

**Meeting of the Central Valley Flood Protection Board
August 24, 2012
Staff Report – Encroachment Permit
California Department of Transportation (Caltrans)
Minkler Bridge Removal and Replacement, Fresno County**

1.0 – ITEM

Consider approval of Permit No. 18761.

2.0 – APPLICANT

California Department of Transportation, District 6 (Caltrans); Tom Fisher, Central Region Hydraulic Engineer.

3.0 – LOCATION

The project is located at the State Route (SR) 180 crossing of the Kings River Overflow channel at mile marker 77.2 in the town of Minkler, California (Kings River Overflow Canal, Fresno County, see Attachment A for location maps and photos).

4.0 – DESCRIPTION

The applicant proposes to remove the SR180 (East Kings Canyon Road) bridge (No. 42-0074) over the Kings River Overflow channel and replace it with a wider, concrete slab bridge (No. 42-0437) along the existing roadway alignment and profile.

Initially Caltrans also proposed to provide mitigation landscaping / plantings for this project at a nearby site. However they now plan to submit another permit application for this bridge's Riparian Mitigation Landscaping Plan as part of the overall State Route (SR) 180 Re-Alignment Project. The SR 180 Re-Alignment Project is scheduled to begin construction in July 2013 and be completed by October 31, 2014. The California Department of Fish & Game (DFG) was consulted and supports Caltrans proposal to combine mitigation for both the SR 180 Re-Alignment Project segments 2 & 3 and this SR 180 (Minkler) Bridge Replacement Project in the future. By combining the mitigation for all three projects Caltrans will be better able to conserve a large block of area, rather than constructing several small mitigation sites at separate locations. DFG considers this riparian mitigation combination approach to be both environmentally beneficial and cost effective.

5.0 – PROJECT ANALYSIS

5.1 – Project Background

The existing structure was built in 1921 by Fresno County and widened in 1954. It is a nine-span structure with 17-foot spans, a total length of 153 feet, and a total width of 28.5 feet. The existing structure depth is roughly one foot, 10.5 inches. The bridge needs to be replaced due to a structural deficiency, resulting from high chloride deck core test results and the deteriorated state of the superstructure.

High-water records were located by Caltrans for the years of 1937, 1945 and 1952, with some indicating overtopping of the existing bridge deck. However, no high-water elevations or reports of overtopping were located after 1954 when construction of Pine Flat Dam on the Kings River was completed.

The proposed replacement bridge is a five-span structure (26.8 feet, three spans at 35.5 feet, 26.8 feet), cast-in-place reinforced concrete slab bridge structure. The proposed new structure depth is one foot, 6.5 inches, and the total new bridge length and width are 160 feet, and 42 feet, 10 inches, respectively (see Attachment B for bridge plan, profile and foundation plans).

The proposed replacement bridge has four pier walls with an approximate thickness of 18 inches with upstream and downstream rounded pier noses. Due to the historical Minkler Cash Store structure located next to the bridge site and other geotechnical considerations, no pile driving is allowed in the vicinity of the bridge due to potential damage to this structure. Therefore Caltrans has proposed spread-footing foundations at both abutments and all pier locations replacing the existing foundations of similar design.

It should be noted that a route re-alignment for a section of the existing SR180 has also been proposed in the vicinity, and includes proposed construction of new Byrd Slough (minor channel) and Kings River Overflow bridges in conjunction with other new structures along a new northern alignment upstream of the existing bridge sites. The existing bridges along the existing section of SR180, along with the proposed bridge replacement under consideration in this report, would be relinquished to a local agency for future operation and maintenance once the SR180 re-alignment project is completed. It is possible that the future SR180 realignment, including new bridge waterway crossings, may affect the local hydraulics of this proposed replacement bridge in the future.

5.2 – Authority of the Board

- Title 23, §112, Regulated Streams, §128, Bridges

5.3 – Hydraulic Analysis

The Kings River Overflow channel is part of Byrd Slough (main channel) which divides into two smaller “low-flow” channels roughly 1,600 feet upstream of the existing SR180. These two “low-flow” channels cross SR180 through two adjacent bridge sites: Kings River Overflow (Bridge No. 42-0074) and Byrd Slough (minor channel) (Bridge No. 42-0073) (See Attachment C, Figure 1). Byrd Slough (main channel) is owned and operated by the Alta Irrigation District (AID), and is part of a complex water distribution system to the immediate area which includes a series of diversions, weirs, control gates and other water-related structures.

In late January 2012, Board staff provided Caltrans with its own analysis of the design discharges for Byrd Slough (main channel) of 2,500 cubic feet per second (cfs) upstream of the flow split, with individual discharges of 1,250 cfs for Byrd Slough (minor channel), and 1,250 cfs for the Kings River Overflow channel downstream of the flow split location. The staff analysis also determined the Kings River Overflow channel is a “minor stream” for regulatory bridge encroachment permit evaluation purposes under California Code of Regulations, Title 23 (CCR 23).

It should be noted the FEMA Flood Insurance Rate Map (FIRM) for this area indicates a common floodplain area between these two adjacent low-flow channels upstream of SR180, and two separate low-flow channels downstream of SR180 (See Attachment C, Figure 2).

For the purposes of evaluating potential hydraulic impacts due directly from the proposed Minkler Bridge replacement project, the existing and proposed conditions were evaluated using HEC-RAS Version 4.1 hydraulic modeling software using the Board staff’s design discharge criteria. The hydraulic model was created using geometric data provided by field surveys, bridge/channel design details from As-Built and proposed Plan Sheets, and other necessary assumptions required to run the model. The survey data was referenced to NGVD29 vertical datum and consisted of representative cross sections taken across the channel and floodplain area, extending roughly 2,000 feet and 1,000 feet upstream and downstream of SR180, respectively (See Attachment C, Figure 3).

Based on the design discharge of 1,250 CFS for the Kings River Overflow channel, the HEC-RAS model calculated water surface elevations (WSEL) as shown in the following table:

HEC-RAS River Station	River Station Location	Condition	WSEL (feet, NGVD29)	WSEL Difference (feet)
1031.31 (feet)	Upstream face of proposed bridge	Existing	392.13	- 0.01
		Proposed	392.12	
1024.40 (feet)	Upstream face of existing bridge	Existing	392.06	- 0.03
		Proposed	392.03	

For WSEL comparisons, the computed water surface elevation at both the existing and proposed upstream bridge faces is 392.1 feet (rounded off to 0.1 feet). Based on these computed WSEL values, there is no anticipated change in WSEL due to construction of the proposed bridge replacement project (See Attachment C, Figures 4A and 4B).

Minimum soffit elevations for the existing and proposed bridges are 393.8 feet and 394.2 feet respectively. Based on computed WSELs and minimum soffit elevations there is roughly 1.7 feet of freeboard [$393.8 - 392.06 = 1.74$, rounded to 1.7] for the existing bridge, and 2.1 feet of freeboard [$394.2 - 392.12 = 2.08$, rounded to 2.1] for the proposed bridge (See Attachment C, Figure 5). CCR 23 requires 2.0 feet of freeboard below the minimum soffit elevation for minor streams therefore the proposed bridge is compliant with CCR 23.

The HEC-RAS software also uses direct hydraulic results from the HEC-RAS model to provide scour estimates. Based on the proposed bridge details (pier walls) and current assumptions used for scour evaluation purposes, the calculated local pier scour depth was 4.0 feet. Based on the HEC-RAS model results for assumed maximum flow conditions, both proposed abutments appear to be generally located outside and above the local calculated maximum WSEL, and are not expected to be subject to significant local scour. Based on a current thalweg elevation of 387.0 feet, and considering a total channel degradation of one foot with local pier scour depth of four feet, a potential local channel bed elevation of 382.0 feet is assumed at any pier location (Piers 2 – 5). For either abutment face the potential local channel bed elevation of 386.0 feet is assumed, which considers the current thalweg elevation plus one foot of long-term channel degradation. In the event that future significant thalweg migration occurs towards the abutments, it should be a relatively gradual process that would likely allow adequate time to detect and address any concerns as required (See Attachment C, Figure 6).

5.4 – Geotechnical Analysis

Beginning at an elevation of 398 feet, a 55 foot deep boring log adjacent to the proposed Abutment 1 indicates the soil deposits consisted of Pleistocene Age Medium

dense SILTY GRAVEL with a small amount (5% or less) of 3- to 4-inch diameter hard granitic COBBLES to elevation 391 feet, followed by dense SILTY GRAVEL with SAND and more COBBLES from elevation 391 feet to 373 feet. From 373 feet to the bottom of the boring the soils became predominately hard granitic COBBLES with interstitial SAND and GRAVEL.

From an elevation of 398 feet, a 38 foot deep boring log adjacent to the proposed Abutment 6 indicates the soil deposits consisted of very dense, poorly graded SAND with GRAVEL and a trace of fines to elevation 390 feet. From 390 feet to 360 feet, the soils were predominately hard granitic 3- to 6-inch diameter COBBLES with interstitial SAND and GRAVEL.

Based on the applicant's corrosion report the bridge site is considered corrosive. The controlling corrosion parameter tests are as follows:

pH	= 6.2	Falls within noncorrosive range (5.5 to 10.0)
Chloride	= 3,747 ppm	Falls within corrosive range (> 250 ppm)
Sulfate	= 5,463 ppm	Falls within corrosive range (> 500 ppm)
Resistivity	= 127.05 ohm-cm	Falls within corrosive range (< 2,000 ohm-cm)

A seismic study also indicated a very low potential for soil liquefaction during a strong ground shaking. Based on submitted geotechnical information and local restrictions, staff is in support of the proposed replacement bridge to be constructed on spread footings.

