and revegetation in accordance with the revised Revegetation Plan dated September 19, 2005, submitted by Kelley Garrett, Caltrans biologist, shall include a site plan to scale with a detailed planting plan overlay specifying the species, size, source location of propagules, and shall include detailed performance standards, milestones, and specific adaptive management measures. The final plan shall include specific rainy season erosion control measures, including, but not limited to, the following measures or their equivalents as specifically matched to the subject site and conditions: (1) the use of geotextile fabric and gravel to cover temporary access roads during construction, (2) the complete removal of all geotextile fabric and gravel, (3) placement of erosion control measures such as mulch, fiber rolls, or straw, and (4) replanting the disturbed area with locally native vegetation. Other features such as natural boulders or low-profile fences to limit vehicle access to sensitive habitat areas shall be included in the final plan and shall be of a design, materials and color palette that blends unobtrusively with the natural setting. No placement of rip-rap or other streambank alteration structures or measures are authorized ; and

B. Monitoring

One year, three years, five years, and ten years from the completion of final grading, Caltrans shall submit for the review and approval of the Executive Director, a landscape monitoring report, prepared by a licensed Landscape Architect or qualified Resource Specialist, that indicates whether the on-site landscaping is in conformance with the final revegetation plan approved pursuant to this Special Condition. The monitoring report shall include photographic documentation of plant species and plant coverage, a listing of the species that did not establish properly, and a listing of the plant species that were replanted to comply with these Special Conditions.

If the landscape monitoring report indicates that landscaping is not in conformance with, or has failed to meet the performance standards specified in the Erosion Control and Revegetation Plan approved pursuant to this permit, Caltrans shall submit a revised or supplemental revegetation plan for the review and approval of the Executive Director. The revised landscape plan must be prepared by a licensed Landscape Architect or a qualified Resource Specialist and shall specify measures to remediate those portions of the original plan that have failed or are not in conformance with the original approved plan. Further monitoring reports in accordance with the above requirements shall be required until the Executive

Director is satisfied that the required cover, vigor, and permanent establishment of native vegetation required in the final plan authorized herein has been achieved.

C. Caltrans shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

9. DRAINAGE STRUCTURE FINAL PLAN; MAINTENANCE RESPONSIBILITY

PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit for the review and approval of the Executive Director, a final plan for drainage structure management in any area of the project that is subject to CDP 1-06-022, including maintenance of hard structures and vegetated swales or similar landscape features designed to capture, slow, and/or treat stormwater runoff, protect coastal water quality, and control erosion. The final plan shall include a maintenance schedule and statement of responsibilities. With acceptance of this permit, Caltrans agrees that should any of the project's surface or subsurface drainage structures fail or result in erosion, Caltrans shall be responsible for any necessary repairs to the drainage system and restoration of the eroded area, and such repairs or restoration shall be timely undertaken such that increased erosion or other adverse affects do not occur. Should repairs or restoration become necessary, prior to the commencement of such repair or restoration work, Caltrans shall submit a repair and restoration plan to the Executive Director to determine if an amendment or new coastal development permit is required to authorize such work.

10. TEMPORARY PILES

No creosote treated piles shall be placed in any area of the project site where chemicals leaching from the piles may reach the waters of the Ten Mile River. Piles used to construct the temporary trestles shall be of concrete, steel, composite, untreated timber, or timber treated with a wood preservative approved by the Department of Fish and Game for use in marine waters. All temporary piles placed shall be pulled up and completely removed without digging them out or cutting them off at the mudline.

11. FINAL AUTHORIZATIONS; COMPLIANCE

PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit, for the review and approval of the Executive Director, complete copies of all final authorizations, reviews or permits for the proposed project that may be required by the California Department of Fish and Game, Regional Water Quality Control Board, U.S. Army Corp of Engineers, NOAA National Marine Fisheries, and U.S. Fish and Wildlife Service. Caltrans and its agents, employees, selected contractors and their subcontractors, agents, or employees shall at all times comply with all requirements, requests and mitigation measures from these state and federal agencies. Any change in the approved project that may be required by the above-stated agencies, or that may conflict with modifications or conditions imposed by the Commission in approving CDP 1-06-022 shall be submitted to

the Executive Director to determine if the proposed change shall require an amendment to CDP 1-06-022 pursuant to the requirements of the Coastal Act and the California Code of Regulations. No changes to the approved project shall occur without a Commission certified amendment to CDP 1-06-022 unless the Executive Director determines that no amendment is legally required.

12. WATER QUALITY PROTECTION PLAN/SWPP

A. PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit a copy of all Best Management Practices and other measures that will be implemented through specific contract measures to protect the quality of coastal waters that may be affected by project activities undertaken in the area subject to CDP 1-06-022, for the review and approval of the Executive Director. The submittal shall show in site-plan view, to scale, the location and limits of all authorized staging and storage areas, the approved offsite fueling area, the location and limits of the concrete washout areas, and any other feature the Executive Director determines applicable to the protection of coastal waters. The Water Quality Protection Plan shall also include specific measures to ensure that while dewatering operations are underway in any containment that may have significant turbidity or enclose an area where wet concrete will be placed, the water shall be pumped to a holding tank and tested to ensure that it meets the water quality standards deemed protective of fish and water quality, including pH levels, before the pumped water is discharged back into the Ten Mile River.

B. PRIOR to COMMENCEMENT OF CONSTRUCTION, Caltrans shall provide a copy of the Storm Water Pollution Prevention Plan (SWPPP) subsequently prepared by the contractor selected by Caltrans for the review and approval of the Executive Director, who shall determine whether the plan adequately incorporates the provisions of subparagraph A of this special condition. If the Executive Director determines that the SWPPP is not adequate for this purpose, project construction shall not commence until all changes reasonably required by the Executive Director have been made by the contractor.

C. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

13. BIOLOGICAL MONITORING

In accepting the Commission's authorization of CDP 1-06-022, Caltrans accepts responsibility for ensuring compliance with all terms and conditions imposed by the Commission. All activities that are undertaken within the Ten Mile River channel, including the banks of the river and the environs of the site immediately adjacent to the top of the river banks, shall be subject to the requirements of this monitoring condition:

A. Qualifications, areas of duty of monitor: Caltrans shall ensure that a qualified biologist (hereinafter "monitor") with significant field experience in fisheries

ecology, including the rescue and release of trapped fish, as well as qualified to identify rare and sensitive plants that may occur within or adjacent to the project area, and who is approved by the Executive Director of the Commission as well as by the California Department of Fish and Game, NOAA National Marine Fisheries Service, and the U.S. Fish & Wildlife Service as applicable, shall observe project activities undertaken within the area subject to Specific PWP Project 1-06-01 adjacent to the Ten Mile River corridor during all activities with the potential to adversely affect sensitive habitat, species, or water quality, and shall monitor and ensure compliance with CDP 1-06-022 during such activities until the project is fully completed. If there is any question as to whether a specific project activity requires monitoring, the question shall be directed to the Executive Director for resolution; and

A. Education of on-site personnel: Prior to commencement of construction, the monitor shall provide copies of and brief all on-site personnel on the requirements of all project authorizations, including requirements related to the protection of sensitive habitat and species, and of water quality, and shall provide additional copies and conduct additional briefings as new field personnel join the project, or as the monitor may determine to be additionally necessary, to ensure that all personnel understand and fully implement the applicable requirements; and

B. Non-compliance: First notification and required action by site supervisor: The monitor shall immediately report any non-compliance with permit conditions to the Resident Engineer or other designated site supervisor and shall both log the incident in the monitoring notes and document the incident in writing with photographs. Within 24 hours the monitor shall provide an oral report of the incident to the Executive Director of the Coastal Commission followed by a written report detailing the incident. If the monitor observes any potentially adverse impacts to sensitive species, habitat, or water quality, the monitor shall immediately notify the Caltrans Resident Engineer ("site supervisor"), the Resident Engineer's designated substitute, or other site supervisor designated by Caltrans, and the site supervisor shall order the immediate cessation of any activities contributing to the reported non-compliance. If the site supervisor is uncertain about the compliance status of certain activities, the site supervisor shall nonetheless require cessation of such activities if the monitor identified any compliance concern about them. Resolution of any questions of intent or interpretation of any condition is reserved for the Executive Director or the Coastal Commission pursuant to Standard Condition 3, above. Nothing in these requirements shall relieve the site supervisor from additionally monitoring the compliance with permit conditions of any party authorized to perform work on Caltrans' behalf and intervening to address or prevent non-compliance whether or not observed by the monitor; and

D. Further Notification and Remedial Action: Immediately notifying the Resident Engineer or other designated site supervisor, the monitor shall additionally notify Caltrans' designated District 1 Environmental Unit Construction Liaison ("liaison") or the liaison's designated representative of any incident of non-

compliance with the requirements of this permit. In addition, if for any reason the usual Caltrans site supervisor is unavailable, Caltrans shall ensure that the liaison has the authority to order the immediate cessation of any activity identified by the liaison or the monitor to be potentially non-compliant with the requirements of this project authorization, and Caltrans shall ensure that this authority is clearly understood by all parties undertaking any activities on the subject site. The designated site supervisor or liaison shall not allow the project activities of concern to re-commence until the state and regulatory agencies (which may include: California Department of Fish and Game, Regional Water Quality Control Board, Coastal Commission – North Coast District Office, NOAA National Marine Fisheries Service, U.S. Fish and Wildlife Service, Army Corps of Engineers) with applicable authority have been notified and have had an opportunity to advise Caltrans of any remedial action or additional project authorizations that may be necessary, and such project authorizations have been obtained and such remedial action has been fully implemented, to the satisfaction of the liaison, monitor, and the consulting agency or agencies; and

E. Monitor to verify SWPPP compliance reports: The monitor shall evaluate for accuracy and completeness all Storm Water Prevention Plan (SWPPP) Best Management Practices compliance reports, typically prepared by the contractor chosen by Caltrans, and when the monitor is unavailable, the Caltrans site supervisor shall evaluate the reports for accuracy and completeness and the results shall be recorded in the engineer's daily records; and

F. Record-keeping, preservation, reporting: The monitor-- and to the extent the liaison observes site conditions and activities, the liaison--- shall keep detailed field notes of all observations, including biological and physical environmental baseline observations daily, and shall document in writing with supporting photographs - any instance of potential non-compliance, including any instance of sediment or other discharge into the Ten Mile River corridor or other coastal waters, or areas that may drain to these waters, as shall the site supervisor. The monitor shall additionally record a professional estimate of any adverse impact on sensitive habitat, species or water quality that any instance of potential non-compliance imposes. The monitor and liaison shall individually retain copies of all notes, logs, and photographs, descriptions of any remedial actions taken in the event of non-compliance or accident, and copies of the records and photographs of the monitoring biologists shall be permanently preserved and retained by Caltrans with the project records. The monitor and liaison shall additionally submit a complete copy of these materials to the Coastal Commission's North Coast District Office quarterly upon commencement of construction. The monitor and liaison shall additionally ensure and document that rainy season protective measures are fully in place to control erosion and thereby prevent the discharge of sediment to coastal waters, before the onset of rainy season annually October 15, and that the implemented measures perform adequately, until construction is completed.

G. Additional Responsibility and Authority: Nothing in these requirements shall relieve the Caltrans site supervisor or designated substitute, or the liaison, from additionally monitoring the compliance with project conditions of any party authorized to perform work on behalf of Caltrans within the area subject to CDP 1-06-022, and intervening to address or prevent non-compliance whether or not observed by the monitor. Caltrans shall ensure that a site supervisor is continuously available on-site or by telephone for the monitor's benefit, however if the site supervisor is unavailable for any reason, in accepting this project authorization, Caltrans shall authorize the liaison or the liaison's designated representative to order immediate cessation of any project activity that the monitor or liaison determine may be non-compliant with the requirements of the coastal development permit. In such cases, the responsibilities of the liaison shall be the same as the site supervisor pursuant to subparagraphs (c) and (d) above. Caltrans shall inform, in writing, all contractors working on the project of such designated, and at times delegated, authorities and ensure that all contractors understand and abide by the authority of the Caltrans site supervisor or his/her designated representative, the liaison, and the monitor.

14. SITE INSPECTIONS

Coastal commission staff, and other agency staff that the Coastal Commission staff may coordinate site visitation with, shall be authorized to enter the site at any time to observe project activities without prior notice. Caltrans shall ensure that a minimum of two sets of protective gear are available on site at all times (including hard hats, goggles, safety vests, and high visibility rain gear, etc., such as Caltrans deems necessary for the safety of site visitors). If activities are underway that could cause a hazard to site visitors, the site supervisor or designee shall require that these activities be temporarily suspended as soon as practicable, for a reasonable amount of time to allow safe site inspection by Commission and agency staff, and the site supervisor or designee shall accompany staff during such site visits.

15. AUTHORIZED DEVELOPMENT ONLY; PERMIT AMENDMENT REQUIRED

All activities associated with the development authorized herein shall be undertaken in continual conformance with the approved project description and with the terms and conditions of approval of the permit. Any proposed changes to the approved project shall be reported to the Executive Director. No changes to the approved project shall occur without a Coastal Commission-approved amendment to the coastal development permit, unless the Executive Director determines that no amendment is legally required.

16. PROTECTION OF FUTURE PUBLIC ACCESS

PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall record a deed restriction, in a form and content acceptable to the Executive Director, to protect permanent public access for pedestrian and bicycle use on the Ten Mile River Bridge as generally depicted on Exhibit 1A attached hereto. The 5-ft-wide pedestrian corridor on

the bridge deck shall remain available as an important link in the California Coastal Trail and shall be maintained for safe pedestrian and handicapped access through separation from the traffic side of the bridge by means of a crash-test-approved guard rail (ST-10 or equivalent). In addition, the 6-ft.-wide paved shoulders shall not be reduced in the future to less than 4-ft.-wide for the protection and continued use of bicyclists.

17. UNIVERSAL (HANDICAPPED) ACCESS

A. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT 1-06-022, Caltrans shall submit for the review and approval of the Executive Director revised plans that include continuous universal (handicapped) access that is Americans With Disability Act-compliant between the southern end of the ADA-compliant pedestrian corridor proposed for the bridge deck through the location of handicapped parking within the proposed parking turnout entrance approximately 445 feet south of the southerly end of the pedestrian corridor on the bridge or provide an alternative means of ADA compliant parking and access to the ADA-compliant pedestrian corridor on the bridge deck. An amendment to CDP 1-06-022 may be required unless the revisions to secure such alternative ADA compliance are determined to be *de minimis* by the Executive Director.

B. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

18. FINAL RAIL DESIGN

WITHIN ONE YEAR OF COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit a complete application for an amendment of CDP 1-06-022 to incorporate a final Design Plan for bridge and guard rail or other barrier structures proposed for installation in any portion of the subject project subject to this coastal development permit. The Design Plan shall incorporate the lowest profile, most visually permeable design feasible for these features, consistent with safety requirements. The rail design shall incorporate graceful, arching elements where feasible, and shall not be painted unless the Commission subsequently approves an amendment for a specific painted finish and color. The final finish of surface elements shall otherwise be comprised either of non-reflective matte metal, or timber, or a combination of these, or an alternate material that may be deemed more attractive or less visually intrusive than these. The final design plan shall include a wildlife permeable design for off-bridge elements that is visually compatible with the final designs approved by the Commission pursuant to the amendment request(s).

19. PERMANENT SIGNAGE/SIGNAL/LIGHTING PLAN; LIMITATION ON FUTURE DEVELOPMENT

A. PRIOR TO ISSUANCE OF CDP 1-06-022, Caltrans shall submit a final, permanent signage, signal and lighting plan for the review and approval of the Executive

Director. The signage, signal and lighting elements shall be of the minimum profile necessary and shall be limited only to those deemed essential for safety. No digital display "message" signs, "highway maintained by…" signs, other public relations signage, or solar power installations shall be allowed in the highly scenic Highway 1 corridor subject to this coastal development permit. The final plan shall specify the size, color, design, content and location of any sign within the area of the project that is subject to CDP 1-06-022. Permanent lighting is not authorized and would require an amendment to the coastal development permit.

No additional development including, but not limited to, widening, paving, placement of signs or other information displays, advertisements, lighting, digital or other data displays/advisories, solar installations, communications equipment, or maintenance facility improvements shall be undertaken within the area subject to CDP 1-06-022 without an amendment to CDP 1-06-022 for such additional development.

B. PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall submit, for the review and approval of the Executive Director, a Permanent Signage Plan, which shall specify the size, color, design, content, and placement of any sign or signal proposed for placement within the area of the proposed project that is subject to CDP 1-06-022. No sign may be posted to exclude or limit the use by pedestrians or bicyclists of the trail and bicycle corridors on the bridge approved herein.

C. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

20. IMPLEMENTATION OF WETLAND MITIGATION PLAN

All project activities shall be conducted in accordance with the Final Wetland Delineation and Supplemental Wetland Delineation Information dated August 2005, including mitigation, monitoring, and adaptive management described in the final plan, which shall be fully implemented in accordance with Caltrans' proposal.

21. FINAL DISPOSAL PLAN

PRIOR TO COMMENCEMENT OF CONSTRUCTION, Caltrans shall identify designated disposal site(s) for all debris, wastes, or excess graded material that may be generated by the subject project. These materials may not be placed where they may come into contact with coastal waters, either directly or indirectly, or will displace agricultural lands, adversely affect sensitive species or habitat, or be visible from any public viewing area. Caltrans shall include evidence that all necessary permits, including coastal development permits, for such disposal, have been obtained not less than thirty (30) days prior to commencement of disposal, and shall provide copies of the applicable permits to the Executive Director. Caltrans shall maintain records of the final disposal of any debris, wastes, other materials or excessive graded soils generated during the

construction of the project authorized herein and submit a copy of such records to the Executive Director annually, commencing on January 1 of the year following Commission approval of CDP 1-06-022, and a final report shall be submitted to the Executive Director within thirty (30) days of project completion.

22. AREA OF ARCHAEOLOGICAL SIGNIFICANCE

If excavation is proposed in an area of known or suspected cultural significance, a Native American Monitor shall be present during all ground-disturbing activities. If cultural remains are discovered, excavation or other ground disturbance shall cease and shall not re-commence until an archaeological plan has been reviewed and approved by the Executive Director if the Executive Director determines in writing that changes to the project or posed mitigation measures are de minimis in nature or scope. However, if such changes or measures are not deemed de minimis by the Executive Director, construction that may further affect the cultural remains may not recommence until after an amendment to this permit is approved by the Commission.

23. FINAL PLANS

A. PRIOR TO ISSUANCE OF COASTAL DEVELOPMENT PERMIT 1-06-022, Caltrans shall submit for the review and approval of the Executive Director two copies of final revised to-scale project plans, including two copies of reduced plans, showing the final proposal for 6-ft.-wide paved shoulders adjacent to the traffic lanes on the bridge, and a 5-ft.-wide Americans With Disabilities Act-compliant paved pedestrian corridor on the west side of the bridge, separated from the traffic side of the bridge by a crash-test-approved guard rail (final design to be determined by the Commission as otherwise set forth in these special conditions). No permanent lighting shall be included without an amendment to CDP 1-06-022 and this shall be noted on the final plans. The bridge rails, guard rails, crash barriers, and other similar features shall be reserved for final Commission design approval in a subsequent amendment to CDP 1-06-022 as provided in these special conditions.

B. Caltrans shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

24. TIMING OF CONSTRUCTION

In accordance with Caltrans' proposal, no pile driving activities shall occur unless undertaken within a de-watered cofferdam except during the period between June 15 and October 31 of the first year of construction (commencing in 2007 according to Caltrans), and between September 15 and October 31 of subsequent years. Changes to windows for pile driving activities require an amendment to Coastal Development Permit 1-06-022 and the application for such an amendment must be accompanied by written evidence of

approval by NOAA Fisheries, U.S. Fish & Wildlife Service, California Department of Fish and Game, and the Regional Water Quality Control Board.

25. ASSUMPTION OF RISK

A. By acceptance of Commission approval of CDP 1-06-022, Caltrans acknowledges and agrees: (i) that the site of the proposed Ten Mile Bridge project including relocated elements of Highway One to the point of conformity with the existing highway, and the proposed new turnout area south of the bridge, may be subject to hazards from seismic events, liquefaction, storms, floods and erosion; (ii) to assume the risks to employees and assigns of Caltrans, including contractors and subcontractors and their officers, agents, and employees, and to the public utilizing the proposed project during and after construction, and to the property that is the subject of this permit of injury and/or damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense against such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

B. PRIOR TO ANY CONVEYANCE OF THE PROPERTY THAT IS THE SUBJECT OF THIS SPECIFIC PUBLIC WORKS PLAN PROJECT APPROVAL, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director: (1) indicating that, pursuant to the Commission's certification of this Public Works Plan as modified herein and authorization this Specific Public Works Plan Project approval as conditioned herein, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property (hereinafter referred to as the "Standard and Special Conditions"); and (2) imposing all Standard and Special Conditions of this Specific Public Works Plan Project approval as covenants, conditions and restrictions on the use and enjoyment of the Property. The restriction shall include a legal description of the applicant's entire parcel or parcels. It shall also indicate that, in the event of an extinguishment or termination of the deed restriction for any reason, the Standard and Special Conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this Specific Public Works Plan Project approval or the development it authorizes – or any part, modification, or amendment thereof – remains in existence on or with respect to the subject property.

C. WITHIN 90 DAYS OF COMMISSION APPROVAL OF CDP 1-06-022, Caltrans shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

26. FUTURE DEBRIS EXPOSURE DUE TO RIVER SCOUR OR EROSION

In accepting the Commission's approval of Coastal Development Permit 1-06-022, Caltrans agrees that if any subsurface debris, such as remnant pilings or portions of the abandoned bridge abutments or other components of the existing bridge that are not fully excavated and removed should become exposed in the future due to river scour or streambank erosion, Caltrans accepts responsibility for undertaking timely removal of such debris, which may pose hazards to coastal visitors, increase streambank erosion, or cause adverse visual impacts in the Highly Scenic river corridor. Removal of such debris shall require a new coastal development permit.

II. FINDINGS

The Commission finds and declares as follows:

A. Background

The Commission previously reviewed the version of the proposed project that was submitted by the California Department of Transportation (Caltrans) in conditionally concurring with Consistency Certification CC-074-05 through the Federal Consistency review process, last November, 2005. The Commission conditioned its concurrence with Caltrans' Consistency Certification by requiring that the 8-ft-wide paved shoulders on the bridge be scaled down to provide for a 4-ft.-wide pedestrian corridor on each side of the bridge.

Caltrans has modified the project since that time in minor ways, but the most significant change is that Caltrans has revised the bridge design to include some, though not all, of the revisions previously required by the Commission.

Caltrans has evaluated that Commission's requirements and determined that the agency cannot revise the project to the extent that the Commission required while still meeting the safety standards Caltrans regards as critical to bridge safety. Caltrans asserts that the width of paved shoulders is directly related to a significant statistical reduction in traffic accidents (the greater the width, the fewer the accidents) and has submitted an excerpt from a study showing this correlation, attached as Exhibit 4A (1). In addition, a new analysis of accident statistics associated with the Ten Mile River Bridge has been provided to the Commission. The analysis produced by Caltrans Geometrics Program Engineer John Steele, is attached as Exhibit 4A(2). Caltrans had previously stated that the accident rate for the existing Ten Mile River Bridge over the past 5 years has been below the state average for similar structures. However, the new document shown in Exhibit 4A(2) indicates that this representation was apparently based on incorrect information. The correct conclusion according to Exhibit 4A(2) is that the existing bridge has a vehicular accident rate that is almost double the statewide average for such structures – lending support thereby to Caltrans assertions that the reduction of paved shoulder widths called for by the Commission should be reconsidered in light of this evidence, and in light of the accident rate reductions afforded generally by wider highway shoulders as shown in Exhibit 4A(1).

In addition to evidence that wider paved shoulders are statistically associated with reduced traffic accidents, Caltrans now indicates that the Ten Mile River Bridge has an accident rate approximately twice the average anticipated statewide for a structure of this type, lending emphasis to Caltrans assertions that the paved traffic shoulders cannot be reduced to less than the now-proposed 6-ft.-wide shoulders. To substantiate the claim that the accident rate is higher than previously calculated, on May 17, 2006 Caltrans staff submitted the latest revised information provided by Caltrans geometrics engineer John Steele, via the Caltrans Intergovernmental Liaison Program Manager, Sheila Mone, and the Commission's Statewide Caltrans Liaison. The revised information submitted by Caltrans is attached hereto as Exhibit 4A(2).

For all of these reasons, Caltrans asserts that the paved shoulders on the bridge cannot be reduced to a width any narrower than six (6) feet wide adjacent to each of the two proposed traffic lanes, despite the requirements of the Commission in conditionally concurring with CC-074-05 (The adopted findings staff report and the transcript of the November 16, 2005 hearing are attached to the staff report for Friday June 16, 2006 Agenda Items 5a and 6a, as Exhibits 3A and 4A, respectively).

Thus, Caltrans proposes that in place of the previously-proposed 8-ft.-wide paved shoulders on the bridge, which the Commission required be divided between 4-ft.-wide paved traffic shoulders and 4-ft.-wide separated pedestrian walkways, a 6-ft.-wide paved shoulders would be constructed on each side of the traffic lanes (as explained in the staff notes above, Caltrans states that 6-ft.-wide shoulders are only proposed on the condition that the Commission approves the project quickly).

Although the Commission required revised plans to incorporate a 4-ft.-wide pedestrian corridor separated from traffic on each side of the new bridge, Caltrans proposes a compromise pedestrian design. Caltrans proposes to construct a corridor on the west side of the bridge, separated from traffic by a guard rail (ST-10, 31 inches high, 18 inches wide) to accommodate pedestrians. The outer rail would be the metal "picket" style of railing that Caltrans installed on the Noyo Bridge in downtown Fort Bragg. That rail is 54 inches high.

The east side of the bridge would be the ST-20 type of guard rail with horizontal bars to the 54-inch level required for bicyclist safety according to Caltrans.

Caltrans proposes to accommodate not only pedestrians on the separated corridor, but has designed the pathway to a width of five (5) feet so that wheelchair access can be safely accommodated. The Commission only required a 4-ft.-wide corridor, but Caltrans asserts that a minimum width of five feet is essential to comply with Americans with Disability Act (ADA) requirements.[2]

[2] The off-bridge elements of the project are reviewed in the staff report for June 16, 2006 Items Fri 5a and 6a, pursuant to Caltrans' request for Commission certification of a Public Works Plan for those areas of the project. The recommended findings in that staff report explain that the certified Mendocino County Local Coastal Program, which is the

The Commission also expressed concern about the visual impacts of the proposed bridge rail design during the November 2005 hearing on the subject project (the transcript of that hearing is attached to the staff report for June 16, 2006 agenda items Fri 5a & 6a as Exhibit 4A, and the adopted findings are attached in full to that report as Exhibit 3A).

Caltrans previously proposed to construct the bridge with two 12-ft.-wide traffic lanes flanked by two 8-ft.-wide paved shoulders, with an outside rail of the ST-20 type, which is comprised of a series of simple horizontal beams to a height of 54 inches (the height necessary to protect bicyclists sharing the shoulder, according to Caltrans).

Caltrans still proposes that type of rail on the east (upriver) side of the new bridge, which as presently proposed would not have a separated pedestrian corridor. The Commission did not respond favorably to the aesthetic properties of that rail design, and Caltrans has disposed of it on the west side of the bridge. The pedestrian outer rail does not have to meet crash test requirements so more design options are available. Also, where there is a pedestrian corridor on the outside, the paved traffic shoulder does not require a rail that is 54" high for bicyclists because with the adjacent pedestrian corridor west of the paved shoulder, a bicyclist would fall into the pedestrian lane only, and not over an outside bridge rail should an accident occur.

Future Commission review of bridge rail designs

The Commission convened a subcommittee (more about the subcommittee is explained in the staff report for June 16, 2006 agenda items Fri 5a and 6a) to investigate rail design

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standard of review for the PWP, sets forth specific policies that require Caltrans to improve viewing areas in designated areas of the coast, such as the Ten Mile Bridge environs which are designated as Highly Scenic in the LCP. Additional policy requirements call for provision of handicapped parking access and connection of such parking to the subject viewing areas where such access can be accommodated. Caltrans is also proposing a new parking turnout south of the proposed new bridge. The parking would be in a flat area that can be made compliant with ADA requirements for wheelchair accessible parking. Thus, Caltrans' proposal to ensure ADA compliance on the bridge helps the project achieve overall compliance with standards applicable to the various project components. Conversely, the separated pedestrian corridor now proposed by Caltrans on the bridge also renders the overall project compliant with LCP requirements that for viewing area improvements. As the staff report for the Ten Mile Bridge PWP states, however, the paved shoulder connecting the proposed parking turnout and the bridge sidewalk for pedestrians must *also* be made ADA-compliant or coastal visitors relying on wheelchairs would have no way to reach the bridge. If wheelchair-reliant coastal visitors cannot be accommodated, then the bridge deck corridor would not actually be accessible for wheelchair traffic, and the overall project description would not therefore be ADA-compliant (no ADA-compliant access appears feasible on the north side of the bridge as the project is presently proposed). If ADA compliance on the bridge were thus rendered moot, the pedestrian corridor could be designed to a narrower width than the presently-proposed five feet.

options, and Caltrans has presented the current project proposal to the subcommittee. No recommendations have been made by the subcommittee to date, but Caltrans has agreed to continue to collaboratively explore design options through the subcommittee and subsequently return to the Commission for an amendment to CDP 1-06-022 (and the related Public Works Plan) to select a final design for the Ten Mile Bridge rails.

Caltrans developed a preferred alternative to place the new bridge on an upstream alignment to the east of the existing bridge (about 100 feet upstream as measured from the easternmost edge of each bridge, at the widest point of separation, with approximately 25 feet of clearspan between the two bridges before demolition and removal of the existing bridge).

The existing bridge is two-lane, approximately 31 feet wide (outside) with a 26-ft.-wide paved surface according to Caltrans. The proposed bridge will be about 1500 feet long and about 45 feet wide (outside to outside), with 36 feet of paved traffic area (including two 12-ft. traffic lanes and two 6-ft. shoulders), 18 inches of 31-inch-high inner guard rail (ST-10), and a 5-ft.-wide pedestrian corridor on the west side of the bridge (about 43 feet of paved surface). The outside pedestrian rail would be a 48-inch-high metal "picket" style. Caltrans states that the west side of the bridge will be "banked" higher than the east side to counter the centrifugal force of traffic traveling on a curve at high speed. This moderate increase in elevation on the west side will provide pedestrians with a slightly better view than if the trail were located on the east side of the bridge.

Other changes to the project description have been made by Caltrans, and these are mostly in response to issues raised by other state and federal agencies reviewing the project (none of the required permits or other authorizations of other state and federal agencies were finalized at the time of publication, except that State Lands Commission approved a land lease on January 6, 2006). These changes are set forth in revisions published by Caltrans on April 12, 2006, attached as Exhibit 7A.

Federal Consistency staff reported to North Coast District staff in handing off the project files and records after the Commission adopted the revised findings for CC-074-05 in March, 2006 that Caltrans had reported that the state and federal agencies seemed comfortable with the project as proposed but required more time to complete the preparation of final documents (mostly Biological Opinions). By April 2006, however, some remaining areas of disagreement emerged between Caltrans and other agencies.

The question of how to identify and fulfill adequate compensatory mitigation for residual adverse impacts to fisheries remained unresolved as well. That there would likely be lethal and sublethal affects on fish seems clear, though the degree of impact and means of detecting it remain unresolved, as does any plan to implement compensatory mitigation for the habitat of the affected fish species. For example, a fish passage improvement proposal suggested by Caltrans during the previous fall's Federal Consistency review, specifically for coho salmon mitigation, was later discovered to be proposed for a stream where coho are not present. Concerns about rare plants were finally resolved after protracted biological surveys and negotiations between Caltrans and other agencies in part because Caltrans revised the project description to avoid sensitive plant habitat.

NOAA Fisheries and California Department of Fish and Game had other unresolved concerns about the project that remained unresolved as this report was being prepared, such as how to establish adequate performance standards to evaluate eelgrass regrowth in areas affected by the project (several versions of the eelgrass mitigation and monitoring proposal have been published by Caltrans since Federal Consistency review was completed).

In addition, the complicated question of how best to apply the emerging science of hydroacoustic impact analysis to the evaluation and mitigation of fish kill that could be caused by sound pressure generated by pile driving in shallow waters has proven particularly challenging. As noted, one area of concern involves the monitoring and mitigation of hydroacoustic trauma that pile-driving activities may cause to nearby fish (Caltrans' hydroacoustic monitoring plan is attached as Exhibit 2A, and other related information is attached as Exhibits 8A through 10A). Four state and federally listed fish species inhabit the Ten Mile River in various life stages and during different seasons: coho and chinook salmon, northern California steelhead trout, and tidewater goby. Adverse impacts from sound pressure generated by pile-driving cannot be fully mitigated by the best available sound attenuation strategies, according to Caltrans. Thus some degree of lethal or sublethal effects are virtually certain to occur during pile-driving operations, despite deployment of the sound attenuation measures - but consensus about the severity of impacts, the allowable degree of impacts, and even how to parse the metrics of hydroacoustic measurements had not been fully reached during the short time available to undertake the present review on the expedited timeline Caltrans has requested.

To expedite Caltrans' urgent request for a June 2006 Commission hearing on final project approvals, staff decided to prepare final reports without waiting for other state and federal approvals as is usual. The special conditions reflect this, and provide for the subsequent incorporation of the standards and requirements eventually established by the other agencies (Caltrans indicates that final state and federal reviews should be completed by July 2006).

While the Federal Consistency review considered the project as a whole, CDP Application No. 1-06-022 is only for that portion of the project that is located within the area of the Commission's retained jurisdiction. As stated previously, separate staff reports have been prepared (also for the June 16, 2006 Commission agenda) for the components of the project that traverse the area that is presently subject to the certified Mendocino County LCP.

To the extent that the adopted findings for CC-074-05 apply to the area of the project in the Commission's retained jurisdiction, the previous findings are incorporated below and are shown in **Arial bold font** to distinguish that text.

Project Overview

Primary access to the bridge construction zone will use an existing dirt road on the south side of the river. A new access road and trestle (to allow

movement across wetlands and the river) will be constructed north from the haul road east of the new bridge alignment. This will provide access for construction of the four landside bents, three in-water piers, upland and in-water cofferdams, northern abutment, and falsework for the bridge superstructure. A second access road and trestle will be constructed north from the haul road on an alignment west of the existing bridge; this will provide access for construction of ground-level and above-ground debris containment structures required for bridge demolition. Earthwork and construction of an engineered fill slope is required at the south bluff to extend the realigned Hwy. 1 roadway to the bluff edge and construct the south abutment of the new bridge. Construction is scheduled to start in early 2006 and last for approximately three years.
(Caltrans now estimates that construction would likely commence in early 2007 and other referenced years will move to the future, accordingly)

Public Access and Recreation. The project will protect an existing informal public accessway to the shoreline located at the south end of the bridge and provides the only possible crossing of the California Coastal Trail (CCT) over the Ten Mile River. The Commission has conditioned its concurrence with CC-074-05 to state that the project would be consistent with the California Coastal Management Program (CCMP) if:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

Separated pedestrian pathways and widened shoulders for bicycle traffic will improve the safety of pedestrians and bicyclists crossing the river on this segment of the CCT and State Highway 1. The project will generate adverse but not significant impacts on public access due to Highway 1 construction delays and the temporary closure of the aforementioned informal accessway during demolition of the existing bridge. However, the replacement of the Ten Mile River bridge with a new bridge that meets current seismic safety standards will ensure the long-term protection of public access and recreation provided by Highway 1 on this section of the Mendocino coast. If modified in accordance with the Commission's aforementioned conditional concurrence, the proposed project would be consistent with the public access and recreation policies of the CCMP (Coastal Act Sections 30210-14, 30220-21, and 30223).

Marine Resources. Construction and demolition activities for the project will occur in the river and within and adjacent to freshwater and brackish water wetlands found along the south bank of the river. The project includes new fill of coastal waters and is an allowable use under the

"incidental public service" provision of Section 30233(a)(5) as the project is a limited expansion of an existing transportation facility necessary to maintain existing capacity. The project will not alter or affect the functional capacity of the Ten Mile River estuary and can be considered a "very minor incidental public facility" based on previous Commission reviews of development in Section 30233(c) "priority wetlands."

The proposed project is the least environmentally damaging feasible alternative, in terms of its river crossing location, design features to minimize intrusions into wetland habitat, and construction methods and scheduling. Mitigation for permanent wetland impacts will occur on-site at a ratio of 3:1. The project will also generate temporary impacts on wetlands and eelgrass due to pilings, excavation, fill, ground mats, and shading. Mitigation for temporary impacts includes removal of all construction and demolition materials, implementation of revegetation and eelgrass mitigation plans, and restoration of all disturbed areas to pre-project conditions. Final success criteria for wetland and eelgrass restoration will not be met until a minimum three-year period with no remedial actions is achieved.

Temporary project impacts on coho and chinook salmon, northern California steelhead, and tidewater goby present in the Ten Mile River arise primarily from noise generated by pile driving for the new bridge piers, trestles, and framework. To minimize adverse effects on these species, the project includes seasonal restrictions and work windows for in-water pile-driving, requirements for use of cofferdams and double-walled isolation casings, monitoring of noise levels during pile driving, and implementation of an off-site coho salmon passage enhancement project. The proposed project is consistent with the wetlands and marine resources protection policies of the CCMP (Coastal Act Sections 30230 and 30233).
<u>Water Quality</u>. The proposed project contains design features to minimize water quality impacts from the completed project, and will include an up-to-date package of construction-related best management practices to ensure that the multi-year construction and demolition activities will not degrade water quality in the Ten Mile River. The project is consistent with the water policy of the CCMP (Section 30231 of the Coastal Act).

<u>Environmentally Sensitive Habitat</u>. The proposed project is designed to minimize significant adverse effects on environmentally sensitive habitat. No construction work or disturbance will occur in areas where federal- and state-endangered plant species occur, and nesting for migratory birds will be protected during bridge construction and demolition activities. The project revegetation plan includes provisions for replanting and restoring all disturbed areas to native vegetative cover, restoring all roadbed areas outside the new alignment of Hwy.1, and monitoring and remediation measures to ensure that environmentally sensitive habitats are restored to optimum, pre-project conditions in a timely manner. The project will

protect environmentally sensitive habitat and is consistent with the environmentally sensitive habitat protection policy of the CCMP (Section 30240 of the Coastal Act).

<u>Visual Resources</u>. The proposed Ten Mile River bridge replacement project is located in a highly scenic coastal area and involves construction on a rural, two-lane section of Highway 1. The replacement bridge will be located immediately east of the existing bridge and is designed to mimic its height above the river, span length, and geometry. Visual design improvements include haunch girders to soften the more rectangular look of the existing bridge superstructure, and fewer bridge piers within the river and its south bank. The visual resource impacts from temporary relocation of transmission lines, cut and fill earthwork, and revegetation are adverse in the short-term but are not significant in the long term due to the restoration of disturbed areas that is incorporated into the project.

The wider bridge deck will make it more difficult to gaze directly down onto the Ten Mile River but the views that dominate the traveler's eyesight while crossing the bridge are primarily those in the middle ground and in the distance: the upper Ten Mile River Valley, the lower Ten Mile River and its estuary, the sand dunes of MacKerricher State Park, and the distant Pacific Ocean. Any adverse impact on visual resources from this perspective due to the wider bridge deck would be insignificant, but views from and towards the bridge would be adversely affected by the proposed installation of the industrial-looking version of the ST-20 rail. The Commission conditioned its concurrence with CC-074-05 to state that the project would be consistent with the CCMP if:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

This condition will limit the width of paved shoulders on the bridge available for vehicles and bicycles, and will help to maintain the scenic character of the two-lane bridge located in this rural area of the coastal zone. In addition, the requirement of separated pedestrian pathways on the bridge will necessitate a revised set of vehicle and pedestrian safety rails, and these rails should be more esthetically appealing than the originally proposed version of the ST-20 multi-use. The widening of paved shoulders along the Hwy.1 approaches to the proposed Ten Mile River bridge does not require significant landform alteration, massive vegetation removal, fill of wetlands, or construction in environmentally sensitive habitat. The visual appearance of the new roadway corridor will be different from that which exists today, but because the existing roadway is not physically

constrained by the landscape through which it passes, any adverse effect from this new corridor would not be significant to the traveler. If modified in accordance with the Commission's aforementioned conditional concurrence, the proposed project would be consistent with the scenic and visual resource policies of the CCMP (Coastal Act Sections 30251 and 30254).

Cultural Resources. The proposed project would occur primarily in a previously developed area along the Highway 1 corridor. With the results of cultural resources surveys conducted by Caltrans, Native American consultation, and Caltrans' commitment to stop work and undertake additional consultation should cultural resources be discovered during construction, the project does not hold the potential to adversely affect cultural resources. The project is consistent with the cultural and archaeological resource policy of the CCMP (Coastal Act Section 30244).

Agricultural Lands. The proposed project requires an expansion of Caltrans' right of way north and south of Ten Mile River in order to accommodate the eastward shift of Highway 1 as it aligns with the new Ten Mile River Bridge. To that end, Caltrans has initiated the process of purchasing the required strips of land from adjacent property owners. One property south of Ten Mile River encompasses coastal agricultural resources that are protected by a deed restriction from non-agricultural development. Due to the narrow strip of land to be obtained by Caltrans, its location immediately adjacent to Hwy.1, and the public service purpose of the project, the proposed conversion of approximately three acres of land from agricultural use to Hwy. 1 right-of-way would not significantly affect the agricultural viability of the remaining lands currently deed-restricted for agricultural uses. The project is consistent with the agricultural land protection policies of the CCMP (Coastal Act Sections 30241 and 30242).

2. General Setting

The Ten Mile River Bridge is located in one of the most scenic, rural, two-lane stretches of Highway 1 in Mendocino County. The lands on the east and west sides of the bridge are designated as Highly Scenic in the certified Mendocino County Local Coastal Program. Aerial photographs of the Ten Mile River Bridge and environs are available on the Coastal Records Project website:

http://www.californiacoastline.org/cgi-bin/image.cgi?image=11273

The Highway 1 corridor near the bridge has been formally identified as part of the California Coastal Trail, and during much of the year the bridge is the only safe means of crossing the Ten Mile River.

3. Project Description

The California Department of Transportation (Caltrans) is proposing to construct a replacement bridge for the State Highway 1 crossing of the Ten Mile River, ten miles north of Fort Bragg in Mendocino County (Exhibits 1-4). The existing Ten Mile River Bridge is located approximately 1,600 feet from the Pacific Ocean. The reinforced concrete bridge was built in 1954 and is approximately 1,360 feet long and 26 feet wide, with two 12-foot lanes, 1-foot shoulders, and narrow raised curbs. The bridge superstructure consists of slab T-beam girder spans, with box girder spans over the river. The bridge is supported almost entirely on timber pile and spread footing foundations (two abutments and 20 bents and/or piers). It is the only bridge that provides access across Ten Mile River. State Hwy. 1 in the project area consists of one 12-foot lane in each direction with shoulder widths varying between 0.75 and 4.75 feet.

Caltrans has clarified the proposed project description to include the following: the proposed new public and maintenance turnout will be approximately the same size (2,841 square feet) as the existing turnout and will remain open to the public (the proposed new turnout had been previously proposed at 12,600 square feet); off-bridge transitions from 6-ft.-width to the point of conformity with the existing highway will be reduced in light of the shortened length necessary when reducing the shoulders from the previously proposed 8-ft.-width to the presently proposed 6-ft.-width on the bridge and at the beginning of the transition shoulder in each direction off the bridge. Caltrans transmitted a facsimile copy to staff of the final revised transition calculations for the paved shoulders now proposed on May 30, 2006, attached as Exhibit 7A(2), to the Public Works Plan/Project staff report, Agenda Items Fri 5a and 6a, June 16, 2006.

Caltrans has also clarified that although staging activities were originally proposed to be authorized anywhere within the right-of-way at the complete discretion of the contractor that will eventually be selected to undertake the project, the proposal is now revised to limit staging activities exclusively to the "mixing table" area (presently used for occasional maintenance activities, according to Caltrans), the proposed trestles, and the existing roadbed. No permanent lighting is presently proposed on or off of the bridge.

The proposed project arises from the need to provide a new earthquake-resistant bridge at this location and the determination by Caltrans that retrofitting the existing bridge was infeasible due the calculated vulnerability of a retrofitted bridge to collapse during a large flood event on Ten Mile River. Caltrans' *Project Report* for the Ten Mile River Bridge seismic replacement project states that:

> ***The controlling fault for this project site is the San Andreas Fault located approximately 17.4 kilometers*** **[10.8 miles]** ***west of the project site and is capable of generating a maximum credible earthquake of moment magnitude 8.0. The site is located within a peak bedrock acceleration zone of 0.4g. The underlying soils at the Ten Mile River***

> ***Bridge are prone to liquefaction during moderate-to-strong ground shaking.***
>
> ***. . . The Office of Structure Design determined that the timber pile foundations are the controlling failure mechanism during a seismic event and that under liquefying conditions, the existing timber pile foundations cannot support the structure, making the bridge susceptible to collapse.***
>
> ***The risk of collapse is considered high, and there is no interim retrofit work that can be done to reduce structural deficiencies of the existing structure.***

Since the publication of the revised findings in March 10, 2006 a new earthquake fault has been identified along the Mendocino Coast, in the approximate location of the Ten Mile Bridge, according to the Commission's staff geologist. The fault, named the "Pacific Star Fault" has been reported as potentially capable of causing an earthquake of the same magnitude as the San Andreas Fault. Because the proposed bridge is engineered to withstand an 8.0 earthquake, the maximum Caltrans has determined could be generated in the area of the bridge from a San Andreas Fault earthquake, the bridge would be adequate to withstand the magnitude of earthquake that may be generated by the Pacific Star Fault. There is no evidence available at the time of publication of this report to indicate that a rupture zone associated with the fault would traverse the proposed bridge footprint.

The Ten Mile River Bridge does not meet current state and federal seismic guidelines for highway structures.

