INFORMATION HANDOUT

For Contract No. 03-0F6904
At 03-But-70-24.0/24.5

Identified by
Project ID 0300000100

PERMITS

U.S. Fish and Wildlife Service

United States Army Corps of Engineers

Non-Reporting Nationwide 404

WATER QUALITY

California Regional Water Quality Control Board

Central Valley Region

AGREEMENTS

California Department of Fish and Wildlife

Notification No. 1600-2014-0105-R2

03-0F6904
03-But-70-24.0/24.5
Project ID 0300000100

MATERIALS INFORMATION

Summary of Foundation Recommendation Reports

Hydraulic Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
08ESMF00-2013-I-0253

MAY 21 2013

Ms. Suzanne Melim
Chief, Environmental Management, Branch M3
California Department of Transportation, District 3
703 B Street
Marysville, California 95901

Subject: Informal Consultation on the Proposed Flag Canyon Creek Bridge Replacement Project, Butte County, California (03-BUT 70-0F690)

Dear Ms. Melim:

This letter is in response to the California Department of Transportation's (Caltrans) December 19, 2012, letter and supporting documentation requesting informal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Flag Canyon Creek Bridge Replacement Project (proposed project) in Butte County, California. You requested our concurrence that the proposed project may affect, but is not likely to adversely affect the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle), the federally-listed as endangered vernal pool tadpole shrimp (*Lepidurus packardi*) (tadpole shrimp) and designated tadpole shrimp critical habitat unit 4E. Your request was received on December 26, 2012; however, the supporting documentation you provided was insufficient for the Service to concur with your determination. On March 19, 2013, the Service requested that you provide additional information on the proposed project before informal consultation could commence. We received the requested information on May 1, 2013. Our primary concern is the protection of federally-listed species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The findings and recommendations in this consultation are based on: (1) the April 30, 2013, *Addendum to the December 19, 2012 Request to Initiate Section 7 Consultation for the State Route 70 Flag Canyon Bridge Replacement Project in Butte County*, received by the Service May 1, 2013; (2) the December 19, 2012, *Natural Environment Study for Flag Canyon Creek Bridge Replacement Project, Located on State Route 70 at Postmile 23.91/24.46 in Butte County, California* (NES), prepared by Caltrans, and received by the Service on December 26, 2012; (3) your December 19, 2012, letter initiating informal consultation; (4) the July 9, 1999, *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*, prepared by the Service; and (5) other information available to the Service.

Project Description

Caltrans, in conjunction with the Federal Highway Administration, is proposing to replace an existing 3-span bridge along State Route (SR) 70, nine miles east of Oroville. The proposed project will replace the existing bridge spanning Flag Canyon Creek with a new wider, single span bridge that will accommodate two 12-foot lanes with 8-foot shoulders. In order to demolish the existing bridge and construct the new bridge on the same alignment, a temporary bridge will be constructed parallel to the existing bridge to detour traffic. An access road leading down to Flag Canyon Creek on the west side of SR 70 will be constructed to install the temporary bridge. Once the temporary bridge is in place, staging and storage will occur on and around the existing bridge and within the temporary construction easement required for placement of the temporary power poles needed for the temporary traffic signal system. A creek diversion, crossing and/or cover will be required during the bridge demolition and construction.

In addition to replacing the existing bridge, other construction work associated with the proposed project include repairing failed pavement areas, reconstructing existing shoulders and roadbed, reconstructing a slope with ditch concrete, removing failed pavement areas, extending culverts, replacing down-drains and over-side drains, placing rock slope protection, installing a temporary signal system, placing new metal beam guard railing, and a final surface overlay with new asphalt concrete and slurry seal. The equipment used for construction include cranes, hoe rams, jack hammers, dump trucks, pavers, concrete and water trucks, front end loaders, pile drivers, dozers, excavators, compactors, and backhoes. One construction season will be required for just the bridge construction and the entire proposed project will be completed within two years.

There are three elderberry shrubs (*Sambucus* spp.), the sole host for the beetle, located within the project area. Two shrubs are located on the northeast side of the existing bridge and will be avoided with a 20-foot area around the drip-line of each shrub where no construction activities will take place. The third shrub is located southwest of the existing bridge and is more than 50 feet away from any proposed construction work. Construction activities that will occur within 100 feet of the elderberry shrubs (but not within 20 feet) will be limited to the movement of construction equipment and materials, rock slope protection placement, and embankment work.

Aquatic resources within the project area that could potentially be habitat for the tadpole shrimp consist of Flag Canyon Creek, a wetland bisected by SR 70, and a drainage culvert. Surveys to assess the potential habitat were conducted on three occasions in the spring of 2011 and two separate occasions in April of 2013. Flag Canyon Creek does not provide adequate habitat for the tadpole shrimp because water is consistently flowing through the channel and does not pond for any length of time. The two halves of the bisected wetland are connected via a culvert under the road which is proposed to be extended at both the inlet and outlet. The culvert is lined with a rocky substrate and primarily conveys water from rain events and agricultural practices from olive trees on adjacent foothills. Both halves of the bisected wetland are at a 2-5% slope, which eliminates these features as potential tadpole shrimp habitat since the slope does not allow for water to pond. The drainage culvert located northwest of the existing bridge is an ephemeral drainage that could potentially support the tadpole shrimp, but no construction activities are proposed for this culvert. Although there is a California Natural Diversity Database record for the tadpole shrimp 0.5 mile away (CDFW 2012), there are no known records within the project area.

Although the proposed project bisects designated critical habitat unit 4E for the tadpole shrimp, the only proposed action within unit 4E is painting new roadway stripes on the existing pavement. This action will be confined to the existing roadway and will not adversely affect this critical habitat unit.

Proposed Conservation Measures

Caltrans has proposed conservation measures which will minimize any potential effects to the beetle. These measures are described on pages 22-23 of the NES and are also described below:

- Before initiation of any ground disturbing activities, a qualified biologist will conduct mandatory worker awareness training for all construction personnel. The awareness training will provide information on how to avoid federally-listed species, and to inform workers of the penalties for non-compliance. New construction personnel that are subsequently added to the proposed project will receive the training as well.

- Prior to any ground disturbing activities, Caltrans will install 4-foot tall temporary construction fencing 20 feet from the drip-line of the three elderberry shrubs. The fencing is to prevent encroachment by construction equipment and personnel. The exact location of the fencing will be determined by a qualified biologist with the intent of protecting habitat for the beetle. The fencing will be installed in a way that prevents equipment from enlarging the work area beyond what is necessary and will be checked and maintained weekly until all construction is completed.

- Signs will be erected around each shrub's buffer area stating "This is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines and imprisonment." Signs will be legible from a distance of 20 feet and will be maintained during the duration of construction.

- No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 20-feet from the drip-line of any elderberry shrub.

Based on our review of the information provided, the Service concurs with your determination that the proposed project is not likely to adversely affect the beetle, the tadpole shrimp and the tadpole shrimp critical habitat unit 4E. The three elderberry shrubs will each have fencing installed to ensure that no construction activity will occur within the fenced area. The project area has already been heavily disturbed by construction and paving of the existing SR 70 and bridge, and the conditions of any suitable tadpole shrimp habitat are not sufficient to support the tadpole shrimp. In addition, tadpole shrimp critical habitat will not be impacted since there is a lack of primary constituent elements within the project area and the construction activity proposed for the portion of the proposed project that is bisecting tadpole shrimp critical habitat will be confined to the existing pavement.

Therefore, unless new information indicates that the proposed action may affect listed species in a manner or to an extent not previously considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to the Act is necessary.

If you have any questions regarding the proposed Flag Canyon Creek Bridge Replacement Project, please contact Amber Aguilera, Fish and Wildlife Biologist, or Kellie Berry, Chief, Sacramento Valley Division, at (916) 414-6600.

Sincerely,

Daniel Russell

Daniel Russell
Deputy Assistant Field Supervisor

cc:
Kelli Angell, Caltrans, Marysville, CA

LITERATURE CITED

California Department of Fish and Wildlife (CDFW). 2012. California Natural Diversity Database (CNDDB). July 2012. Natural Heritage Division, California Department of Fish and Game, Sacramento, California.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

July 9, 2014

Regulatory Division (SPK-2012-01244)

Mr. Rodney Murphy
California Department of Transportation
703 B Street
Marysville, California 95901-0911

Dear Mr. Murphy:

We are responding to your April 28, 2014, request for a Department of the Army Nationwide Permit (NWP) verification for the Flag Canyon Creek Bridge Replacement Project (EA 03-0F690) (PM 23.91-24.46). This approximately 18-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to replace a Flag Canyon Creek bridge. The project is located in Section 1, Township 20 North, Range 3 East, Mount Diablo Meridian, Latitude 39.62757°, Longitude -121.59128°, Oroville, Butte County, California.

Based on the information you provided, the proposed activity, resulting in the permanent loss of approximately 0.096 acre of wetland, 0.005 acre of riverine, and temporary loss to approximately 0.110 acre of riverine, is authorized by Nationwide Permit Number (NWP) 3. However, until Section 401 Water Quality Certification for the activity has been issued or waived, our authorization is denied without prejudice. Once you have provided us evidence of water quality certification, the activity is authorized and the work may proceed subject to the conditions of certification and the Nationwide Permit. Your work must comply with the general terms and conditions listed on the enclosed 2012 NWP 14 information sheets (enclosure 1), the Final Sacramento District NWP Regional Conditions for California (enclosure 2) especially #5, 6, 7, 8, 10, 11, 12, 13, 14, and the following Special Conditions:

Special Conditions

1. To mitigate for the loss of approximately 0.101 acre of waters of the United States, you shall purchase 0.101 credit of vernal pool establishment at the Meridian Ranch Mitigation Bank. Evidence of this purchase shall be provided to the Corps prior to initiation of construction activities within waters of the U.S.

2. The enclosed drawing entitled *Project Impacts Map, Flag Canyon Bridge Replacement Project,* dated April 16, 2014, is incorporated as a condition of this authorization (enclosure 3).

3. To ensure temporary impacts are restored, the enclosed restoration plan, *Restoration Plan, Flag Canyon Creek Bridge Replacement Project*, dated July 2014, is incorporated as a condition of this authorization.