5.5 – Additional Staff Analysis

Although the HEC-RAS model results do not seem to indicate any adverse hydraulic impacts between existing and proposed conditions, the proposed replacement bridge would (from a qualitative perspective): (1) provide a slightly longer bridge waterway opening width, (2) significantly reduce the total number of piers in the waterway from eight to four, (3) increase available open-span lengths for drift passage between the piers, (4) significantly reduce or eliminate the hydraulic skew effects at the piers by more closely aligning the piers in the direction of high flow, and (5) slightly raise the minimum bridge soffit elevation to provide additional freeboard.

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- Staff anticipates receipt of a letter from the U.S. Army Corps of Engineers (USACE) prior to the August 24, 2012 Board meeting indicating that the USACE District Engineer has no comments or recommendations regarding flood control because the proposed project does not affect a federally constructed flood

damage reduction project. The draft permit (Attachment D) reflects this expectation in special condition FORTY-FIVE. Upon receipt of the letter Board staff will incorporate it into the permit as Exhibit A.

- The Kings River Conservation District submitted a comment letter dated May 1, 2012 with conditions and Board staff will incorporate it into the permit as special condition FORTY-SIX and Exhibit B.

7.0 – CEQA ANALYSIS

Board staff has prepared the following CEQA findings:

The Board, as a responsible agency under CEQA, has reviewed Initial Study/Mitigated Negative Declaration (IS/MND) (SCH Number: 2009091121, December 2009) for the Kings River Overflow Bridge Replacement Project prepared by the lead agency, the Caltrans. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at <http://www.cvpfb.ca.gov/meetings/2012/08-24-2012.cfm> under a link for this agenda item. These documents are also available for review in hard copy at the Board and the Caltrans offices.

Caltrans has determined that the project would not have a significant effect on the environment on December 31, 2009, and subsequently filed a Notice of Determination on January 13, 2010 with the State Clearinghouse. Board staff finds that although the proposed project could have a potentially significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. The project proponent has incorporated mandatory mitigation measures into the project plans to avoid identified impacts or to mitigate such impacts to a point where no significant impacts will occur. These mitigation measures are included in the project proponent's IS/MND and address impacts to biological resources. The description of the mitigation measures are further described in the adopted IS/MND.

8.0 – SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on the facilities of the State Plan of Flood Control, and consistency of the proposed project with the Central Valley Flood Protection Plan as adopted by Board Resolution 2012-25 on June 29, 2012:

The proposed project has no adverse effect on facilities of the State Plan of Flood Control and is consistent with the Central Valley Flood Protection Plan.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

Changes in hydrology, climate and development within the applicable watershed may affect the flows within the Kings River Overflow channel over time.

9.0 – STAFF RECOMMENDATION

Staff recommends that the Board adopt the CEQA findings, approve the permit conditioned upon receipt of the anticipated U.S. Army Corps of Engineers “no comment” letter, and direct the Executive Officer to take the necessary actions to execute the permit and to file a Notice of Determination with the State Clearinghouse.

10.0 – LIST OF ATTACHMENTS

- A. Location Maps and Photos
- B. Plan, Profile and Foundation Plans
- C. Kings River Overflow Channel Hydraulic Information
- D. Draft Permit No. 18761

Design Review:	Jon P. Tice, Jr., PE
Environmental Review:	James Herota / Andrea Mauro
Document Review:	David R. Williams, PE – Senior Engineer Eric Butler, PE – Supervising Engineer Len Marino, PE – Principal Engineer

Figure 1
Project Vicinity Map
Kings River Overflow Bridge
06-Fre-180-PM 77.1-77.2
EA-06-0H1700

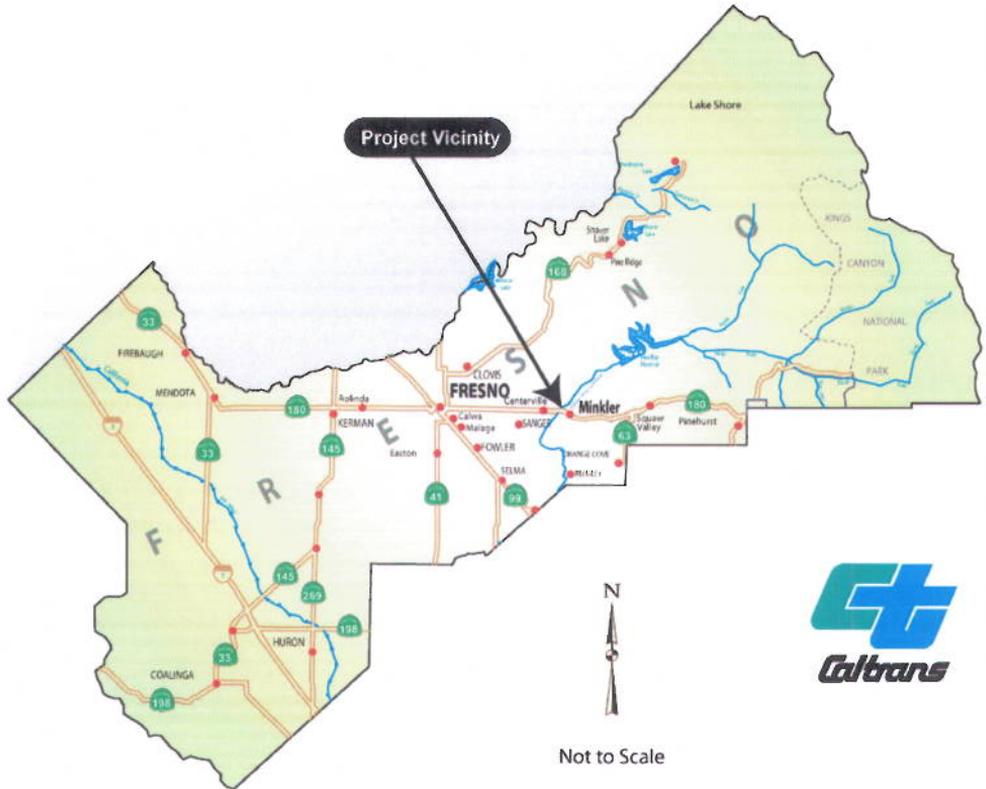
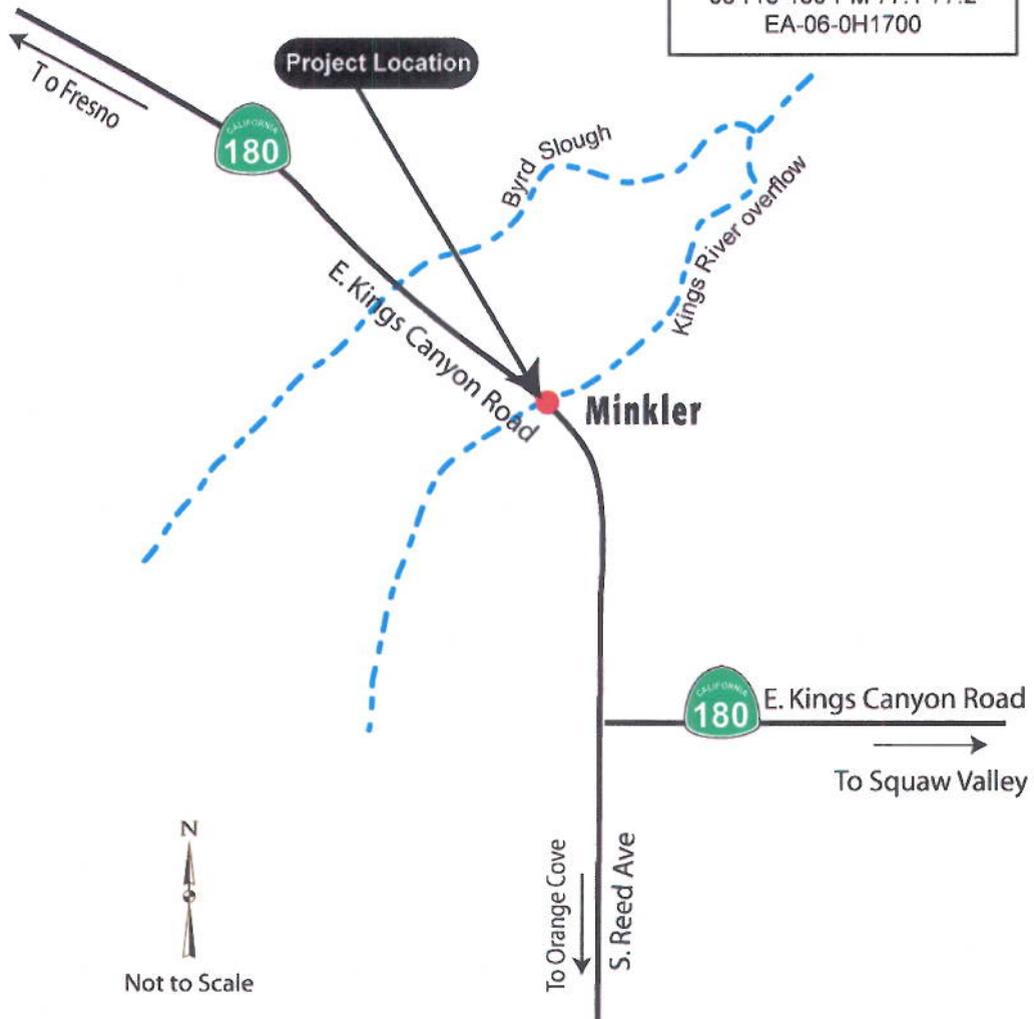