Caltrans states in its *Project Report* that it sponsored public meetings and provided opportunities for local organizations to participate in the development of the proposed project:

- **June 1996: Public open house on the original bridge retrofit design (this project alternative was abandoned in June 1998 due to flood hydraulic concerns).**
- **July 2002: Public information workshop to present bridge replacement alternatives A, B, C, 1, and 2.**
- **September 2004: Public information workshop to present Alternative C (the current project alternative).**
- **Friends of the Ten Mile River participated in the development of the 1999 *Project Study Report* and the *Project Report* for the proposed alternative. Their Chief Environmental Officer was a member of the Project Development Team.**

- **The Ten Mile Coastal Trail Foundation attended the January 1999 Project Development Team meeting and the July 2002 public workshop.**

- **The Northern California Trails Council participated in Project Development Team meetings in January 1999 and October 2002.**

The proposed Ten Mile River Bridge replacement project includes the following components (Exhibits 6-9 illustrate the project plan, Exhibits 10-11 illustrate typical roadway cross-sections, and Exhibits 12-14 illustrate the location of trestles and falsework):

1. **The project limits encompass a 1,410-foot-long southern approach along Hwy. 1, the proposed 1,488-foot-long bridge, a 650-foot-long northern approach along Hwy. 1, and access ways and construction zones on both sides of Hwy. 1 and on both sides of Ten Mile River. The construction zone across the river will extend from approximately 50 feet beyond the western edge of the existing bridge to 80 feet beyond the eastern edge of the new bridge.**

2. **The new bridge would be constructed on an approximately parallel, curved alignment east of the existing curved bridge at a variable offset of 50 to 63 feet. The proposed cast-in-place/prestressed concrete box girder bridge would have an eight-span superstructure (the bridge roadway) supported by three piers (the middle supports in the river), four bents (the middle supports on land), and two abutments (the bridge end supports). Each pier and bent would consist of two, six-foot-diameter cast-in-drilled-hole and/or cast-in-place-steel-shell pile columns approximately 132 feet in length. The height of the bridge roadway above the river would vary between 36 feet at mid-span and 39 feet at bridge ends, due to the sag vertical curve design of the bridge. The bridge would be approximately 1,488 feet long and 43** (now approximately 45) **feet wide, with two 12-foot-wide lanes and 8-foot-wide** (now 6-foot-wide) **shoulders** and a 5-foot-wide Coastal Trail pedestrian corridor on the west side only, with a 48-inch-high outer "picket" style pedestrian rail, and separated by traffic by an approximately 2.7-foot-high, 1.6-ft.-wide ST 10 type guard rail, and 54-inch-high ST-20 rail on the east side of the bridge as previously proposed**. Type ST-20 guardrails would be installed on the new bridge due to their 68% "see-through" capability. The ST-20 railing is 54 inches high and includes the four main rails and a bicycle rail. Metal beam guardrails will be installed at the approaches to and exits from the bridge.**

3. **The bridge shoulders would transition from 8 feet to 4 feet off the bridge along the new approaches, and would ultimately transition back down to the existing Hwy.1 shoulder widths (which range between 0.72 and 4.72 feet). In particular, the proposed shoulder**

widths on Hwy.1 (off the bridge) in each of the four geographical quadrants of the project are as follows:

i. **NW quadrant: 63-foot-long 8-foot shoulder with guardrail; 40-foot-long transition from 8-foot to 4-foot shoulder; 375-foot-long 4-foot shoulder; 100-foot-long transition from 4-foot to 2-foot shoulder; 66-foot-long transition from 2-foot to existing 0.75-foot shoulder.**

ii. **NE quadrant: 25-foot-long 8-foot shoulder with guardrail; 269-foot-long transition from 8-foot to 4-foot shoulder; 195-foot-long 4-foot shoulder; 100-foot-long transition from 4-foot to 2-foot shoulder; 66-foot-long transition from 2-foot to existing 0.72-foot shoulder.**

iii. **SW quadrant: 25-foot-long 8-foot shoulder with guardrail; 195-foot-long transition from 8-foot to 4-foot shoulder; 1,125-foot-long 4-foot shoulder; 66-foot-long transition to existing 4.72-foot shoulder.**

iv. **SE quadrant: 63-foot-long 8-foot shoulder with a 280-foot-long guardrail (due to adjacent slope); 40-foot-long transition from 8-foot to 4-foot shoulder; 1,243-foot-long 4-foot shoulder; 66-foot-long transition to existing 4.39-foot shoulder.**

(As noted above, Caltrans has submitted revised calculations for the off-bridge paved shoulder transitions based on a starting width of six feet, instead of eight feet. The transition lengths are reduced proportionately.)

Caltrans states that providing 8-foot shoulders on the new bridge will improve safety for bicyclists and pedestrians crossing the 1,488-foot-long bridge and provide space for disabled vehicles to pull out of the traffic lane. The shoulders will also provide adequate space for Caltrans maintenance vehicles to operate without the need to implement one-way traffic control on the bridge.

4. **A maintenance parking turnout on the west side of Hwy.1 approximately 330 feet south of the new bridge would be constructed to accommodate Caltrans maintenance vehicles and the general public. This feature would replace an existing maintenance turnout located immediately adjacent to the south end of the existing bridge on the west side of Hwy.1. Access from the proposed turnout to an existing informal trail at the south end of the existing bridge which leads to Ten Mile River and the shoreline at MacKerricher State Park would follow the old Hwy. 1 roadbed (pavement will be removed and the corridor re-vegetated).**

5. **Primary access to the bridge construction zone will use an existing dirt access road on the south side of the river; this former logging haul road exits the east side of Hwy.1 one-half mile south of the bridge and eventually passes under the bridge on its westward route towards the Pacific shoreline.**

6. **A new access road and trestle (to allow movement across wetlands and the river) will be constructed north from the haul road east of the new bridge alignment and will provide access for construction of the four landside bents, three in-water piers, upland and in-water cofferdams, northern abutment, and falsework for the bridge superstructure. Construction of the access road will include the use of landing mats and/or fill on geo-fabric placed over wetland habitat. The main trestle across the river will also have trestle extensions to and around the bent and pier locations, will sit 3.3 feet above the 100-year flood elevation of the river, and will rest on approximately 90 H-piles. The falsework will be supported by approximately 145 timber H-piles.**

7. **A second access road and trestle will be constructed north from the haul road on an alignment west of the existing bridge to provide access for construction of ground-level and above-ground debris containment structures required for bridge demolition. The trestle will rest on approximately 64 H-piles, and a containment platform under the portion of the bridge over the river will be constructed using approximately 34 H-piles. Piers supporting the existing bridge would be removed to a minimum depth of 2 feet below final grade of the riverbed.**

8. **Piers and bents for the new bridge will be constructed by driving steel shells deep into the earth until competent material is reached. Shells will be drilled out, fitted with reinforcing steel bars, filled with concrete, and capped. Concrete columns will be constructed upwards from the caps and connected to the bridge decking, consisting of steel-reinforced concrete and tensioning tendons supported by falsework.**

9. **Approximately 4,000 cu.yds. of material will be drilled out for the new piers and transferred to an offsite disposal location on private property in the coastal zone, approximately four miles south of the project site and 1.5 miles east of the hamlet of Cleone (Exhibit 15). Fill material will be placed and compacted on the site, erosion control measures will be implemented, and the site will be seeded with California native grasses. Prior to commencement of disposal, Caltrans will obtain a coastal development permit from Mendocino County for this activity in the non-appealable area of the coastal**

zone. Caltrans has since indicated that the eventually-selected contractor would be required to obtain the necessary CDP and that Caltrans will not join as an applicant for such permit. There is not sufficient information presently available to determine whether such permit could be considered appealable to the Commission as a major public works project, even if processed separately from the project the waste material arises from. Caltrans indicates that a number of coastal agricultural land holdings have been tentatively identified for this purpose, as noted in the Initial Study released by Caltrans on April 3, 2006. Caltrans has also stated that no particular location for waste disposal is binding on the contractor eventually selected because Caltrans is required to allow the contractor to exercise discretion in this area as a potential contract cost savings measure.

10. **Barges and small boats (with drafts not to exceed 14 inches) may be used to transport construction materials and personnel between the construction site and a single river access point on the south bank of the river, approximately one-quarter mile east of the bridge and adjacent to the existing haul road near its intersection with Hwy.1.**

    Caltrans notes that the use of a barge is unlikely due to the shallow depths of the river, but decided to keep this option in the project description to reserve it as an option for the eventually-selected contractor.

11. **An existing private gravel road located north of the Ten Mile River Bridge along the east side of Highway 1 will be realigned outside Caltrans' proposed eastward right-of-way expansion.**

12. **Overhead SBC telecommunication lines which cross the Ten Mile River immediately east of the existing bridge will be relocated into a conduit within the new bridge superstructure. In addition, the existing overhead SBC lines on the east side of Hwy.1 (extending 1,300 feet south of the existing bridge) will be placed underneath the relocated segments of Hwy.1 north and south of the new bridge. During project construction, the existing overhead SBC line will be temporarily re-routed to the west side of Hwy.1 at a location 1,300 feet south of the existing bridge. The aerial line will be strung along five temporary poles and three tree attachments until just south of the existing bridge. At this point the line will be placed in a gray plastic conduit and attached to the west side of the existing bridge using a series of metal brackets. North of the bridge, the temporary line will be buried along with a new permanent PGE power line on the west side of existing Hwy.1 for approximately 700 feet, whereupon the underground lines will cross under Hwy.1 to a new SBC cabinet at the northeast corner of the intersection of Hwy. 1 and Camp 2 Ten Mile Road.**

13. **Approximately 9,000 cu.yds. of cut and 9,000 cu.yds.** (Caltrans now proposes approximately 9,500 cu. yds. of cut and 9,500 cu. yds. of fill) **of fill are**

required to construct the realigned Hwy. 1 approaches, new abutments, and the private roadway realignment. Earthwork and construction of an engineered fill slope is required at the south bluff to extend the realigned roadway to the bluff edge and construct the south abutment of the new bridge. Cut and fill slopes will be constructed with 2:1 slopes to minimize landfill alteration and will avoid environmentally sensitive habitats, including wetlands. Any excess cut material will be disposed at the aforementioned off-site disposal area. Concrete and steel debris from the demolition of the existing bridge will be taken by the construction contractor to an approved disposal site for these materials (and possibly recycled).

14. **Right-of-way acquisition of approximately 3.3 acres of private property along the east side of Hwy.1 north and south of the river is required. Caltrans will retain ownership of the abandoned Hwy.1 roadbeds north and south of the bridge and the existing bridge right-of-way. Caltrans will obtain temporary construction access easements on private property.**

15. **Construction staging and materials storage will occur within an existing one-quarter-mile-long highway turn-out (known as the "mixing table") within Caltrans right-of-way on the west side of Hwy.1 approximately one-third mile south of the bridge. The northern 130 feet of the turn-out will be reserved and maintained for public parking during the construction period; the balance of the turn-out may be fenced for security. Additional staging and materials storage may occur within the construction site** Caltrans has since clarified that except for the "mixing table" area, additional staging and materials storage within the project area would only take place on the old trestle and would not be authorized anywhere within the project area at the contractor's discretion as previously stated.

16. **Construction is scheduled to start in early 2006** (the start of construction would likely be in 2007 according to Caltrans' most recent estimates)**. In-water work (i.e., pile driving for temporary trestles, falsework, and cofferdams) is limited in general to the period June 15 to October 31 of the first year of construction, and to the period September 15 to October 31 of subsequent years, as needed. Installation of permanent piles would occur year-round within the dewatered cofferdams. Once cofferdams and pilings are driven, bridge construction can occur year-round. Once the bridge deck is completed, the roadway will be re-aligned at the north and south approaches and demolition of the existing bridge will commence. Construction, demolition, and clean-up activities are currently scheduled for completion by the end of 2008; however, unforeseen circumstances could delay construction start and completion dates.**

B. Public Coastal Access and Recreation

The Coastal Act provides the following:

***Section 30210**. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

***Section 30211**. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.*

***Section 30212**.*
(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) It is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,
(2) Adequate access exists nearby, or,

. . .

(c) Nothing in this division shall restrict public access nor shall it excuse the performance of duties and responsibilities of public agencies which are required by Sections 66478.1 to 66478.14, inclusive, of the Government Code and by Section 4 of Article X of the California Constitution.

***Section 30213**. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred . . . .*

***Section 30214**.*
(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following:

(1) Topographic and geologic site characteristics.

(2) The capacity of the site to sustain use and at what level of intensity.
(3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses.
(4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter.

(b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution . . .

Section 30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

Section 30223. Upland areas necessary to support coastal recreational

As stated previously, Caltrans presently proposes to construct a 5-ft-wide pedestrian corridor on the proposed bridge, to accommodate the Coastal Trail and as much of the Commission's requirements in conditionally concurring with CC-074-05 as Caltrans believes feasible consistent with safety standards. The pedestrian corridor would be separated from the traffic lane by an ST-10 type of crash-test-approved guard rail. The outer pedestrian rail is proposed to be the metal "picket" type, 48 inches high, installed last year on the popular new Noyo River Bridge on Highway 1 where the road passes through downtown Fort Bragg.

The Commission previously required Caltrans to place a pedestrian walkway on each side of the bridge, and to divide the necessary area from the then-proposed 8-ft.-wide paved shoulders. This would leave approximately 4 feet of width for paved shoulders. Caltrans has explained why this option would not leave sufficient traffic shoulder from the perspective of vehicle safety, and also that bicyclists would be safer on the constrained, relatively long bridge corridor if traveling on the 6-ft.-wide shoulders shoulders that

Caltrans instead proposes to construct. Caltrans has submitted further evidence of the increased safety of wider bridge shoulders and of the increased accident statistics associated with the existing bridge that recent re-calculations of older data have now demonstrated (see Exhibit 4A). Caltrans has only provisionally proposed the 6-ft.-wide paved shoulders, however, as indicated in the recent Public Works Plan submittal noted above. The Commission finds it necessary, therefore, to require final plans pursuant to Special Condition 23 to ensure among other requirements that the proposed revisions are fully implemented.

The Commission finds the revised proposal to be an acceptable compromise between Caltrans' standards and the public access provisions of the Coastal Act, while achieving consistency with the key requirements of Chapter 3 applicable to pubic coastal access and recreation. The Coastal Trail on the bridge, safely designed with a guard rail protecting pedestrians from traffic, will provide a significant new public coastal access and recreation amenity, and will allow visitors to confidently approach the bridge deck to enjoy the scenic vistas of the beautiful Ten Mile River estuary and Pacific Coast from the elevated vantage point. Caltrans also proposes to construct a new parking turnout approximately 445 feet south of the southerly end of the bridge, replacing a similar turnout that is located immediately south of the existing bridge. Once the two features are linked via the proposed new road alignment that is part of the proposed Public Works Plan Caltrans has also submitted for Commission certification, public coastal views and access will be enhanced significantly by the proposed project.

Caltrans proposes to construct the bridge corridor in a manner that will be fully compliant with the requirements of the Americans with Disabilities Act. Caltrans states that the ADA requires that the pedestrian corridor on the bridge be a minimum of five feet in width, to accommodate wheelchair access. The Commission commends Caltrans for including universal access features for all coastal visitors, but finds that Caltrans must demonstrate that the final plans link the parking turnout with the bridge in such a manner that each element is ADA-compliant and that there is a continuous wheelchair accessible path between handicapped parking in the new parking turnout, along the highway corridor to the bridge, and on the bridge as well. The only location that handicapped parking could be accommodated according to Caltrans is at the proposed new parking turnout south of the bridge, on the west side of the highway. Without these features, Caltrans need not design the pedestrian corridor to the full five feet in width, which has increased the total bridge with somewhat over Caltrans' previous proposal, despite the 4-ft.-reduction in total paved shoulder width. The Commission finds it necessary, therefore, to require Special Condition 17 (Universal((Handicapped)) Access) to ensure that ADA-compliance is incorporated fully into all related components of the project so that the width required for ADA compliance of the bridge component is not rendered unusable for wheelchairs due to lack of ADA compliance in other components of the project.

The Commission further finds that if Caltrans cannot revise the plans to link the ADA-compliant bridge design with wheelchair accessible parking and an ADA-compliant connection between the two features, then the bridge could more accurately be declared inaccessible for ADA purposes. In such case, the project plans could be revised to install

a narrower pedestrian corridor on each side of the bridge, with ST-10 guard rail on the inner side and a 48-inch-high Noyo Style pedestrian picket rail on the outside of the eastern and western outer edges of the bridge. This alternative would conform more closely with the redesign that the Commission required in November 2005 (CC-074-05). Such redesign would also enable Caltrans to eliminate the ST-20 bike rail design that is otherwise necessary on the eastern side of the bridge and thereby substantially improve the aesthetically superior options for outer rail design necessary for pedestrians only.

In addition, though Caltrans presently indicates that the proposed bridge is being widened only to more safely accommodate existing traffic while accomplishing the increased seismic safety standards made possible only by a bridge replacement, there is always pressure to increase development intensities in scenic coastal areas. The Coastal Act requires, however, as stated below, that highly scenic rural sections of Highway 1, such as the Ten Mile Bridge stretch of the highway, remain a two-lane road. Thus, the Commission finds it necessary to require to impose Special Condition 16 (Protection of Future Public Access) for the protection of future public access to the pubic access amenities as presently proposed by Caltrans. Special Condition 16 requires Caltrans to record a deed restriction to protect permanent public access for pedestrian and bicycle use on the Ten Mile River Bridge, which will protect these amenities should conversion of any portion to use for motorized vehicles be contemplated in the future.

As further noted, Caltrans further proposes to include a crash-tested guard rail separating pedestrians and traffic as required by the Commission in November. This feature will significantly increase the safety of wheelchair-bound-visitors seeking out the bridge deck views, and the safety of any frail visitors, or visitors with small children – anyone unable to move quickly out of the path of an errant vehicle, or distracted by the views on the deck. The design Caltrans presently proposes will make the magnificent, sweeping coastal views available from the bridge deck available to a wide range of potential coastal visitors who might never otherwise venture onto the Coastal Trail traversing the deck, even if the 8-ft.-wide paved shoulders unseparated from traffic by a guardrail that were previously proposed, had been installed. Therefore, the Commission additionally finds that to preserve the important safety feature provided by the guard rail separating the Coastal Trail from the traffic corridor, which creates expanded opportunities for coastal access for a wider range of potential visitors with various mobility constraints, that Special Condition 16 is additionally necessary to require that the ST-10 guard rail or its equivalent remain in place in the future.

Conclusion

For all of the reasons set forth above, the Commission finds that the proposed project is consistent with the Chapter 3 policies of the Coastal Act concerning public coastal access and recreation, as conditioned.

The adopted findings for the Commission's conditional concurrence with CC-074-05 continue:

1. Introduction. The primary coastal access and recreation issues raised by the proposed project are: (1) protection of existing parking and coastal access opportunities at the south end of the bridge; (2) improved safety for pedestrians and bicyclists on the new bridge and along its northern and southern approaches; and (3) potential construction impacts on coastal access.

Caltrans' consistency certification provides the following analysis of public access and recreation at the project site and potential project effects on those resources:

> ***Coastal zone access within the project limits exists at two locations: Access Point 1, an approximate 22-meter (72-foot) long area at the immediate southern end of the existing bridge (west side), and Access Point 2, an approximate 400-meter (1,320-foot) long area located approximately 0.5 km (0.3 mile) south of the existing bridge (west side). Both parking areas are maintenance parking areas, but are often used by visitors to access the coast . . . .***
>
> ***Access Point (1):***
>
> ***Access Point 1 consists of a dirt Caltrans maintenance turnout and trail. The maintenance turnout is within Caltrans' right-of-way, and the trail passes through private property. Caltrans does not own or maintain the coastal access trail(s) within the project limits. Neither the turnout nor the trail(s) are identified as "official" coastal access points.***
>
> ***The current maintenance parking area and trail(s) would remain unchanged during construction. After the new bridge is complete, the current maintenance parking area would no longer be available for public use. There would, however, be a new area available for maintenance parking located approximately 115 meters (380 feet) south of the existing maintenance parking area, and would be 42 meters (138 feet) long and about 9 meters (30 feet) wide. The new maintenance parking area is within easy access to the "unofficial" coastal access trails.***
>
> ***Removal of the existing bridge would occur after the new bridge is complete, and would take approximately 6 months. During the removal, the trail(s) at Access Point 1 would not be available from Caltrans' right-of-way.***
>
> ***Access Point (2):***
>
> ***Access Point 2 consists of an approximately 400-m (1,320-foot) long dirt area used by Caltrans' maintenance personnel. The public often parks in this area and crosses Caltrans' right-of-way to unmarked trails***

on State Park land. Neither the parking area nor the trails are identified as "official" coastal access points.

During construction, a portion of this area would continue to be used by Caltrans' maintenance and as a construction equipment staging area. A 40-meter (132-foot) long section at the north end of this area would be available for public parking during the entire construction process. The remaining area may be fenced, temporarily, for safety and security. When the project is complete, the fence would be removed and the area would provide the same access opportunities as currently present.

2. <u>Parking and Shoreline Access</u>. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses coastal access issues and states that:

In the 1995 Department of Parks and Recreation (DPR) General Plan for MacKerricher State Park, DPR would like to formalize access into the Ten Mile River area to prevent erosion, wetland trampling, disruption of wildlife, and trespassing that now occurs. When possible, DPR would acquire an interest either by purchase or through an easement from a willing landowner south of the Ten Mile River Bridge for use of sufficient land to park 30 vehicles, including spaces for horse trailers and for visitors with disabilities. DPR will respect the wishes of the Department of Fish and Game not to provide formal boat access to the river, as that agency's intent is eventually to acquire the wetlands, including those on the south shore of the river, if the sellers are willing.

The U.S. Fish and Wildlife Service is concerned about public access to the northern portion of MacKerricher State Park land due to the presence of listed birds and plant species.

. . .

Mendocino County's LCP Policy 4.2-19 states the DPR shall develop a trail system, and in conjunction with Caltrans and property owners addressing access in the north end of MacKerricher State Park. The policy also states that a parking area shall be signed and improved by DPR utilizing the existing widened Caltrans right of way located on the west side of Highway 1 several hundred feet south of the Ten Mile River Bridge. A trail system shall be developed by DPR, in conjunction with Caltrans and private property owners, to connect this parking area via an existing trail entrance which is located at the southwest corner of the bridge.

Abutting the western edge of the existing Hwy.1 right-of-way are several parcels of private property and the northern reach of MacKerricher State

Park, which encompasses nine miles of sandy beach, dunes, and rocky headlands between the Ten Mile River and Pudding Creek, at the north end of Fort Bragg. No formal public coastal accessways connect Hwy.1 and the shoreline in the project vicinity. The nearest public accessway to the shoreline is Seaside Creek Beach, 0.75 miles north of Ten Mile River. To the south, the nearest public access to the shoreline is at the main entrance to MacKerricher State Park, approximately five miles south of Ten Mile River. From this point, shoreline trails in the State Park follow an old logging haul road south to Pudding Creek and north to Ten Mile River.

However, as Caltrans notes in its consistency certification, an informal trail exists that leaves the north end of the existing unpaved maintenance turnout at the south end of the bridge, crosses over onto private property while dropping down the south bluff of Ten Mile River, and meets the old logging haul road (Exhibits 7 and 8). From this point, trail users follow the haul road out to the shoreline at MacKerricher State Park, follow the haul road upriver, or follow informal paths that lead to the south bank of Ten Mile River; the latter two locations are on private property. There are no signs on Hwy.1 approaching the turnout, or anywhere at the turnout, indicating the availability of shoreline access from this location.

Nevertheless, staff from the Commission, Caltrans, and California Department of Parks and Recreation (DPR) all confirmed that members of the public have long used the maintenance turnout at the south end of the bridge as a parking area and access point to reach the shoreline at the northern end of MacKerricher State Park. In addition, staff from these agencies confirm that members of the public also park at the much larger maintenance turnout one-third mile south of the existing bridge, walk up the highway shoulder to the smaller turnout at the bridge, and follow the aforementioned informal trails to the shoreline and Ten Mile River. Staff from DPR, U.S. Fish and Wildlife Service, and Caltrans also confirmed the sensitivity of natural resources at the northern end of MacKerricher State Park (including sand dunes, wetlands, endangered plants species, and endangered Western snowy plover habitat) and the potential conflicts between resource protection and public access that could arise from providing new formal access routes at this time between Hwy.1 and the shoreline in the area south of Ten Mile River.

As noted above, Caltrans proposes to eliminate the maintenance turnout at the south end of the existing bridge in concert with demolition of that bridge, which will occur after construction and opening of the replacement bridge. In conjunction with the realignment of the Hwy.1 approach to the south end of the new bridge, Caltrans will also construct a new unpaved maintenance turnout approximately 330 feet south of the existing turnout. In a July 8, 2005, letter to the Commission, Caltrans modified the subject consistency certification by stating that the new turnout would be the approximate size of the existing turnout, would accommodate the same

number of vehicles, and is located as close to the new bridge as possible given the need to achieve sight distance safety requirements. In addition, Caltrans made the following commitments:

- **The existing maintenance turnout would be landscaped and treated with erosion control measures, and would be kept open for walking/maintenance access.**

- **The proposed maintenance turnout would be used as maintenance parking/staging (long-term material storage would not occur).**

- **The area between the two maintenance turnouts (i.e., the abandoned Hwy.1 roadbed) would be landscaped (e.g., trees, contour grading, rocks, berms, wood fencing, etc.) to allow foot traffic only.**

- **There potential exists to expand the proposed maintenance turnout in the future to provide additional coastal access and/or provide additional maintenance material storage locations. Caltrans would coordinate with Coastal staff and other appropriate resource agencies prior to modifying or expanding either turnout.**

Caltrans has also committed that no fencing, signage, or landscaping elements will be installed to block or discourage members of the public from parking at this new turnout, walking up the abandoned highway corridor to the site of the existing turnout, and taking the informal trail leading down to the shoreline and Ten Mile River. (As noted previously in the Project Description section of this report, Caltrans will retain ownership of the abandoned highway corridor and the existing bridge right-of-way.) At the same time, no signage would be provided to either identify or encourage public use of the informal accessway up the vacated and revegetated highway corridor and down to the shoreline. The goals are to maintain the existing provision of public access to the shoreline at the southern end of the bridge, to not encourage an increase in the volume of access that could in turn adversely affect environmentally sensitive habitat in this area, and to not prejudice ongoing coastal access planning efforts by DPR by formalizing any existing informal accessways. As noted above, Caltrans has committed to coordinating with Commission staff and other appropriate resource agencies prior to any modification to or expansion of the new or existing turnout, including maintenance material storage or coastal access improvements. Lastly, in the April 2005 *Project Report* and in a meeting with Commission staff on August 15, 2005, Caltrans committed that it would cooperate with DPR and the Commission in future planning efforts for improving public access from Hwy.1 to the shoreline at the northern end of MacKerricher State Park.

3. <u>Pedestrian and Bicycle Access/Bridge and Highway Shoulder Widths</u>. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses provisions for pedestrian and bicycle access improvements along Hwy.1 and states that:

> ***Route 1 is heavily traveled by recreationists and tourists during the summer months and has been designated by the Legislature as part of the Pacific Coast Bike Route. The entire route has seasonally high bicycle traffic volumes during the summer months.***
>
> **. . .**
>
> ***On October 2, 2002, Senate Bill 908 was signed into law by Governor Davis. The bill requires the Coastal Conservancy (CC) in conjunction with various State agencies to develop and provide to the Legislature by January 31, 2003, a plan for a coastal trail from Oregon to Mexico to afford visitors views of some of the most majestic vistas in California. The bill requires the trail to be completed by January 31, 2008, providing budgeted funding materializes. Reconstruction and rehabilitation strategies involving Route 1 are to incorporate provisions for accommodating the coastal trail where feasible.***
>
> ***. . . Caltrans has evaluated segments of the Pacific Coast Bike Route to prioritize improvement locations. The project will provide 1.2-m (4-foot) paved shoulders, improving safety for bicyclists and pedestrians.***

On January 31, 2003, the State Coastal Conservancy published *Completing the California Coastal Trail*, which provides a strategic blueprint for implementing the California Coastal Trail. While the Highway 1 bridge across the Ten Mile River is the only bridged crossing of the river for bicyclists and pedestrians following the Coastal Trail, the mouth of the river can occasionally be waded across during the summer. For all practical purposes, however, the proposed replacement Hwy.1 bridge will continue to serve as the sole crossing of Ten Mile River for users of the Coastal Trail.

As noted previously in this report, the existing paved shoulder widths on Hwy.1 within the project limit vary between 0.72 and 4.72 feet; the existing Ten Mile River bridge has one-foot-wide shoulders. Caltrans is proposing 8-foot shoulders on the new bridge, shoulders ranging between 8 and 4 feet along Hwy.1 south of the bridge, and shoulders ranging between 8 and 0.7 feet along Hwy.1 north of the bridge. Caltrans states that these shoulder widths will allow for pedestrians and bicyclists to more safely traverse the Hwy.1 crossing of Ten Mile River as compared to current conditions and will serve as an improved link in the Coastal Trail.

The proposed bridge and highway shoulder widths in the project area have generated extensive discussions between Caltrans and the Commission staff over how to best balance the public access and visual resources policies of the Coastal Act (including comments sent to the Commission staff by the public via mail (Exhibits 16 and 17) and telephone calls). Currently, the Ten Mile River bridge includes one-foot-wide shoulders and the shoulders along the north and south approaches to the bridge in the project area vary between 0.7 and 4.7 feet. Caltrans initially proposed the following shoulder widths and lengths: (1) extending the eight-foot-wide bridge shoulders approximately 100 feet to the north and south of the bridge; (2) next constructing approximately 190-foot-long transitions from eight- to four-feet wide shoulders north and south of the bridge; (3) next constructing four-foot-wide shoulders for 200 feet north of the bridge and 980 feet south of the bridge; and (4) constructing 195-foot-long (north) and 66-foot-long (south) transitions from four-foot-wide shoulders to existing shoulder widths.

Caltrans stated that these shoulder dimensions were necessary at Ten Mile River bridge and along the north and south approaches on Hwy.1 due to existing vehicle traffic levels, current highway and bridge safety design guidelines, the need to improve safety for bicyclists and pedestrians crossing the 1,488-foot-long bridge, the need to provide safe space out of traffic lanes for disabled vehicles, and the need to provide adequate space for Caltrans maintenance vehicles to park and/or operate without the need to implement one-way traffic control on the bridge. The Commission staff noted that the introduction of such wide shoulders along this stretch of rural Hwy.1 did not appear to be supported by the below-average accident and collision data for this Hwy.1 segment and the adjacent Hwy.1/Camp 2 Ten Mile Road intersection just north of the bridge. However, the Commission staff acknowledged that the essential lack of shoulders on the existing bridge does create a significant safety hazard for bicyclists and pedestrians crossing the bridge, and does not provide a safe pullover area for disabled vehicles, emergency vehicles, or Caltrans maintenance vehicles.

The Commission staff also questioned the need for the proposed lengths of eight-foot-wide shoulders and of the transition lengths between eight- and four-foot-wide shoulders along Hwy.1 north and south of the bridge. While Caltrans continued to argue for the proposed shoulder widths and lengths based on design guidelines, the Commission staff argued that the supposed public access benefits that would arise from the introduction of paved shoulders in excess of four feet in width into a stretch of Hwy.1 where existing shoulder widths rarely reach four feet (and in most areas are significantly less than four feet) would be inconsequential, but that potential visual resource impacts from these shoulders could be significant (see Section E of this report). As a result, Caltrans agreed to modify the proposed project by reducing the lengths of the eight-foot-wide shoulders

off the bridge and the lengths of shoulder transitions between eight and four feet on the bridge approaches, as follows:

Hwy.1 North of Bridge	**Original Length**	**Proposed Length**	
		NE Exit	**NW Approach**
8-foot-wide shoulder	**96 ft.**	**25 ft**	**63 ft**
8- to 4-foot-wide transition shoulder	**185 ft**	**195 ft**	**40 ft**

Hwy.1 South of Bridge	**Original Length**	**Proposed Length**	
		SW Exit	**SE Approach**
8-foot-wide shoulder	**100 ft**	**25 ft**	**63 ft**
8- to 4-foot-wide transition shoulder	**194 ft**	**195 ft**	**40 ft**

The Commission notes the significant reductions agreed to by Caltrans (and incorporated into its consistency certification) in the length of eight-foot shoulders off the bridge in all four quadrants, and in the length of the eight- to four-foot transition shoulders on the bridge approaches (SE and NW quadrants, above). Caltrans justified the need to maintain longer eight-foot-wide shoulders and eight-to-four-foot-wide shoulder transitions coming off the bridge in both directions due to the overall narrowing of the improved right-of-way as one exits the bridge (as compared to the widening of the paved right-of-way when entering the bridge) and the rising left hand curves as vehicles exit the bridge in north and southbound directions. The proposed project as modified will continue to provide significant improvements (e.g., wider paved shoulders on the new bridge bicyclists and pedestrian) to public access along this stretch of Hwy.1 and at the same time will reduce the potential for adverse effects on visual resources from the widening of the paved roadway on both approaches to the new Ten Mile River bridge.

Staff has received information from Caltrans explaining the agency's view of the improved safety provided by widened bridge shoulders. The transmittal is attached as Exhibit 4A(1), and a chart prepared by Caltrans that indicates that the widening of shoulders is associated with a significant decrease in traffic accidents. Caltrans geometrics engineer John Steele of Caltrans headquarters engineering staff has previously

informed Commission staff that he must determine the suitability of all design "exceptions" (variations from the published standards in the engineering specifications references that are often requested for context sensitive design purposes) for projects that have Federal Highways funding. Mr. Steele determines whether such exceptions will be approved, as the Federal Highways Administration has delegated such review authority to Caltrans. In the case of the Ten Mile Bridge project, Mr. Steele has determined that he will only support a reduction from the previously proposed 8-ft.-wide paved shoulders on (and transitioning from) the proposed bridge, to a minimum of 6-ft.-wide paved shoulders.

The Commission staff also inquired about feasible alternatives for traffic lane/shoulder separation markers that could be placed on the bridge as a means to alert vehicle drivers of the lane/shoulder boundary. Caltrans will install an extra-thick layer of white thermoplastic paint, thick enough to let drivers know when they are crossing over it into the shoulder yet not too thick as to be a road hazard to vehicles or bicycles. The well known "bots dots" lane dividers are not preferred by bicyclists and require extra maintenance activity, and "rumble strips" (parallel grooves cut into the roadbed that trigger strong and loud vibrations when vehicle tires roll over them) are only feasible on asphalt surfaces and not on concrete bridge decks such as that proposed for the Ten Mile River bridge.

During its evaluation of the proposed project, the Commission staff inquired of Caltrans about the feasibility of providing a separated pedestrian pathway on the new bridge in order to further improve public access at the Coastal Trail crossing of Ten Mile River. Such a feature was included on the Noyo River bridge replacement project in Fort Bragg (CDP 1-98-100), and was referenced in communications from the public to the Commission staff during its analysis of the subject Ten Mile River bridge consistency certification. Caltrans responded that the Noyo River bridge is located in a more urban and developed location with a significant volume of historic, current, and expected future pedestrian and bicycle traffic that justified the inclusion of a separated pedestrian pathway. Caltrans stated that at the rural location of Ten Mile River bridge there is presently "an insufficient level of pedestrian and bicycle traffic at this location to justify construction of a separated pedestrian and bicycle pathway on the bridge." Caltrans cited a finding from the *Pacific Coast Bike Route Study* (Redwood Community Action Agency, March 2003) which:

> **. . . included counts taken at various locations, including Seaside Beach – which is approximately one mile north of Ten Mile Bridge. The 12 hour count was taken during Labor Day weekend, resulting in a count of eight bicyclists and zero pedestrians.**

Caltrans also noted the below-average vehicle accident rate at Ten Mile River bridge and that no significant adverse safety conflicts between

vehicles and pedestrians/bicyclists currently exist at the bridge or along its approaches.

While the Commission staff acknowledged Caltrans' characterization of present conditions at Ten Mile River bridge, the staff nevertheless believed that potential future increases in vehicle, bicycle, and pedestrian traffic along this stretch of Hwy.1 and the Coastal Trail justified the incorporation by Caltrans of the potential future need for pedestrian and/or bicycle safety improvements into the Ten Mile River bridge replacement project. Caltrans subsequently agreed to add the following language to its consistency certification:

Ten Mile Bridge Replacement Project: Bicycle and Pedestrian Use Language

The proposed project includes paved, eight-foot-wide shoulders on the bridge, a substantial improvement to the one foot wide shoulders that currently exist on the bridge. The new shoulder widths will provide room for disabled automobiles, Caltrans maintenance vehicles, and an expanded margin of safety for bicyclists and pedestrians to cross the Ten Mile River; the shoulder will also serve as the river crossing route of the California Coastal Trail.

The Pacific Coast Bike Route Study (March, 2003—Redwood Community Action Agency) included counts taken at various locations, including Seaside Beach—which is approximately one mile north of Ten Mile Bridge. The 12 hour count was taken during Labor Day weekend, resulting in a count of eight bicyclists and zero pedestrians.

Presently, there is an insufficient level of pedestrian and bicycle traffic at this location to justify the construction of a separated pedestrian and bicycle pathway on the bridge. The paved shoulder on and adjacent to the bridge will have a painted symbol showing the shoulder can be used for bicycle travel. The shoulder will also be separated by a painted, raised thermoplastic white stripe, alerting drivers if they stray from the traffic lanes. A pedestrian/bicycle advisory sign and a California Coastal Trail sign will be placed at the north and southbound approaches of the new bridge. The sign text, location, size, and color will be consistent with Caltrans' statewide standards, and subject to review and approval by the Coastal Commission's Executive Director.

No later than five years after and again at ten years after the new bridge is completed, Caltrans will conduct a pedestrian and bicycle count, and interview appropriate user groups (including Coastwalk) to receive input on the pedestrian and bicycle use of the bridge. Caltrans will then provide a written analysis to the Commission's Executive Director on the results of these efforts. The analysis will include a comparison

of pre- and post-bridge construction pedestrian and bicycle count data, as well as post construction user experiences, and a discussion of the potential need for pedestrian and/or bicycle bridge safety improvements. Data from the 2003 Pacific Coast Bike Route Study would serve as the baseline data for future counts.

If the level of pedestrian and/or bicycle traffic increases substantially, or if a substantiated pedestrian and/or bicycle safety concern arises on the bridge, Caltrans will complete an analysis within six months of Caltrans being informed of the substantiated concern. Depending on the concerns identified, the analysis will discuss options for improvements to better address safety issues and protect public access. The analysis will assess a range of appropriate and feasible pedestrian and bicycle improvement alternatives, and may include a separate or cantilevered pedestrian and/or bicycle pathway.

In the event, as described above, an immediate analysis is required, Caltrans will coordinate with Commission staff to ensure safe pedestrian and bicycle access on the new bridge is maintained. This coordination will also help to identify whether changes or amendments to this consistency certification and/or future coastal development permits may be necessary.

However, the Commission determined at its November 16, 2005, public hearing for CC-074-05 that the aforementioned commitments by Caltrans were insufficient and that in order to find the proposed bridge replacement project consistent with the public access and recreation policies of the Coastal Act, Caltrans would need to provide pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge (Exhibit 28, excerpts from reporter's transcript of proceedings). The Commission emphasized the critical importance of providing a safe and pedestrian-friendly route for the California Coastal Trail (CCT) on the Ten Mile River Bridge. The Commission also determined that the proposed eight-foot-wide vehicle shoulders on the bridge are out of scale for this scenic rural road and that this segment of Highway 1 – based on the available traffic and accident statistics – does not appear to be a public safety hazard. The Commission noted the Mendocino County LCP policy (while not the standard of review for federal consistency certifications, but rather a source of background information for the Commission) calls for paved, four-foot wide shoulders along Highway 1 (where environmentally feasible). The Commission also noted exemptions that Caltrans has made to its shoulder "standards" at other state highway locations. The Commission further determined that designing and incorporating provisions for public access at this stage of the project was preferable to future retrofitting of the bridge, particularly given the current lack of safe pedestrian access across the bridge and the use of the bridge as the most obvious route of the CCT across Ten Mile

River. In addition, the Commission noted that they will be reviewing this project under a coastal development permit application in the future and will expect to see greater detail as to how the project will be modified to be consistent with the CCMP at that time and through that process.

For these reasons, the Commission determined that in order for the proposed Ten Mile River Bridge replacement project to be found consistent with the public access and recreation policies of the CCMP, the project would need to be modified as follows:

> ***The California Department of Transportation will submit to the California Coastal Commission, via coastal development permit applications, revised project plans for the Ten Mile River Bridge Replacement Project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge.***

The project also raises the issue of the potential for the Ten Mile River bridge replacement project – in particular, the proposed eight foot shoulders on and off the bridge – to be viewed as a precedent for future Caltrans Hwy.1 improvement projects in the coastal zone. The proposed Ten Mile River bridge replacement project is based on a unique set of site-specific environmental and infrastructure characteristics, and the Commission is evaluating the project elements for consistency with the policies of the Coastal Act. For instance, the topographic relief, distribution of vegetation types, and views to the shoreline at the Ten Mile River bridge project area are notably different from those present along Hwy.1 crossings of Noyo River and Greenwood Creek to the south. Separated pedestrian pathways, eight-foot-wide shoulders, and four lanes of vehicle traffic are appropriate at the urban location of Noyo Creek bridge. The expansive and rolling landscape at the rural location of Ten Mile River bridge requires minimal grading and landscape alteration to construct the proposed replacement bridge with widened shoulders and separated pedestrian pathways on the bridge. In contrast, bridge construction at the Hwy.1 crossing of Greenwood Creek is complicated in part by more severe topography, the presence of different vegetation and wetland types, different viewshed characteristics, and its close proximity to the village of Elk. Replacement bridge project elements appropriate and consistent with the Coastal Act at one location on Hwy.1 in Mendocino County may be inconsistent with coastal protection policies at other locations. As a result, the Commission will continue to examine each Hwy.1 improvement project on a case-by-case basis, using a project's site-specific characteristics, to determine whether proposed Hwy.1 improvements are consistent with the Coastal Act. At a meeting between Caltrans and Commission staff on August 15, 2005, Caltrans acknowledged this Commission process and committed that Commission action on the

Ten Mile River bridge replacement project would not be cited or used by Caltrans as a precedent for any future Hwy.1 projects in the coastal zone.

4. Construction Impacts. Caltrans' *Project Report* for the Ten Mile River Bridge replacement project in part addresses Hwy.1 traffic management during the three-year-long construction period and states that:

> ***Standard traffic control features (flaggers, COZEEP* [Construction Zone Enforcement Enhancement Program, a statewide master agreement between Caltrans and the California Highway Patrol, whereby Caltrans pays the CHP for furnishing officers and cars for use in construction zones]*, etc.), lane-closure requirements, changeable message signs, and public awareness measures have been incorporated in the project cost estimate.***
>
> ***It is anticipated that temporary traffic signals will not be needed and the work can be accomplished with one-way reversible traffic control conforming to Caltrans Standard Plan T-13. Traffic may need to be stopped for periods not to exceed 30 minutes. Bicyclists and pedestrians shall be accommodated through the work zone.***
>
> ***Access to side roads and residences would be maintained at all times.***
>
> ***Where available, a minimum of one 3.6-m (12-foot) lane and 1.2-m (4-foot) shoulder would remain open to traffic at all times. Otherwise, a minimum of one 3.0-m (10-foot) and 0.6-m (2-foot) shoulder shall be provided.***

Caltrans estimates that due to the size and complexity of the bridge construction and demolition work, and the environmental work window restrictions due to the presence of endangered species in Ten Mile River, the project is expected to take approximately 758 working days (or 1,100 calendar days) to complete, without accounting for weather and other unexpected construction delays. Caltrans expects that field construction would start in early 2006 (now 2007) **and be completed by the end of 2008** (now 2009)**, but that delays could extend project completion into 2009** (2010)**. As a result, construction activities will occur year-round for several years at Ten Mile River and will generate some level of adverse effect on vehicle, bicyclist, and pedestrian access on this stretch of Hwy.1, primarily in the form of traffic delays when construction work requires the closure of a lane of traffic.**

There are no alternative crossings of the Ten Mile River that would allow the public to avoid the construction zone, and there are no reasonable construction/demolition scheduling alternatives that avoid the peak summer recreation season. The potential adverse impacts on public access and recreation along this section of the Mendocino County coast

should the existing bridge collapse or be closed due to earthquake damage are far more significant than the temporary effects (albeit over a three-year time period) due to construction and demolition delays. In addition, the closure of the informal accessway from the southern end of the existing bridge down to the shoreline during the demolition of the existing bridge is unavoidable in order to protect public safety. However, demolition and trail closure will occur between October and February due to environmental restrictions and as a result, significant adverse effects on public access during the peak summertime recreational use period will be avoided.

5. Conclusion(from adopted findings for CC-074-5)**. The Commission finds that the proposed Ten Mile River bridge replacement project will protect an existing informal public accessway to the shoreline located at the south end of the bridge. The Commission also finds that it is necessary to condition its concurrence with CC-074-05 to state that the California Department of Transportation will submit revised project plans via coastal development permit applications for the project that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge. These pedestrian pathways and the vehicle shoulders on the bridge will improve the safety of pedestrians and bicyclists crossing the river on this segment of State Highway 1. The project will also generate adverse but not significant impacts on public access due to Highway 1 construction delays and the temporary closure of the aforementioned informal accessway during demolition of the existing bridge. However, the replacement of the Ten Mile River bridge with a new bridge that meets current seismic safety standards will ensure the long-term protection of public access and recreation provided by Highway 1 on this section of the Mendocino coast. Therefore, the Commission finds that if modified in accordance with the Commission's conditional concurrence, the proposed project would be consistent with the public access and recreation policies of the CCMP (Coastal Act Sections 30210-14, 30220-21, and 30223).**

D. Marine Resources

The Coastal Act provides the following:

> ***Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.***
>
> ***Section 30233.***

> **(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:**
>
> ***. . .***
>
> ***(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines . . .***
>
> ***(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division . . . .***

The proposed Ten Mile River bridge replacement project requires construction within the Ten Mile River, in eelgrass beds in the river, and within adjacent wetlands on the south bank of the river. The project will generate permanent and temporary impacts on wetlands and marine resources, including the federally endangered tidewater goby and federally threatened coho salmon, chinook salmon, and northern California steelhead. This section of the report will examine the wetland and marine resources present, describe project impacts on those resources, determine project consistency with the allowable use and alternatives policies of the Coastal Act, and review the marine resources mitigation plans.

1. <u>Wetland Resources</u>. Caltrans' *Wetland Delineation and Assessment* (April 2005) for the proposed project describes the wetland resources in the project area:

> ***Below the north embankment of the GP haul road, the project extends into the adjacent wetlands along the south bank of the Ten Mile River. These wetlands are dominated by habitat transitioning from Freshwater Marsh (52400) to Coastal Brackish Marsh (52200). Within the freshwater marsh, the dominant plant types found are willow (Salix hookeriana), wax myrtle (Myrica californica), scrub with an understory of slough sedge (Carex obnupta) and water hemlock. Closer to the***

river the adjacent wetland is dominated by wetland grasses and Pacific silverweed (Potentilla anseriana). The banks of the river are vegetated with a mix of salt rush (Juncus lesueurii), salt grass (Distichalis spicata), Scirpus maritimus, Pacific silverweed, and pickleweed (Salicornia virginica).

. . .

The estuary has extensive aquatic areas vegetated with eelgrass (Zostera marina), interspersed with non-vegetated mud in both shallow and deep-water channels.

. . .