4. We understand the State of California, Department of Transportation (Caltrans) is the National Environmental Policy Act (NEPA) lead Federal agency for this project, and as such, will ensure compliance with NEPA and all other applicable Federal Laws. You shall include this office in all future consultation and coordination activities involving compliance with the Endangered Species Act, the Magnuson-Stevens Act, and the National Historic Preservation Act, as they pertain to the activities authorized herein, so that we may consult as appropriate or designate you to consult on our behalf.

5. This permit is contingent upon the permittee applying for and being issued a Section 401 Water Quality Certification. Evidence of a water quality certification must be submitted to this office, prior to commencing work in Waters of the U.S. All terms and conditions of the Section 401 Water Quality Certification are expressly incorporated as conditions of this permit.

6. No work shall occur within standing or flowing waters. Temporary dewatering structures (e.g. coffer dams) shall be deployed when the channel is naturally dry. Dewatering plans must be approved, in writing, by this office prior to commencement of construction activities. Plans, maps and/or drawings may be submitted electronically to regulatory-info@usace.army.mil.

7. Excavated materials from the permit area shall not be stockpiled or disposed of outside the permit area. Disposal and stockpile areas must be reviewed and approved by this office prior to commencement of construction activities. Plans, maps and/or drawings may be submitted electronically to regulatory-info@usace.army.mil.

8. If any of the above conditions are violated or unauthorized activities occur, you shall stop work immediately and notify this office. You shall provide us with a detailed description of the unauthorized activity(s), photo documentation, and any measures taken to remedy the violation.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid until March 18, 2017, when the existing NWPs are scheduled to be modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified, reissued or revoked, you will have twelve (12) months from the date of the modification, reissuance or

revocation of the NWP to complete the activity under the present terms and conditions. Failure to comply with the General and Regional Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2012-01244 in any correspondence concerning this project. If you have any questions, please contact Mr. Peck Ha at our California North Branch Office, Regulatory Division, Sacramento District, U.S. Army Corps of Engineers, 1325 J Street, Room 1350, Sacramento, California 95814-2922, by email at *Peck.Ha@usace.army.mil*, or telephone at 916-557-6617. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

Nancy Arcady Haley
Chief, California North Branch
Regulatory Division

Enclosures

cc: (w/o encls)
Ms. Kelli Angell, California Department of Transportation, kelli_angell@dot.ca.gov
Mr. Elizabeth Lee, California Regional Water Quality Control Board, EMLee@waterboards.ca.gov
Mr. Paul Jones, U.S. Environmental Protection Agency, Region IX, Jones.Paul@epa.gov
Ms. Tina Bartlett, California Department of Fish and Game, TinaBartlett@wildlife.ca.gov
Mr. Ryan Olah, U.S. Fish and Wildlife Service, ryan_olah@fws.gov

Central Valley Regional Water Quality Control Board

4 August 2014

Ms. Kelli Angell
Caltrans
703 B Street
Marysville, CA 95901

CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE AMENDED FLAG CANYON CREEK BRIDGE REPLACEMENT PROJECT (WDID#5A04CR00234a), OROVILLE, BUTTE COUNTY

ACTION:

1. ☐ Order for Standard Certification
2. ■ Order for Technically-conditioned Certification
3. ☐ Order for Denial of Certification

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

3. The validity of any non-denial certification action shall be conditioned upon total payment of the full fee required under 23 CCR §3833, unless otherwise stated in writing by the certifying agency.

4. Certification is valid for the duration of the described project. Caltrans shall notify the Central Valley Water Board in writing within 7 days of project completion.

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the four standard conditions, Caltrans shall satisfy the following:

1. Caltrans shall notify the Central Valley Water Board in writing 7 days in advance of the start of any in-water activities.

2. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.

3. All areas disturbed by project activities shall be protected from washout or erosion.

4. Caltrans shall maintain a copy of this Certification and supporting documentation (Project Information Sheet) at the Project site during construction for review by site personnel and agencies. All personnel (employees, contractors, and subcontractors) performing work on the proposed project shall be adequately informed and trained regarding the conditions of this Certification.

5. An effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working during all phases of construction.

6. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.

7. Caltrans shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	ml/l	Grab	Same as above.
Visible construction related pollutants	Observations	Visible Inspections	Continuous throughout the construction period

8. Activities shall not cause turbidity increases in surface water to exceed:

   (a) where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTU;
   (b) where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
   (c) where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
   (d) where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs;
   (e) where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

   Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters 300 feet downstream from the working area. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be assessed by prior permission of the Central Valley Water Board.

9. Activities shall not cause settleable matter to exceed 0.1 ml/l in surface waters as measured in surface waters 300 feet downstream from the project.

10. The discharge of petroleum products or other excavated materials to surface water is prohibited. Activities shall not cause visible oil, grease, or foam in the work area or downstream. Caltrans shall notify the Central Valley Water Board immediately of any spill of petroleum products or other organic or earthen materials.

11. Caltrans shall notify the Central Valley Water Board immediately if the above criteria for turbidity, settleable matter, oil/grease, or foam are exceeded.

12. Caltrans shall comply with all Department of Fish and Wildlife 1600 requirements for the project.

13. The California Department of Transportation shall comply with their General NPDES Permit Order No 2012-0011-DWQ (NPDES No. CAS 000003) issued by the State Water Resources Control Board.

14. The Conditions in this water quality certification are based on the information in the attached "Project Information." If the information in the attached Project Information is modified or the project changes, this water quality certification is no longer valid until amended by the Central Valley Water Board.

15. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under State law and section 401 (d) of the federal Clean Water Act. The applicability of any State law authorizing remedies, penalties, process, or

sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance into this Order.

a. If Caltrans or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Order, or falsifies any information provided in the monitoring reports, the applicant is subject to civil monetary liabilities, for each day of violation, or criminal liability.

b. In response to a suspected violation of any condition of this Order, the Central Valley Water Board may require Caltrans to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

c. Caltrans shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this certification and determining the ecological success of the project.

ADDITIONAL STORM WATER QUALITY CONDITIONS:

Caltrans shall also satisfy the following additional storm water quality conditions:

1. During the construction phase, Caltrans must employ strategies to minimize erosion and the introduction of pollutants into storm water runoff. These strategies must include the following:

   (a) the Storm Water Pollution Prevention Plan (SWPPP) must be prepared during the project planning and design phases and before construction;
   (b) an effective combination of erosion and sediment control Best Management Practices (BMPs) must be implemented and adequately working prior to the rainy season and during all phases of construction.

2. Caltrans must minimize the short and long-term impacts on receiving water quality from the Flag Canyon Creek Bridge Replacement Project by implementing the following post-construction storm water management practices:

   (a) minimize the amount of impervious surface;
   (b) reduce peak runoff flows;
   (c) provide treatment BMPs to reduce pollutants in runoff;
   (d) ensure existing waters of the State (e.g., wetlands, vernal pools, or creeks) are not used as pollutant source controls and/or treatment controls;
   (e) preserve and, where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones;
   (f) limit disturbances of natural water bodies and natural drainage systems caused by development (including development of roads, highways, and bridges);
   (g) use existing drainage master plans or studies to estimate increases in pollutant loads and flows resulting from projected future development and require

incorporation of structural and non-structural BMPs to mitigate the projected pollutant load increases in surface water runoff;

(h) identify and avoid development in areas that are particularly susceptible to erosion and sediment loss, or establish development guidance that protects areas from erosion/ sediment loss;

(i) control post-development peak storm water run-off discharge rates and velocities to prevent or reduce downstream erosion, and to protect stream habitat.

3. Caltrans must ensure that all development within the project provides verification of maintenance provisions for post-construction structural and treatment control BMPs. Verification shall include one or more of the following, as applicable:

   (a) the developer's signed statement accepting responsibility for maintenance until the maintenance responsibility is legally transferred to another party; or
   (b) written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance; or
   (c) written text in project conditions, covenants and restrictions for residential properties assigning maintenance responsibilities to a home owner's association, or other appropriate group, for maintenance of structural and treatment control BMPs; or
   (d) any other legally enforceable agreement that assigns responsibility for storm water BMP maintenance.

4. Staff of the Central Valley Water Board has prepared total maximum daily load (TMDL) allocations that, once approved, would limit methylmercury in storm water discharges to the Sacramento-San Joaquin Delta. The Central Valley Water Board has scheduled these proposed allocations to be considered for adoption. When the Central Valley Water Board adopts the TMDL and once approved by the Environmental Protection Agency, the discharge of methylmercury may be limited from the proposed project. The purpose of this condition is to provide notice to Caltrans that methylmercury discharge limitations and monitoring requirements may apply to this project in the future and also to provide notice of the Central Valley Water Board's TMDL process and that elements of the planned construction may be subject to a TMDL allocation.

REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:

Scott A. Zaitz, R.E.H.S., Redding Branch Office, 364 Knollcrest Drive, Suite 205, Redding, California 96002, szaitz@waterboards.ca.gov, (530) 224-4784

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that any discharge from Caltrans, Amended Flag Canyon Creek Bridge Replacement Project (WDID# 5A04CR00234a) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)."

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Caltrans's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Water Quality Control Plan *for the Sacramento River and San Joaquin River*, Fourth Edition, revised October 2011 (Basin Plan).

Any person aggrieved by this action may petition the State Water Quality Control Board to review the action in accordance with California Water Code § 13320 and California Code of Regulations, title 23, § 2050 and following. The State Water Quality Control Board must receive the petition by 5:00 p.m., 30 days after the date of this action, except that if the thirtieth day following the date of this action falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Quality Control Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

(for) PAMELA C. CREEDON
Executive Officer

SAZ:lmw

Enclosure: Water Quality Order No. 2003-0017 DWQ

cc w/o enclosures: Ms. Leah Fisher, U.S. Army Corp of Engineers, Sacramento
Department of Fish and Wildlife, Region 2, Rancho Cordova
U.S. Fish and Wildlife Service, Sacramento
Mr. Bill Jennings, CALSPA, Stockton

cc w/o enclosures by email: U.S. EPA, Region 9, San Francisco
Mr. Bill Orme, SWRCB, Certification Unit, Sacramento

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PROJECT INFORMATION

Application Date: 30 April 2014

Application Complete Date: 2 July 2014

Applicant: Caltrans, Attn: Ms. Kelli Angell

Project Name: Amended Flag Canyon Creek Bridge Replacement Project

Application Number: WDID No. 5A04CR00234a

U.S. Army Corps File Number: SPK-2012-01244

Type of Project: Replacement of the existing Flag Canyon Creek Bridge at Highway 70, nine miles east of Oroville.