Figure 2
Project Location Map

Kings River Overflow Bridge
06-Fre-180-PM 77.1-77.2
EA-06-0H1700



Copyright 2003 Caltrans Department of Transportation

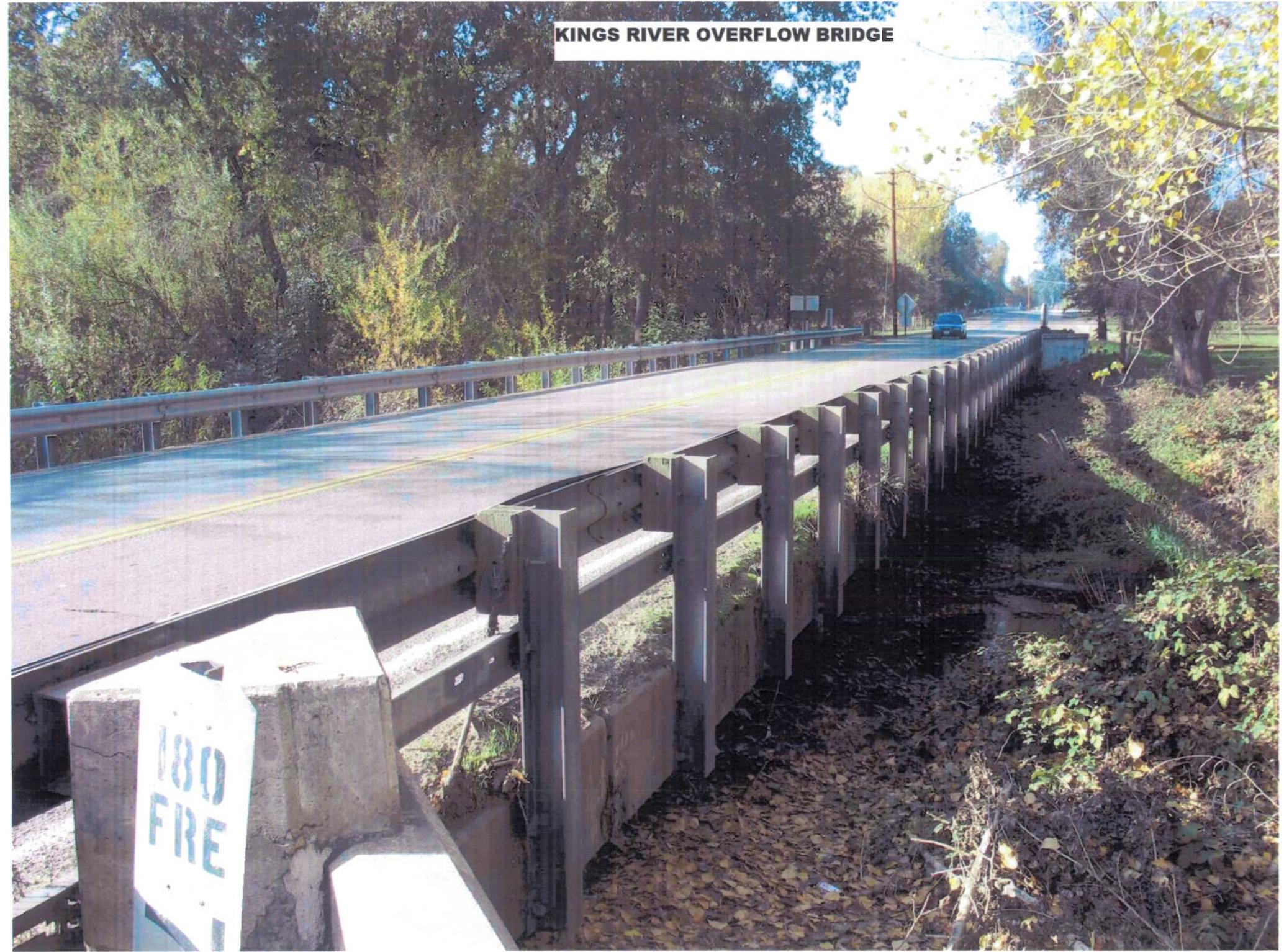
KINGS RIVER OVERFLOW BRIDGE



North, no scale



KINGS RIVER OVERFLOW BRIDGE



KINGS RIVER OVERFLOW BRIDGE



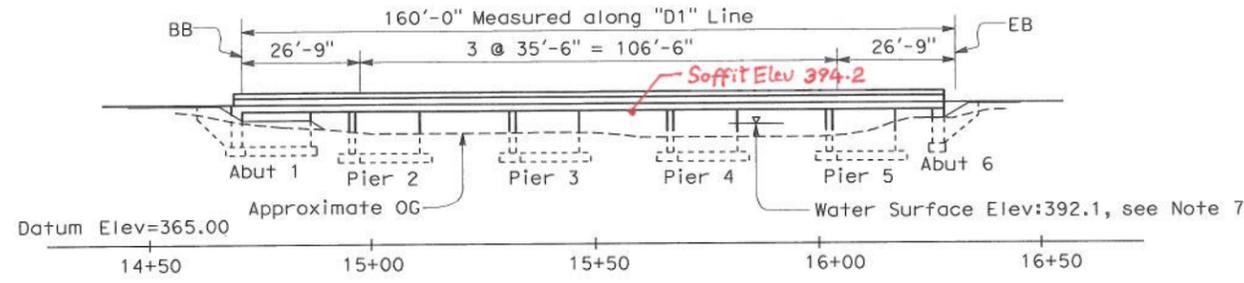


KINGS RIVER OVERFLOW BRIDGE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	FRE	180	77.2		
Prem P. Rimal REGISTERED CIVIL ENGINEER			DATE	04/01/2012 PLANS APPROVAL DATE	
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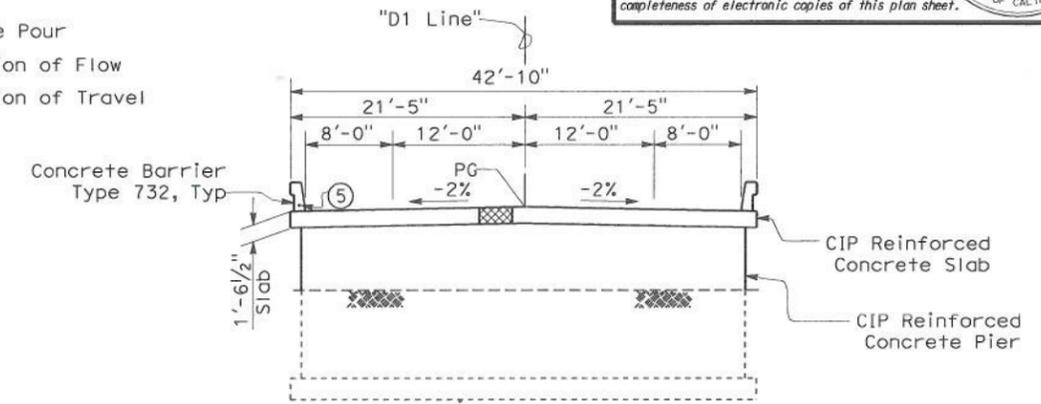
PROFILE GRADE
No Scale



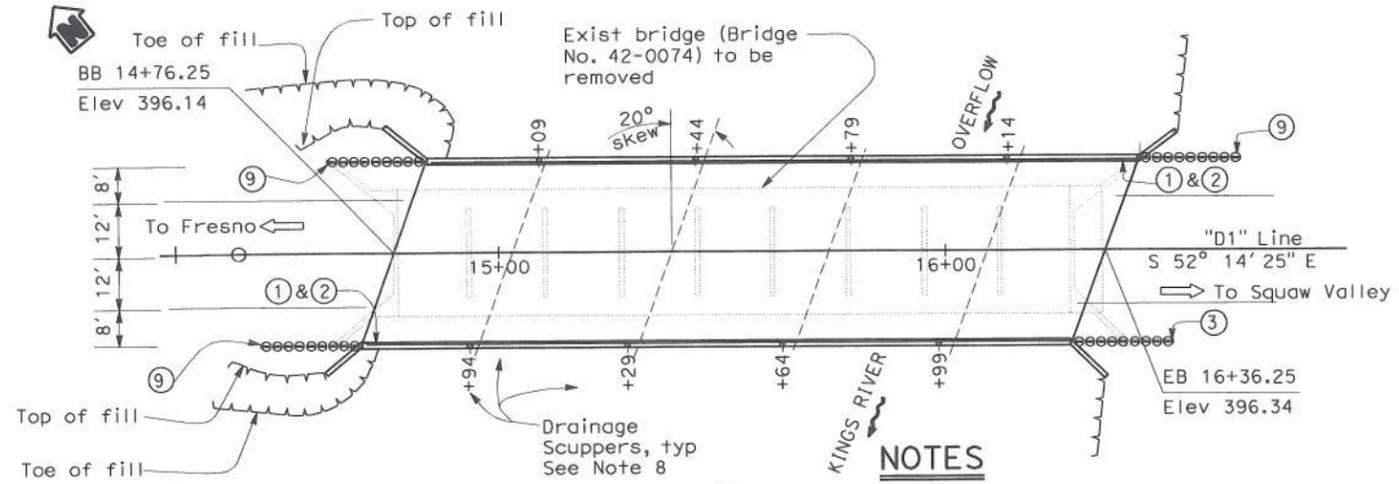
ELEVATION
1" = 20'