The boundary between wetland and non-wetland areas was determined by following the margin between the dominant wetland vegetation and upland vegetation. Often this differentiation corresponded with a change in elevation or soil type.

Corps jurisdictional wetlands within the study area are delineated in Figure 2. There are 1.12 ha (2.77 ac) of Corps jurisdictional wetlands within the study area.

"Other waters" which are subject to Corps regulation were also delineated within the study area. These consist of the river below the ordinary high water level. This area also includes the eelgrass flats, which are designated by EPA as a "special aquatic site." There are 1.44 ha (3.55 ac) of "other waters" including eelgrass flats with a total length of 110 m (360 ft) within the study area.

For the purpose of the delineation of Coastal Zone jurisdictional wetlands, all of the Corps wetlands and "other waters" constitute Coastal Zone jurisdiction as wetlands . . . There are 2.84 ha (7.02 ac) of Coastal Zone jurisdictional wetlands within the study area . . . .

The Commission staff reviewed the *Wetland Delineation* report and requested that Caltrans provide a more thorough analysis of wetland data points to confirm the determination of wetland boundaries in the project area. The additional information was provided in *Wetland Delineation Supplemental Information* (August 11, 2005) and this report confirmed the initial wetland boundaries (Exhibit 18).

Caltrans also submitted its final *Eelgrass Mitigation and Monitoring Plan* (August 15, 2005) which documents eelgrass distribution in the project area (Exhibit 19):

> ***The Ten Mile estuary has extensive aquatic areas vegetated with eelgrass (Zostera marina), interspersed with non-vegetated mud in both shallow and deep-water channels. All of this area is classified as wetlands for the California coastal zone. In addition, the eelgrass and mud flats are "special aquatic sites", and the deep-water channels are "other waters" for the purpose of Army Corps of Engineers jurisdiction.***

The *Wetland Delineation Supplemental Information* (August 11, 2005) also provided additional information on eelgrass in the project area:

> **The eelgrass was delineated within the estuary, both upstream and downstream of the bridge, by examining the bottom of the river at low tide for the presence of eelgrass. The water in the river was very clear and the bottom at depths of over 6 feet was visible. Observations and photographs were taken from the bridge deck every 5 meters between the riverbanks, both upstream and downstream of the bridge. The results were sketched onto the wetland delineation sheet. The density of eelgrass was highly variable (as observed) but was not measured.**

Since the Commission review of CC-074-05 in November, 2005, Caltrans' Final Eelgrass Mitigation and Monitoring Plan has been revised at least twice. The most recent version (Exhibit 3A) is dated April 7, 2006. The California Department of Fish and Game has notified Commission staff by copy of a letter dated May 6, 2006 that the agency remained concerned that:

> "…The Plan proposes pre- and post-construction eelgrass surveys for the temporary impacts to eelgrass from shading, barge grounding, etc. If there are significant differences in area and density of eelgrass, then CDOT proposes to replant eelgrass to pre-construction amounts. There is no success criteria provided for assessing if the re-planting will be successful. For impacts to eelgrass from the cofferdam excavations, replanting of eelgrass is proposed. Again, there is no success criteria proposed to assess the success of the replanting. The Department recommends that CDOT follow the guidance of the Southern California Eelgrass Mitigation Policy for acceptable success criteria in assessing eelgrass transplant success. In addition, if eelgrass replanting is required post-construction, then a minimum ratio of 1.2:1 should be used to compensate for temporal losses and to insure "no net loss" of eelgrass."

To ensure that the eelgrass monitoring plan provides sufficient monitoring and success criteria to ensure that impacts are fully identified and mitigated, the Commission finds it necessary to impose Special Condition 5 (Revised Eelgrass Mitigation and Monitoring Plan.) Special Condition 5 also requires Caltrans to survey the areas of eelgrass habitat potentially affected by the installation of the temporary trestle piles and the outer casing for noise attenuation, and if impacts are identified in these areas after one year has passed since the trestle piles were removed, to replant the eelgrass in accordance with the requirements of the condition.

Caltrans examined the presence in the project area of the federally endangered tidewater goby in its *Biological Assessment* (September 2004) submitted to the U.S. Fish and Wildlife Service. The tidewater goby is a small fish, rarely exceeding two inches in length, generally restricted to waters with low salinity in California's coastal wetlands. All tidewater goby life stages are located in lagoons and estuaries, and in northern California the tidewater goby likely breeds both in the spring and fall. Based on surveys conducted between 1994 and 2003, tidewater goby populations are presumed to exist in the Ten Mile River estuary; the river in the vicinity of the existing Hwy.1 bridge provides suitable habitat for the tidewater goby.

The Ten Mile River supports populations of coho salmon, chinook salmon, and steelhead. Caltrans' *Biological Assessment* (September 2004) submitted to NOAA Fisheries examines the current state of these populations in the project area:

> ***Both adult and juvenile coho are expected to be in the river system during different phases of the construction although neither life stage would probably be spending extended periods of time in the vicinity of the bridge. Adults would be moving much further upstream to spawning areas and juveniles would likely be rearing upstream of the bridge where oxygen levels are higher, and water temperatures would be cooler with little or no salinity. Although coho would be using the estuary where the bridge is located only as a migratory corridor, the possibility that individuals could be near the bridge can not be entirely ruled out therefore, the project may affect the species.***
>
> ***. . . there is evidence that chinook juveniles may spend time rearing for short periods of time in estuaries prior to swimming out to the ocean. Of the three listed salmonid species, it is more likely that only juveniles of chinook would be spending time rearing near the bridge since their downstream migration period begins in late winter when water temperatures throughout the system would be cooler. Both adult and juvenile chinook may be traveling upstream and downstream respectively during the pile driving in late fall and winter and therefore may be affected by the project.***
>
> ***As with other salmonid species, steelhead presumably use the river in the vicinity of the project primarily as a migratory corridor. Steelhead should be absent from the bridge area during construction of the trestle, falsework, and cofferdams. However, both upstream and downstream peak migrations of adult steelhead would be occurring beginning November when pile driving is slated to occur.***

2. <u>Project Impacts</u>. Caltrans' April 2005 *Wetland Delineation and Assessment* contained information on expected impacts to wetlands from

construction and demolition activities. However, the Commission staff requested more precise analysis of potential temporary impacts to wetland resources, including a breakdown of the type of impacts, duration of impacts, and the likely wetland effects. To address those effects, Caltrans submitted its aforementioned *Wetland Delineation Supplemental Information* report in August 2005.

The proposed bridge has a total of seven piers, with each pier comprised of two concrete columns (each column covers an area of 28.3 sq.ft. and each pier therefore covers an area of 56.6 sq.ft.). Two piers will be located in an upland area and three piers will be placed in the river. Two of the piers will be constructed in the wetlands on the south bank of the river and will permanently impact 113 sq.ft. of wetland habitat. It should be noted that the seven piers for the replacement bridge will occupy a total footprint of 396 sq.ft., and that five of these piers (occupying 283 sq.ft.) would be within the river and wetland habitat. The piers and columns in the river and wetland habitat associated with the existing bridge to be removed occupy a total footprint of 450 sq.ft. Therefore, the bridge replacement project will ultimately provide for a *net decrease* in the amount of river and wetland fill. Temporary impacts to wetlands will arise from placement of pilings to support trestles and falsework for new bridge construction and old bridge demolition, cofferdam excavation to support new pier construction and old pier removal, fill for construction of an access road to the old bridge demolition site, ground mats to catch demolition debris, and shading from trestles and falsework. The following table summarizes the expected temporary effects to wetlands:

Temporary Wetland Impacts		
	sq.ft.	**duration**
Shading (trestle/falsework)		
new bridge	**58,265**	**21 mos.**
old bridge	**20,165**	**6 mos.**
Pilings		
new bridge	**404**	**21 mos.**
old bridge	**119**	**6 mos.**
Cofferdams		
new bridge	**7,639**	**14 mos.**
old bridge	**5,886**	**2 mos.**
Road Fill		
old bridge	**10,071**	**6 mos.**
Ground Mat		
old bridge	**13,450**	**3 mos.**

As noted previously, three of the piers for the new bridge will be constructed in the channel of Ten Mile River; these structures will result in the permanent loss of 170 sq.ft. of eelgrass beds in the river. Temporary impacts to eelgrass beds in the river are summarized in the following table:

Temporary Eelgrass Impacts		
	sq.ft.	**duration**
Shading (trestle/falsework)		
new bridge	**20, 982**	**19 mos.**
old bridge	**10,825**	**6 mos.**
Pilings		
new bridge	**144**	**19 mos.**
old bridge	**84**	**6 mos.**
Cofferdams		
new bridge	**1,829**	**14 mos.**
old bridge	**753**	**2 mos.**

The bridge replacement project may adversely affect the federally endangered tidewater goby. Caltrans' September 2004 *Biological Assessment* delivered to the U.S. Fish and Wildlife Service summarized the potential impacts:

> ***Impacts to the substrate will be temporary and localized. There is the chance that vibrations from pile driving could collapse burrows resulting in mortality of individuals and missed reproductive efforts. Pile driving may also alter the goby's behavior or in extreme cases, result in mortality. Fish rescues, if required during installation of the attenuation and containment systems for the new and old bridges respectively, may also result in mortality of stranded juvenile fish. Therefore, the project may affect and is likely to adversely affect the tidewater goby.***

The bridge replacement project may also adversely affect federally threatened populations of coho salmon, chinook salmon, and steelhead in the Ten Mile River. Caltrans' September 2004 *Biological Assessment* delivered to NOAA Fisheries summarized the potential impacts:

> ***First year chinook juveniles and second year coho salmon and steelhead may be out-migrating during the time the trestles, falsework, and attenuation systems for the new and existing bridges are constructed. Also, there is a low probability that first year juvenile***

coho and steelhead could be rearing in the project area during this portion of the in-river work. Although unlikely, these project components may alter fish behavior and in extreme cases, although even more unlikely, result in mortality.

Fish rescue during construction of the attenuation and containment systems for the construction of the new bridge and demolition of the existing bridge respectively, may adversely affect juvenile fish and may result in mortality of some individuals.

Although doubtful, noise effects from driving permanent piles may affect and could likely adversely affect adults of all three salmonid species. Although changes in behavior may occur due to noise, the chance of mortality is low.

The proposed project is not likely to result in adverse modification of designated critical habitat for coho salmon.

3. Allowable Use. As described above, the proposed project includes permanent fill in estuarine waters and wetlands as defined under the Coastal Act, and therefore triggers the three-part test under Section 30233(a): allowable use, alternatives, and mitigation. The Ten Mile River estuary is one of the 19 listed coastal wetlands referred to in Section 30233(c), and the proposed project must be consistent with the allowable use provision of this section as well. In addition, the Mendocino County LCP provides in Section 3.1-6 that in the wetland portions of Ten Mile River development shall be limited to wetland restoration, nature study, and salmon restoration projects.[3]

Under the first of the Section 30233(a) tests, a project must qualify as one of the eight stated uses allowed under Section 30233(a). Since the other allowable uses clearly do not apply, the Commission must determine whether the proposed project can be permitted under Section 30233(a)(5), which authorizes fill for:

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[3] It is reasonable to conclude that this policy applies to proposed projects that generate adverse impacts on wetlands beyond the existing baseline level of impact in the Ten Mile River. The proposed bridge replacement project will result in a net *reduction* in the amount of wetland fill in the river. Alternatively, to the extent that an argument can be made that the proposed fill is not consistent with this policy, such an argument would not be binding on the Commission in that the standard of review for the proposed project in this consistency review is the Chapter 3 policies of the Coastal Act and not the Mendocino County LCP.

> ***Incidental public service purposes, including but not limited to, burying cables, pipes or inspection of piers and maintenance of existing intake and outfall lines.***

In order for an "incidental public service purpose" a proposed fill must satisfy two tests: (1) the project must have a "public service purpose"; and (2) the purpose must be "incidental" within the meaning of that term as it is used in Section 30233(a)(5). Because the project will be constructed by a public agency (Caltrans) for the purpose of replacing the seismically unsafe Hwy.1 bridge crossing the Ten Mile River, the fill is for a public service purpose. Thus, the project satisfies the first test under Section 30233(a)(5).

With respect to the second test, in 1981 the Commission adopted the "Statewide Interpretive Guidelines for Wetlands and Other Wet Environmentally Sensitive Habitat Areas" (hereinafter, the "*Guidelines*"). The *Guidelines* analyze the allowable uses in wetlands under Section 30233 including the provision regarding "incidental public service purposes." The *Guidelines* state that fill is allowed for:

> ***Incidental public service purposes which temporarily impact the resources of the area, which include, but are not limited to, burying cables and pipes, inspection of piers, and maintenance of existing intake and outfall lines (roads do not qualify).***

A footnote (no. 3) to the above-quoted passage further states that:

> ***When no other alternative exists, and when consistent with the other provisions of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted.***

The Court of Appeal has recognized the Commission's interpretation in the *Guidelines* of the term "incidental public service purposes" as a permissible one. In the case of *Bolsa Chica Land Trust et al., v. The Superior Court of San Diego County* (1999) 71 Cal.App.4th 493, 517, the Court found that:

> ***. . . we accept Commission's interpretation of sections 30233 and 30240 . . . In particular we note that under Commission's interpretation, incidental public services are limited to temporary disruptions and do not usually include permanent roadway expansions. Roadway expansions are permitted only when no other alternative exists and the expansion is necessary to maintain existing traffic capacity.***

In past cases the Commission has considered the circumstances under which fill associated with the expansion of an existing "roadbed or bridge" might be allowed under Section 30233(a)(5). In such cases the

Commission has determined that, consistent with the analysis in the *Guidelines*, the expansion of an existing road or bridge may constitute an "incidental public service purpose" when no other alternative exists and the expansion is necessary to maintain existing traffic capacity.

The Commission previously granted to the Cities of Seal Beach and Long Beach a coastal development permit (5-00-321) for the construction of bridge abutments and concrete piles for the Marina Drive Bridge located on the San Gabriel River. The Commission found that the project involved the fill of open coastal waters for an incidental public service purpose because the fill was being undertaken by a public agency in pursuit of its public mission, and because it maintained existing road capacity.

The Commission also determined in conjunction with a project (El Rancho Road Bridge) proposed by the U.S. Air Force at Vandenberg AFB that permanent impacts to wetlands are allowable under Section 30233(a)(5) of the Coastal Act as an incidental public service because the Air Force was undertaking the fill in pursuit of a public service mission and because the "permanent fill [was] associated with a bridge replacement project [that] would not result in an increase in traffic capacity of the road." (CD-070-92, and reiterated in CD-106-01).

The Commission recently concurred with a consistency determination submitted by the Bureau of Land Management (CD-084-04) for a roadway repair project on the South Spit of Humboldt Bay that required fill of open coastal waters to prevent the erosion and undermining of South Jetty Road by tidal and wave action. The repair project did not increase road capacity and was necessary in part to protect public access to and along the bay and ocean shoreline.

Thus, based on past interpretations, fill for the expansion of existing roadways and bridges may be considered to be an "incidental public service purpose" if: (1) there is no less damaging feasible alternative; (2) the fill is undertaken by a public agency in pursuit of its public mission; and (3) the expansion is necessary to maintain existing traffic capacity. The Ten Mile River bridge replacement project will not increase the existing capacity of Highway 1 in this region of Mendocino County. Rather, the project is necessary in order to ensure that this segment of Highway 1 is not severed by an earthquake and to prevent the significant disruption to residents, tourists, and the regional economy that a bridge collapse would generate.

Furthermore, while Ten Mile River estuary is one of the "priority wetlands" afforded additional protection under Section 30233(c), which was not at issue in the above-referenced cases, the Commission finds that: (1) the project will not alter or affect the functional capacity of the Ten Mile River estuary; and (2) even if it considered the project to alter the estuary, the

project can be considered a "very minor incidental public facility" based on the same rationale discussed above and in the Commission's wetlands guidelines[4] and several past Commission permit reviews.[5] These reviews and guidelines apply the same test for a project that the Commission has determined is necessary to maintain existing capacity to constitute an allowable use under Section 30233, regardless of whether it is being viewed as an "incidental public service" under Section 30233(a), or a "very minor incidental public facility" under Section 30233(c). Thus, the Commission has determined that a limited expansion of an existing transportation facility that is necessary to maintain existing capacity is an allowable use as an incidental public service under either Section 30233(a)(5) or Section 30233(c). Moreover, because it will result in a net decrease of fill in the estuary, the project will not adversely affect the functional capacity of the Ten Mile River estuary, a secondary test of Section 30233(c). Therefore, the Commission finds that the Ten Mile River bridge replacement project is an allowable use as an incidental public service and a very minor incidental public facility under Sections 30233(a) and 30233(c) of the Coastal Act, respectively.

4. Alternatives. Caltrans examined a number of alternatives to the proposed project and these alternatives are examined in the April 2005 *Project Report*:

> ***The project began as a seismic retrofit of the existing bridge to meet current seismic standards. During the course of project development, a hydraulic study concluded that the consultant's pier footing design would cause the bridge to become "scour critical" and, therefore, vulnerable to collapse during a large flood event. A decision was made by Caltrans management to replace the existing bridge with a new bridge which would address both scour and seismic concerns.***

The specific details of the proposed project alternative were described previously in Section I of this report. The replacement and retrofit alternatives considered by Caltrans in the *Project Report* are as follows:

- **No-Build. This alternative would not correct the seismic deficiencies of the existing bridge, would risk public safety, and would not meet**

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[4] The Commission's wetland guidelines include a footnote for "incidental public services," which states: [Footnote 3:] "When no other alternative exist, and when consistent with the other provisions of this section, limited expansion of roadbeds and bridges necessary to maintain existing traffic capacity may be permitted." The footnote for "very minor incidental public facilities" states: "(see footnote #3)."

[5] Including Coastal Development Permit 6-97-11, City of Carlsbad, Cannon Rd./Kelly Ranch.

the goals of the seismic safety program mandated by the State Legislature.

- **Alternative A. Construct a bridge 60 to 150 feet upstream of the existing bridge. This alternative generated a longer bridge and greater wetland impacts.**

- **Alternative B. Construct a bridge 33 to 108 feet west of the existing bridge. This alternative generated a shorter bridge and fewer impacts to wetlands, but greater impacts to listed plants and to MacKerricher State Park.**

- **Alternative 1. Retrofit the bridge with outrigger bents and encasing the existing columns. This alternative generated greater impacts to the river channel, eelgrass, and visual resources, and would only extend the life of the bridge for 20 years.**

- **Alternative 2. Retrofit the existing bridge with enlarged foundations, additional pilings, and encasing the existing columns. This alternative generated greater impacts to the river channel, wetlands, and listed salmonids, would be difficult to mitigate impacts, and would only extend the life of the bridge for 20 years.**

- **Other Rejected Alternatives. (a) construct new bridge on existing alignment; rejected due to the need to construct a temporary bridge prior to demolition and construction of new bridge, and the resultant greater environmental impacts; (b) install seismic-activated traffic gates at both ends of the existing bridge to prevent vehicles from entering bridge at the start of an earthquake; rejected because it did not meet the project purpose or state seismic safety mandate.**

As noted previously in this report, the existing Ten Mile River bridge does not meet current state seismic safety standards, would likely suffer significant damage from or would collapse during a major earthquake, and must be replaced by Caltrans. While the proposed bridge replacement project will create adverse effects on marine resources: (1) alternatives to the proposed project would generate greater adverse effects on the river channel, eelgrass beds, wetlands, federally endangered and threatened fish species, listed plant species, visual resources, and/or public access and recreation; (2) the proposed project includes a construction alternative designed to minimize adverse marine resource impacts, the use of temporary trestles to support new bridge construction and existing bridge demolition; and (3) as will be discussed in the following section, adverse impacts will be mitigated. While these structures require the driving of approximately 650 temporary pilings to support the trestles, this amounts to only 63 sq.ft. of direct habitat loss in the river, wetlands, and upland

areas. The alternative to using pile-supported trestles was to construct temporary, but nevertheless substantial earthen fills across wetlands and across the river channel to support construction and demolition falsework. These land and river fills would clearly generate tremendously significant impacts to wetlands and the biological resources of Ten Mile River and were rejected in favor of the pile-supported trestles. The Commission agrees with Caltrans' determination that the proposed replacement bridge is the least environmentally damaging feasible alternative and that the project meets the alternatives test of Section 30233(a)(5) of the Coastal Act.

5. Mitigation. Caltrans is proposing a wide range of avoidance, minimization, and mitigation measures to ensure that the proposed project meets the Section 30233(a) requirement that "feasible mitigation measures have been provided to minimize adverse environmental effects." This section of the report will address mitigation measures provided for impacts to wetlands, eelgrass, and salmonids and tidewater gobies. Caltrans submitted to the Commission staff a wetland delineation report, eelgrass mitigation and monitoring plan, revegetation plan, documents and memos regarding pile-driving noise effects on fish, and biological assessments that described Caltrans' wetlands and marine resources restoration and mitigation plans.

(a) Wetlands. The August 2005 *Wetland Delineation Supplemental Information* document describes Caltrans' proposed wetland restoration measures. This report states in part that:

> ***Restoration of these* [shading effects] *areas range from just the removal of the temporary impact and allow unassisted regeneration of the vegetation, to replanting areas that are unlikely to revegetate without intervention.***
>
> ***Total disturbance of the habitat is likely to occur from the placement of temporary pilings and temporary fills for access roads. The areas impacted by the placement of pilings are relatively small and dispersed, and would be expected to revegetate naturally after the pilings are removed. After the fill placed for the temporary road is removed for off-site disposal, that area will be replanted to facilitate re-establishment of native vegetation.***
>
> ***Total disturbance of the various habitats will result from the installation, excavation, and removal of cofferdams used to construct new bridge footings and to remove the old bridge footings. These excavations will be restored by filling the cofferdam area with native soil to match the adjacent topography followed by replanting with appropriate native vegetation.***

A moderate level of disturbance is likely to occur from the temporary debris cover used to catch and retain debris for off-site disposal during the demolition of the old bridge. The placement of the debris cover will shade the ground and crush all vegetation. However, the debris cover will be used under the old bridge where the bridge shadow already limits natural vegetation. The duration of the debris cover is very short and occurs in the late fall when most plants are dormant. After the bridge rubble and debris cover are removed, the area impacted is expected to recover naturally within the first season by natural regeneration. Other than the placement of permanent erosion control in areas of exposed soil, no further treatment of these areas is likely to be needed.

The September 2005 *Revegetation Plan* provides additional information on wetland restoration plans, including planting plans, monitoring requirements, success criteria, remedial actions, contingency measures, and maintenance of restored areas (Exhibit 20).

The Commission staff reviewed the proposed wetland restoration and revegetation plans and requested that additional measures be included to ensure successful restoration. Caltrans agreed to add the following measures to the proposed project:

- **The replacement bridge at Ten Mile River will lead to the permanent loss of 113 sq.ft. of wetland habitat due to the placement of two bridge piers on the south bank of the river. Given the Commission's numerous prior actions requiring that mitigation for permanent wetland fill is to be restoration of wetland habitat at a 3:1 mitigation ratio, 339 sq.ft. of on-site wetland restoration is required for this project. As a part of the demolition of the existing bridge, the existing bridge columns that currently occupy 200 sq.ft. of wetland habitat on the south bank of the river will be removed. Caltrans will plant and restore these bridge column footprints with wetland vegetation. Therefore, Caltrans' net mitigation requirement for permanent wetland impacts is 139 sq.ft. of additional on-site wetland restoration. Caltrans will implement this planting and restoration work at a site on the south bank of the river adjacent to the existing bridge.**

- **For temporary impacts to wetland habitat, Caltrans will: (1) implement the various restoration actions (e.g., stockpile all excavated materials, soil backfill, benthic sediment backfill, plantings, monitoring) identified in the aforementioned restoration plans upon completion of project construction; (2) survey the temporary impact areas one year after completion of project construction ; (3) based on the survey results, implement further**

restoration actions (e.g., soil/sediment backfill, plantings) for those temporary impact areas that did not return to pre-project conditions; and (4) continue this survey/restoration work until all temporary impact areas are returned to pre-project conditions.

(b) Eelgrass. The August 15, 2005, Eelgrass Mitigation and Monitoring Plan provides details on project impacts to eelgrass, goals and objectives of the mitigation plan, pre- and post-construction survey details, mitigation techniques, and the monitoring and reporting program. The document states that the project includes 170 sq.ft. of new fill (from new bridge piers) of eelgrass beds in the river and the removal of 250 sq.ft. of existing fill (from existing bridge piers) of eelgrass beds. Caltrans concluded that since the project will result in a net gain of eelgrass habitat, no additional mitigation is required. After reviewing the *Plan*, the Commission staff reported to Caltrans that the "net gain" conclusion rests on the assumption that eelgrass will naturally recover in those areas where existing bridge piers are removed. If it does not, the project could generate a net loss of eelgrass habitat. Therefore, Caltrans agreed to add the following measure to the proposed project:

- **If the 250 sq.ft. area of existing bridge piers and columns has not naturally recovered with eelgrass one year after the completion of project construction, Caltrans will plant those areas with eelgrass. All materials excavated within cofferdams in the river (for construction of new piers and removal of existing piers) will be stockpiled for replacement to ensure an adequate substrate for eelgrass revegetation.**

In addition, Caltrans agreed to modify its mitigation plan for temporary impacts to eelgrass in a manner similar to temporary wetland impacts:

- **For temporary impacts to eelgrass, Caltrans will: (1) implement the various restoration actions (e.g., stockpile all excavated materials, soil backfill, benthic sediment backfill, plantings, monitoring) identified in the aforementioned eelgrass plan upon completion of project construction; (2) survey the temporary impact areas one year after completion of project construction ; (3) based on the survey results, implement further restoration actions (e.g., soil/sediment backfill, plantings) for those temporary impact areas that did not return to pre-project conditions; and (4) continue this survey/restoration work until all temporary impact areas are returned to pre-project conditions.**

Caltrans submitted a project-wide *Revegetation Plan* on July 8, 2005. The Commission staff reviewed and submitted comments on this plan and requested that Caltrans submit a revised plan. The staff received the

revised *Revegetation Plan* on September 20, 2005. The *Plan* includes a description of the project area, restoration goals, implementation schedule, information on site preparation, a planting plan and plant palette, information on success criteria, monitoring plans, maintenance and remedial actions, and reporting requirements. Revegetation of all disturbed areas will use native plant stock from the project work site and/or materials grown from propagules originating within a range from the Russian River northwards to Humboldt Bay and within an inland extent of ten miles from the coast.

The *Plan* states that two sets of criteria were established to evaluate the success of revegetation efforts:

1. **An intermediate set of criteria that will be used to determine whether the replanted habitat is developing on a course that will meet the revegetation plan goals, and**
2. **Final criteria that will determine whether the revegetation plan goals have been actually achieved. Failure to meet this criteria will require re-evaluation of the site conditions followed by corrective measures. The final success criteria will not be considered to have been met until a minimum three-year period with no remedial actions is achieved (excluding invasive plant abatement activities).**

Planted areas will be monitored twice annually at the beginning (approx. January) and end (approx. August) of the growing season for a period of five years, and annual reports will be provided to the Coastal Commission by December 31.

(c) <u>Salmonids and Tidewater Gobies</u>. Caltrans has consulted and negotiated with the U.S. Fish and Wildlife Service, NOAA Fisheries, and California Department of Fish and Game (CDFG) to develop mitigation measures to reduce the potential for significant adverse project impacts on listed fish species. The agreed-upon measures include in-water construction work windows, construction materials and techniques, monitoring, and fish habitat enhancement. The details are provided in the consistency certification, *Project Report*, *Biological Assessments*, *Ten Mile River Bridge Replacement Project – Hydroacoustic Report*, and letters from Caltrans to the CDFG (dated August 24, 2005, and September 19, 2005). The September 19, 2005, letter states that the proposed work windows were designed to minimize effects to both the tidewater goby and the listed salmonid species (coho and Chinook salmon and steelhead). The goby's breeding periods as well as the use of the project location area by salmonids primarily as a corridor during migrating stages were considered while formulating the following construction windows:

- **Temporary Piles: Pile driving for temporary trestles, falsework, and cofferdams would be permitted for the new bridge's first year of**

construction between June 15 and October 31. Additional work windows for pile driving for temporary trestles, falsework, and cofferdams in subsequent years would occur between September 15 and October 31, for both new bridge construction and existing bridge demolition.

- **Permanent Piles: Installation of permanent piles would occur year round within dewatered cofferdams. The cofferdams for the permanent piles would be installed between June 15 and October 31 the first season, and between September 15 and October 31 the following two seasons.**

Caltrans references the September 2005 *Hydroacoustic Report* and states that the best noise attenuation method for permanent pile driving (i.e., to reduce peak sound pressure levels to 190 decibels (dB)) is to pile drive within dewatered cofferdams. To that end, Caltrans states that it is:

> ***. . . committed to dewatered cofferdams during permanent pile driving as a noise attenuation measure. For this project, water would be lowered within each cofferdam (eight total required – three for the proposed new bridge, and five for the existing bridge pier) by pumping to allow trapped fish to be rescued. After the fish rescue is completed, the water level inside the cofferdam would be kept at or below the existing river mudline. Maintaining the water at this level achieves the highest level of noise attenuation for permanent pile driving.***

While originally not a part of the project, after discussion with the aforementioned resource agencies, Caltrans reports that it now proposes to drive the temporary pilings within Double- Walled Isolation Casings:

> **Dewatered Isolation Casing creates an "air" space between the temporary H pile and the surrounding river. This system was utilized on the Humboldt Bay Bridges Seismic retrofit project and was found to provide about 9 dB of attenuation. The driving of temporary H piles through a Dewatered Isolation Casing should not cause peak pressure levels over 190 db at 10 meters, and is described in the attached Hydroacoustic Report.**

Caltrans further states in its September 19, 2005, letter that the type and size of temporary and permanent piles has changed:

> **The attached Hydroacoustic Report indicates temporary steel piles create higher dB levels than temporary H piles. In order to attenuate noise, during project development Caltrans changed the project to include H piles instead of steel piles. Early analysis also indicated that larger diameter cast in steel shell (CISS) permanent piles create higher dB levels than smaller diameter piles. To reduce potential**

> **peak noise levels, Caltrans changed foundation type and reduced the diameter of the cast in steel shell (CISS) piles from eight foot to 30 inch.**

The *Hydroacoustic Report* also includes a description of the methodology to be used for monitoring noise levels during pile driving operations in the Ten Mile River. Caltrans has committed to contacting CDFG and NOAA Fisheries if noise levels exceed (at ten meters from the source) 190 dB sound pressure level during monitoring (excluding errant measurements). Caltrans has also committed to submitting a copy of the noise monitoring plan to be implemented at the Ten Mile River project site to the Commission's Executive Director for review and approval prior to the start of in-water construction activities.

U.S. Fish and Wildlife Service staff reported to the Commission in September 2005 that while the proposed project in-water pile driving construction windows, sound attenuation devices, and the 190 dB level would likely lead to adverse effects on tidewater gobies during one breeding season, other mitigation alternatives would lead to a longer cumulative construction period and greater adverse impacts on the goby. The USFWS determined that the proposed project schedule and mitigation measures represent the best and least damaging feasible way to protect the goby and construct the replacement bridge.

The consistency certification states that a fisheries biologist would be onsite during the installation of the cofferdams and the pumping process to capture and move trapped gobies and salmonids, along with any other fish, to suitable habitat upstream of the work area. The project does not include any night work and, as a result, the use of lights will not be required during construction.

In addition to the above measures, Caltrans has committed to implement a fish enhancement project to further mitigate impacts to coho salmon that may occur during project construction. Caltrans initially identified the culvert at Digger Creek/Hwy. 1 (near Fort Bragg) as a suitable location for a coho salmon passage enhancement project. However, in its September 19, 2005, letter to CDFG, Caltrans found that:

> ***. . . although coho may have historically been in Digger Creek the rainbow trout farm downstream of Caltrans' Digger Creek culvert most likely extirpated the coho from the system. Based on this information, we will be selecting a different location in order to fulfill our mitigation requirements.***

As of this date, no final decision has been reached by Caltrans and the resource agencies for the location of the fish habitat enhancement project. However, Caltrans has committed to submit to the Executive Director, prior

to the start of project construction, additional details (e.g., location, scope of work, objectives, cooperating partners) on the proposed fish enhancement project.

(d) Conclusion. Construction and demolition activities for the Ten Mile River bridge replacement project will occur in and adjacent to freshwater and brackish water wetlands found along the south bank of the river. Other activities will take place directly in the river, which is home to the endangered tidewater goby, serves as a migration corridor for threatened coho and chinook salmon and northern California steelhead, and supports healthy and extensive beds of eelgrass. The project will ultimately result in a net decrease in the amount of permanent fill in wetlands and eelgrass beds, due to a reduction from 450 sq.ft. to 283 sq.ft. in the footprint of piers and columns which support the existing and replacement bridges, respectively. However, the project does include new fill of coastal waters. The proposed fill is an allowable use under the "incidental public service" provision of Section 30233(a)(5) as the project is a limited expansion of an existing transportation facility necessary to maintain existing capacity. The project will not alter or affect the functional capacity of the Ten Mile River estuary and can be considered a "very minor incidental public facility" based on previous Commission reviews of development in Section 30233(c) "priority wetlands."

The proposed project is the least environmentally damaging feasible alternative, in terms of its river crossing location, design features to minimize intrusions into wetland habitat, and construction methods and scheduling. Mitigation (at a ratio of 3:1) for the permanent wetland impacts includes creation of 139 sq.ft. of additional on-site wetland restoration. The project will also generate temporary impacts (ranging between three to twenty-one months) on wetlands and eelgrass due to pilings, excavation, fill, ground mats, and shading. Mitigation includes removal of all construction and demolition materials, implementation of revegetation and eelgrass mitigation plans, and restoration of all disturbed areas to pre-project conditions. The project revegetation plan includes planting plans, monitoring requirements, success criteria, remedial measures, and maintenance of restored areas. Final success criteria for wetland and eelgrass restoration will not be met until a minimum three-year period with no remedial actions is achieved.

Temporary project impacts on listed species of fish present in the Ten Mile River in and adjacent to the project area arise primarily from noise generated by pile driving for the new bridge piers, and for the trestles and framework needed to construct the new bridge and demolish the existing bridge. To minimize adverse effects on these species, the project includes seasonal restrictions and work windows for in-water pile-driving, requirements that permanent pilings be driven within dewatered cofferdams and temporary pilings be driven within double-walled isolation

casings, the use of H piles rather than steel piles for the temporary pilings, monitoring of noise levels during pile driving, capture and relocation of trapped fish from the cofferdams to suitable habitat upstream from the work area, and implementation of an off-site coho salmon passage enhancement project.

As a result, the Commission concludes that the proposed project is an allowable use and is the least environmentally damaging feasible alternative for replacing the Ten Mile River bridge. The Commission also concludes that the project is designed to minimize permanent and temporary impacts within wetland and eelgrass habitat, and includes adequate measures to mitigate unavoidable permanent and temporary adverse impacts to those habitats. The Commission concludes that the proposed project is consistent with the wetlands and marine resources protection policies of the CCMP (Coastal Act Sections 30230 and 30233).

As set forth above, the Commission's previously adopted analysis of the issue of pile driving and noise remains applicable. At the time of the previous review (November 2005), Caltrans referenced, and the Commission relied on, Caltrans' September 2005 *Hydroacoustic Report* and its September 19, 2005, letter which stated that the best noise attenuation method for permanent pile driving (i.e., to reduce peak sound pressure levels to 190 decibels (dB)) is to pile drive within dewatered cofferdams, and that to achieve this maximum limit, Caltrans would dewater the permanent piles, use Double-Walled Isolation Casings for the temporary piles, reduced the pile diameters, from 8 ft. to 30 inch piles, and use "H piles" rather than steel piles for the temporary piles.

Since the Commission's previous review, Caltrans has: (1) developed a marine mammal monitoring and avoidance plan and (2) re-entered negotiations with the resource agencies on the fisheries monitoring and mitigation measures.

The Marine Mammal Monitoring Plan, as prepared by Caltrans, will (1) include a 500 ft. safety zone designed to avoid exposing marine mammals to 160 dB or greater noise levels; (2) assure that pile driving will not commence at the beginning of a day unless the safety zone is clear (however, the plan provides that if a marine mammal later swims into the safety zone, pile driving will not be curtailed); (3) pile driving will not commence at peak energy/noise levels but rather will begin with a "soft start" ("dry start") involving tapping the pile several times; (4) noise levels will be monitored, and the 500 ft. will be modified up or down if actual noise levels are different than predicted; (5) monthly monitoring summaries will be submitted to NOAA Fisheries; and (6) a final report summarizing the monitoring and any general trends observed will be submitted within 30 days of the completion of the monitoring.

With regard to the Marine Mammal Monitoring Plan, the Commission finds that if conditioned pursuant to Special Condition 4 to clarify that the Commission staff will receive all monitoring reports and that pile driving will not commence in "low visibility" conditions (e.g., heavy fog or where visibility distance is less than the preclusion radius), the project as conditioned would be adequate to protect marine mammals.

Hydroacoustic Task Force. As part of a more programmatic effort to bring together top scientists in the field, review existing research on "barotrauma" and other pressure-related effects, develop noise thresholds for injury to fish, and conduct additional research to increase understanding of impacts, Caltrans is working in conjunction with Washington and Oregon State Transportation agencies, the Federal Highway Administration, the U.S. Army Corps of Engineers, NOAA Fisheries, the U.S. Fish and Wildlife Service, and CDFG. This effort has included establishment of a "Fisheries Hydroacoustic Working Group." The working group appears to generally accepts the premise that:

> *Aquatic pile-driving generates hydroacoustic pressure impulses and particle velocities that can cause effects on fish ranging from altered behavior, hearing loss, and tissue injuries to immediate mortality… [and that] Fish kills from pile driving have been noted on both coasts and have resulted in unforeseen impacts to sensitive fishery resources, as well as project delays and additional costs.*

The group notes that while documented fish kills have occurred due to pile driving, including during work at several San Francisco Bay area bridges in recent years (outside the Coastal Commission's jurisdiction):

> *Because of the lack of available scientific data, agencies are forced to rely on conservative interpretations of existing information including anecdotal data to protect sensitive fish. Most of the work relating to noise impacts on fish has been done with explosives, but because explosives produce pressure waves with unique shapes, intensities, and frequencies, their impacts are not directly comparable to pile driving. There is a need to develop a sound scientific basis to predict impacts and mitigate the negative effects of pile and casing installation and removal projects on fish.*

The group has defined the following tasks to assist this effort:

> *TASKS*
>
> *PHASE I (1.) Conduct a critical analysis of published literature and research in progress on the basis of applicability, conclusiveness of findings, and usefulness for the analytical needs of this study. (2.) Conduct a survey and analysis of current practice among domestic and international transportation, natural resource, and construction entities in government, the private sector, and academia on their experiences with negative impacts on fish resulting from pile and casing installation and removal and document the results of any monitoring or mitigation strategies that have been employed. (3.) Based on the results of Tasks 1 and 2, identify information gaps where further research is needed to achieve the project objectives. (4.) Prepare a draft outline of the proposed guidance document, subject to revision based on the results of Phase II research. It is anticipated that the final product will include guidance that will allow an*

agency to make decisions about specific projects by addressing topics including, but not limited to, the following:

- *Prediction or modeling of noise propagation from pile and casing installation and removal (distinguished from ambient noise levels).*
- *Characterization of fish species present at a site based on susceptibility to impacts (compared with test subjects studied in the research).*
- *Identification of site-specific factors such as water characteristics (e.g., salinity, temperature, and depth), habitat usage (e.g., spawning, foraging, rearing, and migration), geology, and channel morphology.*
- *Assessment of the nature and extent of potential impacts on fish, such as barotrauma, hearing, behavior, and physiology.*
- *Determination of appropriate metrics for description and evaluation of sound pressure and particle velocity levels, and correlation of the levels of those metrics to impacts on fish.*
- *Development of recommended performance measures for mitigation of negative impacts.*
- *Selection or development of appropriate design and construction techniques or mitigation strategies as well as cost-effective and practical measures of evaluating the effectiveness of these techniques and strategies.*
- *Development of implementation guidelines for the design and construction techniques and mitigation strategies selected.*

Task Force Work Products**.** Among the important work products from the task force's efforts include two papers by noted experts in the field: (1) an overview discussion entitled "Effects of Sound on Fish," (Hastings & Popper, Caltrans, January 28, 2005); and (2) a draft guidance paper entitled "*Interim Criteria* for Injury of Fish Exposed to Pile Driving Operations: A White Paper" (Popper, Carlson, Hawkins, Southall, and Gentry, (Drafts of February 28, 2006, and May 13, 2006). (Exhibits 8A-10A)

Effects of Sound on Fish. The first of these papers, "Effects of Sound on Fish," states:

Introduction

Over the past decade it has become increasingly apparent that human-generated (often called "anthropogenic") sound has the potential to impact the health and well-being of animals as well as humans. There has been, in this same time frame, an increasing awareness of the presence of human-generated sounds in the aquatic environment, and concern has arisen that these sounds could impact aquatic mammals, diving birds, fishes, amphibians, reptiles, and perhaps even invertebrates (e.g., NRC 1994, 2000, 2003; Richardson et al. 1995; Popper 2003; Popper et al. 2004).

Despite the concerns raised by increased human-generated sound in the aquatic environment, very little is known about the effects of exposure to such sounds on marine mammals, and far less is known about the effects on fishes (see reviews in NRC 1994, 2000, 2003; Popper 2003; Popper et al. 2004). And, even

in cases where data are available for fishes, they are so few that one must be extremely cautious in attempting to extrapolate between species, even for identical stimuli. Moreover, one must also be extremely cautious with any attempts to extrapolate results between stimuli because the characteristics of the sources (e.g., air guns, sonars, ship noise, pile driving) differ significantly from one another.

Areas of Uncertainty and Studies Needed

To date, there are few data for fish on the effects of exposure to sound from pile driving, and these only appear in the gray literature (e.g., Anderson 1990; Feist 1992; Bonar 1995; Shin 1995; Caltrans 2001, 2004; Abbott and Bing-Sawyer 2002; Nedwell et al. 2003; Abbott 2004). Although these studies provide some information about exposures to pile-driving sounds, there is little that can be definitively concluded from them. By way of example, there are data and general observations of mortality and some injury to fishes that are close to the source where the level of sound is very high. Additionally, there are observations based on the numbers of fish that come to the surface dead after pile driving that suggest that there is less (or no) mortality at greater distances from the source (where the received level of sound would be lower than close to the pile). Finally, experimental cage studies also suggest that fishes further from the pile have little or no mortality and/or damage (e.g., Caltrans 2001, 2004; Abbott and Bing-Sawyer 2002; Nedwell et al. 2003; Abbott 2004; Marty 2004).

*It does appear, however, that the degree of damage is not related directly to the distance of the fish from the pile, but to the received level and duration of the sound exposure. Because monitoring data show that sound pressure levels do not necessarily decrease monotonically with increasing distance from the pile, it is imperative that received sound levels be measured in future studies in order to develop exposure metrics that correlate with mortality and different types of damage observed in fish exposed to pile driving. The only study we are aware of to date (Caltrans 2004) that was intended to measure the differential in survival between fish exposed to pile driving with a bubble curtain attenuation device turned on and those exposed with the bubbles turned off, was not able to show a statistical difference in survival between the two conditions because the sample sizes were too small. Though in a study using an explosive sound source, Keevin et al. (1997) showed that use of a bubble curtain significantly reduced mortality of caged bluegill (*Lepomis macrochirus*) during demolition of a dam and locks on the Mississippi River.*

It is also very difficult to extrapolate to pile driving from studies using other types of signals (e.g., pure tones, air guns) because such signals are not analyzed or described in a format that can be interpreted in terms of a pile-driving signal (e.g., acoustic energy flux or acoustic intensity over time). Moreover, signals used in other studies often differ markedly from those emitted by pile driving in terms of duration, rise and fall times, and frequency content (e.g., Yelverton et al. 1975; Hastings et al. 1996; McCauley et al. 2003). Thus,

> *specific signal components that affect fish may be very different in, for example, a study that uses continuous white noise vs. a study that uses impact sound exposures such as generated during pile driving.*
>
> *The authors of this report conclude that it is imperative to initiate studies that start with very basic questions about the effects on fishes from exposure to pile driving sound. Table 1* ([Exhibit 8A]…) *gives an overview of the types of studies that need to be accomplished to better understand the issues of pile driving and the biological effects caused by such signals. Note that this table is presented in much greater detail in Section V of this report (Table 5, page 49), and summarized in Figure 9 (page 73).*
>
> *It is important to note, as discussed in detail in Section V (page 42), that the body of scientific and commercial data currently available is inadequate for the purpose of developing more than the most preliminary scientifically supportable criteria that will protect fish from exposure to pile driving sound. As a consequence, such criteria are not proposed in this report. Instead, the information from earlier blast and pure tone studies has been used to develop recommendations for interim guidance to address physical injury and mortality and damage to auditory sensory cells, while recognizing the need for well-controlled studies to provide clear direction for development of scientifically supported criteria. It is critical to note, however, that the interim guidance developed must be used with the utmost caution, and that such guidance should not be used for any other signal than pile driving. The interim guidance recommended for pile driving is only applicable to that source and not for other sources such as air guns or sonars because it is based on results of effects studies that had received signals with temporal and spectral characteristics similar to those of pile driving signals.* [Emphasis in original]

In elaborating on the concept of a dual "peak" and "sound exposure level (SEL)" criteria, this paper states:

> *Because sound is a form of energy, the damage potential of a given sound environment will depend not only on its level, but also its duration. For constant sound levels this is a straightforward analysis, but if sound level varies it must be sampled repeatedly over a well-defined time window (or sampling period). In human studies, these samples have been averaged together to form a single value known as the Equivalent Continuous Sound Level or L_{eq}, which has the same energy content as a varying sound level.*
>
> *A common alternative energy metric to the L_{eq} is the sound exposure level (SEL), which is defined as the constant sound level acting for one second, which has the same amount of acoustic energy as the original sound. An SEL measurement is often used as an energy metric for a single acoustic event. Because all SEL measurements are normalized to a one second time interval, it may be used to compare the energy content of different exposures to sound. SEL*

> *is calculated by summing the cumulative pressure squared (p^2) over time and is often used as an indication of the energy dose. The unit for SEL is dB re 1µPa^2-s.*
> …
> *In the case of pile driving, there is rarely a plane wave because the sounds are produced in shallow water near shore with numerous boundaries and may interact with sound traveling in the substrate. These conditions produce a very complex sound field that does not have a simple relationship between sound pressure and particle velocity.*

Interim Criteria**.** The Working Groups second product, an "interim criteria," paper, while noting the above uncertainties, attempts to arrive at a guideline for consideration, by among other entities, regulatory agencies, pending further research clearly and admittedly needed. It published an initial draft of an "interim criteria" paper on February 28, 2006, received fairly extensive comments, and published a second draft on May 13, 2006. Both drafts propose/recommend the same dual criteria, which, again, are intended to take into account both "SEL" and peak levels (recommended to be 187 dB (SEL) and 208 dB (peak) (more specifically 187 dB re: 1 µPa^2-sec for Sound Exposure Level threshold, *and* a peak sound pressure threshold of 208 dB re: 1 µPa$_{peak}$ for any single strike.) (See Exhibit 9A for additional technical discussion of sound metrics.) The paper elaborated:

> *In the dual criterion approach adopted here, the SEL value limits the total acoustic energy fish may experience within a single impulsive sound, while the peak sound pressure level protects fish from an especially strong excursion in pressure within the sound impulse. In practice, we recommend that both SEL and peak pressure are measured during pile driving operations and that neither criterion should be exceeded. We note the likely relevance of some means of accounting for the cumulative effects of multiple exposures and the fact that peak pressure fails entirely in this regard.*

In commenting on the Working Group's initial "interim criteria" paper, NOAA Fisheries questioned a number of the paper's assumptions and extrapolations. NOAA Fisheries considered the proposed criteria arbitrary and unwarranted (based on the available science), stating: "As it now stands, such a criterion can be viewed as being arbitrary, not based on the available science, and certainly not being conservative." The primary concern expressed by NOAA Fisheries was how cumulative thresholds are set and exposure levels determined. NOAA Fisheries also noted that during one of the San Francisco Bay pile driving caged fish studies "…the data strongly suggest that fish exposed to single-strike SELs that are substantially less than the proposed 187 dB suffered considerable injury" and that "the data strongly suggest that the proposed SEL criterion is not protective of fishes and that some other method of summing the sound exposure is required."

