

**Meeting of the Central Valley Flood Protection Board
November 21, 2014**

Staff Report

**California Department of Transportation
Scour Mitigation at Dry Creek Bridge, State Route 65, Yuba County**

1.0 – REQUESTED ITEM

Consider approval to allow the applicant to install scour remediation measures including compacted backfill and rock slope protection at the bridge footings at the State Route 65 crossing over Dry Creek (Attachment A) by Draft Permit No. 18964 (Attachment B).

2.0 – APPLICANT

California Department of Transportation (Caltrans)

3.0 – PROJECT LOCATION

The project is located at the Dry Creek Bridge (Br No. 16-0002) on State Route 65 about 0.6 miles north of the City of Wheatland (population approximately 3,500 in 2012) in southern Yuba County (Attachment A). Dry Creek, a tributary of the Bear River, flows in a southwesterly direction across rural agricultural lands (Attachment B).

4.0 – PROJECT DESCRIPTION

Hydraulic modeling and field observations indicate that the existing bridge is subject to hydraulic scour, resulting in the likelihood of further undermining of the spread footings. Caltrans is proposing to mitigate the potential for scour and thereby halt undermining of bridge footings by installing rock slope protection placed over filter fabric under the bridge. Caltrans will also repair concrete spalling in the columns and footings.

5.0 – AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 – 8710

California Code of Regulations Title 23 (Title 23)

- § 6, Need for a Permit
- § 108, Existing Encroachments
- § 112, Streams Regulated and Nonpermissible Work Periods
- § 116, Borrow and Excavation Activities – Land and Channel
- § 120, Levees
- § 121, Erosion Control
- § 128, Bridges

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with the project are as follows:

- The U.S. Army Corps of Engineers (USACE) Sacramento District comment letter has not been received for this application. Staff anticipates receipt of a letter prior to the November 21, 2014 Board meeting indicating that the USACE District Engineer has no objection to the project, subject to conditions. Upon receipt of the letter, staff will review to ensure conformity with the permit language and incorporate it into the permit as Exhibit A.
- Reclamation District 2103 (RD 2103) endorsed the project with no conditions on April 18, 2014 (Attachment C).

7.0 – PROJECT ANALYSIS

7.1 – Project Summary

The rock slope protection (RSP) shall be installed to extend seven (7) and five (5) feet respectively from the upstream and downstream edges of the bridge deck. The RSP will include a 1.8 feet thick embedded toe. The upstream and downstream RSP edges shall be embedded to a minimum depth of 4.5 feet. The upstream edge will include a 3-foot wide vertical key with compacted backfill placed to original grade. Key excavation shall be a minimum of five (5) feet from the spread footings, and the finished grade will be transitioned from the original ground upstream of the bridge to the RSP mat using compacted backfill.

7.2 – Hydraulic Summary

The RSP will not significantly modify channel geometry; the only change being an embedded layer of RSP at the top of the footings.

Dry Creek's channel design capacity at the project site is 9,000 cubic feet per second (cfs) based on the 1957 profile. Manning's "n" roughness coefficients were estimated to range from 0.028 to 0.039 in the main channel, and from 0.030 to 0.033 in the adjoining floodplain. The floodplain is covered with open, grassy areas, walnut orchards and flat agricultural fields. Manning's "n" was estimated up to 0.047 along the low-flow channel banks due to trees and brush.

The after-project water surface elevation (WSE) is expected to decrease by approximately 0.03 and 0.05 feet just upstream and downstream of the bridge, respectively (Attachment E). Channel velocities at the bridge site are modeled to decrease from about 5 to 4.5 feet-per-second (fps).

Based on the submitted hydraulic analysis, staff has determined that the proposed project is expected to result in no significant adverse hydraulic impacts to the Dry Creek channel or floodway.

7.3 – Geotechnical Summary

The addition of the RSP scour remediation will render any potential local pier or contraction scour negligible. A comparison of historical records indicates that future degradation is expected to be minimal at the site.

Board staff has reviewed all submitted geotechnical information and has determined that the proposed project is expected to result in no adverse geotechnical impacts to the Dry Creek channel or floodway.

All fill, excavation, RSP, and temporary structures will be completed in compliance with Draft Permit No. 18964 and all Title 23 standards.

8.0 – CEQA ANALYSIS

Board staff has prepared the following California Environmental Quality Act (CEQA) determination:

The Board, as a responsible agency under CEQA, has reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) (SCH Number: 2012072054, November 2012), and Mitigation Measures for the Bridge Scour Mitigation and Rehabilitation Project prepared by the lead agency, Caltrans. These documents,

including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at <http://www.cvfpb.ca.gov/meetings/2014/11-21-2014.cfm> under a link for this agenda item. These documents are also available for review in hard copy at Board and Caltrans offices.

On November 30, 2012 Caltrans determined that the project would have no significant effect on the environment, and filed a Notice of Determination on December 6, 2012 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 Initial Study/Mitigated Negative Declaration (IS/MND) and address impacts to biological resources, hydrology and water quality. The description of the mitigation measures are further described in the adopted IS/MND.

The documents and other materials which constitute the record of the Central Valley Flood Board's proceedings in this matter are in the custody of Leslie Gallagher, Acting Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Ave., Rm. 151, Sacramento, California 95821.

9.0 – CALIFORNIA WATER CODE § 8610.5 CONSIDERATIONS

- 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 has considered all the evidence presented in this matter, including the applications for Permit No. 18964, all supporting hydraulic, geotechnical, and other technical documentation provided by Caltrans, as well as all evidence submitted up through the hearing on the matter.

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

In making its findings the Board has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts Caltrans used the HEC-RAS one-dimensional flow models. These models are

considered by many experts as the best available and applicable scientific tools for the purpose of modeling river hydraulics for this region.

- 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:

This project is expected to result in no adverse impacts on facilities of the State Plan of Flood Control, and is consistent with the adopted 2012 Central Valley Flood Protection Plan and current Title 23 standards because the proposed project is predicted to result in no significant increase in water surface elevation or substantial increase in channel velocities, and it performs scour mitigation by placing rock slope protection.

- Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:
Caltrans has determined that they do not anticipate any future projects that would impact the project based on research of projects in the area.