LEGEND

- New Structure
- - - Existing Structure
- ▨ Bridge Removal
- ▩ Closure Pour
- Direction of Flow
- ⇨ Direction of Travel

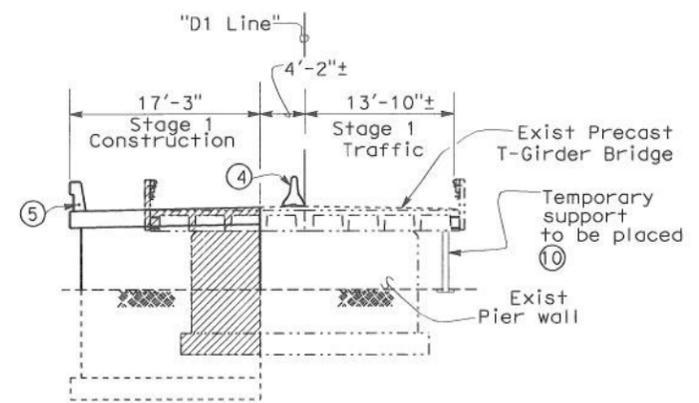


TYPICAL SECTION
1/8" = 1'

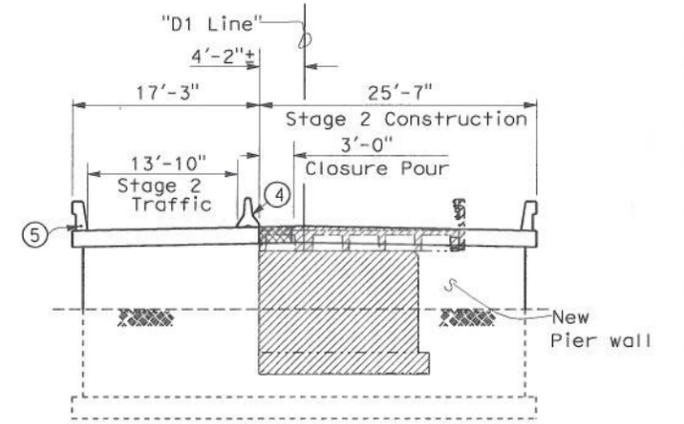


NOTES

- ① Paint "Br. No. 42-0437"
- ② Paint "KINGS RIVER OVERFLOW BRIDGE"
- ③ Crash Cushion, See "ROAD PLANS"
- ④ Temporary Railing (Type K) anchored to bridge deck, see "ROAD PLANS"
- ⑤ 2" Dia Electrical Conduit
- ⑥ For "GENERAL NOTES", and "FOOTING DATA TABLE", see "DECK CONTOURS" sheet.
- ⑦ For "HYDROLOGIC SUMMARY", see "FOUNDATION PLAN" sheet.
- ⑧ For Scuppers, see "SLAB REINFORCEMENT DETAILS" sheet.
- ⑨ Alternative Flared Terminal system, see "ROAD PLANS"
- ⑩ For Temporary Support & Design Loads, see "MISCELLANEOUS DETAILS" sheet.



STAGE 1 CONSTRUCTION
1/8" = 1'



STAGE 2 CONSTRUCTION
1/8" = 1'

INDEX TO PLANS

Sheet No.	Title
1	GENERAL PLAN
2	DECK CONTOURS
3	FOUNDATION PLAN
4	ABUTMENT DETAILS NO. 1
5	MISCELLANEOUS DETAILS
6	PIER LAYOUT & DETAILS
7	TYPICAL SECTION & DECK REINFORCEMENT
8	SLAB REINFORCEMENT DETAILS
9	LOG OF TEST BORINGS 1 OF 5
10	LOG OF TEST BORINGS 2 OF 5
11	LOG OF TEST BORINGS 3 OF 5
12	LOG OF TEST BORINGS 4 OF 5
13	AS-BUILT LOG OF TEST BORINGS

STANDARD PLANS DATED MAY 2006

A10A	ACRONYMS AND ABBREVIATIONS (SHEET 1 OF 2)
A10B	ACRONYMS AND ABBREVIATIONS (SHEET 2 OF 2)
A10C	SYMBOLS (SHEET 1 OF 2)
A10D	SYMBOLS (SHEET 2 OF 2)
A62C	LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL BRIDGE
B0-1	BRIDGE DETAILS
B0-3	BRIDGE DETAILS
B0-5	BRIDGE DETAILS
B0-13	BRIDGE DETAILS
B11-55	CONCRETE BARRIER TYPE 732
B14-3	COMMUNICATION AND SPRINKLER CONTROL CONDUITS (CONDUIT LESS THAN 4")

QUANTITIES

ITEM	QUANTITY	UNIT
TEMPORARY SUPPORT	LUMP SUM	
BRIDGE REMOVAL	LUMP SUM	
STRUCTURE EXCAVATION (BRIDGE)	252	CY
STRUCTURE EXCAVATION (TYPE A)	549	CY
STRUCTURE BACKFILL (BRIDGE)	144	CY
SEAL COURSE CONCRETE	68	CY
STRUCTURAL CONCRETE, BRIDGE FOOTING	95	CY
STRUCTURAL CONCRETE, BRIDGE	594	CY
BAR REINFORCING STEEL (BRIDGE)	122,728	LB
CONCRETE BARRIER (TYPE 732)	320	LF

NOTE:
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

PLAN
1" = 20'

DESIGN ENGINEER MIKE POPE	DESIGN BY: PREM RIMAL	CHECKED: IGOR CHERNIOGLO	LOAD & RESISTANCE FACTOR DESIGN BY: PREM RIMAL	LIVE LOADING: HL93 W/"LOW-BOY" PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 18	BRIDGE NO.: 42-0437	KINGS RIVER OVERFLOW BRIDGE (REPLACE) GENERAL PLAN
	DETAILS BY: PREM RIMAL	CHECKED: IGOR CHERNIOGLO	LAYOUT BY: MARY KOPSA	PLANS AND SPECS COMPARED BY: MARY KOPSA			POST MILE: 77.2	
	QUANTITIES BY: PREM RIMAL	CHECKED: RUPERT WILSON	SPECIFICATIONS BY: MARY KOPSA					

UNIT: 3603 PROJECT NUMBER & PHASE: 06 0000 0118 1 CONTRACT NO.: 06-0H1701

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
06	Fre	180	77.2		
P. P. Rimal REGISTERED CIVIL ENGINEER			04/01/2012	DATE	
PREM P. RIMAL No. C61422 Exp. 06/30/13 CIVIL STATE OF CALIFORNIA			PLANS APPROVAL DATE		
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.					

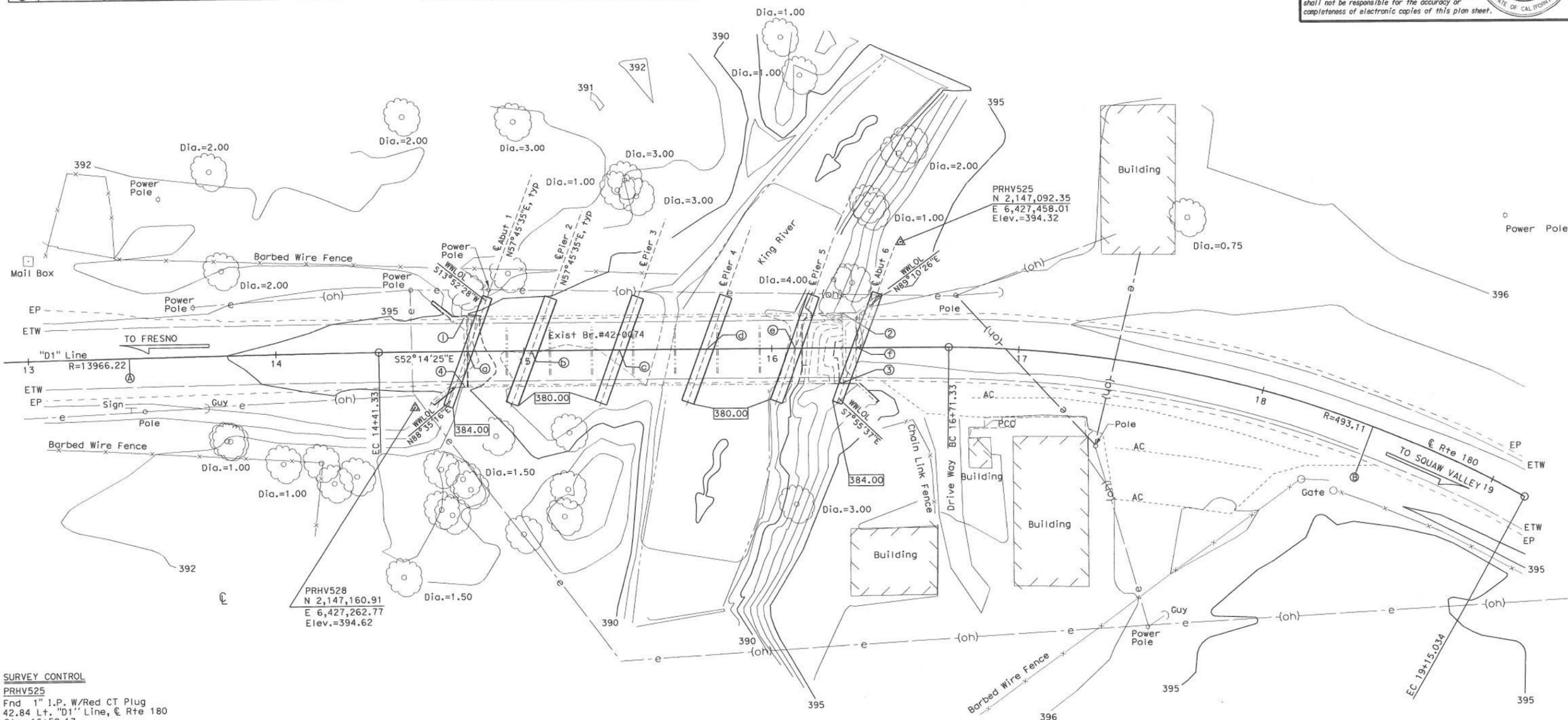
HYDROLOGIC SUMMARY
 DRAINAGE AREA: N/A (Controlled Flow Channel)

FREQUENCY (YEARS)	DESIGN FLOOD	BASE OVERTOPPING FLOOD	FLOOD
	N/A	N/A	N/A
DISCHARGE (CUBIC FEET PER SECOND)	1,250	N/A	N/A
WATER SURFACE ELEV. AT BRIDGE (FEET)	392.1	N/A	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 INVESTIGATIONS.

