INFORMATION HANDOUT

For Contract No. 04-2A3204
At 04-Nap-121-9.2/9.4

Identified by
Project ID 0400000817

MATERIALS INFORMATION

Revised Foundation Report for Sarco Creek Bridge Replacement

HYDRAULICS

Final Hydraulic Report, Sarco Creek Bridge

WATER QUALITY

Water Quality Information Handout

PERMITS

California Department of Fish & Wildlife, 1602 Permit

California Department of Fish & Wildlife, 1602 Permit, Amendment

San Francisco Bay Regional Water Quality Control Board, 401 Permit

Unites States Army Corps of Engineers, 404 Permit

Unites States Army Corps of Engineers, 404 Permit, Amendment

GENERAL

Drawing X-LITE Flared End Terminal

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Serious drought
Help Save Water!

To: MS. KELLY HOLDEN
Office Chief
Office of Bridge Design West

Date: January 20, 2016

Attention: Minh Ha
Peter Soin

File: 04- NAP-121-PM 8.9/9.4
EA 04-2A3201
E-FIS: 0400000817
Sarco Creek Bridge (Replacement)
Bridge No. 21-0008

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Subject: **REVISED FOUNDATION REPORT FOR SARCO CREEK BRIDGE REPLACEMENT**

This report supersedes the "Foundation Report for Sarco Creek Bridge Replacement" dated January 11, 2016.

This project proposes to replace the existing Sarco Creek Bridge (Bridge No. 21-0008) on State Route 121 (SR-121) in the City of Napa, Napa County. A project Location Map is provided in Exhibit A. This foundation report (FR) consists of field investigations and laboratory testing program, site geology and subsurface conditions, groundwater, scour and corrosion evaluations, seismic recommendations, study on as-built data, as well as final foundation recommendations for the proposed bridge abutments and their associated retaining walls.

1. SCOPE OF WORK

The following tasks were performed for the preparation of this Foundation Report:

- Review of as-built plans of the existing bridge from Caltrans Bridge Inspection Records Information System (BIRIS);
- Review of a Foundation Investigation Report dated August 20, 1990 and a Log of Test Boring (LOTB) plan dated July 1990 under EA 04-121931 by Robert Price and R. W. Fox of former Office of Transportation Materials and Research of Caltrans;

- Review of a Preliminary Foundation Report dated November 11, 2004 by Bill Levine of the Office of Geotechnical Design West (OGDW);
- Geologic literature study;
- Field geotechnical exploration, including drilling 2 exploratory borings and performing field and laboratory testing on selected soil samples;
- Foundation design analysis; and
- Preparation of this FR.

2. PROJECT DESCRIPTION

According to BIRIS, the original structure, continuous steel stringers embedded in concrete on rubble masonry abutments, of the existing bridge was constructed circa 1910. A supplemental bent was added to the original bridge in 1946. Also, the original structure was widened on the right side in 1921, and again in 1974. All bridge supports were founded on spread footings. The existing structure has a length of 31 feet, and has an overall width of 35.5 feet. In 1987, the Office of Structure Maintenance and Investigations recommended that the existing structure be replaced because it had already gone well beyond its expected life.

The proposed bridge will have a length of 48.47 feet from beginning of bridge (BB) to end of bridge (EB), and will be 44 feet wide. The proposed single span superstructure will consist of PC/PS concrete voided slabs that will sit on cantilevered stem seat type abutments. The new abutments will have a skew of about 9 degrees and spread footings that will only be as wide as the superstructure. The District wants to minimize the new structure's footprint impact on the relocation of existing utilities and right-of-way; internal shear keys will have to be constructed at the abutments for the superstructure. The new roadway section on the structure will consist of two 12-foot lanes with 8-foot shoulders.

The new structure will also have retaining wall wing walls because the wing walls will be over 20 feet in length. Total of four retaining wall wing walls, namely, RW1R, RW1L, RW2R, and RW2L, are proposed to reduce the impact on the relocation of existing utilities and right-of-way. RW1R and RW1L walls will be constructed on the right (east) and left (west) sides, respectively, of the embankment south to Abutment 1 (Abut 1); meanwhile, RW2R and RW2L walls will be constructed on the right and left sides, respectively, of the embankment north to Abutment 2 (Abut 2). Please refer to the layout plans for details.

Type 736 concrete barriers with railings are proposed for the new bridge and retaining walls.

The vertical datum used in this report is NGVD 29 unless stated otherwise. The horizontal datum is based on NAD 83.

3. EXCEPTION TO POLICY

There is no known exception to Department policy relating to the investigation or design of the proposed structures.

4. FIELD INVESTIGATION AND TESTING PROGRAM

A total of two rotary borings, namely, RC-12-001 and R-12-002, were performed by Caltrans in August 2012. Borings RC-12-001 and R-12-002 were drilled near the Abutment 1 and Abutment 2, respectively, of the proposed Sarco Creek Bridge. A summary of each boring is shown in Table 1.

Table 1. Summary of Field Geotechnical Borings

Boring ID	Date of Completion	Total Depth (ft)	Depth to Groundwater (ft)	Groundwater Elev. (ft)
RC-12-001	08/07/2012	66.5	14.2	12.3
RC-12-002	08/08/2012	66.5	N/A	Encountered but not measured

In both borings, Standard Penetration Tests (SPT) were typically conducted at 5-feet interval in soil strata, and Pocket Penetrometer (PP) Tests were performed on soil samples showing apparent cohesion. Soil samples were selected at various depths for laboratory testing including particle size analysis and moisture content, Atterberg Limits, and corrosion tests to update soil information.

5. LABORATORY TESTING PROGRAM

The laboratory testing program for the aforementioned borings consists of 25 moisture content tests, 6 mechanical analyses, 6 plasticity index tests, and 2 corrosion tests.

6. SITE GEOLOGY AND SUBSURFACE CONDITIONS

6.1 Climate

The climate of Napa County is characterized by cool, moderately wet winters, and warm to hot, dry summers. Average low temperatures through the winter are typically in the upper 30’s (F) while average high temperatures in the late summer are in the mid 80's (F). Humidity in the region is generally low, with winter having the highest humidity and fall, the lowest. Winds are generally out of the northwest during the summer and the south during the winter, and rarely

reach greater than 30 miles per hour. The strongest winds are associated with cold winter storms and westerly summer breezes drawn in by the warmer eastern interior. Rainfall is greatest during the winter with annual totals averaging 20 inches in the dryer southern half of the county and 60 inches in the wettest northern regions. December and January are the wettest months, while July and August are the driest (Lambert and Kashiwagi, 1978)

6.2 Topography & Drainage

The project is at the southeastern end of the Napa Valley, a long, narrow depression that runs northwest/southeast and is drained by the Napa River. The valley is bordered by the Sonoma Mountains to the west, Vaca Mountains to the east, and San Pablo Bay to the south. The elevations at northern and southern ends of the Sarco Creek Bridge are +26.3 ft and +27.0 ft, respectively. Sarco Creek, which flows east to west to the Napa River, is at elevation +11.0 ft (as recorded in June, 1990). Sarco Creek originates several miles to the east on the northern flank of Mt. George, elevation 1877 ft.

6.3 Regional Geology

Located within the Coast Range geomorphic province of California, the geology of the region consists of northwest-trending ridges, gently sloping hills, intermontane valleys, and large elongated depressions. The San Andreas Fault system, the most prominent geologic feature in the area, includes the San Andreas Fault as well as numerous splays, including the Rodgers Creek and Green Valley Faults, which together take up strain between the northward migrating Pacific plate and the southward (relatively) moving North American plate. The major faults within the system are predominantly right-lateral, strike-slip faults with some compressional component, and these act together to form the prominent ridges and valleys. The San Francisco Bay, a partially filled northwest-trending depression extending from the Santa Clara Valley in the south to the Petaluma Valley in the north, is a direct result of these fault interactions.

6.4 Site Geology

Site geology is based on the mapping of Klahan, et al, 2004, and Logs of Test Borings recovered during a geotechnical investigation within the project limits in 1990. Refer to attached Geology Map in Exhibit B.

Within the project limits, the subsurface is comprised of alluvial material derived from the adjacent Milliken and Sarco Creek drainages. These alluvial units include older Pleistocene alluvium consisting of consolidated sand, silt, clay, and gravel; Holocene alluvium; Late Holocene stream terrace deposits; and Late Holocene stream channel deposits. Foundation materials for the Sarco Creek Bridge consist of dense silty sand with gravel, hard silty clay, and dense clayey silt.

6.5 Subsurface Conditions

Based on the subsurface data from our 2012 borings, at boring RC-12-001, we estimated that the subsurface materials consist of approximately nine feet of loose sandy silt with gravel underlain by altering layers of dense to very dense silty sand, stiff to hard elastic silt, stiff silt with sand, dense to very dense clayey sand/gravel, stiff sandy silt, and very stiff to hard lean clay. The Pocket Penetrometer readings for soils present cohesion range mostly from 1.0 tsf to 4.5 tsf. The energy-corrected SPT blow counts vary from 5 to refusal (50 blows for less than 2 inches).

At boring R-12-002, subsurface materials consist of approximately eight feet of medium dense well-graded gravel underlain by altering layers of medium stiff to stiff silt with sand, stiff to hard elastic silt, very stiff to hard sandy silt/silt, very stiff to hard lean clay, and very dense well-graded sand. The Pocket Penetrometer readings for soils present cohesion range mostly from 1.0 to 4.5 tsf. The energy-corrected SPT blow counts vary from 10 to 85.

Please refer to the LOTB plans for details.

7. GROUNDWATER

The groundwater was measured at approximately 14.2 feet below the ground surface, corresponding to elevation 12.3 feet, at borehole RC-12-001 on August 8, 2012. Please note that groundwater level typically fluctuates with season and correlates with the local geology, and topography. Also, it is anticipated that the groundwater will be affected by the water level in the creek.

8. SCOUR EVALUATION

According to the 'Final Hydraulic Report' dated July 1, 2012 by Ronald McGaugh of the Office of Structure Design, Hydraulics and Hydrology Branch, total abutment scour is estimated to be 1 foot for both abutments.

9. CORROSION EVALUATION

Corrosion studies are conducted in accordance with the requirements of California Test Method No. 643. The Department considers the site to be corrosive to foundation elements if one or more of the following conditions exist for the representative soil samples taken at the site:

> Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.

Based on the test results from the Materials Engineering Testing Services (METS) of Caltrans (Table 2) for samples obtained from borings RC-12-001 and RC-12-002, the foundation soils in the proposed bridge site are considered not corrosive.

Table 2. Soil Corrosion Test Summary

Location	SIC Number	Minimum Resistivity (Ohm-Cm)	pH	Chloride Content (ppm)	Sulfate Content (ppm)
RC-12-001	C633246	1250	6.9	9	8
RC-12-002	C633247	998	7.7	8.4	27

10. SEISMIC RECOMMENDATIONS

Please refer to the memo from Hossain Salimi of OGDW to your Branch, dated November 16, 2012 for the final seismic design recommendations (FSDR). For clarification or additional information on seismic design aspects of the project, please consult with Hossain Salimi at (916) 227-7147. According to the FSDR, the Peak Ground Acceleration (PGA) is about 0.64g at the project site. Furthermore, the potential for surface rupture due to fault movement as well as liquefaction during a seismic event at the project site are considered minimal.

11. AS-BUILT FOUNDATION DATA

Please refer to Section 2 for the foundation information of the existing Sarco Creek Bridge. According to BIRIS, the bottom of footing elevations of the existing bridge are approximately at 8 feet. However, no as-built LOTB plan is available in the BIRIS database.

12. FOUNDATION RECOMMENDATIONS

12.1 Abutments

Structure Design has provided foundation data as well as controlling LRFD Loads in Service-I, Strength/Construction and Extreme Event Limit States for the bridge, as shown in Tables 3 through 5. Based on the subsurface materials and conditions below the proposed footings, the condition of the existing structure, and construction restraints at the project site, we recommend spread footing at both abutment locations for the proposed new structure. Idealized subsurface soil profile and soil engineering parameters at each support location were defined based on the LOTBs of 2012, relevant literature, and engineering judgment.

The foundation excavation for abutment footings is expected to be below groundwater level. Therefore, it is recommended to use Type A structure excavation with seal course to mitigate excessive seepage issues during construction. The minimum depth of seal course is 2 feet below the bottom of footing elevation for both Abut1 and Abut 2. The sub-excavation should be extended at least one foot beyond each side of the footing. In addition, temporary shoring (steel sheet piles) is required for the structure excavation near and/or inside the creek to avoid interfering with the installation of temporary creek diversion system. This is because in our opinion the 1:1 (or flatter) temporary excavation slope on the creek side will, in fact, interfere with the diversion system. The inner facing of each shoring should be at least 3 feet outside the edge of footing. Please note that design of the steel sheet piling is contractor's responsibility. The location and limits of the temporary shoring should be shown on the structure plan(s).

Table 3: Foundation Data

Support No.	Finish Grade Elev. (ft)	Bottom of Footing Elev. (ft)	Foundation Dimensions (ft)		Permissible Settlement under Service Load (in)
			B	L	
Abut 1	26.90	6.00	19.0	44.00	2.00
Abut 2	26.95	6.00	19.0	44.00	2.00

Table 4. LRFD Service-I Limit State Loads for Controlling Load Combinations

Support No.	Total Load					Permanent Load				
	P_{Total} (kips) Net	M_X (kip-ft)	M_Y (kip-ft)	V_X (kips)	V_Y (kips)	P_{Perm} (kips) Net	M_X (kip-ft)	M_Y (kip-ft)	V_X (kips)	V_Y (kips)
Abut 1	636.79	-1020.83	N/A	N/A	379.14	391.99	-232.1	N/A	N/A	328.18
Abut 2	636.79	-1020.83	N/A	N/A	379.14	391.99	-232.1	N/A	N/A	328.18

Table 5. LRFD Strength, Construction and Extreme Event Loads for Controlling Load Combinations

Support No.	Strength/Construction Limit State (Controlling Group)					Extreme Event Limit State (Controlling Group)				
	P_{Total} (kips) Gross	M_X (kip-ft)	M_y (kip-ft)	V_X (kips)	V_Y (kips)	P_{Total} (kips) Gross	M_X (kip-ft)	M_Y (kip-ft)	V_X (kips)	V_Y (kips)
Abut 1	2996.58	2869.45	N/A	N/A	118.09	2996.58	2869.45	N/A	N/A	118.09
Abut 2	2996.58	2869.45	N/A	N/A	118.09	2996.58	2869.45	N/A	N/A	118.09

The foundation design analysis was performed in general using the methods outlined in AASHTO LRFD Bridge Design Specifications with Caltrans amendments. The results are shown in Tables 6 and 7 below. The calculated factored gross nominal bearing resistance exceeds the factored vertical load in all cases. In addition, the factored gross nominal sliding resistance exceeds the factored shear force in all cases as well. The calculated total settlement is estimated to be less than two inches at both abutment locations. Note that most of the foundation materials have been pre-stressed by the existing bridge and embankment for at least 40 years, so the actual settlement is expected to be smaller than the estimates.

Table 6. Foundation Design Recommendations for Spread Footing

Support No.	Footing Size (ft)		Bottom of Footing Elev. (ft)	Min. Footing Embedment Depth (ft)	Total Permissible Support Settlement (inches)	Service Limit State	Strength or Construction Limit State $\varphi_b = 0.45$	Extreme Event Limit State $\varphi_b = 1.0$
	L	B				Permissible Net Contact Stress (ksf)	Factored Gross Nominal Bearing Resistance (ksf)	Factored Gross Nominal Bearing Resistance (ksf)
Abut 1	44.0	19.00	6.00	1.5	2	1.0	7.0	15.5
Abut 2	44.0	19.00	6.00	1.5	2	0.9	4.6	10.2

Table 7. Spread Footing Data Table

Support No.	Service Permissible Net Contact Stress (Settlement) (ksf)	Strength/Construction Factored Gross Nominal Bearing Resistance $\varphi_b = 0.45$ (ksf)	Extreme Event Factored Gross Nominal Bearing Resistance $\varphi_b = 1.0$ (ksf)
Abut 1	1.0	7.0	15.5
Abut 2	0.9	4.6	10.2

12.2 Earth Retaining Systems

Four Standard Plan Type 5 (Case 1) retaining walls, namely, RW1R, RW1L, RW2R and RW2L, with concrete barriers are proposed as the wing wall retaining walls for the embankments adjacent to Abut 1 and Abut 2.

According to the project plans and roadway cross-sections provided by District 4 Design, the existing roadway is proposed to be widened primarily on the east side. Within the limits of the proposed wing wall retaining walls RW1R and RW2R, the widening widths is about 10 feet and new fills are required to accomplish this widening. The heights of the new fills are estimated to be about 6 to 11 feet on the south side of the Abut 1 and 3 to 6 feet on the north side of Abut 2. Furthermore, additional fills, up to 6 feet in height, are proposed to be constructed on the creek bank adjacent to RW1R wall due to the proposed slope regarding. Based on the aforementioned facts, we estimate that the total settlement caused by new fills at RW1R wall location can exceed two inches. To minimize the settlement, we recommend the followings:

(1) Sub-excavate into the existing side slope with 1.5H:1V or flatter as shown in the Exhibit C.
(2) Backfill using AB3 materials at 95% relative compaction up to the bottom of footing elevations of corresponding retaining wall segments.

For all segments of RW1L, RW2R and RW2L walls, it is also recommended to sub-excavate the bottom of footing by at least 2 feet in depth and at least 1 foot wider than both front and back sides of the footing and backfill up to the bottom of footing elevation of each footing segment with AB3 materials at 95% relative compaction to account for variability in foundation soil as well as to increase the bearing capacity of the proposed retaining walls. A summary of required sub-excavation depths (minimum) for RW1L, RW2R and RW2L walls is shown in Table 8.

Table 8 Required Minimum Depth for Sub-excavation and Backfill

District ERS ID	Segment (ft)		Design Height (ft)	Required Minimum Sub-excavation Depth (ft)
	Begin Station	End Station		
RW1L	"B" 17+99.2	"B" 18+06.7	12	2.0
	"B" 17+92.1	"B" 18+00.7	8	2.0
	"B" 17+81.9	"B" 17+93.6	4	5.0
RW2R	"B" 18+64.4	"B" 18+72.0	12	5.0
	"B" 18+70.5	"B" 18+78.0	8	2.0
	"B" 18+76.5	"B" 18+64.4	4	5.0
RW2L	"B" 18+70.9	"B" 18+78.4	12	5.0
	"B" 18+76.9	"B" 18+84.3	8	2.0
	"B" 18+82.8	"B" 18+87.8	4	5.0

Based on the LOTBs (2012) shown in the project plans and the abovementioned foundation soil improvements, the foundation soil is mainly considered as either cohesionless or c-ϕ soils. Estimated unit weight, internal friction angles and cohesions for foundation soils in the analysis are shown in Table 9.

Tables 10 through 12 provide foundation design recommendations. Footing dimensions and bearing stresses for various limit states are obtained from 2010 Revised Standard Plan RSP B3-4A.

Table 9 Estimated Foundation Soil Parameters

District ERS ID	Segment (ft)		Design Height (ft)	Unit Weight (pcf)	Cohesion (psf)	Internal Friction Angle (degree)
	Begin Station	End Station				
RW1R	"B" 17+91.7	"B" 17+99.3	12	120	0	34
	"B" 17+85.6	"B" 17+93.2	8	120	0	34
	"B" 17+82.0	"B" 17+87.2	4	120	0	34
RW1L	"B" 17+99.2	"B" 18+06.7	12	120	2,750	0
	"B" 17+92.1	"B" 18+00.7	8	120	1,000	5
	"B" 17+81.9	"B" 17+93.6	4	120	0	34
RW2R	"B" 18+64.4	"B" 18+72.0	12	120	0	34
	"B" 18+70.5	"B" 18+78.0	8	120	1,000	5
	"B" 18+76.5	"B" 18+64.4	4	120	0	34
RW2L	"B" 18+70.9	"B" 18+78.4	12	120	0	34
	"B" 18+76.9	"B" 18+84.3	8	120	1,000	5
	"B" 18+82.8	"B" 18+87.8	4	120	0	34

Table 10. Retaining Wall Foundation Design Recommendations – Service Limit State

ERS ID	Segment (ft)		Design Height (ft)	Bottom of Footing Elev. (ft)	Min. Footing Embedment Depth (ft)	Footing Width (ft)	Service Limit State		Settlement	
	Begin Station	End Station					Effective Foundation Width (ft)	Net Bearing Stress (psf)	Calculated at Net Bearing Pressure (in.)	Total Permissible (in.)
RW1R	"B" 17+91.7	"B" 17+99.3	12	14	2	10.5	7.7	2,800	1.6	2.0
	"B" 17+85.6	"B" 17+93.2	8	18	2	8.5	6.4	2,100	1.2	2.0
	"B" 17+82.0	"B" 17+87.2	4	22	2	7.25	6.2	1,400	0.7	2.0
RW1L	"B" 17+99.2	"B" 18+06.7	12	14	2	10.5	7.7	600	1.2	2.0
	"B" 17+92.1	"B" 18+00.7	8	18	2	8.5	6.4	600	0.7	2.0
	"B" 17+81.9	"B" 17+93.6	4	22	2	7.25	6.2	600	0.5	2.0
RW2R	"B" 18+64.4	"B" 18+72.0	12	14	2	10.5	7.7	1,270	1.5	2.0
	"B" 18+70.5	"B" 18+78.0	8	18	2	8.5	6.4	1,200	1.0	2.0
	"B" 18+76.5	"B" 18+82.8	4	22	2	7.25	6.2	940	0.5	2.0
RW2L	"B" 18+70.9	"B" 18+78.4	12	14	2	10.5	7.7	600	1.1	2.0
	"B" 18+76.9	"B" 18+84.3	8	18	2	8.5	6.4	600	0.6	2.0
	"B" 18+82.8	"B" 18+87.8	4	22	2	7.25	6.2	600	0.3	2.0

Table 11. Retaining Wall Foundation Design Recommendations – Strength and Extreme Limit States

ERS ID	Segment (ft)		Strength I Limit State			Extreme I Limit State Factored			Extreme II Limit State Factored		
	Begin Station	End Station	Effective Foundation Width (ft)	Gross Uniform Bearing Stress (psf)	Factored Bearing Resist. φq_n, $\varphi = 0.45$ (psf)	Effective Foundation Width (ft)	Gross Uniform Bearing Stress (psf)	Factored Bearing Resist. φq_n $\varphi = 1.0$ (psf)	Effective Foundation Width (ft)	Gross Uniform Bearing Stress (psf)	Factored Bearing Resist. φq_n $\varphi = 1.0$ (psf)
RW1R	"B" 17+91.7	"B" 17+99.3	6.6	4,000	4,100	4.2	4,800	6,800	5.8	3,500	8,400
	"B" 17+85.6	"B" 17+93.2	5.3	3,000	3,500	4.0	3,100	6,400	3.8	3,200	6,200
	"B" 17+82.0	"B" 17+87.2	6.2	2,400	3,000	4.4	1,500	4,900	2.5	2,700	2,900
RW1L	"B" 17+99.2	"B" 18+06.7	6.6	4,000	6,800	4.2	4,800	14,900	5.8	3,500	15,100
	"B" 17+92.1	"B" 18+00.7	5.3	3,000	3,500	4.0	3,100	7,500	3.8	3,200	7,500
	"B" 17+81.9	"B" 17+93.6	6.2	2,400	4,000	4.4	1,500	6,900	2.5	2,700	4,700
RW2R	"B" 18+64.4	"B" 18+72.0	6.6	4,000	6,500	4.2	4,800	12,400	5.8	3,500	13,800
	"B" 18+70.5	"B" 18+78.0	5.3	3,000	3,400	4.0	3,100	7,300	3.8	3,200	7,300
	"B" 18+76.5	"B" 18+64.4	6.2	2,400	3,000	4.4	1,500	4,900	2.5	2,700	2,900
RW2L	"B" 18+70.9	"B" 18+78.4	6.6	4,000	7,000	4.2	4,800	13,400	5.8	3,500	14,900
	"B" 18+76.9	"B" 18+84.3	5.3	3,000	3,400	4.0	3,100	7,300	3.8	3,200	7,300
	"B" 18+82.8	"B" 18+87.8	6.2	2,400	3,100	4.4	1,500	5,100	2.5	2,700	3,100

Table 12. Foundation Data Table

District ERS ID	Segment (ft)		Design Height (ft)	Service Limit State Permissible Net Contact Stress (ksf)	Strength Gross Nominal Bearing Resistance for Controlling Load Case, φ_b = 0.45 (ksf)	Extreme Event Gross Nominal Bearing Resistance φ_b = 1.00 (ksf)
	Begin Station	End Station				
RW1R	"B" 17+91.7	"B" 17+99.3	12	3.3	4.1	6.8
	"B" 17+85.6	"B" 17+93.2	8	3.2	3.5	6.4
	"B" 17+82.0	"B" 17+87.2	4	4.2	3.0	4.9
RW1L	"B" 17+99.2	"B" 18+06.7	12	2.8	6.8	14.9
	"B" 17+92.1	"B" 18+00.7	8	3.6	3.5	7.5
	"B" 17+81.9	"B" 17+93.6	4	5.6	4.0	6.9
RW2R	"B" 18+64.4	"B" 18+72.0	12	3.0	6.5	12.4
	"B" 18+70.5	"B" 18+78.0	8	4.0	3.4	7.3
	"B" 18+76.5	"B" 18+64.4	4	6.6	3.0	4.9
RW2L	"B" 18+70.9	"B" 18+78.4	12	3.9	7.0	13.4
	"B" 18+76.9	"B" 18+84.3	8	4.7	3.4	7.3
	"B" 18+82.8	"B" 18+87.8	4	6.6	3.1	5.1

13. CONSTRUCTION CONSIDERATIONS

13.1 Notes for Specification Development

- The abutment footing elevations are below groundwater elevations. Dewatering and water storage/treatment are probably required during foundation excavation.
- The new abutment footings are founded below the existing bridge footings. The footings and all other debris from the existing structure should be completely removed within the footprint of the new footings.
- Class B2 subgrade enhancement geotextiles are required to be placed at the bottom of each sub-excavation mentioned in Section 12.2 where the AB3 materials are backfilled. See Sections 19-8 and 88-1.02O 'Subgrade Enhancement Geotextile' of the Caltrans Standard Specifications (2010) for details.