Project Location: Section 36, Township 21 North, Range 3 East, MDB&M.
Latitude: 39°37'37" and Longitude: -121°35'28"

County: Butte County

Receiving Water(s) (hydrologic unit): Flag Canyon Creek, which is tributary to Butte Creek and the Sacramento River. Colusa Basin Hydrologic Unit-Butte Basin Hydrologic Area No. 520.40

Water Body Type: Wetlands, Streambed, Riparian

Designated Beneficial Uses: The Basin Plan for the Central Valley Water Board has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include: Agricultural Supply (AGR); Groundwater Recharge, Water Contact Recreation (REC-1); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Cold Migration of Aquatic Organisms (MIGR); Warm Spawning, Reproduction, and /or Early Development (SPWN); and Wildlife Habitat (WILD).

Project Description (purpose/goal): The Amended Flag Canyon Creek Bridge Replacement Project consists of replacing the existing 3-span bridge with a wider single span bridge. The new bridge will be constructed on the existing tangent alignment and will provide 8' shoulders. This project will not be required to provide alternatives in the Environmental documents since there are no sensitive plants or animal species being impacted requiring measures of avoidance, etc. The project has been assigned the Project Development Processing Category 4B because it does not require substantial new right of way and does not increase traffic capacity.

A temporary bridge on a parallel alignment located just downstream from the existing bridge (northwest side) will be constructed to detour traffic while the existing bridge is removed and replaced (stage construction for the new bridge will not be required). Using temporary signals, one –way traffic control will be used with one 16'wide roadway during construction for both vehicular and bicycle traffic. Construction of temporary false work will not be required (Precast I

Girders will be used). A creek diversion and/or crossing/cover would be required during bridge demolition and construction.

One construction season would be required for bridge construction alone. The project will be completed in approximately two years or less. The new bridge would be constructed on the existing tangent alignment. The new bridge would be approximately 100 feet long with two 12-foot-wide lanes and standard 8-foot-wide shoulders. The bridge, approach, and departure will be on approximately the same profile as the existing (0.5% grade).

In addition to construction of a temporary bridge/detour, the road work involves repairing failed pavement areas within the lanes, reconstructing existing shoulders and roadbed, reconstructing a slope ditch with concrete, removing asphalt concrete pavement by grinding (at failed pavement areas, at the conforms, and at the bridge ends), extending culverts, replacing down-drains and over-side drains, placing rock slope protection, installing a temporary signal system (possibly with temporary highway lighting), placing new bridge approach metal beam guardrailing (MBGR), and a final surface overlay with new asphalt concrete and slurry seal. AC pavement grindings will be disposed of in conformance with the provisions in the Standard Specifications of Section 7-1.13. The project work is not within a 100 year floodplain. See Floodplain Hydraulic Study (FHS) and Preliminary Drainage Report (PDR) dated Dec 12, 2012. All construction will be performed within the R/W. A temporary construction easement (TCE) will be required for placement of temporary overhead power poles for a temporary signal system that will be needed during stage construction. Typical equipment used for construction include pile drivers, cranes, pavers, dozer, excavators, backhoes, hauling and dump trucks, compactors, portable generators, concrete trucks, saws, pumps, and jackhammers.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity and settleable matter.

Proposed Mitigation to Address Concerns: Caltrans will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Caltrans will conduct turbidity and settleable matter testing during in-water work, stopping work if Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area: Project implementation will permanently impact 0.096 acre of jurisdictional wetland and temporarily impact 0.12 acre of riparian and 0.04 acres of un-vegetated streambed.

Dredge Volume: Not Applicable

U.S. Army Corps of Engineers Permit Number: Nationwide Permit #3 (Maintenance)

Department of Fish and Wildlife Streambed Alteration Agreement: Caltrans applied for a Streambed Alteration Agreement in May 2014. Lake & Streambed Alteration Agreement Number: 1600-2014-0105-R2

Possible Listed Species: Vernal pool fairy shrimp and valley elderberry longhorn beetle (VELB).

Status of CEQA Compliance: The California Department of Transportation issued an Environmental Initial Study with a Mitigated Negative Declaration stating the project will not have a significant effect on the environment. (State Clearinghouse Number 2012112057).

Compensatory Mitigation: Caltrans must comply with the U.S. Army Corps of Engineers' requirements for compensatory mitigation for the impacts to jurisdictional waters as required.

Application Fee Provided: On 30 April 2014 a certification application fee of $2,286.00 was submitted as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e). A remaining certification fee of $3,552 was received on 2 July 2014 as required by 23 CCR §3833b(2)(A) and by 23 CCR § 2200(e).

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.wildlife.ca.gov

EDMUND G. BROWN, Jr. Governor
Charlton H. Bonham, Director

JUL 2 2 2014
Date

Rodney L. Murphy
Department of Transportation – Caltrans
703 B Street
Marysville, CA 95901
Rodney.L.Murphy@dot.ca.gov

Subject: Final Streambed Alteration Agreement
Notification No. 1600-2014-0105-R2
Flag Canyon Creek Bridge Replacement Project

Dear Mr. Murphy,

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Flag Canyon Creek Bridge Replacement Project (Project). Before the Department of Fish and Wildlife (Department) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, the Department, acting as a responsible agency, filed a notice of determination (NOD) on the same date it signed the Agreement. The NOD was based on information contained in the Mitigated Negative Declaration the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 30-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this matter, please contact Kursten Sheridan, Environmental Scientist, at (916) 358-2950 or kursten.sheridan@wildlife.ca.gov.

Sincerely,

Tina Bartlett
Regional Manager

ec: Kursten Sheridan, CDFW, Environmental Scientist,
kursten.sheridan@wildlife.ca.gov
Kelli Angell, Caltrans, Associate Environmental Planner, kelli_angell@dot.ca.gov

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670

STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2014-0105-R2
FLAG CANYON CREEK

FLAG CANYON CREEK BRIDGE REPLACEMENT PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (Department) and Caltrans (Permittee) as represented by Rodney L. Murphy.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified the Department on May 1, 2014 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, the Department has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The Flag Canyon Creek Bridge Replacement Project (Project) site is on Flag Canyon Creek that is a tributary to Dry Creek, in the County of Butte, State of California; Latitude 39.624697N, Longitude,-121.593332W; "Cherokee" U.S. Geological Survey (USGS) 7.5-minute quadrangle (Exhibit A).

PROJECT DESCRIPTION

The overall project will replace the existing 3-span bridge crossing Flag Canyon Creek (Creek) with a wider single span bridge. The existing bridge has pier walls in the Creek to support the structure; the new bridge will not require pier supports. The new bridge will be approximately 100 feet long with two 12-foot-wide-lanes and standard 8-foot-wide shoulders. Since the existing piers will be removed, and new piers will not be placed within the Creek channel, the Creek channel banks will be re-conformed and sloped at a 1.5:1 ratio (Exhibit B).

Traffic will be detoured while the existing bridge is being removed and replaced with a new bridge. A temporary bridge will be constructed on a parallel alignment located just downstream from the existing bridge. The temporary bridge will have a wooden bridge deck and will have no pier supports within the stream.

A dewatering plan will be required during the existing bridge demolition and construction. The plan will likely consist of culvert pipes installed in the Creek channel to allow water to flow during construction. Rock will be placed on top of the culvert pipes to catch debris as the bridge is removed and allow construction equipment access to both sides of the channel.

Roadway widening to accommodate the new, wider bridge will require extending two culverts (on 24-inch and one 36-inch). Both culverts will have new flared end section at the inlets and outlets. Rock Slope protection (RSP) will then be placed at the two culvert outlets.

Impacts associated with the bridge replacement, water diversion and demolition will result in the 0.11-acres of temporary impacts to the Creek channel. Culvert extensions will result in 0.004-acres and 0.001-acres respectively (Exhibit C).

Bridge demolition will likely require a large excavator-mounted hydraulic hammer. The contractor will likely begin at one end of the existing bridge and continue removal across to the other end of the bridge. The foundations will then be removed as will the abutments. The piers will be removed to a minimum of 3 feet below the finished grade of the channel. To avoid demolition debris from entering the channel, a stream diversion with a protective cover will be required. The contractor may also build a temporary structure to catch debris so it will not enter the stream bed.

Vegetation will be cleared upstream and downstream from the bridge to allow for construction within Caltrans right-of-way. Where riparian vegetation is removed restoration will include replanting with native vegetation similar to those found within the project area.

Additional project activities include the annual maintenance associated with ensuring successful implantation of the Restoration Plan.

The proposed project would use a dump truck, a front-end loader, a track-hoe excavator, a bulldozer, and a compactor.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: warm water fish species, amphibians, and other aquatic and terrestrial plant and wildlife species.

The adverse effects the project could have on the fish or wildlife resources identified above include: loss of natural bed or bank, change in contour of bed or bank, soil compaction or other disturbance, change in turbidity, increased sedimentation from adjacent construction, short-term release of contaminates (e.g. incidental from construction), construction pits and trenches that can capture terrestrial organisms, dewatering, flow deflection, change in fluvial geomorphology, change in turbidity, flow deflection, loss or decline of instream channel habitat, disruption to nesting birds, reptiles and other wildlife.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to the Department personnel, or personnel from another state, federal, or local agency upon request.

1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

1.3 Notification of Conflicting Provisions. Permittee shall notify the Department if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, the Department shall contact Permittee to resolve any conflict.

1.4 Project Site Entry. Permittee agrees that the Department personnel may enter the project site at any time to verify compliance with the Agreement.

1.5 Notification of Project Modification. Permittee agrees to notify the Department of any modifications made to the project plans submitted to the Department.

1.6 Change of Conditions and Need to Cease Operations. If conditions arise, or change, in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until corrective measures approved by the Department are taken.

1.7 Does Not Authorize "Take." This Agreement does not authorize "take" of any listed species. Take is defined as hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture, or kill. If there is potential for take of any listed species to

occur, the Operator shall consult with the Department as outlined in FGC Section 2081 and shall obtain the required state and federal threatened and endangered species permits.