CURVE DATA

No.	R	Δ	T	L
Ⓐ	13966.00	1°48'38"	220.69	441.33
Ⓑ	493.00	28°18'58"	124.39	243.70



SURVEY CONTROL
 PRHV525
 Fnd 1" I.P. W/Red CT Plug
 42.84 Lt. "D1" Line, C Rte 180
 Sta. 16+52.17
 N 2,147,092.35
 E 6,427,458.01
 Elev.=394.32
 PRHV528
 Fnd 1" I.P. W/Red CT Plug
 22.51 Rt. "D1" Line, C Rte 180
 Sta. 14+55.84
 N 2,147,160.91
 E 6,427,262.77
 Elev.=394.62

Bridge Location #42-0074 (PN Points)

①	- 13.70 Lt. "D1" Line C Rte 180, Sta.14+76.22, EL.=395.29±
②	- 14.07 Lt. "D1" Line C Rte 180, Sta.16+29.26, EL.=395.28±
③	- 14.04 Rt. "D1" Line C Rte 180, Sta.16+29.37, EL.=395.36±
④	- 14.38 Rt. "D1" Line C Rte 180, Sta.14+76.35, EL.=395.23±

Note: Elec. line (OH) per District Utility Map

Abutments and Piers Stations

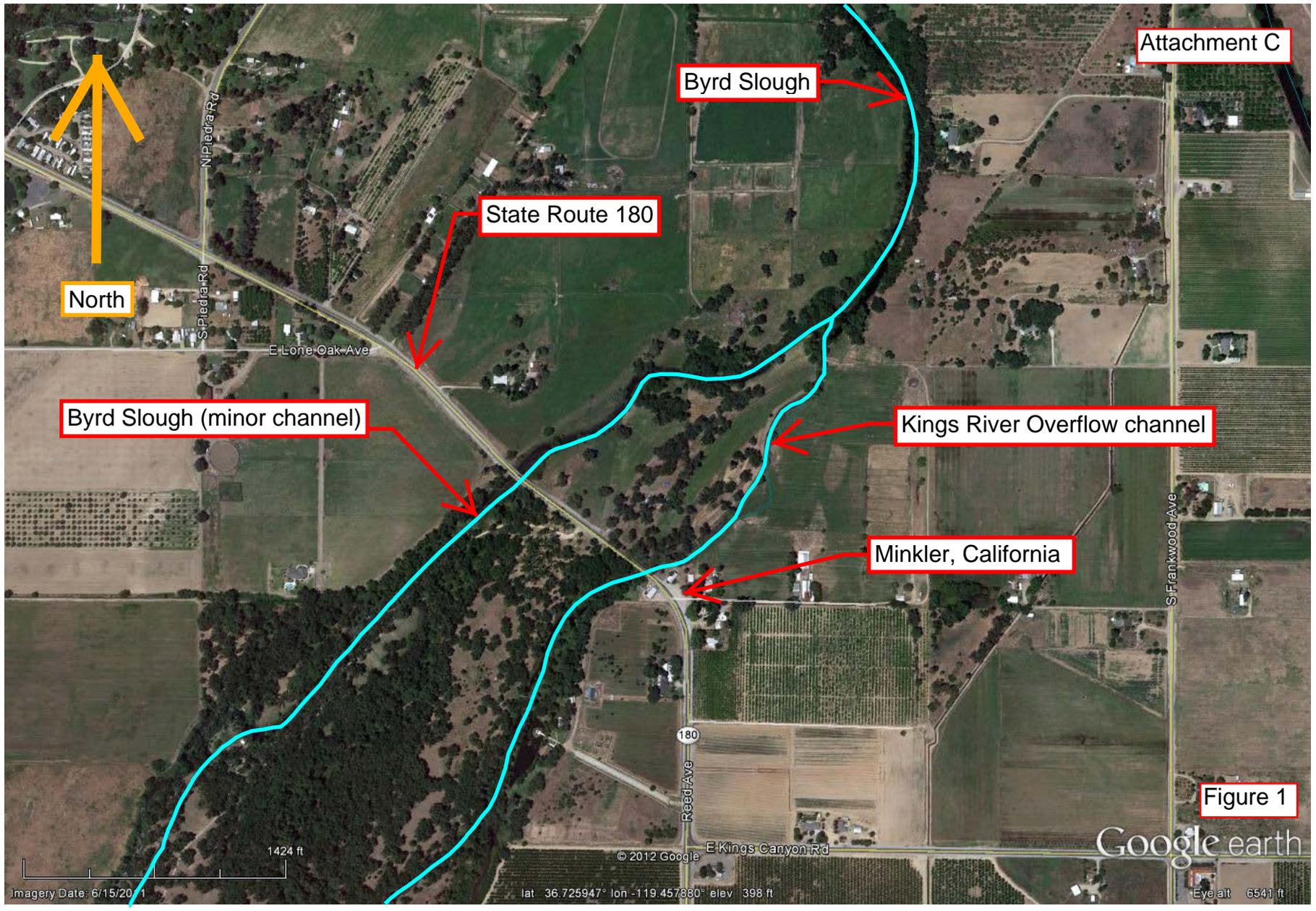
Ⓐ	- 14+77.58
Ⓑ	- 15+03.00
Ⓒ	- 15+38.50
Ⓓ	- 15+74.00
Ⓔ	- 16+09.50
Ⓕ	- 16+34.92

LEGEND:
 384.00 indicates bottom of footing elevation
 N/A = Not Applicable

NOTE:
 THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

PRELIMINARY INVESTIGATION SECTION				DESIGN BY PREM RIMAL	CHECKED IGOR CHERNIOGLO	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 18	BRIDGE NO. 42-0437 POST MILE 77.2	KINGS RIVER OVERFLOW BRIDGE (REPLACE)		
SCALE VERT. DATUM NGVD 29	PHOTOGRAMMETRY AS OF: X	CHECKED BY Don Ivy 11/2010	BY PREM RIMAL	CHECKED IGOR CHERNIOGLO	UNIT: 3646		PROJECT NUMBER & PHASE: 06 0000 0118-1 CONTRACT NO.: 06-0H1701		REVISION DATES		SHEET 3 OF 13
1"=20'	HORIZ. DATUM NAD 83 (91.35)	DRAFTED BY Sharon Zheng 11/2010	CHECKED BY T. Zoinikov 11/2010	CHECKED RUPERT WILSON	DISREGARD PRINTS BEARING EARLIER REVISION DATES		11/30/2014 3/27/2011 09/01/11				

STRUCTURES FOUNDATION PLAN SHEET (ENGLISH) (REV. 09-01-10) ORIGINAL SCALE IN INCHES FOR REDUCED PLANS FILE => 06-42-0437-b.fp.dgn



Byrd Slough

State Route 180

North

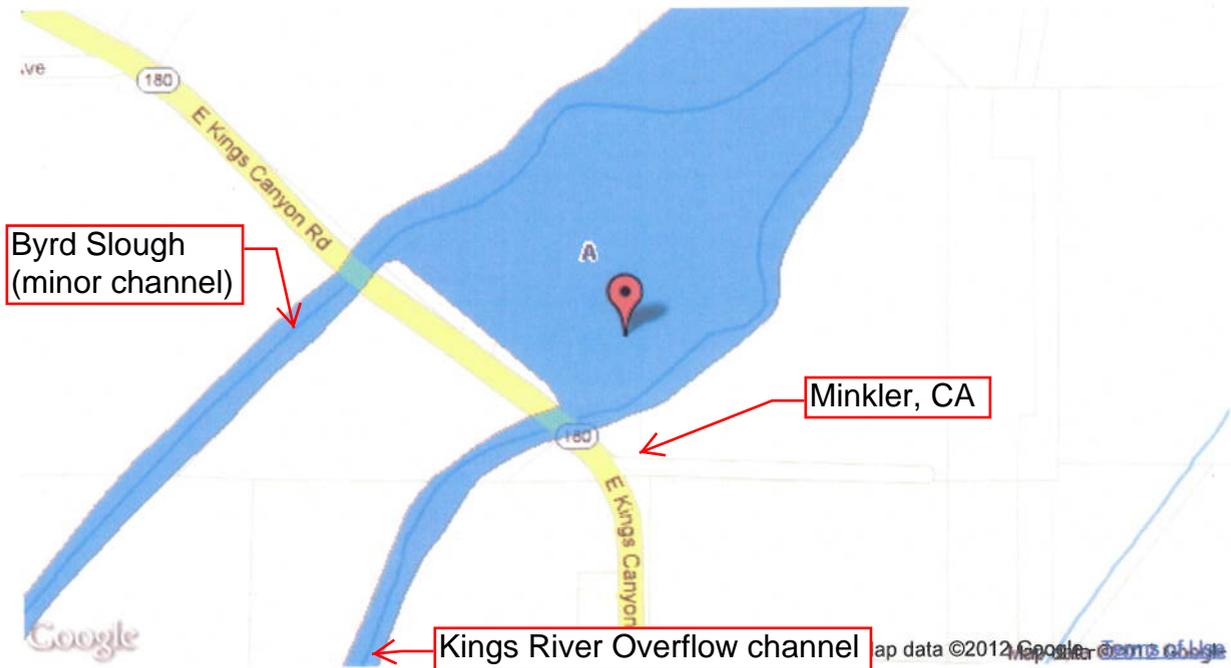
Byrd Slough (minor channel)

Kings River Overflow channel

Minkler, California

Figure 1

Floodplain Information



Floodplains are displayed using semi transparent colors. When viewing overlapping floodplains, the combination of multiple semi transparent colors will not match the legend colors. For accurate color representation, view floodplains individually.