13.2 Notes for Construction

- The bottom of the footing sub-excavation must be inspected by our Office before proceeding with foundation construction.
- Early communication between the Resident Engineer, the Contractor and the Office of Geotechnical Design – West is recommended as soon as differing site conditions are recognized during construction. See Section 4-1.06 "Differing Site Conditions," of the Caltrans Standard Specifications (2010) for details.

14. DISCLAIMER AND CONTACT INFORMATION

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by Office of Structure Design West. If any conceptual and/or foundation dimension changes are made during final project design, the Office of Geotechnical Design West, Design Branch A should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Hooshmand Nikoui at (510) 286-4811.

Attachments:

Exhibit A: Location Map
Exhibit B: Geology Map
Exhibit C: Sub-excavation Typical Section & Plan View at RW1R

c: TJPokrywka, HNikoui, MHung, KHolden, MHa, DManlulu, CRisden, Daily File, RE_Pending_File@dot.ca.gov

MHung/mm

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CHRIS RISDEN
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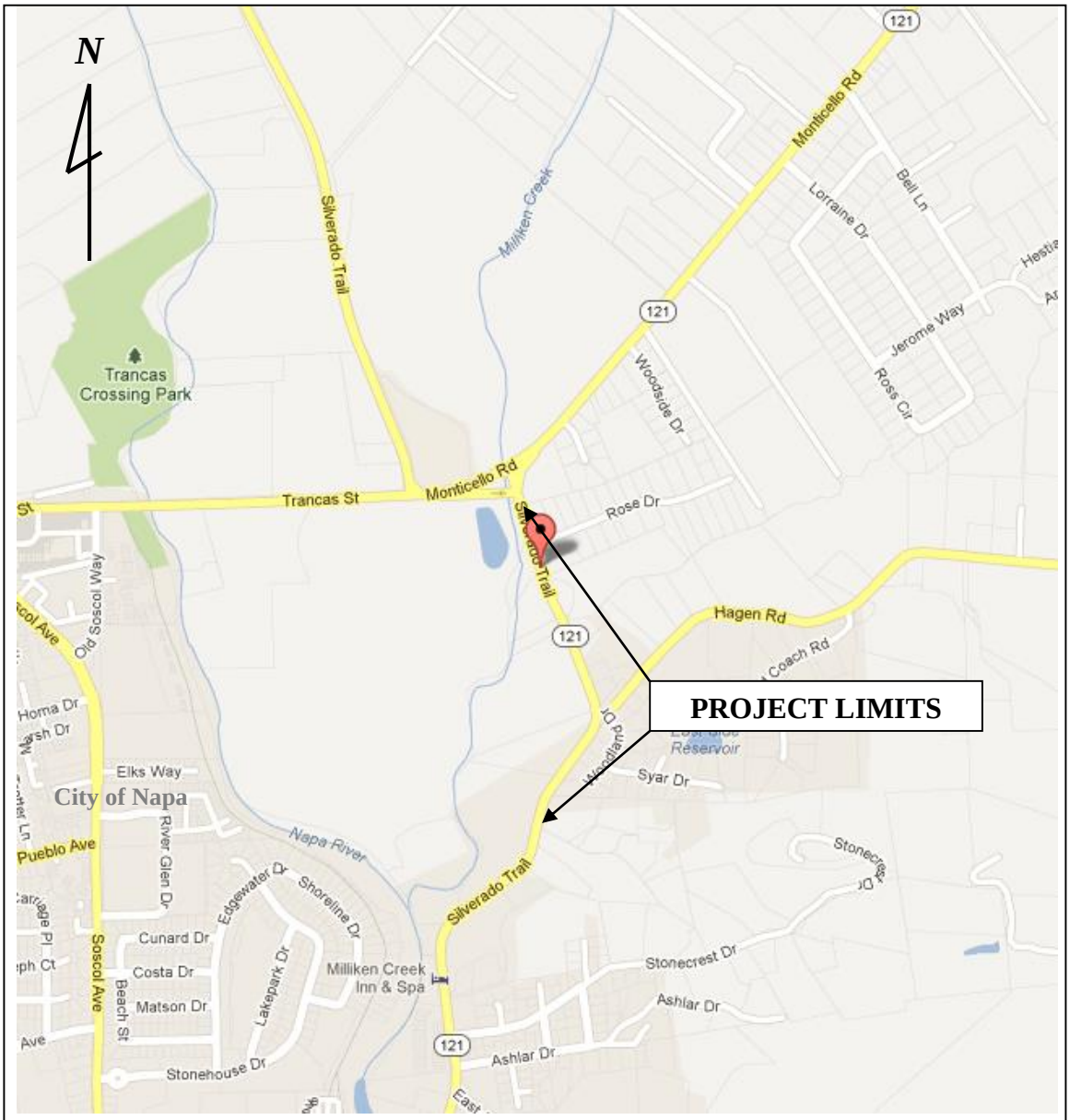


Source: Google Maps
http://maps.google.com

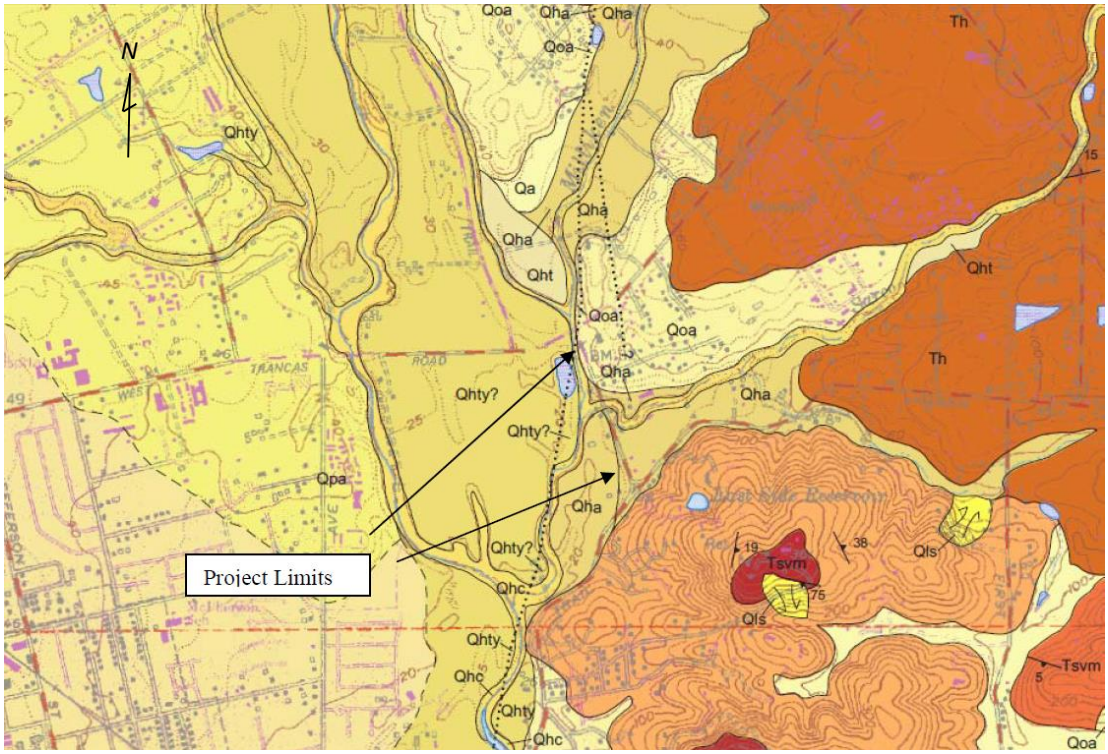
NOT TO SCALE

DIVISION OF ENGINEERING SERVICES
Geotechnical Design - West

Exhibit A: Location Map

04-NAP-121 PM 8.9/9.4
0400000817-1 January 2016

Sarco Creek Bridge (Replace)



MAP UNITS

Qhbm	Bay mud (Holocene <10,000 years) - Silt, clay, peat, and fine sand deposited at or near sea level in San Pablo Bay.
Qhc	Stream channel deposits (latest Holocene <1,000 years) - Deposits in active, natural stream channels, consists of loose alluvial sand, gravel, and silt.
Qhty	Stream terrace deposits (Latest Holocene) - Stream terraces deposited as point bar and overbank deposits along the Napa River, composed of moderately sorted clayey sand and sandy clay with gravel.
Qhfy	Alluvial fan deposits (Latest Holocene) - Alluvial fan sediment deposited by streams emanating from Dry Creek drainage, composed of moderately to poorly sorted and bedded sand, gravel, silt, and clay.
Qht	Stream terrace deposits (Holocene <10,000 years) - Stream terraces deposited as point bar and overbank deposits, composed of moderately to well-sorted and bedded sand, gravel, silt, and minor clay.
Qha	Alluvium, undivided (Holocene) - Alluvium deposited on fans, terraces, or in basins, composed of sand, gravel, silt, and clay that are poorly sorted.
Qhf (Qhf1, Qhf2)	Alluvial fan deposits (Holocene) - Alluvial fan sediment deposited by streams emanating from mountain drainages onto alluvial valleys, composed of moderately to poorly sorted sand, gravel, silt and clay.
Qf	Alluvial fan deposits (Latest Pleistocene <~30,000 years to Holocene) - Sand, gravel, silt and clay mapped on gently sloping, fan-shaped, relatively undissected alluvial surfaces.
Qa	Alluvium, undivided (latest Pleistocene to Holocene) - Flat, relatively undissected fan, terrace, and basin deposits.
Qpa	Alluvium, undivided (latest Pleistocene) - Alluvial fan, stream terrace, basin, and channel deposits, composed of poorly to moderately sorted sand, silt, clay, and gravel.
Qpf	Alluvial fan deposits (latest Pleistocene) - Composed of poorly to moderately sorted sand, silt, clay, and gravel.
Qof	Alluvial fan deposits (early to late Pleistocene) - Composed of consolidated sand, silt, clay, and gravel. Topography is moderately rolling with little or no original alluvial surfaces preserved,deeply dissected.
Qoa	Alluvium (early to late Pleistocene) - Composed of consolidated sand, silt, clay, and gravel. Topography is moderately rolling with little or no original alluvial surfaces preserved,deeply

Sonoma Volcanics (late Miocene to Pliocene) - Mafic lava flows and tuffs, rhyolite to dacite ash flow tuff, lava flows, intrusions, breccia, also includes tuffaceous sediment. The Sonoma Volcanics are divided into the following subunits:

Tsv (Tsvbn, Tsvm, Tsvaa, Tsvfh, Tsvr, Tsvdg, Tsvdgp, Tsvtt, Tsvm, Tsvt)	Tsvbn - Breccia of Napa - Dacite breccia underlying the low hills east of Napa. This unit is likely a resurgent dome within a caldera. It is capped by Tsvm an aphanitic rhyolite.
	Tsvaa - Andesite of Atlas Peak - Dark to grey, plagioclase phyric, andesite interbedded with tuff. Locally has a platy foliation.
	Tsvfh - Lava flows of Huichica Creek - Dark glassy flow rock with highly variable phenocryst assemblage, including plagioclase, pale olivine, and possible amphibole or pyroxene. Appears to be interlayered with a plagioclase phyric dacite.
	Tsvr - Rhyolite ash flow tuff - Black to light grey vitrophyre with angular lithic clasts overlying welded tuff with flattened pumice lapilli and unwelded pumice lapilli tuff. This unit overlies the older rocks with angular unconformity.
	Tsvdg - Dacite of Mt. George - Flows and domes of gray to tan porphyritic dacite. The dacite is typically strongly flow banded. The upper surfaces of flows are commonly perlitic. K-Ar ages for the dacite are 4.3±0.2 and 3.73±1.23 Ma (Mankinen, 1972; Fox and others, 1985).
	Tsvdgp - Pumice breccia, pumice lapilli tuff, and pumice lapilli tuff with lithic fragments and perlitic glass fragments that mantle flows and domes and occur between dacite flows.
	Tsvtt - Tuff of Tulucay Creek - Pumice lapilli tuff interbedded with tuffaceous volcanic agglomerate. Perlitic glass fragments are abundant in some tuff beds.
	Tsvm - Mafic flows and breccias - Basalt, basaltic andesite and andesite flows and breccias, interbedded with volcanic agglomerate and tuff.

Clahan, K.B., Wagner, D.L., Saucedo, G.J., Randolph-Loar, C.E., and Sowers, J.M., Geologic Map of the Napa 7.5' Quadrangle, Napa County, California, CGS, 2004
Scale 1:28,000

Symbol Explanation

- Contact between map units - Solid where accurately located, dashed where approximately located, dotted where concealed, queried where uncertain.
- Fault - Solid where accurately located, dashed where approximately located, dotted where concealed, queried where uncertain.
- Axis of anticline - Solid where accurately located.
- 25 Strike and dip of inclined bedding.
- Approximate strike and dip of inclined bedding.
- 25 Strike and dip of inclined foliation.
- Landslide - Arrows indicate principal direction of movement, queried where existence is questionable (some geologic features are drawn within questionable landslides); hachured where headscarp is mappable.

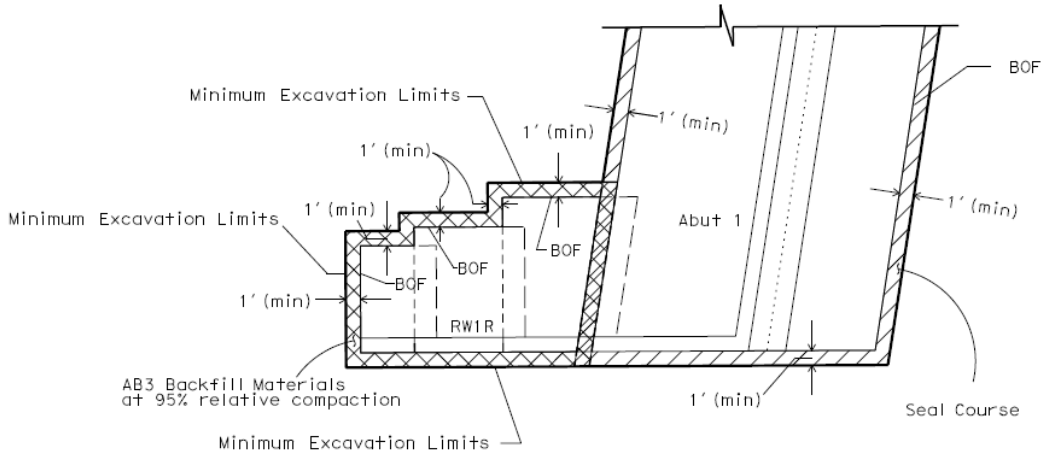
Exhibit B: Geology Map

04-NAP-121 PM 8.9/9.4
0400000817-1 January 2016

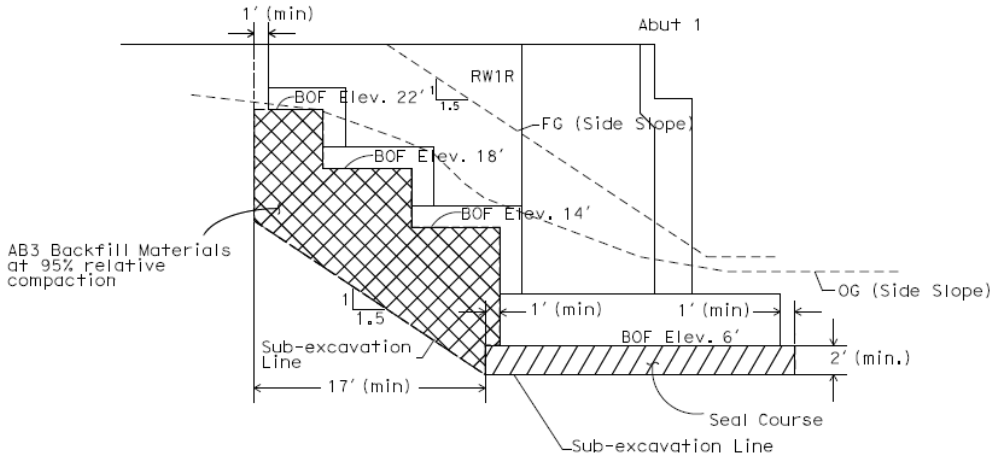
Sarco Creek Bridge (Replace)

Caltrans

Division of Engineering Services - Geotechnical Design - West



Plane View



Elevation View

Sub-excavation Typical Section & Plan View at RW1R

NOT TO SCALE

DIVISION OF ENGINEERING SERVICES **Geotechnical Design - West**	**Exhibit C**
	04-NAP-121 PM 8.9/9.4 **0400000817-1 January 2016**
	Sarco Creek Bridge (Replace)

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

Structure Hydraulics and Hydrology

FINAL HYDRAULIC REPORT

Sarco Creek Bridge

Located on State Route 121 over Sarco Creek in the County of Napa

Bridge No. 21-0008

Project ID 0400000817

04-NAP-121 14.6

July 1, 2012

PREPARED BY:
Ronald McGaugh

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 PROFESSIONAL ENGINEER
RONALD L. McGAUGH
Lic. # C61217
Exp. 06/2013
CIVIL
STATE OF CALIFORNIA

REGISTERED ENGINEER

REGISTRATION NUMBER C 61217

General:

This report is to evaluate the replacement for the existing two span structure with the placement of a proposed single span bridge along the existing alignment of State Route 121. This structure will span Sarco Creek.

Per the April, 2012 Planning Study plans, (Figure -2- on page -6-) the proposed structure replacement indicates widening of approximately 16 feet on the upstream side of the structure and 10 ft on the downstream side. The proposed structure will be on the same alignment and profile grade as the existing structure. The proposed structure is planned to be a 44 ft long, single span, reinforced slab . The thickness of the slab is calculated to be 2 feet and will have sufficient waterway area to pass the 100-year event. All foundations are spread footings.

The assumptions and calculations used for this report are based on the data and references obtained from the following sources:

- Contract Plans dated April 2012
- Caltrans' Bridge Maintenance Records
- Hydrologic, and hydraulic reports
- Planning Study Hydraulic Report dated August 2009 through October 2011
- Field photo documentation, and District 4 Bridge Site Submittal dated April 2009
- Historical cross sections
- FHWA HEC -18 Evaluating Scour At Bridges, 4th edition
- All elevations in this report are based on Vertical Datum, NGVD 29
- City of Napa, Napa County HEC2 FEMA approved regional flood model.

History:

The Sarco Creek Bridge (Br. No. 21-0008) was built in 1899. The original bridge is a steel stringer span on rubble unreinforced masonry abutment walls. The bridge was widened in 1921 and 1974 on the upstream side with single span RC girders on RC abutments. Bent 2 was added to the downstream side of the bridge in 1946 to support the original superstructure. The existing bridge length is 33.5 ft and has a total width of 33.8 ft. The NBIS Item 113 code is 3, which states, "Bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions." This bridge was given the scour critical rating due to exposed footings at Bent 2 and Abutment 3 from channel degradation in 1999. The thalweg elevation was determined to be 1 foot below the bottom of the downstream end of the Bent 2 spread footing due to degradation. It is possible that the thalwag would migrate to Bent 2 and undermine it. The existing footing is situated in a material that is well consolidated and moderately cohesive, so scour is expected to progress slowly. The current degradation rate of the thalweg from 1941 to 2004 has been less than 0.1 ft/yr. Presently there is no indication of the thalweg actively migrating. There is no history of overtopping of this bridge but pressure flow (water surface above soffit) and flooding of the approach roadway occurs periodically at this site. Drift accumulation has been a problem at Bent 2. In 1999 this structure was classified as scour critical due to the amount of scour and other structural deficiencies. This structure is presently being monitored with an annual investigation until either countermeasures to address the scour are in place or the structure is replaced.