In attempting to address these comments the second iteration of the *Interim Criteria* paper reiterated the same proposed dual criteria, but emphasized that:

> *At this point, we know nothing of the accumulation of effects resulting from strikes that are variably spaced in time. Consequently, predicting the cumulative effects of multiple pile strike exposures remains speculative. It is clear that future research, as discussed in the appendix, will be needed to add the very important variables of multiple strikes and inter-strike intervals into subsequent exposure criteria.*

Notwithstanding NOAA Fisheries' comments, the interim criteria paper concluded:

> *Based upon the best available science, and using conservative estimates, we conclude that it is reasonable and appropriate at this point to use a combined interim single strike criterion for pile driving received level exposure; an SEL of 187 dB re: 1 µPa^2 •sec and a peak sound pressure of 208 dB re: 1 µPa (peak) as measured 10 m from the source. We have considered the important issue of cumulative effects of multiple exposures, but emphasize the current absence of any empirical information which would allow cumulative effects to be taken into account. Our expectation is that our interim criteria will change as we obtain more data on effects of pile driving and other sounds on fishes. However, since these values, based upon current data, are conservative, they are far more realistic than the value of 180 dB re: 1 µPa (peak) which is currently in use, and for which there is no scientific justification.*

The paper's summary of the needed additional research is attached as Exhibit 10A.

Commission Conclusion. In addition to the lack of consensus at this time over whether and how any interim criteria would be relied upon, further lack of consensus exists between NOAA Fisheries and Caltrans on the applicability of these criteria to the subject project, including, if they are applicable, how they would be applied and measured. In addition, CDFG requests resolution of this issue before determining appropriate mitigation levels. NOAA Fisheries has provided a draft Biological Opinion to Caltrans and FHWA (which the Commission staff does not have access to as of this date), and it is unclear whether these issues will be resolved prior the upcoming-scheduled June 2006 Commission meeting. There is also a dispute between the Caltrans and NOAA Fisheries as to whether sonar monitoring of fish behavior should be deployed. Caltrans prefers direct observation by human monitors; NOAA Fisheries argues that new sonar technology make it possible to directly observe fish responses at a very refined scale (little is known about sublethal behavioral responses of fish exposed to pile-driving sound pressure) Consequently, other than in general terms as discussed in the previous consistency certification, the Commission does not have sufficient information at this time to know what mitigation measures will be proposed, and what monitoring will be conducted. Caltrans has repeatedly requested a Commission hearing by June 2006, citing the urgency of their administrative commitments to put the project out to bid soon, as well as the public safety benefits of replacing the seismically deficient bridge. Accordingly, the Commission believes these measures must be brought back to it for a public hearing and Commission action to ensure the proposed project is fully consistent with the applicable marine resources, fisheries, and environmentally sensitive habitat policies of the Coastal Act.

The Commission is clarifying in its conditions areas that need to include further details (including those plans that will need further public hearings). The conditions require Commission review of acoustic footprint monitoring plans, fish damage/behavioral monitoring plans, and offsite fisheries enhancement/mitigation plans, and Commission staff review of marine mammal monitoring plans. The conditions also clarify that the "acoustic footprint" monitoring plan will need to be clarified to provide at least as many data collection points as Caltrans provided in its Noyo River Bridge acoustic monitoring program (which contained hydrophone arrays at six different locations from the pilings (in that case, ranging between 12 m (meters) and 150 m). For the proposed project, Caltrans has proposed hydrophone arrays at 10 m, 100 m, "and various other [unspecified] locations." The above-discussed "Effects on Fish" paper notes that "Thus it is possible that at certain locations received levels of sound could be higher further from the pile than at locations closer to it and this has been observed in some monitoring data (Caltrans 2001)." Indeed, as the Commission is well aware and has observed (e.g., Mobil pier demolition acoustic monitoring), shallow water acoustics are quite complex. Substantially more than 2 locations (10 m and 100 m) are needed to verify the sound field.

The marine mammal monitoring and avoidance plan is generally adequate and can thus be delegated to Commission staff review, with one clarification: the Commission is adding a "visibility" requirement/clarification into the condition. Thus, as conditioned, this would be subject to Executive Director review and approval, and the plan must provide that, at the beginning of a day of pile driving, when biological monitors observe for marine mammals, if the visibility distance is less than the preclusion area, pile driving may not commence until visibility has improved and the observer can verify that the area is clear of marine mammals. The Commission concludes that, as conditioned (through Special Conditions 1 – 5 attached hereto, including further Commission review and analysis of acoustic footprint monitoring plans, fish damage/behavioral monitoring plans, and offsite fisheries enhancement/mitigation plans, the project would be consistent with Sections 30230, 30233, 30234, 30234.5, and 30240 of the Coastal Act.

E. Water Quality

Section 30231 of the Coastal Act provides that:

> ***The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.***

The Ten Mile River bridge replacement project is located 0.4 miles upstream from the mouth of the river at the Pacific Ocean. The 120 sq.mi. watershed consists of hilly mountainous terrain predominately forested with Coastal redwood, Douglas Fir, and Tanoak. Roadway drainage in the project area is currently conveyed within drainage swales adjacent to both sides of Hwy.1, where it is then conveyed through culverts to slopes that drain down to Ten Mile River. The proposed project holds the potential to adversely impact water quality in the Ten Mile River and its estuary due to construction-related activities and runoff from completed project features (e.g., the bridge deck, highway approaches, cut and fill slopes, and areas undergoing revegetation). The Ten Mile River is currently on the State Water Quality Control Board's 303(d) list of impaired water bodies due to sediment levels; the river's total maximum daily load (TMDL) was established by the U.S. EPA in December 2000. The North Coast Regional Water Quality Control Board (NCRWQCB) is developing a *Sediment Waste Discharge Prohibitions and Action Plan for the Control of Sediment Waste Discharges* for the Ten Mile River to address man-made sources of sediment waste discharges from new projects and existing sources.

The consistency certification, and in particular the July 2004 *Storm Water Date Report*, addresses the project's Design Pollution Prevention BMPs, measures incorporated into the project at the early design phase to minimize adverse water quality effects from the completed project:

> ***Proposed and improved cut and embankment slopes are 1:2 or flatter on the east side and 1:4 or flatter on the west side. The impervious surface (paved shoulder) area added (cumulative) to the project is less than 0.1 ha (0.25 acres), and is offset by the flatter cut slopes, thus resulting in an insignificant hydraulic difference in flow volumes or rates.***
>
> ***Cut and fill slopes will require temporary and permanent measures be taken to provide protection from erosion. Erosion control planting will be recommended by the District Landscape Architect.***
>
> ***Two existing RCP culverts (one north and one south of the bridge) will either be extended to move the outlets from the clear recovery zone or replaced along the new alignment. Downdrains will be added at the bridge abutments.***
>
> ***Preservation of existing vegetation has been maximized on the project.***

The consistency certification next examines the control of potential construction-related water quality impacts, primarily from vegetation removal, grading, and stockpiling of excavated materials for later use as

backfill. The October 2004 *Biological Assessment* for the project states that:

> ***Since the project will result in the soil disturbance of greater than one acre, construction activities will be regulated under Caltrans' Statewide General National Pollutant Discharge Elimination System (NPDES) Permit. NPDES permits for storm water discharges must meet all applicable provisions of section 301 and 402 of the Clean Water Act (CWA) . . . Caltrans has a revised Storm Water Management Plan (SWMP, May 2003) that includes new and revised best management practices (BMPs) categories, including:***
>
> > ***1. Design Pollution Prevention BMPs - Preservation of existing vegetation, concentrated flow conveyance systems, slope/surface protection, etc;***
> >
> > ***2. Treatment BMPs - Infiltration and detention basins, traction sand traps, biofiltration, etc.;***
> >
> > ***3. Construction Site BMPs - Temporary soil stabilization and sediment control, non-storm water management, and waste management; and***
> >
> > ***4. Maintenance BMPs - Litter pickup, materials handling, waste management, street sweeping, etc.***

In addition, the July 2004 *Storm Water Data Report* prepared for the Ten Mile River bridge replacement project states that the total disturbed area for the project is 10.85 acres, and because this disturbed area is greater than 1.0 acres, a Storm Water Pollution Prevention Plan (SWPPP) must be prepared for this project during the final design phase.

Caltrans reports that while the final list of specific construction BMPs for the Ten Mile River bridge replacement project is not yet developed, the following classes of BMPs are considered minimum requirements (unless later demonstrated to not be appropriate for a particular project):

- **<u>Temporary Soil Stabilization</u>: preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextiles, plastic covers, erosion control blankets/mats.**
- **<u>Temporary Sediment Control</u>: silt fence, fiber rolls, street sweeping and vacuuming, storm drain inlet protection.**
- **<u>Non-Storm Water Management</u>: illicit connection/illegal discharge detection and reporting, vehicle equipment and cleaning, vehicle equipment and fueling, vehicle and equipment maintenance.**

- **Waste Management and Material Pollution Control: material delivery and storage, material use, stockpile management, spill prevention and control, solid waste management, sanitary/septic waste management.**

The final list of construction BMPs will be incorporated into the project contract during the final design phase, depending on various site-specific factors and expected phases of project construction. Caltrans has committed to submitting the SWPPP and final list of construction BMPs to the Executive Director for his review and concurrence prior to the start of construction at Ten Mile River.

The consistency certification next addresses runoff from the proposed new bridge:

> ***Due to the natural topography of the project vicinity, the bridge needed to be designed with a vertical sag, resulting in storm water draining towards the center of the bridge. Given the necessity of this design, the California Regional Water Quality Control Board (CRWQCB) submitted a letter to Caltrans (see attached letter) approving the drainage of storm water falling on the bridge directly into Ten Mile River*** **[through vertical deck drains and/or scupper drains]*. The CRWQCB is requiring that water that falls on the bridge approaches must be diverted to a biofiltration source. . . .*** **[Exhibit 21]**

A June 2, 2005, memo from Caltrans' North Region Office of Environmental Engineering provided background information on the selection of this drainage alternative for the bridge:

> ***Caltrans investigated the potential for incorporating drop inlet inserts into the bridge deck drain inlet. However, there are no drop inlet inserts currently available on the market that are designed for use in bridge deck drains.***
>
> ***Caltrans investigated whether storm water could be collected from the bridge deck to discharge locations outside of the stream channel for treatment on land. An engineering study concluded that this alternative would require a complex set of pipe networks but that due to bridge geometry the collected storm water could not reach the upland discharge points.***
>
> ***Caltrans next investigated seeking approval from the RWQCB to allow storm water discharge off the bridge deck into the river. In August 2003, the RWQCB concurred that collection of storm water from the bridge deck would not be feasible without a significant vertical realignment of the bridge structure. The NCRWQCB conditioned its***

concurrence with the requirement that storm water falling on bridge approaches be treated with biofiltration.

To that end, Caltrans has proposed the installation of biofiltration strips at three sites adjacent to the western edge of Hwy.1 to treat storm water runoff:

For biofiltration strips, we chose available areas that will provide a broad vegetated surface that receives and discharges runoff as sheet flow. Caltrans has no minimum or maximum slope criteria for biofiltration strips but hydraulic sheet flow criteria indicates that the maximum length in the direction of flow is approximately 300 feet and may be much less due to flowline grades and surface roughness. Up to this limit biofiltration strips should be as long in the flow direction as site conditions allow. Other considerations are having design side slopes as long and as flat as ROW and maintenance requirements allow. The east side is not wide enough to incorporate bio-strips. The bio-strips **[on the west side of Hwy.1]** ***south of the bridge are 361 and 354 sq.yds., and the bio-strip north of the bridge is 1683 sq.yds.***

The proposed Ten Mile River bridge replacement project contains design features to minimize water quality impacts, and will include an up-to-date package of construction-related best management practices to ensure that the multi-year construction and demolition activities will not degrade water quality in the Ten Mile River. The Commission's water quality staff reviewed the project's water quality protection measures – including the technical information supporting the proposed bridge drains and biofiltration strips – and concluded that the project will not lead to adverse water quality effects to the Ten Mile River and the biological resources of its estuary. Caltrans has committed to submitting the project's SWPPP and final list of construction BMPs to the Executive Director prior to the start of construction at Ten Mile River. This will allow the Commission staff an additional opportunity to review and comment on the adequacy of the final water quality protection measures. Therefore, the Commission finds that the Ten Mile River bridge replacement project is consistent with the water quality policy of the CCMP (Section 30231 of the Coastal Act).

The Commission additionally finds that because Caltrans relies on a subsequently-selected contractor to prepare the Storm Water Pollution Prevention Plan(SWPPP) "downstream" of the project bidding, Special Condition 12 (Water Quality Protection Plan/SWPPP) is necessary to ensure that prior to issuance of the coastal development permit, Caltrans submits for the review and approval of the Executive Director, a Water Quality Protection Plan that will form the template for the SWPPP, and against which the Executive Director will subsequently review the contractor-prepared SWPPP for consistency with the Water Quality Protection Plan and for the adequacy of the SWPPP/Best Management Practices to carry out the Water Quality Plan. Special Condition 12 also specifically incorporates the requirement that while dewatering

operations are underway that pump water out of areas subject to turbidity or the placement of wet concrete, the water shall be pumped to a holding tank and tested to ensure that it meets the water quality standards deemed protective of fish and water quality, including pH levels, before the pumped water is discharged back into the Ten Mile River.

In addition, the Commission notes that Caltrans has not ruled out the use of timber temporary piles. Therefore the Commission finds it necessary to attach Special Condition 10 (Temporary Piles), which requires that no creosote treated piles shall be placed in any area of the project site where chemicals leaching from the piles may reach the waters of the Ten Mile River, that piles used to construct the temporary trestles shall be of concrete, steel, composite, untreated timber, or timber treated with a wood preservative approved by the Department of Fish and Game for use in marine waters, and that all temporary piles placed shall be pulled up and completely removed without digging them out or cutting them off at the mudline.

Special Condition 7 (Construction Related Requirements), Special Condition 8 (Erosion Control and Revegetation) and Special Condition 9 (Drainage Structure Final Plan) contain a number of requirements protective of water quality, including the obligation to properly maintain drainage structures and repair any erosion that may result from the failure of such structures. The Commission finds it necessary to impose these conditions to ensure that the water quality of the Ten Mile River and other coastal waters are not polluted by runoff transporting excess sediment and that construction wastes and other debris do not reach the waters of the river.

The Commission finds for all of the reasons set forth above that the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act protective of water quality.

F. Environmentally Sensitive Habitat Area

The Coastal Act provides the following:

Section 30240.

(a) Environmentally sensitive habitat habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

In addition to the wetland and other marine resources examined in Section B above, additional environmentally sensitive resources are present in or

adjacent to the project area uplands south of Ten Mile River which could be affected by construction activity (the north bank of the river rises sharply and is minimally vegetated). As reported in Caltrans' October 2004 *Biological Assessment* prepared for the California Department of Fish and Game (CDFG), the federal and state endangered Menzies' wallflower (*Erysimum menziesii*) is a low-growing, succulent, biennial to short-lived perennial herb that occurs near the south side of the logging haul road on the south bank of Ten Mile River. The federally endangered and state threatened Howell's spineflower (*Chorizanthe howellii*) is a flowering, annual herb in the buckwheat family, and is discontinuously distributed within the dunes south of Ten Mile River. Both these plant species are endemic to coastal dune habitats of central and northern California. In Caltrans' August 24, 2005, memo to CDFG, it was reported that two additional sensitive plant species were observed in the general project vicinity. Lyngbye's sedge (*Carex lyngbyei*) was observed along both banks of the river, primarily upstream of the bridge. Round-headed Chinese houses (*Collinsia coymbosa*) was observed south of the river and over 400 feet downstream of the existing bridge and will not be affected by the project. The consistency certification reports that migratory birds, including cliff swallows and purple martins, nest and breed on the existing bridge. Sand dune habitat extends from near the southern end of the existing bridge westward to the ocean shoreline in MacKerricher State Park, and in locations provides nesting habitat for the endangered Western snowy plover.

Construction of the proposed project could adversely affect the aforementioned upland sensitive resources, due primarily to grading for realignment of the Hwy.1 to the new bridge, clearing of vegetation in the realignment corridor, and construction of trestles, falsework, and access roads to support new bridge construction and existing bridge demolition. However, the consistency certification and Caltrans' August 24, 2005, memo to CDFG documents provide the following documentation that the project will avoid sensitive habitat areas:

> ***Howell's spineflower. The project had originally proposed to use an area near the existing population of Howell's spineflower to access the existing bridge during the demolition phase of the project. It has now been determined that the previously discussed access road leading from the haul road will not be used. In addition, construction access for demolition of the existing bridge is now confined to 48 feet west of the existing bridge. This western boundary of the work area avoids all of the existing spineflower as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the plant's current population.***
>
> ***Menzies' wallflower. As discussed above, construction access for demolition of the existing bridge will be confined to 48 feet west of the***

existing bridge. The western boundary of the work area avoids all of the existing wallflower as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the plant's current population).

Lyngbye's sedge. The plant may be temporarily affected by the placement of trestle piles. Any impacts to the species will be minor and temporary. It is anticipated that any depressions left in the substrate subsequent to removal of temporary piles will quickly fill in during high flows along the river's banks and be repopulated with the adjacent species, including Lyngbye's sedge.

In addition, the populations of Menzies' wallflower and Howell's spineflower will be fenced off to prevent personnel, equipment, or materials from entering these areas throughout the construction and demolition period. As discussed in Section B above, all wetland habitat disturbed during project construction will be restored to pre-project conditions, either through natural re-vegetation or planting by Caltrans. Populations of Lyngbye's sedge adversely affected by construction would be included in these wetland restoration efforts.

Nesting for migratory and resident birds will be protected during construction and demolition activities (Exhibits 22 and 23). Caltrans provides that:

- **Migratory birds are protected under the Federal Migratory Bird Treaty Act. The Ten Mile River bridge supports a large colony of cliff swallows that nest primarily under the overhang of the existing bridge. The new bridge would have a ledge (i.e. overhang) that would allow swallows to nest as they currently do on the existing bridge. In addition, the new bridge would have holes underneath the bridge deck similar to those found under the existing bridge. These holes would be available for nesting by purple martins and other cavity nesting birds.**

- **In order to protect bridge nesting birds during demolition of the existing bridge, the construction and removal of temporary falsework and/or temporary platform to catch the bridge pieces as well as the removal of the superstructure itself, would be restricted to August 1-March 31 of any year of construction. The falsework and platform are confined to this work window (when cliff swallows are not present) given that they could provide angles for the birds to construct a nest.**

- **Bridge demolition may extend beyond March 31 if birds have not begun nesting yet and depending on the type of work to be done and the time required to finish it. Additionally, if nesting is shown to be**

complete (fledglings are not detected), prior to August 1, demolition of the bridge may begin earlier than August 1.

- **Riparian vegetation on the project site also supports nesting migratory bird species as well as resident bird species. Riparian vegetation that would be affected during the construction project would be cleared between September 1 and February 28 of the first year of construction to avoid affecting any nesting activity.**

The *Ten Mile River Bridge Revegetation Plan* (September 2005) includes measures that will ensure that environmentally sensitive habitats adjacent to construction areas will continue to be protected against adverse effects from ground disturbance:

- **Restoration of self-sustaining native vegetative cover, appropriate to the habitat type, across the approximately 1.8 acres of upland habitat impacted by grading and construction, and including restoration of the existing maintenance turnout at the south end of the bridge and all existing roadbed areas outside of the new alignment of Hwy.1 north and south of the bridge.**

- **Where the project results in cut and/or fill areas, the top six inches of native topsoil will be removed and stockpiled. Salvaged topsoil will then be placed at a minimum two inch depth on all new fill slopes and in areas where existing roadway is to be abandoned and obliterated (asphalt paving and base removed, roadbed then ripped to a depth of ten inches). Replacement of native topsoil will prepare the area for planting.**

- **Adjacent to the roadway, revegetation will consist solely of erosion control effort and hydroseeding. In these upland areas the seed mix will be comprised of grass and wildflower species native to the project site.**

In conclusion, the proposed bridge replacement project is designed to minimize significant adverse effects on environmentally sensitive habitat within and adjacent to the project zone. No construction work or disturbance will occur in areas where federal- and state-endangered plant species occur; fencing will be installed prior to the start of construction to prohibit any entry into these mapped areas throughout the multi-year construction period. Nesting for migratory birds will be protected during bridge construction and demolition activities. The proposed bridge includes design elements that will allow cliff swallows to nest as they do on the existing bridge. Demolition of the existing bridge will occur between August 1 and March 31 when cliff swallows are not present. Clearing and removal of vegetation and riparian habitat will occur between September 1 and February 28 of the first year of construction to avoid adversely

affecting nesting birds in the project area. The project revegetation plan includes provisions for replanting and restoring all disturbed areas to native vegetative cover, restoring all roadbed areas outside the new alignment of Hwy.1, and monitoring and remediation measures to ensure that environmentally sensitive habitats are restored to optimum, pre-project conditions in a timely manner. Therefore, the Commission finds that the Ten Mile River bridge replacement project will protect environmentally sensitive habitat and is consistent with the environmentally sensitive habitat protection policy of the CCMP (Section 30240 of the Coastal Act).

As can be seen from the excerpts from the adopted findings for the Commission's conditional concurrence with CC-074-05, Caltrans has undertaken a number of revisions of their draft revegetation plan, through the most recent plan dated September 2005, received by Federal Consistency staff September 20, 2005. The final plan remains somewhat vague, however about specific measures such as a weeding schedule ("early weed control will be implemented until planted materials are well established"), which should be prepared in detail as part of the plan and should require that weeding take place every other month for the first year and quarterly thereafter according to Commission's Senior Staff ecologist who reviewed an earlier draft of the revegetation plan in August 2005 and made a number of specific recommendations for revisions. Dr. Dixon also recommended that specific criteria be developed to measure success, including height, new growth, and reproduction, and that success criteria be improved (only plant health or vigor was cited in the Caltrans September 2005 draft). Other recommendations included expanding success criteria that relate to species diversity and to percent ground cover and abundance of non-native plants, and developing a sampling plan with a prescribed statistical analysis plan, and use of a reference site to determine the sampling replication necessary to detect specified biologically significant differences. The Commission therefore imposes Special Condition 8 (Revised Erosion Control and Revegetation Plan) to ensure that the recommendations of the Commission staff ecologist are incorporated fully in the final plan for the review of the Executive Director.

The Commission also finds it necessary to impose Special Condition 7 (Construction Related Responsibilities), Special Condition 13 (Biological Monitoring), and Special Condition 21 (Final Disposal Plan) which, fully implemented, will ensure that site activities are undertaken in a manner that avoids unauthorized access to sensitive habitat areas, that a qualified biological monitor oversees project activities that may affect environmentally sensitive habitat or species, and that debris, graded spoils, and other wastes generated by the project are disposed of in a manner that does not adversely affect sensitive resources.

Conclusion: The Commission finds that the proposed project, as conditioned, is consistent with the Chapter 3 policies of the Coastal Act protective of environmentally sensitive habitat and species.

G. Visual Resources

The Coastal Act provides the following:

> ***Section 30251. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.***
>
> ***Section 30254. New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road . . . .***

The proposed bridge will be located in an area of rural Mendocino County marked by spectacular, expansive coastal views. The current bridge proposal will serve the dual purpose of providing for the Coastal Trail and providing a safe viewing destination for coastal visitors – including handicapped coastal visitors – who would be attracted to the bridge to enjoy the spectacular views available from the deck. The photograph of the bridge and environs that is available on the Coastal Records Project site shows the panoramic coastal view potential that will be available on the new bridge deck. For those with internet access, the website for the Ten Mile River Bridge is: http://www.californiacoastline.org/cgi-bin/image.cgi?image=11273

Caltrans' new proposal for the bridge design includes an ADA-compliant corridor separated from traffic by a crash-tested guard rail. This design ensures that the views available on the existing bridge deck remain available to the public, but are significantly improved through the enhanced safety features of the proposed project. In addition to making the Coastal Trail corridor wheelchair-safe, the use of the guard rail and widened corridor (5-ft.-wide) will make the bridge safely available to the coastal visitor who is frail, shepherding small children, or pushing a stroller. As stated previously in the public access section, the Commission finds it necessary to impose Special Condition 23 (Final Plans) to ensure that these features are finalized in the project plans.

Caltrans has also revised the proposal to include a pedestrian outer rail of the "picket" style that was installed on the Noyo Bridge in Fort Bragg. That rail will be approximately 48 inches high. The pedestrian corridor will be five feet wide, and on the inner edge a guard rail (ST-10 style) 31 inches high and 18 inches wide will separate the now-proposed 6-ft.-wide paved traffic shoulder from the pedestrian corridor. The outer

rail on the eastern (upstream) side of the bridge is still proposed as the ST-20 type with the see-through horizontal metal rails with the additional rail necessary to achieve the 54-inch bicycle safety height that Caltrans believes is necessary. Caltrans also proposes approximately 600 linear feet of guard rail off the bridge, along the realigned highway section subject to the PWP/Specific PWP Project, and two 24-foot-long QuadGuard crash cushions, one on the northwest side of the bridge, and one on the southwest side of the bridge. These would be installed at the end of the bridge. The Commission's review of the overall design elements of these features will ensure that a final project design compatible with the project's highly scenic setting is approved, pursuant to the requirements of Special Condition 18 (Final Rail Design). The Commission also finds it necessary to impose Special Condition 19 (Permanent Signage/Signal/Lighting Plan; Limitation on Future Development) to ensure that nonessential signage, displays, or other accessory devices are not placed on the bridge where such features could interfere with the views from the bridge. In addition no permanent lighting on the bridge is proposed by Caltrans and Special Condition 19 prohibits the installation of lighting features (such as overhead spotlighting) on the bridge unless Caltrans obtains an amendment to CDP 1-06-022 for such development. Special Condition 19 would allow very minor lighting that is the minimum necessary for essential safety purposes).

As discussed in the public access section, Caltrans continues to meet with the Commission's "Road's Edge" Subcommittee to resolve visual impact concerns associated with railings and other design features associated with roadway edges. The final design recommendations of this subcommittee would be incorporated into an amendment of the coastal development permit and would be returned to the Commission for final public action, pursuant to Special Condition 18 (Final Rail Design). Therefore, the Commission's review of the final design elements need not be resolved at the present time.

As cited above, the Coastal Act and specific policies of the LCP require Highway 1 to remain a scenic, rural, two-lane road. The Ten Mile River Bridge and environs are designated Highly Scenic in the certified LCP, and therefore the project location fully meets the test of being a Highway 1 segment in a scenic, rural, two-lane location that must be preserved as such. The Commission has found in the past that the operative guidance of Section 30254 of the Coastal Act is that the visual amenities – the scenic charm and character of the highway – are what the policy seeks to preserve. Thus the Commission must weigh carefully the "creep" of widened paved areas that while strictly speaking are not additional lanes, include enough additional paved surface that the visual affect is the same. The Commission finds in the case of the current Ten Mile Bridge replacement proposal, that the addition of the pedestrian corridor provides such a significant amenity for the enjoyment of the spectacular views of the area, and is actually a component of the Coastal Trail, for pedestrians – rather than an additional highway lane. The paved shoulders of greater than the 4-ft.-wide standard applicable in the County's certified LCP portion of the Mendocino Highway 1 route is limited mostly to the bridge deck, where the difference in width on such a long bridge is less visually apparent than might otherwise be the case. In addition, the shoulder tapers from 6-ft.-wide at the ends of the bridge back to the width of the existing highway at the point of

conformity along the shortest overall transition length that Caltrans designers could manage consistent with applicable safety standards.

Finally, Special Conditions 6 (Permit Obligations), 7 (Construction Responsibilities), 8 (Erosion Control and Revegetation Plan), 9 (Drainage Structure Maintenance Responsibility), and 15 (Authorized Development Only), fully implemented, will ensure that project activities and long term maintenance are undertaken in a manner fully protective of the visual resources associated with the project site and environs.

Therefore, for all of these reasons, the Commission finds that the proposed bridge design, as conditioned to require permanent protection of public access to the pedestrian corridor, to limit extraneous signage and lighting and allow only the minimal signage and lighting necessary for safety, t return the bridge rail design to the Commission for final consideration, and to construct and maintain the project in a manner protective of visual resources, will combine to ensure that the proposed project as conditioned is consistent with the Chapter 3 policies protective of visual resources and of the rural, two-lane character of Highway 1 in scenic coastal areas.

The text below contains the adopted findings for the Commission's conditional concurrence with CC-074-05 regarding visual resources.

1. Background. The Ten Mile River – along with its estuary and adjacent coastal dunes and uplands that are viewed by travelers along Highway 1– is an outstanding example of the type of scenic area where new development should be subordinate to the setting (Exhibit 4). The expansive and rolling landscape, the backdrop of the Coastal Range and the distant Pacific Ocean, and the minimal level of residential development at the Hwy. 1 crossing of Ten Mile River is the type of setting for a stretch of rural two-lane Hwy. 1 that the Coastal Act was designed to protect.

The proposed bridge replacement project could adversely affect visual resources – both temporarily and permanently – at and adjacent to the project site due to temporary construction activities (e.g., access roads, staging areas, vegetation removal, grading, trestles, falsework, equipment, demolition activity, aerial transmission lines, cut and fill slopes undergoing revegetation) and design features of the new bridge (e.g., wider bridge deck, wider paved shoulders on the Hwy.1 approaches to the bridge). However, the project also includes elements that will improve visual resources at and adjacent to the project area (e.g., removal of overhead transmission lines that cross the river just east of the existing bridge, reduced number of piers supporting the bridge, a haunched girder design, improved see-through characteristics of the bridge railing).

The consistency certification states that the bridge replacement project was designed to avoid and minimize potential effects on visual resources:

> ***This included an analysis of bridge alignment, bridge abutment slope angles, and bridge railing types, resulting in a design that would minimize tree impacts, and provide a low profile and unobtrusive structure as possible. Trees, shrubs, and wetland vegetation removal would be required. Four cypress trees and one willow would be removed south of the bridge on the east side of the highway, and one pine would be removed north of the bridge on the east side of the highway.***
>
> ***Replanting of native trees and vegetation (including in the temporarily affected and newly created wetland areas) would occur . . . .***

The potential visual resource impacts associated with the Ten Mile River bridge replacement project were analyzed further by Caltrans in its June 2005 *Ten Mile River Bridge Visual Assessment*. This document provides a summary of present conditions in the project area:

> **. . . The overall visual quality of this area is extremely high; generally speaking the viewshed of the Ten Mile River is intact as far as development is concerned . . . In its current condition, the Ten Mile River Bridge seems to fit in well with the surrounding landscape. The existing bridge is a simple structure and allows highway travelers a variety of views as they approach and travel across the bridge. Highway travelers get a unique perspective when approaching the bridge from the south as they approach the bridge at a higher elevation, and at such an angle the bridge profile is seen with the river outlet and the coast as a backdrop . . . .**
>
> ***The project also borders MacKerricher State Park . . .* [There] *are areas within the boundaries of the State Park that have views of the project area.***

2. <u>Impacts and Mitigation</u>. The *Visual Assessment* notes that the new bridge would be located just east of the existing structure and would generally mimic the profile of the existing bridge, although the new bridge would be several feet higher at the southern end and several feet lower at the northern abutment. The Hwy. 1 southern approach will be realigned to the east by approximately 65 feet in order to connect with the new bridge. As a result, the roadway must be extended 340 feet northward on a new fill slope built across a portion of the bluff that slopes down to the haul road parallel to and south of Ten Mile River.

The *Visual Assessment* reports that the proposed bridge will include a "haunch girder" type design rather than the typical "box girder" design (Exhibits 24 and 25):

> **The design of the structure is very important to the visual impacts any bridge would pose. The Caltrans standard is a box type girder with round piers . . . A haunch girder system with rectangular piers were used in all simulations and is recommended in this situation. The haunch girders make the structure seem less massive through the tapered girders and chamfered corners. This type of design seems to be more organic, and makes the bridge lines softer. A subtle design is best suited given the tranquil and undeveloped setting that makes this location unique.**

The *Visual Assessment* next describes the approach used to assess the potential visual resource impacts generated by the proposed project:

> **The project area was analyzed by assessing the different viewer groups, determining where their views of the project occur, and to what extent those views will be affected. Viewpoints and viewers were identified and described. Photo simulations were done for selected views to show existing compared to proposed conditions in order to illustrate impacts both visually and descriptively.**

Two of the viewer groups are comprised of residents living in close proximity to the bridge on the north bank of the river and users of private roads and lands south of the river. The remaining three groups are: (1) all recreational users of the Ten Mile River corridor (i.e., anglers, boaters, nature enthusiasts, etc.); (2) users and viewers from MacKerricher State Park, as there are several places within the park with views of the project area; and (3) north and south bound travelers on Highway 1, including those in vehicles and on bicycles.

Based on the design of the replacement bridge and the eastward realignment of the Hwy. 1 southern approach to the new bridge, the *Visual Assessment* states that the main visual resource impacts to the three aforementioned viewer groups from public lands, waters, and roads are caused by the fill slope at the south approach and the wider bridge deck:

> ***Impacts to* [the recreational users of the river] *will vary depending on the vantage point of the particular user. In general, this alternative would introduce a longer bridge and a north-facing fill slope to the east of the existing bridge. The fill would be noticeable to viewers in the river corridor and would displace mature vegetation. The longer and thicker structure may be more visibly more intrusive than the existing bridge, but the new structure would have fewer supports in the river and longer spans . . . .***
>
> ***There are areas within the MacKerricher State Park with views of the Ten Mile River corridor including the Ten Mile River Bridge. The majority of these views are from the top of a sand dune to the***

southwest of the bridge, although the bridge also can be seen from the beach and the park directly west of the bridge. The Ten Mile River Bridge can also be seen from the Old Haul Road which now serves as a trail in and out of the State Park. The alignment of Alternative C would move the bridge further away from the State Park and would not impact the views from the park users. Although the profile is at a higher elevation it mimics the profile of the existing and would not be a negative impact from this distance. The fill slope may be less visible from this side of the bridge.

Views for the travelers of State Route 1 would be changed significantly. As the bridge is now, highway travelers have fairly clear views of the Pacific Ocean and MacKerricher State Park to the west, as well as the Ten Mile River corridor to the east. The proposed replacement bridge, due to wider shoulders, will reduce views to the east and west of the bridge . . . .

The *Visual Assessment* recommends – and Caltrans has incorporated into the project – the following mitigation measures to minimize visual resource impacts:

The introduction of the fill slope on the south bluff would pose a mitigable visual impact. Much of the mature vegetation that currently occupies this slope would be removed, along with the mound that now serves to buffer views to the highway from viewers from the north of the river corridor. The slope would extend to the south side of the Old Haul Road.

All earthwork should be done in a manner to help it blend into the surrounding landscape through slope rounding and contour grading. Replanting of the slope would help restore the slope to a similar state and improve the view of the slope. The North Region Landscape Architect has recommended the use of 2:1 (H:V) or flatter on all slopes. This is suggested to maximize the ability for new plants to get established. Revegetation shall be part of this project, in order to restore what vegetation has been lost and to stabilize disturbed areas.

3. <u>Bridge Railing</u>. The proposed replacement bridge includes installation of the Type ST-20 "see-through" bridge railing. The *Visual Assessment* states that:

[Caltrans] ***North Region Office of Landscape Architecture recommends the Type ST-20 for use on the Ten Mile River Bridge due to its optimal "see-through" capability of 68%. Use of the ST-20 bridge rail will improve views of the Ten Mile River and the middle and background compared to the current bridge rail used on the existing bridge structure. The Type-80 is acceptable for use since there is an***

> ***opportunity for concrete surface treatment which helps the structure blend into the surrounding visual environment. Both railing types accommodate bicycle traffic which is required due to State Route 1 being part of the Coastal Bike Trail. . . .*** **[Exhibit 26]**

The *Visual Assessment* also includes a June 3, 2005, revised memo prepared by the Caltrans North Region Landscape Architect, which further addresses the proposed bridge ST-20 railing and states in part that:

> ***Views to the east from the*** **[new]** ***bridge will include Ten Mile River in the foreground, the coastal plain in the middle ground, and the Coast Range in the background. To the west, Ten Mile River, sand dunes and the beach are visible in the foreground and the Pacific Ocean is visible in the middle and background. Quality of the foreground views towards the west will depend on the level of transparency of the bridge railing selected.***
>
> ***The ST-20 bridge railing type was approved for use in 2004. This railing type provides for optimum visibility of the surrounding landscape. The ST-20 is designed for use on bicycle and pedestrian corridors. The overall structure height including the bicycle railing is 54 inches. The main railing height is 46.7*** **[inches]** ***with four 3 to 4 inch thick horizontal rails and a 2 inch thick bicycle rail above the main rail structure. The bicycle rail is attached to the vertical posts. The concrete foundation is 5.9 inches high. The mostly see through vertical posts are 11 inches thick and are spaced at approximately 9.8 feet. There is a total of 32.2 inch high window between the posts, rails, and foundation. When viewed from the highway, the ST-20 has 68% window area and 32% solid surface.***

The aforementioned June 3, 2005, Caltrans memo also examined potential alternative railings for Ten Mile Bridge:

- ***The Type-80 is 31.8 inches high with a 11.8 inch horizontal concrete rail and a 9 inch high concrete foundation. The 15 inch thick posts are concrete and spaced at 10 feet and there is an 11 inch window between the railing and the foundation. When viewed from the highway, Type-80 has 35% window area and 65% solid surface. A 23.2 inch high bicycle railing will be attached to the top horizontal rail which is a requirement on designated bicycle routes.***

- ***The ST-10 rail is 32.6 inches high with two 4 inch high horizontal steel rails and a six inch high concrete foundation. The steel posts are spaced at 10 feet and there is a 18.7 inch window between the posts, rail and foundation. When viewed from the highway, the ST-10 has 57% window area and 43% solid surface. Although this***

> ***railing provides for the best views of the surrounding landscape, the design does not allow for the construction of a bicycle safety railing . . . The ST-10 rail is designed for vehicular traffic only and is not suitable for pedestrian or bicycle use.*** **(On the Noyo River Bridge, the ST-10 rail separates vehicle traffic lanes from a pedestrian pathway on the bridge and a taller picket railing fence is installed on the outer edges of the bridge deck for pedestrian safety.)**

The Commission also received a comment letter (Exhibit 16) opposing use of the ST-20 railing on the replacement Ten Mile River bridge. The letter includes an attachment specific to Caltrans' proposed Greenwood Creek bridge further south in Mendocino County, but the author states in his letter that, "All of the information, citations, and argument that I make in it are equally relevant to the 10 Mile Bridge." The commenter – while not supporting combination auto-bicycle rails on Hwy.1 rural bridges – states that where such a rail makes sense, a more transparent and lower railing (48 rather than 54 inches) should be designed. Regarding the replacement Ten Mile River bridge, the commenter recommends reducing shoulder widths to four feet, installing a sidewalk on the bridge, installing the ST-10 railing to separate vehicle traffic and pedestrians, installing a newly-designed pedestrian rail incorporating curved and arched elements found on historic Hwy.1 bridges, and incorporating into the project the Commission's 2001 comments to Caltrans on the design of rails for use in scenic coastal areas (Exhibit 27).

During the Commission's discussion of the proposed vehicle shoulder widths on the bridge and its subsequent determination that separated pedestrian pathways are required on both sides of the bridge, the Commission also analyzed the proposed ST-20 multi-use railing. Several Commissioners expressed the view that the proposed version of this rail was not appropriate for the Ten Mile River bridge due in large measure to its industrial-looking design. It was the sense of the Commission that a more esthetically-pleasing railing would be needed for the proposed bridge in order for the Commission to find the project consistent with the scenic and visual resource policies of the Coastal Act. Given the Commission's condition regarding separated pedestrian pathways within the eight-foot-wide shoulders on both sides of the bridge, a revised railing system will consequently be required and reviewed under coastal development permit applications. Based on Commissioner comments, should the currently proposed version of the ST-20 rail be an element of future coastal development permit applications for the replacement bridge, it is doubtful that this version of the rail could be found consistent with the scenic and visual resource policies of the Coastal Act.

4. <u>Conclusion</u>. The proposed Ten Mile River bridge replacement project is located in a highly scenic coastal area and involves construction on a rural, two-lane section of Highway 1. As a result, the project elements must be

designed, constructed, and operated in a manner that avoids creating significant adverse effects on public views of the Ten Mile River, its immediate environs, and the distant Pacific Ocean. The replacement bridge will be located immediately east of the existing bridge and is designed to mimic its height above the river, its horizontal and vertical geometric curves, and the length of the river crossing. Visual design improvements include haunch girders to soften the more rectangular look of the existing bridge superstructure, and fewer bridge piers within the river and its south bank. The bridge itself will not introduce any new, significant, adverse impacts on visual resources.

The aerial transmission lines that cross the river immediately east of the existing bridge will be removed and placed inside a conduit that will run within the new bridge superstructure, thereby improving the views up the valley of the Ten Mile River. Cut and fill earthwork and vegetation removal is required for the realignment of the Hwy. 1 approaches to the new bridge, including a fill slope to extend the southern approach beyond the existing edge-of-slope. However, the project requires no significant landform alteration or retaining walls to support realigned sections of Hwy.1, and cut and fill slopes will be constructed at 2:1 ratio (horizontal: vertical) to reduce the footprint of ground disturbance and to support the revegetation work that will occur on all disturbed areas. The new fill slope at the south approach will create a temporary visual impact, primarily from the north and from the river upstream of the new bridge, until native vegetation becomes established on this slope. The visual resource impacts from these project elements are adverse in the short-term but are not significant in the long term due to the restoration of disturbed areas that is incorporated into the project.

The proposed project includes eight-foot-wide shoulders on the replacement bridge and shoulder widths off the bridge in the project area that range between eight feet and less than one foot (See Section A.3 for additional details on project shoulders). The potential impacts on visual resources from the widened shoulders and the proposed ST-20 railing design arise from two geographical perspectives: (1) views down to the river from vehicles crossing the bridge could be affected by the wider bridge deck and the ST-20 rail design; and (2) views of the Hwy. 1 corridor in the project area from those traveling on Hwy. 1 could be affected by the wider paved right-of-way and the rail design. While the wider bridge deck will make it more difficult to gaze directly down onto the Ten Mile River, the views that grab ones attention while crossing the Ten Mile River bridge are primarily those in the middle ground and in the distance: the upper Ten Mile River Valley backed by the Coast Range, the lower Ten Mile River and its estuary, the sand dunes of MacKerricher State Park, and the distant Pacific Ocean. Any adverse impact on these visual resources from this perspective due to the wider bridge deck would be insignificant, but views from and towards the bridge would be adversely affected by the proposed

installation of this industrial-looking ST-20 rail design. As discussed previously in this report, the Commission's conditional concurrence calls for Caltrans to revise the project to include pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge (and as a result, to provide a more esthetically-pleasing railing system for the bridge).

The more challenging question from the Coastal Act perspective is whether the widened shoulders will significantly and adversely affect scenic views of the Hwy.1 corridor itself for those traveling north or south on the roadway, be they in a vehicle, on a bicycle, or on foot. The existing bridge is 26 feet wide; the proposed bridge would be 43 feet wide, a sixty-five percent increase in width. (The wider bridge will provide shoulders for bicyclists, disabled vehicles, and Caltrans maintenance vehicles, and as a condition of the Commission's concurrence, separated pedestrian pathways within the eight-foot-wide shoulders on the bridge.) Existing shoulders off the bridge in the project area range in width between 0.7 and 4.7 feet. The proposed project will increase the upper end of that range to eight feet in order to match the connection with the new bridge. However, as discussed previously in this report (Section A.3), Caltrans agreed to a Commission staff request to significantly reduce the length of eight-foot shoulders off the bridge in all four quadrants, and in the length of the eight- to four-foot transition shoulders on the bridge approaches. This reduction in the extent of proposed paved right-of-way off the bridge reduces the footprint of the project – and the potential visual impact – while still providing the public access improvements of a wider shoulder off the bridge for bicyclists and pedestrians and the safety features noted above.

As discussed previously, the widening of paved shoulders along the Hwy.1 approaches to the proposed Ten Mile River bridge does not require significant landform alteration or massive vegetation removal, and does not involve fill of wetlands or construction in environmentally sensitive habitat. The visual appearance of the new roadway corridor will be different from that which exists today, but because the existing roadway is not physically constrained by the landscape through which it passes (unlike many stretches of rural, coastal Hwy.1 that are squeezed by steep cliffs or rugged topography, more tightly curved in their geometry, or hemmed in by the shoreline or sensitive habitat), any adverse effect of this new corridor would not be significant. The landscape at this location is a widening river valley where Hwy.1 drops down to the bridge from the north and south, and where the scenic coastal views that capture a traveler's attention are focused not on the roadway but away from the road. Hwy.1 at and approaching the crossing of Ten Mile River would remain a scenic two-lane road, albeit wider on the new quarter-mile-long bridge and gradually wider on the approaches to the bridge.

The proposed ST-20 bridge railing is designed to provide safety for vehicles, bicyclists, and pedestrians on the multi-use Hwy.1 crossing of the Ten Mile River. When viewed from the highway, this rail has a 68% window area and 32% solid surface and will not adversely affect views up-valley or west towards the Ten Mile River estuary, the dunes of MacKerricher State Park, or the Pacific Ocean. However, and as noted previously, the industrial-looking design version of this rail as proposed would adversely affect scenic visual resources from and towards the bridge. Lastly, construction and demolition activities that will occur over a three-year time period will affect scenic views in the project corridor. While these latter effects may be adverse at times, they are unavoidable and temporary in nature.