10.0 – STAFF RECOMMENDATION

Board staff recommends that the Board:

- adopt the CEQA findings;
- approve Draft Encroachment Permit No. 18964 (in substantially the form provided); and
- direct the Executive Officer to take necessary actions to execute the permit and file a Notice of Determination pursuant to CEQA with the State Clearinghouse.

11.0 – LIST OF ATTACHMENTS

A – Project Vicinity and Location Maps

B – Draft Permit No. 18964

Exhibit A: USACE Comment Letter (expected prior to 11-21-14 meeting)

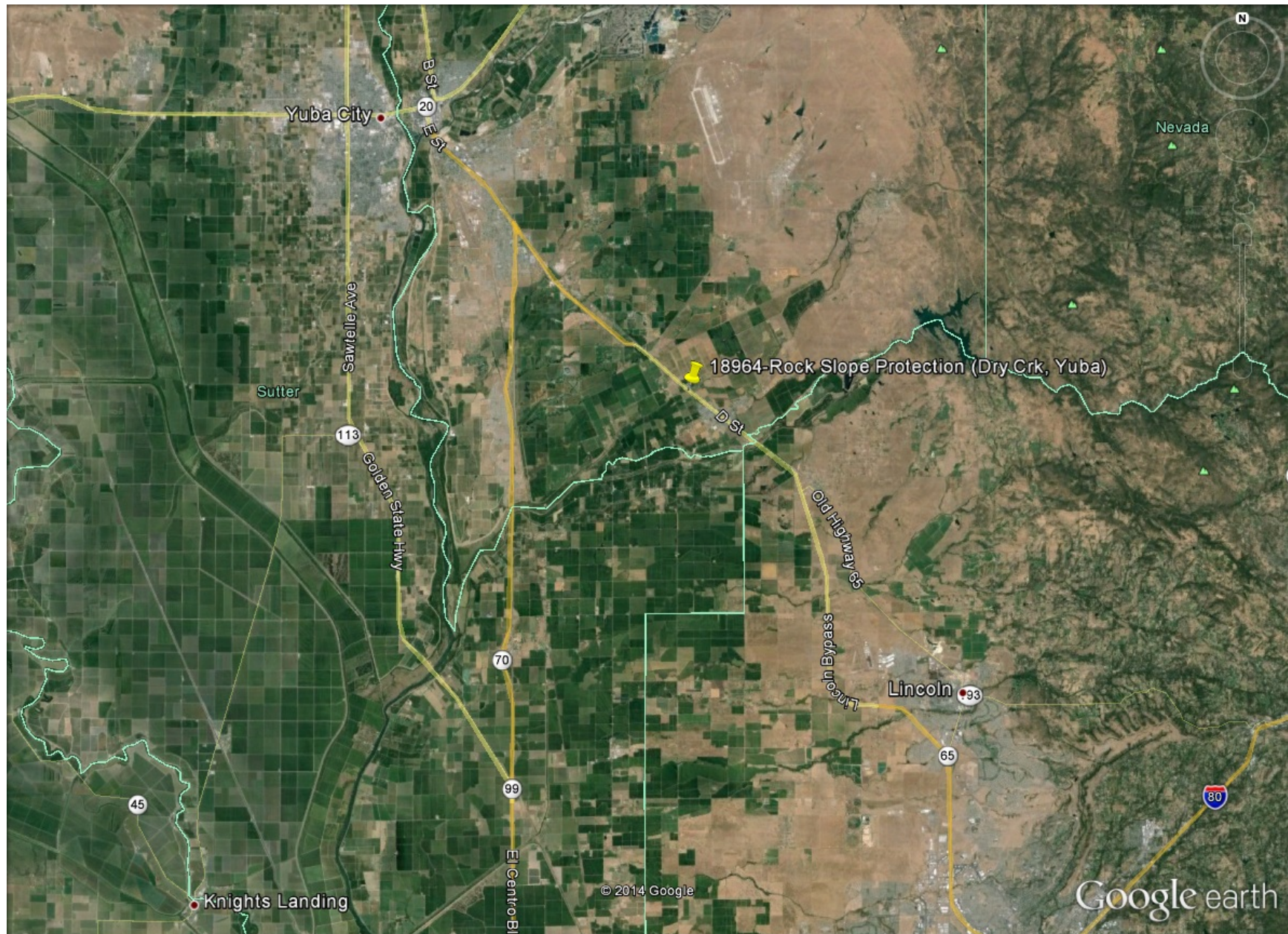
C – RD 2103 Endorsement

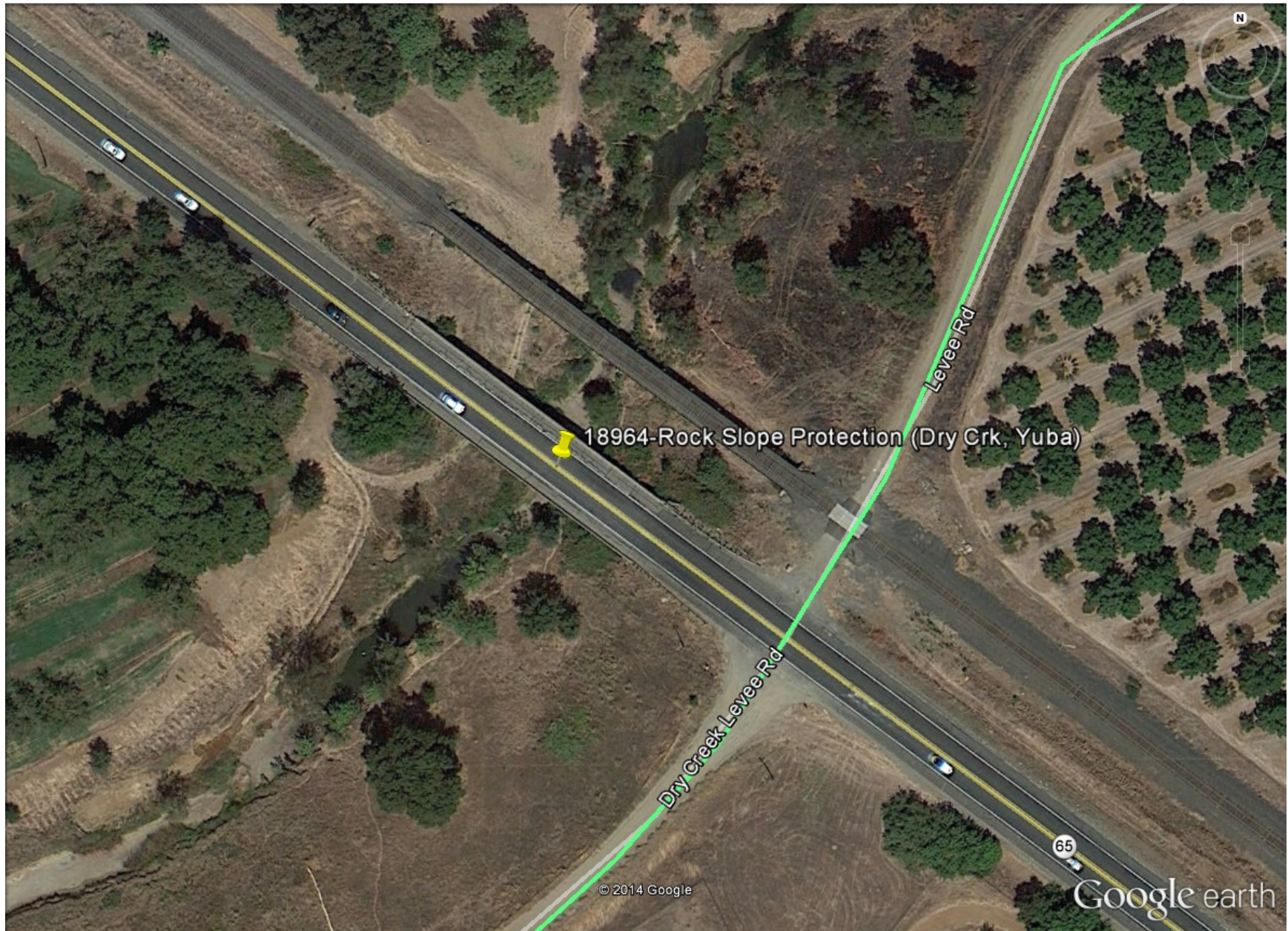
D – General and Foundation Plans

E – Hydraulic Profile Information

Prepared by:	Sungho Lee, Engineer, Water Resources, Planning Branch
Document Review:	Nancy C. Moricz, Senior Engineer, Planning Branch Andrea Buckley, Senior Environmental Scientist Eric Butler, Supervising Engineer, Planning Branch Len Marino, Chief Engineer
Legal Review	Leslie Gallagher, Chief Counsel

ATTACHMENT A – VICINITY AND LOCATION MAPS





DRAFT

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

PERMIT NO. 18964 BD

This Permit is issued to:

California Department of Transportation (Caltrans)
703 B Street
Marysville, California 95901

To install scour remediation mitigation under the bridge and footings including compacted backfill and Rock Slope Protection (RSP) placed over filter fabric. Spalling in the columns and footings will also be repaired.

The project is located at the Dry Creek Bridge (Caltrans Br No. 16-0002, Post Mile 2.21) on State Route 65, just north of the City of Wheatland (Section 32, T14N, R5E, MDB&M, Reclamation District 2103, Dry Creek, Yuba 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. 18964 BD

THIRTEEN: All work completed under this permit, as directed by the general and special conditions herein, shall be accomplished to ensure that the work is not injurious to adopted plans of flood control, regulated streams, and designated floodways under Board jurisdiction, as defined in California Code of Regulations, Title 23. This permit only applies to the completion of work in the project description located within, or adjacent to and having bearing on Board jurisdiction, and which directly or indirectly affects the Board's jurisdiction. This special condition shall apply to all subsequent conditions herein.

LIABILITY AND INDEMNIFICATION

FOURTEEN: 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 Central Valley Flood Protection Board, the Department of Water Resources, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, arising out of failure on the permittee's part to perform the obligations under this permit, the permittee shall defend and shall hold each of them harmless from each claim. This condition shall supersede condition TEN.

FIFTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board, the Department of Water Resources, and their respective officers, agents, employees, successors and assigns, 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 Central Valley Flood Control Board and the Department of Water Resources expressly reserve the right to supplement or take over their defense, in their 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, the Department of Water Resources, and their respective officers, agents, employees, successors and assigns, 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 Central Valley Flood Control Board and the Department of Water Resources expressly reserve the right to supplement or take over their defense, in their sole discretion.

SEVENTEEN: The Central Valley Flood Protection Board, Department of Water Resources, and Caltrans 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: If the permittee does not comply with the conditions of the permit and enforcement by the Board is required, the permittee shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees. Permittee acknowledges that State law allows the imposition of fines in enforcement matters.

PERMITTING AND AGENCY CONDITIONS

NINETEEN: The permittee shall comply with all conditions set forth in the letter from the U.S. Army Corps of Engineers District Engineer dated xxxx, 2014, which is attached to this permit as Exhibit A and is incorporated by reference.

TWENTY: The permittee shall contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act will be required.

TWENTY-ONE: The permittee agrees to incur all costs for compliance with local, State, and Federal permitting. If any conditions issued by other agencies conflict with any of the conditions of this permit, then the permittee shall resolve conflicts between any of the terms and conditions that agencies might impose under the laws and regulations it administers and enforces.

PRE-CONSTRUCTION

TWENTY-TWO: The permittee shall contact the Board by telephone at (916) 574-0609 to schedule a preconstruction conference. Failure to do so at least 20 working days prior to start of work may result in delay of the project.

TWENTY-THREE: The permittee shall provide construction supervision and inspection services acceptable to the Board.

TWENTY-FOUR: Prior to commencement of work, the permittee shall create a photo record, including associated descriptions of project conditions. The photo record shall be submitted to the Central Valley Flood Protection Board within thirty (30) calendar days of beginning the project.

TWENTY-FIVE: No construction work of any kind shall be done during the flood season from

November 1st to April 15th without prior approval of the Central Valley Flood Protection Board.