Basin:

Sarco Creek watershed drains approximately 8.4 square miles. The watershed is located between the basins of Miliken Creek and Tulucay Creek. All three basins drain into the Napa River which controls water surface elevations due to backwater. The region consists mainly of gently sloped residential/farmlands and foothill sage lands. Approximately 60 percent of the watershed is open land at this time. Napa County has future plans for more residential, commercial and industrial development. Hot dry summers and cool wet winters characterize the climate. This region has a history of flood related sheet flow problems. The watershed ranges from elevation 5000 ft at the upper reaches of the watershed and to approximately 40 ft near the project site. This watershed has good potential for moderate debris yield. The average basin channel slope was calculated at 0.15 % and average annual precipitation is about 30 inches.

Drift:

Reviews of historical records indicate drift/debris were present but not a major problem. The proposed single span will alleviate the minor drift issues.

Discharge:

The discharge was calculated using US Geological Survey (Regional Regression Method) Magnitude and Frequency of Floods in California--Bulletin 77-21, used for the National Stream Statistics Program. Estimated discharge for the 100-year flood event is 1700 cfs. The Napa River and Milliken Creek watersheds are less than 300 downstream and much larger than the Sacro Creek watershed where the bridge site is located. The backwater from the Napa River is greater than the flow contributed by the Sarco watershed so the Q_{100} capacity is adusted to be 2100 cfs. For design purposes the Q_{100} and the Q_{50} will be 2100 cfs and 1900 cfs respectively. This flow situation has the effect that no matter how large the capacity of the structure is, the backwater elevation will always be the controlling event. For the proposed structure, the height of the backwater at the confluence is the controlling water surface elevation.

Velocity:

The estimated average channel velocity for the Q_{100} discharge of 2,100 cfs is approximately 1.3 feet per second for both the existing and proposed structures.

Streambed:

From Field observations the existing channel carrying the anticipated flow to the proposed structure is relatively straight. The streambed is mainly composed of sand, silt and clay soils. Away from the bridge site, in the upper reaches, the soils are similar. At the bridge approach, the slope is fairly flat with a gradient of 0.006 ft/ft. Manning's roughness coefficients used in calculations included 0.034 in the main channel, and 0.045 in the rough overbank area. The Manning's numbers were obtained from a site visit and surveys. The channel floodplain has light to moderate vegetation. There is little evidence that channel degradation or migration has occurred. It was not determined from aerial photos if a potential of channel migration exists or not. From the General Plan the proposed bridge will have no hydraulic skew normal to the centerline of the channel.

Model Preparation:

US Army Corps of Engineers software HEC-RAS was used to create the one dimensional model for this project. This model was compared and calibrated from the HEC 2 model provided to us by the City of Napa. The lowest calculated chord of the proposed bridge was used for the soffit elevation. The structural section depth was added to the soffit to get the planned deck elevation height. For this model the pre-conditions were based on District 4 Bridge Site Submittal dated April 2009 and the HEC 2 model. This model was prepared first by importing the HEC 2 into HEC-RAS. Additional duplicate cross sections and bridge elements were adjusted to make the HEC2 compatible with HEC-RAS. Model was then infused with latest topographical data, and re-stationed for proper pre-project representation. The last step was to add the proposed structure improvements and compare to the pre-project representation.

General parameters used for the HEC-RAS Model:

- Conservative n value of 0.035, 0.045 for the overbanks
- Average slope at structure is 0.006 ft/ft
- No increase of existing roadway
- No increase in water surface elevations per HEC 2 model at structure

Model Results and Water Surface Elevations:

Key results are shown in the Summary Table on page 6.
For both the pre and post conditions the backwater influence is longitudinally about 650 ft. upstream from the upstream bridge. The flows and velocities do not deviate in any appreciable amount for the pre-condition state to the proposed post condition state.

For this site there is no mitigation planned.

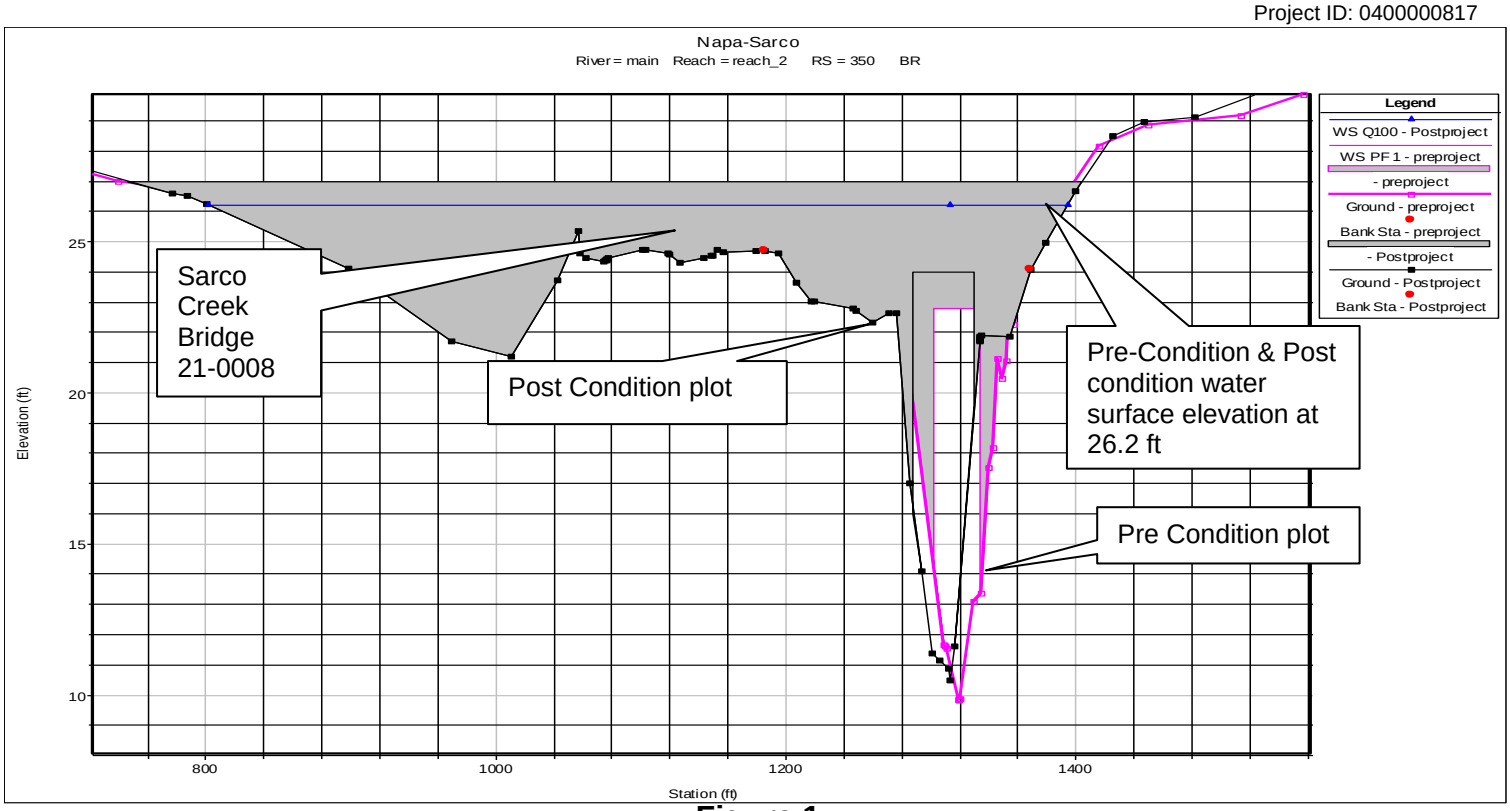


Figure 1

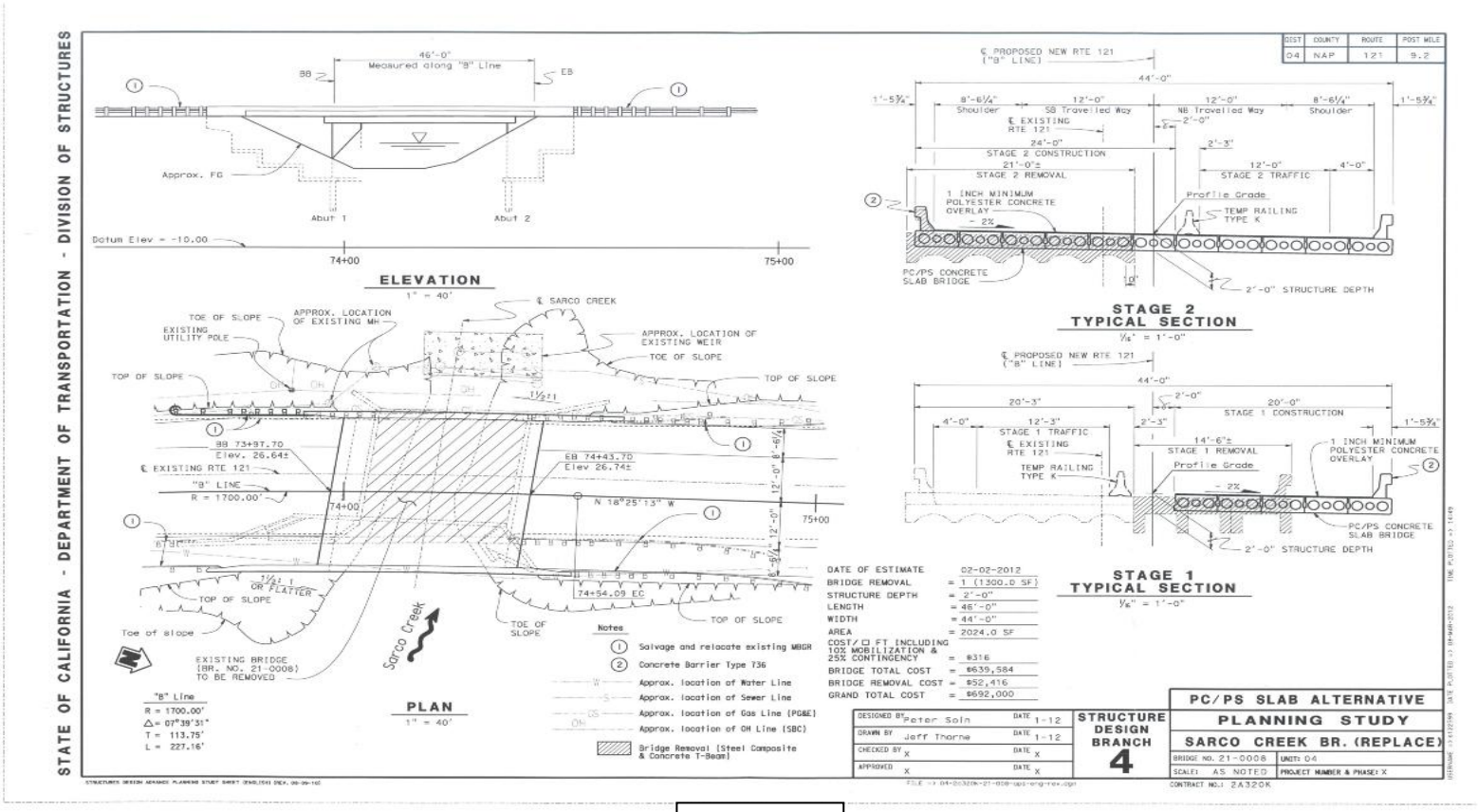


Figure 2

Scour:

The scour calculations were performed assuming the worst soil conditions as sandy soil. Since the approach velocities are so low no appreciable scour occurred.

Local Scour (ft.)	0
Contraction Scour (ft.)	1
Degradation Abutments (ft./year)	0.0
Total Pier Scour (ft.)	N/A
Total Abutment Scour (ft.)	1

Bank Protection:

Thalweg migration is not apparent, and velocities are less than 5 ft/s, therefore no bank protection is necessary.

Summary Table

Sarco Creek Bridges	
Structure depth (ft.)	2 ft
Spans	Single
Proposed Bridge Length (ft.)	46 ft
Lowest modeled soffit elevation (ft.)	26.5 ft
Q_{100} (cfs)	2100 cfs
Freeboard (ft.)	0 ft
Water surface elevation at upstream bridge face (ft.)	26.2 ft
Velocities bridge exit (ft/s)	1.3ft /s
Potential Scour Elevation At Piers (ft.)	N/A
Potential Scour Elevation at Abutments (ft.)	0.5 ft

Table A1 HEC RAS Model results comparison

River Sta	Profile	Plan	Q Total	W.S. Elev	Vel Total
			(cfs)	(ft)	(ft/s)
1463.957	Q100	Postproject	2100.00	28.83	6.37
1463.957	PF 1	preproject	2100.00	28.83	6.37
993.978*	Q100	Postproject	2100.00	26.61	4.81
993.978*	PF 1	preproject	2100.00	26.60	4.82
524	Q100	Postproject	2100.00	26.59	1.31
524	PF 1	preproject	2100.00	26.59	1.31
372.955	Q100	Postproject	2100.00	26.58	0.96
372.955	PF 1	preproject	2100.00	26.58	0.96
361.202	PF 1	preproject	2100.00	26.56	1.10
350 BR U	**Q100**	**Postproject**	**2100.00**	**26.23**	**4.67**
350 BR U	**PF 1**	**preproject**	**2100.00**	**25.99**	**5.97**
350 BR D	Q100	Postproject	2100.00	25.80	6.75
350 BR D	PF 1	preproject	2100.00	25.80	6.74
323.289	Q100	Postproject	2100.00	26.20	2.22
323.289	PF 1	preproject	2100.00	26.20	2.26
307.966	Q100	Postproject	2100.00	26.25	1.67
307.966	PF 1	preproject	2100.00	26.25	1.67
298.529	Q100	Postproject	2100.00	26.24	1.37
298.529	PF 1	preproject	2100.00	26.24	1.37
276.609	Q100	Postproject	2100.00	26.26	1.16
276.609	PF 1	preproject	2100.00	26.26	1.16
240.919	Q100	Postproject	2100.00	26.25	1.29
240.919	PF 1	preproject	2100.00	26.25	1.29
232.839	Q100	Postproject	2100.00	26.25	1.35
232.839	PF 1	preproject	2100.00	26.25	1.35
226.099	Q100	Postproject	2100.00	26.24	1.37
226.099	PF 1	preproject	2100.00	26.24	1.37
200.319	Q100	Postproject	2100.00	26.23	1.49
200.319	PF 1	preproject	2100.00	26.23	1.49
175.299	Q100	Postproject	2100.00	26.20	1.74
175.299	PF 1	preproject	2100.00	26.20	1.74

Table A2 HEC 2 to HEC-RAS conversion information

Reach	River Sta	Profile	Plan	Q Total	W.S. Elev	Vel Total
				(cfs)	(ft)	(ft/s)
Reach-1	100080	PF 1	duplicate eff	900.00	39.07	8.97
Reach-1	100080	PF 1	Eff model	900.00	89.08	8.95
Reach-1	100070	PF 1	duplicate eff	1850.00	37.73	3.29
Reach-1	100070	PF 1	Eff model	1850.00	87.73	3.29
Reach-1	100060	PF 1	duplicate eff	1850.00	34.78	10.99
Reach-1	100060	PF 1	Eff model	1850.00	84.79	10.97
Reach-1	100050	PF 1	duplicate eff	1850.00	30.60	3.84
Reach-1	100050	PF 1	Eff model	1850.00	80.53	3.92
Reach-1	100040	PF 1	duplicate eff	2100.00	28.62	7.19
Reach-1	100040	PF 1	Eff model	2100.00	78.04	8.24
Reach-1	100030	PF 1	duplicate eff	2100.00	29.02	1.02
Reach-1	100030	PF 1	Eff model	2100.00	78.54	1.20
Reach-1	100014	PF 1	duplicate eff	2100.00	28.96	0.75
Reach-1	100014	PF 1	Eff model	2100.00	78.46	0.95
Reach-1	**100012 BR U**	**PF 1**	**duplicate eff**	**2100.00**	**25.30**	**12.21**
Reach-1	**100012 BR U**	**PF 1**	**Eff model**	**2100.00**	**75.30**	**12.21**
Reach-1	100012 BR D	PF 1	duplicate eff	2100.00	25.30	12.21
Reach-1	100012 BR D	PF 1	Eff model	2100.00	75.30	12.21
Reach-1	100010	PF 1	duplicate eff	2100.00	26.20	9.59
Reach-1	100010	PF 1	Eff model	2100.00	75.70	10.92

Model Tabular table For Sarco Creek Project
September 23, 2011

Effective(datum adjusted by -50 ft)				Duplicate Effective			Pre Project			Post Project		
River Sta Napa City	Approximate distance from bridge	Q Total	W.S. Elev	River Sta Napa City	Q Total	W.S. Elev	River Sta CALTRANS	Q Total	W.S. Elev (ft)	River Sta CALTRANS	Q Total	W.S. Elev (ft)
		(cfs)	(ft)		(cfs)	(ft)						
100010	0	2100	25.70	100010	2100	26.20	323.289	2100	26.20	323.289	2100	26.20
100012	0	2100	bridge	100012	2100	bridge	350	bridge		350	bridge	
100014	14	2100	28.46	100014	2100	28.96	361	2100	26.42	372.955	2100	26.44
100030	532	2100	28.54	100030	2100	29.02	524	2100	26.45	524	2100	26.45
100040	1132	2100	28.04	100040	2100	28.62	993	2100	26.47	993	2100	26.47
100070	3000	1850	37.73	100070	1850	37.73	2982.625	1850	37.67	2982.625	1850	37.67

For the Pre Project and the Post project the 0.02 difference in water surface elevation at pre project station 361 to Post project station 372.995 is due to the 12 ft cross section location difference caused by the widening of the proposed bridge.

On the attached map below Cross sections 402,399 and 397 were overlaid on our survey data. Section 405(not shown) was used for calibration but is not included in the final HEC-RAS models. Chart below show cross section locations and reference.

FEMA HEC2 Data Sheet			Napa Hec2		Caltrans
Cross section number		distance from bridge	River Sta	distance from bridge	River Sta
396		0	100010	0	323.289
bridge			100012		bridge
397		52.6	100014	14	361.202
					372.955
398		526	100030	532	524
399		1052	100040	1132	993
400		1578			1463.957
401		2630	100060	2332	
402		3156	100070	3000	2982.625

This diagram the table below, our new survey and the HEC2 model submitted earlier was used to generate this HEC-RAS model.

DATA FOR PROPOSED FLOODWAY
(Designed to Pass Base Flood)

Cross Section	Cross Section Location mi.	Floodway Width ft.	Floodway Cross Section Area sq. ft.	Floodway Mean Velocity f.p.s.	Floodway W.S. Elev. ft.	W.S. Elev. Without Floodway ft.	Differe ft.
Sarco Creek							
396	0.0	60*	280	7.5	27.2	26.2	1.0
397	0.01	535	2,550	0.8	30.4	29.4	1.0
398	0.1	275	1,710	1.2	30.4	29.4	1.0
399	0.2	90*	400	5.3	30.1	29.0	1.1
400	0.3	130	560	3.3	31.3	30.8	0.5
401	0.5	45*	170	10.9	34.7	34.7	0.0
402	0.6	110	600	3.1	38.1	38.1	0.0
404	0.9	60*	250	6.4	46.9	46.8	0.1
405	1.0	60*	170	9.4	53.0	53.0	0.0
Milliken Creek							
Mile 0.0 to Mile 0.7 the floodway is governed by the proposed Co of Engineers Project on the Napa River							
406	0.7	315	3,280	1.4	28.1	27.1	1.0
407	0.9	110	670	6.7	29.1	28.3	0.8
408	1.1	320	960	4.7	32.1	31.0	1.1
409	1.2	535	1,880	2.4	34.1	33.0	1.1
410	1.3	90	560	8.0	35.4	34.5	0.9
411	1.4	100	620	7.3	38.7	37.9	0.8
412	1.5	165	1,200	3.8	40.7	40.4	0.3
413	1.7	105	760	5.9	41.8	41.5	0.3
414	1.76	110	410	11.0	45.7	45.7	0.0
415	1.78	90	750	6.0	47.9	47.9	0.0
416	1.79	90	840	5.4	49.0	48.0	1.0
417	1.8	135	510	8.9	49.0	48.1	0.9
418	1.9	150	700	6.5	54.2	53.9	0.3
419	2.0	80	490	9.2	57.8	56.7	1.1
420	2.1	125	880	5.1	60.7	60.6	0.1

Face o
10030

Note: * indicates that the computed floodway is inside the channel banks.

The following pages represent additional forms required by the City of Napa and is not a normal part of our Final Hydraulic Report.

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires: ***12/31/2010***

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Napa river
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☐ Precipitation/Runoff Model
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	100010	323	26.2	26.2
Upstream Limit	100040	1463	29.0	28.84

2. Hydraulic Method/Model Used

Hec-ras Version 4

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs may help verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. **These tools do not replace engineering judgment.** CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. Review of your submittal and resolution of valid modeling discrepancies may result in reduced review time.

4. Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name: hec2	Plan Name:	File Name:	Plan Name:	nvgd29
Corrected Effective Model*	File Name: Dup2	Plan Name: Eff Model	File Name:	Plan Name:	nvgd29
Existing or Pre-Project Conditions Model	File Name: Dup2	Plan Name: Preproject	File Name:	Plan Name:	nvgd29
Revised or Post-Project Conditions Model	File Name: Dup2	Plan Name: postproject	File Name:	Plan Name:	nvgd29
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	_____

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

☐ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
      - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot.

   b. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No

      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR/CLOMR requests, does this request have the potential to impact an endangered species? ☐ Yes ☒ No

   If Yes, please submit documentation to the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.

   For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

FLOODWAY "NO-RISE /NO-IMPACT" CERTIFICATION

This document is to certify that I am duly qualified engineer licensed to practice in the State of California (State). It is to further certify that the attached technical data supports the fact that proposed Sarco Creek Bridge (Name of Development) will not impact the base flood elevations, floodway elevations, and floodway widths on SARCO CREEK (Name of Stream) at published cross sections in the Flood Insurance Study for, City of Napa California (Name of community), dated 09/26/2008 (Date) and will not impact the base flood elevations, floodway elevations, and floodway widths at the Unpublished cross-sections in the area of the proposed development.

REGISTERED PROFESSIONAL ENGINEER
STEVE NG
No. C 35187
Exp. Sept. 30, 2013
CIVIL
STATE OF CALIFORNIA

SEAL, SIGNATURE AND DATE

Steve Ng
Name

Senior Transportation Engineer
Title

California Dept. of Transportation

1801 30th St Sacramento, CA 95816
Address

FOR COMMUNITY USE ONLY:
Community Approval

☐ Approved ☐ Disapproved

Community Official's Name | Community Official's Signature | Title

FEMA, MT
DTD.09/2004

WATER QUALITY INFORMATION HANDOUT

CONTRACT NO. 04-2A320

04- NAP-121-PM 9.2/9.4

SARCO CREEK BRIDGE REPLACEMENT

California Department of Transportation
District 04
Office of Water Quality
111 Grand Avenue, Oakland, CA 94612

~~March 2016~~
Revised July 2016

Disclaimer

A "Disclaimer" is required specifying that the information provided in the Water Quality Information Handout is just a guideline and is to be used for information purposes only and should not be considered a sole source document to adhere to the requirements of the new National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), Number CAS000002, adopted Order 2009-0009-DWQ (as amended by 2010-0014-DWQ and 2012-006-DWQ). The contractor is required to provide water quality monitoring, sampling and implement best management practices (BMPs) based on standard industry operations, field conditions and conditions encountered based on the contractor's means and methods. The information in this handout is not to be construed in any way as a waiver of the provisions in the CGP. Bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to satisfy the conditions encountered in performance of work, with respect to the following: sampling and monitoring locations, distribution of watershed areas for sizing of BMPs, and selection of BMPs in order to conform to the requirement of the contract documents and the CGP.