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

2.1 Work Period. Work within the Creek channel shall be confined to the period between May 1 and October 31 of the same calendar year in the years the Agreement is valid. Construction activities within the Creek channel shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream shall cease until all reasonable erosion control measures, have been implemented prior to all storm events. Construction equipment and material shall be removed from the floodplain if inundation is likely. Re-vegetation, restoration and erosion control work is not confined to this time period.

2.2 Work Period Modification. If Permittee needs more time to complete the project activity, the work may be permitted outside of the work period and extended on a day-to-day basis or for some other set period of time by the Department representative who reviewed the project, or if unavailable, through contact with the Regional office (see Contact Information). Permittee shall submit a written request for a work period variance to the Department. The work period variance request shall: 1) describe the extent of work already completed; 2) detail the activities that remain to be completed; 3) detail the time required to complete each of the remaining activities; and 4) provide photographs of both the current work completed and the proposed site for continued work. The work period variance request should consider the effects of increased stream flows, rain delays, increased erosion control measures, limited access due to saturated soil conditions, and limited growth of erosion control grasses due to cool weather. Work period variances are issued at the discretion of the Department. The Department will review the written request to work outside of the established work period. The Department reserves the right to require additional measures to protect fish and wildlife resources as a condition for granting the variance.

2.3 Bird Survey before Project Commencement. If construction, grading, or other project-related improvements are scheduled during the nesting season of protected raptors and migratory birds (February 15 through August 31) a focused survey for active nests of such birds shall be conducted by a qualified biologist within 14 days prior to the beginning to project-related activities. The results of the survey shall be emailed to R2LSA@wildlife.ca.gov. Refer to Notification Number (1600-2014-0105-R2) when submitting the survey to the Department. If active nest are found, Permittee shall consult with the Department and the United States Fish & Wildlife Service (USFWS) regarding appropriate action to comply with the

Migratory Bird Treaty Act of 1918 and the FGC of California. If a lapse in project-related work of 15 days or longer occurs, another focused survey and if required, consultation with the Department and USFWS, shall be required before project work can be reinitiated.

2.4 CEQA Compliance. Permittee shall implement and adhere to the mitigation measures related to the Covered Species in the Biological Resources section of the Mitigated Negative Declaration (SCH No: 2012112057) certified by the Department of Transportation, Caltrans on June 20, 2013 as lead agency for the Project pursuant to the CEQA (Pub. Resources Code, § 21000 et seq.).

2.5 Vegetation Removal. Disturbance or removal of vegetation shall be kept to the minimum necessary to complete project related activities. Except for the trees specifically identified for removal in the notification, no native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of the Department representative. Vegetation marked for protection may only be trimmed with hand tools to the extent necessary to gain access to the work sites. All cleared material/vegetation shall be removed out of the Creek channel.

2.6 Restoration Plan. Permittee shall adhere to the Restoration Plan submitted with the notification, including monitoring, annual reports, and performance criteria.

2.7 Stream Diversion. When work in a flowing stream is unavoidable, Permittee shall divert the stream flow around or through the work area during construction operations.

2.8 Clean Rocks. Only clean rocks and boulders shall be used for the project.

2.9 Sediment Control. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass into the Creek channel. **Products with plastic monofilament or jute netting (such as found in straw wattles/fiber rolls and some erosion control blankets) shall not be allowed.**

2.10 Removal of Sediment Control. Permittee is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season).

2.11 Operating Equipment and Vehicle Leaks. Any equipment or vehicles driven and/or operated adjacent to the Creek channel shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat.

2.12 Staging and Storage Areas. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located more than twenty (20) feet from the stream channel and banks. All equipment and fuel stored on site shall be bermed to contain any spilled material and shall be protected from rain. Berms shall consist of plastic covered dirt or sand bags.

2.13 Pollution Control. Utilize Best Management Practices (BMPs) to prevent spills and leaks into the Creek channel. Any equipment or vehicles drive and/or operated within or adjacent to the stream shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Place drip pans or absorbent materials under vehicles and equipment when not in use. Ensure that all construction areas have proper spill clean up materials (absorbent pads, sealed containers, booms, etc.) to contain the movement of any spilled substances. Any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by the Applicant or any party working under contract or with the permission of the Permittee, shall be removed immediately. The Department shall be notified immediately by the Permittee of any spills and shall be consulted regarding clean-up procedures.

2.14 No Dumping. Permittee and all contractors, subcontractors, and employees shall not dump any litter or construction debris within the stream, or where it may pass into the stream. Permittee shall pick up all debris and waste daily.

2.15 Disturbed Soils. Permittee shall stabilize all disturbed soils within the Project site to reduce erosion potential, following construction. Planting, seeding with native species, sterile seed mix, and mulching is acceptable. Where suitable vegetation cannot reasonably be expected to become established, non-erodible materials, such as coconut fiber matting, shall be used for such stabilization.

2.16 Site Restoration. All exposed/disturbed areas and access points within the stream left barren of vegetation as a result of the construction activities, such as staging areas, shall be restored using locally native grass and/or forb seeds, locally native grass plugs and/or a mix of quick growing sterile non-native grass with locally native grass/forb seeds. Seeded areas shall be covered with broadcast straw and/or seeded erosion control blankets. **Products with plastic monofilament or cross joints in the netting that are bound/stitched (such as found in straw wattles/fiber rolls and some erosion control blankets) which may cause entrapment of wildlife, shall not be allowed.**

3. Reporting Measures

Permittee shall meet each reporting requirement described below.

3.1 Permittee shall notify the Department within two working days of beginning work within the Creek channel. Notification shall be submitted as instructed in Contact Information section. Email notification is preferred.

3.2 Upon completion of the project activities described in this Agreement, the project area shall be digitally photographed. Photographs shall be submitted to the Department within fifteen (15) days of completion. Photographs and notification of project completion shall be submitted as instructed in Contact Information section. Email submittal is preferred.

CONTACT INFORMATION

Any communication that Permittee or the Department submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or the Department specifies by written notice to the other.

To Permittee:

Rodney L. Murphy
Department of Transportation – Caltrans
703 B Street
Marysville, CA 95901
Phone: (530) 741-5127
Email: Rodney.L.Murphy@dot.ca.gov

To the Department:

California Department of Fish and Wildlife
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program
Notification #1600-2014-0105-R2
Phone: (916) 358-2885
Email: R2LSA@wildlife.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers,

employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute the Department's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

The Department may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before the Department suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before the Department suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused the Department to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes the Department from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects the Department's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

The Department may amend the Agreement at any time during its term if the Department determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by the Department and Permittee. To request an amendment, Permittee shall submit to the Department a completed the Department "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in the Department's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter the Department approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to the Department a completed the Department "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in the Department's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to the Department a completed the Department "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in the Department's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). The Department shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (FGC, § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of the Department's signature, which shall be: 1) after Permittee's signature; 2) after the Department complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at http://www.wildlife.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire **five years** from date signed by the Department, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

Exhibits

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

Exhibit A. Project Location Map
Exhibit B. Bridge Layout View
Exhibit C: Project Impact Map

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify the Department in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION - CALTRANS