TWENTY-SIX: Thirty (30) calendar days prior to the start of any demolition and / or construction activities within the floodway or within the existing levee prism, the permittee shall submit to the Board's Chief Engineer two sets of detailed plans and specifications and supporting geotechnical and / or hydraulic impact analyses, for any and all temporary, in channel, or levee prism work that may have an impact during the flood season from November 1 through April 15. The Board may request additional information as needed and will seek comment from the U.S. Army Corps of Engineers and / or the local maintaining agency when necessary. The Board will provide written notification to the permittee if the review period is likely to exceed thirty (30) working days.

CONSTRUCTION

TWENTY-SEVEN: All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No work, other than that approved by this permit, shall be done in the project area without prior approval of the Central Valley Flood Protection Board.

TWENTY-EIGHT: All addenda and contract change orders made to the approved plans and / or specifications by the permittee after Board approval of this permit shall be submitted to the Board's Chief Engineer for review and approval prior to incorporation into the permitted project. The submittal shall include all supplemental plans, specifications, and necessary supporting geotechnical, hydrology and hydraulics, or other technical analyses. The Board shall acknowledge receipt of the addendum or change submittal in writing within ten (10) working days of receipt, and shall work with the permittee to review and respond to the request as quickly as possible. Time is of the essence. The Board may request additional information as needed and will seek comment from the U.S. Army Corps of Engineers and / or local maintaining agencies when necessary. The Board will provide written notification to the permittee if the review period is likely to exceed forty five (45) calendar days. Upon approval of submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes.

TWENTY-NINE: All debris generated by this project shall be disposed outside of Dry Creek.

THIRTY: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15.

THIRTY-ONE: Rock slope revetment shall be uniformly placed and properly transitioned into the bank, levee slope, or adjacent original ground and in a manner which avoids segregation.

THIRTY-TWO: The revetment shall not contain any reinforcing steel, floatable, or objectionable material. Asphalt or other petroleum-based products may not be used as fill or erosion protection on the levee section or within the floodway.

THIRTY-THREE: Density tests by a certified materials laboratory will be required to verify compaction of backfill within Dry Creek.

THIRTY-FOUR: Except with respect to the activities expressly allowed under this permit, the work area shall be restored to the condition that existed prior to start of work.

THIRTY-FIVE: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

VEGETATION / ENVIRONMENTAL MITIGATION

THIRTY-SIX: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

THIRTY-SEVEN: In the event that scour of channel bed injurious to facilities of the State Plan of Flood Control occurs at or adjacent to and as a result of the project, the permittee shall repair the eroded area and propose measures, to be approved by the Board, to prevent further erosion.

POST-CONSTRUCTION

THIRTY-EIGHT: The permittee shall be responsible for repair of any damages to Dry Creek due to construction, operation, or maintenance of the proposed project.

THIRTY-NINE: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board as-built drawings and 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.

OPERATIONS AND MAINTENANCE

FORTY: 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 Central Valley Flood Protection Board, Department of Water Resources, or any other agency responsible for maintenance.

FORTY-ONE: If the scour mitigation 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.

FORTY-TWO: If the permitted structure results in any adverse hydraulic impact or scouring the permittee shall provide appropriate mitigation measures subject to review and approval of the Central Valley Flood Protection Board.

FORTY-THREE: The permitted encroachment(s) shall not interfere with the flood conveyance capability of Dry Creek. 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-FOUR: At the request of either the permittee or Central Valley Flood Protection Board the

permittee and Board shall conduct joint inspections of the project and floodway after significant flood events or flood seasons to assess the integrity and operation of the project, and to assess and respond to any adverse impacts on the floodway or adjacent properties.

PROJECT ABANDONMENT, CHANGE IN PLAN OF FLOOD CONTROL

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

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

END OF CONDITIONS

ATTACHMENT B – Exhibit A: USACE Comment Letter

This letter has not yet been received by Board staff; however, it is expected to arrive prior to the Board Meeting on November 21, 2014

State of California

DEPARTMENT OF WATER RESOURCES
CENTRAL VALLEY FLOOD PROTECTION BOARD

California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMITApplication No. 18964
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.

The California Department of Transportation (Caltrans) is proposing to perform scour mitigation at the Dry Creek Bridge (Br No. 16-0002) on State Route 65, near the City of Wheatland, at Post Mile 2.21. Rock Slope Protection will be placed over filter fabric under the structure and across the creek. Spalls in the columns and footings will also be repaired.

2. Project

Location: Yuba County, in Section 35
 Township: T. 14 N. (N) (S), Range: R. 5 E. (E) (W), M. D. B. & M.
 Latitude: 39° 01' 22.3" N Longitude: 121° 26' 42.78" W
 Stream: Dry Creek, Levee: Unit 1-0.5 mi (left bank) Designated Floodway: No
 APN: State Right of Way

3. California Department of Transportation (Caltrans) of 703 B Street
 Name of Applicant / Land Owner Address
Marysville California 95901 (530) 741-4517
 City State Zip Code Telephone Number
Dennis.jagoda@dot.ca.gov
 E-mail

4. Mike Panchesson-Project Engineer of Caltrans
 Name of Applicant's Representative Company
Marysville California 95901 (530)-741-4224
 City State Zip Code Telephone Number
mike.panchesson@dot.ca.gov
 E-mail