1 Project Information

1A Project Description

The proposed project is located on State Route 121 (Silverado Trail) in the City of Napa between postmile 9.2 and 9.4. The Sarco Creek Bridge was constructed in 1918 and widened in 1974. The bridge was classified as "scour critical" in the latest Structures Replacement and Improvement Needs (STRAIN) report that resulted in the need for replacement of the Sarco Creek Bridge as it is structurally deficient.

The proposed project will remove the existing two span Sarco Creek Bridge and replace it with a single span concrete structure as part of a bridge rehabilitation project which includes roadway widening and construction of a fish passage downstream of the bridge.

Latitude and Longitude:	38.3234,-122.2734
Construction Start Date	01/01/2017
Construction End Date	01/01/2018
Project Area	2.37 ac
Disturbed Soil Area	1.45 ac

1B Receiving Water Bodies

Sarco Creek flows into Milliken Creek and eventually to Napa River. Napa River is on the Clean Water Act 2012 303(d) list of water quality limited segments for sedimentation/siltation, pathogens, and nutrients.

2 Construction General Permit

A Storm Water Pollution Prevention Plan (SWPPP) is required since the disturbed soil area is more than one acre. Rain event action plans (REAPs), storm water sampling and analysis days, and storm water annual reports are required.

2A Risk Level

Since this project has disturbed soil area of more than one acre, a risk level determination was assessed. The site sediment risk factor is medium and the receiving water risk factor is high. The combined risk level for this project is 2. The risk level determination is attached.

3 Temporary Construction Site BMPs

The estimated quantities of temporary construction site BMPs are in the PSE package. Various soil stabilization, sediment control and tracking control are proposed due to the project's direct discharge into the Sarco Creek. A temporary creek diversion system and a temporary construction access road are proposed.

3A Water Quality Monitoring

Water quality monitoring is required for in-water work. Locations also need to be reviewed for inspection and/or sampling, such as stockpiling locations, contractor's yard, and possible areas of high sediment and pH discharge.

3B Run-on Discharges

Run-on discharges are off-site storm water that can potentially run onto the site. Run-on discharges should be calculated based on a rainfall intensity for a 2-year 24-hour event per the PPDG. The Rational Method is typically used to calculate run-on discharges.

Equation: $Q=CiA$

where Q = Run-on discharge (cubic feet per second)

C = Runoff coefficient (see HDM Figure 819.2A)

i = 2-year, 24-hour rainfall intensity (inches/hour)

The Contractor needs to verify all run-on for the proposed project.

3C Temporary Creek Diversion System

A temporary creek diversion system is proposed during in-water work. The nSSP and plans are in the PSE package. The plans show a system consisting of gravel bags and an impermeable plastic membrane. As noted in section 3A, sampling and monitoring will be required. Summer flows calculations are attached.

3D Dewatering

An Active Treatment System specification is included in the project. A dewatering and discharge work plan is required before dewatering activities.

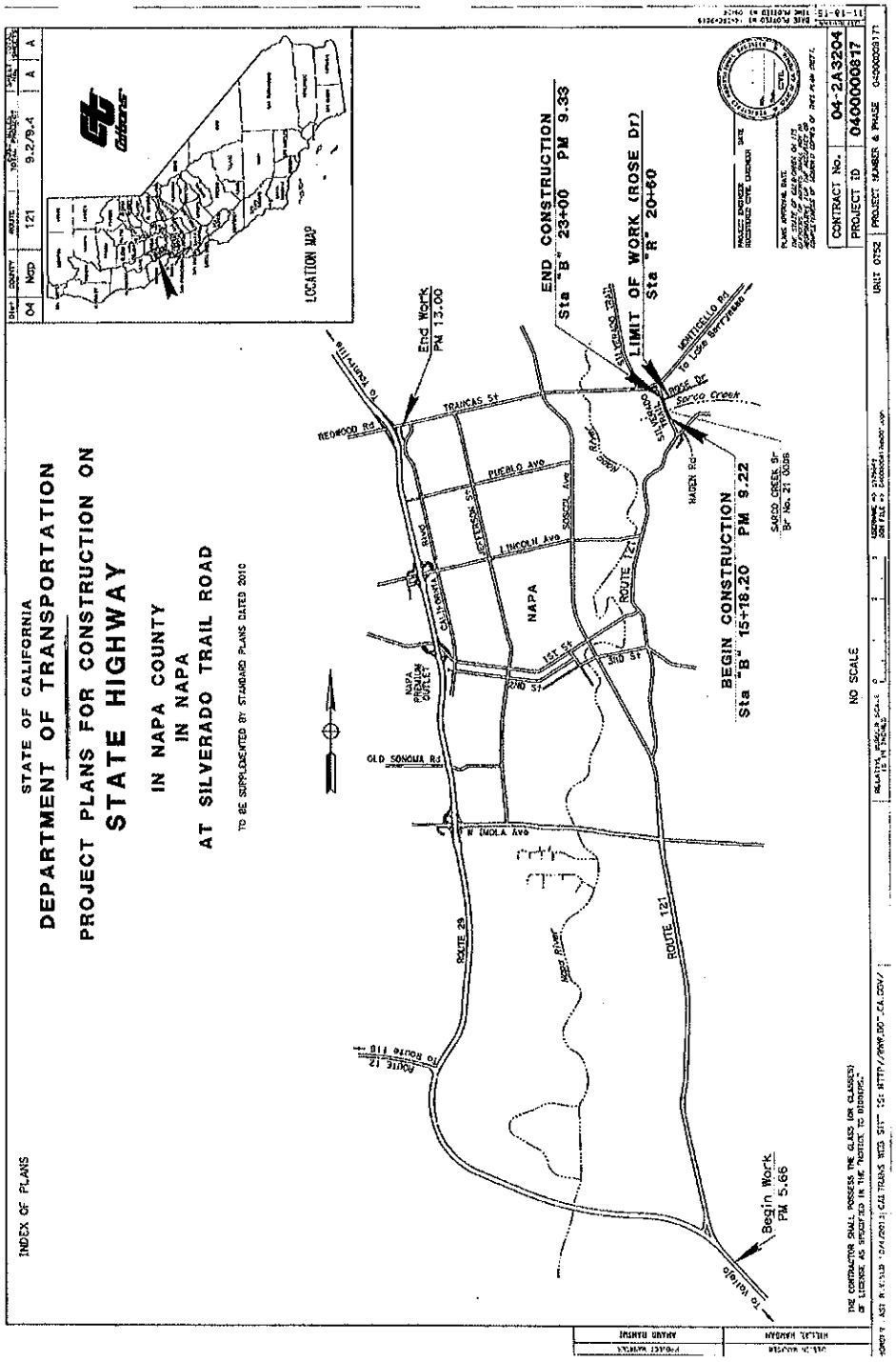
The specification allows discharging into a POTW system. If groundwater, stormwater, or both are discharged to a POTW, the Contractor needs to obtain a municipal batch discharge permit and is responsible for all costs and requirements related to obtaining the municipal batch discharge permit and discharging the water. The seepage rate memo and list of POTWs are attached.

4 Permits

4A General

The permits required for the project note conditions that may call for special consideration from the Contractor. Conditions include work windows for in water work and various job site management, including equipment and stockpiles.

ATTACHMENT A: MAP



ATTACHMENT B

RISK LEVEL DETERMINATION

Sediment Risk Factor Worksheet	**Entry**
A) R Factor	
Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.	
http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	62.5
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.	
Site-specific K factor guidance	
K Factor Value	0.28
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.	
LS Table	
LS Factor Value	0.89
Watershed Erosion Estimate (=RxKxLS) in tons/acre	15.575
Site Sediment Risk Factor Low Sediment Risk: < 15 tons/acre Medium Sediment Risk: >=15 and <75 tons/acre High Sediment Risk: >= 75 tons/acre	**Medium**

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	yes	High
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml		
Region 1 Basin Plan Region 2 Basin Plan Region 3 Basin Plan Region 4 Basin Plan Region 5 Basin Plan Region 6 Basin Plan Region 7 Basin Plan Region 8 Basin Plan Region 9 Basin Plan		

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	Level 2
High	Level 2	Level 2	Level 3

Project Sediment Risk: Medium

Project RW Risk: High

Project Combined Risk: Level 2

ATTACHMENT C

GROUNDWATER SEEPAGE RATE

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. KARMAN NAKHJIRI
Senior Transportation Engineer
Office of Water Quality

Date: March 18, 2014

Attention: N.Tran
M.Hung

File: 04- NAP- 121 PM8.9/ 9.4
04 – 2A3201
E-FIS 0400000817
Sarco Creek Bridge Replacement
And Retaining Wall

From: RIFAAT NASHED RN
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

CHRIS RISDEN
Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject : **SEEPAGE RATE (FLOW RATE) ESTIMATE AT SARCO CREEK BRIDGE**

This memo is in response to your request to provide the groundwater depth and seepage rate for the construction of two abutments and one type 5 retaining wall wing wall located in the project site. All the construction elements will be supported by spread footing method. It is our understanding that this information will be used in estimating dewatering quantities.

It should be noted that our estimate is based on the following:

1- For the Abutment 1 and 2 upper footing, elevation ranges between 12 ft and 26 ft, but we considered in our calculations as 12 feet as the worst case scenario.

2- The bottom of the footing elevation for the Abutments 1 & 2 is 3 feet.

3- For simplicity, we considered one pool of excavation for each side to include one abutment and the first adjacent element of the wing wall. The anticipated excavation dimension is 44 ft x 25 ft in each side of the bridge at the bottom and 62 ft x 43 ft at the top of the excavated pool and 9 feet depth (assuming 1:1 cut).

4- The groundwater elevation is 12.3 ft as encountered in Borehole No. RC-12-001 drilled in August 2012.

Abutment 1 & first element of the wing wall

Based on the LOTB of boring RC-12-001 drilled in August 2012 (at the southern side of the abutment), the soil at and below the groundwater level and extending to the bottom of the footing is elastic silt (MH) with trace of fine gravel.

By using the Coefficient of Permeability, K value 2.7×10^{-4} ft /day for elastic silt, the seepage rate for this location is 0.001 gallon/day/ft^2.

Abutment 2 & first element of the wing wall

Based on the LOTB of boring RC-12-002 drilled in August 2012 (at the northern side of the abutment), the soil at and below the groundwater level and extending to the bottom of the footing is elastic silt (MH) with trace of fine gravel.

By using the Coefficient of Permeability, K value 2.7×10^{-4} ft /day for elastic silt, the seepage rate for this location is 0.001 gallon/day/ft^2.

According to "The Federal Highway Report NO. FHWA-TS-80-224, Page 48-49" the Coefficient of Permeability K (ft./day) for the soils encountered are as follows

Unified Soil Classification	Coefficient of Permeability K (ft./day)
Elastic Silt (MH)	2.7×10^{-4} to 2.7×10^{-6}

Our estimate of the seepage rate (flow rate) for the project area in general is approximately 0.001 gallons /day/ ft^2. This seepage rate (flow rate) estimate is provided for cost estimate purposes only.

If you have any questions or need additional information, please call Rifaat Nashed at (510) 622-1773 or Chris Risden at (510) 622-8757.

c: TPokrywka, CRisden, Daily File

RNashed/mm

Sarco reek Bridge & Retaining Retaining Wall - Seepage Rate

Construction Elemen	Soil Type	Bed Thickness under G.W.(ft)	Length (ft)	Width (ft)	A (ft^2)	K (ft/day)	H (ft)	H0 (ft)	dH (ft)	d S (ft)	i	q(ft3/day)	q total (Gallon/day)	Flow Rate (Gallon/day/ft2)	Average flow rate per sector(Gallon/day/ft2)
Abutment 1 & Wing wall															
	Elastic silt (MH)	9.0	62 (44+18)	43 (25+18)	2666	0.00027	12.3	3.00	9.30	35.34	0.2632	0.189426316	1.413629222	0.0005302	0.001
Abutment 2 & Wing wall															
	Elastic silt (MH)	9.0	62 (44+18)	43 (25+18)	2666	0.00027	12.3	3.00	9.30	35.34	0.2632	0.189426316	1.413629222	0.000530244	0.001
														General Average	0.001

q = KIA

Note

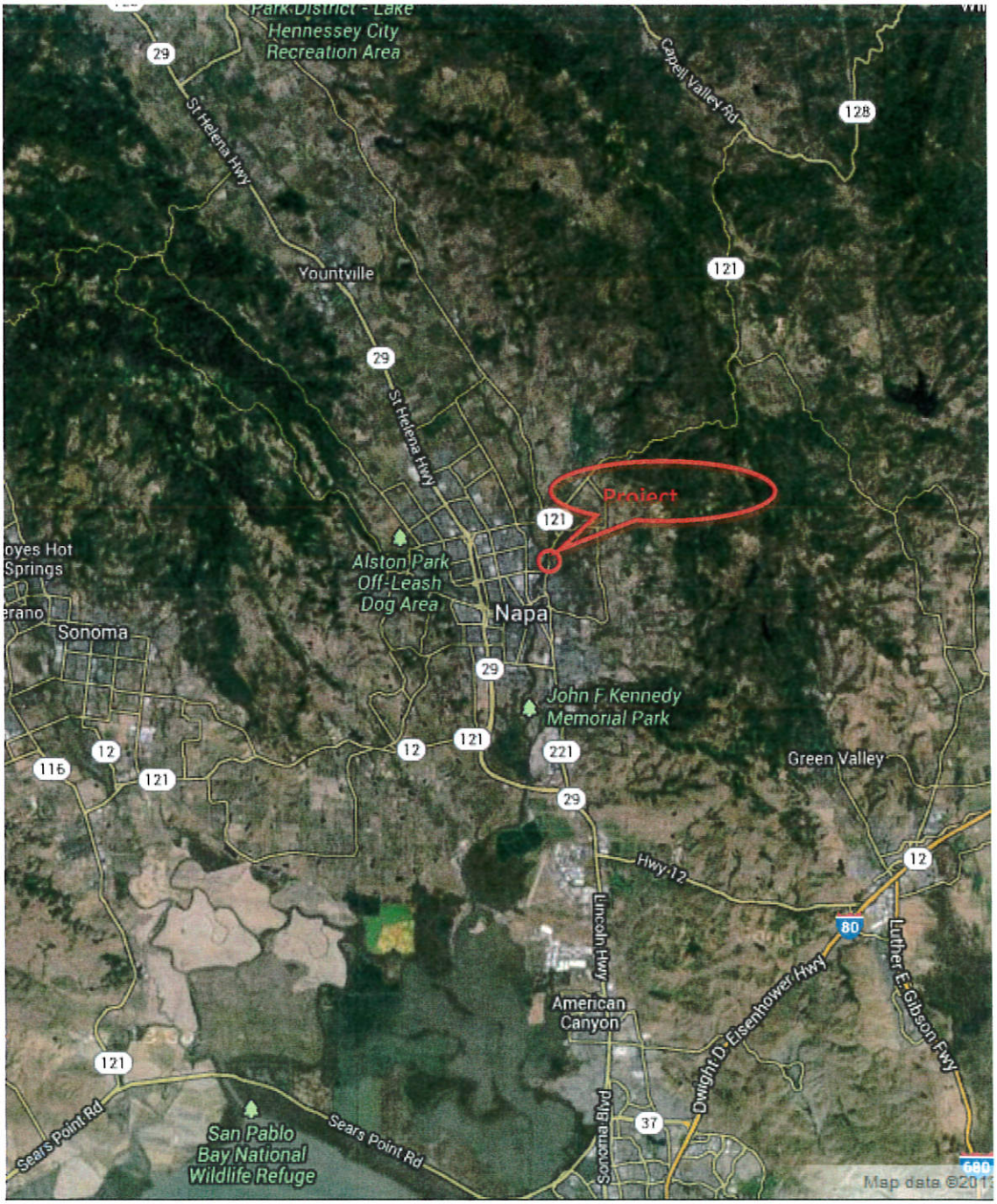
A = Surface area
k = Soil permeability (from Hwy Subdrainage Design Report No. FHWA - TS-80-224- Page 48-49) and
H = ground water elevation
H0 = elevation the bottomof excavation
dH = water head
ds = gradient distance $L_f = 3.6x(H - H0)$.....Ref. FHWA-Ts-80-224 Page 56
"i" = dH/ds
q total = (gallon/day/ft2) = q total (gallon/day)/ total surface area

ATTACHMENT D

SUMMER FLOW CALCULATION

EA 2A320 Sarco Creek

Summer Runoff Rates



Norman Gonsalves

Caltrans D4 Office of Water Quality

September 2013, (Updated July 2016)

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1. INTRODUCTION

1.1 Purpose and Need

This study evaluates the risk associated with summer flows in Sarco Creek, at Post Mile 8.9/9.4 on State Route 121, in Napa County.

It is needed to establish a reasonable risk to be assumed by the contractor for stream diversion work necessary for the construction of a new highway bridge at this location. It may also be needed to determine the probability of occurrence of significant flows that actually occur during the project construction period.

The period of interest ("summer flows") for this project is from June 1 to October 15.

This document is intended to explain the methodology used to determine summer flows for this project and to present the results clearly. It is not intended to be an instruction manual for the software used.

The use of Streamstats and Web Soil Survey, both very popular online tools, is quite straightforward. Minimal guidance has been provided for selecting rain gages in BASINS 4.1. Creating a SWMM file with BASINS 4.1 could present some challenges.

SWMM, with its large set of engineering methods, has a high potential for producing widely varying results. Therefore, some guidance was presented on its use for this purpose, to hopefully limit the range of results.

Using a spreadsheet to separate flows for the period of interest requires the development and use of a Visual Basic macro. Expert spreadsheet users should find this task not too difficult.

The use of HEC-SSP for the log-Pearson III analysis is also fairly straightforward. The user, however, needs to become familiar with this software, BASINS 4.1 and especially SWMM 5.

2. METHODOLOGY

2.1 Methodology Outline

The basic premise is to analyze an annual series of stream flows in Sarco Creek that includes only the days in the period of interest for each year.

Sarco Creek is un-gauged and therefore its flow rates have to be simulated. This is accomplished using publicly available continuous rainfall data and a hydrology model to generate a complete set of daily runoff flow rates. The Rational Method may used for watersheds of area less than 0.5 square mile (Caltrans Highway Design Manual (HDM) Index 819.2).

A spreadsheet is then used to isolate flow rates for the period of interest, from which an annual series is derived. Probabilities of occurrence for various flow rates are then calculated using a log-Pearson Type III distribution, as recommended in Bulletin 17B (Section 4.3.4 of HDS-2 Highway Hydrology).

2.2 Software

2.2.1 Streamstats: The Sarco Creek watershed was plotted using Streamstats, (http://water.usgs.gov/osw/streamstats) which is an online application created by the United States Geological Survey (USGS).

Streamstats uses a Digital Elevation Model to plot stream paths and watershed limits. It produces the shed area (A, in square miles), Mean Annual Precipitation (p, in inches), and the altitude index (H, in thousands of feet).

The software uses these values to calculate peak flows for the shed, for various return periods, using the Regional Flood-Frequency Equations found in Figure 819.2C in the HDM. These "all-year-round" peak flows will be used later to calibrate the hydrology model.

It also produces the elevation at the shed outlet (project site), mean shed slope, percentage of shed covered by forest, percentage of shed covered by lakes and ponds, percentage of shed impervious area and the length of the longest shed flow path. These are useful for SWMM and hand calculations.

2.2.2 Web Soil Survey (http://**websoilsurvey**.nrcs.usda.gov) produces the Hydologic Soil Groups (HSG) for soils within the watershed. Using the watershed plot from Streamstats, the user plots the watershed in Web Soil Survey. This results in percentages of each soil type for the shed. These, when combined with the cover type (forest, impervious area, etc), produce Curve Numbers for use in SWMM 5, to calculate watershed infiltration. A single area-weighted Curve Number should be developed.

2.2.3 BASINS 4.1 (http://www.aquaterra.com/basins4) produces the continuous rainfall data for the shed runoff simulation. The rain gage should be selected carefully, taking elevation and years of rainfall data into consideration. The data should be edited to keep only non-zero hourly precipitation values, for efficiency. Either a Rainfall File (Section 11.3 of the SWMM Manual) or Time Series File (Section 11.6 of the SWMM Manual) should be generated in BASINS 4.1 for use in SWMM.

2.2.4 SWMM 5 (http://www.epa.gov/nrmrl/wswrd/wq/models/swmm) should be used to convert the continuous rainfall data from BASINS 4.1 to an hourly shed runoff set.

The project should be set up as a single watershed (S1) and outlet (Out1), with a rain gage (RG1). Watershed information from Streamstats (area in acres, mean slope, percentage of impervious area) should be used.

Watershed values for "Manning's overland n" and "watershed storage" for pervious and impervious surfaces, needed in S1, may be taken from Tables A.5 and A.6 in the SWMM Manual. The infiltration method should be set to "Curve Number" in the SWMM Options dialog box and the Reporting Time steps to 1 hour.

The weighted Curve Number from Web Soil Survey should be entered in the Infiltration dialog box, within the S1 watershed dialog box.

The model should be run after the rainfall or time-series file from BASINS 4.1 is connected to the rain gage, the simulation dates are set in the SWMM Options dialog box.

The Statistics reporting tool should be used to view the return periods of the simulated runoff events, by setting Object Category

to Sub-catchment, Object Name to S1, Variable Analyzed to Runoff, Event Time Period to Annual and Statistic to Peak.

At this point, values for the return periods are based on the natural distribution of the data. These values will change somewhat after data are fit to a log-Pearson III distribution.

The 5-year event should be used for calibrating the SWMM model because it is intermediate between the 2-year and 10-year events. The simulated 2-year event will tend to be higher, and the simulated 10-year event lower, than the corresponding events from Streamstats.

Calibration should be accomplished by varying the watershed width until 5-year simulated peak from SWMM is close (within 5%) of the 5-year event from Streamstats.

The complete flow series is produced by resetting the Event Time Period in the Statistics Reporting tool from Annual to Daily and re-running the tool (after matching the 5-year events).

2.2.5 Spreadsheet. The complete flow series generated in SWMM should be copied to a spreadsheet, via the clipboard. Unnecessary columns should be deleted, keeping only the "Start Date" and "Daily Peak" columns. Sort the data by date, oldest first.

Flow values for the days of interest (1 June to 15 October, for example) should be extracted from the complete series and an annual series based on these days only should be created (using a Visual Basic macro, for example).