Legend:

100-Year Floodplains

FEMA Effective

Disclaimer:

The BAM does not replace existing FEMA regulatory floodplains shown on Flood Insurance Rate Maps (FIRM). For more information on the FEMA regulatory floodplains, please contact FEMA directly. The BAM floodplains identify potential flood risks that may warrant further studies or analyses for land use decision making. The floodplains shown delineate areas with potential exposure to flooding for three different storm events: one with storm flows that have a 1% chance of being equaled or exceeded in any year (100-year), one with storm flows that have a 0.5% chance of being equaled or exceeded in any year (200-year), and one with storms flows that have a 0.2% chance of being equaled or exceeded in any year (500-year). These flows and resulting flooded area are based on the best available floodplain information and may not identify all areas subject to flooding.

The floodplain map is best viewed and printed in color

Figure 2

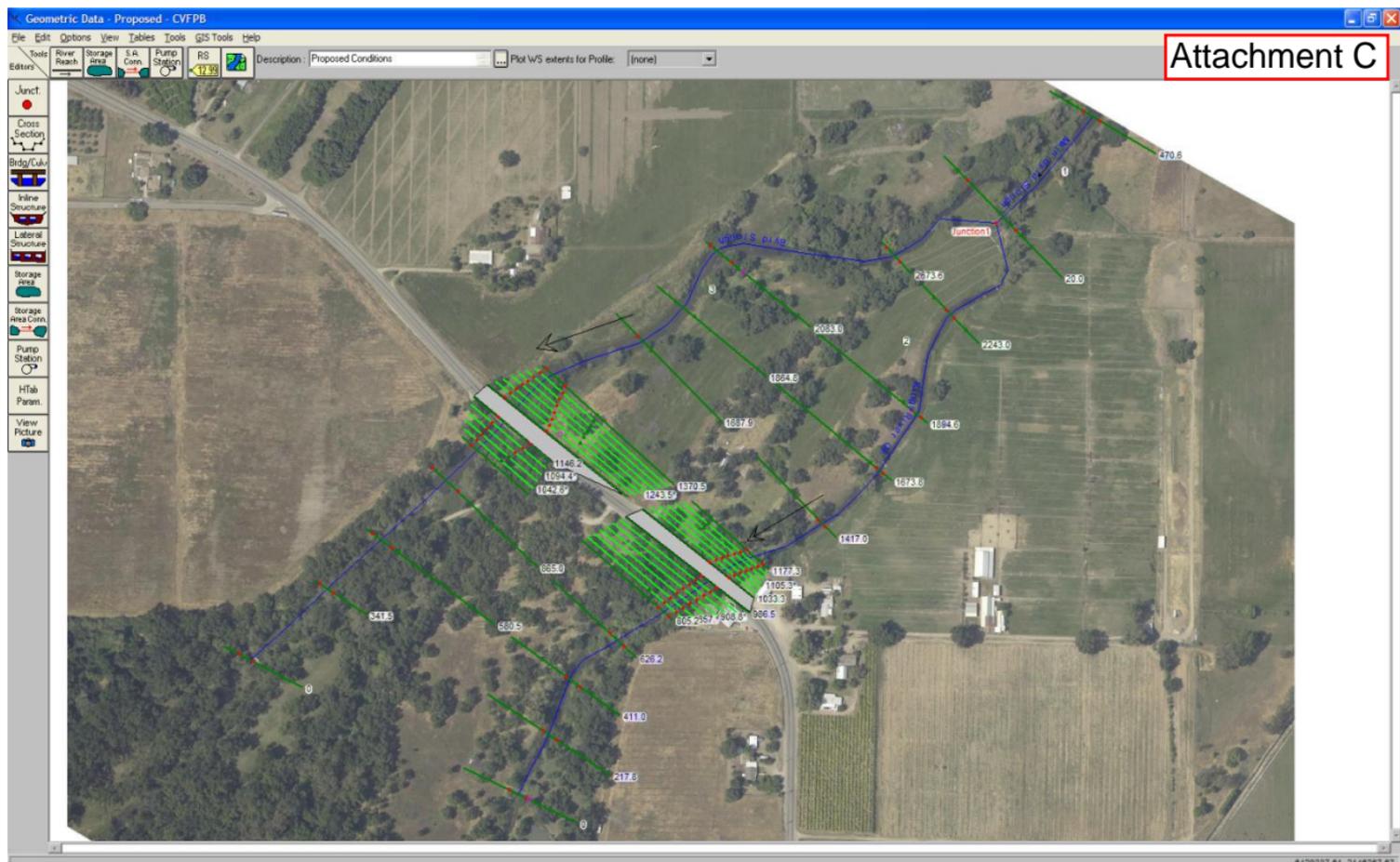
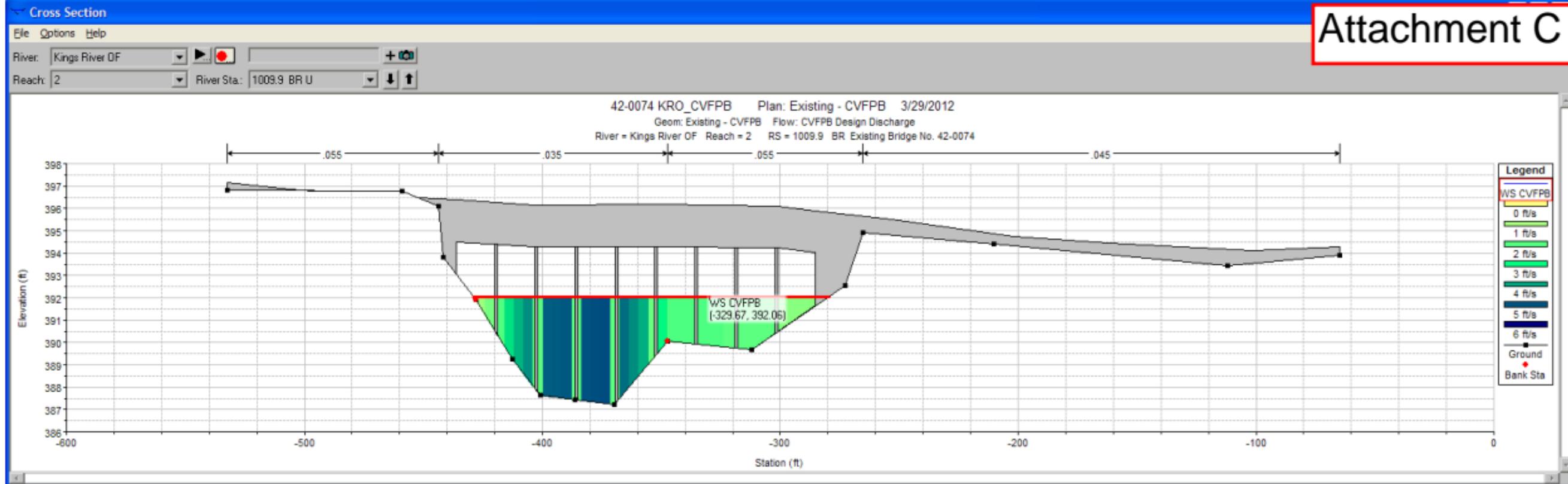
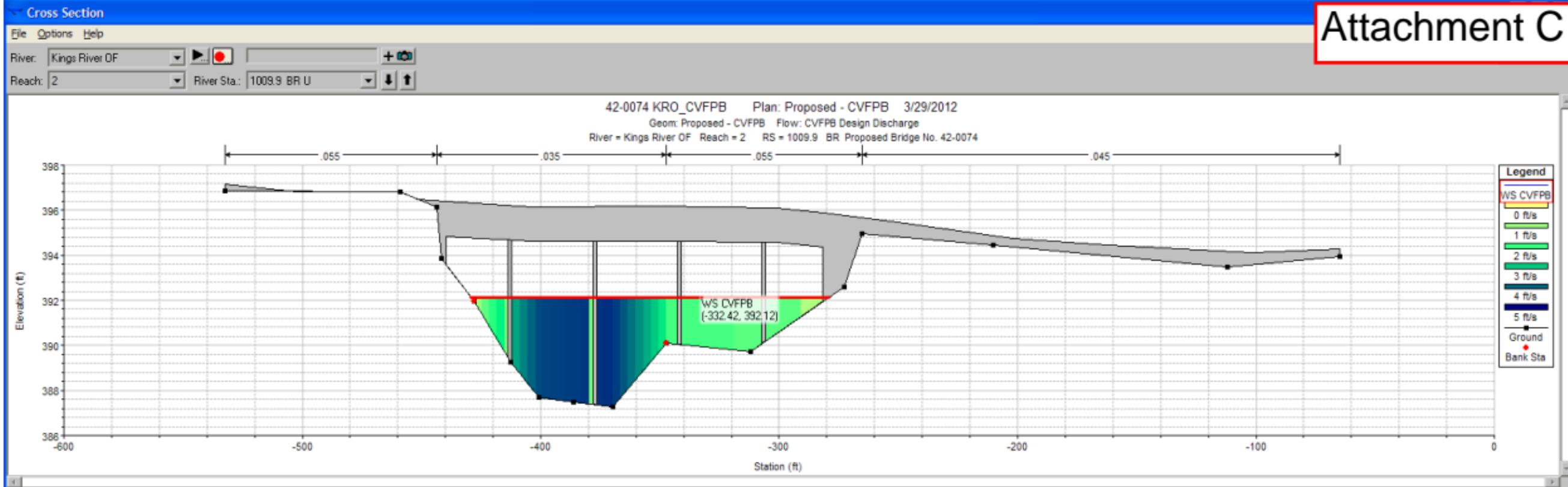