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

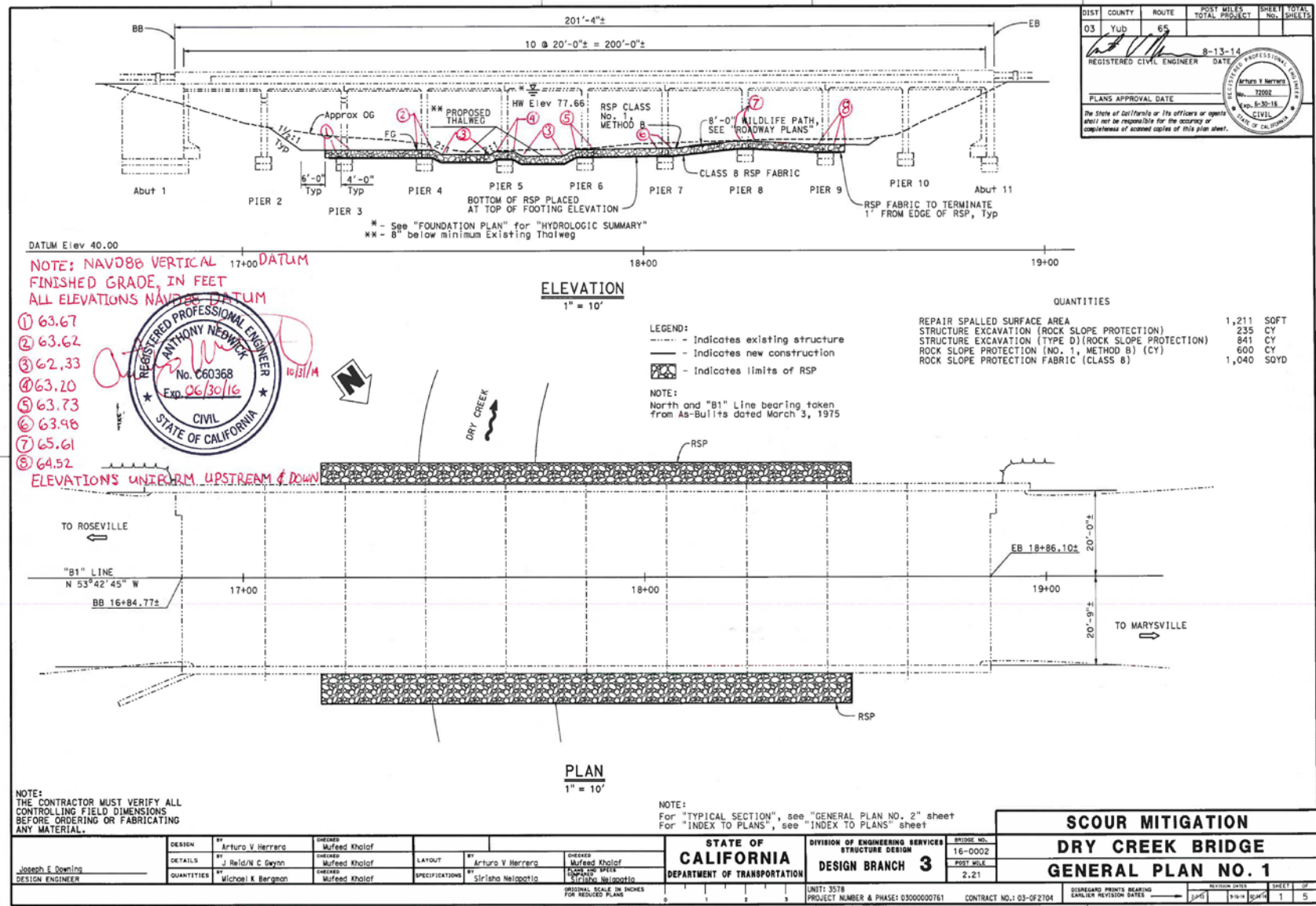
We, the Trustees of Reclamation District 2103 approve this plan, subject to the following conditions:
 Name of LMA

☐ Conditions listed on back of this form ☐ Conditions Attached ☒ No Conditions

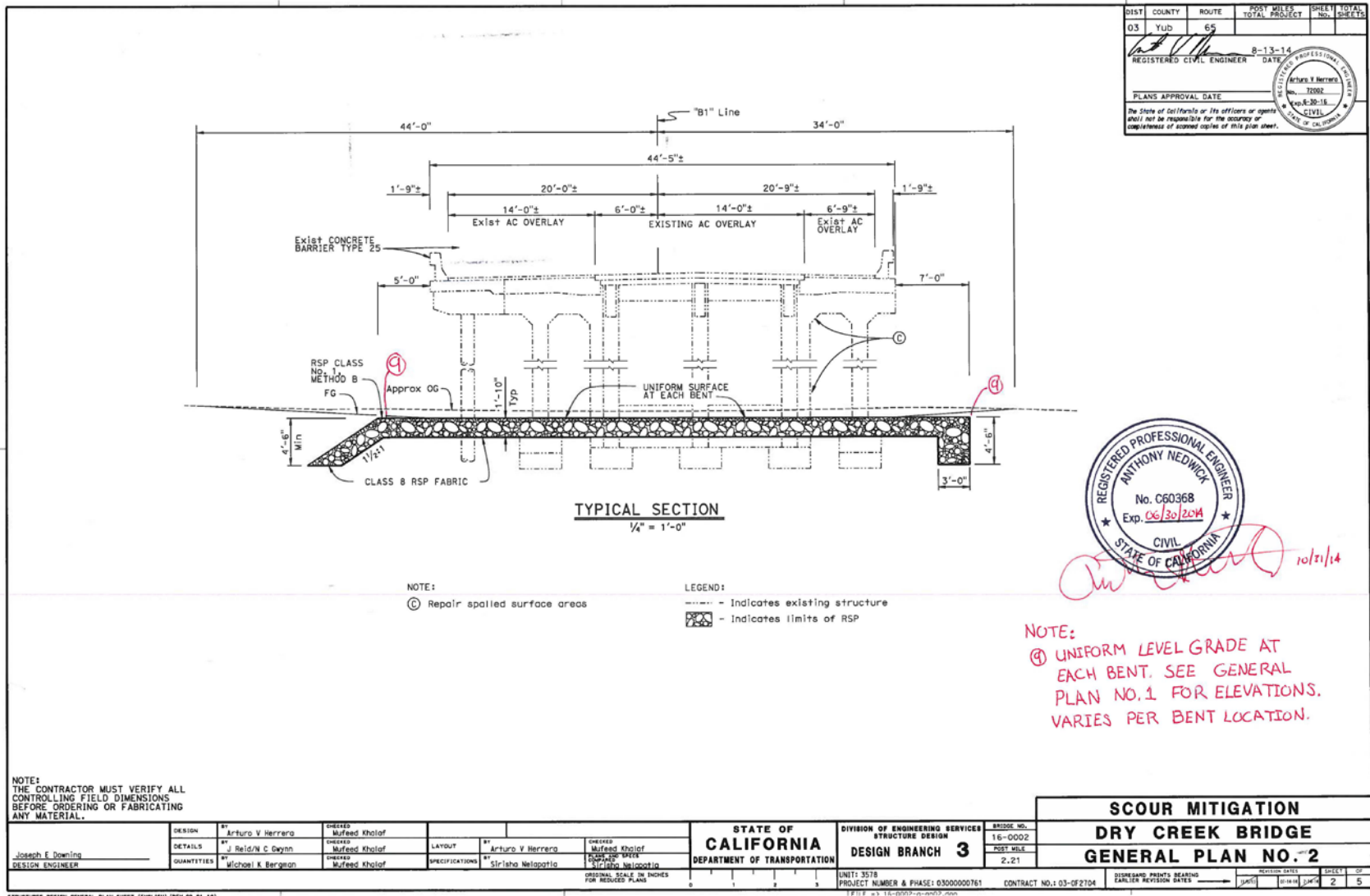
Dean Wehl 4-18-14 John J. Gifford 4-18-14
 Trustee Date Trustee Date