2.2.6 HEC-SSP (http://www.hec.usace.army.mil/software/hec-ssp) should used to perform the log-Pearson Type III analysis on the annual series, by importing the series directly from the spreadsheet.

This analysis produces flow values for standard return periods, based on industry-accepted software and methods.

3. RESULTS AND RECOMMENDATIONS

3.1 Streamstats

Basin Characteristics Report (StreamStats)

Date: Tue Nov 26 2013 15:34:44 Mountain Standard Time
NAD27 Latitude: 38.3232 (38 19 24)
NAD27 Longitude: -122.2722 (-122 16 20)
NAD83 Latitude: 38.3231 (38 19 23)
NAD83 Longitude: -122.2733 (-122 16 24)

Table 1. Basin Characteristics Report

Parameter	Value
Area, in square miles	8.3
Mean annual precipitation, in inches	29.4
Maximum elevation, in feet	1876
Minimum elevation, in feet	16
Elevation at outlet, in feet	16
Average basin elevation, in feet	631
High Elevation Index - Percent of area above 6000 feet	0
Altitude Index, in thousands of feet. Estimated as 0.00083 times mean basin elevation.	0.52
Mean basin slope computed from 30 m DEM, in percent	20.9
Percentage of basin covered by forest	17.2
Percent of area covered by lakes and ponds	0
Percentage of impervious area determined from NLCD 2001 imperviousness dataset	3.1
Latitude of the outlet, NAD83	38.32312
Distance in miles from basin centroid to the coast	36.1

Streamstats Ungaged Site Report

Date: Tue Nov 26 2013 15:32:34 Mountain Standard Time
Site Location: California
NAD83 Latitude: 38.3231 (38 19 23)
NAD83 Longitude: -122.2733 (-122 16 24)
Drainage Area: 8.3 mi2
Percent Urban: 15.9 %
Percent Impervious: 3.1 %

Table 2. Regional Regression Equation Input

Peak-Flow Basin Characteristics			
100% North Coast Region (8.3 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	8.3	0.13	3113
Mean Annual Precipitation (inches)	29.4	19	104
Altitude Index (thousand feet)	0.52 (below min value 1)	1	5.7

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Table 3. Regional Regression Equation Output

Peak-Flow Streamflow Statistics					
Statistic	**Flow (ft^3/s)**	**Standard Error (percent)**	**Equivalent years of record**	**90-Percent Prediction Interval**	
				Minimum	**Maximum**
PK2	652				
PK5	904				
PK10	1110				
PK25	1290				
PK50	1460				
PK100	1550				
PK500	1860				

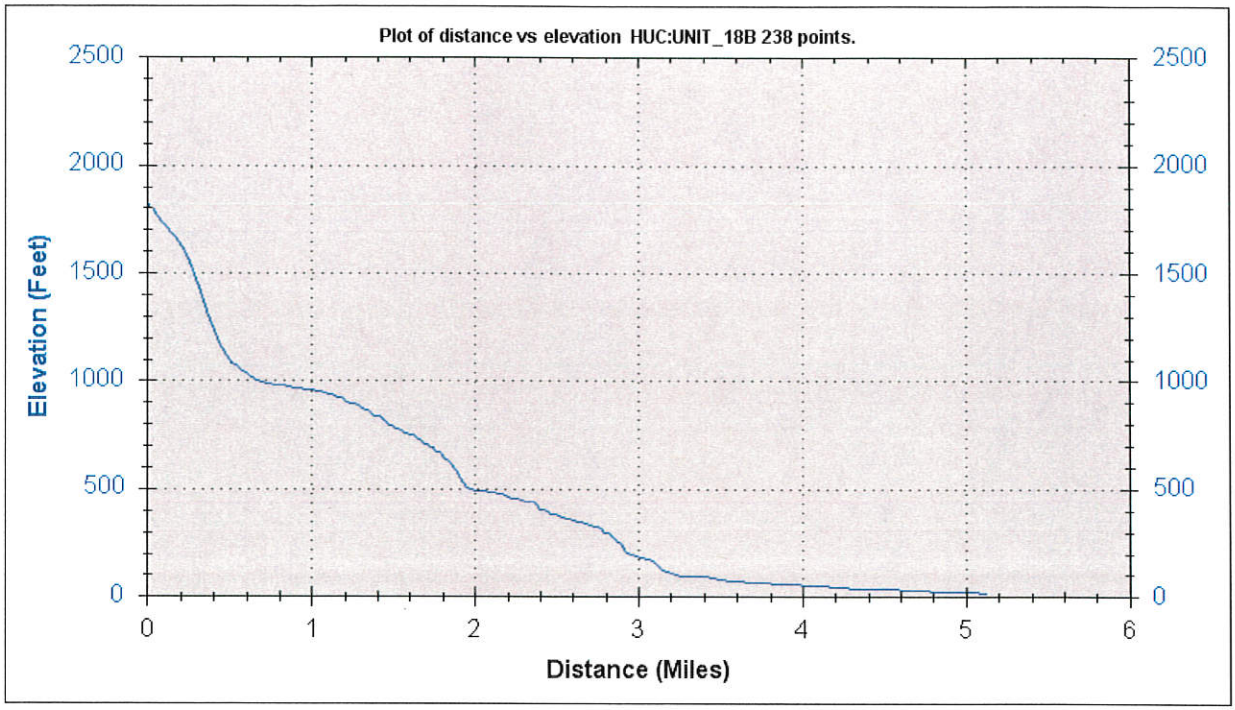

Fig 1. Profile of Sarco Cr from western extreme to SR-121 (from StreamStats)

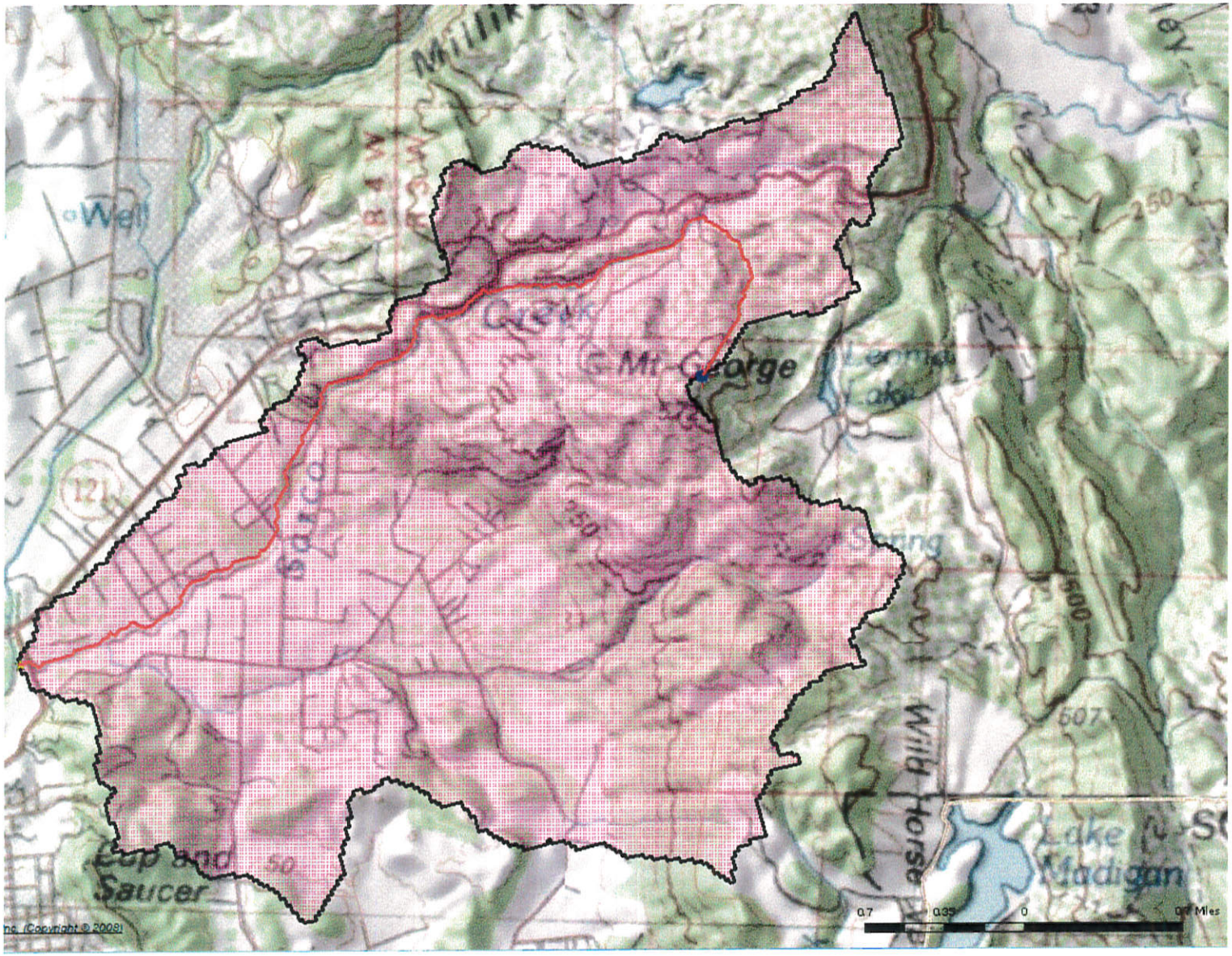

Fig 2. Sarco Cr watershed at SR-29 (produced with StreamStats)

3.2 Web Soil Survey

Table 4. Weighted Curve Number

Symbol	HSG	Area (Acre)	Area (%)	Cover	CN*	Area*CN
105	C	55.9	1.10%	Good, Lawn	74	4136.6
122	B	428.1	8.00%	Fair, Lawn	69	29538.9
123	B	944.3	17.70%	Good, Lawn	61	57602.3
139	C	227.3	4.30%	Farmsteads	82	18638.6
140	C	235	4.40%	Fair, Forestland	76	17860
146	C	43.8	0.80%	Fair, Lawn	79	3460.2
150	C	20.8	0.40%	Fair, Pasture	79	1643.2
151	D	136.1	2.60%	Fair, Wood/Grass	82	11160.2
152	D	846.2	15.90%	Fair, Forestland	82	69388.4
155	D	43.1	0.80%	Good, Pasture	80	3448
156	D	547.6	10.30%	Good, Forestland	79	43260.4
175	D	1,077.30	20.20%	Fair, Wood	79	85106.7
176		415	7.80%	Rock Outcrop	99	41085
178	C	247.6	4.70%	Fair, Sage-grass	63	15598.8
179	C	16.1	0.30%	Poor, Wood	77	1239.7
181	B	28.2	0.50%	Good, Sage-grass	47	1325.4
183		8.1	0.20%	Water	0	0
Totals for Area of Interest		5,320.30	100.00		0	404492.4

*CN taken from Table 5.4 HDS-2 Highway Hydrology

Total Area = 5,320.30 acres.

Total Area*CN = 404492.4 acres.

Weighted Curve Number = Total Area*CN / Total Area = 404492.4 / 5,320.30 = 76

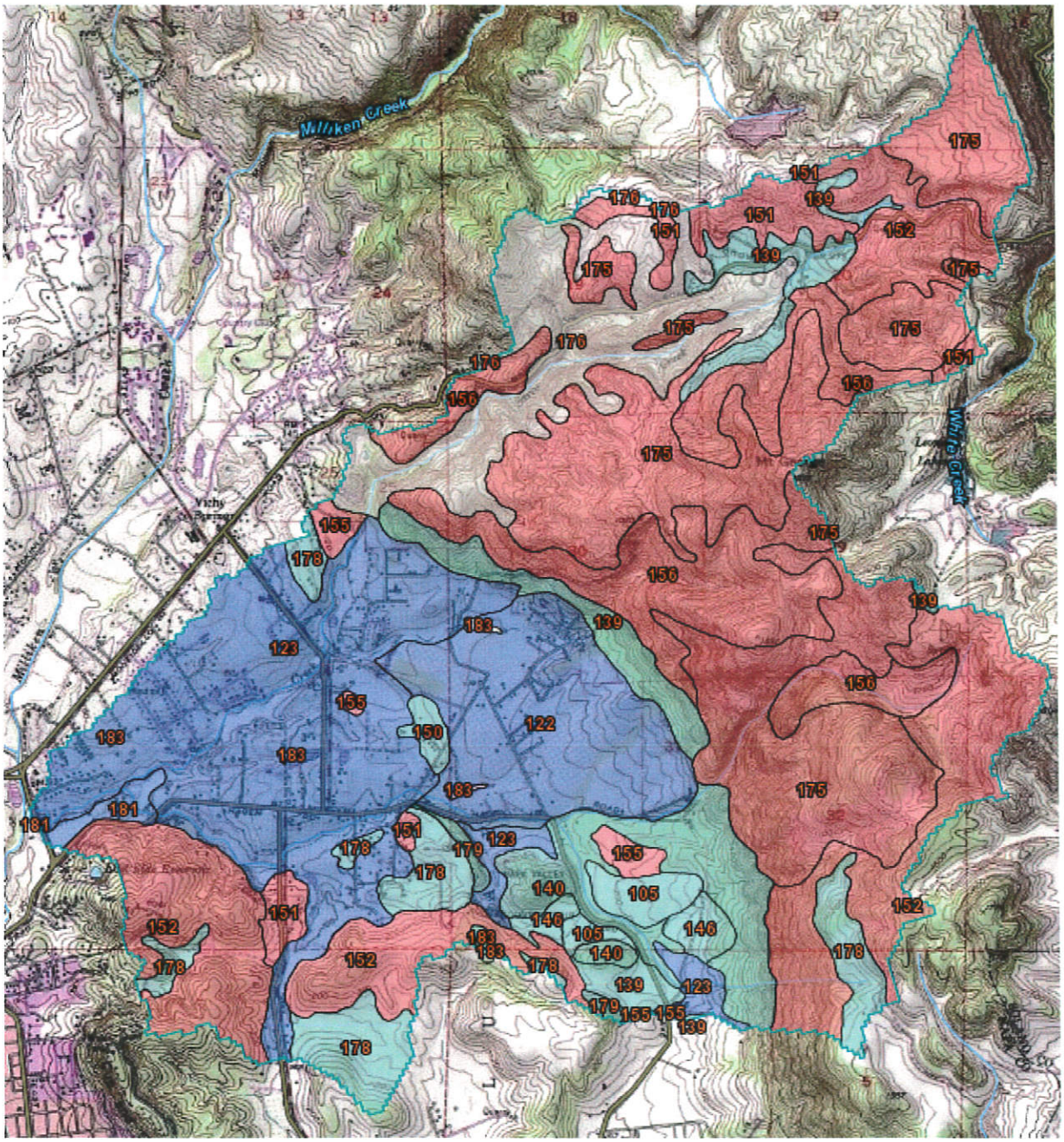

Fig 3. Hydrologic Soil Group Map (from Web Soil Survey)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Topographic Map
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 4, Dec 10, 2007

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 2, 2010—Feb 17, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Fig 4. Map legend for Figure 3.

Table 5. Hydrologic Soil Group

Table—Hydrologic Soil Group (Sarco Creek)

Hydrologic Soil Group— Summary by Map Unit — Napa County, California (CA055)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
105	Bale clay loam, 2 to 5 percent slopes	C	55.9	1.1%
122	Coombs gravelly loam, 0 to 2 percent slopes	B	428.1	8.0%
123	Coombs gravelly loam, 2 to 5 percent slopes	B	944.3	17.7%
139	Forward gravelly loam, 9 to 30 percent slopes	C	227.3	4.3%
140	Forward gravelly loam, 30 to 75 percent slopes	C	235.0	4.4%
146	Haire loam, 2 to 9 percent slopes	C	43.8	0.8%
150	Haire clay loam, 15 to 30 percent slopes	C	20.8	0.4%
151	Hambright-Rock outcrop complex, 2 to 30 percent slopes	D	136.1	2.6%
152	Hambright rock-Outcrop complex, 30 to 75 percent slopes	D	846.2	15.9%
155	Kidd loam, 15 to 30 percent slopes	D	43.1	0.8%
156	Kidd loam, 30 to 75 percent slopes	D	547.6	10.3%
175	Rock outcrop	D	1,077.3	20.2%
176	Rock outcrop-Hambright complex, 50 to 75 percent slopes		415.0	7.8%
178	Sobrante loam, 5 to 30 percent slopes	C	247.6	4.7%
179	Sobrante loam, 30 to 50 percent slopes	C	16.1	0.3%
181	Yolo loam, 0 to 2 percent slopes	B	28.2	0.5%
183	Water		8.1	0.2%
Totals for Area of Interest			**5,320.3**	**100.0%**

Rating Options—Hydrologic Soil Group (Sarco Creek)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

3.3 Basins 4.1

Rain gage selection

The rain gages considered are listed below.

Table 6. Rain gages considered.

Station Name	Start	End	Lat	Long	MAP	Elev
			deg	deg	inches	feet
NAPA	6/30/1948	12/31/1965	38.3	-122.283	25.62	6.096
NAPA STATE HOSPITAL	12/2/1946	12/31/2009	38.2775	-122.264	26.08	10.668

*MAP = Mean Annual Precipitation

NAPA STATE HOSPITAL was chosen, despite being further away than NAPA. Its length of record was 63 years, whereas NAPA had only 17 years of data.

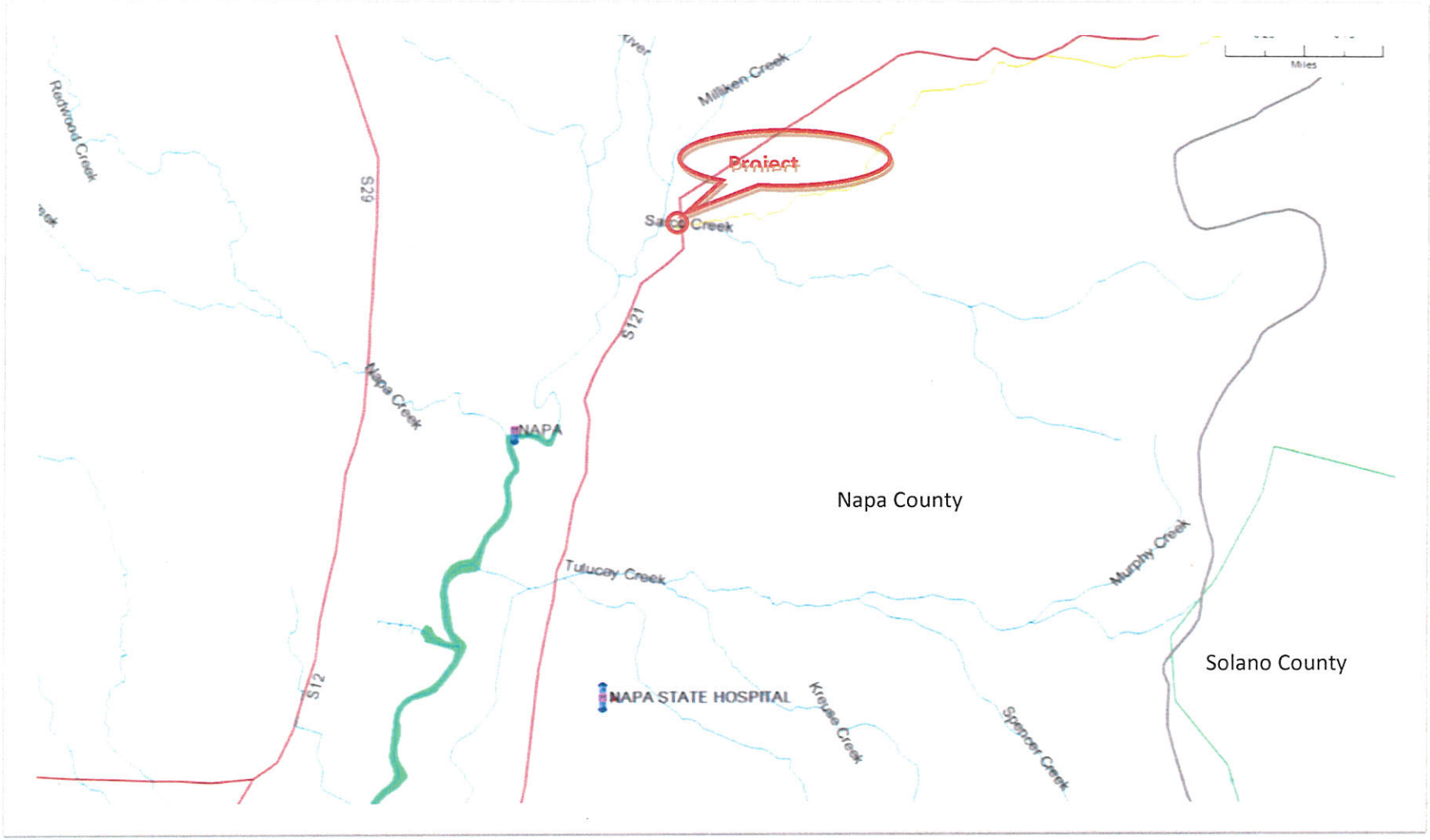

Fig 5. Rain gages considered, with data begin and end dates (from Basins 4.1)

3.4 SWMM 5

SWMM input (for non-default values)

Watershed values:
Area = 5,320.30 acres = 8.3 square mile (Table 1)
Width = 904 feet (varied to match PK5 from Table 3)
%Slope = 20.9 (Table 1)
%Imperv = 3.1 (Table 1)
N-Perv = 0.4 (Manning's overland n for "Woods - Light underbush" (SWMM manual Appendix A.6)
Dstore-Perv = 0.3 (Forest litter depression storage, SWMM manual Appendix A.5)
Infiltration curve number = 76 (Table 4)

A single watershed should be created in SWMM, using the values above and default values. The time steps should be set to 1 hour, except the routing step (left at default). A time series rainfall file from BASINS 4.1, with continuous hourly rainfall for NAPA STATE HOSPITAL (Table 6) should be used, with analysis started on 12/2/1946 at 00:00 hours. Reporting should start on 01/01/1947 and the analysis should end on 12/31/2009, at 00:00 hours.

The SWMM model should be calibrated and run as described in Section 2.2.4 of this report. Flow values from the SWMM output are shown in Table 7, along with values for the same events from Streamstats (from Table 3), for comparison.