Rodney L Murphy
RODNEY L. MURPHY

07/17/14
Date

FOR DEPARTMENT OF FISH AND WILDLIFE

Jeff Drongen
TINA BARTLETT
Regional Manager

7/22/14
Date

Prepared by: Kursten Sheridan, Environmental Scientist

Exhibit A: Project Location

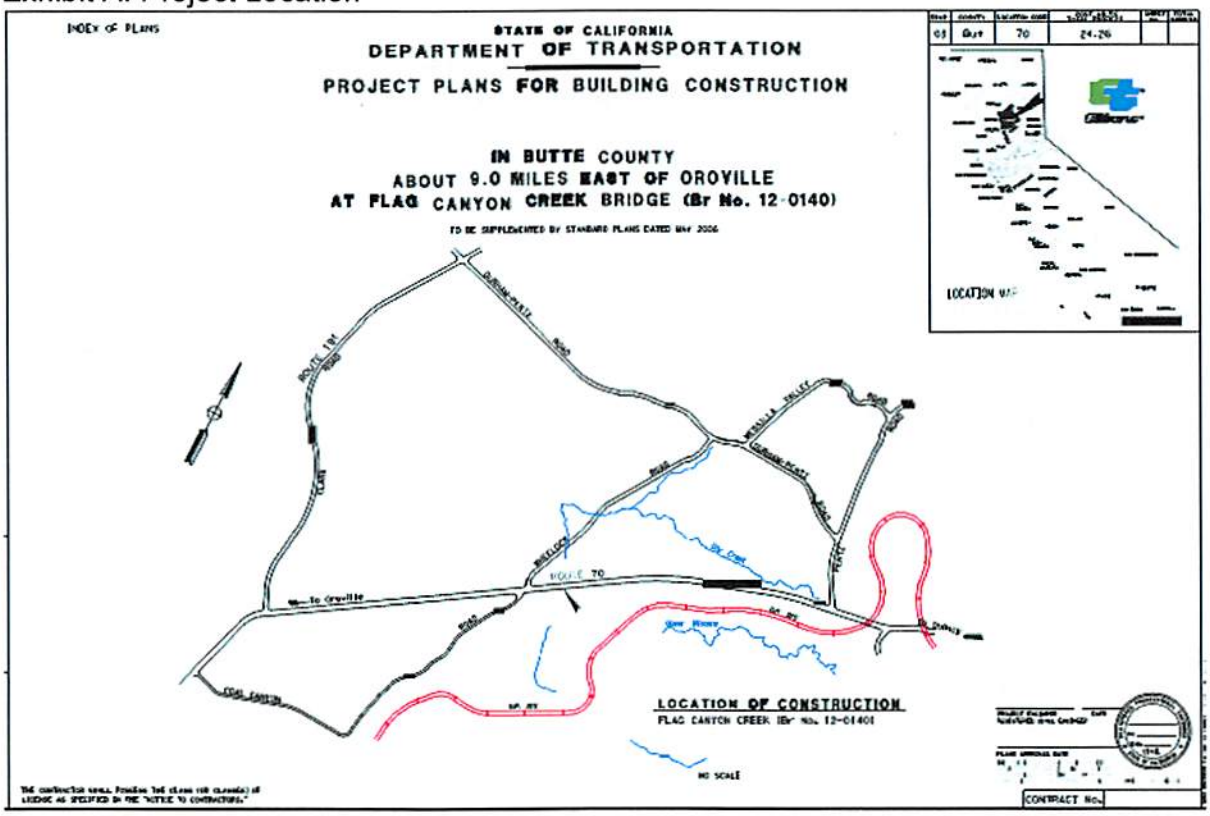


Exhibit B: Bridge Layout View

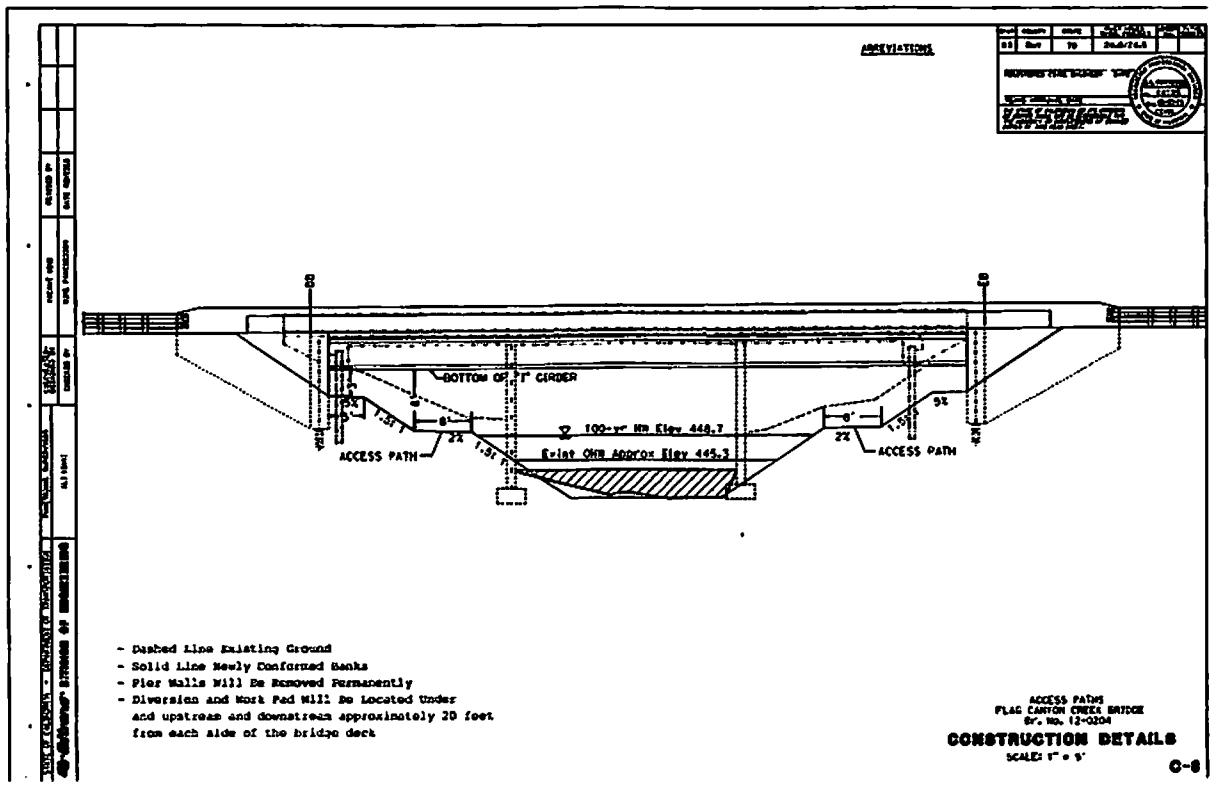
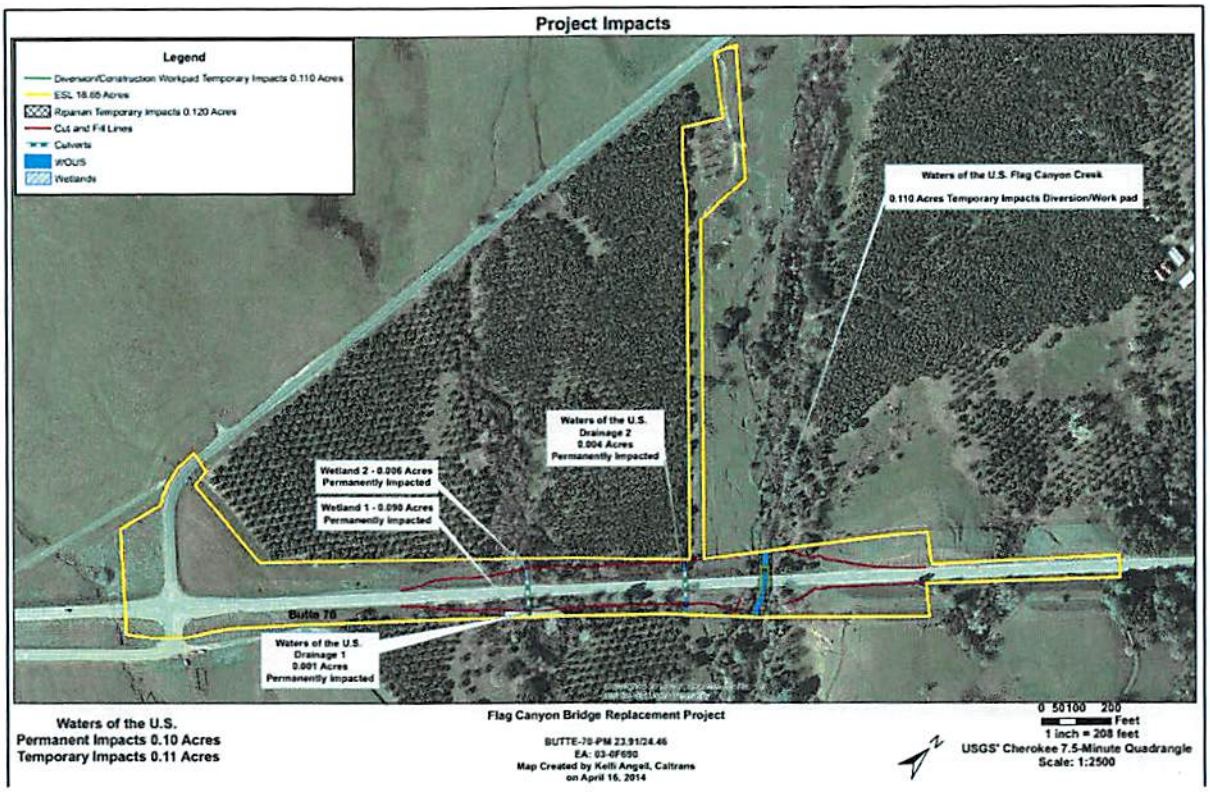


Exhibit C: Project Impacts Map



M e m o r a n d u m

Flex your power!
Be energy efficient!

To: MR. JEFF SIMS
BRANCH CHIEF
Division of Engineering Services
Structural Design-Mail Station 9-4/8I
Office of Bridge Design South 1-Branch 1

Attn: Daniel Sessions

Date: February 27, 2014

File: 03-BUT-70-PM 24.2
Flag Canyon Creek Bridge (Replace)
Br. No. 12-0204
E.A. 03-0F6901
EFIS 0300000100

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Geotechnical Services – MS 5
Office of Geotechnical Design – North

Subject: Revised Foundation Report for Flag Canyon Creek Bridge (Replace)
THIS MEMO SUPERSEDES AND REPLACES THE MEMO DATED February 11, 2014

Scope of Work

The Office of Geotechnical Design-North (OGD-N) has prepared this Foundation Report for the Flag Canyon Creek Bridge (Br. No. 12-0204), the proposed replacement of the existing Flag Canyon Creek Bridge (Br. No. 12-0140) located on State Route 70 at PM 24.2, in Butte County, California, approximately 10 miles east of the City of Oroville. Foundation recommendations for the temporary bridge during construction are also included in this report.

This report includes review and evaluation of the existing Flag Canyon Creek Bridge (Bridge No. 12-0140), the As-Built bridge records, the As-Built Log of Test Borings (LOTBs), and a subsurface investigation in April and May of 2013.

Project Description

The proposed replacement of Flag Canyon Creek Bridge (Br. No. 12-0204), is a PC/PS "I" girder single span structure with a length of 94 feet 3 inches. The abutments will be supported on steel H-piles. The existing Flag Canyon Creek Bridge (Br. No. 12-0140) was built in 1958. The existing bridge will be removed and the new structure will be built on the same alignment. A temporary bridge will be built during construction to route traffic around the removal of the existing bridge and construction of the new bridge. The temporary structure will be a 49 feet long single span structure over Flag Canyon Creek supported on spread footings.

The following foundation recommendations are based on the subsurface information gathered during the subsurface investigation (April and May 2013). With regards to the foundation recommendations provided in this report, elevations are based on the NAVD 88 vertical datum, and horizontal coordinates are based on the NAD 83 horizontal datum, unless otherwise noted. The "As-Built" elevations were converted from NGVD 29 to NAVD 88 by using a conversion factor of +2.39 ft for this project.

Field Investigation and Testing Program

The Office of Geotechnical Design-North conducted a subsurface investigation in April and May 2013.

The 2013 subsurface investigation consisted of three mud rotary borings (Nos. RC-13-001, RC-13-002, and RC-13-003). The mud rotary borings were advanced using a self-casing wireline drilling method. The maximum depth reached by the 2013 subsurface investigation was approximately 150 feet. Sampling was achieved in all borings by utilizing the Standard Penetration Test (SPT) sampler. Selected soil and rock samples were tested in the Caltrans Geotechnical Laboratory. A summary of the borings drilled during the subsurface investigation is included below in Table 1.