 Trustee Date Trustee Date

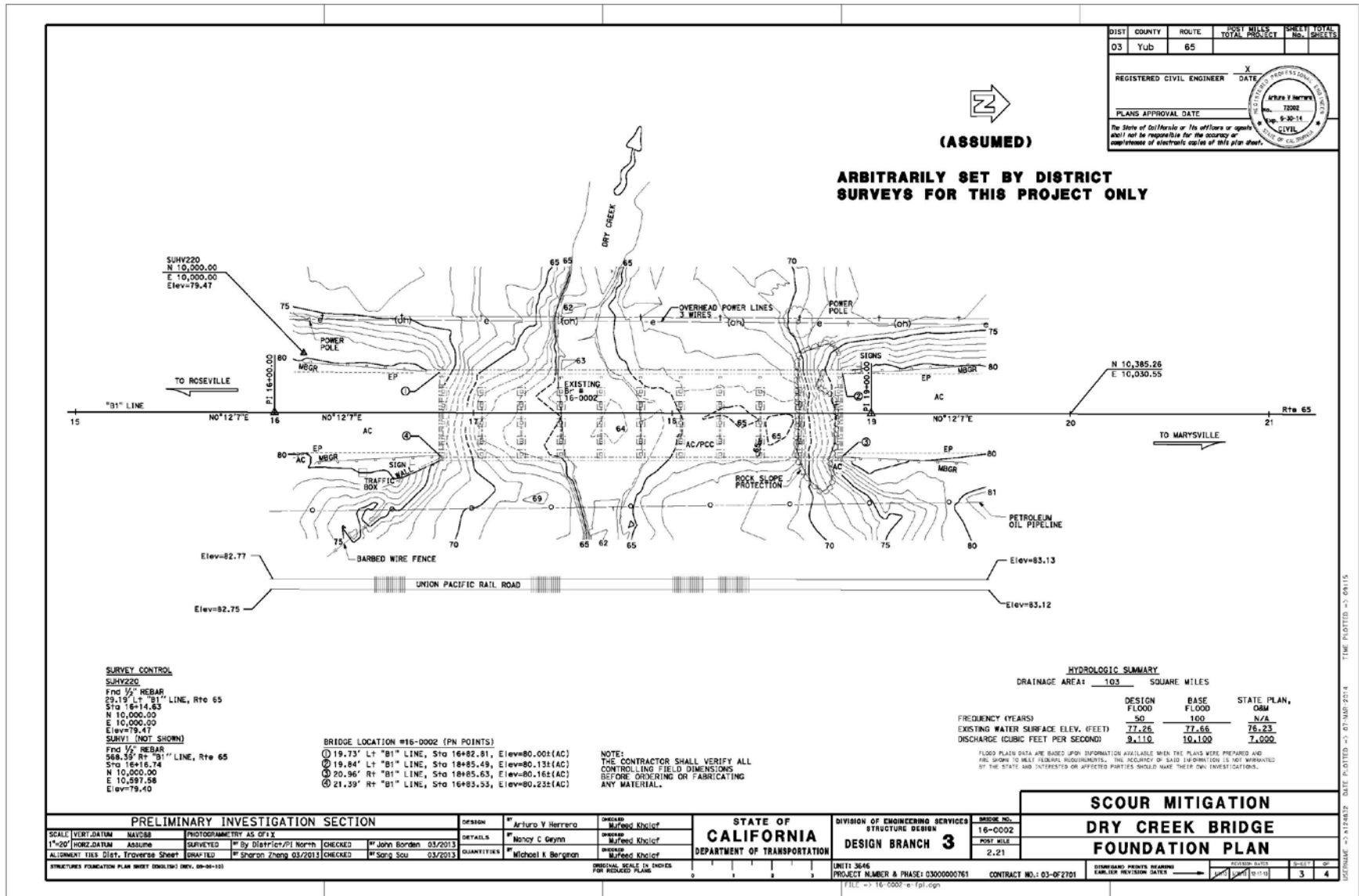
ATTACHMENT D – GENERAL PLAN AND FOUNDATION PLAN



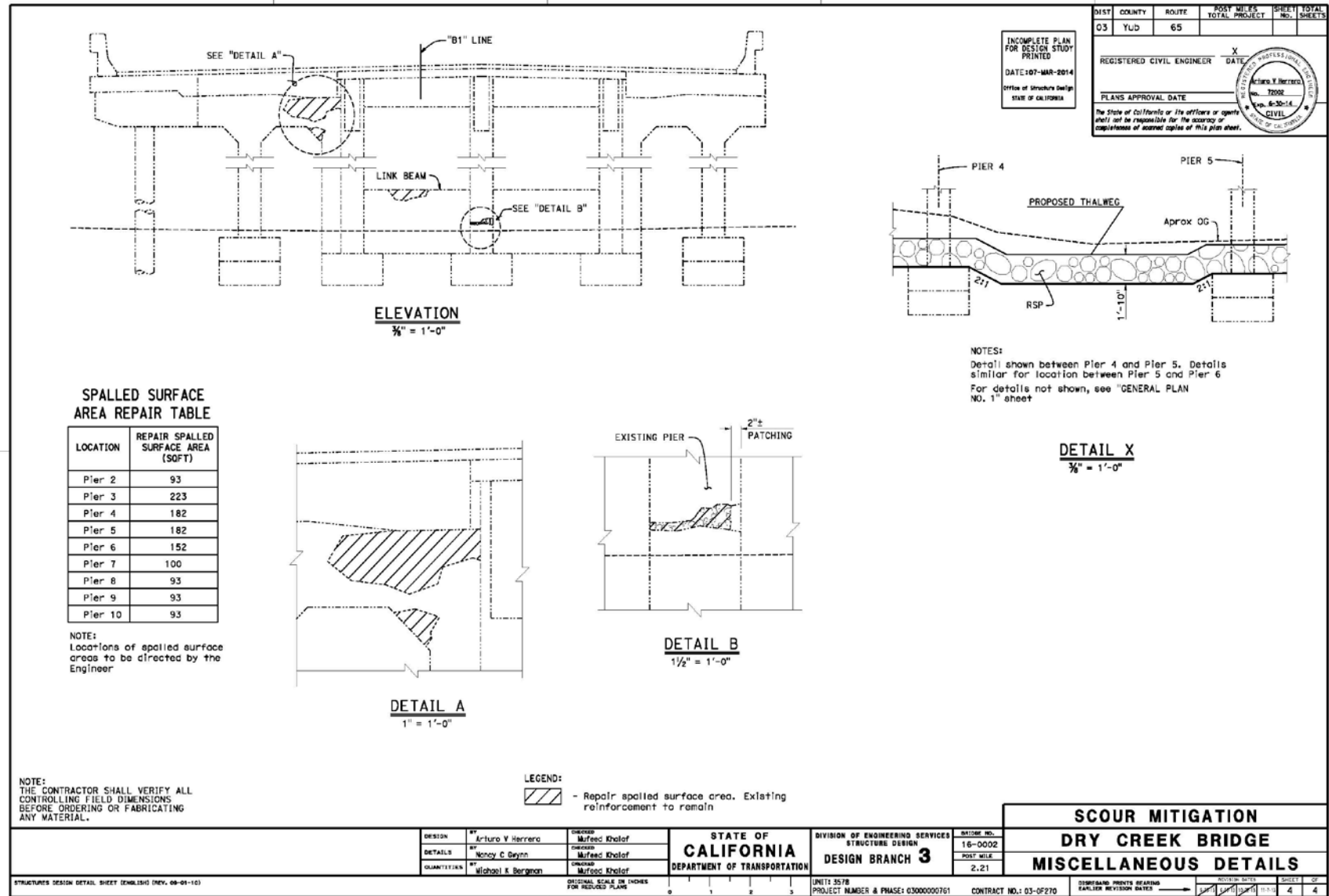