Figure 3: HEC-RAS Schematic Diagram of Entire Hydraulic Model
 (Aerial Image Source: Caltrans DHIPP)



**FIGURE 4A - HEC-RAS Cross-Section of Existing Bridge
Looking downstream (D/S) direction at U/S face of Kings River Overflow, Br. No. 42-0074**



**FIGURE 4B - HEC-RAS Cross-Section of Proposed Bridge
Looking D/S direction at U/S face of Kings River Overflow, Br. No. 42-0437**

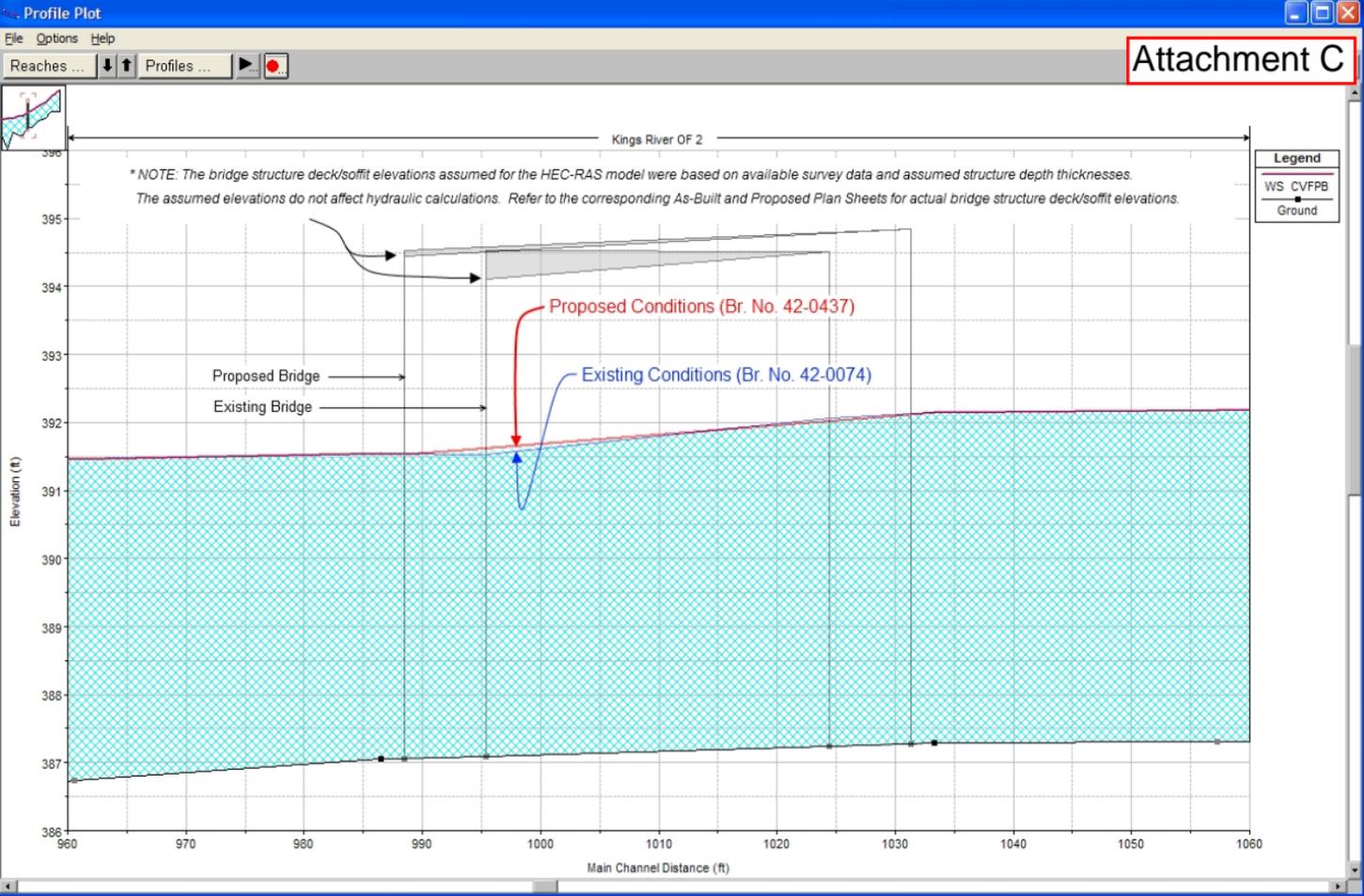


Figure 5: WSEL Profile Plot Comparison of Existing and Proposed Bridges

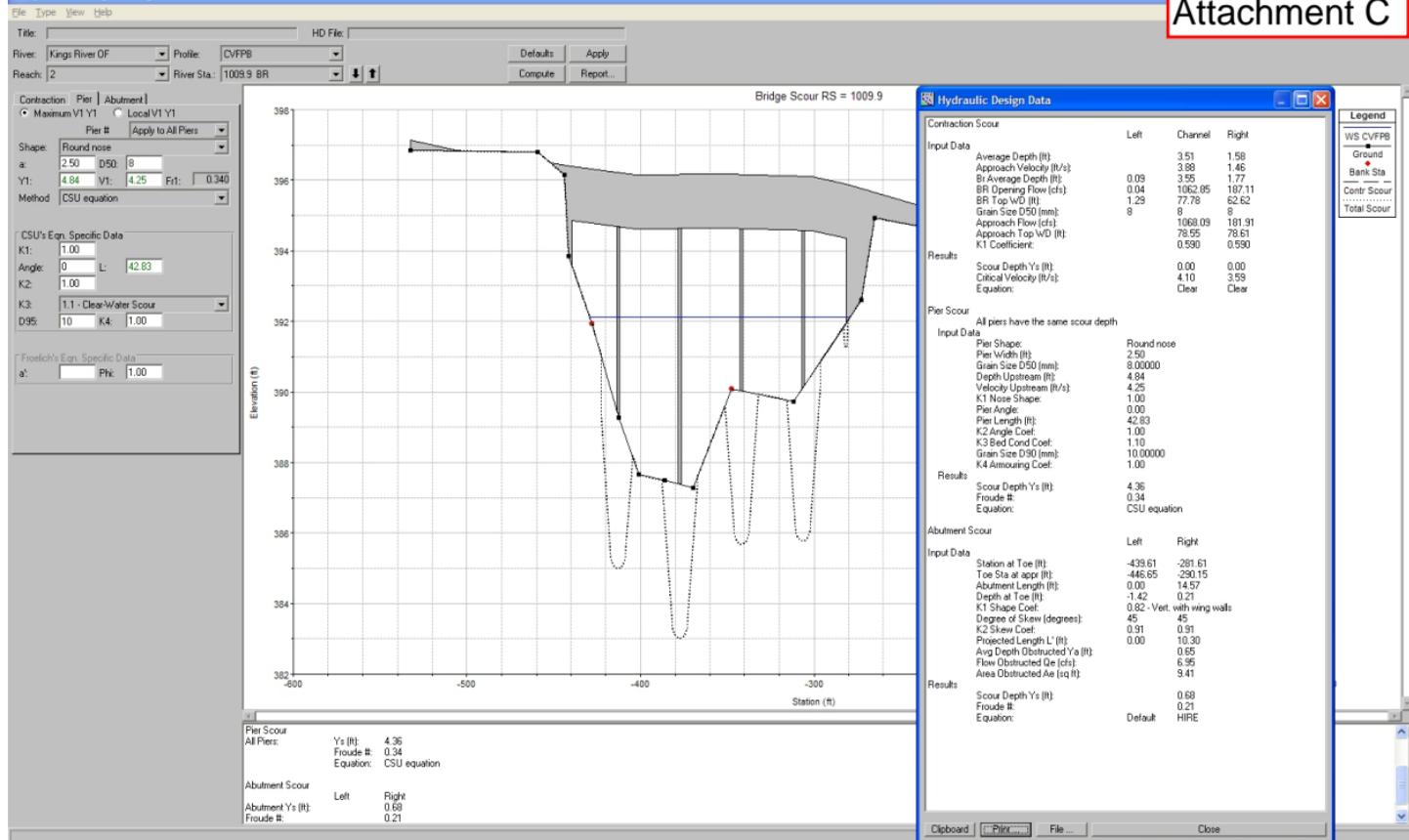


Figure 6: HEC-RAS Hydraulic Design - Estimated Kings River Overflow Bridge Scour
 (Scour Calculation Method: Hydraulic Engineering Circular No. 18 (HEC-18) Manual, "Evaluating Scour at Bridges" (4th Edition, March 2001).)