Table 7. Comparison of Streamstats and SWMM flow output

Event	Flows (cfs)		Comment
	Streamstats	SWMM	
2-year	652	578	-11.35%
5-year	904	904	Match
10-year	1110	1208	+8.82%
25-year	1290	1503	+16.51%

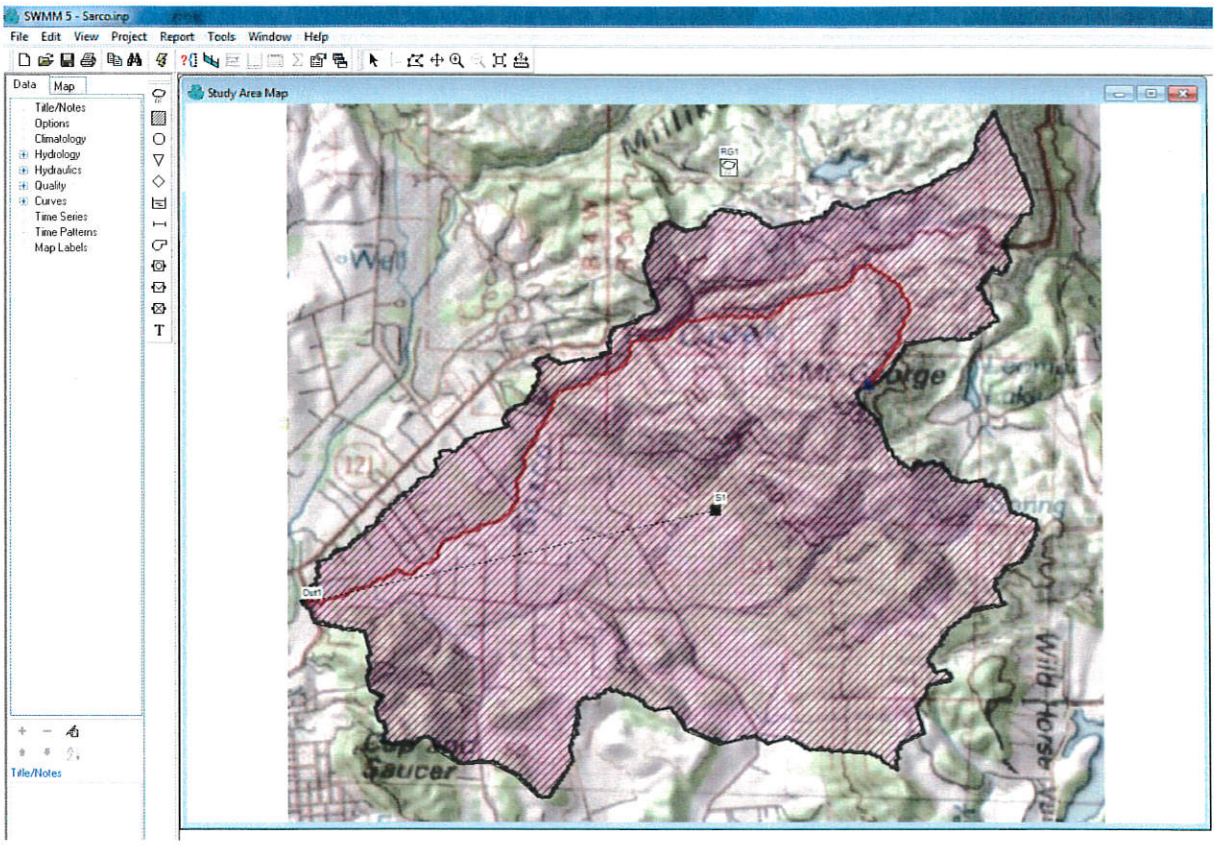

Fig 6. The SWMM interface.

3.5 Spreadsheet

After simulated flows for the period of interest (6/1/1949 to 10/15/1972) are isolated the annual series in the left half of the table below is produced.

It can be seen that flows in October dominate this annual series both in frequency and magnitude. The effect of removing October from the period of interest would also be studied, by creating another annual series, from 6/1/1949 to 9/30/1972.

Table 8. Annual series for summer months only

6/1/1951 to 10/15/2009			6/1/1951 to 9/30/2009		
Year	Date	Value	Year	Date	Value
1951	10/3/1951	20.216	1951	9/18/1951	2.810
1952	6/28/1952	59.500	1952	6/28/1952	59.500
1953	6/5/1953	73.480	1953	6/5/1953	73.480
1954	8/27/1954	32.149	1954	8/27/1954	32.149
1955	9/15/1955	43.568	1955	9/15/1955	43.568
1956	9/19/1956	20.710	1956	9/19/1956	20.710
1957	10/13/1957	227.368	1957	9/28/1957	129.014
1958	6/3/1958	25.549	1958	6/3/1958	25.549
1959	9/18/1959	350.918	1959	9/18/1959	350.918
1960	10/6/1960	14.961	1960	6/1/1960	3.608
1961	9/16/1961	20.684	1961	9/16/1961	20.684
1962	10/13/1962	1503.266	1962	9/28/1962	18.058
1963	10/11/1963	252.425	1963	9/12/1963	30.388
1964	6/8/1964	69.388	1964	6/8/1964	69.388
1965	8/11/1965	116.417	1965	8/11/1965	116.417
1966	6/6/1966	16.434	1966	6/6/1966	16.434
1967	6/2/1967	208.571	1967	6/2/1967	208.571
1968	10/12/1968	106.974	1968	8/19/1968	11.944
1969	10/15/1969	425.812	1969	6/9/1969	0.921
1970	6/9/1970	37.825	1970	6/9/1970	37.825
1971	9/29/1971	26.131	1971	9/29/1971	26.131
1972	10/15/1972	180.087	1972	9/26/1972	121.164
1973	10/7/1973	52.532	1973	9/22/1973	38.073
1974	7/8/1974	107.914	1974	7/8/1974	107.914
1975	10/10/1975	224.197	1975	7/15/1975	9.507
1976	10/1/1976	98.24	1976	8/18/1976	89.5
1977	9/19/1977	94.032	1977	9/19/1977	94.032
1978	9/10/1978	146.924	1978	9/10/1978	146.924

1979	10/13/1979	0.814	1979	6/1/1979	0.265
1980	10/13/1980	17.834	1980	7/2/1980	10.212
1981	10/7/1981	94.427	1981	9/24/1981	15.298
1982	9/16/1982	192.764	1982	9/16/1982	192.764
1983	8/20/1983	141.218	1983	8/20/1983	141.218
1984	10/11/1984	128.649	1984	8/31/1984	57.431
1985	9/11/1985	63.132	1985	9/11/1985	63.132
1986	9/24/1986	97.884	1986	9/24/1986	97.884
1987	6/1/1987	0.118	1987	6/1/1987	0.118
1988	6/7/1988	17.301	1988	6/7/1988	17.301
1989	9/17/1989	204.213	1989	9/17/1989	204.213
1990	6/1/1990	49.197	1990	6/1/1990	49.197
1991	6/28/1991	40.186	1991	6/28/1991	40.186
1992	6/29/1992	117.235	1992	6/29/1992	117.235
1993	10/14/1993	130.842	1993	6/4/1993	97.875
1994	10/4/1994	225.957	1994	6/6/1994	2.908
1995	6/1/1995	122.401	1995	6/1/1995	122.401
1996	6/1/1996	1.548	1996	6/1/1996	1.548
1997	10/8/1997	229.843	1997	8/20/1997	93.92
1998	6/1/1998	23.125	1998	6/1/1998	23.125
1999	10/6/1999	3.929	1999	9/22/1999	1.051
2000	10/10/2000	20.563	2000	6/7/2000	8.499
2001	9/24/2001	89.524	2001	9/24/2001	89.524
2002	6/1/2002	1.69	2002	6/1/2002	1.69
2003	8/22/2003	107.946	2003	8/22/2003	107.946
2004	9/19/2004	10.814	2004	9/19/2004	10.814
2005	6/9/2005	72.923	2005	6/9/2005	72.923
2006	10/4/2006	113.287	2006	6/28/2006	7.972
2007	10/10/2007	121.69	2007	9/20/2007	1.549
2008	10/4/2008	23.49	2008	6/1/2008	0.771
2009	10/13/2009	1304.828	2009	9/14/2009	10.642

3.6 HEC-SSP

A Bulletin 17B analysis should be performed for 3 scenarios for this project:

1. The Full period of interest (6/1/1949 to 10/15/1972)
2. The Shortened period of interest, without October (6/1/1949 to 9/30/1972) and
3. The Full Year (for comparison).

The HEC-SSP reports for the 3 scenarios are attached at the end of this report.

Table 9. Results From HEC-SSP analyses

Event	Full	Shortened	Full Year
	cfs	cfs	cfs
2-year	71.9	31.5	607.5
5-year	208.9	105.6	880.3
10-year	331.3	174.5	1077.2

3.7 Recommendations

A stream diversion should be designed for at least twice the number of summers for which the diversion would be needed. This is necessary to reduce the likelihood of flooding to less than once per season.

If the Sarco diversion would be needed for one summer then the 2-year event would be required. This would be 71.9 cfs up to October 15, but could be reduced to 31.5 cfs up to September 30.

Per Norman Gonsalves and Kamran Nakijiri on 7/11/16

Site conditions, specifically head water and right of way needed for riprap, limit the maximum flow that could be conveyed by a single pipe gravity system to 35 cfs, which should be used instead of 71.9 cfs.

4. ATTACHMENT - HEC-SSP REPORTS

4.1 HEC-SSP Report - 6/1/1951 To 10/15/2009

```
-------------------------------
Bulletin 17B Frequency Analysis
    09 May 2014   04:24 PM
-------------------------------

--- Input Data ---

Analysis Name: Sarco
Description: Sarco

Data Set Name: Sarco-FLOW-PEAK
DSS File Name: C:\Users\s136558\Documents\HEC\Sarco\Sarco.dss
DSS Pathname: ///FLOW-PEAK/01jan1900/IR-CENTURY//

Report File Name:
C:\Users\s136558\Documents\HEC\Sarco\Bulletin17bResults\Sarco\Sarco.rpt
XML File Name:
C:\Users\s136558\Documents\HEC\Sarco\Bulletin17bResults\Sarco\Sarco.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Median

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value


--- End of Input Data ---


--- Preliminary Results ---


<< Skew Weighting >>
-----------------------------------------------------------------
Based on 59 events, mean-square error of station skew =      0.25
Mean-square error of regional skew =                           -?
-----------------------------------------------------------------
```

<< Frequency Curve >>
Sarco-FLOW-PEAK

Computed Curve FLOW, cfs	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 FLOW, cfs	0.95
634.0	649.1	0.2	1,132.4	398.7
593.8	608.1	0.5	1,051.1	375.6
552.8	566.6	1.0	969.2	351.9
500.4	512.4	2.0	865.7	321.2
409.7	419.0	5.0	690.7	267.4
323.1	328.5	10.0	528.9	214.6
221.7	224.2	20.0	347.9	150.9
78.3	78.3	50.0	113.3	55.0
16.9	16.4	80.0	24.6	11.0
6.1	5.7	90.0	9.5	3.5
2.3	2.1	95.0	4.0	1.2
0.3	0.2	99.0	0.6	0.1

<< Systematic Statistics >>
Sarco-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	1.745	Historic Events	0
Standard Dev	0.716	High Outliers	0
Station Skew	-1.284	Low Outliers	0
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-1.284	Systematic Events	59

--- End of Preliminary Results ---

<< Low Outlier Test >>

Based on 59 events, 10 percent outlier test deviate K(N) = 2.831
Computed low outlier test value = 0.52

1 low outlier(s) identified below test value of 0.52

Statistics and frequency curve adjusted for 1 low outlier(s)

<< Systematic Statistics >>
Sarco-FLOW-PEAK

Log Transform:	

FLOW, cfs		Number of Events	
Mean	1.791	Historic Events	0
Standard Dev	0.628	High Outliers	0
Station Skew	-0.764	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-1.284	Systematic Events	59

<< High Outlier Test >>

Based on 58 events, 10 percent outlier test deviate K(N) = 2.824
Computed high outlier test value = 3,660.39

0 high outlier(s) identified above test value of 3,660.39

Note: Statistics and frequency curve were modified
using conditional probablity adjustment.

--- Final Results ---

<< Plotting Positions >>
Sarco-FLOW-PEAK

Events Analyzed		Ordered Events			
Day Mon Year	FLOW cfs	Rank	Water Year	FLOW cfs	Median Plot Pos
03 Oct 1951	20.2	1	1963	1,503.3	1.18
28 Jun 1952	59.5	2	2010	1,304.8	2.86
05 Jun 1953	73.5	3	1970	425.8	4.55
27 Aug 1954	32.1	4	1959	350.9	6.23
15 Sep 1955	43.6	5	1964	252.4	7.91
19 Sep 1956	20.7	6	1998	229.8	9.60
13 Oct 1957	227.4	7	1958	227.4	11.28
03 Jun 1958	25.5	8	1995	226.0	12.96
18 Sep 1959	350.9	9	1976	224.2	14.65
06 Oct 1960	15.0	10	1967	208.6	16.33
16 Sep 1961	20.7	11	1989	204.2	18.01
13 Oct 1962	1,503.3	12	1982	192.8	19.70
11 Oct 1963	252.4	13	1973	180.1	21.38
08 Jun 1964	69.4	14	1978	146.9	23.06
11 Aug 1965	116.4	15	1983	141.2	24.75
06 Jun 1966	16.4	16	1994	130.8	26.43
02 Jun 1967	208.6	17	1985	128.6	28.11
12 Oct 1968	107.0	18	1995	122.4	29.80
15 Oct 1969	425.8	19	2008	121.7	31.48
09 Jun 1970	37.8	20	1992	117.2	33.16
29 Sep 1971	26.1	21	1965	116.4	34.85
15 Oct 1972	180.1	22	2007	113.3	36.53
07 Oct 1973	52.5	23	2003	107.9	38.22
08 Jul 1974	107.9	24	1974	107.9	39.90

10 Oct 1975	224.2	25	1969	107.0	41.58
01 Oct 1976	98.2	26	1977	98.2	43.27
19 Sep 1977	94.0	27	1986	97.9	44.95
10 Sep 1978	146.9	28	1982	94.4	46.63
13 Oct 1979	0.8	29	1977	94.0	48.32
13 Oct 1980	17.8	30	2001	89.5	50.00
07 Oct 1981	94.4	31	1953	73.5	51.68
16 Sep 1982	192.8	32	2005	72.9	53.37
20 Aug 1983	141.2	33	1964	69.4	55.05
11 Oct 1984	128.6	34	1985	63.1	56.73
11 Sep 1985	63.1	35	1952	59.5	58.42
24 Sep 1986	97.9	36	1974	52.5	60.10
01 Jun 1987	0.1	37	1990	49.2	61.78
07 Jun 1988	17.3	38	1955	43.6	63.47
17 Sep 1989	204.2	39	1991	40.2	65.15
01 Jun 1990	49.2	40	1970	37.8	66.84
28 Jun 1991	40.2	41	1954	32.1	68.52
29 Jun 1992	117.2	42	1971	26.1	70.20
14 Oct 1993	130.8	43	1958	25.5	71.89
04 Oct 1994	226.0	44	2009	23.5	73.57
01 Jun 1995	122.4	45	1998	23.1	75.25
01 Jun 1996	1.5	46	1956	20.7	76.94
08 Oct 1997	229.8	47	1961	20.7	78.62
01 Jun 1998	23.1	48	2001	20.6	80.30
06 Oct 1999	3.9	49	1952	20.2	81.99
10 Oct 2000	20.6	50	1981	17.8	83.67
24 Sep 2001	89.5	51	1988	17.3	85.35
01 Jun 2002	1.7	52	1966	16.4	87.04
22 Aug 2003	107.9	53	1961	15.0	88.72
19 Sep 2004	10.8	54	2004	10.8	90.40
09 Jun 2005	72.9	55	2000	3.9	92.09
04 Oct 2006	113.3	56	2002	1.7	93.77
10 Oct 2007	121.7	57	1996	1.5	95.45
04 Oct 2008	23.5	58	1980	0.8	97.14
13 Oct 2009	1,304.8	59	1987	0.1*	98.82

* Outlier

<< Skew Weighting >>

Based on 59 events, mean-square error of station skew = 0.144
Mean-square error of regional skew = -?

<< Frequency Curve >>
Sarco-FLOW-PEAK

Computed Curve FLOW, cfs	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 FLOW, cfs	0.95
1,092.1	1,176.6	0.2	2,035.7	673.1
917.9	977.8	0.5	1,666.7	575.9
781.9	826.4	1.0	1,386.3	498.5
644.0	674.5	2.0	1,110.2	418.4

463.0	479.4	5.0	762.4	310.1
331.3	339.2	10.0	522.2	228.1
208.9	211.8	20.0	312.1	148.4
71.9	71.9	50.0	99.2	52.6
19.1	18.6	80.0	26.7	12.9
8.5	8.1	90.0	12.6	5.2
4.1	3.8	95.0	6.5	2.3
0.9	0.7	99.0	1.7	0.4

<< Synthetic Statistics >>
Sarco-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	1.777	Historic Events	0
Standard Dev	0.634	High Outliers	0
Station Skew	-0.762	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-0.762	Systematic Events	59

--- End of Analytical Frequency Curve ---

4.2 HEC-SSP Report - 6/1/1951 To 9/30/2009

```
Bulletin 17B Frequency Analysis
    20 May 2014    11:04 AM
-------------------------------


--- Input Data ---


Analysis Name: Sarco2
Description: Sarco2


Data Set Name: Sarco2-FLOW-PEAK
DSS File Name: C:\Users\s136558\Documents\HEC\Sarco2\Sarco2.dss
DSS Pathname: ///FLOW-PEAK/01jan1900/IR-CENTURY//


Report File Name:
C:\Users\s136558\Documents\HEC\Sarco2\Bulletin17bResults\Sarco2\Sarco2.rpt
XML File Name:
C:\Users\s136558\Documents\HEC\Sarco2\Bulletin17bResults\Sarco2\Sarco2.xml


Start Date:
End Date:


Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity


Plotting Position Type: Median


Upper Confidence Level: 0.05
Lower Confidence Level: 0.95


Display ordinate values using 1 digits in fraction part of value


--- End of Input Data ---


--- Preliminary Results ---


<< Skew Weighting >>
-----------------------------------------------------------------
Based on 59 events, mean-square error of station skew =     0.182
Mean-square error of regional skew =                           -?
-----------------------------------------------------------------
```

<< Frequency Curve >>
Sarco2-FLOW-PEAK

Computed Curve FLOW, cfs	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 FLOW, cfs	0.95
526.9	556.1	0.2	1,055.1	305.1
460.4	483.5	0.5	904.1	270.1
403.0	422.0	1.0	776.5	239.4
339.9	353.9	2.0	639.4	205.1
249.3	257.8	5.0	449.8	154.6
178.2	182.4	10.0	308.0	113.4
109.0	110.7	20.0	178.2	71.7
32.0	32.0	50.0	47.6	21.8
6.1	6.0	80.0	9.3	3.8
2.2	2.0	90.0	3.5	1.2
0.8	0.7	95.0	1.5	0.4
0.1	0.1	99.0	0.2	0.0

<< Systematic Statistics >>
Sarco2-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	1.376	Historic Events	0
Standard Dev	0.777	High Outliers	0
Station Skew	-1.009	Low Outliers	0
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-1.009	Systematic Events	59

--- End of Preliminary Results ---

<< Low Outlier Test >>

Based on 59 events, 10 percent outlier test deviate K(N) = 2.831
Computed low outlier test value = 0.15

1 low outlier(s) identified below test value of 0.15

Statistics and frequency curve adjusted for 1 low outlier(s)

<< Systematic Statistics >>
Sarco2-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	1.416	Historic Events	0
Standard Dev	0.721	High Outliers	0
Station Skew	-0.864	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-1.009	Systematic Events	59

<< High Outlier Test >>

Based on 58 events, 10 percent outlier test deviate K(N) = 2.824
Computed high outlier test value = 2,825.01

0 high outlier(s) identified above test value of 2,825.01

Note: Statistics and frequency curve were modified
using conditional probablity adjustment.

--- Final Results ---

<< Plotting Positions >>
Sarco2-FLOW-PEAK

Events Analyzed		Ordered Events			
Day Mon Year	FLOW cfs	Rank	Water Year	FLOW cfs	Median Plot Pos
18 Sep 1951	2.8	1	1959	350.9	1.18
28 Jun 1952	59.5	2	1967	208.6	2.86
05 Jun 1953	73.5	3	1989	204.2	4.55
27 Aug 1954	32.1	4	1982	192.8	6.23
15 Sep 1955	43.6	5	1978	146.9	7.91
19 Sep 1956	20.7	6	1983	141.2	9.60
28 Sep 1957	129.0	7	1957	129.0	11.28
03 Jun 1958	25.5	8	1995	122.4	12.96
18 Sep 1959	350.9	9	1972	121.2	14.65
01 Jun 1960	3.6	10	1992	117.2	16.33
16 Sep 1961	20.7	11	1965	116.4	18.01
28 Sep 1962	18.1	12	2003	107.9	19.70
12 Sep 1963	30.4	13	1974	107.9	21.38
08 Jun 1964	69.4	14	1986	97.9	23.06
11 Aug 1965	116.4	15	1993	97.9	24.75
06 Jun 1966	16.4	16	1977	94.0	26.43
02 Jun 1967	208.6	17	1997	93.9	28.11
19 Aug 1968	11.9	18	2001	89.5	29.80
09 Jun 1969	0.9	19	1976	89.5	31.48
09 Jun 1970	37.8	20	1953	73.5	33.16

29 Sep 1971	26.1	21	2005	72.9	34.85
26 Sep 1972	121.2	22	1964	69.4	36.53
22 Sep 1973	38.1	23	1985	63.1	38.22
08 Jul 1974	107.9	24	1952	59.5	39.90
15 Jul 1975	9.5	25	1984	57.4	41.58
18 Aug 1976	89.5	26	1990	49.2	43.27
19 Sep 1977	94.0	27	1955	43.6	44.95
10 Sep 1978	146.9	28	1991	40.2	46.63
01 Jun 1979	0.3	29	1973	38.1	48.32
02 Jul 1980	10.2	30	1970	37.8	50.00
24 Sep 1981	15.3	31	1954	32.1	51.68
16 Sep 1982	192.8	32	1963	30.4	53.37
20 Aug 1983	141.2	33	1971	26.1	55.05
31 Aug 1984	57.4	34	1958	25.5	56.73
11 Sep 1985	63.1	35	1998	23.1	58.42
24 Sep 1986	97.9	36	1956	20.7	60.10
01 Jun 1987	0.1	37	1961	20.7	61.78
07 Jun 1988	17.3	38	1962	18.1	63.47
17 Sep 1989	204.2	39	1988	17.3	65.15
01 Jun 1990	49.2	40	1966	16.4	66.84
28 Jun 1991	40.2	41	1981	15.3	68.52
29 Jun 1992	117.2	42	1968	11.9	70.20
04 Jun 1993	97.9	43	2004	10.8	71.89
06 Jun 1994	2.9	44	2009	10.6	73.57
01 Jun 1995	122.4	45	1980	10.2	75.25
01 Jun 1996	1.5	46	1975	9.5	76.94
20 Aug 1997	93.9	47	2000	8.5	78.62
01 Jun 1998	23.1	48	2006	8.0	80.30
22 Sep 1999	1.1	49	1960	3.6	81.99
07 Jun 2000	8.5	50	1994	2.9	83.67
24 Sep 2001	89.5	51	1951	2.8	85.35
01 Jun 2002	1.7	52	2002	1.7	87.04
22 Aug 2003	107.9	53	2007	1.5	88.72
19 Sep 2004	10.8	54	1996	1.5	90.40
09 Jun 2005	72.9	55	1999	1.1	92.09
28 Jun 2006	8.0	56	1969	0.9	93.77
20 Sep 2007	1.5	57	2008	0.8	95.45
01 Jun 2008	0.8	58	1979	0.3	97.14
14 Sep 2009	10.6	59	1987	0.1*	98.82

* Outlier

<< Skew Weighting >>

Based on 59 events, mean-square error of station skew = 0.155
Mean-square error of regional skew = -?