Table 1. The 2013 Subsurface Exploration Summary for Flag Canyon Creek Bridge (Replace) (Br. No. 12-0204)

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency (%)	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
RC-13-001	4/24/2013	CS2000	Auto	85	462.8	134
RC-13-002	4/24/2013	CS2000	Auto	86	463.3	150
RC-13-003	5/1/2013	Acker	Auto	58	447.0	75

Laboratory Testing

Laboratory testing was performed on selected samples of the subsurface materials obtained from the 2013 subsurface investigation. Tests were performed to determine the corrosion and engineering properties of the subsurface materials for use in the foundation analyses. Refer to the Corrosion Evaluation section of this report for information concerning corrosion test results. In addition to the corrosion tests, the following tests were performed on selected samples: particle-size analysis, Atterberg limits, triaxial, direct shear, unconfined compression strength and moisture content. All tests were performed in general accordance with American Society for Testing and Materials (ASTM) standards or California Test Methods (CTM). Laboratory test results are available upon request.

Site Geology and Subsurface Conditions

Regional Setting and Area Geology

Based on the Geologic Map of Chico Quadrangle (Wagner, 1992), the project vicinity is underlain by two units. The two units mapped are shown as the Tuscan Formation (Ptu), and the Chico Formation (Kc). The Pliocene Tuscan Formation is described as interbedded lahars, volcanic conglomerate, volcanic sandstone, siltstone, and pumiceous tuff. The Cretaceous Chico Formation is described as marine sandstone, conglomerate and siltstone.

According to the 1957 As-Built LOTB, five one-inch soil tube borings were performed during the subsurface investigation for the Flag Canyon Creek Bridge in December 1956. The deepest boring was drilled 10.75 feet to an elevation of approximately 434 feet. Based on the As-Built LOTB, the subsurface materials consist of cobbles, fractured rock, sand, “compacted” fine sandy silt, and “compacted” silt."

The material encountered during the 2013 subsurface investigation generally consists of cohesive and cohesionless fill material underlain by sedimentary rock. The cohesive fill material consists of stiff to hard, lean clay, lean clay with gravel, and gravel to cobble sized rock fragments in sandy lean clay. The cohesionless fill material consists of medium dense to dense sandy silt and sandy silt with gravel sized rock fragments. The rock consists of decomposed to fresh siltstone and sandstone that ranges from very soft to very hard.

For subsurface data and boring locations, please refer to the Log of Test Borings for detailed observations, information and conditions.

Groundwater

During the 2013 subsurface investigation, three boreholes were completed and RC-13-003 was finished as an open stand pipe piezometer. Groundwater elevations were subsequently measured in borehole RC-13-003 on May 9, 2013 and July 24, 2013. The borehole has since been backfilled with neat cement grout The groundwater was encountered generally at the same elevation as the water level in Flag Canyon Creek.

Groundwater elevations are subject to seasonal fluctuations and may occur at higher or lower elevations than those observed. Groundwater elevations respond to rainfall patterns, groundwater usage patterns and upstream stream flow regulation and diversions. For more details, please refer to the LOTB sheets.

Table 2. Groundwater Measurement Data

Piezometer Location	Groundwater Elevation on 5/9/13 (ft)	Groundwater Elevation on 7/24/13 (ft)
RC-13-003	437.6	436.5

Scour Evaluation

The Memorandum “Final Hydraulic Report for Flag Canyon Creek Bridge” dated March 12, 2013, was written by Neal Alie from Structure Hydraulics and Hydrology. This memo “Recommends that all new foundations for the abutments should be designed assuming no ground support (lateral or vertical) as a result of soil loss due to possible future scour or migration to elevation 438.5 feet.”

For more information, refer to the Final Hydraulic Report by Neal Alie with Structure Hydraulics and Hydrology.

Corrosion Evaluation

Composite soil samples were collected from Borings RC-13-002 and RC-13-003 drilled during the 2013 subsurface investigation. The Office of Testing and Technology Services, Corrosive Technology Branch tested the composite samples for corrosive potential. The Corrosion Technology Branch considers a site to be corrosive if one or more of the following conditions exist for the representative soil or water samples collected at the site: chloride concentration is 550 ppm or greater, sulfate concentration is 2000 ppm or greater, or the pH is 5.5 or less. The minimum resistivity serves only as an indicator parameter for the possible presence of soluble salts and is not used to define a site as being corrosive. It is the practice of the Corrosion Technology Branch that if the minimum resistivity of the sample is greater than 1000 ohm-cm, the sample is considered to be non-corrosive and testing to determine the sulfate and chloride content is not performed.

The results of the laboratory tests determined that the composite samples were considered to be non-corrosive at this site. Refer to Table 3 for specific test results.

Table 3. Corrosion Test Summary of the Composite Samples for Flag Canyon Creek Bridge (Replace). (Br. No. 12-0204)

SIC Corrosion Number	Nearby Support Location	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (Ohm-Cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C739505	Abutment 1	RC-13-002	1-2.4	8.05	6215	N/A	N/A
C739506	Abutment 1	RC-13-003	11.5-15.85	7.31	2380	N/A	N/A

Seismic Recommendations

Based on the Caltrans ARS Online Tool (Version 2.3.0.6), the nearest active fault for the site is the Foothills Fault System-northern reach section (Swain Ravine fault zone) with MMax of 6.5. The fault is located southeast of the bridge site, and the closest distance to the fault rupture plane from the bridge site is approximately 11.0 miles.

Based on the Log of Test Borings, a V_{S30} (the weighted shear wave velocity for the top 100 feet of foundation materials) of 1310 feet per second (400 meters per second) is considered to be applicable to the foundation materials.

According to the "Methodology for Developing Design Response Spectrum for Use in Seismic Design Recommendations, November 2012," the design ground motion for the replacement

bridge is the highest spectral acceleration as obtained by any or a combination of the following three methods for the Flag Canyon Creek Bridge:

1) Statewide minimum deterministic spectrum requirements with MMax of 6.5, vertical strike-slip event with a rupture distance of 7.5 miles.
2) The nearest active fault as shown on the ARS Online Tool (Version 2.3.0.6).
3) The USGS 5% Probability of Exceedance in 50 years (975 year return period).

Based on the V_{S30}, the Acceleration Response Spectrum (ARS) is an envelope of methods 1 and 3 as stated above. The peak ground acceleration is estimated to be 0.22g as shown on the ARS curve.

According to MTD 20-2 for temporary structures, ground motion is based on 10% probability of exceedance in 10 years (95 year return period). This ARS curve for the temporary bridge was created using the USGS 2008 Interactive Deaggregations website (https://geohazards.usgs.gov/deaggint/2008/). Since this website does not have an option for Caltran's requirement of 10% probability of exceedance in 10 years (95 year return period), it was determined that the equivalent would be to use 20% probability of exceedance in 21 years (95 year return period). Based on this method, the peak ground acceleration is estimated to be 0.075g as shown on the ARS curve for the temporary bridge.

The potential for surface rupture at the site due to fault movement is considered insignificant since there are no known faults projecting towards or passing directly through the project site.

Based on the data from the LOTB the potential for soil liquefaction is considered low.

As-Built Foundation Data

At Abutment 1 and Abutment 4, driven steel H-piles were used for support. At Pier 2 and Pier 3, spread footings were used for support. According to the As-Built plans, the bottom of the spread footing located at Pier 2 was constructed at elevation 438.9, and the bottom of the spread footing located at Pier 3 was constructed at elevation 439.4. The spread footings were designed with an allowable bearing pressure of 6 ksf.

Table 4: 1956 As-Built Foundation Data Table for Abutment 1 and 4 locations of the Flag Canyon Creek (Bridge No. 12-0140).

Location	Foundation Type	Design Load (kips)	Pile Tip Elevation(s) (ft)
Abutment 1	10BP42	90	433.8 to 434.6
Abutment 4	10BP42	90	437.1 to 437.9

Foundation Recommendations

The following foundation recommendations for the replacement of Flag Canyon Creek Bridge and Flag Canyon Creek Temporary Bridge are based on the General Plans, conversations with Mr. Daniel Sessions and Mr. Kevin Harper from the Division of Structure Design and the subsurface investigations conducted at the site.

Flag Canyon Creek Bridge (Br. No. 12-0204)

Driven H-Pile foundations driven into rock are recommended at all support locations. Due to hard driving conditions we recommend the use of high grade steel (50 ksi) to be used for the H-piles.

Table 5. Foundation Design Recommendations for H-Piles for Bridge No. 12-0204[1,2]

Abutment Foundations Design Recommendations									
Support Location	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load (kips) per Support		LRFD Service-I Limit State Total Load (kips) per Pile (Compression)	Nominal Resistance (kips)	Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance (kips)
			Total	Permanent					
Abut. 1	14 x 117 H-Piles	449.8	975	800	140	280	417.0 (a)	417.0	280
Abut. 2	14 x 117 H-Piles	450.3	975	800	140	280	417.0 (a)	417.0	280

Notes:

1) *Design tip elevations are controlled by (a) Compression.*
2) *The nominal driving resistance is the resistance if the pile location is predrilled to the scour elevation (438.5 feet).*

Table 6. Pile Data Table, Flag Canyon Creek Bridge (Br. No. 12-0204)

Pile Data Table						
Location	Pile Type	Nominal Resistance (kips)		Design Tip Elevation (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance (kips)
		Compression	Tension			
Abut. 1	14x117 H-Piles	280	0	417.0 (a)	417.0	280
Abut 2	14x117 H-Piles	280	0	417.0 (a)	417.0	280

Notes:

1) *Design tip elevations for Abutments are controlled by (a) Compression.*
2) *The nominal driving resistance is the resistance if the pile location is predrilled to the scour elevation (438.5 feet).*
3) *The specified tip elevation shall not be raised above the design tip elevations for Lateral Load.*

Flag Canyon Creek Temporary Bridge

It is proposed to support the Flag Canyon Creek Temporary Bridge on spread footings at all support locations. The Office of Structure Construction should inform the Office of Gectechnical Design-North of the Contractor's proposed bottom of footing elevation and the footing will be inspected by a representative of this Office for approval.

Table 7. Foundation Design Recommendations for Spread Footings, Flag Canyon Creek Temporary Bridge[1,2].