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY
THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18761 BD

This Permit is issued to:

CALTRANS
2015 East Shields Avenue
Suite 100
Fresno, California 93726

Removal of the State Route 180 (East Kings Canyon Road) bridge (No. 42-0074) over the Kings River Overflow canal and replacement with a wider, concrete slab bridge (No. 42-0437). The project is located near the town of Minkler on State Route 180 between post miles 77.1 and 77.2, in Fresno County. (Section 10, T14S, R23E, MDB&M, Kings River Conservation District, Byrd Slough, Fresno County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection

Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18761 BD

THIRTEEN: No work authorized by this permit shall be performed until the Department of Water Resources has received, reviewed, and approved in writing, a complete set of final submitted plans, drawings, and specifications for the project. The Central Valley Flood Protection Board shall have up to 30 days after receipt of plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period up to 15 days by written notification.

FOURTEEN: All addendums or other changes made to the submitted documents by the permittee after issuance of this permit are subject to submittal and review for approval by the Central Valley Flood Protection Board prior to incorporation into the permitted project. Upon review and approval of any new submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes. The Central Valley Flood Protection Board shall have up to 90 days after receipt of any documents, plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period by written notification.

FIFTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SIXTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood

Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SEVENTEEN: The Central Valley Flood Protection Board, Department of Water Resources, and Fresno County shall not be held liable for damages to the permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

EIGHTEEN: The mitigation measures approved by the CEQA lead agency and the permittee are found in its Mitigation and Monitoring Reporting Program (MMRP) adopted by the CEQA lead agency. The permittee shall implement all such mitigation measures.

NINETEEN: A temporary bench mark, set to a known datum, shall be placed at the project site prior to the beginning of construction and shall be maintained through the construction of the project.

TWENTY: No construction work of any kind shall be done during the flood season from November 1st to July 15th without prior approval of the Central Valley Flood Protection Board.

TWENTY-ONE: No excavation shall be made or remain in the channel section during the flood season from November 1st to July 15th.

TWENTY-TWO: Temporary staging, formwork, stockpiled material, equipment, and temporary buildings shall not remain in the floodway during the flood season from November 1st to July 15th.

TWENTY-THREE: Prior to commencement of excavation, the permittee shall create a photo record, including associated descriptions, of the channel conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer registered in the State of California and submitted to the Central Valley Flood Protection Board within 30 days of beginning the project.

TWENTY-FOUR: A civil engineer registered in the State of California representing the permittee shall provide periodic reports and records to the Department of Water Resources that are acceptable to the Central Valley Flood Protection Board which certifies that all work accomplished by contract to the permittee was thoroughly inspected and performed in accordance with submitted drawings, specifications, and permit conditions.

TWENTY-FIVE: Fill material shall be placed only within the area indicated on the approved plans.

TWENTY-SIX: Fill material placed within 2 feet of a structure shall be compacted with appropriate hand-operated compaction equipment.

TWENTY-SEVEN: The proposed bridge site general project work area shall be restored to at least the condition that existed prior to commencement of work.

TWENTY-EIGHT: The soffit of the new bridge shall be a minimum of 2 feet above the flood plane

elevation of 392 feet, NGVD29.

TWENTY-NINE: The method and schedule of removing the existing SR 180 Kings River Overflow bridge shall be approved by the Central Valley Flood Protection Board prior to start of work.

THIRTY: Piers, bents, and abutments being dismantled shall be removed to at least 1 foot below the natural ground line and at least 3 feet below the bottom of the low-water channel.

THIRTY-ONE: Drainage from the new bridge and/or highway shall not be discharged onto the streambanks.

THIRTY-TWO: If erosion occurs adjacent to the permitted encroachment(s), the permittee shall repair the eroded areas and place adequate revetment on the affected areas to prevent further erosion.

THIRTY-THREE: Trees, brush, sediment, and other debris shall be kept cleared from the bridge site and disposed of outside the floodway to maintain the design flow capacity and flowage area.

THIRTY-FOUR: If the bridge is damaged to the extent that it may impair the channel or floodway capacity, it shall be repaired or removed prior to the next flood season.

THIRTY-FIVE: All debris generated by this project shall be disposed of outside the Kings River Overflow channel and floodplain area.

THIRTY-SIX: The permittee shall assume all responsibility for the protection, relocation, or removal of the permitted project works if required by the Central Valley Flood Protection Board.

THIRTY-SEVEN: In the event that bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

THIRTY-EIGHT: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Department of Water Resources, or any other agency responsible for maintenance.

THIRTY-NINE: Any vegetative material, living or dead, that interferes with the successful execution, functioning, maintenance, or operation of the adopted plan of flood control must be removed by the permittee at permittee's expense upon request by the Central Valley Flood Protection Board, Department of Water Resources, or local maintaining agency. If the permittee does not remove such vegetation or trees upon request, the Central Valley Flood Protection Board reserves the right to remove such at the permittee's expense.

FORTY: The permitted encroachment(s) shall not interfere with operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at

the permittee's expense.

FORTY-ONE: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

FORTY-TWO: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

FORTY-THREE: Upon completion of the project, the permittee shall submit copies of compaction test results, all permit related inspection reports, construction documentation and a complete set of as-constructed drawings to: Department of Water Resources, Flood Project Inspection Section, P.O. Box 219000, Sacramento, California 95821-9000.

FORTY-FOUR: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board a certification report, stamped and signed by a professional engineer registered in the State of California, certifying the work was performed and inspected in accordance with the Central Valley Flood Protection Board permit conditions and submitted drawings and specifications.

FORTY-FIVE: The letter from the Department of the Army (U.S. Army Corps of Engineer, Sacramento District) dated August, XX, 2012 is attached to this permit as Exhibit A in reference to this project.

FORTY-SIX: The permittee shall comply with all conditions set forth in the letter from Kings River Conservation District dated May 1, 2012, which is attached to this permit as Exhibit B and is incorporated by reference.

**Placeholder for
Exhibit A – USACE
Comment Letter for
Permit No. 18761**



May 1, 2012

Mr. Ashley Cousins
 Central Valley Flood Protection Board
 P.O. Box 942836
 Sacramento, CA 94236

4886 East Jensen Avenue
 Fresno, California 93725

Tel: 559-237-5567
 Fax: 559-237-5560

www.krcd.org

Re: Kings River Designated Floodway - Encroachment Permit Application
KRC D No. 800.05-256 - California Department of Transportation
Kings River Overflow Bridge Replacement

Dear Mr. Cousins:

The Kings River Conservation District is in receipt of application and accompanying drawings submitted by the California Department of Transportation to replace a bridge on the existing Highway 180 crossing of Byrd Slough. The project is located on the Byrd Slough Floodway (adopted June 25, 1971), C.M. 1.7 in Section 10, T.14S., R.23E., M.D.B. & M. of Fresno County.

The Kings River Conservation District has no objection to the approval of this Application subject to the following conditions:

1. The Kings River Conservation District and the Kings River Water Association shall not be held liable for damages to the permitted encroachment resulting from releases of water, flood fight activities, operation, maintenance, inspection, or emergency repair.
2. The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend and hold harmless the Kings River Conservation District and Kings River Water Association from any liability or claims of liability associated therewith.
3. The permittee shall be responsible for the repair of any damages to the Kings River Designated Floodway due to construction, operation, and/or maintenance of the herein permitted project.
4. The permittee shall be responsible for the removal and clearance of all debris which lodges or collects against any portion of the bridge structure during periods of high water. Cleared trees and brush shall be properly disposed outside the limits of the designated floodway.
5. In the event erosion of the banks occurs at the project site, the permittee shall repair the eroded areas with adequate protection to prevent future erosion.
6. The permittee shall submit a water diversion plan to the Central Valley Flood Protection Board for any temporary staging and form work allowed to remain in the floodway during the flood season (November 15th through July 20th). The

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Mr. Ashley Cousins
May 1, 2012
Page 2

plan shall contain all elements required by the Board including: (a) proposed methods to monitor current and predicted flood flow conditions; (b) proposed actions for all flow conditions up to 100-year conditions; and (c) analysis of impacts for failure to take planned action of for the occurrence of unanticipated conditions. The permittee is solely responsible for monitoring existing and predicted flow conditions and taking appropriate actions throughout construction. A copy of the plan shall be provided to the Kings River Conservation District at least sixty (60) days prior to the commencement of work.

7. The permittee shall provide to the Kings River Conservation District a design report, design memorandum, or other written documentation of the engineering analysis used to determine the hydraulic design flow rate of this reach of the floodway.
8. In the event that ownership, operation, or maintenance responsibilities for the project facilities are transferred or delegated to the County of Fresno or any other entity, the California Department of Transportation shall provide the Kings River Conservation District with evidence acknowledging acceptance of all permit conditions.
9. The permittee shall contact the Kings River Conservation District by telephone, (559) 237-5567, at least ten (10) days prior to the commencement of work.

The applicant has been directed to submit four (4) copies of the application with the Kings River Conservation District's endorsement and accompanying data to the Central Valley Flood Protection Board.

If you have any questions, please contact Keith Seligman, Manager of Flood Operations & Maintenance, at (559) 237-5567 extension 120 (office phone). Please provide the Kings River Conservation District with a copy of any pertinent correspondence and Board action concerning this application.

Sincerely,



Steven Stadler, P.E.,
Deputy General Manager of
Flood Control and Environmental Resources/Chief Engineer

SPS/sjs

L12-0077
File: 800.05.256