<< Frequency Curve >>
Sarco2-FLOW-PEAK

Computed Curve FLOW, cfs	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 FLOW, cfs	0.95
588.5	630.8	0.2	1,172.7	343.4
498.3	529.4	0.5	968.8	295.7
425.6	449.4	1.0	808.6	256.5
350.1	366.8	2.0	647.0	215.0
249.0	258.2	5.0	439.0	157.6
174.5	178.9	10.0	293.9	113.7
105.6	107.3	20.0	167.9	71.2
31.8	31.8	50.0	46.2	22.2
6.8	6.6	80.0	10.0	4.3
2.6	2.5	90.0	4.1	1.5
1.1	1.0	95.0	1.9	0.6
0.2	0.1	99.0	0.4	0.1

<< Synthetic Statistics >>
Sarco2-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	1.398	Historic Events	0
Standard Dev	0.732	High Outliers	0
Station Skew	-0.870	Low Outliers	1
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	-0.870	Systematic Events	59

--- End of Analytical Frequency Curve ---

4.3 HEC-SSP Report - 1/1/1951 To 12/31/2009

```
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Bulletin 17B Frequency Analysis
    19 May 2014    04:35 PM
-------------------------------

--- Input Data ---

Analysis Name: Sarco3
Description: Sarco3

Data Set Name: Sarco3-FLOW-PEAK
DSS File Name: C:\Users\s136558\Documents\HEC\Sarco3\Sarco3.dss
DSS Pathname: ///FLOW-PEAK/01jan1900/IR-CENTURY//

Report File Name:
C:\Users\s136558\Documents\HEC\Sarco3\Bulletin17bResults\Sarco3\Sarco3.rpt
XML File Name:
C:\Users\s136558\Documents\HEC\Sarco3\Bulletin17bResults\Sarco3\Sarco3.xml

Start Date:
End Date:

Skew Option: Use Station Skew
Regional Skew: -Infinity
Regional Skew MSE: -Infinity

Plotting Position Type: Median

Upper Confidence Level: 0.05
Lower Confidence Level: 0.95

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---


----------------------
<< Low Outlier Test >>
----------------------
 Based on 59 events, 10 percent outlier test deviate K(N) = 2.831
                        Computed low outlier test value = 182.38

           0 low outlier(s) identified below test value of 182.38


-----------------------
<< High Outlier Test >>
-----------------------
 Based on 59 events, 10 percent outlier test deviate K(N) = 2.831
                      Computed high outlier test value = 2,079.92

        0 high outlier(s) identified above test value of 2,079.92
```

--- Final Results ---

<< Plotting Positions >>
Sarco3-FLOW-PEAK

Events Analyzed		Ordered Events			
Day Mon Year	FLOW cfs	Rank	Water Year	FLOW cfs	Median Plot Pos
01 Dec 1951	565.2	1	1978	1,603.1	1.18
07 Dec 1952	505.2	2	1963	1,503.3	2.86
13 Nov 1953	417.3	3	1986	1,411.7	4.55
17 Jan 1954	452.2	4	1982	1,305.7	6.23
22 Dec 1955	834.4	5	2010	1,304.8	7.91
23 Feb 1956	342.5	6	2006	1,208.2	9.60
17 Dec 1957	266.3	7	1996	1,050.2	11.28
03 Apr 1958	666.7	8	1979	1,021.5	12.96
16 Feb 1959	481.4	9	2003	935.4	14.65
01 Dec 1960	487.0	10	1999	928.3	16.33
01 Dec 1961	350.1	11	1970	922.1	18.01
13 Oct 1962	1,503.3	12	1967	904.1	19.70
31 Jan 1963	537.9	13	2003	870.0	21.38
23 Dec 1964	582.1	14	1983	866.2	23.06
05 Jan 1965	485.6	15	1956	834.4	24.75
05 Jan 1966	578.0	16	1998	832.3	26.43
21 Jan 1967	904.1	17	1997	774.9	28.11
30 Jan 1968	582.5	18	1974	761.2	29.80
16 Oct 1969	447.6	19	2008	757.8	31.48
14 Jan 1970	922.1	20	1980	751.4	33.16
26 Mar 1971	259.0	21	1996	682.0	34.85
14 Nov 1972	681.8	22	1973	681.8	36.53
12 Jan 1973	552.6	23	1958	666.7	38.22
04 Jan 1974	761.2	24	2000	623.8	39.90
12 Feb 1975	369.4	25	1982	609.4	41.58
02 Mar 1976	498.4	26	1987	603.0	43.27
21 Nov 1977	1,603.1	27	1995	585.5	44.95
16 Jan 1978	576.9	28	1968	582.5	46.63
11 Jan 1979	1,021.5	29	1965	582.1	48.32
19 Feb 1980	751.4	30	1966	578.0	50.00
21 Nov 1981	609.4	31	1985	577.6	51.68
04 Jan 1982	1,305.7	32	1978	576.9	53.37
25 Feb 1983	866.2	33	1952	565.2	55.05
27 Nov 1984	523.5	34	1973	552.6	56.73
08 Feb 1985	577.6	35	2006	543.9	58.42
18 Feb 1986	1,411.7	36	1963	537.9	60.10
13 Feb 1987	603.0	37	2002	528.5	61.78
23 Nov 1988	409.3	38	1993	525.6	63.47
26 Nov 1989	317.0	39	1985	523.5	65.15
27 May 1990	400.3	40	1993	511.9	66.84
26 Oct 1991	494.5	41	1953	505.2	68.52
29 Oct 1992	525.6	42	1976	498.4	70.20
13 Jan 1993	511.9	43	1992	494.5	71.89
06 Nov 1994	585.5	44	1961	487.0	73.57
12 Dec 1995	1,050.2	45	1965	485.6	75.25
01 Apr 1996	682.0	46	1959	481.4	76.94
22 Jan 1997	774.9	47	2005	455.4	78.62
03 Feb 1998	832.3	48	1954	452.2	80.30

07 Feb 1999	928.3	49	1970	447.6	81.99
14 Feb 2000	623.8	50	1954	417.3	83.67
02 Dec 2001	528.5	51	1989	409.3	85.35
16 Dec 2002	870.0	52	1990	400.3	87.04
14 Mar 2003	935.4	53	1975	369.4	88.72
08 Dec 2004	455.4	54	1962	350.1	90.40
31 Dec 2005	1,208.2	55	1956	342.5	92.09
27 Feb 2006	543.9	56	1990	317.0	93.77
20 Dec 2007	249.6	57	1958	266.3	95.45
04 Jan 2008	757.8	58	1971	259.0	97.14
13 Oct 2009	1,304.8	59	2008	249.6	98.82

<< Skew Weighting >>

Based on 59 events, mean-square error of station skew = 0.1
Mean-square error of regional skew = -?

<< Frequency Curve >>
Sarco3-FLOW-PEAK

Computed Curve FLOW, cfs	Expected Probability	Percent Chance Exceedance	Confidence Limits 0.05 FLOW, cfs	0.95
2,347.1	2,528.5	0.2	3,046.9	1,927.3
2,013.8	2,129.1	0.5	2,548.9	1,683.7
1,778.3	1,856.4	1.0	2,205.9	1,508.0
1,555.5	1,605.9	2.0	1,889.3	1,338.7
1,277.7	1,302.8	5.0	1,506.6	1,122.1
1,077.2	1,090.2	10.0	1,240.4	960.7
880.3	885.7	20.0	989.7	796.5
607.5	607.5	50.0	666.6	553.3
427.5	425.2	80.0	472.7	379.9
358.4	354.9	90.0	401.3	312.0
311.1	306.3	95.0	352.7	265.7
240.8	233.4	99.0	280.2	197.9

<< Systematic Statistics >>
Sarco3-FLOW-PEAK

Log Transform: FLOW, cfs		Number of Events	
Mean	2.790	Historic Events	0
Standard Dev	0.187	High Outliers	0
Station Skew	0.192	Low Outliers	0
Regional Skew	---	Zero Events	0
Weighted Skew	---	Missing Events	0
Adopted Skew	0.192	Systematic Events	59

--- End of Analytical Frequency Curve ---

5. REFERENCES

1. Caltrans Highway Design Manual, 6th Edition, May 2012.
2. HDS-2 Highway Hydrology, FHWA-NHI-02-001, October 2002.
3. Storm Water Management Model User's Manual, Version 5.0. EPA/600/R-05/040, July 2010.

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., *Governor*
CHARLTON H. BONHAM, *Director*

November 12, 2014

Mr. Hardeep Takhar
California Department of Transportation
111 Grand Avenue
Oakland, CA 94623

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2014-0167-R3
Sarco Creek Bridge Replacement Project

Dear Mr. Takhar:

Enclosed is the final Streambed Alteration Agreement ("Agreement") for the Sarco Creek Bridge Replacement Project ("Project"). Before the 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 November 12, 2014 based on information contained in the 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 Melissa Escaron, Senior Environmental Scientist (Specialist), at (925)786-3045 or melissa.escaron@wildlife.ca.gov.

Sincerely,

Craig J. Weightman
Environmental Program Manager
Bay Delta Region

cc: Whitney Brennan – whitney_brennan@dot.ca.gov
Lieutenant Jones
Warden Monroe

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
BAY DELTA REGION
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558
(707) 944-5500
WWW.WILDLIFE.CA.GOV

STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2014-0167-R3
Sarco Creek Bridge Replacement Project
EA 2A3200

CALIFORNIA DEPARTMENT OF TRANSPORTATION

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and the California Department of Transportation (Permittee), as represented by Mr. Hardeep Takhar.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified CDFW on December 9, 2013 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, CDFW 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

This Project is located in Napa County on State Route 121, Post Mile 9.3, at the Sarco Creek Bridge.

PROJECT DESCRIPTION

The California Department of Transportation (Permittee) proposes to replace the existing 2-span Sarco Creek Bridge with a single span structure to correct scour problem (Project). The new structure will be wider than the existing bridge to accommodate standard lane widths. The new structure would include a pre-cast reinforced concrete slab deck approximately 2-feet thick. The project includes embankment work and construction of fish passage improvements downstream of the

bridge. The new bridge and highway will be realigned approximately 4 feet to the east to minimize impacts to the exiting utilities and residential properties. Water and gas lines will be relocated to accommodate the Project.

A temporary water diversion system, consisting of an upstream cofferdam and a PVC water conveyance pipe will be in place during the entire construction period. This diversion pipe will be protected by placing timber mats on top of temporary K-rail placed along the edge of the creek bed under the existing bridge, covering and protecting the PVC pipe and the creek bed. Any standing water that is encountered below the bridge during construction will be removed.

To improve fish passage a roughened rock ramp and, if necessary, one rock weir will be constructed downstream of the existing sewer line concrete encasement. The roughened rock ramp will be covered with clean native bed materials. The roughened ramp and rock weir will be built from the bank and/or deck of the bridge utilizing a crane and only small construction machinery within the dewatered channel.

To minimize riparian impacts, only one access road will be constructed on the northeast corner of the bridge. This bank is over-steepened and vegetated primarily with blackberry. Therefore, there is no room to restore this bank to stable slope with native materials following bridge replacement, and permanent erosion controls will be necessary. Rock slope protection (RSP) covering the width and height of the access road will be placed and covered with native soil and plantings to fill voids between the rocks. The RSP will be keyed in at the bottom of the slope and match the existing slope conforms

Equipment will include a backhoe excavator, mud reclaimer, front end loader, bulldozer, horizontal drilling machine, crane, bobcat loader, and manlift.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include:

- Riparian habitat
- Native trees
- North coast riparian forest
- Central California Coastal Steelhead habitat
- Aquatic invertebrates
- Amphibians
- Migratory bird nesting and habitat
- Western pond turtles and habitat
- Bats and habitat

The adverse effects the project could have on the fish or wildlife resources identified above include:

- Tree removal
- Increased shading
- Permanent and temporary loss of natural bed and bank
- Permanent and temporary loss of riparian habitat
- Loss of avian nesting, foraging, and roosting sites
- Disruption of nesting
- Loss of bat habitat
- Loss of Western pond turtle habitat
- Loss of amphibian habitat
- Degradation and/or loss of salmonid habitat
- Water quality degradation
- Short-term release of contaminants

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 CDFW 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 CDFW 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, CDFW shall contact Permittee to resolve any conflict.

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

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. The following conditions apply to areas located within CDFW riparian jurisdiction.

2.1 All work within riparian zones shall occur between June 15 and October 15.

2.2 The Permittee shall incorporate a Fish Passage Improvement design into the Project. The Permittee shall submit a Fish Passage Improvement Plan for CDFW review and approval at least 6 months prior to start of construction.

2.3 At least 30-days prior to commencing Project activities covered by this Agreement, the Permittee shall submit to CDFW, for review and approval, the qualifications for a number of biologists (Qualified Biologist) that shall oversee the implementation of the conditions in this Agreement. At a minimum, the Qualified Biologists shall have a combination of academic training and professional experience in biological sciences and related resource management activities. The Qualified Biologists shall communicate to the Resident Engineer when any activity is not in compliance with this Agreement and the Resident Engineer shall immediately stop the activity that is not in compliance with this Agreement.

2.4 Prior to the start of construction Environmentally Sensitive Areas (ESAs) shall be clearly delineated using high-visibility orange fencing to protect sensitive habitats. The ESA fencing will remain in place throughout the duration of the Project. The final Project plans will depict all locations where ESA fencing will be installed and how it will be installed. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. ESA fencing shall be erected as directed by a Qualified Biologist.

2.5 If Project activities will occur between February 15 and September 1, a Qualified Biologist shall conduct pre-construction surveys for nesting birds no more than one week prior to construction. Surveys shall consist of multiple days of observations. If nests are found the Qualified Biologist shall establish an appropriate buffer to be in compliance with Migratory Bird Treaty Act (MBTA) and Fish and Game Code 3503. The Qualified Biologist shall perform at least two hours of pre-construction monitoring of the nest to characterize "typical" bird behavior. The Qualified Biologist shall monitor the nesting birds and shall increase the buffer if the Qualified Biologist determines the birds are showing signs of unusual or distressed behavior by Project activities. Atypical nesting behaviors which may cause reproductive harm include, but are not limited to, defensive flights/vocalizations directed towards Project personnel, standing up from a brooding position, and flying away from the nest. The Qualified Biologist

shall have authority, through the Resident Engineer, to order the cessation of all Project activities if the nesting birds exhibit atypical behavior which may cause reproductive failure (nest abandonment and loss of eggs and/or young) until an appropriate buffer is established. To prevent encroachment, the established buffer(s) shall be clearly marked by high visibility material. The established buffer(s) shall remain in effect until the young have fledged or the nest has been abandoned as confirmed by the Qualified Biologist. Any sign of nest abandonment shall be reported to CDFW within 48 hours.

2.6 A Qualified Biologist shall conduct a habitat assessment for potentially suitable bat roosting habitat, including within the open expansion joints of the bridge and trees, March 1 to April 15 or August 31 to October 15 prior to bridge construction activities. If the habitat assessment reveals the bridge structure is suitable roosting habitat for bats, then appropriate exclusionary measures will be implemented prior to bridge construction during the period between March 1 to April 15 or August 31 to October 15. Potential avoidance efforts may include exclusionary blocking or filling potential roosting cavities with foam, visual monitoring, and staging project work to avoid bats. If bats are known to use the bridge structure, exclusion netting shall not be used. If the habitat assessment reveals suitable bat habitat within trees, and tree removal is scheduled from April 16 through August 30 and/or October 16 through February 28, then presence/absence surveys shall be conducted two to three days prior to any tree removal or trimming. If presence/absence surveys are negative, then tree removal may be conducted by following a two-phased tree removal system. If presence/absence surveys indicate bat occupancy, then the occupied trees shall only be removed from March 1 through April 15 and/or August 31 through October 15 by following the two-phased tree removal system. The two-phased removal system shall be conducted over 2 consecutive days. The first day (in the afternoon), limbs and branches are removed by a tree cutter using chainsaws or other hand tools only. Limbs with cavities, crevices, or deep bark fissures are avoided, and only branches or limbs without those features are removed. On the second day, the entire tree shall be removed.

2.7 Within 48 hours prior to construction, a Qualified Biologist shall conduct a wildlife survey, at the appropriate time of day, focusing on presence of Western pond turtle (*Clemmys marmorata*) and Foothill yellow legged frog (*Rana boylii*). If any Western pond turtles or Foothill yellow legged frogs are found, a Qualified Biologist shall relocate the animal downstream of the project site in appropriate habitat.

2.8 Permittee shall conduct work defined in the above Project Description, and within the Project area, during periods of dry weather. The Project area is defined as the bed, bank, channel, and associated wetland habitat. The Permittee shall monitor forecasted precipitation. When ¼ inch or more of precipitation is forecasted to occur, the Permittee shall stop work before precipitation commences. No Project activities may be started if its associated

erosion control measures cannot be completed prior to the onset of precipitation. After any storm event, the Permittee shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sediment problems and take corrective action as needed. Seventy-two hour weather forecasts from National Weather Service shall be consulted and work shall not start back up until runoff ceases and there is less than a 30% forecast for precipitation for the following 24-hour period.

2.9 Permittee shall utilize erosion control measures throughout all phases of operation where sediment runoff from exposed slopes threatens to enter waterways. At no time shall silt laden runoff be allowed to enter the stream or directed to where it may enter the stream. Erosion control installations shall be monitored for effectiveness and shall be repaired or replaced as recommended by a Qualified Biologist or Water Quality Monitor to the Resident Engineer. As needed to prevent sediment transport, Permittee shall deploy soil stabilizer such as hydroseeding, netting, erosion control mats, mulch, fiber rolls, silt fences, check dams, and flow velocity dissipation devices. Permittee shall stabilize and equip construction site entrances and exits with tire washing capability. Materials containing monofilament or plastic shall not be used. Erosion and sediment control measures shall be installed prior to unseasonable rain storms.

2.10 All disturbed areas shall be re-graded and hydroseeded. Hydroseed shall not contain invasive exotic plant species. Prohibited exotic plant species include those identified in the California Exotic Pest Plant Council's database, which is accessible at: http://www.cal ipc.org/ip/inventory/weedlist.php.

2.11 Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the creek channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek shall be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.

2.12 Refueling of mobile construction equipment and vehicles shall not occur within 50 feet of any water body, or anywhere that spilled fuel could drain to a water body. Refueling of stationary equipment requiring breakdown and setup to move will remain in place. All equipment shall be refueled with appropriate drip pans, absorbent pads, and water quality Best Management Practices. Equipment and vehicles operating in the Project site shall be checked and maintained daily to prevent leaks of fuels, lubricants, or other liquids.

2.13 Permittee shall comply with all applicable state and federal laws, including the California and Federal Endangered Species Act. This Agreement does not authorize the take of any state or federally endangered listed species. Liability

for any take or incidental take of such species remains the responsibility of the Permittee for the duration of the Project. Any unauthorized take of listed species may result in prosecution and nullification of the Agreement. This Agreement does not authorize the capture or relocation of Fully Protected Species.

2.14 Permittee shall design the horizontal directional drilling operation in such a way as to Permittee shall design the horizontal directional drilling operation in such a way as to minimize the risk of spills of all types. Permittee shall use lower pressure and greater boring depths in areas with frac out potential. If the potential for frac out exists, the Permittee shall prepare a contingency plan to address the release of drilling lubricants. The frac out contingency plan shall include a containment and remediation plan, include staging location of vacuum trucks and equipment, equipment list, and necessary hose lengths. The contingency plan shall include emergency contact phone numbers for prompt response by biological monitors. Permittee shall call biological monitors as soon as a spill is suspected. Permittee shall notify the United State Fish and Wildlife Service (USFWS) and DFG in the event of a frac out. Permittee shall not resume project activities until the spill has been remediated and approval to resume has been granted by the USFWS and DFG.

3. Mitigation Measures

Permittee shall meet each reporting requirement described below.

3.1 Permittee shall submit an Onsite Restoration Plan for temporary impacts within 3 months of the issuance of this Agreement. The Onsite Restoration Plan shall be based on the Tree Survey Results for the Sarco Creek Bridge Replacement Project, Natural Environment Study, prepared by Caltrans, dated June, 2012. The Onsite Restoration plan shall include shall include a plant palette of native species to be used, success criteria, a monitoring a reporting schedule, and corrective actions to be taken if mitigation measures do not meet the approved success criteria. All plantings shall be derived from locally available genotypes. The Permittee shall monitor the survival and vigor of onsite plantings for a period of 5 years to ensure attainment of 75% survivorship. Permittee shall control invasive species as needed to ensure attainment of 75% survivorship after 5 years.

3.2 At the issuance of this Agreement CDFW has not approved an offsite mitigation location. At least 60 days prior to commencement of construction the Permittee shall submit a detailed North Coast Riparian Forest Habitat Mitigation Plan (Habitat Mitigation Plan) to CDFW for review and written approval. The Habitat Mitigation Plan shall mitigate permanent north coast riparian forest habitat impacts at a minimum of a 3:1 acreage ratio. Mitigation shall be based on all trees regardless of diameter at breast height. The Habitat Mitigation Plan shall include proposed mitigation locations, a plant palette of native species to be

used, success criteria, a monitoring a reporting schedule, and corrective actions to be taken if mitigation measurees do not meet the approved success criteria. The Permittee shall monitor the survival and vigor of offsite plantings for a period of 5 years to ensure attainment of 75% survivorship. Offsite mitigation may include a combination of habitat restoration, creation, enhancement, and/or preservation of habitat that will support a similar plant community to that found at the project site, including but not limited to the following species: red willow; valley oak; coast live oak; California walnut, black oak; California rose; arroyo willow; Oregon ash; blue elderberry; and hawthorn. The Habitat Mitigation Plan shall be based on the Tree Survey Results for the Sarco Creek Bridge Replacement Project, Natural Environment Study, prepared by Caltrans, dated June, 2012.

CONTACT INFORMATION

Any communication that Permittee or CDFW 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 CDFW specifies by written notice to the other.

To Permittee:

California Department of Transportation
Mr. Hardeep Takhar
111 Grand Ave
Oakland, Ca
Hardeep.takhar@dot.ca.gov

To CDFW:

California Department of Fish and Wildlife
Bay Delta Region
7329 Silverado Trail
Napa, California 94558
Attn: Lake and Streambed Alteration Program – Melissa Escaron
Notification #1600-2014-0167-R3
Fax (707) 944-5553
Melissa.escaron@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 CDFW'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

CDFW 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 CDFW 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 CDFW 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 CDFW to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes CDFW 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 CDFW'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

CDFW may amend the Agreement at any time during its term if CDFW 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 CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in CDFW'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 CDFW 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 CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in CDFW'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 CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW 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 (Fish & G. Code, § 1605, subd. (f)). .