In conclusion, the Commission finds that if modified in accordance with the Commission's conditional concurrence to require submittal of revised plans for the project via coastal development permit applications that provide for pedestrian pathways separated from vehicle traffic lanes and located within the eight-foot-wide shoulders on both sides of the bridge, and with the resulting need for a redesigned and more esthetically-pleasing rail system for the bridge, the Ten Mile River bridge replacement project could be developed in a manner which would minimize permanent and temporary adverse impacts on public views along this section of Highway 1, be compatible with the character of the surrounding area, minimize landform alteration, include adequate measures to mitigate unavoidable impacts, and would be consistent with the scenic and visual resource policies of the CCMP (Coastal Act Sections 30251 and 30254).

H. Cultural Resources

Section 30244 of the Coastal Act provides that:

> **Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.**

The* Statutory Exemption Determination Form *prepared by Caltrans for the proposed project addresses in part the potential for cultural resources in the project area:

> **The Area of Potential Effect (APE) for this project has been identified, and includes all construction access routes, temporary construction easements, disposal site, existing and proposed right of way and staging areas for the proposed project. The review of Caltrans cultural resource records indicated that no cultural resources have been previously recorded within the APE. During field surveys by the Caltrans District Archaeologist, no cultural resources were**

observed within the APE, and no known historic properties or historical resources would be affected by the project. Native American consultation also determined no resources of concern within the APE.

An Historic Property Survey Report (HPSR) with findings of No Historic Properties, and Properties Not Eligible For Inclusion In The National Register, has been prepared and signed by the appropriate Caltrans Professionally Qualified Staff, the Environmental Branch Chief, and the Project Manager. The HPSR includes a Historic Resources Evaluation Report and an Archaeological Survey Report supporting the HPSR Findings. The State Historic Preservation Officer has submitted a letter concurring with these findings. The proposed project, therefore, would not involve any significant impacts or adverse effects to any historic, architectural, or archaeological properties.

Further archaeological study may be necessary if the proposed area of work, or work plan, is altered. Additionally, in the event that archaeological materials are encountered during construction activities, Caltrans' policy requires that work be immediately halted in the area of the find until it can be evaluated by a qualified archaeologist.

The proposed Ten Mile River bridge replacement project would occur primarily in a previously developed area along the Highway 1 corridor. The bridge and highway approaches would be realigned to the east approximately 65 feet, a private driveway east of Highway 1 and north of the river would be relocated further to the east, and new pilings would be driven to support the new bridge. All of these activities hold the potential to disturb previously unidentified cultural resources. However, given the cultural resources surveys conducted by Caltrans, Native American consultation, State Historic Preservation Officer concurrence, and Caltrans' commitment to stop work and undertake additional consultation should cultural resources be discovered during construction, the project does not hold the potential to adversely affect cultural resources.

As stated above, a Caltrans staff archeologist has surveyed the project area and determined that there is no evidence in available cultural resource records, or in the field, to suggest that cultural remains are located within the area that would be excavated or otherwise disturbed to construct the proposed project. Nevertheless, it is possible that excavation activities could encounter cultural remains that are not presently anticipated. To ensure that such circumstances would be appropriately handled in a manner protective of cultural resources, the Commission attaches Special Condition 22 (Area of Archaeological Significance, thereby ensuring that if cultural remains are encountered during project operations, the subject ground-disturbing activities shall cease and shall

not recommence until an archaeological plan has been reviewed and approved by the Executive Director.

The Commission finds, therefore, that as conditioned by Special Condition 22, the proposed project would be consistent with policies of Chapter 3 of the Coastal Act protective of cultural resources.

I. Hazards; Geologic Stability

Section 30253 of the Coastal Act provides in pertinent part:

Section 30253 Minimization of adverse impacts

> New development shall:
>
> (1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
>
> (2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Assumption of Risk

Caltrans states that the proposed bridge location is subject to substantial seismic risks, (including an earthquake of magnitude 8.0 that could be generated by the nearby San Andreas Fault) which may include liquefaction, and the location of the bridge renders it subject to the additional hazards posed by storms, floods, and erosion, as is true of any bridge located over a river that drains a substantial watershed and is additionally subject to tidal influence due to the bridge's proximity to the Pacific Ocean.

Caltrans has performed geotechnical testing of the Ten Mile Bridge area and represents that the proposed bridge is designed to withstand the predictable hazards associated with its location to the extent feasible. Nevertheless, the proposed bridge will be subject to natural hazards that can never be fully mitigated and therefore it is not possible to remove all associated risk associated with the uncertainties of natural hazards. Residual risks remain.

For these reasons, the Commission finds that even though Caltrans has mitigated predictable risks by engineering the proposed bridge to withstand the associated forces, a degree of risk from natural or human-induced hazards will remain and cannot be fully mitigated. To protect the Commission and its employees from liability for the hazards posed by the subject structures and project features designed and managed by Caltrans, the Commission requires Special Condition 25 (Assumption of Risk).

Coastal Act Section 30253 also requires that proposed development minimize risks posed by natural hazards, such as flooding. The Ten Mile River estuary is may experience

periodic flooding and scouring that could uncover debris left behind below the present finished elevations of the riverbed and banks (such as the lower levels of pilings, or abutments that scour out years later, as has happened at the Van Duzen River Bridge in Humboldt County during the past two years). The present Ten Mile River conditions are moderately depositional, and scour of the streambed is not occurring generally. Howver, if these factors change over the anticipated 75 to 100-year anticipated life of the proposed bridge, associated debris left beneath the present surface could be exposed. Caltrans only proposes to cut off the old pilings, for example, a few feet below the riverbed. If piles were exposed in the future, they could present a danger to kayakers or swimmers. Therefore the Commission finds it necessary to impose Special Condition 26 (Future Debris Exposure) to ensure that any debris that is exposed in the future, while presently unexpected, will be removed by Caltrans if necessary.

Finally, Coastal Act Section 30253 requires that new development neither cause nor contribute to erosion or the need to install protective devices that alter natural landforms. Special Condition 8 (Erosion Control and Revegetation Plan) and pertinent parts of Special Conditions 7 (Construction Responsibilities), 9 (Drainage Structures/Maintenance Responsibility), and 12 (Water Quality Protection Plan/SWPPP) require in pertinent part that project activities be conducted in a manner that protects against erosion, and that an erosion control and revegetation plan be finalized to ensure long term performance in accordance with standards typically imposed by the Commission in conditions throughout the coastal zone to ensure long-term erosion control through successful implementation of revegetation requirements.

For all of these reasons, the Commission finds that as conditioned, the proposed project is consistent with the applicable requirements of Section 30253 of the Coastal Act regarding hazards and erosion, and assumption of risk.

I. CEQA

The Commission incorporates its findings on conformity with LCP policies at this point as if set forth in full. These findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As discussed above, the Coastal Development Permit 1-06-022 has been conditioned by the Commission so as to be found consistent with the policies of Chapter 3 of the Coastal Act. As specifically discussed in these above findings which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been made requirements of project approval. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse impact that the activity may have on the environment. Therefore, the Commission finds that the proposed project can be found to be consistent with the requirements of the Coastal Act to conform to CEQA.

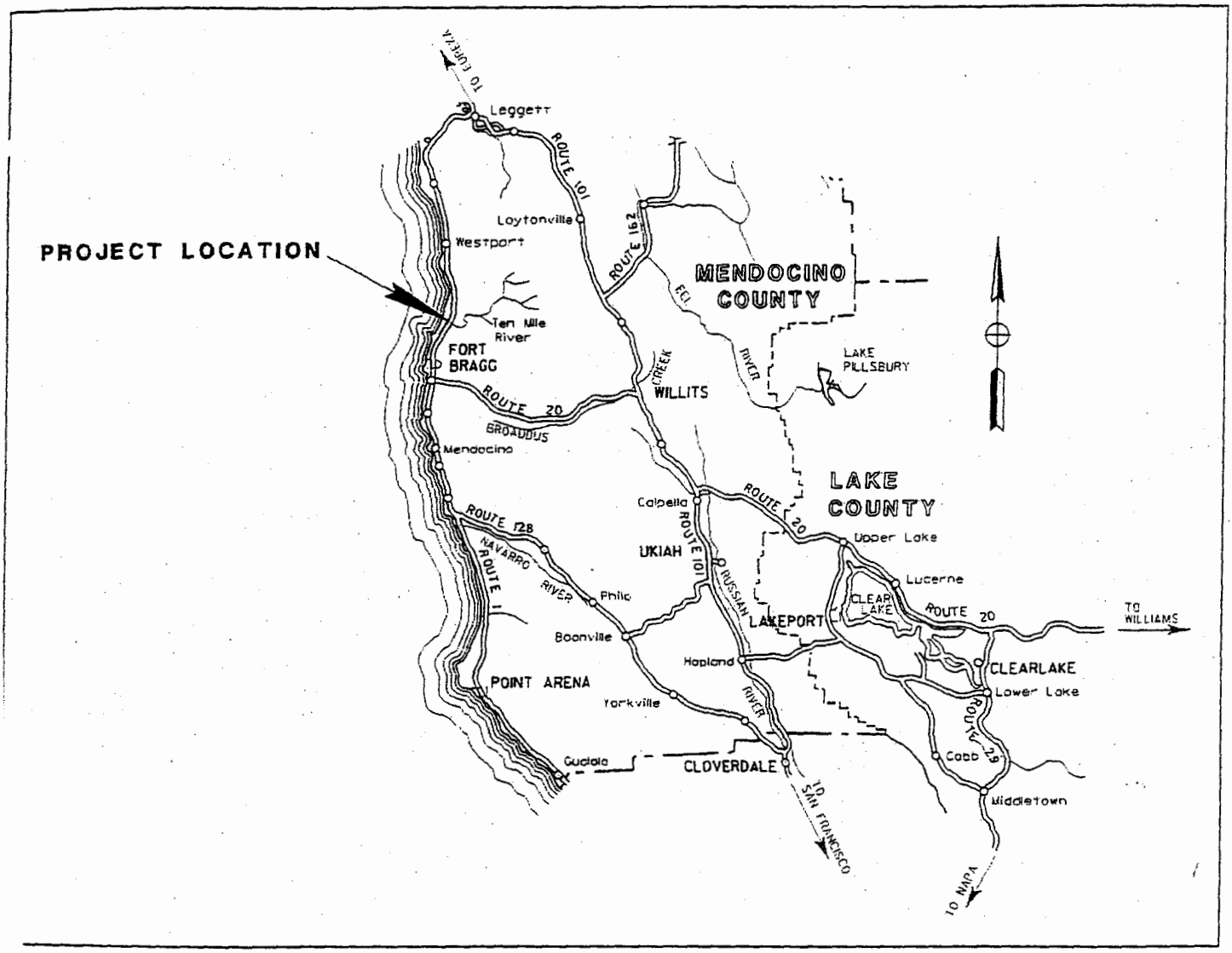


Figure 1-1 Project Location Map

EXHIBIT NO. **1A**

APPLICATION NO.

1-06-022

CALTRANS

REGIONAL LOCATION AND PROJECT PLANS (1 of 21)

INDEX OF SHEETS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

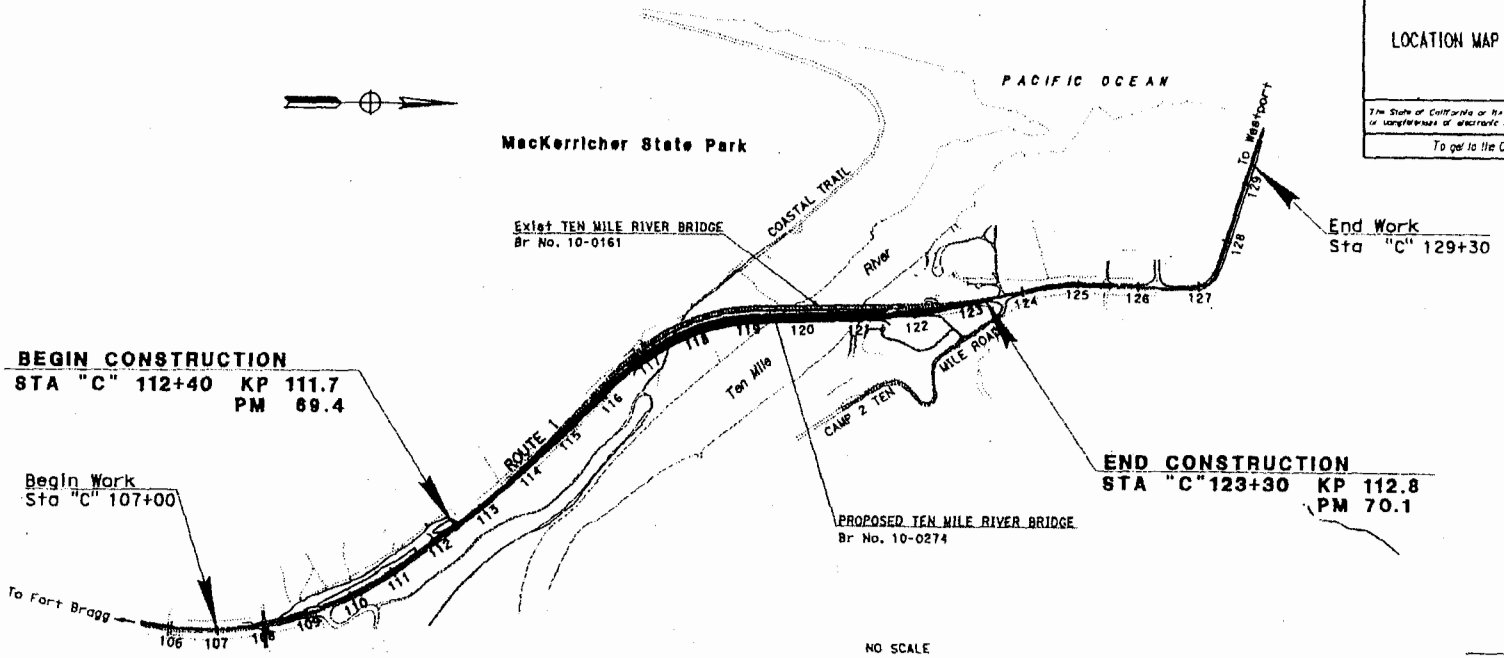
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN MENDOCINO COUNTY
NEAR FORT BRAGG
FROM 0.5 KM SOUTH TO 0.2 KM
NORTH OF TEN MILE RIVER BRIDGE

To be supplemented by Standard Plans dated July, 2004

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	1	20

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.

To get to the Caltrans web site, go to: http://www.dot.ca.gov



NO SCALE

Project Engineer Date
Registered Civil Engineer

Plans Approval Date

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

The Contractor shall possess the Class (or Classes) of license as specified in the "Notice to Contractors".

Contract No. 01-385704

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 38570

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	2	20

REGISTERED CIVIL ENGINEER

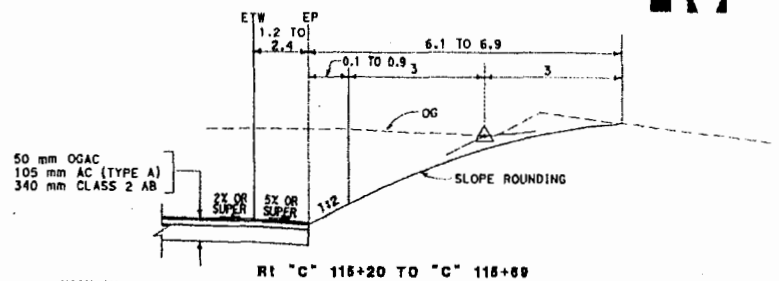
PLANS APPROVAL DATE

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

To get to the Caltrans web site, go to: http://www.dot.ca.gov

NOTES:

1. DIMENSIONS OF THE STRUCTURAL SECTIONS ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATION AS SHOWN OR AS DIRECTED BY THE ENGINEER.
3. FOR MBGR AND AC DIKE LOCATIONS, SEE SHEETS L-1 THROUGH L-4.
4. SHOULDER BACKING SHALL BE PLACED FROM EP OVER A WDITH OF 1 m AFTER PLACEMENT OF OGAC.
5. FOR COLD PLANE AC PAVEMENT DETAILS SEE SHEET C-7.
6. FOR TRIM LINE LOCATION SEE STAGE CONSTRUCTION SHEETS SC-1 THROUGH SC-14.
7. PROFILE GRADE AT THE TOP OF AC (TYPE A).



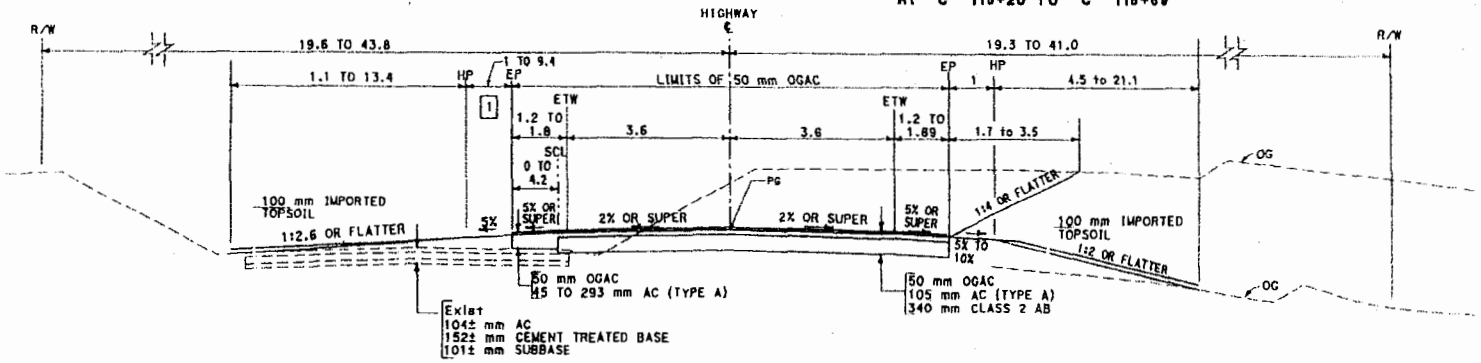
Rt "C" 115+20 TO "C" 115+69

LEGEND

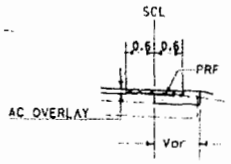
[1] IMPORTED MATERIAL (Shld BACKING)

ABBREVIATIONS

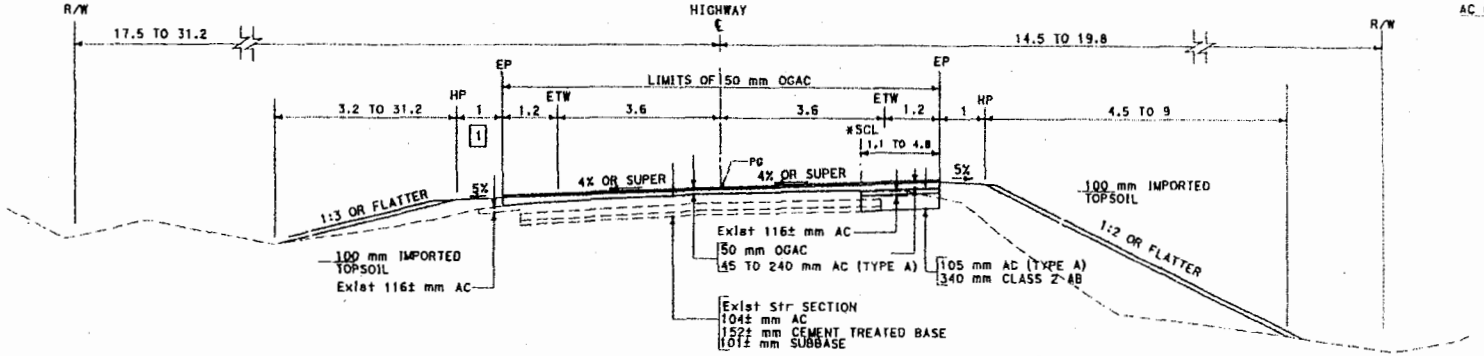
SCL - SAWCUT LINE



"C" 114+46 TO "C" 115+73



PRF DETAIL



"C" 112+40 TO "C" 114+46

ROUTE 1

* SEE PRF DETAIL

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT
PROJECT ENGINEER
CALCULATED/ DESIGNED BY
CHECKED BY
DATE REVISED
REVISED BY SW
DATE REVISED 4/12/

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

04-12-06

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	3	20

REGISTERED

PLANS APPROVAL DATE

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CIVIL

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Metric

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
PROJECT DEVELOPMENT

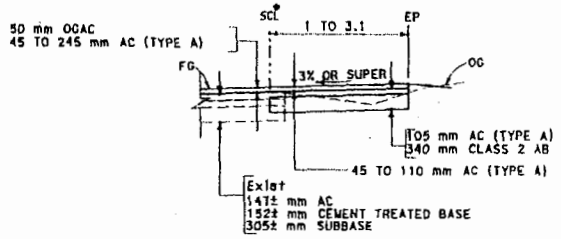
PROJECT ENGINEER

CALCULATED/ DESIGNED BY

CHECKED BY

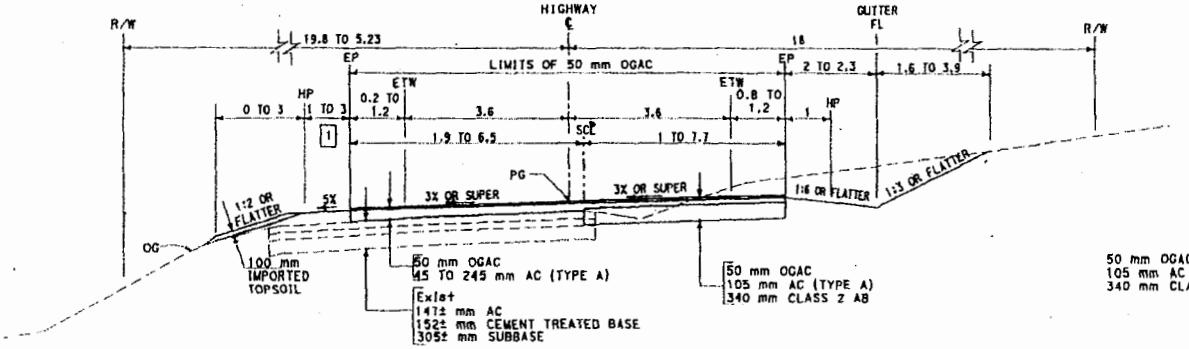
DATE REVISED BY

DATE REVISED 4/12

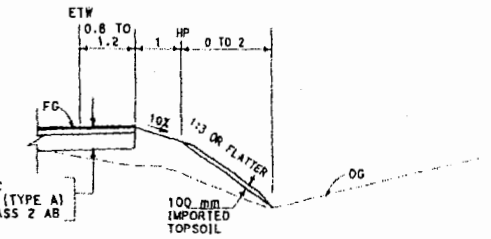


*SEE PRF DETAIL Sht X-1

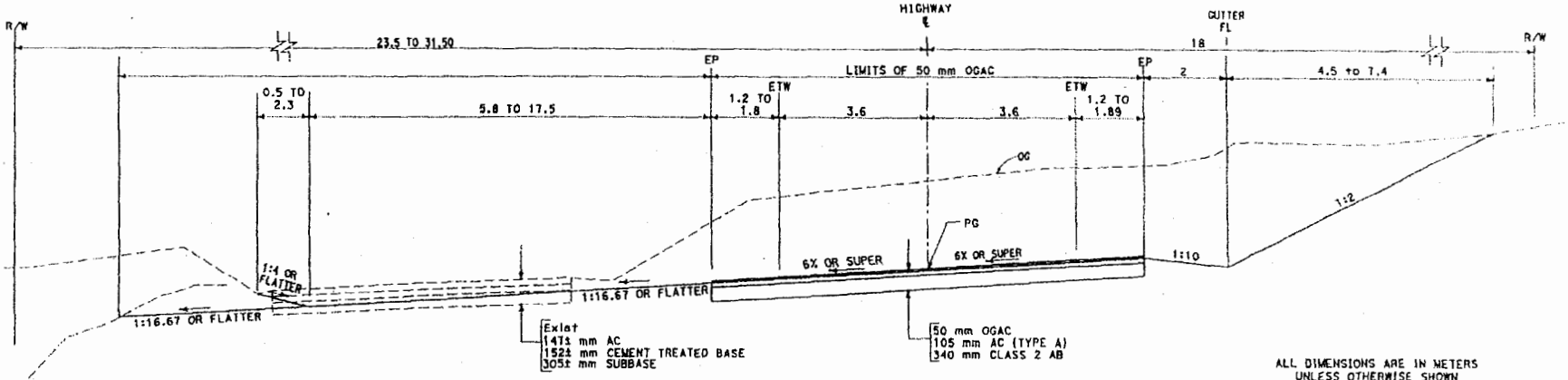
Rt "C" 122+95 TO "C" 123+30



"C" 122+50.788 TO "C" 123+30



Rt "C" 123+10 TO "C" 123+30



"C" 121+30 TO "C" 122+50.787

ROUTE 1

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-2

LAST REVISED DATE ADOPTED 04-12-06

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Men	1	111.7/112.8	4	20

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT
PROJECT ENGINEER
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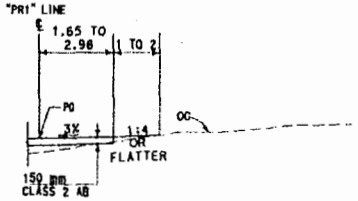
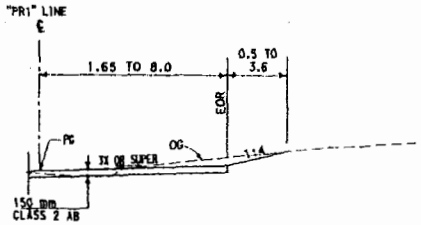
CHECKED BY
DATE REVISED BY
DATE REVISED

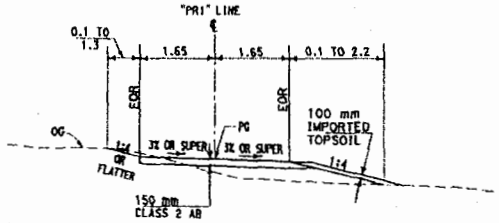
"PR1" LINE



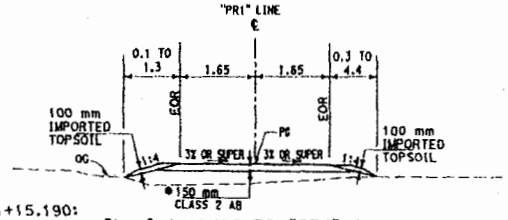
Rt "PR1" 2+55 TO 2+77



Rt "PR1" 2+41 TO Rt "PR1"2+55
Rt "PR1" 2+77 TO Rt "PR1"2+89.753
Rt "PR1" 2+78.069



"PR1" 1+45 TO "PR1" 1+98
Lt "PR1" 2+77 TO "PR1" 2+89.753

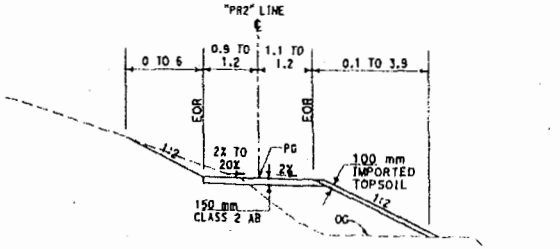


* USE THE FOLLOWING STRUCTURAL SECTION FOR "PR1" 1+01.278 TO "PR1" 1+15.190:
100 mm AC (TYPE A)
150 mm CLASS 2 AB

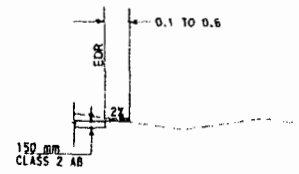
"PR1" 1+15.190 TO "PR1" 1+45
"PR1" 1+98 TO "PR1" 2+41
Lt "PR1" 2+41 TO "PR1" 2+55
Lt "PR1" 2+78.069

PRIVATE ROAD "PR1"

"PR2" LINE

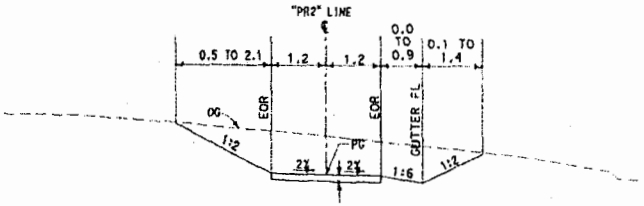


"PR2" 0+22.029 TO "PR2" 0+42



Rt "PR2" 0+05.308 TO Rt "PR2" 0+10

"PR2" LINE



"PR2" 0+05.308 TO "PR2" 0+22.029

PRIVATE TRAIL "PR2"

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-3

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

11-02-05

12 of 51

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Men	1	111.7/112.8	5	20

REGISTERED

PLANS APPROVAL DATE

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
PROJECT DEVELOPMENT
PROJECT ENGINEER
CALCULATED/ DESIGNED BY
CHECKED BY
DATE REVISED BY
DATE REVISED

NOTES:

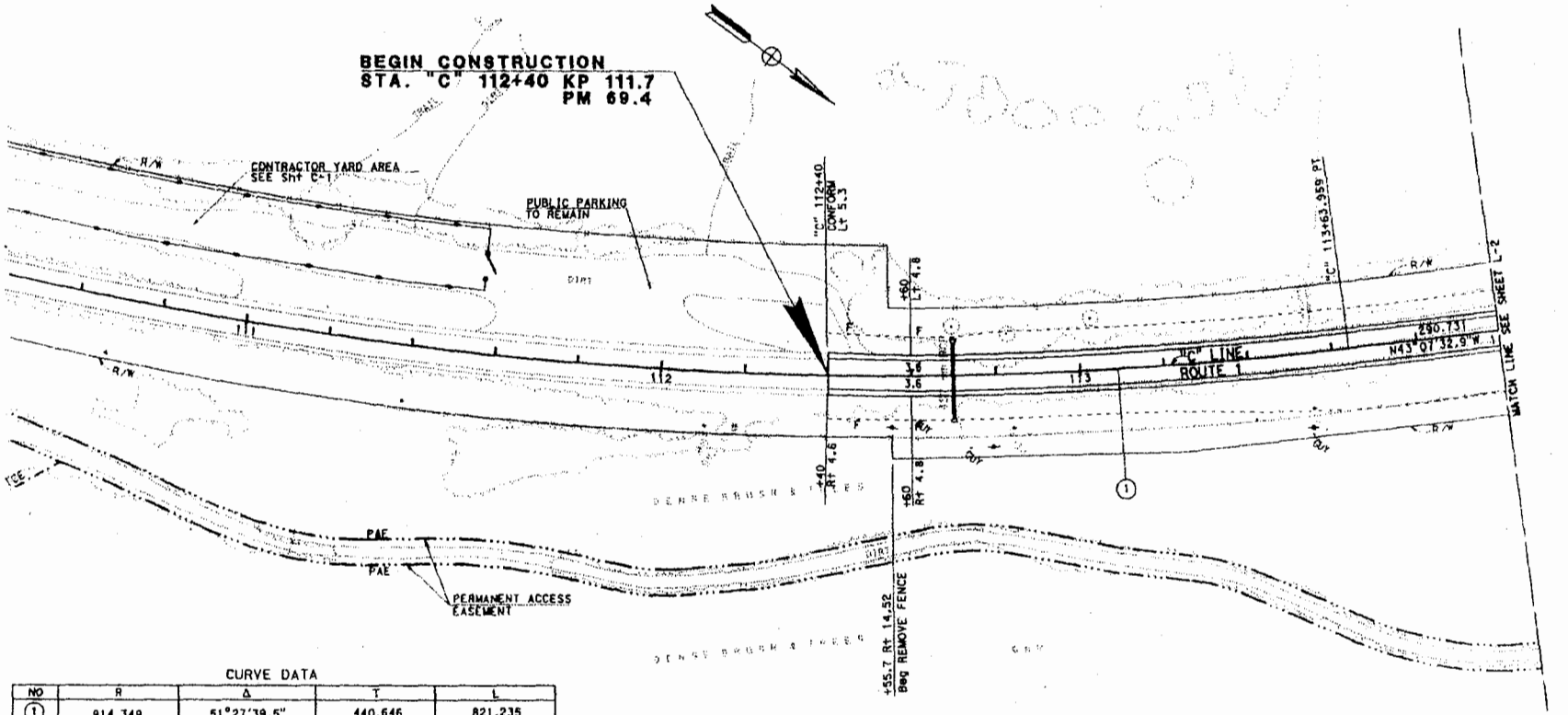
1. FOR COMPLETE R/W DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.
2. HORIZONTAL CONTROL FOR THIS PROJECT IS CALIFORNIA COORDINATE SYSTEM ZONE II . GRID DISTANCES AND GRID BEARINGS SHOWN. TO OBTAIN GROUND DISTANCES, MULTIPLY BY 1.000057723, HORIZ DATUM: NAD 83.
3. ELEVATION BASED ON NAVD 88 ON 1929 NATIONAL GEODETIC VERTICAL DATUM.
4. SEE UTILITY PLANS FOR UTILITY INFORMATION.
5. FOR DRAINAGE FACILITY DETAILS SEE DRAINAGE SHEETS.

LEGEND

- ESA — TEMPORARY FENCE (TYPE ESA)
- PAE — PERMANENT ACCESS EASEMENT
- TEMPORARY CHAIN LINK FENCE
- OBLITERATE SURFACING

ABBREVIATIONS

- TW - TRAVELED WAY
- SCL - SAWCUT LINE
- TCE - TEMPORARY CONSTRUCTION EASEMENT
- OSD - OVERSIDE DRAIN
- PAE - PERMANENT ACCESS EASEMENT
- ESA - ENVIRONMENTALLY SENSITIVE AREA
- WCM - WEED CONTROL MAT (FIBER)
- AFTS - ALTERNATIVE FLARED TERMINAL SYSTEM
- TAA - TERMINAL ANCHOR ASSEMBLY (TYPE SFT)



CURVE DATA

NO	R	Δ	T	L
(1)	914.349	51°27'39.5"	440.646	821.235

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

L-1

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

NOTES:

1. FOR COMPLETE R/W DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.
2. SEE UTILITY PLANS FOR UTILITY INFORMATION.
3. FOR DRAINAGE FACILITY DETAILS SEE DRAINAGE SHEETS.

——— STATE/COUNTY CDP JURISDICTION BOUNDARY

CURVE DATA

NO	R	Δ	T	L
(2)	366	41°11'32.8"	137.543	263.134

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	6	20

REGISTERED

PLANS APPROVAL DATE

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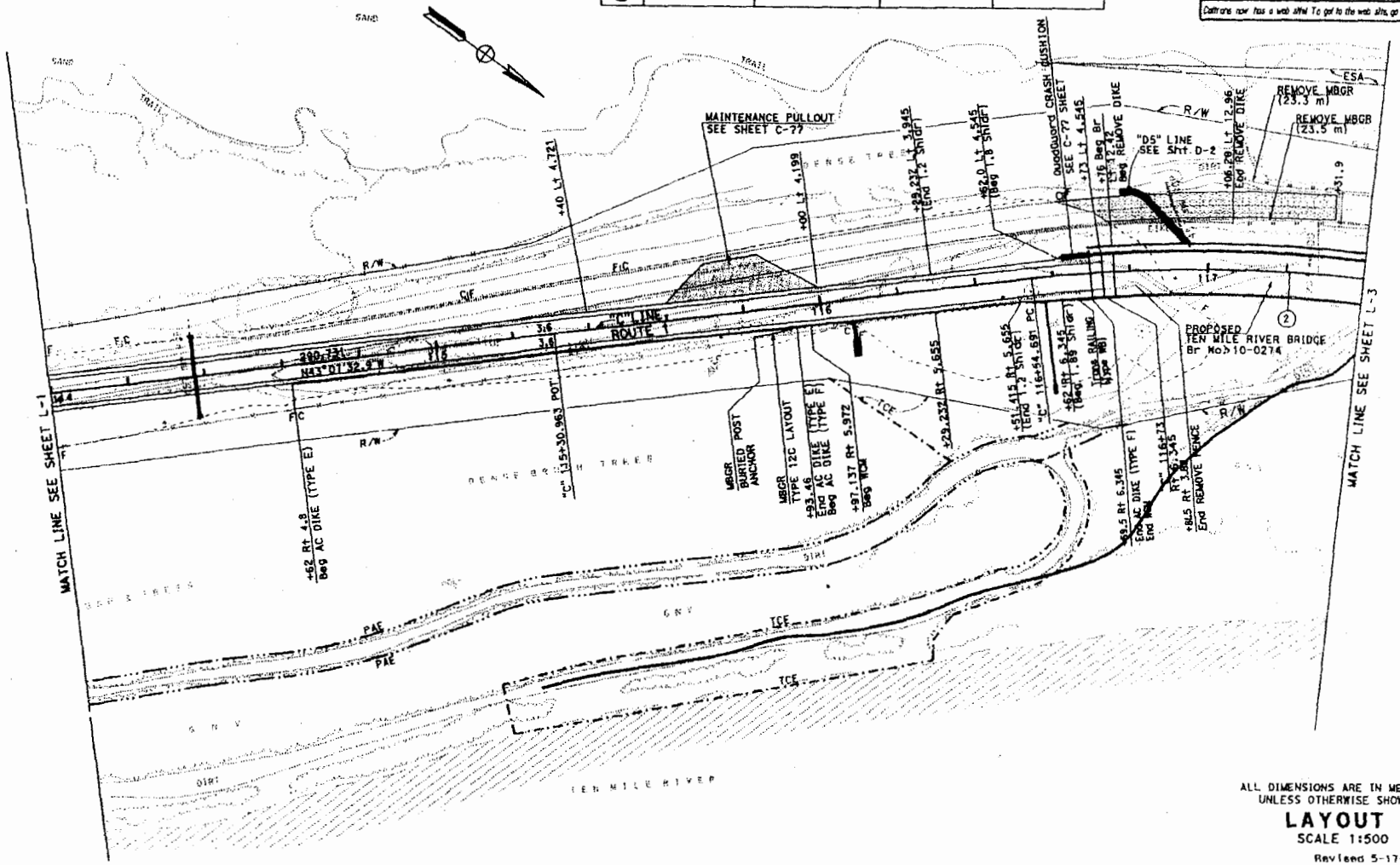


ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

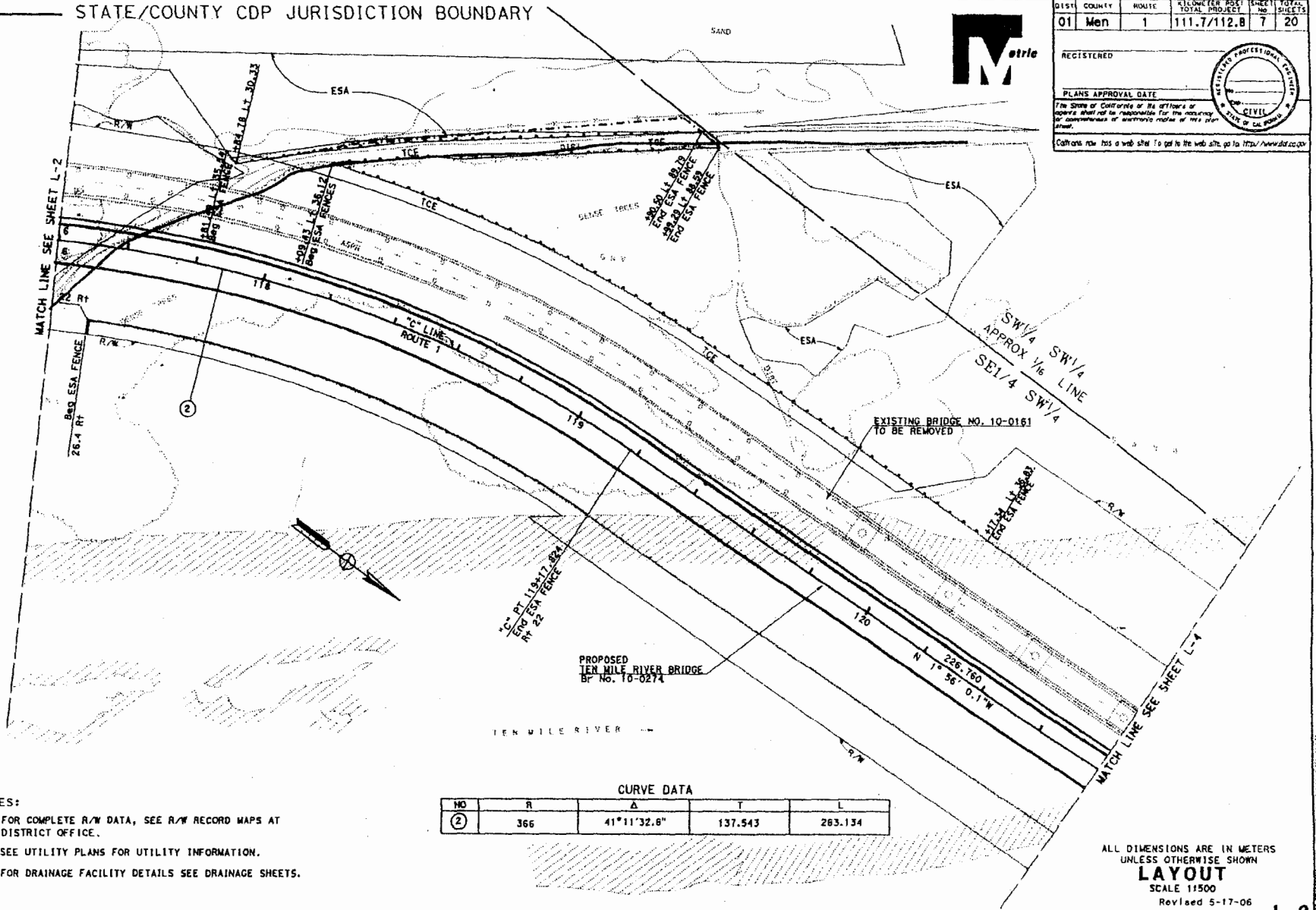
Revised 5-17-06

L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT
PROJECT ENGINEER
CALCULATED/DESIGNED BY
CHECKED BY
DATE REVISED BY
DATE REVISED 4/5

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	7	20

REGISTERED

PLANS APPROVAL DATE

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Caltrans
PROJECT DEVELOPMENT
PROJECT ENGINEER
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CHECKED BY
DATE REVISED BY
DATE REVISED

NOTES:

1. FOR COMPLETE R/W DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.
2. SEE UTILITY PLANS FOR UTILITY INFORMATION.
3. FOR DRAINAGE FACILITY DETAILS SEE DRAINAGE SHEETS.