Support Location	Footing Size (ft)		Bottom of Footing Elevation (ft)	Minimum Footing Embedment Depth (ft)	WSD (LRFD Service-I Limit State Load)		LRFD		
							Service	Strength $\varphi = 0.45$	Extreme Event $\varphi = 1.0$
	B	L			Permissible Gross Contact Stress (ksf)	Allowable Gross Bearing Capacity (ksf)	Permissible Net Contact Stress (ksf)	Factored Gross Nominal Bearing Resistance (ksf)	Factored Gross Nominal Bearing Resistance (ksf)
Abut 1	4.0	20.0	See Note No. 3	See Note No. 3	3.0	6.0	N/A	N/A	N/A
Abut 2	4.0	20.0	See Note No. 3	See Note No. 3	3.0	6.0	N/A	N/A	N/A

Notes:
1) Recommendations are based on the foundation geometry and the load data provided by Structure Design in the Foundation Design Data Sheet. The footing contact area is taken as equal to the effective footing area, where applicable.
2) See MTD 4-1 for definitions and applications of the recommended design parameters.
3) To be determined by Contractor and approved by the Engineer: may not be higher than original grade.

Table 8. Spread Footing Data Table for Flag Canyon Creek Temporary Bridge

Support Location	Working Stress Design (WSD)		Load and Resistance Design (LRFD)		
	Permissible Gross Contact Stress (Settlement) (ksf)	Allowable Gross Bearing Capacity (ksf)	**Service** Permissible Net Contact Stress (Settlement) (ksf)	**Strength** Factored Gross Nominal Bearing Resistance φ_b=0.45 (ksf)	**Extreme Event** Factored Gross Nominal Bearing Resistance φ_b=1.00 (ksf)
Abutment 1	3.0	6.0	N/A	N/A	N/A
Abutment 2	3.0	6.0	N/A	N/A	N/A

Construction Considerations

1. The steel H-piles should be driven to the specified tip elevations with minimal interruptions in order to minimize an increase in driving resistance due to soil setup.

2. Groundwater was encountered during the subsurface investigation and should be considered during all phases of construction and pile installation. Groundwater surface elevation is subject to seasonal fluctuations. Groundwater may occur higher or lower than indicated on the Log of Test Boring Sheets (LOTB) at the time of construction.

3. The Contractor may use predrilled holes for the piles, Refer to the 2010 Caltrans Standard Specifications 49-2.01C(4). The predrilled holes may be extended to the scour elevation of 438.5 feet.

4. Hard driving should be expected from approximately elevations 440.0 feet to pile tip elevation due to driving into a rock layer.

5. Due to hard driving conditions we recommend the use of high grade steel (50 ksi) to be used for the H-piles.

6. At the Engineer's option, if the H-piles are driven below lateral design tip elevation and to a depth that is within 10.0 feet of the specified tip and three times the required pile acceptance criteria is achieved, the pile tip elevation may be considered adequate and the excess pile length cut-off. Refer to the 2010 Caltrans Standard Specifications 49-2.01A(4)(b) for information concerning the pile acceptance criteria.

7. Due to expected hard driving, driving tips may be necessary to ensure pile integrity.

8. For the temporary bridge, the Office of Structure Construction should inform the Office of Gectechnical Design-North of the Contractor's proposed bottom of footing elevation and the footing will be inspected by a representative of this Office for approval.

Project Information

"Project Information," discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is information originating from Geotechnical Services.

Data and information attached with the project plans are:

A. Log of Test Borings (Flag Canyon Creek Bridge (Replace), Br. No. 12-0204).

Data and information included in the Information Handout provided to the bidders and contractors are:

A. Revised Foundation Report for Flag Canyon Creek Bridge (Replace), (Br. No. 12-0204) dated February 26, 2014.

Data and information available for inspection at the Transportation Laboratory:

A. Core Samples.
B. Rock and Soil Laboratory Data.

The recommendations contained in this report are based on specific project information regarding design loads and structure locations that has been provided by the Office of Bridge Design South. If any conceptual changes are made during final project design, the Office of Geotechnical Design-North, should review those changes to determine if the foundation recommendations provided in this report are still applicable. Any questions regarding the above recommendations should be directed to Joseph Kaump (916) 227-1044, of the Office of Geotechnical Design-North.

Report by:

JOSEPH KAUMP
Engineering Geologist
Office of Geotechnical Design-North

BENJAMIN BARNES
Transportation Engineer-Civil
Office of Geotechnical Design-North

PROFESSIONAL GEOLOGIST
JOSEPH KAUMP
No. 7837
Exp. 1-31-15
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
BENJAMIN M. BARNES
No. 66090
Exp. 6/30/2014
CIVIL
STATE OF CALIFORNIA

Attachment: ARS curve for Flag Canyon Creek Bridge
ARS curve for Flag Canyon Creek Bridge (Temporary)

c: Reid Buell
Michael Panchesson - District Project Engineer
Structure Construction R.E. Pending File – RE_Pending_File@dot.ca.gov
Craig Whitten - DES Office Engineer
Dan Ferchaud - District Materials Engineer
Rodney Murphy– District Project Manager

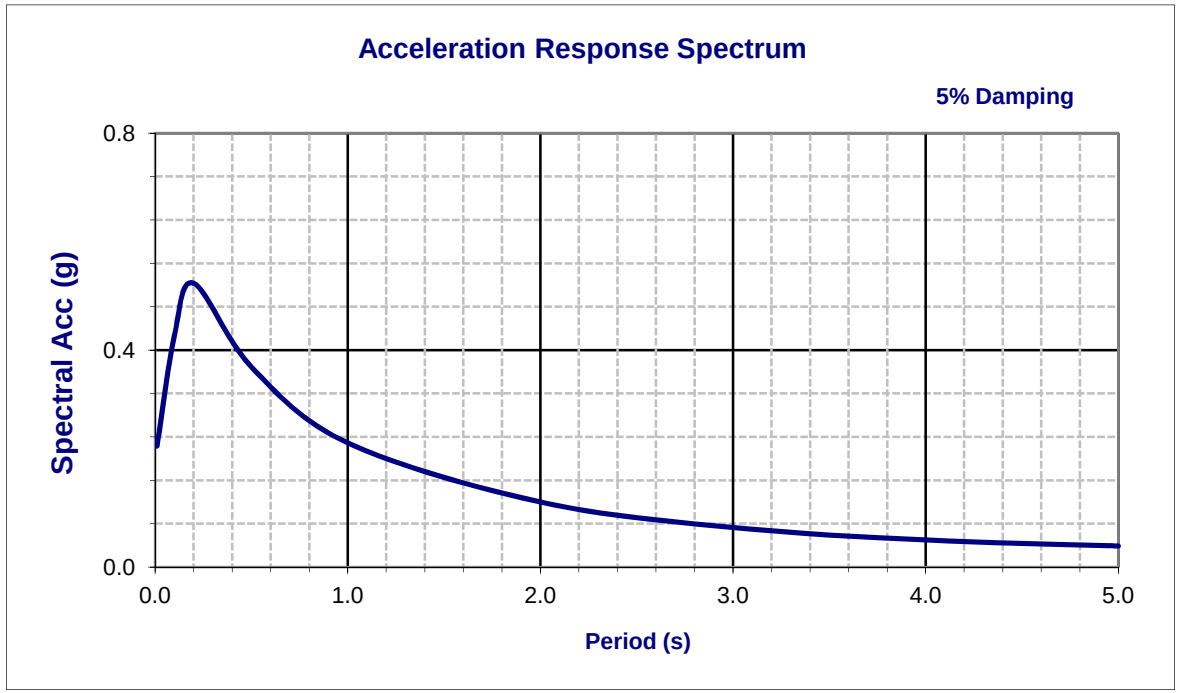
Flag Canyon Creek Bridge

Bridge No. 12-0204
EFIS 0300000100

Latitude 39.6284
Longitude -121.5896

Control **Envelope**

Period (s)	Sa(g)
0.010	0.223
0.100	0.426
0.200	0.523
0.500	0.369
1.000	0.229
2.000	0.120
3.000	0.073
4.000	0.050
5.000	0.039



Nearest Active Deterministic Fault Data

Fault	Foothills Fault System- northern reach section (Swain Ravine fault zone)		R_{rup}	17	km
Fault ID	71		R_{jb}	15	km
Style	N		R_x	12	km
Mmax	6.5		V_{S30}	400	m/s
Dip	50	deg	$Z_{1.0}$	N/A	m
Z_{TOR}	0	km	$Z_{2.5}$	N/A	km

Notes

Please note the Design ARS curve is an envelope of the USGS 5% Probability of Exceedance in 50 years (975 years return period) and the Minimum Deterministic methods.

Design Response Spectrum

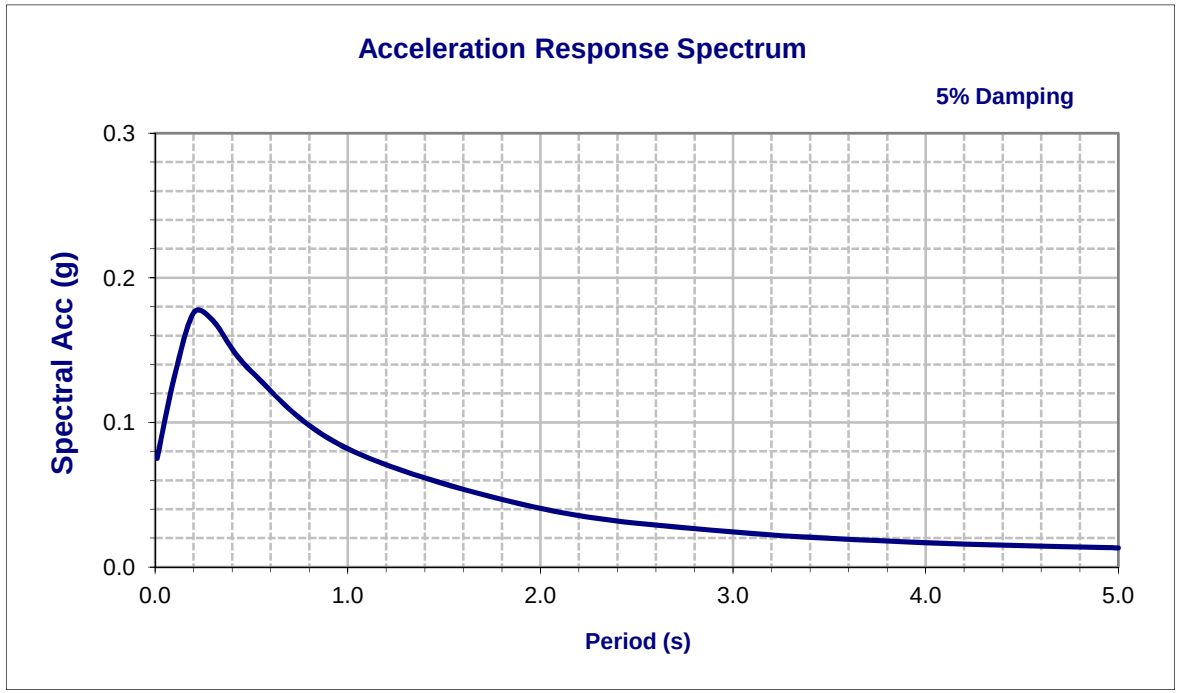
Temp Flag Canyon Creek Bridge

Latitude 39.6284

Bridge No. **12-0204** **Longitude** -121.5896 Control **Probabilistic**

EFIS **0300000100**

Period (s)	Sa(g)
0.010	0.075
0.100	0.132
0.200	0.176
0.300	0.171
0.500	0.135
1.000	0.082
2.000	0.041
3.000	0.024
4.000	0.017
5.000	0.013