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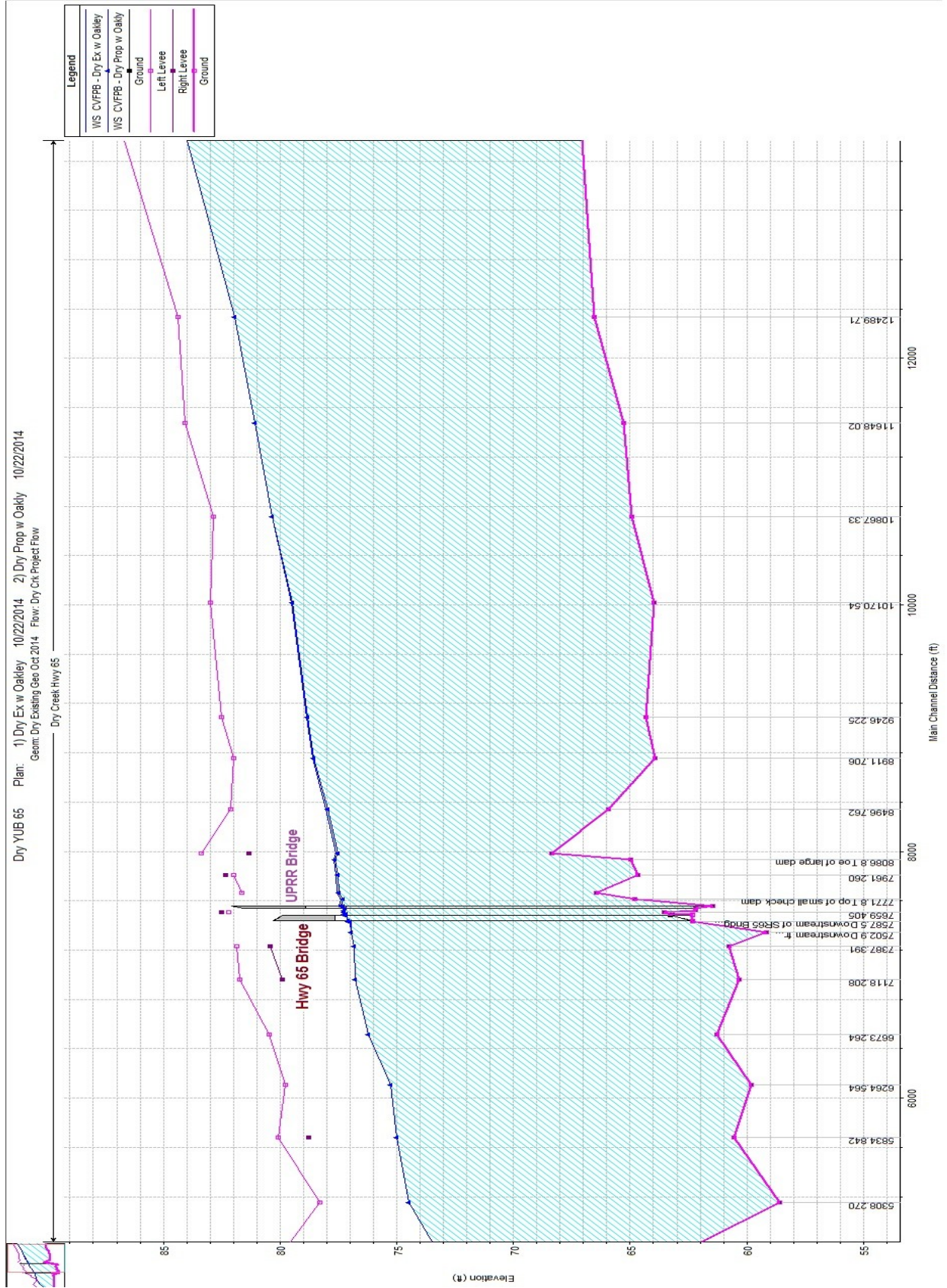
ATTACHMENT D – GENERAL PLAN AND FOUNDATION PLAN