CURVE DATA

NO	R	Δ	T	L
(2)	366	41°11'32.8"	137.543	263.134

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

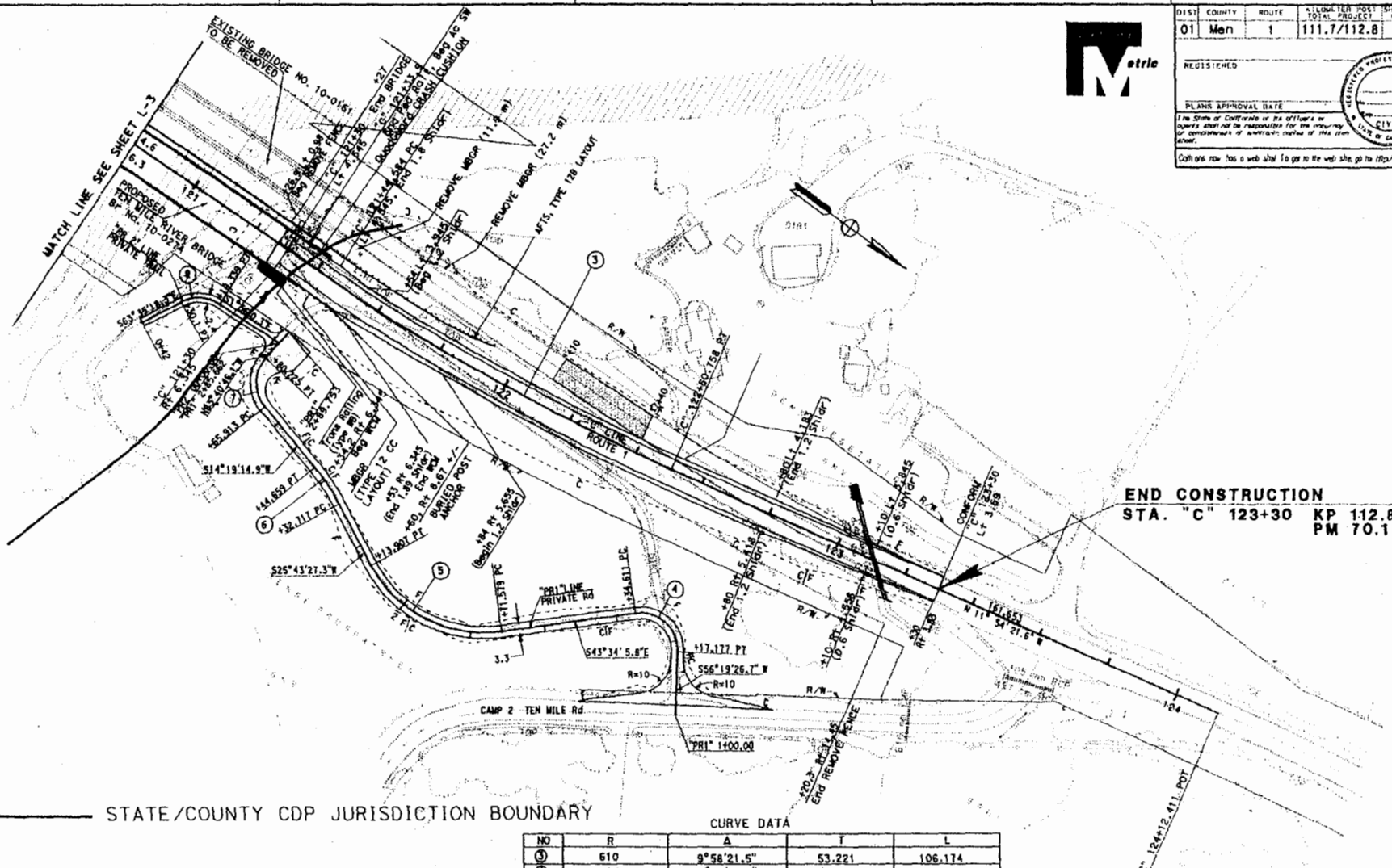
Revised 5-17-06

L-3

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227

EA 385701



STATE/COUNTY CDP JURISDICTION BOUNDARY

CURVE DATA

NO	R	Δ	T	L
③	610	9°58'21.5"	53.221	106.174
④	10	99°53'32.5"	11.895	17.435
⑤	35	69°17'33.1"	24.187	42.328
⑥	60	11°24'12.4"	5.991	11.942
⑦	10	81°59'59.0"	8.693	14.312
⑧	10	61°39'18.1"	5.968	10.761

NOTES:

1. FOR COMPLETE R/W DATA, SEE R/W RECORD MAPS AT DISTRICT OFFICE.
2. SEE UTILITY PLANS FOR UTILITY INFORMATION.
3. FOR DRAINAGE FACILITY DETAILS SEE DRAINAGE SHEETS.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

L-4

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	8	20

REGISTERED CIVIL

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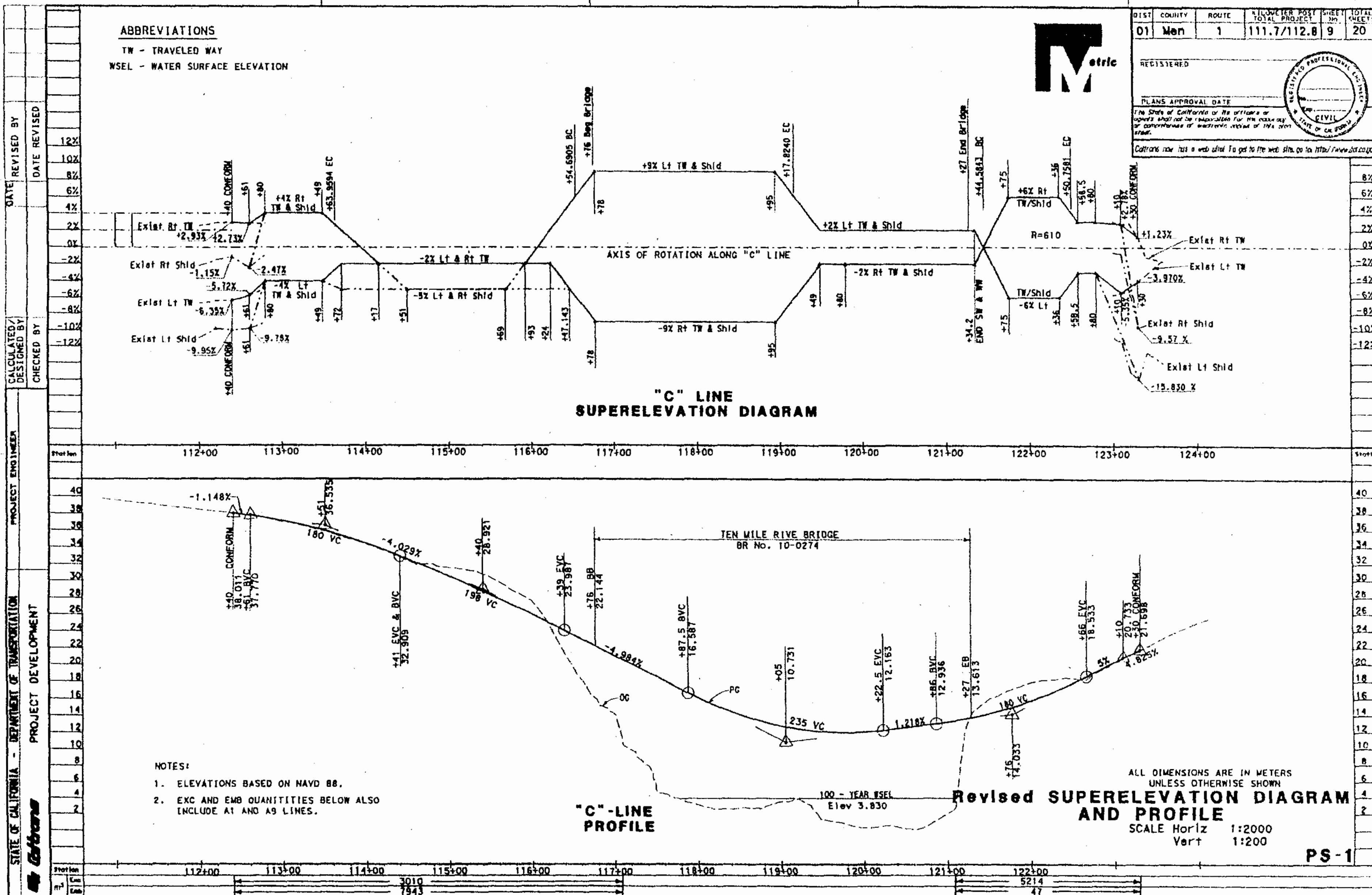
PROJECT DEVELOPMENT
PROJECT ENGINEER
CALCULATED/DESIGNED BY
CHECKED BY
DATE REVISED BY
DATE REVISED 4/5

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701


ABBREVIATIONS
TW - TRAVELED WAY
WSEL - WATER SURFACE ELEVATION
"C" LINE SUPERELEVATION DIAGRAM
AXIS OF ROTATION ALONG "C" LINE
R=610
+9% Lt TW & Shld
-9% Rt TW & Shld
+2% Lt TW & Shld
-2% Rt TW & Shld
-2% Lt & Rt TW
-5% Lt & Rt Shld
+4% Rt TW & Shld
-4% Lt TW & Shld
+6% Rt TW/Shld
-6% Lt TW/Shld
+76 Beg Bridge
+27 End Bridge
+54.6905 BC
+17.8240 EC
+44.5843 BC
+50.7581 EC
+63.9594 EC
+34.2 END SW & WW
+40 CONFORM
+30 CONFORM
Exist Rt TW
Exist Lt TW
Exist Rt Shld
Exist Lt Shld
"C"-LINE PROFILE
TEN MILE RIVE BRIDGE
BR No. 10-0274
100 - YEAR WSEL
Elev 3.830
-1.148%
-4.029%
-4.984%
1.218%
5%
1.825%
180 VC
198 VC
235 VC
180 VC
+41 EVC & BVC 32.909
+39 EVC 23.987
+76 BB 22.144
+87.5 BVC 16.587
+05 10.731
+22.5 EVC 12.163
+86 BVC 12.936
+27 EB 13.613
+76 14.033
+66 EVC 18.533
+10 20.733
+30 CONFORM 21.698
+40 28.921
+51 36.535
+40 38.011
+61 BVC 37.770
OG
PG
NOTES:
1. ELEVATIONS BASED ON NAVD 88.
2. EXC AND EMB QUANITITIES BELOW ALSO INCLUDE A1 AND A9 LINES.
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN
Revised SUPERELEVATION DIAGRAM AND PROFILE
SCALE Horiz 1:2000
Vert 1:200
PS-1
DIST 01
COUNTY Men
ROUTE 1
KILOMETER POST TOTAL PROJECT 111.7/112.8
SHEET No. 9
TOTAL SHEETS 20
REGISTERED
PLANS APPROVAL DATE
CIVIL
Metric
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
PROJECT DEVELOPMENT
PROJECT ENGINEER
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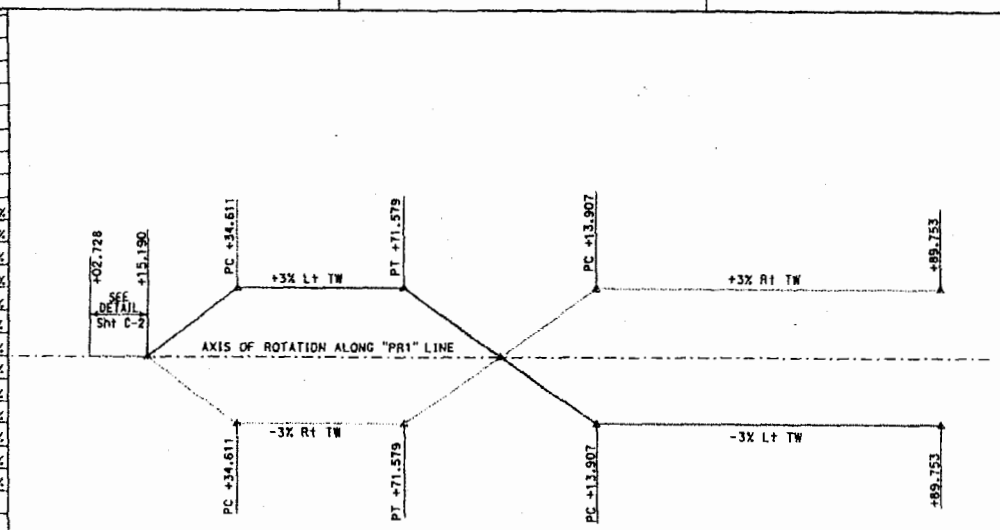
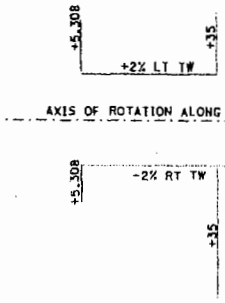
DATE REVISED BY
DATE REVISED
3010
7943
5214
47
FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS
CU 03 227
EA 385701
03-23-06I

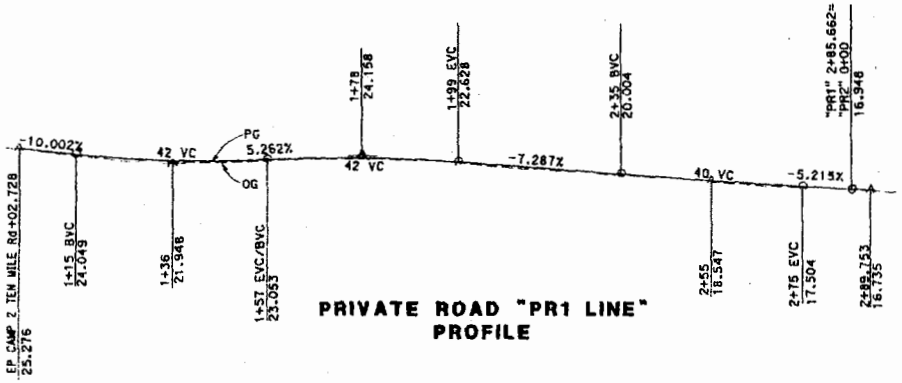
10 of 21



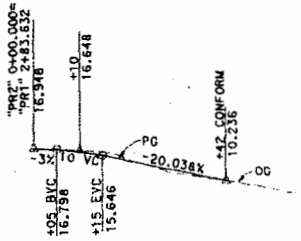
PRIVATE ROAD "PR1"
SUPERELEVATION DIAGRAM



PRIVATE TRAIL "PR2"
SUPERELEVATION DIAGRAM



PRIVATE ROAD "PR1 LINE"
PROFILE



PRIVATE TRAIL "PR2" LINE
PROFILE

ALL DIMENSIONS ARE IN METERS
UNLESS OTHERWISE SHOWN

SUPERELEVATION DIAGRAMS AND PROFILES

SCALE Horiz 1:500
Vert 1:50

PS-2

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	10	20

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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PROJECT DEVELOPMENT
DATE REVISED BY SW
DATE REVISED 3/31
CALCULATED/DESIGNED BY
CHECKED BY

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

03-31-06

DIST	COUNTY	ROUTE	ALIGNMENT POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
01	Men	1	111.7/112.8	11	20

REGISTERED

PLANS APPROVAL DATE

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DATE REVISED BY | DATE REVISED

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PROJECT ENGINEER

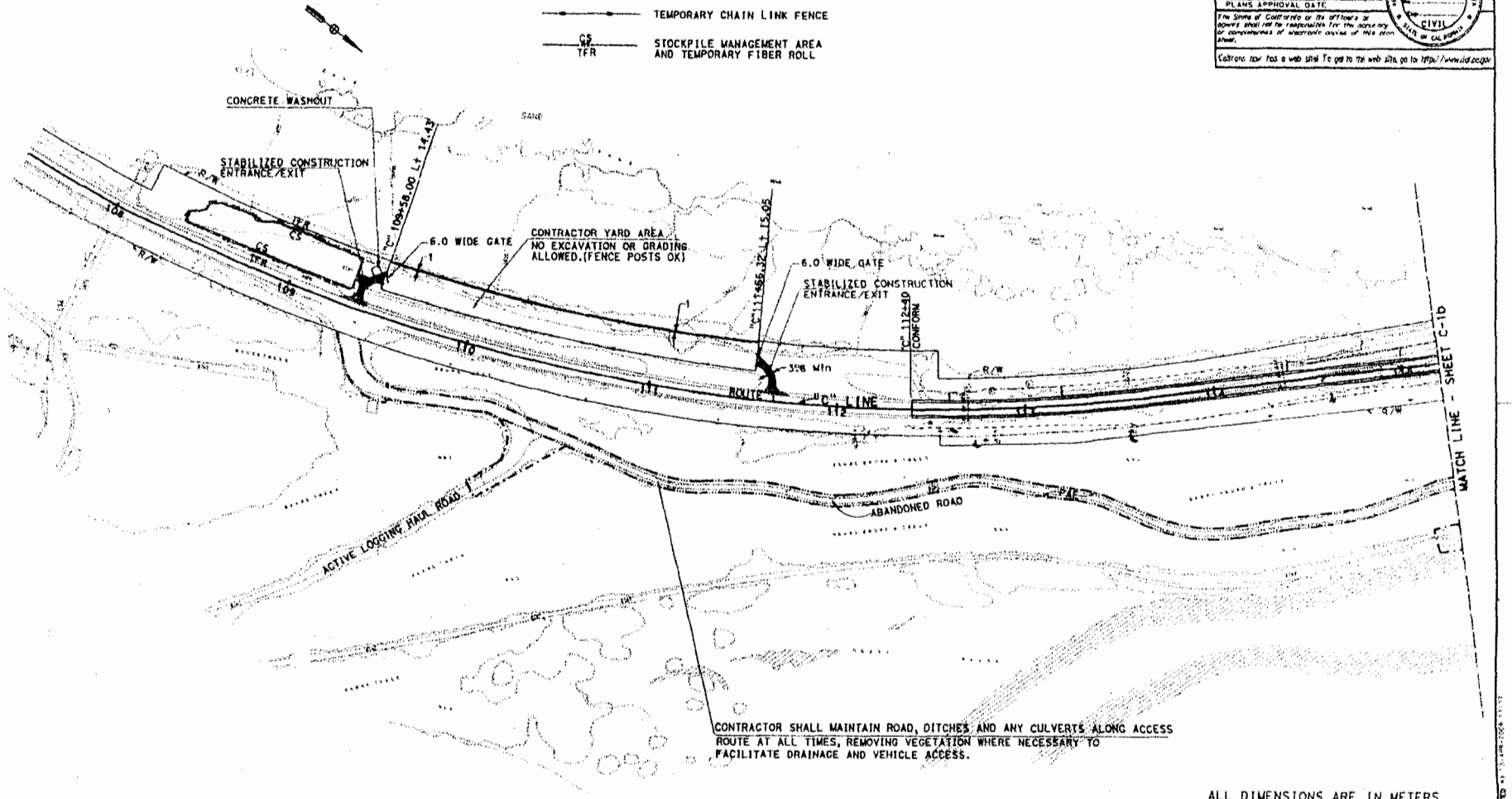
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

PROJECT DEVELOPMENT

LEGEND

- TCE — TEMPORARY CONSTRUCTION EASEMENT
- PAE — PERMANENT ACCESS EASEMENT
- TEMPORARY CHAIN LINK FENCE
- CS / TFR — STOCKPILE MANAGEMENT AREA AND TEMPORARY FIBER ROLL



CONTRACTOR SHALL MAINTAIN ROAD, DITCHES AND ANY CULVERTS ALONG ACCESS ROUTE AT ALL TIMES, REMOVING VEGETATION WHERE NECESSARY TO FACILITATE DRAINAGE AND VEHICLE ACCESS.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

CONSTRUCTION ACCESS AND BOUNDARIES

CONSTRUCTION DETAILS

SCALE 1:1000

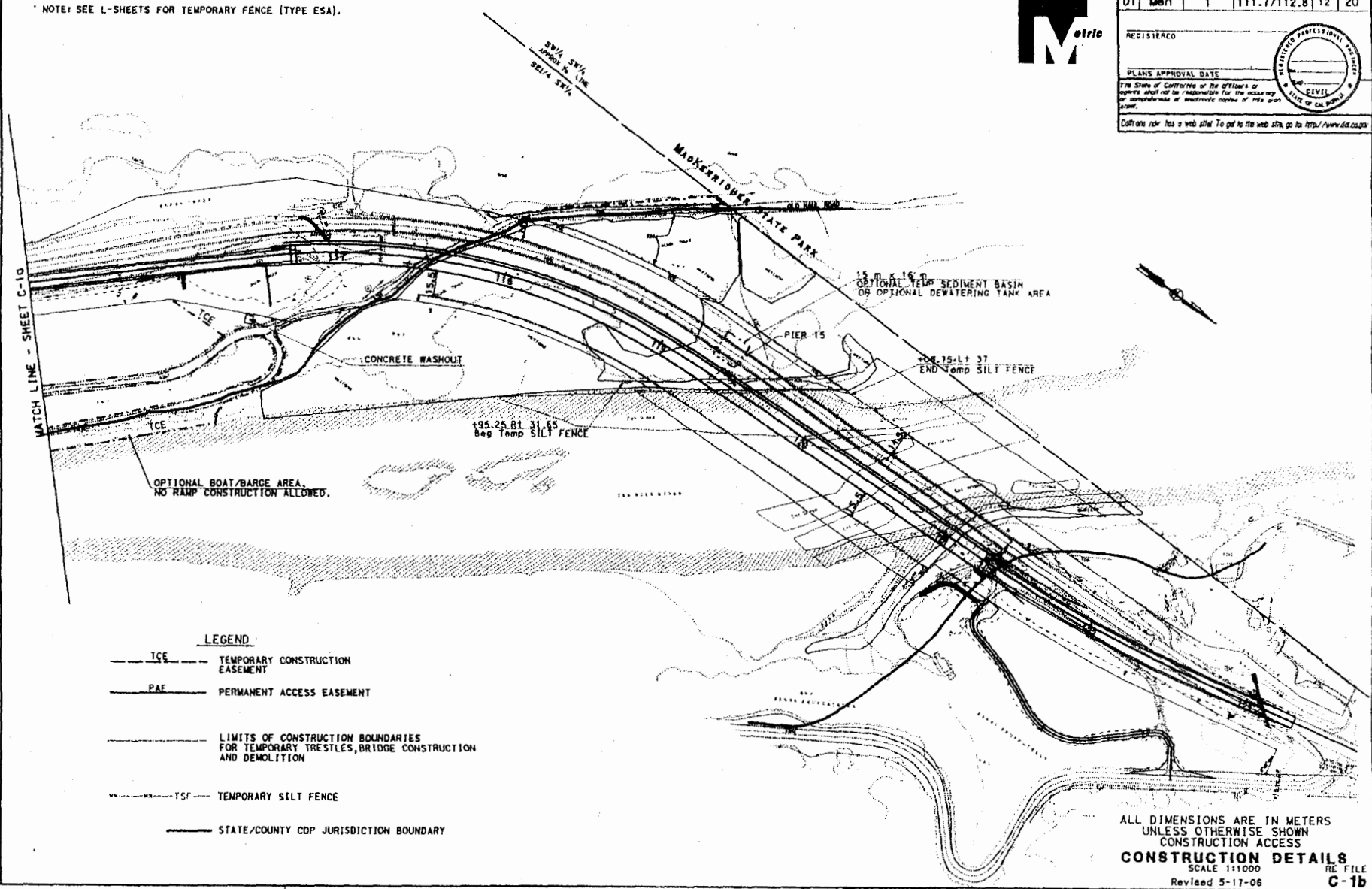
RE FILE C-1a

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227

EA 385701

12421


NOTE: SEE L-SHEETS FOR TEMPORARY FENCE (TYPE ESA).
MATCH LINE - SHEET C-1a
MacKERRICHER STATE PARK
OLD MAIL ROAD
SW1/4 SW1/4 APPROX ¼ LINE SE1/4 SW1/4
15 m x 15 m OPTIONAL TEMP SEDIMENT BASIN OR OPTIONAL DEWATERING TANK AREA
PIER 15
CONCRETE WASHOUT
+04.75-Lt 37 END Temp SILT FENCE
+95.25 Rt 31.65 Beg Temp SILT FENCE
TCE
OPTIONAL BOAT/BARGE AREA. NO RAMP CONSTRUCTION ALLOWED.
LEGEND
TCE TEMPORARY CONSTRUCTION EASEMENT
PAE PERMANENT ACCESS EASEMENT
LIMITS OF CONSTRUCTION BOUNDARIES FOR TEMPORARY TRESTLES, BRIDGE CONSTRUCTION AND DEMOLITION
TSF TEMPORARY SILT FENCE
STATE/COUNTY COP JURISDICTION BOUNDARY
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN
CONSTRUCTION ACCESS
CONSTRUCTION DETAILS
SCALE 1:1000
Revised 5-17-06
C-1b
DIST 01 | COUNTY Men | ROUTE 1 | KILOMETER POST TOTAL PROJECT 111.7/112.8 | SHEET NO 12 | TOTAL SHEETS 20
REGISTERED
PLANS APPROVAL DATE
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DATE REVISED BY SM DATE REVISED 4/12
CALCULATED/ DESIGNED BY
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PROJECT ENGINEER
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT
FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS
0 20 40 60 80
CU 03 227
EA 385701
RE FILE
04-12-06

NOTES FOR 95% CR

1. TEMPORARY UG TELEPHONE WILL BE PLACED PRIOR TO CONTRUCTION.
2. PERMANENT UG ELECTRIC WILL BE PLACED PRIOR TO CONSTRUCTION.
3. PERMANENT UG TELEPHONE WILL BE PLACED DURING CONSTRUCTION.
4. ALL POLES (PG&E/SBC) WILL BE PLACED PRIOR TO CONSTRUCTION.

LEGEND

- TCE — TEMPORARY CONSTRUCTION EASEMENT
- ESA — ENVIRONMENTALLY SENSITIVE AREA FENCE
- PAE — PERMANENT ACCESS EASEMENT
- —T— TEMPORARY UG TELEPHONE (ATT/SBC)
- —T— PERMANENT UG TELEPHONE (ATT/SBC)
- —E— PERMANENT UG ELECTRIC (PG&E)
- —T— (OH) TEMPORARY OH TELEPHONE (ATT/SBC)
- —E— (OH) PERMANENT OH ELECTRIC (PG&E)
- NEW PG&E POLE
- EXISTING POLE

ABBREVIATIONS

- TW - TRAVELED WAY
- TL - TRIM LINE
- KV - KILO VOLT
- TEL - TELEPHONE
- TOB - TOP OF BANK
- TCE - TEMPORARY CONSTRUCTION EASEMENT
- OSD - OVERSIDE DRAIN
- PAE - PERMANENT ACCESS EASEMENT

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Men	1	111.7/112.8	13	20

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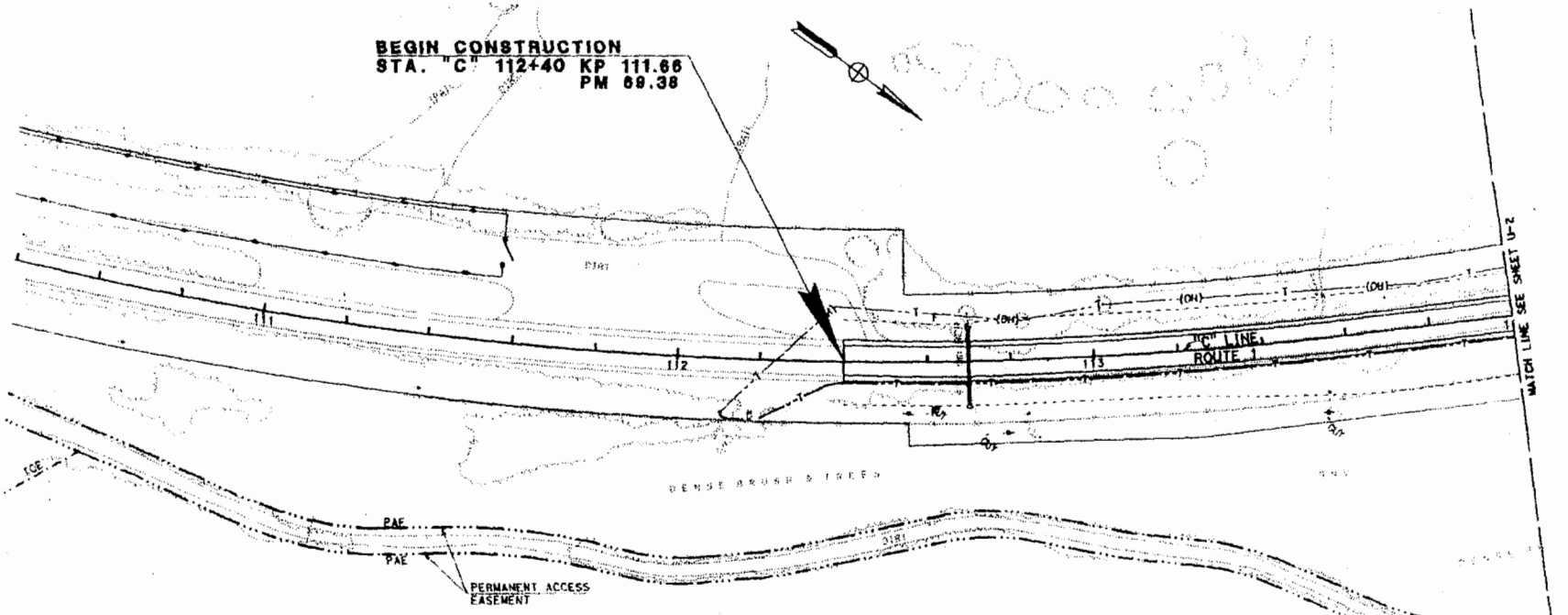
PROJECT DEVELOPMENT

BEGIN CONSTRUCTION
STA. "C" 112+40 KP 111.66
PM 69.38



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UTILITY PLAN

SCALE 1:500

U-1

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 | EA 385701

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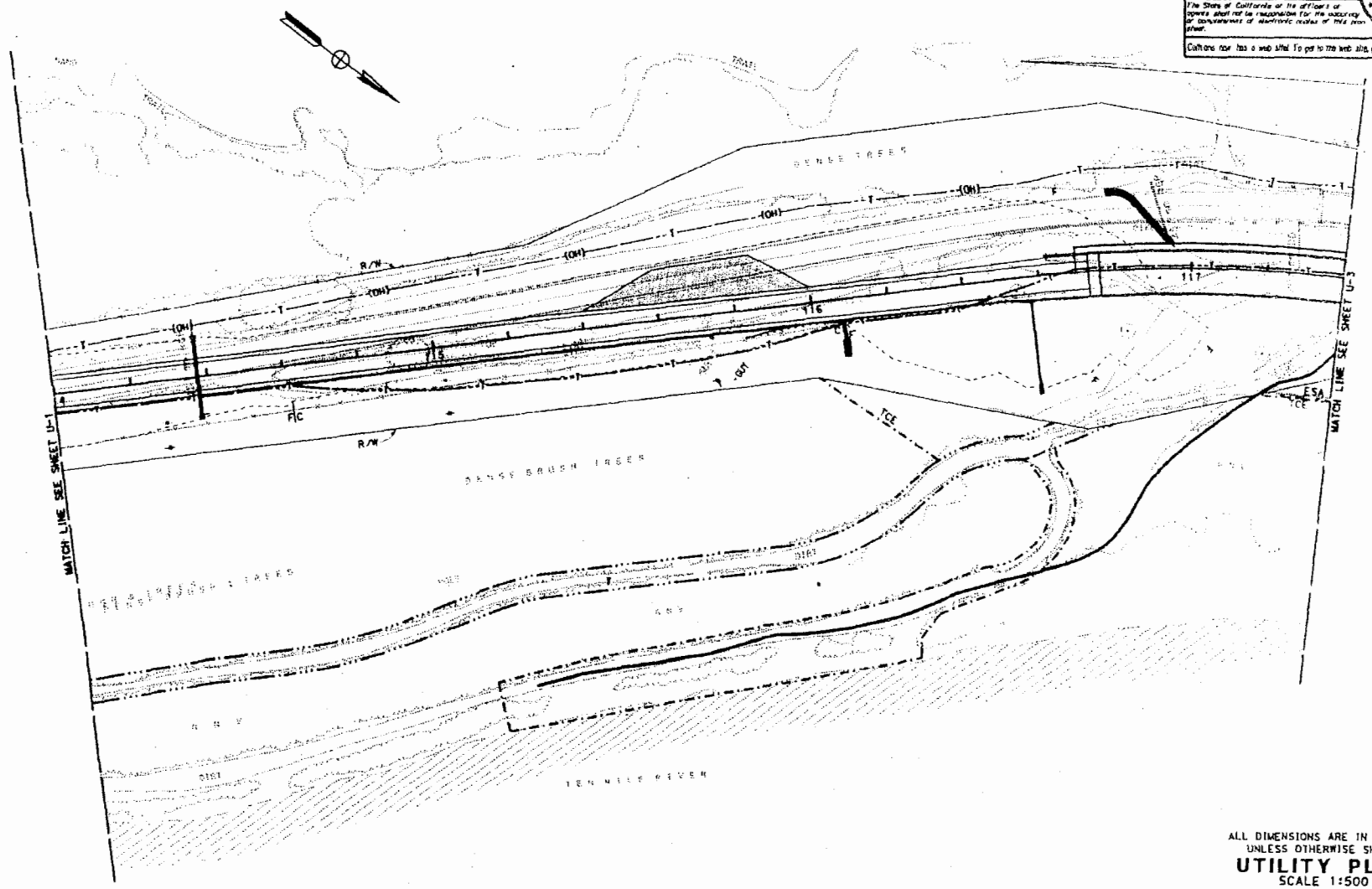

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UTILITY PLAN
SCALE 1:500

U-2

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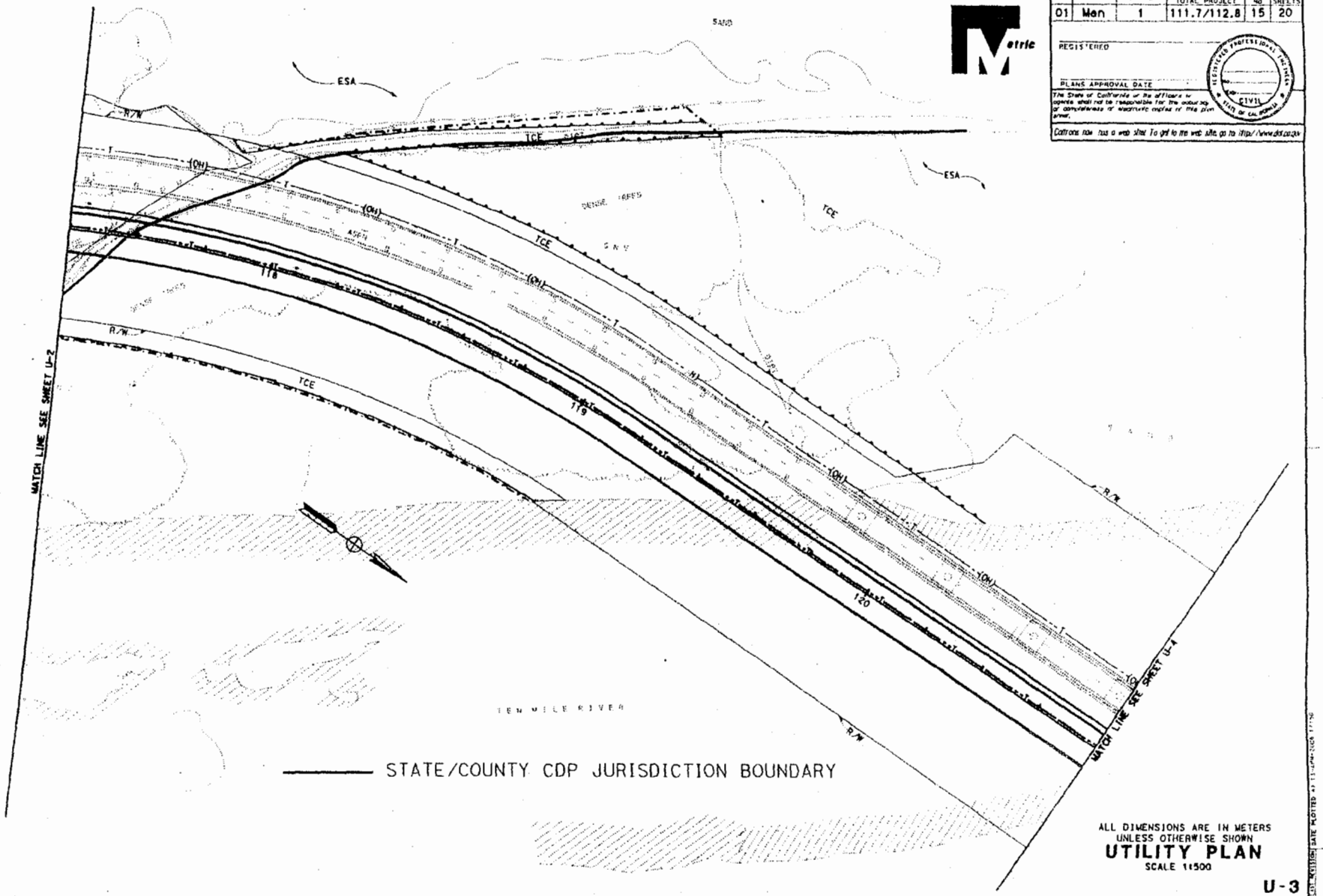

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UTILITY PLAN

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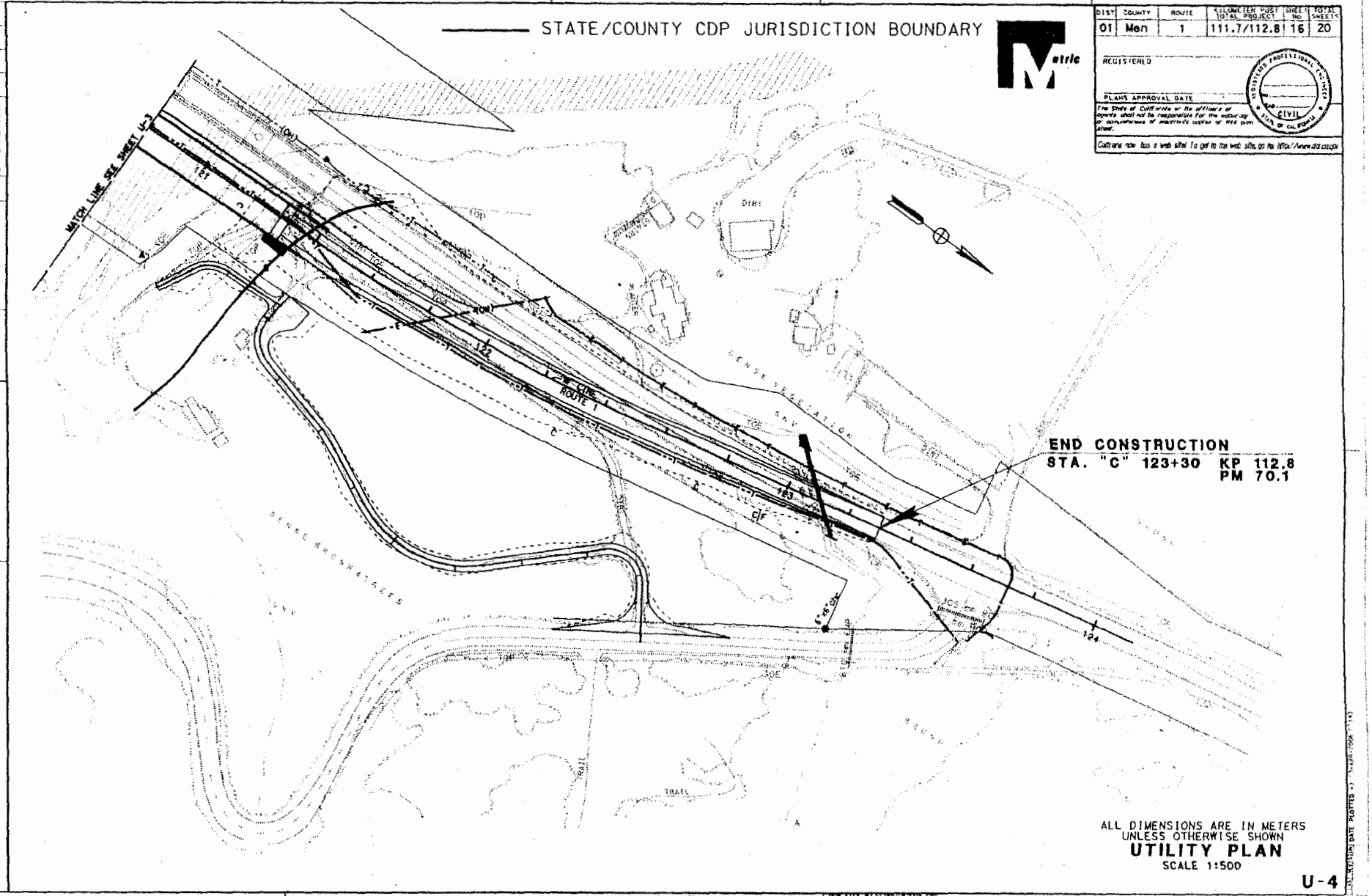

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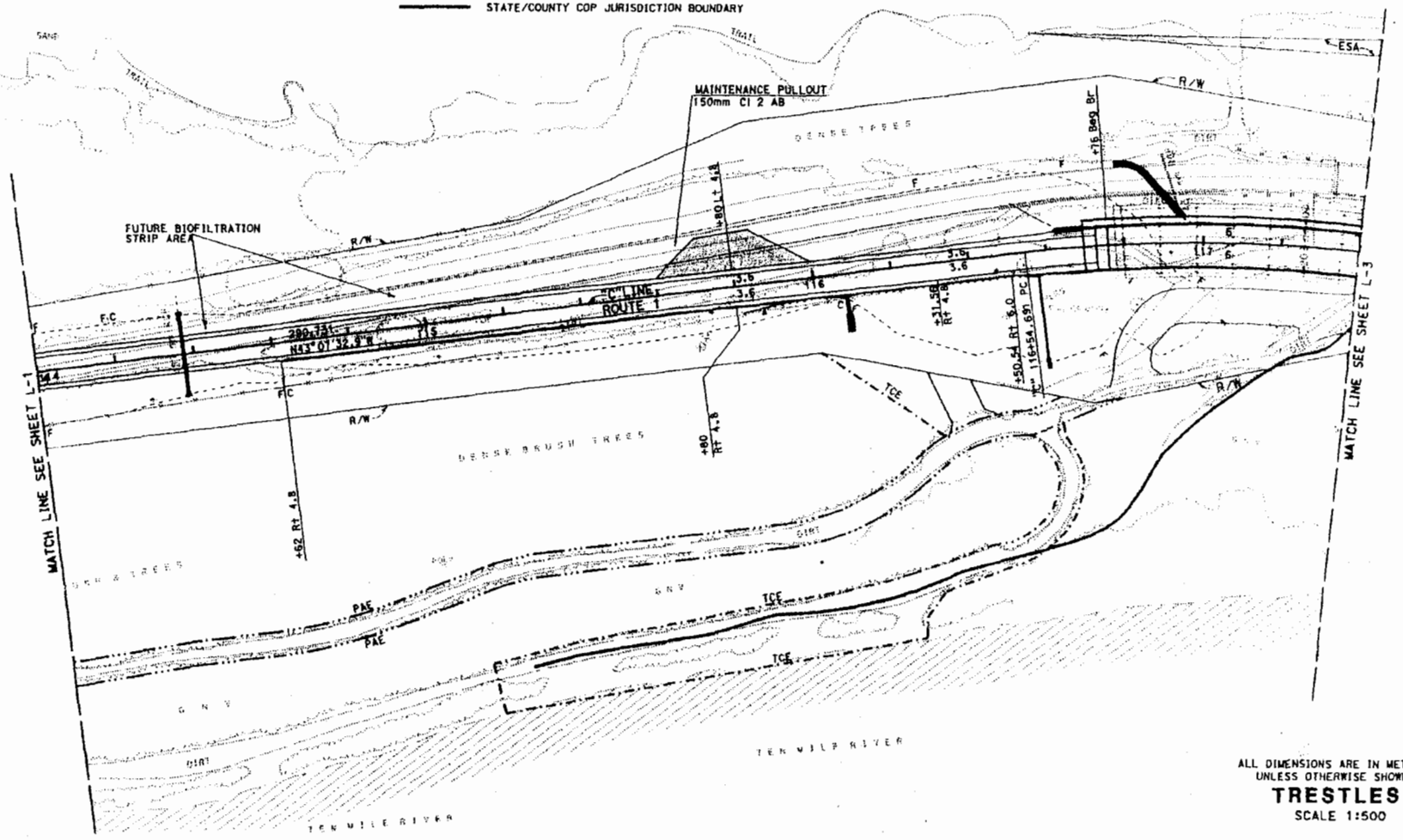
CU 03 227 | EA 385701

Rows of Falsework and Trestle piles shown are generally spaced at 9 meters longitudinally and spaced 2.4 meters transversely.

Falsework and Trestles shown are possible designs. The contractor will design and may use smaller/larger diameter piles and/or H-piles which will affect the pile spacing, span lengths (stringers and girders). The ultimate footprint will depend on the contactor's Trestle designs.