Nearest Active Deterministic Fault Data

Fault	Foothills Fault System- northern reach section (Swain Ravine fault zone)		R_{rup}	17	km
Fault ID	71		R_{jb}	15	km
Style	N		R_x	12	km
Mmax	6.5		V_{S30}	400	m/s
Dip	50	deg	$Z_{1.0}$	N/A	m
Z_{TOR}	0	km	$Z_{2.5}$	N/A	km

Notes

Please note the Design ARS curve is based on the USGS 20% Probability of Exceedance in 21 years (95 years return period).

Design Response Spectrum

Memorandum

To: Jeff Sims, Chief
Office of Bridge Design Services
Design Branch 1
Att: Daniel Sessions

Date: March 12, 2013

File: 03-But-70-24.2
EA 03-0F690
(0300000100)
Flag Canyon Creek Bridge
Br. No. 12-0140

From: Neal Alie
Division of Engineering Services
Office of Design and Technical Services
Structure Hydraulics and Hydrology

Subject: Final Hydraulic Report for Flag Canyon Creek Bridge

Attached for your records is the Final Hydraulic Report for the above referenced project. If you have any questions, please contact me at (916) 227-0444 or my mobile at (916) 224-9640.

Sincerely,

Neal Alie
Hydrology/Hydraulics Engineer

cc: Steve Ng

State of California - Department of Transportation
Division of Engineering Services
Structure Design Services

Structure Hydraulics and Hydrology

Final Hydraulic Report

Flag Canyon Creek Bridge

JOB:	
Bridge No. 12-0140	Bridge Replacement
03-But-70-PM 24.2	
EA 0F690 (0300000100)	

PREPARED BY:	DATE:	REVIEWED BY:
Neal Alie	3/11/2013	Steve Ng

Hydrology/Hydraulic Report

General

The Flag Canyon Creek Bridge (Br. No. 12-0140) is located approximately 10 miles east of Oroville in Butte County. The existing bridge was built in 1958 and is a 3 span RC continuous slab with RC piers on spread footings and RC open end diaphragm abutments on steel piles. The existing structure is 82.0 feet long and 36.7 feet wide with a structure depth of 1.3 feet.

According to the maintenance records, this structure has a long history of scour problems dating back to 1963. On 6/16/2001 the Bridge's scour potential was assessed in accordance with FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges" and within current Caltrans guidelines, the bridge was determined to be scour critical. The item 113 code was changed to 3, "Bridge foundations determined to be unstable for calculated scour conditions."

Structure Design is proposing to replace the existing bridge with a 94.3 foot long, 42.8 feet wide single span Precast P/S I Girders, with a structure depth of 5.8 feet. It was determined that the most cost-effective way to replace the structure was to construct a single span temporary bridge approximately 20.0 feet downstream from the existing structure. The temporary bridge will be 49.0 feet long with a structure depth of 3.3 feet. The temporary structure should be designed to pass a 10-year flood event with a water surface elevation of 445.7 feet. The soffit elevation for the proposed bridge is approximately 447.7 to 448.2 feet, providing a freeboard of 2.0 to 2.5 feet. The velocity was calculated to be 10.1 feet per second.

This report makes extensive reference to the (1) Caltrans Bridge Maintenance Reports, (2) General plans and profiles submitted by structures, (3) Caltrans As-Built Plans (4) Preliminary Report, June 1941, (5) Geotechnical memo, May 9, 2008, Bridge Stability Rating memo, January 16, 2001.

All elevations indicated in this report are referenced to the 1988 datum.

Drainage Basin

Flag Canyon Creek drains a watershed of approximately 2.6 square miles of highly vegetated terrain subject to the collection of debris during high-water flows. The channel has approximately a 3.0 % slope at the bridge site. A mean annual precipitation of 44 inches was used for this project.

Discharge

The watershed modeling system, "WMS" program in conjunction with the National Flood Frequency Equation, "NFF" was used to calculate a 50-year discharge of 1590 cubic feet per second and a 100-year discharge of 2020 cubic feet per second. The 10-year discharge was calculated to be 882 cubic feet per second.

Stage, Velocity and Waterway

The U.S. Army Corps of Engineers Hydraulics Engineering Circular-River Analysis System (HEC-RAS) program was used to perform a one-dimensional hydraulic analysis to calculate the water surface elevations and velocity at the existing structure. The average velocity and the stage for the 50-year and 100-year discharges at the upstream face of the bridge are given below.

Existing Conditions

	WSEL	Average Velocity	Available Freeboard
50-year Design Flood 1590 cfs	447.9 ft	11.9 fps	**12.8 ft**
100-year Base Flood 2020 cfs	448.9 ft	12.7 fps	**11.8 ft**

The minimum soffit elevation of the existing structure is 460.7 feet. There is more than adequate freeboard and waterway area for both the design flood (50-year discharge) and base flood (100-year discharge).

Proposed Bridge

	WSEL	Average Velocity	Available Freeboard
50-year Design Flood 1590 cfs	447.8 ft	10.9 fps	**9.3 ft**

100-year Base Flood 2020 cfs	448.7 ft	11.6 fps	**8.4 ft**

The minimum soffit elevation of the proposed structure is 457.1 feet. According to Caltrans Structure Hydraulic Guidelines there is adequate freeboard and waterway area for both the design flood (50-year discharge) and base flood (100-year discharge).

Streambed and Scour

According to the maintenance records, this structure has a long history of scour problems dating back to 1963 due to degradation, contraction, local pier scour and debris.

Approximately 6 feet of degradation occurred in span 2 between 1959 and 2001, but the channel has stabilized since. The degradation possibly occurred due to aggregate mining in Deer Creek, approximately 1 mile downstream of the bridge at the confluence of Flag Canyon Creek and Deer Creek.

It the early 1970's, grouted rock was placed upstream on each side of the channel at span 1 and 3 to protect the fill. The rock and fill against the piers resulted in an elevation differential of about 8 to 12 feet between the end spans and the center span. The blocked span 1 and 3 constricted the flow causing some contraction scour and channel incision.

Based on a recent stream cross section taken 05/25/2012, the entire Span 2 side of Pier 3 footing was vertically exposed. The upstream end was exposed up to 1 foot, the middle was exposed up to 2.9 feet from the top of the footing to the ground, and the downstream end was exposed 2.0 feet. The local pier scour at Pier 3 is likely caused from the hydraulic skew, debris and due to the contracted flow.

The Geotechnical Support Office determined that the material supporting the footings is sandstone bedrock. Once the overlay conglomerate is removed, the exposed sandstone can be easily removed by the flowing water and sediments.

Another Peer Review meeting was held on 5/30/2012 to consider whether to confirm or modify the recommendation to replace the structure. The Peer Review Team unanimously agreed to replace the existing bridge.

The potential local pier scour for the existing bridge was calculated to be 5.6 feet for Pier 2 and 3 at elevation 425.6 feet. It was also determined that Wheelock Road located

approximately 2000 feet downstream acts as a substantial check dam reducing the threat of any future degradation.

The proposed single span structure will eliminate any local pier scour concerns.

Structure Hydraulics recommends that all new foundations for the abutments should be designed assuming no ground support (lateral or vertical) as a result of soil loss due to possible future scour or migration to elevation 438.5 feet.

Drift

According to the maintenance Records, there is a long history of drift consisting of trees and tree branches accumulating at Piers 2 and 3. The accumulation of drift at the piers increases the effective pier diameter increasing local pier scour. The proposed single span alternatives will eliminate any debris concerns.

Bank Protection

Rock slope protection at the proposed bridge will be designed by the District to protect the proposed 8 foot access paths under the bridge. The average velocity (See "Stage, Velocity and required Waterway" section above) is provided to assist the District hydraulic engineers in the design of the RSP. Structure Hydraulics recommends that the face of the RSP be designed flush with existing stream bank so that the waterway area is not reduced.

HYDROLOGIC SUMMARY FOR FLAG CANYON CREEK (Existing Bridge) Br. No. 12-0140			
Drainage Area: 2.6 sqmi			
	Design Flood	**Base Flood**	**Overtopping Flood/Flood of Record**
Frequency	50-yr	100-yr	N/A
Discharge	1590 cfs	2020 cfs	N/A
Water Surface Elevation at Bridge	447.9 ft	448.9 ft	N/A
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

HYDROLOGIC SUMMARY FOR FLAG CANYON CREEK (Proposed) Br. No. 12-0140			
Drainage Area: 2.6 sqmi			
	Design Flood	**Base Flood**	**Overtopping Flood/Flood of Record**
Frequency	50-yr	100-yr	N/A
Discharge	1590 cfs	2020 cfs	N/A
Water Surface Elevation at Bridge	447.8 ft	448.7 ft	N/A
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

Flag Canyon Creek Bridge
Br. No. 12-0140
03-But-70-PM 24.2
03-0F690

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the professional Engineers Act of the State of California.

REGISTERED CIVIL ENGINEER (SIGNATURE)

REGISTRATION NUMBER: C056398 DATE: 3/12/13

REGISTERED PROFESSIONAL ENGINEER
NEAL ALIE
C 56398
EXP. 06/30/2015
CIVIL
STATE OF CALIFORNIA