ATTACHMENT D – GENERAL PLAN AND FOUNDATION PLAN



ATTACHMENT E – PROFILE AND HEC-RAS OUTPUT



ATTACHMENT E – PROFILE AND HEC-RAS OUTPUT

Profile Output Table - Standard Table 1													
HEC-RAS River: Dry Creek Reach: Hwy 65 Profile: CVFPB													Reload Data
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Hwy 65	7819.073	CVFPB	Dry Ex w Oakley	9000.00	66.45	77.58	73.52	77.79	0.000528	4.65	2884.88	633.49	0.26
Hwy 65	7819.073	CVFPB	Dry Prop w Oakly	9000.00	66.45	77.49	73.52	77.72	0.000556	4.74	2831.81	632.36	0.27
Hwy 65	7771.8	CVFPB	Dry Ex w Oakley	9000.00	64.82	77.38		77.74	0.000686	6.25	2028.83	294.95	0.33
Hwy 65	7771.8	CVFPB	Dry Prop w Oakly	9000.00	64.82	77.31		77.67	0.000732	6.10	2008.30	294.22	0.32
Hwy 65	7714.3	CVFPB	Dry Ex w Oakley	9000.00	61.46	77.48	71.07	77.67	0.000251	3.49	2548.93	298.23	0.16
Hwy 65	7714.3	CVFPB	Dry Prop w Oakly	9000.00	61.46	77.40	71.07	77.60	0.000257	3.53	2526.10	297.37	0.16
Hwy 65	7700	UPRR Bridge	Bridge										
Hwy 65	7672.8	CVFPB	Dry Ex w Oakley	9000.00	62.20	77.31		77.60	0.000480	5.72	2244.05	296.26	0.28
Hwy 65	7672.8	CVFPB	Dry Prop w Oakly	9000.00	62.20	77.24		77.53	0.000513	5.52	2224.13	294.93	0.27
Hwy 65	7659.405	CVFPB	Dry Ex w Oakley	9000.00	63.54	77.35	71.85	77.57	0.000421	4.41	2429.00	311.70	0.23
Hwy 65	7659.405	CVFPB	Dry Prop w Oakly	9000.00	63.54	77.28	71.85	77.50	0.000433	4.46	2405.55	310.89	0.23
Hwy 65	7650.0	CVFPB	Dry Ex w Oakley	9000.00	63.30	77.24		77.56	0.000518	5.15	2035.44	230.24	0.25
Hwy 65	7650.0	CVFPB	Dry Prop w Oakly	9000.00	63.30	77.16		77.49	0.000532	5.20	2017.72	230.06	0.25
Hwy 65	7647.5	CVFPB	Dry Ex w Oakley	9000.00	63.20	77.22		77.56	0.000467	5.33	2036.22	230.20	0.27
Hwy 65	7647.5	CVFPB	Dry Prop w Oakly	9000.00	62.33	77.24		77.45	0.000315	3.71	2478.35	230.24	0.19
Hwy 65	7641.0	CVFPB	Dry Ex w Oakley	9000.00	63.29	77.27	70.06	77.53	0.000338	4.10	2237.80	230.32	0.22
Hwy 65	7641.0	CVFPB	Dry Prop w Oakly	9000.00	62.33	77.23	68.76	77.45	0.000341	3.77	2423.83	230.22	0.20
Hwy 65	7600	Hwy 65 Bridge	Bridge										
Hwy 65	7591.5	CVFPB	Dry Ex w Oakley	9000.00	62.33	77.07		77.43	0.000614	4.80	1889.89	199.13	0.26
Hwy 65	7591.5	CVFPB	Dry Prop w Oakly	9000.00	62.33	77.11		77.37	0.000388	4.19	2211.56	199.31	0.21
Hwy 65	7587.5	CVFPB	Dry Ex w Oakley	9000.00	62.33	76.95		77.42	0.000762	6.39	1733.74	203.14	0.32
Hwy 65	7587.5	CVFPB	Dry Prop w Oakly	9000.00	62.33	77.02		77.36	0.000430	4.75	1948.88	203.77	0.25
Hwy 65	7502.9	CVFPB	Dry Ex w Oakley	9000.00	59.17	76.97		77.31	0.000770	6.16	2332.85	517.64	0.30
Hwy 65	7502.9	CVFPB	Dry Prop w Oakly	9000.00	59.17	76.97		77.31	0.000791	6.24	2330.92	517.61	0.30
Hwy 65	7387.391	CVFPB	Dry Ex w Oakley	9000.00	60.77	76.81	72.49	77.22	0.000670	6.27	2068.84	327.31	0.31
Hwy 65	7387.391	CVFPB	Dry Prop w Oakly	9000.00	60.77	76.81	72.49	77.22	0.000678	6.31	2068.01	327.25	0.31
Hwy 65	7118.208	CVFPB	Dry Ex w Oakley	9000.00	60.35	76.76	73.35	77.02	0.000526	5.38	2802.92	749.78	0.27
Hwy 65	7118.208	CVFPB	Dry Prop w Oakly	9000.00	60.35	76.76	73.35	77.02	0.000526	5.38	2803.09	749.78	0.27
Hwy 65	6673.264	CVFPB	Dry Ex w Oakley	9000.00	61.29	76.20	73.18	76.68	0.000974	7.13	1976.53	528.56	0.35
Hwy 65	6673.264	CVFPB	Dry Prop w Oakly	9000.00	61.29	76.20	73.18	76.68	0.000973	7.13	1976.72	528.57	0.35
Hwy 65	6264.564	CVFPB	Dry Ex w Oakley	9000.00	59.81	75.26	72.53	76.15	0.001520	9.52	1468.27	446.42	0.44
Hwy 65	6264.564	CVFPB	Dry Prop w Oakly	9000.00	59.81	75.26	72.53	76.15	0.001520	9.52	1468.53	446.67	0.44
Hwy 65	5834.842	CVFPB	Dry Ex w Oakley	9000.00	60.56	74.99	72.06	75.52	0.000997	6.96	2106.34	854.84	0.38
Hwy 65	5834.842	CVFPB	Dry Prop w Oakly	9000.00	60.56	74.99	72.06	75.52	0.000996	6.96	2107.22	854.92	0.38

Total flow in cross section.