LEGEND

- POSSIBLE TEMP ACCESS ROUTE OR ROAD.
- TEMP CONTAINMENT SYSTEM ABOVE RIVER
- TEMP CONTAINMENT SYSTEM ON GROUND
- TEMP ESA FENCE
- STATE/COUNTY COP JURISDICTION BOUNDARY



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TRESTLES

SCALE 1:500

T-1

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
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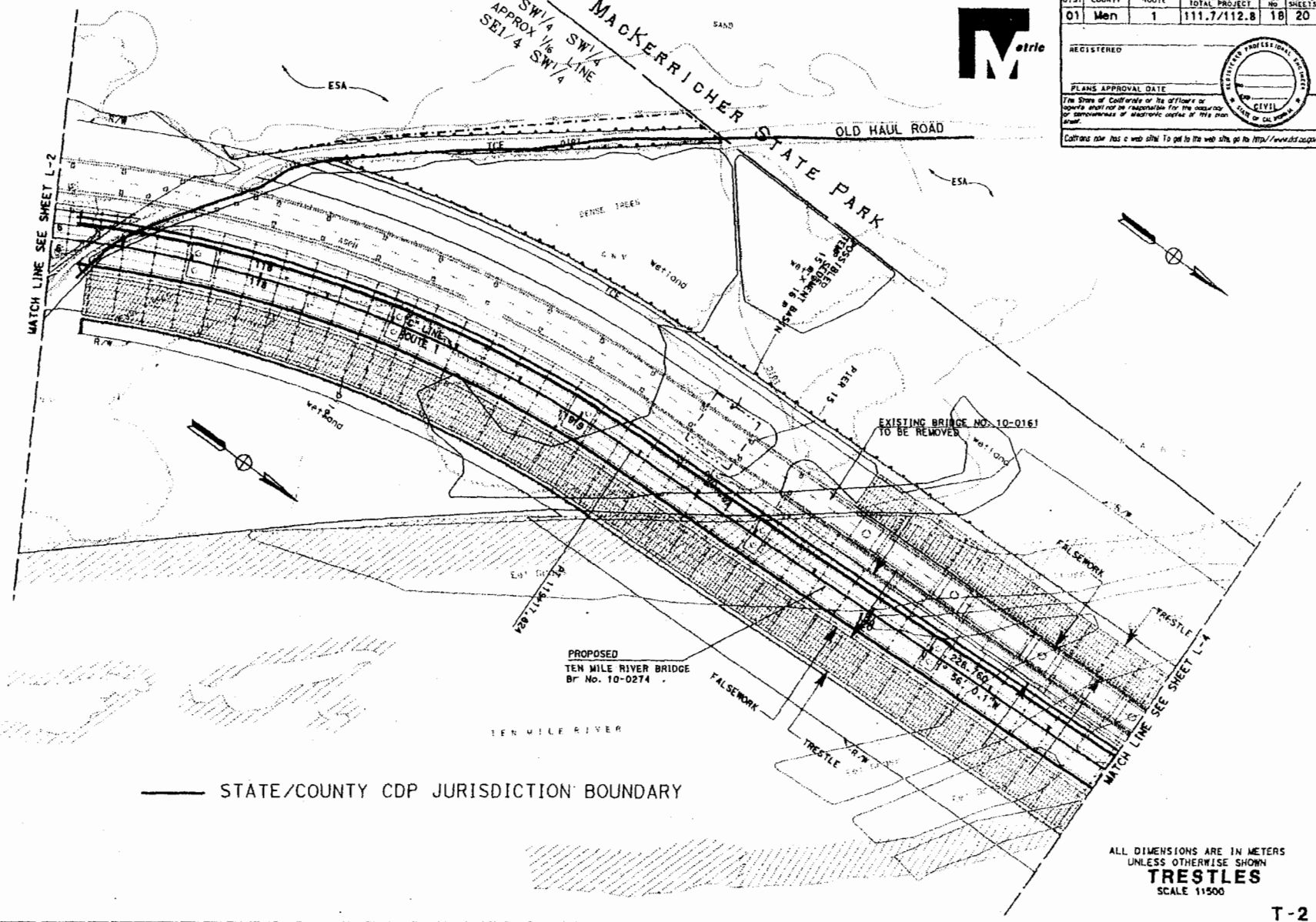

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
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TRESTLES

SCALE 1:500

T-2

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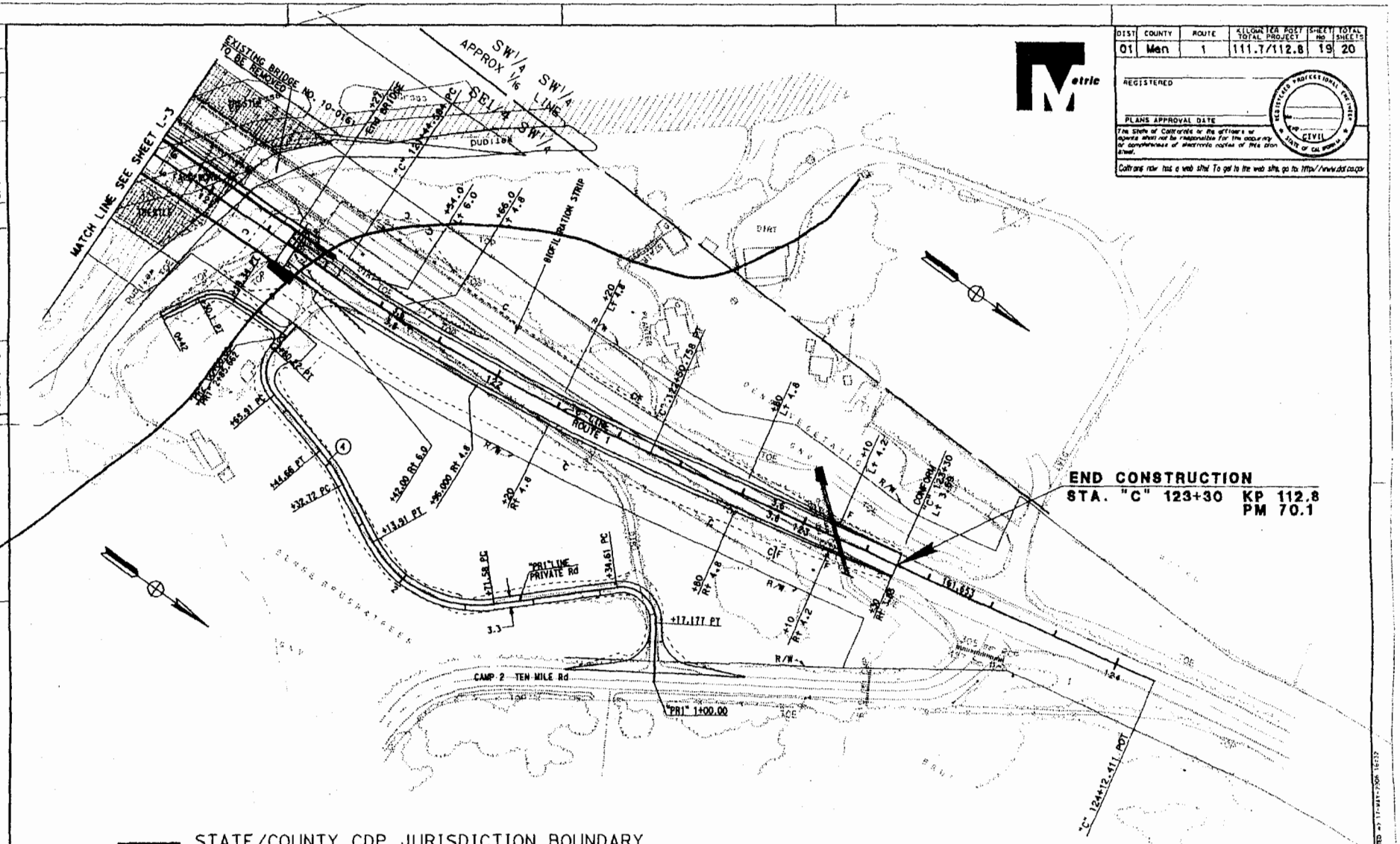

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Men	1	111.7/112.8	19	20

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TRESTLES

SCALE 1:500

T-3

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

CU 03 227 EA 385701

DIST	COUNTY	ROUTE	
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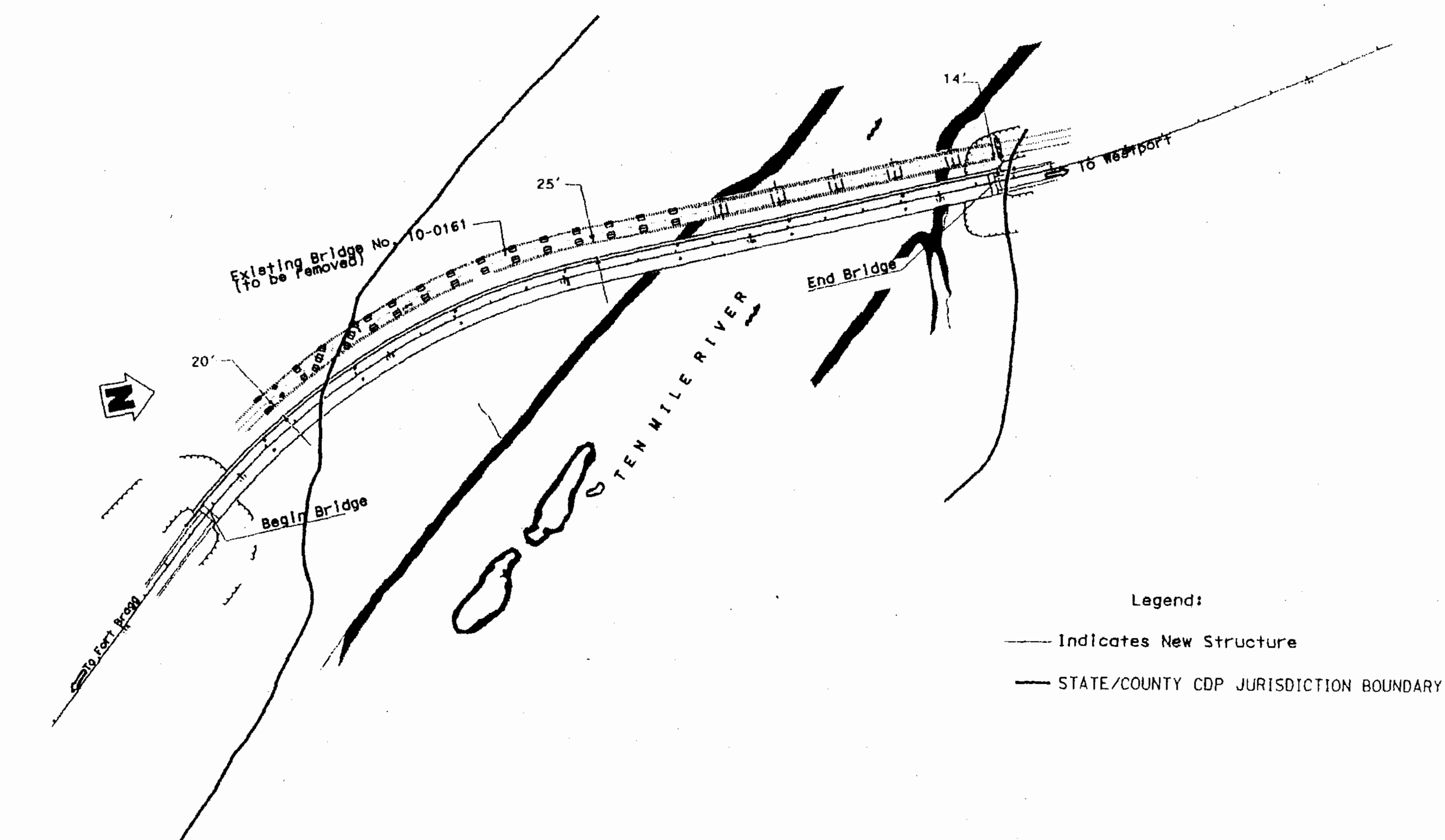

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 10-0274
KILOMETER POST 112.1

TEN MILE RIVER BRIDGE (REPLACE)
ALTERANTIVE C-8W

CU 03227
EA 385701
FILE => 2capl.dgn

DESIGN ENGINEER

2lp21

January 30, 2006

HYDROACOUSTIC MONITORING PLAN FOR THE TEN MILE RIVER BRIDGE REPLACEMENT PROJECT

The purpose of this plan is to document how underwater sound pressures will be measured to assess underwater noise impacts from pile driving activities associated with the construction of the Ten Mile River replacement bridge. There are two types of piles being driven for the project, temporary piles and permanent piles. Underwater sound measurements would be made for the placement of the two types of piles. Underwater noise monitoring would include the measurement of peak sound pressures, root mean square ($RMS_{impulse}$)[1] sound pressure levels and sound energy levels (SEL).

Temporary Piles

At this time, steel shell piles on land and H-Piles in the water are proposed for construction of the temporary trestles and false work. The steel shell piles will be driven on land and no monitoring is proposed for these piles. For H-piles driven in water, underwater sound levels will be measured for a minimum of one day or two piles. Underwater sound levels will also be measured any time a change in hammer type or size occurs. Measurements would be made at a distance of 10 meters (m) and at other various distances. An attempt will be made to measure closer than 10m when the following conditions are met:

1) The Caltrans Resident Engineer, the construction representative and personnel measuring the underwater sound pressure agree that it does not compromise the workers' safety,
2) It does not put the equipment for measuring the underwater sound pressure in a position that would either delay the contractor or cause damage to the equipment.

The measurement depth will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth. No measurements will be made in water less than 1m in depth.

Permanent Piles

The permanent piles are 30-inch diameter Cast in Steel Shell piles (CISS) that will be driven in a dewatered cofferdam. There are three planned piers in the water and one bent that is near the water on land. For each of these four locations, underwater sound levels will be measured for a minimum of one day or two piles. Underwater sound levels will also be measured any time a change in hammer type or size occurs. These measurements will be made at a distance of 10m and at other various distances, including 100m both upstream and downstream of the construction activity and at both edges of the Ten Mile River when possible. An attempt will be made to measure closer than 10m when the following conditions are met:

[1] Measured over the representative duration of the pulse.

EXHIBIT NO. 2A
APPLICATION NO.
1-06-022
CALTRANS
HYDROACOUSTIC
MONITORING PLAN DATED
1/30/06 AND RELATED MEMO
DATED 9/16/05 (1 of 8)

1) The Caltrans Resident Engineer, the construction representative and personnel measuring the underwater sound pressure agree that it does not compromise the workers' safety,
2) It does not put the equipment for measuring the underwater sound pressure in a position that would either delay the contractor or cause damage to the equipment.

The measurements depth, will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth. No measurements will be made in water less than 1m in depth.

Measurement Equipment

Measurements will be made using G.R.A.S. 10CT hydrophones with PCB in-line charge amplifiers (Model 422E13) and PCB Multi-Gain Signal Conditioners (Model 480M122) or equivalent systems. The signals will be fed into Integrating Sound Level Meters (SLM) and Digital Audio Tape Recorders (DAT).

The peak pressure and root-mean square average sound pressure levels ($RMS_{impulse}$ levels) will be measured "live" using the SLM. The SLM will have the ability to measure the unweighted peak sound pressure and RMS sound pressure levels over the relative short periods (e.g., less than 50 milliseconds). Many SLMs can measure the RMS sound pressure level of these pulses using the standard "impulse exponential-time weighting" (35 millisecond rise time) function. Additional subsequent analyses of the acoustical impulses will be performed using a Real Time Analyzer capable of providing narrow band frequency and corresponding pressure over time analysis (waveform).

Quality Control

The measurement systems will be calibrated prior to use in the field. For example, an acoustical pistonphone and hydrophone coupler could be used to send known sound signals to the underwater sound measurement system. This type of pistonphone used with the hydrophone coupler, produces a continuous 145 dB (re 1 μPa) tone at 250Hz. The SLMs are calibrated to this tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audiotapes that will be used. The system calibration status would be checked at the end of the measurement event by both measuring the calibration tone and recording the post-measurement on the tape. The taped calibration tones are used to calibrate the real time analyzer prior to analysis of tape-recorded pulses.

All field notes would be recorded in water-resistant field notebooks. Such notebook entries would include calibration notes, measurement positions, pile-driving information, system gain setting, and equipment used to make each measurement.

Data Reporting

A report will be prepared and submitted 30 days following the completion of marine pile driving activities. This report will contain acoustical information (peak, RMS, and SEL)

for all piles where measurements were made. Representative frequency spectra and waveform analysis would be provided for each measured pile at a minimum of two different measurement positions. Included with the acoustical information would be the pile identification, distance from the pile, water depth/measurement depth, pile driver size, and other pertinent information. The report would also contain a brief project description, methodology, and presentation of results.

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
505 Petaluma Boulevard South
Petaluma, California 94952
Tel: 707-766-7700 *Fax: 707-766-7790*
www.Illingworthrodkin.com
illro@illingworthrodkin.com

Date: September 16, 2005
To: Lisa Embree, Caltrans District 1
From: Richard B. Rodkin, PE
James Reyff

Subject: Ten Mile River Bridge Replacement Project – Hydroacoustic Report

This report presents information in response to a memo from California Department of Fish and Game (CDFG) dated July 21, 2005 and comments and questions regarding the Ten Mile River Bridge Replacement Construction Project that were discussed at the meeting with Caltrans, Department of Fish and Game, U.S. Fish and Wildlife Service, NOAA Fisheries, and Rich Rodkin of Illingworth and Rodkin, Inc. on August 24, 2005.

As we discussed at the meeting, data gathered by Illingworth & Rodkin, Inc. since the BA was published indicates that the 190 dB peak threshold used in the BA could be met or exceeded during driving of both temporary H piles (peak SPLs of 185-198 dB at 10 meters), and permanent 30-inch CISS piles in dewatered cofferdam (peak SPLs up to 190 dB at 10 meters). If steel pipe piles are used instead of H piles for the temporary piles, data gathered by I&R indicates expected SPLs would be up to 205 dB at 10 meters.

In general, measurements have shown that for piles in water, sound pressure levels drop off with distance at a rate of about 5 to 7 dB for each doubling of distance. The drop off rate measured in shallower water at Noyo River, that is similar to Ten Mile River, was about 8 dB per doubling of distance. The permanent 30-inch CISS piles will be driven in cofferdams dewatered to the mudline. For these piles, low frequency ground-radiated noise results from vibration propagating through the ground and not the shallow water. Attenuation rates vary considerably depending on the substrait but typically attenuate at rates of 6 to 10 dB per doubling of distance. Using the data at 10 meters, and these various propagation rates, we have determined the distances anticipated to the 190 dB peak SPLs for temporary H piles and permanent 30-inch CISS piles driven in cofferdams dewatered to the mudline (see Table 1).

Data is also presented for temporary H piles with an attenuation system. The proposed attenuation system is a double walled isolation casing (DWIC) with an air space that does not include a bubble ring. This system was utilized at Humboldt Bay and found to provide about 9 dB of attenuation. Data for this attenuator is included because in previous discussions it was determined that the use of a confined or unconfined bubble ring would cause serious turbidity

4 9 8

issues. The DWIC does not utilize a bubble curtain, avoiding turbidity problems. The driving of permanent piles inside a cofferdam dewatered down to the mudline, and the driving of H piles through a DWIC, should not cause peak pressures over 190 dB at 10 meters. There is almost no possibility of exceeding peak pressures of 200 dB at 10 meters.

Root mean square (RMS) sound pressures were also presented in the BA. For temporary H piles, the RMS pressures are estimated to be 15 to 20 dB below the peak pressures and for permanent CISS piles driven in cofferdams dewatered to the mudline, the RMS pressures are estimated to be 11 to 13 dB less than peak pressures.

Other attenuation options were evaluated. First, for permanent piles driven in a cofferdam dewatered to the mudline, there are no additional measures that we can recommend to further reduce underwater sound pressure levels. Second, for temporary H piles driven in shallow water, our review of bubble curtain data indicates attenuation on the same order as the DWIC.

The proposed Hydroacoustic Monitoring Plan attached to this report, includes the measurement of sound exposure level (SEL) in addition to instantaneous peak and RMS sound pressure levels. SEL data will be gathered for single strikes and accumulated during the driving of each representative pile. Data gathered for this project can, therefore, be evaluated with respect to the Interim Guidance presented in the Hastings and Popper report, as well as against an instantaneous peak SPL threshold established for the project.

The proposed Hydroacoustic Monitoring Plan for Ten Mile River Bridge includes recommendations regarding the number of measurements and measurement locations for temporary piles and permanent piles. These recommendations are based on extensive prior experience with acoustical monitoring for pile driving projects and would provide a defensible and representative data set.

RBR:gfl
Attachments

Table 1

Estimated Distances to Instantaneous Peak Sound Pressures of 190 dB Impact Pile Driving at Ten Mile River Replacement Bridge

		Estimated Distance (meters)
Source	Source Level (10 meters)	To 190 dB Peak SPL
Temporary H Piles – Unattenuated	185-198 dB	
- 5 dB drop off rate		<10m – 30m
- 8 dB drop off rate		<10m – 20m
Temporary H Piles – Attenuated with DWIC	176-189 dB	
- 5 dB drop off rate		<10m
- 8 dB drop off rate		<10m
Permanent 30-inch CISS Piles in Cofferdam Dewatered to Mudline	190 dB	
- 6 dB drop off rate		10m
- 10 dB drop off rate		10m

Note: Distances rounded to nearest 5 meters

Hydroacoustic Monitoring Plan for Ten Mile River Bridge Replacement

The purpose of this plan is to document how underwater sound pressures will be measured to assess underwater noise impacts from pile driving activities associated with the construction of the Ten Mile River Bridge Replacement Project. There are two types of piles being driven for the project; Temporary piles and Permanent piles. Underwater sound measurements would be made for the two types of piles and their placement. Underwater noise monitoring would include the measurement of peak sound pressure levels (SPL), root mean square (RMS)[1] sound pressure levels, and sound exposure levels (SEL).

Temporary Piles

At this time, steel shell piles on land and H-Piles in the water are proposed for construction of the temporary trestles. The steel shell piles will be driven on land and no monitoring is proposed for these piles. For H-piles driven in double walled isolation casing (DWIC), underwater sound levels will be measured for a minimum of one day or at least two piles. Measurements would be made at a distance of 10 meters (m) and at various distances to establish where the peak 190 dB (re 1μPa) levels occur. The measurement depth will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth.

Permanent Piles

The permanent piles are 30-inch diameter Cast in Steel Shell piles (CISS) driven in a dewatered cofferdam. There are three planned piers in the water and one that is near the water on land. For each of the three new pier locations in the river and the one on land near the water, underwater sound levels will be measured for a minimum of one day or two piles. These measurements will be made at a distance of 10m and at various distances to identify the areas where peak pressure levels of 190 dB (re 1μPa) occur. The measurement depth will be 3 m for water depths of 4 m or greater. In shallower water, the measurement position will be mid-depth.

Measurement Equipment

Measurements will be made using G.R.A.S. 10CT hydrophones with PCB in-line charge amplifiers (Model 422E13) and PCB Multi-Gain Signal Conditioners (Model 480M122) or equivalent systems. The signals will be fed into Integrating Sound Level Meters (SLM) and Digital Audio Tape Recorders (DAT).

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[1] Measured over the representative duration of the pulse.

RMS sound pressure level of these pulses using the standard "impulse exponential-time weighting" (35 millisecond rise time) function. Additional subsequent analyses of the acoustical impulses will be performed using a Real Time Analyzer capable of providing SEL, narrow band frequency, and corresponding pressure over time analysis (waveform).

Quality Control

The measurement systems will be calibrated prior to use in the field. For example, an acoustical pistonphone and hydrophone coupler could be used to send known sound signals to the underwater sound measurement system. This type of pistonphone used with the hydrophone coupler, produces a continuous 145 dB (re 1 μPa) tone at 250Hz. The SLMs are calibrated to this tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audiotapes that will be used. The system calibration status would be checked at the end of the measurement event by both measuring the calibration tone and recording the post-measurement on the tape. The taped calibration tones are used to calibrate the real time analyzer prior to analysis of tape recorded pulses.

All field notes would be recorded in water-resistant field notebooks. Such notebook entries would include calibration notes, measurement positions, pile driving information, system gain setting, and equipment used to make each measurement.

Data Reporting

A report will be prepared and submitted 30 days following the completion of marine pile driving activities. This report will contain acoustical information (peak, RMS, and SEL) for all piles where measurements were made. Representative frequency spectra and waveform analysis would be provided for each measured pile at a minimum of two different measurement positions. Included with the acoustical information would be the pile identification, distance from the pile, water depth/measurement depth, pile driver size, and other pertinent information. The report would also contain a brief project description, methodology, and presentation of results. The report would also briefly discuss the effectiveness of the noise attenuation systems that will be used for construction of the Ten Mile River Bridge Replacement Project.

Ten Mile River Bridge
Seismic Retrofit Project
April 7, 2006

TEN MILE RIVER BRIDGE
SEISMIC RETROFIT PROJECT

EELGRASS MITIGATION AND MONITORING PLAN

Prepared by: _____
Lisa Embree, Associate Biologist
North Region Environmental Services, Branch E-2
California Department of Transportation

I. SUMMARY

The California Department of Transportation proposes to replace the Ten Mile River Bridge over Route 1, post mile 69.4 in Mendocino County. The bridge replacement project involves work in the river which could affect eelgrass, a seagrass that provides food and shelter for various marine wildlife. This Mitigation and Monitoring Plan describes how potential effects to eelgrass will be analyzed and how mitigation, if required, will be accomplished.

The project is anticipated to result in a net gain of eelgrass habitat, therefore, no mitigation is proposed for permanent impacts to eelgrass. Temporary impacts may occur due to piles that will support temporary structures, shade from temporary platforms, and excavation.

Use of temporary piles is not expected to result in substantial effects to eelgrass since the areas are expected to recover naturally. If significant differences in eelgrass populations are found between control sites and areas shaded during construction, planting of eelgrass will occur within the shaded areas. Areas excavated to construct cofferdams will be replanted with eelgrass.

II. PROJECT BACKGROUND

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing to replace the bridge over the Ten Mile River on Route 1, post mile 69.4 in Mendocino County. The project is part of Caltrans' Statewide Seismic Safety Program. The purpose of the project is to provide an earthquake-resistant and scour-resistant bridge by replacing the existing bridge with a new one.

The Ten Mile estuary has extensive aquatic areas vegetated with eelgrass (*Zostera marina*), interspersed with non-vegetated mud in both shallow and deep-water channels. All of this area is classified as wetlands for the California coastal zone. In addition, the eelgrass and mud flats are "special aquatic sites", and the deep-water channels are "other waters" for the purpose of Army Corps of Engineers jurisdiction. Eelgrass provides many benefits to the Ten Mile River coastal ecosystem. This Plan provides details as to how affects to the eelgrass will be assessed and how mitigation, in the form of replanting, will occur.

Alternatives Analysis

Alternatives to replacing the bridge with the selected alignment were explored. Two retrofit and two different replacement alternatives were evaluated. It was concluded that the two retrofit alternatives considered were not logical choices since the enlargement of the bridge footings would cause the bridge to become "scour critical" and vulnerable to collapse during a large flood event. This would necessitate replacing the bridge sooner than if the bridge were replaced now during the seismic program. The other replacement alternatives would have resulted in further impacts to listed plants and riparian habitat. After numerous meetings with regulatory agencies and special interest groups, reviewing the results of initial biological and cultural resource surveys, and evaluating cost and extended life of each alternative, it was

decided to move forward using the proposed replacement alternative and abandon the remaining alternatives.

The creation of temporary trestles functioning as work platforms in shallow water was selected as the least environmentally damaging option for accessing construction activities in the Ten Mile River. Alternatives to the use of trestles were reviewed, including: the importation of material to construct access roads within the river banks; and water diversion methods such as excavating a channel and diverting the water to the new channel, or by utilizing such items as sandbags, water bladders or native gravel to divert the flow, gradually displacing the water. These options were not selected due to increased environmental concerns.

III. SUMMARY OF POTENTIAL IMPACTS TO EELGRASS

Permanent Loss of Eelgrass Populations/Habitat

The project will result in a permanent fill area in the river of 15.8 m^2 (170 ft^2). This fill area comprises the surface area displacement of the two concrete columns at each of the three new pier locations in the river. A permanent fill area of 23.3 m^2 (250 ft^2) will be removed from the river. This permanent fill consists of the above ground extension of the five existing concrete support columns. The project will result in a net gain of 7.5 m^2 (81 ft^2) of eelgrass habitat.

In regards to potential permanent effects as a result of shade from the new bridge, any shade effect from the new bridge will be balanced by the removal of the existing bridge. Since the project will result in a net gain of eelgrass habitat, no mitigation is proposed for permanent impacts to eelgrass.

Temporary Loss of Eelgrass Populations/Habitat

The replacement project may temporarily affect existing eelgrass populations as well as habitat suitable for eelgrass due to the use of piles to form the trestles, falsework, and debris cover, as well as the possible use of barges or boats. Eelgrass may also be affected due to shading from these temporary construction components. In addition, eelgrass will be affected from the excavation within the cofferdams that will be installed to construct the new bridge footings and to remove the old bridge footings.

Table 1 (below) summarizes the potential functional impacts to eelgrass related to temporary construction structures. For ease of relating the various impacts, the table is broken down to show temporary impacts upstream from the bridge related to new bridge construction activities, and downstream from the old bridge related to old bridge demolition activities.

The table condenses a progressive activity timeline in a "duration" for the construction that is likely to occur between the dates shown. The duration of each activity shown in the table is

based on the Engineers' estimate of a probable construction scenario, which is based on a logical sequence of work dictated by the project design, objectives and purpose. This probable schedule is severely constrained by seasonal restrictions on some construction activities, which are stipulated by other regulatory agency consultations to avoid or minimize potential adverse impacts to sensitive species.

Table 1 – Summary of Temporary Impacts

Type of Impact	**Eelgrass (#)[1], area[2]**
New Bridge Construction	
Trestle 2 – River Access – from 6/07 to 12/08	
Shade	720
Temporary piles	(45), 5.4, *82*
New Bridge Falsework – from 4/07 to 5/08	
Shade	1230
Temporary piles	(67), 8.0, *122*
New Bridge Cofferdam Excavation – from 4/07 to 5/08	
Temporary excavation[3]	170
Old Bridge Demolition	
Trestle 3 – River Access – from 10/08 to 3/09	
Shade	756
Temporary piles	(43), 5.3, *78*
Old Bridge Debris Cover (Falsework) – from 10/08 to 3/09	
Shade	250
Temporary piles	(21), 2.5, *116*
Old Bridge Cofferdam Excavation – from 12/08 to 1/09	
Temporary excavation[3]	70

[1] The number of temporary piles related to each temporary structure.
[2] Area in m^2. Nonitalicized numbers indicate area for only the temporary piles. Italicized numbers indicate area for DWIC which include area of the piles.
[3] Number reflects only the area currently covered with eelgrass.

Trestle, Falsework and Debris Cover (Piles)

Access in the river for the construction of the new bridge and demolition of the existing bridge will occur by use of a system of trestles. Each trestle will consist of a timber deck platform supported by timber or steel H-piles. The trestle for the new bridge will have several legs extending around the new pier locations. The legs may be extended to the west to provide access and containment for the old bridge demolition.

Alternatively, a separate trestle may be constructed for demolition of the existing bridge. This trestle would be constructed west of the existing bridge and would extend across the river to the toe of the north bank. Several legs of the trestle would likely extend under the bridge to facilitate demolition.

Falsework will be constructed to temporarily support the superstructure of the new bridge. Just as with the trestles, the falsework's foundation in the river will consist of driven timber or steel H-piles. In addition to the platform that will support what will become the superstructure, the portion of the falsework over the river may also include a platform similar in height to the trestle to allow for movement under the superstructure. This second platform would provide additional access for the construction staff and would be in use during the same time period as the adjacent trestle.

A debris cover, similar to falsework, will be used during demolition of the existing bridge over the river and will include a platform to contain material that will be removed for off-site disposal. Timber or steel H-piles will support the structure which will be constructed under the old bridge where the bridge's shadow may already limit natural vegetation.

Not originally proposed, the project now proposes to use a dewatered isolation casing (DWIC), or a similar system, to drive the temporary H piles for the trestles, falsework, and debris cover, in the river. DWICs create an "air" space between the temporary H pile and the surrounding river, resulting in attenuation of sound pressure levels associated with pile driving. The DWICs will be in place only for the length of time it takes to drive each respective pile.

Once construction has been completed, the trestle, falsework, cofferdam, and debris cover piles can be removed. The use of temporary piles, along with DWICs, or any barge or anchor grounding should not result in substantial loss or modification of river substrate. Any effect is expected to be short-term, with these areas recovering on their own naturally. It is unknown how long the temporary piles will be in the river. It is anticipated that any depressions left in the substrate subsequent to the removal of the temporary piles will quickly fill in and be repopulated with eelgrass. The same would be true for any depressions occurring as a result of barge anchors resting on the substrate. While the use of the DWICs increases the footprint of each pile, the DWICs will be on the substrate for only a brief period of time, in some cases possibly a matter of minutes. In those areas where eelgrass is not currently present, impacts, if any, should not substantially affect the substrate's ability to provide habitat for eelgrass. Mitigation in association with potential effects from the use of temporary piles and DWICs is not proposed. The trestles, falsework, and debris cover, consist of temporary piles capped by platforms which could result in shade effects to the eelgrass below. Potential project effects to eelgrass from shade are discussed in the next section.

The project as proposed, meets the obligations set forth in the California Coastal Commission's Consistency Certification, dated March 10, 2006, which states: "*For temporary impacts to eelgrass, Caltrans will: (1) implement the various restoration actions (e.g.,*

stockpile all excavated materials, soil backfill, benthic sediment backfill, plantings, monitoring) identified in the aforementioned eelgrass plan [August 15, 2005] upon completion of project construction; (2) survey the temporary impact areas one year after completion of project construction; (3) based on the survey results, implement further restoration actions (e.g.. soil/sediment backfill, plantings) for those temporary impact areas that did not return to pre-project conditions; and (4) continue this survey/restoration work until all temporary impact areas are returned to pre-project conditions."

Trestle, Falsework and Debris Cover (Shade)

The placement of the trestle platforms will shade the river. The effects of shade may be negligible and/or difficult to assess. Shade may actually be beneficial in areas where the water level is relatively shallow which can result in higher water temperatures. The new and existing bridges, and thus their respective trestles, are aligned in a fairly north/south direction. Therefore, sunlight will be available to the river and the corresponding substrate to some degree during the morning and afternoon throughout the growing season of the eelgrass. The aspect of the structures may allow for the continued growth of the eelgrass. Potential trestle effects from shade will be analyzed with pre and post construction surveys as discussed in section V below.

Either or both of the temporary falsework platforms could result in some level of shadow effect on eelgrass below it. However, the portion of the river under the temporary platforms will be permanently shaded by the new bridge. Shade from the new bridge has been considered as a permanent effect to eelgrass, hence, shade from the temporary falsework platforms will not be considered as potentially affecting eelgrass.

Once the existing bridge is demolished, any permanent shade effect will have been removed, thereby eliminating the need to analyze potential temporary effects to eelgrass from the shade of the temporary debris cover.

Barges and/or Boats

Barges and/or small motorized boats may be used to provide greater access for construction staff during pile driving. A small boat would most likely be put in the river by a crane located on the trestle. The proposed point for launching a barge is approximately 420m (1,380ft) east of the existing bridge on the south bank of the river. The eastern extent of eelgrass is roughly two-thirds of the distance between the bridge and the launch point. Once launched, the barge would progress to the deep-water channel, which is near the northern bank of the river and estimated at 75 feet in width. The barge would then travel west in the deep-water channel to the work site.

The Ten Mile River estuary is subject to seasonal flooding due to tidal action and the formation of a barrier sandbar across the mouth of the river. The use of a watercraft will be maximized during times when the river is of sufficient depth to fully support it. However, due to the tidal action in the estuary, there is a remote chance that the bottom of either type of craft could touch the substrate. Any grounding would occur within the boundaries of the trestle

and/or falsework. Mitigation in association with potential effects from the use of barges is not proposed

Cofferdams

Cofferdams will be constructed around pier locations prior to permanent pile driving operations for the new bridge and pier removal for the existing bridge. After any fish are rescued and pumping stops, soil inside the area will be excavated to the required elevations to facilitate construction of the new footings or removal of the existing ones.

After construction is completed, areas within each cofferdam will be restored to the level of the surrounding substrate with the material previously excavated. The cofferdam sheet piles will be removed and the total area within all eight cofferdams (788 m^2 (8,482 ft^2)), will be replanted with eelgrass. The total area within the cofferdams that currently have eelgrass equals 240 m^2 (2,583 ft^2), resulting in 548 m^2 (5,899 ft^2) of new area that will have eelgrass.

IV. GOALS AND OBJECTIVES OF THE MITIGATION PLAN

The goals of this mitigation plan are to:

1) Minimize effects on eelgrass populations in the areas temporarily affected by construction activities and replant those areas that have shown a significant decrease in density.

To accomplish these goals, the following objectives have been formulated:

1) Once construction is completed, all areas within the cofferdams will be replanted with eelgrass;

2) A survey and delineation of eelgrass within the river where the trestle platforms will be placed will be conducted both before and after construction; and

3) In areas of eelgrass populations within the plots showing a significant decrease in density, healthy eelgrass clusters will be replanted to accelerate the recovery of the eelgrass populations.

V. PRE- AND POST-CONSTRUCTION SURVEY DETAILS

Pre-construction surveys, post-construction surveys, and annual monitoring (if required) of the portions of the river that will be temporarily shaded by the trestle platforms will occur as follows:

Cover

Cover of the eelgrass beds will be estimated by determining the total area covered by eelgrass within study and control plots. Areas that approximate the spatial location of the following will serve as study plots:

- the trestle platform used for construction of the new bridge [Study Plot 1];
- the trestle platform used for demolition of the existing bridge [Study Plot 2];
- post construction, the replanted areas within the cofferdams will serve as Study Plot 3.

Two control plots of similar dimensions as the study plots will also be analyzed. Any changes in the control areas will be used to account for natural variability. Surveying a control area is necessary due to the wide seasonal fluctuations in the location, density and covered area of this type of habitat. Control Plot 1 will be located upstream of the trestle that will be used for the new bridge construction. Control Plot 2 will be located downstream of where the trestle used for the demolition of the existing bridge will be located. Having controls both up and downstream of the construction area will test if there are differences in variables, such as salinity and water depth.

The eelgrass will be delineated from current aerial photography or by using an existing photograph to map the eelgrass from the existing bridge, the new bridge, or by use of a kayak. Eelgrass cover within each plot will then be determined. While use of current aerial photographs is preferred, other options need to be available due to the logistics involving aerial photography; i.e. the following assumptions have to be made in order for aerials to be usable for determining eelgrass cover: 1) the flight can be timed to occur during a low tide and within the growing period of eelgrass to provide the best representation of the eelgrass; and 2) fog will be absent at both the project location and takeoff site.

Density

Density of eelgrass is defined as the average number of turions per unit area. Surveys to evaluate the density of eelgrass will be conducted in each of the two study plots and the two control plots, and will consist of random sampling within patches of eelgrass equal to or greater than 2 meters square. A kayak will be used to access each patch of eelgrass within each of the four plots. A quadrate will be randomly tossed out into the patch and the number of turions within the quadrate will be noted. Either a ¼ meter square quadrat or a meter quadrat will be used, depending on the amount of eelgrass present when the pre-construction surveys begin. Once a sampling method has been chosen for the pre-construction surveys, that method will be used for all sampling efforts throughout the life of the monitoring work. A representative number of samples will be taken.

Survey Schedule

Surveys to evaluate the existing eelgrass populations will be conducted prior to any construction work occurring in the river. These surveys will provide baseline data from which the post-construction surveys can be compared. As agreed upon by both NOAA Fisheries and

the U. S. Fish and Wildlife Service, temporary piles can be installed in the river between June 15 and October 31 during the first year of construction. If additional time is necessary to complete these items, the work will continue between September 15 and October 31 during subsequent years of construction. Since the period of active growth of eelgrass is May through August, the preconstruction surveys will be completed between May and June 15 of the first year of construction`.

This plan assumes that post-construction surveys in all of the plots will be conducted between May and June 15 following completion of the entire project. Surveys may occur at alternate times of the year if conditions are favorable. For example, post-construction surveys of the new bridge area and the control site upstream of the new bridge could conceivably be conducted after the bridge's completion but prior to the demolition of the existing bridge. Also, pre-construction surveys of the existing bridge and the downstream control area could conceivably be done during the growing season but just prior to demolition.

Conducting surveys during the alternative time periods discussed in the preceding paragraph depend on the following variables: 1) timing of when the trestles are removed; the contractor may elect to remove all of the temporary structures after project completion; 2) timing of the surveys in relation to when eelgrass is growing and visible; and 3) whether ongoing construction work elsewhere could interfere with the surveys or pose a danger to the survey crew.

VI. ANALYSIS OF DATA

Pre-construction Data

The eelgrass beds within the plots will be analyzed prior to commencement of construction to determine if there are pre-existing differences in the plots. Comparisons between the following will be done:

- Control Plot 1 and Study Plot 1
- Control Plot 2 and Study Plot 2
- The two control plots. If it is determined that the two control plots are the same in terms of eelgrass density, then either one could be used to compare with the two study plots. If there is a statistical difference between the two control plots, analyses will proceed as listed above.

Separate Student's *t* tests will be used to test the hypothesis that there is no statistical difference in eelgrass density between the plots.

Post-construction Data

The same comparisons discussed above will be conducted with the post-construction data. Student's *t* tests will be used to determine if any change in density attributable to the

construction project occurred. In addition, a control plot will be compared to Study Plot 3 to evaluate the condition of the areas replanted with eelgrass.

The post-construction data will utilize analysis of variance (ANOVA) to test the initial hypothesis that no change in eelgrass density occurred that is attributable to the project. This allows for testing statistically significant variation between more than two sample groups as well as testing for statistically significant variation between samples within each group. Use of ANOVA will also be useful if surveys need to occur over multiple years.

If post-construction survey results indicate that eelgrass densities have significantly decreased in one or both of the study areas, then the area(s) shall be replanted as discussed in the next section of this plan.

If the post-construction survey results demonstrate that eelgrass densities have not substantially decreased at all, then no further monitoring or mitigation would be required.

A monitoring report will be prepared and submitted within 30 days after the post-construction survey has been completed. The report will discuss the density of eelgrass documented in both the pre- and post-construction surveys, and whether or not further monitoring is required or if replanting is required.

VII. MITIGATION TECHNIQUE

The Southern California Eelgrass Mitigation Policy (Mitigation Policy), adopted on July 31, 1991, will be followed as a guide for the mitigation and monitoring of eelgrass at the Ten Mile River Bridge. Updated and approved guidelines will be utilized if developed by the time mitigation is slated to begin.

- If required, replanting will occur under the direction of a contractor with experience in collecting and transplanting eelgrass.
- If required, replanting will include the use of donor material taken from the area affected whenever possible, or transplanting eelgrass from other eelgrass beds in the area.
- No more than 10% of an existing bed will be harvested for transplanting purposes.
- Plants harvested will be taken in a manner to thin an existing bed without leaving any noticeable bare areas.
- Plantings will consist of bare-root bundles (clusters) of 8-12 individual turions. Due to seasonal fluctuations in the eelgrass beds, spacing of the bundles will be determined at the time of planting.

- Collection and transplanting of eelgrass populations, if necessary, shall be undertaken between May and early June. All transplanting work is to be completed by July 1 of the planting year to allow for sufficient vegetative growth prior to winter exposure. If it is determined that differences in density between the study and control areas associated with the new bridge construction exist, replanting will not occur until the entire project has been completed.

VIII. MONITORING PROGRAM FOR REPLANTING

A specific monitoring program will be developed if results of the post-construction survey determine that planting of eelgrass at the bridge site is necessary. Precise details are not outlined in this plan to allow for the incorporation of new methodologies that may be developed over the next few years. General details, however, are discussed below:

Replanting, if necessary, will occur within areas of the study plots where eelgrass is absent. A monitoring procedure shall be implemented to document the success of the restoration program including the monitoring of the supplemented eelgrass habitat. All monitoring work shall be conducted during the active eelgrass growth period (May through August) and shall avoid the winter months. A schedule will be developed that will detail when each of the required monitoring events will be completed.

Monitoring methods for evaluating the success of the replanting will be similar to the methods used for the pre- and post-construction surveys and shall include on-the-ground sampling of the populations to determine density.

IX. SUCCESS CRITERIA

Success criteria of the replanted areas will be based upon a comparison of vegetation coverage (area) and density (number of turions per square meter) between the study plots and the control plots. Although comparisons can be made, specific criteria as listed in the Mitigation Policy are not appropriate for the Ten Mile River estuary, since the river is dynamic with continual changes occurring due to streamflow, erosion, and sediment deposition.

X. MONITORING AND REPORTING SCHEDULE

A reporting process will be implemented for post-planting surveys according to the latest eelgrass guidelines accepted by the resource agencies. At a minimum, the process will include an initial monitoring report documenting the restoration work itself as well as annual reports documenting the progress of the replanting to include density. Photos and quantitative sampling will be taken annually during the peak growing season at approximately the same time of year to provide consistent documentation of eelgrass presence and growth in both the

study and control areas. The annual report shall include, at a minimum, the following information:

- Results of quantitative measurements;
- Comparison with control area;
- Observations of the health and vigor of the restoration site; and
- Results of monitoring of invasion by exotic species.

XI. CONCLUSIONS

The initial analysis between the sample groups before construction occurs should indicate that there is no statistical difference between the control and the construction samples since no disturbance has yet occurred. Testing this premise will allow for the evaluation of the sample size, sampling methods, statistical tests, and making corrections in the methodology, if needed, prior to construction.

If the analysis between the sample groups after construction indicates that there is no statistically significant difference attributable to the project, then no replanting or continued monitoring of eelgrass will occur.

If the analysis between the sample groups after construction indicates that eelgrass densities are significantly different than of pre-construction survey results, then replanting and monitoring of eelgrass will occur.

XII. ATTACHMENT

Figure 1 Location Map

Melanie Faust

From: Tami Grove
Sent: Monday, May 29, 2006 6:20 PM
To: Melanie Faust; Bob Merrill
Subject: RE: Responding to some of the issues raised re: Ten Mile Bridge

In the flurry of all the e-mails last week, I want to be sure that you remain cognizant of the information I wrote in the one below regarding the NCHRP report because I think that you will want to include some of it in your staff report.

Also, relative to the differences in anticipated safety results from the 8', 6' and 4' shoulders on the bridge*, I want to make sure that you a aware that Caltrans is seeking a design exception in order to build the 6' shoulders. The design standards call for 8' shoulders. In processing such an exception, a registered Professional Engineer must first analyze, justify and document the need for the exception and ensure that the change in design will still provide adequate safety. That Professional Engineer must affix his/her certification seal to the design exception form attesting to these facts. According to Caltrans' **Project Development Procedures Manual** Appendix BB *Exceptions to Design Standards*, page 3: "Traffic safety is of primary importance to both (Caltrans and the Federal Highway Administration) when considering approval or rejection of design exceptions." Accordingly, the exception request "must include an analysis of accident data to identify prevalent accident types and causes, plus an evaluation of the effect of the requested design exceptions on accident types and frequencies." Mr. John Steele, the Professional Engineer who prepared the 6' bridge shoulder request for this project, has stated to Commission staff that in his professional judgment, 6' is the narrowest width that he believes can be justified to provide safe operations on the Ten Mile Bridge.

**As to the chart that I worked on with Sheila Mone displaying the research on anticipated accident reduction from these various shoulder widths, I am attaching it again in the hopes that you will reconsider using it in your staff report. I still think it would be useful information for the Commission and public to have.*

Table 25 from \CHRP 440version..

Hope things are going well there for both of you. I am off the next two days and will be back in the office on Thur. June 1st.

Regards,
Tami

EXHIBIT NO. **4A**
APPLICATION NO.
1-06-022
CALTRANS
SAFETY INFORMATION SUPPLIED BY CALTRANS VIA EMAIL (1 of 4)

-----Original Message-----
From: Tami Grove
Sent: Monday, May 22, 2006 12:46 PM
To: Melanie Faust; Bob Merrill
Cc: Susan Hansch; Peter Douglas
Subject: Responding to some of the issues raised re: Ten Mile Bridge

Hi Melanie and Bob,

I hope this information comes in time to be helpful to you. As I promised I would, I did some additional research on some of the bridge shoulder width issues raised in Vince Taylor's March 18 letter to the Bridge Railing Subcommittee.

Vince raised questions about the applicability of NCHRP Report 440 to conditions at Ten Mile and asserted that "there is no significant safety benefit from increasing road shoulder width from 4' to 8'."

Here's what I found:

The *Accident Mitigation Guide for Congested Rural Two-Lane Highways* was published by the National Cooperative Highway Research Program (NCHRP) in 2000 (and is also know as NCHRP Report 440). This was an important resource relied upon by Caltrans in taking into account safety needs at the Ten Mile River Bridge. Some have questioned the applicability of such a report to many of the rural two-lane roads in California because of the use of the term "congested" in the title. Mr. Ray Derr, the study coordinator at NCHRP was asked by Caltrans about the use of

this term, particularly when many of the traffic volumes in the report begin at low levels such as "under 500 Average Daily Traffic (ADT)" levels or "1000 to 3000 ADT." His response that was shared with Commission staff (see Attachment below) was that the original scope of the project related to two-lane highways with high volumes of use that could not be widened. However, as the research proceeded, the project scope became broader to include all rural roadways with lower levels of use and thus, he suggests in hindsight, the term "congested" should have been dropped from the title. In any event, the conditions at Ten Mile are comparable since the ADT at Ten Mile, originally stated to be 1200, but recently corrected by Caltrans to now be 1600, are well within the bounds of the lower traffic levels covered within the report.

Within NCHRP, on page 42, a summary of accident reduction factors associated with widening shoulders on bridges is given, based on a research paper entitled "Prediction of Bridge Accident Rates, " from the Journal of Transportation Engineering, Vol 110, No , American Society of Civil Engineers, New Your, NY (January 1984), pp. 45-54. (I will attempt to scan this chart for you and e-mail it later today.) As you will see, this research indicates a fairly significant difference between 4' and 6' wide shoulders on rural road bridges that are being widened from 1' wide shoulders: i.e.. while 4' would be expected to result in a 45% accident reduction, widening to 6' would be expected to result in a 72% accident reduction. It is important to note that these studies deal explicitly with *bridge* shoulder widths, as road shoulder width studies are not interchangeable, particularly given the hard edge boundaries of bridges compared to the off-highway recoverable space that can usually be found on rural roads. (The studies that Vince referred to in his Nov. 2005 letter related to *roadway* shoulders.)

I also have been trying to follow up on some of the collision rate information on Ten Mile. John Steele has been out for personal reasons, but I am trying to get more information from him this week. Apparently, they have data showing that the current
collision rate at Ten Mile (calculated by a number of factors, including CHP reports) is nearly twice the expected rate for this type of facility. As soon as I get anything on this, I will forward up to you.

In addition, I have inquiries into bike groups about their position on 4 vs. 6 foot wide shoulders on bridges and if I get any responses, I will immediately forward up to you. I also am looking into the ADA issues that Vince raised in his 5/8 e-mail to Caltrans on ADA and the sidewalk and thought that I might forward a few thoughts that you might want to use in your staff report.

Hope things are going well for you. (And that this is helpful.)

<< File: SteeleDerr e-mail.doc >>
Regards,
Tami Grove
California Coastal Commission
Statewide Development
and Transportation Liaison
725 Front Street, Suite 300
Santa Cruz, CA 95060
Phone: (831) 427-4863
Fax: (831) 427-4877

Visit the CCC website at: www.coastal.ca.gov

Summary of accident reduction factors associated with widening shoulders on bridges. [1, 2, 3]

Bridge Shoulder Width Before Widening, in feet		Bridge Shoulder Width, in feet, after Widening Each Side [Total of Both Sides in Brackets]						
Each Side	Total of Both Sides	2 [4]	3 [6]	4 [8]	5 [10]	6 [12]	7 [14]	8 [16]
0	0	23	42	57	69	78	83	85
1	2	--	25	45	60	72	78	80
2	4	--	--	27	47	62	71	74
3	6	--	--	--	28	48	60	64
4	8	--	--	--	--	44	44	50

[1] Adapted from Table 25 in *Accident Mitigation Guide for Congested Rural Two-Lane Highways*, National Cooperative Highway Research Program (NCHRP) Report 440, National Academy Press, 2000. (The original table uses both metric and English units; metric units were deleted to simplify the table.)

[2] Assume that the width of lanes on the bridge remains constant.

[3] The reduction factors are the percent reductions in total accident rate expected due to widening shoulders on bridges. For example, widening from 2-ft shoulders on each side to 6-ft shoulders on each side would reduce the total bridge accident rate by 62%.

Collision Data for Ten Mile River Bridge

The collision comparison data supplied by Caltrans during the Federal Consistency review of the project has since been discovered to be in error because an incorrect figure for the Average Daily Traffic (ADT) was used: 1200 was used instead of the actual figure of 1600, which is based on traffic counts collected by Caltrans between the period of June 30, 2000 to June 30, 2005. This changes the comparisons of accidents at Ten Mile to similar facilities in the state, showing that the collisions on the existing bridge were at a rate that is nearly **double** the statewide average, according to Caltrans.

Caltrans regularly collects collision data from the California Highway Patrol and stores it on its Traffic Accident Surveillance and Analysis System (TASAS). This system provides Caltrans with a number of reports, including calculations of accident rates for any specific location as well as summaries of total, fatal and injury accidents. Averages for comparisons within this system are calculated based on "Highway Rate Groups" which are defined by such characteristics as highway type (number of lanes, access control, divided/undivided); terrain; ADT; design speed; and population area (urban, suburban, rural).

Caltrans has submitted the following information regarding Ten Mile Bridge:

Actual at Ten Mile (MEN 01 PM 69.65/69.99)				**Statewide Average****			
F*	F + I**	PDO***	**Total**	F	F + I	PDO	**Total**
0.0	0.7	0.71	**1.41**	0.017	0.37	0.373	**0.76**

*F = Fatal accident (not number of fatalities)
**F + I = Fatal plus Injury
***PDO = Property Damage Only
****The "Statewide Average" rate groups were reviewed in 2000 and are based on data from 1994 through 1996.

This means that the actual collision rate for Ten Mile Bridge is 1.41 collisions/million vehicles, which is nearly twice the expected rate of 0.76 collisions/million vehicles for this type of facility.

State of California
Department of Transportation

Memorandum

EXHIBIT NO. 5A
APPLICATION NO.
1-06-022
CALTRANS
MEMORANDUM DATED
4/13/06, PREPARED BY
CALTRANS (1 of 9)

Business, Transportation and Housing Agency

To: Steven Croteau
Associate Environmental Planner
Environmental Branch E2

Date: April 13, 2006

File No.: 01-385700
Men-1-PM 69.4/70.1
Ten Mile River Bridge

Original Signed by
From: David Melendrez, Chief
North Region Office of Environmental Engineering—North

Subject: Response Comments to California Coastal Commission Letter for Information for Ten Mile River Bridge PWP/CDP Processing

The following information is intended to address Items 5, 9, and 11, as listed in a letter dated March 28, 2006, from the California Coastal Commission (CCC) for the Ten Mile River Bridge Replacement Project.

Item 5. Coffer Dam De-Watering Plan: *"The plan should explain how the de-watering process will be undertaken, including specific measures to ensure that sediment, concrete, debris, or other contaminants that may find their way into the interior of the cofferdams will be separated/filtered/treated prior to return of the pumped water to the Ten Mile River or environs. The Plan should specify the water quality standards proposed for the treated effluent prior to return to the river, and how this standard will be implemented while coffer dams are in use (including what containment methods, testing protocols, etc., are proposed to ensure that applicable standards are met, monitored for continuing conformance to the approved standards throughout the project, etc.)."*

Construction dewatering will be required during various phases of bridge construction: for dewatering of isolation casings to construct a temporary trestle system, for dewatering of cofferdams during pile driving operations and construction, and for dewatering of isolation casings during falsework pile construction. Effluent from dewatering of isolation casings will consist entirely of surface water with sediment being the only constituent of concern.

Dewatering of isolation casings is proposed for noise attenuation. The isolation casing would be placed just below the river substrate and dewatered to allow the driving of temporary H-piles. The specific water quality objective for turbidity for North Coast Regional waters of the State is set in the North Coast Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan for the North Coast Region (Basin Plan). The Basin Plan states, "*Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waivers thereof*". (Note: No allowable zones of dilution are specified in the discharge permit for this project). All dewatering

construction activities must maintain a turbidity limit of less than 20% above background values.

Caltrans has applied for and received approval to perform construction dewatering activities in accordance with North Coast RWQCB's General National Pollutant Discharge Elimination System Permit, Waste Discharge Requirements for Discharges of Groundwater to Surface Water Related to Construction and Subsurface Seepage Dewatering Activities in the North Coast Region, Order No. 93-61, NPDES Permit No. CA0024902 (Construction Dewatering Permit). The contractor is required to implement the Monitoring and Reporting Program issued in conjunction with the Construction Dewatering Permit in order to proceed with construction dewatering activities. Monitoring and Reporting Program No. R1-2005-0079 requires the effluent from dewatering activities be monitored for flow, turbidity, and conductivity. The receiving water is to be monitored for turbidity and conductivity. The Monitoring and Reporting Program requires daily sampling for these constituents with monitoring reports submitted to the RWQCB on a monthly basis. It is important to note that the Monitoring and Reporting Program is required for direct discharges to Ten Mile River. The contractor could opt to discharge to a temporary sedimentation basin and/or settling tank located within the temporary construction easement (TCE), and therefore, would not be required to sample the effluent and/or the receiving water. The use of a temporary sedimentation basin would require that all the dewatered effluent completely infiltrate with no over-topping of the basin.

Cofferdam construction would proceed from a trestle, or from land, depending on the active river location and/or constraints. Cranes would be used to drive sheet piles in a rectangular shape at about the centerline of the new footing location. Typically this area is a minimum of 1-meter larger that the planned footing/pilecap to allow room for the construction forms. [Note: Even though dewatering is not required to drive sheet piles, the water quality objective of maintaining a turbidity value of no more than 20% above background would still apply].

After the sheet piles are installed, the riverbed would be excavated to approximately 1-meter below the bottom of the footing elevation – this would require a minimum depth of excavation of 2.5-meters below the existing riverbed. After the required depth of excavation is completed, pile driving would commence. For noise attenuation during pile driving, it is proposed to dewater the cofferdam to below the existing elevation of the riverbed (i.e. below the 'mud line'). Again, this would consist of contained surface waters, and sediment would be the only constituent of concern.

After the pile shells are installed, the inside of each pile is bored out by drilling. Often, drilling extends several meters beyond the shell tips. Finally, the shells are filled with reinforcing steel and concrete. Depending on water and pile elevations, continuous pumping of water out of the cofferdam and/or piles may be necessary at this stage of construction. Water that meets water quality effluent limitations as contained in the Construction Dewatering Permit may be

discharged directly to Ten Mile River. Constituents of concern for this construction phase consist of turbidity and pH. The water quality objective for pH is set in the Basin Plan. The Basin Plan states: *"The pH shall conform to limits listed in Table 3-1. For waters not listed in Table 3-1 and where pH objectives are not prescribed, the pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.2 units in waters designated in marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses"*. Table 3-1 lists specific water quality objectives for designated receiving waters within the North Coast Region. Specific water quality objectives for Ten Mile River consist of dissolved oxygen (minimum 7.0 mg/l, 90% lower limit of 7.5 mg/l, 50% lower limit 10.0 mg/l) and Hydrogen Ion (pH – maximum 8.5, minimum 6.5).

Water quality standards consist of 1) designated beneficial uses; 2) the water quality objectives to protect those designated uses; 3) implementation of the Federal and State policies for anti-degradation; and 4) general policies for application and implementation. The beneficial uses for Ten Mile River as listed in the Basin Plan are: Municipal and Domestic Supply, Agricultural, Industrial Service Supply, Industrial Process Supply (Potential), Groundwater Recharge, Freshwater Replenishment, Navigation, Power Supply (Potential), Contact and Non-Contact Water Recreation, Commercial, Cold Water Habitat, Wildlife Habitat, Rare, Threatened, or Endangered Species Habitat, Migration of Aquatic Organisms, Spawning, Reproduction, and/or Early Development, Estuarine Habitat, and Aquaculture (Potential). Ten Mile River is listed as not meeting beneficial uses due to sediment, siltation, and temperature, in accordance with Section 303(d) of the Clean Water Act. The U.S. EPA established the Ten Mile River Total Maximum Daily Load (TMDL) for Sediment in December 2000. It should be noted that less than $1/10^{th}$ of 1 percent of Highway 1 is located within the Ten Mile River watershed. As such, the operation of the highway facility is not a primary factor for the impairment of the beneficial uses of Ten Mile River. [Note: Ten Mile River is not designated for marine or saline beneficial uses, therefore the allowable pH range within background would be 0.5 units].

The Monitoring and Reporting Program requires the following sampling regime:

Wastewater

The effluent from dewatering activities shall be monitored for the following:

Parameter	Units	Type of Sample	Sampling Frequency[1]
Flow	gals/day	meter	continuous
Turbidity	ntu	grab	daily
Conductivity	micromhos	meter	daily

Receiving Water

The receiving water shall be monitored for the following:

Parameter	Units	Type of Sample	Sampling Frequency[1]
Turbidity	ntu	grab	daily
Conductivity	micromhos	meter	daily

[1] When discharge activities are occurring.

Daily sampling, as required by the Monitoring and Reporting Program, will ensure compliance with water objectives as identified in the North Coast Basin Plan. To dewater and discharge to Ten Mile River the contractor will be required to implement the Monitoring and Reporting Program and report any exceedance of the water quality objectives as outlined above. A copy of the Construction Dewatering Permit and the Monitoring and Reporting Program are attached.

Implementation of Best Management Practices (BMPs) During Construction Dewatering: The necessary implementation of BMPs to control turbidity, pH, and other receiving water limitations, will be driven by the Monitoring and Reporting Program and water quality objectives as identified in the Basin Plan. If the turbidity water quality objective is difficult to maintain while driving sheet piles, then the contractor could utilize turbidity silt curtains to localize the turbidity and eliminate any potential for sediment plumes. There are several manufacturers of turbidity curtains available on the market. If the turbidity water quality objective is difficult to maintain during dewatering of isolation casings, pile dewatering, or cofferdam dewatering, several BMP options are available to the contractor: mobile cartridge filters, adjustment of pumping rates, pumping water to a settling tank, or pumping water to a temporary sedimentation basin. Several dewatering options are discussed in Caltrans Construction Site BMP Manual (NS-2). To control pH the contractor will likely monitor the water prior to discharge to allow pH levels to stabilize to within 0.5 pH units of background.

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act. These provisions require controls of pollutant discharges to utilize best available technology economically achievable, and best conventional pollutant control technology (BAT/BCT) to reduce pollutants necessary to meet water quality standards. Construction dewatering is considered a non-storm water discharge. All storm water and non-storm water discharges from all Department properties, facilities, and activities are regulated under Order No. 99-06-DWQ, NPDES NO. CAS000003, NPDES Permit, Statewide Storm Water Permit and Waste Discharge Requirements for the State of California Dept. of Transportation (Caltrans Statewide NPDES Permit). The proposed project will also be regulated by NPDES General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity

(Construction General Permit). BAT and BCT requirements are cited as necessary in both Caltrans Statewide NPDES Permit and in the Construction General Permit.

The Receiving Water Limitations in the Construction General Permit require the Storm Water Pollution Prevention Plan (SWPPP) be designed and implemented so that storm water discharges and authorized non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standard. (Receiving Water Limitation B.2.)

Item 9. Staging/Stockpiling/Material Storage/Fuel Storage & Fueling/Cement Mixing/Washout. *"The use of the 'Mixing Table' area was generally considered during Federal Consistency review. The revised plans and project description should verify this location and the extent of the area that would be used for these activities, including specific locations for various components, such as concrete washout area, fuel storage area (and containment), etc. If any additional or changed areas have been proposed since the November 2005 Federal Consistency hearing, these should be fully disclosed and incorporated into the Revised Plans and Project Description. Future areas determined necessary during construction, if not identified at this stage, would require an amendment of the CDP or PWP, as applicable."*

Please see the attached plans C-1a and C-1b. These plans delineate the staging area (Mixing Table), a stockpile management area with a linear sediment barrier (fiber roll), stabilized construction entrances and exits, and concrete washout areas. Attached plan C-1b delineates the location of temporary silt fence, a concrete washout area, and a proposed location for an optional sediment basin and/or dewatering tank. These are the minimum construction BMPs identified. The contractor-prepared SWPPP will include a suite of construction BMPs, inspection and maintenance schedules, hazard spill control BMPs, a sampling and analysis plan, and contingency plans. The staging area will be used for, but not be limited to, stockpiling, material storage, and fuel storage & fueling.

It should be noted that FHWA does not allow the State of California Dept. of Transportation to mandate a specific staging area be used by a contractor.

Item 11. Final Water Quality Protection Plan. *"Provide the final plan incorporating all of the elements of water quality protection commitments made during the Federal Consistency review; BMPs on and off the bridge, in-water construction measures (such as sediment control during cofferdam installation), etc., should be included. As we discussed, a logical division of these provisions would be into 4 overall categories, including:*

a) Construction Phase (temporary) in PWP area,
b) Construction Phase (temporary) in CDP area,

c) Operational Phase (permanent) in PWP area,
d) Operational Phase (permanent) in CDP area."

The following discussion focuses on measures that are implemented to protect water quality. These measures consist of identified minimum critical construction BMPs, permanent BMPs, tools and resources available to the contractor, general statewide permit conditions, site-specific permits, and the over-sight review by state agencies of the contractor-prepared SWPPP.

Minimum Critical Construction BMPs
Please see attached layouts L-1 through L-4, and C-1a and C-1b. The areas for state coastal jurisdiction and the local coastal jurisdiction are clearly delineated.

The layouts delineate *temporary* BMPs proposed as minimum construction project elements and include: designated soil stockpile area, linear sediment barrier (fiber roll) for the stockpile area, temporary cover for the stockpile area during wet weather conditions, construction site entrances and exits, two concrete washout areas, temporary silt fence, and environmental sensitive area (ESA) fencing. All of the temporary BMPs delineated on the attached layouts will be identified in the specifications as required project elements.

The layouts delineate *permanent* BMPs as necessary project elements and these include: revegetation of disturbed soil areas, fiber rolls as part of the permanent erosion control/revegetation plan, rock energy dissipators at culvert outlets, rock lined ditches, rock slope protection, and biofiltration strips. All of the permanent BMPs delineated on the attached layouts will be identified in the specifications as required project elements.

Tools and Resources Available to the Contractor
The contractor will be required to develop a SWPPP that will identify all temporary construction BMPs required for project construction, including those outlined above. The SWPPP will contain a detailed listing of temporary construction BMPs along with inspection and maintenance schedules. The SWPPP must also contain specific text that holds the contractor legally liable for project construction activities, requires training of designated construction personnel (i.e. water pollution control manager), a site-specific erosion control and revegetation plan, designated fueling areas and BMPs, a description of spill response BMPs that will be available on the construction site, drainage patterns at the construction site, and sample collection locations. Caltrans has developed a SWPPP template that contains certain necessary erosion control and temporary construction BMPs, and specific text that is legally required to be part of the SWPPP. A copy of a SWPPP template can be downloaded from: http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm. The template contains all the major project elements that are required by the Statewide Construction General Permit. The SWPPP, at a minimum, must address soil stabilization, sediment control, wind erosion control,

tracking control, non-storm water management control, and waste management and materials pollution control.

As part of Caltrans specifications, the contractor will be required to develop a Water Pollution Control Cost Breakdown Table that will identify all the temporary construction BMPs to be used on the project along with the estimated quantities of each BMP. Attached is Caltrans standard specification for projects that require a SWPPP to be developed and approved prior to significant soil disturbing activities.

Caltrans has also developed a Construction Site BMP manual. The Construction Site BMP manual contains all the BMPs that Caltrans has identified as feasible and effective for use at project construction sites. The manual also contains descriptions of when and where temporary construction BMPs may be required. The manual can be downloaded at:
http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf

General Statewide Permits
All storm water discharges and non-storm water discharges from all Department properties, facilities, and activities are regulated under Caltrans Statewide NPDES Permit. Caltrans Statewide NPDES Permit states that any discharge from Caltrans right-of-way, properties, facilities, and activities that is not composed entirely of storm water to water of the United States is prohibited, unless authorized by Section B of the Permit. Section B allows discharges authorized by a separate NPDES permit (i.e. Construction Dewatering Permit), or an authorized non-storm water discharge. The authorized exempted non-storm water discharges as outlined on page 8 of the Permit will not be part of the proposed project. Caltrans Statewide NPDES Permit can be downloaded at:
http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/_pdfs/management_ar_rwp/CTSW-RT-99.pdf.

Section A., General Discharge Prohibitions of Caltrans Statewide NPDES Permit contains seven discharge prohibitions to protect water quality. In accordance with Caltrans Statewide NPDES Permit, storm water discharges shall not cause or contribute to a violation of an applicable water quality standard. If receiving water quality standards are exceeded, Caltrans is required to submit a written report providing additional BMPs or other measures to be taken that will be implemented to achieve water quality standards.

Caltrans Statewide NPDES Permit incorporates, by reference, the Statewide Construction General Permit. Appendix A of the Construction General Permit also discusses and lists required project components of a SWPPP.

In addition, the Construction General Permit was modified in 2001 by Resolution No. 2001-046, "Modification of Water Quality Order 99-08-DWQ, State Water Resources Control Board

(SWRCB) National Pollutant Discharge Elimination System (NPDES), General Permit For Storm Water Discharges Associated With Construction Activity". The Modifications to the Construction General Permit require that a sampling and analysis strategy and sampling schedule for certain storm water discharges from construction projects be developed and kept with the project's SWPPP. The sampling and analysis requirements supplement, but do not replace, the visual monitoring program required by Section B of the Construction General Permit. All construction projects must contain a visual monitoring program including inspections before predicted rain events, during extended rain events, and following rain events.

The Construction General Permit requires permittees to implement specific sampling and analytical procedures to determine whether BMPs implemented on a construction site are preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired (Clean Water Act Section 303(d) List [303(d) List]) for sediment, silt, or turbidity; and preventing other pollutants that are known or should be known to occur on the project site and that can not be visually observed in storm water discharges, from causing or contributing to exceedances of water quality objectives.

The Receiving Water Limitations in the Construction General Permit require the SWPPP be designed and implemented so that storm water discharges and authorized non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standard. (Receiving Water Limitation B.2.)

Ten Mile River is listed on the 303(d) List for sediment/siltation and temperature. Therefore, a sampling and analysis plan (SAP) must be developed for both visible and non-visible pollutants.

The Construction General Permit requires that the SWPPP identify a strategy for conducting the sampling and analysis, including the frequency at which sampling will be conducted. The SWPPP must also describe:

- The location(s) of direct discharges from construction activities to the receiving water;
- The designated sampling location(s) in the listed water body representing the prevailing conditions down-stream of the discharge; and
- The sampling design which describes the sampling devices used; the sample size; the number of samples to be taken at each location, the laboratory protocol employed; and the statistical test used to determine if the upstream/downstream samples differ to a statistically significant degree.

The Modifications to the Construction General Permit require the contractor to only sample up to four storm events per month.

Site-Specific Permits
The following site-specific permits are required for the proposed project and in some way address water quality either directly or indirectly:

- Biological Opinion: U.S. Fish and Wildlife Service
- Biological Opinion: National Oceanic and Atmospheric Administration's National Marine Fisheries Service
- Biological Opinion Consistency Determination: California Dept. of Fish and Game
- Clean Water Act 404 Permit: U.S. Army Corps of Engineers
- Clean Water Act 401 Certification: North Coast RWQCB
- 1602 Streambed Alteration Agreement: California Dept. of Fish and Game
- California Coastal Permit: California Coastal Commission
- Local Coastal Permit: Mendocino County
- Caltrans Statewide NPDES Permit: Adopted by the State Water Resources Control Board and enforced by the RWQCBs
- Construction General Permit: Adopted by the State Water Resources Control Board and enforced by the RWQCBs
- Construction Dewatering Permit, Order No. 93-61, and the accompanying Monitoring and Reporting Program No. R1-2005-0079: North Coast RWQCB.

The above discussion outlines regulatory criteria in-place to protect water quality and identifies construction activities that may impact water quality. In addition, both temporary and permanent BMPs are identified. The Coastal Commission will also have the opportunity to review the contractor-prepared SWPPP. This will allow Coastal Commission staff to request additional BMPs as appropriate. It is expected that the North Coast RWQCB will also request a copy of the SWPPP. As such, three State agencies, Caltrans, the Coastal Commission, and the North Coast RWQCB will have the opportunity to review the contractor-prepared SWPPP and request changes and/or additions. This over-sight role, together with Caltrans Construction Site BMP Manual, SWPPP template, standard specifications (07-345), identified minimum critical construction BMPs, and the incorporation of bio-strips as treatment BMPs provides adequate measures to protect water quality.

If you have any questions or concerns regarding the above, or would like to generally discuss project elements regarding storm water and/or water quality, feel free to contact me at your earliest convenience at (707) 445-5201.

Attachments

DM/ks

999

State of California
Department of Transportation

Business, Transportation and Housing Agency

EXHIBIT NO. 6A
APPLICATION NO.
1-06-022
CALTRANS
CALTRANS MEMORANDUM
DATED 4/30/06 (1 of 6)

Memorandum

To: Steven Croteau
Associate Environmental Planner
Environmental Branch E2

Date: April 30, 2006

File No.: 01-385700
Men-1-PM 69.7
Ten Mile River Bridge
Replacement

From: Lisa Embree
Associate Biologist
Environmental Branch E2

Subject: Response to California Coastal Commission memo of 4/20/06 – Biological Issues

This memorandum was prepared to address a request for information relating to biological issues put forth by the California Coastal Commission during review of the PWP/Specific PWP Project/CDP Application/CDP Amendment for the referenced Ten Mile River Bridge Replacement Project.

California Coastal Commission Items:

1. Eelgrass Mitigation and Monitoring Plan (Eelgrass Plan) previously dated March 17, 2006....included in the April 14, 2006 submittal. ... The Plan considers the shading impacts of the temporary structures to be either neutral or potentially beneficial. ...

Response:

The April 7, 2006 Eelgrass Mitigation and Monitoring Plan (Plan) does state that shade from the temporary structures may be negligible or even beneficial, and that shade effects may be difficult to assess. The Plan further states that potential effects of shade from the trestle will be analyzed with pre- and post-construction surveys.

...The memo concludes that mitigation for the eelgrass impacts ... unmitigated natural recovery is ultimately successful.....

Response:

The project proposes that eelgrass will fill in naturally subsequent to removal of the temporary piles. Monitoring for natural recovery subsequent to removal of the piles placed to support the trestle used for the construction of the new bridge and the trestle used for the demolition of the existing bridge, will not be conducted. However, potential shade effects from the trestle platforms, which include the areas where the temporary piles had been placed, will be assessed with pre- and post-construction

surveys. According to the Plan, areas showing a significant decrease in the density of eelgrass in these areas will be replanted with eelgrass and monitored.

...The additional area of impact associated with the DWICs (beyond what was previously calculated for H-piles alone) is not separately quantified in the biologist's memo. We would appreciate quantification .....installation of the cofferdams, etc.

Response:

The April 10, 2006 memo contained a table, titled Summary of Temporary Impacts, that included the area for both the temporary piles and the DWICs (which include the piles). By way of subtraction, the amount of additional eelgrass habitat that could be affected by use of the DWICs can be determined. The Summary of Temporary Impacts table is provided below with a new column showing the additional amount of eelgrass associated with the DWICs.

Summary of Temporary Impacts
(New Bridge Construction and Old Bridge Demolition) [1]

Type of Impact	Eelgrass	
	(#)[2], area[3]	**DWIC area[4]**
New Bridge Construction		
Trestle 2 – River Access – from 6/07 to 12/08		
Temporary piles	*(45)*, ~~5.4~~, 82	76.6
New Bridge Falsework – from 4/07 to 5/08		
Temporary piles	*(67)*, ~~8.0~~, 122	114
TOTAL	*(112)*, ~~13.4~~, 204	190.6
Existing Bridge Demolition		
Trestle 3 – River Access – from 10/08 to 3/09		
Temporary piles	*(43)*, ~~5.3~~, 78	72.7
Old Bridge Debris Cover (Falsework) – from 10/08 to 3/09		
Temporary piles	*(21)*, ~~2.5~~, 38	35.5
TOTAL	*(64)*, ~~7.8~~, 116	108.2
GRAND TOTAL	*(176)*, ~~21.2~~, 320	298.8

[1] Information is taken from March 17, 2006 Eelgrass Mitigation and Monitoring Plan and the August 11, 2005 Wetland Delineation Supplemental Information Report.
[2] The number of temporary piles related to each temporary structure.
[3] Area in m^2. Figures shown with strikethrough indicate area for only the temporary piles. Figures shown without strikethrough indicate area that includes a DWIC.
[4] Area in m^2. Figure indicates the amount of additional eelgrass habitat that could be affected by use of the DWICs.

While the project proposes to salvage and store benthic material removed from the cofferdams, the project does not propose to salvage and store eelgrass. As you allude to in your memo, salvaging and storing eelgrass over an extended period of time with the intent to replant it requires specific conditions. The eelgrass would have to be placed in large tanks in a laboratory setting to provide a viable ecosystem. Only in a laboratory can conditions of light and temperature be maintained, necessitating constant monitoring of the eelgrass.

Has Caltrans received final approval from other reviewing agencies.....under further negotiations?...

Response:

We are waiting for approval of the April 7, 2006 version of the Plan from the California Department of Fish and Game (CDFG). We have been working closely with staff from CDFG regarding methods to assess potential effects to eelgrass. According to a recent email from CDFG, it is their intent to finalize their review of the Plan sometime this week.

3. Regarding Noise Attenuation and Monitoring. We note that the Commission letter....September 16, 2005...

Response:

We are still awaiting NOAA Fisheries' approval of the January 30, 2006 Noise Monitoring Plan. The Noise Monitoring Plan will be modified to include information pertinent to the use of double walled isolation casings (DWICs) once we receive NOAA's comments. A copy of the revised Plan will be forwarded to you as soon as it is completed.

We understand that reviewing agencies ....and protocols that will be administered.

Response:

U.S. Federal Highway Administration, NOAA Fisheries, and Caltrans, participated in a meeting held in Sacramento last Thursday, April 27, 2006 that focused on NOAA Fisheries' request for sonar monitoring to occur during pile driving. The outcome of the meeting was that NOAA Fisheries' Biological Opinion will include sonar monitoring as a conservation recommendation. While not incorporated into the project description, Caltrans has agreed to conduct sonar monitoring during pile driving at the Ten Mile River bridge site. As this issue was only just resolved late Thursday afternoon, the exact technology and protocols that will be administered have not been discussed with NOAA Fisheries staff yet. We will forward you

specific information regarding the sonar monitoring once the details have been developed.

...In addition, the acoustic monitoring program....additional sound attenuation...

Response:

As stated above in our first response in this section, you will be forwarded a copy of the modified Noise Monitoring Plan that will include a discussion of the use of DWICs once we receive NOAA's comments.

...Are there other changes pending, or proposed in negotiations at the present time?

Response:

We are unaware of any other changes pending or proposed at the present time for the Noise Monitoring Plan.

....Does the peak (maximum) sound pressure .....if the 190 decibel limit is exceeded.

Response:

The project is not being restricted to a 190 decibel limit. Rather, the peak (maximum) sound pressure level we anticipate during driving of all piles is 190 decibels. As currently proposed, the project stipulates that: 1) all cofferdam piles in the river will be driven with a vibratory hammer; 2) all other temporary piles in the river will be driven inside a structure such as a DWIC; and 3) all permanent piles in the river will be driven in cofferdams dewatered to the outside mudline.

A contingency plan to further attenuate peak sound levels if 190 decibels is exceeded is not being developed. The reviewing agencies have acknowledged that there are no additional noise attenuation methods that could be employed during pile driving that would result in lowering the peak decibel limit.

...We further request that the field measurements...by Commission staff.

Response:

We have not received the noise consultant's report for the Klamath Bridge emergency project. A copy will be forwarded to you once we have received it.

4. Status of Other Agency Approvals/Negotiations. ...As Caltrans has requested that the Commission....a full response to Item 7 excerpted above, is necessary.

Response:

As your memo states, we are still awaiting approvals from agencies, except the State Lands Commission for which we have received authorization. In addition to the authorizations themselves, the following items are still in progress:

Sonar Monitoring Study. A sonar monitoring study will be included as a Conservation Recommendation in NOAA Fisheries' Biological Opinion. Specific details on how the study will occur will be developed subsequent to the issuance of the Opinion.

Hydroacoustic Monitoring Plan. Once we have received comments from NOAA Fisheries, the Hydroacoustic Monitoring Plan can be finalized to include a discussion on the use of DWICs. As NOAA Fisheries has reviewed several earlier drafts, we are not anticipating substantial comments.

Eelgrass Mitigation and Monitoring Plan. Once we have received comments from CDFG, the Eelgrass Mitigation and Monitoring Plan can be finalized. As CDFG has reviewed a previous draft, we are not anticipating substantial comments.

6. Fisheries Compensatory Mitigation Plan. ...First, has it been determined ...coho salmon...

Response:

We acknowledge coho salmon are not the only species that may be affected by the project. As coho salmon are listed as endangered under the California Endangered Species Act however, we are committed to conducting offsite work that would "fully mitigate" effects to coho salmon by enhancing fish passage for the species.

Second, under what timeline...be finalized?...

Response:

As stated in the April 10, 2006 memo from the project biologist, CDFG has concurred that the fish passage project will be processed as a separate project. An exact timeline has not been developed with CDFG regarding the processing of the authorization nor the implementation of the off-site fish passage work. Authorization would also be requested from all appropriate agencies.

..Third, has Caltrans considered payment....Coastal Conservancy?...

Response:

Payment of fees into a fund was briefly considered as a mitigation method. However, we have been working with CDFG for just under two years to locate a site that would meet the requirements under the California Endangered Species Act for coho salmon. As coho salmon is the only species that is state listed and may be affected by the project (Howell's spineflower and Menzies' wallflower are also state listed but will be protected during construction), the emphasis has been on "fully mitigating" for potential effects to the species.

..How has Caltrans...compensatory mitigation?...

Response:

This seismic project has been in Caltrans' Statewide Seismic Safety Program for over 10 years, during which time we have corresponded at length with resource agency staff responsible for providing authorizations for potential effects to sensitive species and habitats. Authorizations for geotechnical drilling involved negotiating with the agencies for the same resources that may be affected by the project. During the course of the project's development, one of the foremost items discussed with the agencies has been the function and value of the resources. Another consideration as to the degree of potential effects and corresponding mitigation, has been the goal of incorporating all possible avoidance and minimization measures into the project. The project includes many features that either avoid or minimize effects to resources. Most of these features have been incorporated into the project description after field reviews and/or discussions with the agencies overseeing the resource(s).

Communications regarding the biological issues on this project may be directed to me at (707) 441-5722.

LE/ks

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P. O. BOX 3700
EUREKA, CA 95502-3700
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Flex your power!
Be energy efficient!

April 12, 2006

Tom Daugherty
NOAA Fisheries
777 Sonoma Avenue, Room 325
Santa Rosa, CA 95404

01-MEN-1-69.4/70.1
EA 01-385700
Ten Mile River Bridge
Replacement Project

Dear Mr. Daugherty:

Subject: Endangered Species Consultation with NOAA Fisheries for the Ten Mile River Bridge Replacement Project – Addendum to Biological Assessment

Attached you will find a copy of an addendum to the September 2004 Biological Assessment prepared for the Ten Mile River Bridge Replacement Project. The addendum describes modifications to the project description, some of which were agreed upon during meetings and/or phone conferences held over the past year with previous NOAA biologists.

Information contained in the September 2004 Biological Assessment, combined with the information discussed in the addendum, will hopefully be sufficient for you to prepare a draft Biological Opinion. As we've discussed, the Ten Mile River Bridge Replacement project is one of the last seismic projects in the State's Statewide Seismic Safety Program and it is a statewide priority. We would like to review a draft document, and request you target May 5, 2006, for completion of the final Biological Opinion for this important safety project. If there is any way we can assist you in finalizing the draft Biological Opinion, please let us know. If you have any questions about this transmittal, please contact Lisa Embree, Project Biologist, at (707) 441-5722.

Sincerely,

EXHIBIT NO. 7A
APPLICATION NO.
1-06-022
CALTRANS
REVISIONS TO PROJECT
DESCRIPTION MADE BY
CALTRANS DATED 4/12/06
(1 of 6)

Lena R. Ashley
Chief, North Region Environmental Services – North

Attachment

cc: U.S. Fish and Wildlife Service - Ray Bosch; CA DFG - Corrine Gray

ec: CA DFG – Vicki Frey; NOAA Fisheries - David Woodbury, Monica DeAngelis, Korie Shaeffer

ADDENDUM TO BIOLOGICAL ASSESSMENTS PREPARED FOR THE REPLACEMENT OF THE TEN MILE RIVER BRIDGE

01-MEN-1-PM 69.4/70.1
KP 111.7/112.9
EA 385700

April 12, 2006

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Introduction

Biological Assessments for the Ten Mile River Bridge replacement project were sent to NOAA Fisheries and U. S. Fish and Wildlife Service in September 2004 and to the California Department of Fish and Game in October 2004. Modifications to the original Project Description included in the three assessments have occurred since the assessments were prepared. This addendum provides descriptions of each of the changes.

Construction Window

The beginning and end date for the entire project has been changed to the following: Construction of the new bridge is expected to begin in February 2007 with completion of the entire project anticipated by December 2009.

Night Work

The Biological Assessments stated that pile driving would not occur at night. However minor construction activities, such as maintenance of equipment and delivery of materials for subsequent days work, may occur at night. If lighting is required on the trestle, the lights will be shielded to avoid illumination of the river.

Attenuation of the Temporary Piles

Not originally proposed, the project now proposes to use a dewatered isolation casing, or a similar system, to drive temporary H piles in the river. Dewatered isolation casings create an "air" space between the temporary H pile and the surrounding river. This system was utilized on the Humboldt Bay Bridges Seismic Retrofit project and was found to provide about 9 dB of attenuation. As described in the attached Ten Mile River Bridge Replacement Project – Hydroacoustic Report, the driving of temporary H piles through a dewatered isolation casing should result in peak pressure levels no higher than 190 dB at 10 meters.

Driving and Dewatering of Cofferdams

Not previously discussed in the Biological Assessments, the cofferdam piles in the river will be driven with a vibratory hammer only. Specifying that a vibratory hammer will be used is a result of a recent Port of Oakland project that recorded a peak underwater sound pressure level of 177 dB when a vibratory hammer was used; far below the recorded 205 dB for an impact hammer.

The Biological Assessments stated that after cofferdam sheets are installed, the water would be pumped out of the cofferdams to allow a biologist to rescue any trapped fish. Since the cofferdams have not been sealed from ground water intrusion, continuous pumping will be necessary to sufficiently de-water for the biologist's access. After fish are rescued, the water

level inside the cofferdams will be maintained below the existing mud line by continuous pumping in order to provide attenuation for noise during pile driving.

Size of Permanent Piles

The Biological Assessments stated that the columns of each bent and pier would be supported by 0.9 meter (3-foot) diameter Cast in Steel Shell (CISS) piles. The diameter of the permanent piles will be slightly smaller; 0.7 meter (2.5 feet).

Trestle Height

The assessments stated that the trestles would be built 1 meter (3.3 feet) above the 100-year flood elevation. It is now proposed to have the trestle platforms constructed 1 meter (3.3 feet) above the ordinary high water elevation.

Access for Demolition of the Existing Bridge

According to the original project design, access for demolition of the existing bridge included use of a route from the haul road that could have potentially resulted in affecting the federally endangered and state threatened Howell's Spineflower (*Chorizanthe howellii*). It has since been determined that construction work associated with demolition of the bridge can be limited to 14.5 m (48 ft) west of the west edge of the existing bridge. The area beyond the westerly construction boundary will be fenced as an Environmentally Sensitive Area. Thus the existing spineflower population as well as the area where the species could expand its distribution (in the "open" area between the existing bridge and the existing population) will be protected.

Hydroacoustic Monitoring

Noise levels during pile driving will be monitored according to the Ten Mile River Bridge Replacement Project – Hydroacoustic Report, dated September 16, 2005, and the Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project, dated January 30, 2006. Copies of these reports are provided as Attachments 1 and 2.

Fish Passage Enhancement Project

To fulfill the California Department of Fish and Game's (CDFG) mitigation requirements under the California Endangered Species Act, a separate propjet to enhance fish passage for coho salmon *(Oncorhynchus kisutch)* will be undertaken. Project design and environmental clearances will be completed at a later date. The fish passage project will occur at one of the following sites, as recommended by CDFG:

- Dunn Creek at Post Mile 92.83
- An unnamed tributary to Cottaneva Creek at Post Mile 89.20

- An unnamed tributary to Cottaneva Creek at Post Mile 88.71

Additional Disposal Sites

It has been determined that the currently proposed disposal site, located on Route 1 in Mendocino County at Post Mile 66.0, may not be adequate for the disposal needs of the project. Four additional optional sites have been reviewed and may be used during construction. The sites are located in Mendocino County on Route 1 and are described below:

PM 70.3. This site is located on the Hoechstetter Ranch. This site has not been surveyed.

PM 81.25. This site is within Caltrans' right-of-way and has been used in the past by Caltrans' Maintenance crews for disposal of material. The capacity of the existing disposal site is currently over-full, but expansion may be possible to the east. Ruderal vegetation, including pampas grass, currently covers the area that could be used. A drainage ditch to the east of the existing site would be avoided by incorporating a minimum 100-foot setback.

PM 80.50. This site is located on the Howard Creek Ranch property. A couple of areas upslope from the main field may be suitable for disposal of material.

PM 74.74. This potential disposal area is located on the Gary Quinton property. Vegetation in the area available for disposal use consists mostly of upland coastal scrub and/or ruderal vegetation. The coastal scrub will be preserved if the contractor elects to use this site.

For any of these additional optional disposal sites the contractor chooses to use, botanical (to be conducted during spring/summer months) and wetland surveys will be completed. Areas to be preserved, including wetlands if present, the coastal scrub at PM 74.74, and appropriate setbacks, will be flagged.

Change in Superstructure Design

Changes in project design, as required by the California Coastal Commission in its federal Consistency Certification, include modifications to both the rail design and the shoulder on the west side of the new bridge. Initial design called for two 2.4-meter (7.8-foot) shoulders and two 0.5 meter (1.7-foot) wide Type 80 Concrete Barrier Railings.

Changes include a decrease in shoulder width to 1.8 meter (6-foot) shoulders and the incorporation of a 1.5-meter (5-foot) sidewalk on the west side of the bridge. The bridge width increases by 0.6 meter (2 feet) and the centerline of the bridge shifts east 0.3 meter (1 foot). These modifications result in superstructure redesign only; no substructure (which includes the columns, footings, and piles) redesign work is necessary.

Attachments:

Attachment 1 Ten Mile River Bridge Replacement Project – Hydroacoustic Report, dated September 16, 2005

Attachment 2 Hydroacoustic Monitoring Plan for the Ten Mile River Bridge Replacement Project-dated January 30, 2006

Source - Effects of Sound on Fish (Hastings & Popper, Caltrans, January 28, 2005)

Table 1: Outline of studies to investigate pile driving and its effects on fishes.
Characteristics of pile driving
Define acoustic dose for exposure to pile driving sound – Develop ways to express exposure to pile driving sounds in terms of total energy received over time and degree of temporal variation, and to define the acoustic particle velocity within the sound field.
Structural acoustic analysis of piles – Develop structural acoustics models of piles to investigate how their physical characteristics affect the radiated sound and how modifications to piles could alter the sounds received by fish. Acoustic analysis could also indicate how best to describe the waveform and how it is affected by pile material, geometry and size, hammer type, and environmental factors such as water temperature, depth, and substrate. These studies could lead to a better ability to develop attenuation of sounds produced during pile driving by modifying structural material, attenuation technologies, etc., especially if they are linked to modeling of the underwater sound propagation as described below.
Characteristics of underwater sound field – Develop underwater sound propagation models for locations of interest and integrate with pile structural acoustics models to estimate received levels of sound pressure and particle velocity in the vicinity of pile driving operations and define zones of impact on fishes. Verify with field measurements of underwater sound pressure measurements.
Effects on fishes
Hearing capabilities of Pacific Coast fishes – Determine hearing capabilities (using Auditory Brainstem Response [see Glossary, page 61]) of representative species.3
Mortality of fishes exposed to pile driving – Determine mortality immediately and at longer intervals after exposure of representative species as a result of exposure to pile driving sounds. Measure pathology (using accepted necropsy studies) of the effects of sounds on fishes at different levels and durations of exposure.
Effects of exposure to pile driving sound on non-auditory tissues – Using precisely the same paradigm as used to study the effects on the ear, examine other tissues using standard fish necropsy and histopathological techniques to assess gross, cellular, and molecular damage to fish. Furthermore, determine stress effects on fish using appropriate stress measures (e.g., hormone levels).
Effects of pile driving sound exposure on hearing capabilities – Determine permanent hearing loss (PTS) and temporary hearing loss (TTS) on representative species.
Effects of pile driving sound exposure on fish eggs and larvae – Determine mortality, growth rates, and pathological changes in developing fishes of representative species with exposure at different times during the development cycle
Behavioral responses of fish to pile driving – Observe, in large cages, the short-term behavioral responses of representative species to pile driving sounds. (e.g., Do fish attempt to swim from the source? Do they react to the sounds? Do they "freeze" in place?)
More general behavioral responses of fish to pile driving – Determine if there are longer-term effects that might alter movement patterns of fish schools, preferences for breeding sites, feeding behavior, mating and reproductive behavior, etc.

EXHIBIT NO. **8A**

APPLICATION NO.

1-06-022 (CALTRANS)
OUTLINE OF STUDIES/PILE DRIVING & EFFECTS ON FISH (FROM "EFFECTS OF SOUND ON FISH" (HASTINGS & POPPER, CALTRANS, 1/28/06) (1 of 2)

Effects of exposure to pile driving sound on the ear and lateral line – Determine morphological changes over time for representative species on sensory cells of the ear and lateral line, and whether such changes are reversible
Effects of multiple exposures to sound from pile driving on fish – For the appropriate experiments cited above, determine effects of multiple exposures, over time, of pile driving

3 All studies involve what are called in this report "representative species." These are defined as species that serve as models for fishes in the region of question – in this case, the Pacific Coast. Species for study need to be selected to represent differences in: (a) habitat; (b) presumed hearing capabilities (e.g., hearing specialists vs. non-specialists; (c) ear structure and connections of the ear to peripheral structures such as an air bubble; (d) swim bladder presence/absence, biomechanical properties, and connection to the gut; (e) bony fish vs. non-bony fish (including elasmobranchs); (f) fish size/mass; and (g) other comparable factors. A minimum set of fishes should be defined so as to have the fewest possible studies and yet represent as many of the parameters for the fishes of the area of question as possible.

Sound Metrics. Underwater sound levels are measured with a hydrophone, or underwater microphone, which converts sound pressure to voltage, which is then converted back to pressure, expressed in pascals (Pa), pounds per square inch (psi), or decibels (dB).[2] Several descriptors are used to describe underwater noise. Two common descriptors are the instantaneous peak sound pressure level (dB_{PEAK}) and the Root Mean Square (dB_{RMS}) pressure level during the impulse, which are sometimes referred to as the peak and RMS level respectively. The peak pressure is the instantaneous maximum or minimum overpressure observed during each pulse and can be presented in Pascals (Pa) or SPL in decibels (dB) referenced to a pressure of 1 micropascal (μPa). The RMS level is the square root of the energy divided by the impulse duration. This level, presented in dB re: 1 μPa, is the mean square pressure level of the pulse. It has been used by NMFS in criteria for judging impacts to marine mammals from underwater impulse-type sounds. The majority of literature uses peak sound pressures (dB_{PEAK}) to evaluate injuries to fish. However, in many instances, it is not clear whether the reported pressure is peak or RMS.

It is not possible to convert peak levels to RMS levels, but a conservative rule of thumb can be applied to use in noise assessments. Peak levels are generally 10 – 15 dB higher than RMS levels. To convert from peak to RMS, subtract 10 dB. This likely overestimates the RMS value, but enables the assessment to remain as conservative as possible. Likewise, to convert from RMS to peak, add 20 dB. This again may overestimate the actual peak sound level, but will provide a conservative estimate.

Sound Exposure Level (SEL) is often used as a metric for acoustic events and is often used as an indication of the energy dose. SEL is calculated by summing the cumulative pressure squared (p^2), integrating over time, and normalizing to one second. This metric accounts for both negative and positive pressures because p^2 is positive for both and both are treated equally in the cumulative sum of p^2 (Hastings and Popper, 2005). The units for SEL are dB re: 1 μPa^2-sec.]

EXHIBIT NO. 9A
APPLICATION NO.
1-06-022
CALTRANS
SOUND METRICS EXPLANATION

Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper (Popper, Carlson, Hawkins, Southall, and Gentry, May 15, 2006)

Recommendations for Research

This document proposes the first round of interim criteria for impulsive sound. To refine these criteria, determine more accurate SEL and peak pressure levels, and determine whether metrics other than these would better index injury to fish, a long-term series of studies is needed. The following list outlines the needed studies. Additional studies are presented in Hastings and Popper (2005).

1. Studies are needed that expose fish to simulated pile driving sound impulses while independently varying pressure and particle motion. Fish should be tested levels up to and exceeding the proposed injury criteria for both peak pressure and SEL.
2. Studies are needed that examine cumulative effects of sound exposure on fish. Factors to be considered include cumulative effects of multiple strikes and the effects of different inter-strike intervals on cumulative effects. In other words, is it appropriate to define a criterion based on one strike or many strikes, and if on many strikes, how many and over what period of time?
3. Studies are required to examine the effect of the temporal characteristics of single impulses, including the rise time, in causing injury or hearing loss in fish. Questions need to be asked regarding effects of different rise times on the trauma imposed upon fish, as well as potential temporary effects such as hearing loss.
4. Hardware and software should be acquired or developed so that operators can monitor pile driving signals in SEL in near real time for both single strike and multiple strike exposures. Ultimately, operators may need to measure particle motion as well.
5. A study should be instituted to investigate the behavioral reactions of non-restrained fish to actual pile driving using visual or acoustic detection methods. This project would test the key assumption that fish have no avoidance behavior.
6. The results of this behavioral study should be incorporated into a model, such as the Acoustic Integration Model (AIM), that models accumulated acoustic exposure for simulated fish moving through an ensonified water column.
7. Data are required to determine which approaches (SEL, Kurtosis, peak pressure, something else) are the best descriptors of effects on fish. These should be considered in terms of effects on behavior, hearing, and barotraumas, It should be recognized that different measures may best describe different impacts on fish.