EFFECTIVE DATE

The Agreement becomes effective on the date of CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW 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 on December 31, 2018 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.

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 CDFW in accordance with FGC section 1602.

CONCURRENCE

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

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION

Hardeep Takhar — 11-3-14

Hardeep Takhar
Office Chief

Date

FOR DEPARTMENT OF FISH AND WILDLIFE

11/13/14

Craig J. Weightman
Environmental Program Manager

Date

Prepared by: Melissa Escaron
Staff Environmental Scientist

Date Sent: August 11, 2014

FOR DEPARTMENT USE ONLY				
Date Received	Amount Received	Amount Due	Date Complete	Notification No.
5/7/14	$ 4912.25	$		1600-2014-0167-3

FH-082-317451
Bill Lockyer, Treasurer

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

Escaron
H Jones
Wm Monroe

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

Fish & Wildlife
MAY - 7 2014
Napa

1. APPLICANT PROPOSING PROJECT

Name	Hardeep Takhar		
Business/Agency	California Department of Transportation (Caltrans)		
Street Address	111 Grand Avenue		
City, State, Zip	Oakland, CA 94612		
Telephone	(510) 286-7182	Fax	(510) 286-5642
Email	hardeep_takhar@dot.ca.gov		

2. CONTACT PERSON (*Complete only if different from applicant*)

Name	Whitney Brennan		
Street Address	111 Grand Avenue		
City, State, Zip	Oakland, CA 94612		
Telephone	(510) 286-5999	Fax	(510) 286-5642
Email	whitney_meno@dot.ca.gov		

3. PROPERTY OWNER (*Complete only if different from applicant*)

Name	State of California, California Department of Transportation, District 4		
Street Address	111 Grand Avenue		
City, State, Zip	Oakland, CA 94612		
Telephone		Fax	
Email			

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name	Sarco Creek Bridge Replacement Project			
B. Agreement Term Requested	☑ Regular (*5 years or less*) ☐ Long-term (*greater than 5 years*)			
C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (*year*)	Ending (*year*)	Start Date (*month/day*)	End Date (*month/day*)	
2015	2017	03/01	10/15	600.00

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.

A.	☑ Standard *(Most construction projects, excluding the categories listed below)*	
B.	☐ Gravel/Sand/Rock Extraction (*Attachment A*)	*Mine I.D. Number:* _____
C.	☐ Timber Harvesting (*Attachment B*)	THP *Number:* _____
D.	☐ Water Diversion/Extraction/Impoundment (*Attachment C*)	*SWRCB Number:* _____
E.	☐ Routine Maintenance (*Attachment D*)	
F.	☐ DFG Fisheries Restoration Grant Program (FRGP)	*FRGP Contract Number:* _____
G.	☐ Master	
H.	☐ Master Timber Harvesting	

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. ***Note: The Department may not process this notification until the correct fee has been received.***

	A. Project	B. Project Cost	C. Project Fee
1	Sarco Creek Bridge Replacement	$9,700,000.00	$4,482.75
2			
3			
4			
5			
		D. Base Fee *(if applicable)*	
		E. TOTAL FEE ENCLOSED	$4,482.75

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

☐ Yes (*Provide the information below*) ☑ No

Applicant: _____ Notification Number: _____ Date: _____

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

☑ No ☐ Yes (*Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.*)

☐ *Continued on additional page(s)*

8. PROJECT LOCATION

A. Address or description of project location.

(*Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway*)

Travel south on Silverado Trail. Turn left on Trancas Rd. Turn right on State Route 121 south (Figure 1-2).

☐ *Continued on additional page(s)*

B. River, stream, or lake affected by the project.	Sarco Creek
C. What water body is the river, stream, or lake tributary to?	Milliken Creek
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?	☐ Yes ☑ No ☐ Unknown
E. County	Napa

F. USGS 7.5 Minute Quad Map Name	G. Township	H. Range	I. Section	J. ¼ Section
Napa	06 North	04 West	35	

☐ *Continued on additional page(s)*

K. Meridian (*check one*)	☐ Humboldt ☑ Mt. Diablo ☐ San Bernardino

L. Assessor's Parcel Number(s)

0491-9000-2000, 0491-9000-1000, 0520-100-03000, 0491-9000-6000, 0520-100-16000, 0491-700-02000

☐ *Continued on additional page(s)*

M. Coordinates (*If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)*

Latitude/Longitude	*Latitude:* 38.323544 N	*Longitude:* 122.273423 E	
	☑ Degrees/Minutes/Seconds	☐ Decimal Degrees	☐ Decimal Minutes
UTM	*Easting:*	*Northing:*	☐ Zone 10 ☐ Zone 11
Datum used for Latitude/Longitude or UTM	☐ NAD 27	☑ NAD 83 or WGS 84	

9. PROJECT CATEGORY AND WORK TYPE *(Check each box that applies)*

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	☑	☐	☐
Bank stabilization – rip-rap/retaining wall/gabion	☑	☐	☐
Boat dock/pier	☐	☐	☐
Boat ramp	☐	☐	☐
Bridge	☐	☑	☐
Channel clearing/vegetation management	☐	☐	☐
Culvert	☐	☐	☐
Debris basin	☐	☐	☐
Dam	☐	☐	☐
Diversion structure – weir or pump intake	☑	☐	☐
Filling of wetland, river, stream, or lake	☑	☐	☐
Geotechnical survey	☐	☐	☐
Habitat enhancement – revegetation/mitigation	☑	☐	☐
Levee	☐	☐	☐
Low water crossing	☐	☐	☐
Road/trail	☐	☐	☐
Sediment removal – pond, stream, or marina	☐	☐	☐
Storm drain outfall structure	☐	☐	☐
Temporary stream crossing	☐	☐	☐
Utility crossing : Horizontal Directional Drilling	☑	☐	☐
Jack/bore	☐	☐	☐
Open trench	☑	☐	☐
Other *(specify)*:	☐	☐	☐

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

The proposed project is located on State Route (SR) 121(Silverado Trail) in the City of Napa between Hagen Road (Post Mile (PM) 8.9) and Monticello (PM 9.4). This portion of SR 121 is located within the urban area of the City of Napa. The highway traverses on relatively flat terrain close to the Napa River, driveways, and local roads. The Sarco Creek Bridge was constructed in 1918 and widened in 1974. The bridge was classified as "scour critical" in the latest Structures Replacement and Improvement Needs (STRAIN) report that determined the need for replacement of the Sarco Creek Bridge. The report determined that the bridge is structurally deficient.

The proposed project will remove the existing two span Sarco Creek Bridge and replace it with a single span concrete structure as part of a bridge rehabilitation project which includes roadway widening and construction of a fish passage (downstream of the bridge).

The existing two lane, two-span Sarco Creek Bridge will be replaced with a 46-feet long, 44-feet wide, single-span bridge. The proposed project would include roadway widening with new structure deck width providing two 12-feet wide lanes and two 8-feet wide shoulders, which is wider than the two 4-feet wide shoulders on the existing bridge. The new structure would include a pre-cast reinforced concrete slab deck approximately 2-feet thick. The project includes embankment work and construction of fish passage downstream of the bridge.

The new bridge and highway will be realigned approximately 4 feet to the east to minimize impacts to the existing utilities and residential properties.

Please see attached Additional Information for Lake or Streambed Alteration Agreement (Section 10A).

☑ *Continued on additional page(s)*

B. Specify the equipment and machinery that will be used to complete the project.

Backhoe excavator, mud reclaimer, front end loader, bulldozer, horizontal drilling machine, crane, bobcat loader, and manlift. Please see attached Additional Information for Lake or Streambed Alteration Agreement (Section 10B).

☐ *Continued on additional page(s)*

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).	☑ Yes ☐ No (*Skip to box 11*)
D. Will the proposed project require work in the wetted portion of the channel?	☑ Yes (*Enclose a plan to divert water around work site*) ☐ No

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

This project will require replacement of the Sarco Creek Bridge. This will result in permanent and temporary impacts to Sarco Creek. The project will temporarily impact 110 linear feet and 6,444 square feet. 1,567 cubic yards of dirt will be temporarily displaced for construction. The project will permanently impact 160 linear feet and 9,299 square feet. 916 cubic yards of dirt will be permanently displaced for construction. Please see attached Section 11A.

☑ *Continued on additional page(s)*

B. Will the project affect any vegetation? ☑ Yes (*Complete the tables below*) ☐ No

Vegetation Type	Temporary Impact	Permanent Impact
Riparian forest	Linear feet: 110 Total area: 2728 sq. ft.	Linear feet: 160 Total area: 894 sq. ft.
	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
Oak	4	40-60 in
Bay Laurel	4	20-60 in
Ash	1	20-29 in

☑ *Continued on additional page(s)*

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☑ Yes *(List each species and/or describe the habitat below)* ☐ No ☐ Unknown

Central California Coast Steelhead (CCCS)

☑ *Continued on additional page(s)*

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

NMFS Letter of Concurrence

☑ *Continued on additional page(s)*

E. Has a biological study been completed for the project site?

☑ Yes (*Enclose the biological study*) ☐ No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

☑ Yes (*Enclose the hydrological study*) ☐ No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

12. MEASURES TO PROTECT FISH, WILDIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

During construction, both temporary and permanent erosion controls and scouring protection measures will be placed on the creek bed following Caltrans Structures Hydraulics and Erosion Control Standards. A temporary water diversion system, consisting of an upstream cofferdam and a polyvinyl chloride (PVC) water conveyance pipe, will be in place during the entire construction period (June 1 through October 15). A cofferdam will be constructed across the creek with clean, washed gravel bags wrapped in impermeable plastic sheeting. The PVC water conveyance pipe will be used for diverting the flow of water in the creek.

See attached Additional Information for Lake or Streambed Alteration Agreement (Section 12A).

☑ *Continued on additional page(s)*

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

The following avoidance and minimization measures are for the entire project. To reduce potential impacts to sensitive biological resources, Caltrans proposes to incorporate Caltrans' standard construction best management practices (BMPs) and avoidance and minimization measures into the project. Caltrans will implement reasonable and prudent measures to minimize and avoid take of CCC steelhead and avoid and minimize effects on waters of the State and waters of the United States. The following measures have been incorporated into the design and construction sequencing as avoidance and minimization measures:

See attached Additional Information for Lake or Streambed Alteration Agreement (Section 12B).

☑ *Continued on additional page(s)*

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

Replacement trees will be planted at a ratio of 3:1 for riparian oak trees that have a dbh of greater than 4 inches and are within the riparian areas and within CDFG jurisdiction and a ratio of 2:1 for riparian native trees. Upland trees will be compensated at a ratio of 1:1. Trees will be planted onsite in the Project area to the maximum extent possible after the completion of construction. Potential offsite planting areas are being identified within the Napa Valley. Caltrans is working with the Napa County Flood Control District to locate feasible sites.

See attached Additional Information for Lake or Streambed Alteration Agreement (Section 12C).

☑ *Continued on additional page(s)*

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A.	National Marine Fisheries Service, Biological Opinion	☐ Applied	☑ Issued
B.	U.S. Army Corps of Engineers, Nationwide Permit 14	☑ Applied	☐ Issued
C.	Regional Water Quality Control Board, 401 Water Quality Certification	☑ Applied	☐ Issued

D. Unknown whether ☐ local, ☐ state, or ☐ federal permit is needed for the project. (*Check each box that applies*)

☐ *Continued on additional page(s)*

14. ENVIRONMENTAL REVIEW

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

☑ Yes (*Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each*)

☐ No (*Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared*)

☐ Notice of Exemption	☐ Mitigated Negative Declaration	☑ NEPA document (*type*): CE
☐ Initial Study	☐ Environmental Impact Report	☑ CESA document (*type*): IS
☑ Negative Declaration	☐ Notice of Determination (*Enclose*)	☑ ESA document (*type*): LOC NOAA
☐ THP/ NTMP	☐ Mitigation, Monitoring, Reporting Plan	

B. State Clearinghouse Number (*if applicable*)	2012032073		
C. Has a CEQA lead agency been determined?	☑ Yes (*Complete boxes D, E, and F*)	☐ No (*Skip to box 14.G*)	
D. CEQA Lead Agency	Caltrans		
E. Contact Person	Yolanda Rivas	F. Telephone Number	(510) 286-6216

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

N/A

☐ *Continued on additional page(s)*

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

☑ Yes (*Enclose proof of payment*) ☐ No (*Briefly explain below the reason a filing fee has not been paid*)

Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.

15. SITE INSPECTION

Check one box only.

☐ In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

☑ I request the Department to first contact (*insert name*) Whitney Brennan at (*insert telephone number*) (510) 286-5999 to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

☑ Yes (Please enclose the information via digital media with the completed notification form)

☐ No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

Hardy Takhar

Signature of Applicant or Applicant's Authorized Representative

5-5-14

Date

HARDEEP TAKHAR

Print Name

California Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director

February 16, 2016

Mr. Hardeep Takhar
111 Grand Ave.
Oakland, Ca 94623

Subject: Amendment of Lake or Streambed Alteration Agreement
Notification No. 1600-2014-0167-3
Sarco Creek Bridge Replacement

Dear Mr. Takhar:

The Department of Fish and Wildlife (Department) has received your request to amend Streambed Alteration Agreement 1600-2014-0167-3 (Agreement) and the required fee in the amount of $613.75 for a major amendment. This amendment to the Agreement hereby authorizes an increase in the quantity of rock slope protection (RSP) needed to adequately protect the creek banks, from 100 cubic yards to 280 cubic yards. This increase does not change the originally described RSP footprint, only the volume. This Amendment shall add the following conditions:

2.1 In-channel work and any diversion necessary shall occur only between June 15 and October 15; however non-ground disturbing vegetation removal is authorized outside of this work window to avoid impacts to nesting birds. This work window can be extended via email and written CDFW approval.

2.15 Permittee shall construct rock slope protection (RSP) with suitable non-erodible materials that will withstand wash out. The RSP shall extend above the normal high-water mark. Only clean material such as, rock riprap that is free of trash, debris and deleterious material shall be used as bank stabilization. Asphalt shall not be considered an acceptable material.

2.16 Un-grouted rock slope protection and energy dissipater materials shall consist of clean rock, competent for the application, sized and properly installed to resist washout. RSP slopes shall be supported with competent boulders keyed into a footing trench with a depth sufficient to properly seat the footing course boulders and prevent instability (typically at least 1/3 diameter of footing course boulders). Voids between rocks shall be planted with riparian species native to the area.

2.17 Rock slope protection slopes and footing trenches shall feature an underlayment of appropriate grade geo-textile fabric, on slopes less than 1:1, or gravel blanket, on slopes greater than 1:1.

2.18 Only clean rocks and boulders shall be used for the project unless specified otherwise with the design plans and project description. No broken concrete, asphalt or other construction waste materials shall be used as rock slope protection.

All other conditions in the Agreement remain in effect unless otherwise noted herein.

Please sign and return one copy of this letter to acknowledge the amendment. Copies of the Agreement and this amendment must be readily available at project worksites and must be presented when requested by a Department representative or agency with inspection authority.

If you have any questions regarding this matter, please contact Melissa Escaron, Staff Environmental Scientist, at (925)786-3045 or Melissa.escaron@wildlife.ca.gov.

Sincerely,

Craig J. Weightman
Environmental Program Manager
Bay Delta Region

cc: Melissa Escaron, Staff Environmental Scientist

ACKNOWLEDGEMENT

I hereby agree to the above-referenced amendment.

Print Name: HARDEEP TAKHAR Date: 2-17-16

Signature: _____

FOR DEPARTMENT USE ONLY				
Date Received	Fee Enclosed	Approved?	Date Approved	Expiration Date
2-2-2016	$ 613.75	☒ Yes ☐ No	2-25-2016	12-31-2018

#06-502926 State of California

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND WILDLIFE

ESCAMON
Lt. Jones
Wdn. Morton

REQUEST TO AMEND
LAKE OR STREAMBED ALTERATION AGREEMENT

Complete EACH field and include all required enclosures. Attach additional pages, if necessary.

1. APPLICANT REQUESTING AMENDMENT

If the applicant is a business, agency, or utility, please include the name of the applicant's representative, who should be an employee of the applicant.

Name	JoAnn Cullom		
Business/Agency	California Department of Transportation (Caltrans)		
Street Address	111 Grand Avenue		
City, State, Zip	Oakland, CA 94612		
Telephone	(510) 286-7182	Fax	
Email	JoAnn_Cullom@dot.ca.gov		

Fish & Wildlife
FEB - 2 2016
Napa

2. PROJECT INFORMATION

Agreement Number	1600-2014-0167-R3
Expiration Date	December 31, 2018

3. AMENDMENT REQUEST AND FEE

Check the applicable box below and refer to the current fee schedule to determine the appropriate amendment fee.

- A minor amendment is one that would not significantly modify the scope or nature of any project covered by the agreement or any measure included in the agreement to protect fish and wildlife resources.
- A major amendment is one that would significantly modify the scope or nature of any project covered by the agreement or any measure included in the agreement to protect fish and wildlife resources, or require additional environmental review.

☑ Minor Amendment ☐ Major Amendment

Note: The Department may not process requests for amendments until it receives the correct fee.

REQUEST TO AMEND LAKE OR STREAMBED ALTERATION AGREEMENT

4. AMENDMENT DESCRIPTION

A. Describe the amendment in detail

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

1) The original Notification of Streambed Alteration (1600-2014-0167-3) stated 100 cubic yards of RSP would be placed in the creek. Caltrans requests that the Agreement be modified to allow 180 cubic yards of RSP as well as placement of willows and root wads to stabilize the banks. Plans are attached.

2) Caltrans request that vegetation pruning and limbing be allowed outside of the riparian work window of June 15 to October 15.

☐ Continued on additional page(s)

B. Explain the reason(s) for the amendment request

1) Caltrans determined that 100 cubic yards of RSP would not adequately cover the top of bank.
2) Vegetation pruning and limbing is requested to be allowed to take place October 15 - February 15, which is outside of the bird nesting season.

☐ Continued on additional page(s)

3. SIGNATURE

I hereby certify that to the best of my knowledge the information in this amendment request ("request") is true and correct and that I am authorized to sign this request as, or on behalf of, the applicant. I understand that if any information in this request is found to be untrue or incorrect, the Department may suspend processing this request or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this request. I understand also that if any information in this request is found to be untrue or incorrect and the changes described in this request has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein, unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

Frances Malamud-Roam
Signature of Applicant or Applicant's Authorized Representative

2/1/2016
Date

Frances Malamud-Roam
Print Name

Note: If approved, a copy of this form must be available at the work site with the original agreement.

Sent via electronic mail--no hard copy to follow

March 18, 2016
CIWQS Reg. Meas. 403804
CIWQS Place No. 819871

California Department of Transportation
Attn: Ahmad Rahimi
ahmad.rahimi@dot.ca.gov
111 Grand Ave.
Oakland, CA 94612-3717

Subject: Water Quality Certification for the State Route 121 Sarco Creek Bridge Replacement Project, Napa County

Department Project No.: EA 04-2A320

Dear Mr. Rahimi:

We have reviewed and hereby issue water quality certification (Certification) to the California Department of Transportation (Department) for the State Route (SR) 121 Sarco Creek Bridge Replacement Project (Project). The Department has received Project authorization under the U.S. Army Corps of Engineers Nationwide Permits No. 14 for Linear Transportation and No. 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities, pursuant to Section 404 of the Clean Water Act (33 U.S.C. § 1344). As such, the Department has applied to the San Francisco Bay Regional Water Quality Control Board (Water Board) for a Clean Water Act Section 401 water quality certification that the Project will not violate State water quality standards.

Project: The following Project description was derived from application materials received by Water Board staff on November 25, 2015, and supplemental information received via email on January 8, 15, and 27, February 19 and 25, and March 1 and 4, 2016. Water Board staff deemed the application complete on March 4, 2016. The application fee payment of $2,260 was received on December 4, 2015.

The Department proposes to replace the SR 121 bridge over Sarco Creek because a large scour hole has formed around the middle bridge pier that has been deemed irreparable without removal of the pier. The Project will result in a new bridge spanning the creek with no piers within the channel. The existing bridge is 35.5 feet wide by 31

feet long. The replacement bridge will be widened to 44 feet to allow for standard 8-foot road shoulders and will be lengthened to 46 feet between the abutment walls to allow for conveyance of the 100-year creek flow. An existing sanitary sewer line encased in concrete is located approximately 20 feet downstream of the bridge and is a barrier to fish passage. The Project will construct a roughened ramp starting approximately 40 feet downstream of the concrete sewer encasement to enhance fish passage.
The proposed project elements include:

- Replacement and relocation of utilities including replacement of a sanitary sewer manhole and pipe segment in the creek bank at the southwest corner of the bridge;
- Installation and removal of temporary creek diversion system consisting of gravel bag cofferdams wrapped in impermeable plastic sheeting and a conveyance pipe;
- Clearing and grubbing of vegetation throughout the work area;
- Construction of a temporary access road to the creek at the northeast corner of the bridge;
- Demolition and removal of existing abutments, bridge, and middle pier;
- Storm drain system construction and installation of a biofiltration swale for stormwater treatment;
- Construction of new abutments and single span bridge;
- Construction of a roughened ramp to enhance fish passage;
- Installation of bioengineering bank stabilization and rock slope protection (RSP) on creek banks; and
- Planting of riparian vegetation.

Utility work is scheduled to be completed in 2016, with bridge and roadway work scheduled for 2017. The disturbance of the creek bank to replace the sanitary sewer during the first year of construction will be temporarily stabilized with RSP until the creek work is completed the next year. The RSP will then be removed and bioengineering bank stabilization will be installed. No work will take place within Sarco Creek between June 1 and October 15 of any year.

Impacts: Project implementation would permanently impact approximately 150 linear feet (0.046 acre) of Sarco Creek. Permanent impacts to Sarco Creek would occur due to construction of the new bridge, wing walls, and abutments, installation of RSP along the toe of the creek banks, and installation of a roughened ramp to improve fish passage.

Project implementation would temporarily impact approximately 192 linear feet of Sarco Creek (0.137 acre). Temporary impacts would occur due to construction of an access road, installation of a temporary creek diversion system, demolition of the existing bridge and abutments, creek bank grading, and installation of bioengineering bank stabilization.

Project implementation would impact 10 riparian trees. Riparian tree removal is necessary to construct the access road, roughened ramp, and bridge, and grade the creek banks to conform to the new bridge.

See Impact Maps in the Attachment for locations of permanent and temporary impacts.

Roadway Pollutant Impacts: Project implementation would result in approximately 0.1 acre of reworked and 0.06 acre of new impervious surface area. Stormwater runoff from impervious areas may contain hydrocarbons, metals, volatile organic compounds, trash, and sediment at levels that may significantly impact waters of the State if left untreated.

Hydromodification Impacts: Added impervious areas may result in alterations to existing hydrologic regimes, resulting in erosion and/or changes of sediment transport in receiving waters (hydromodification). Because the added impervious surface area of 0.06 acres for the Project is minimal, hydromodification mitigation is not required.

Avoidance and Minimization: The Department has avoided and minimized impacts to Sarco Creek by: conducting the work under a full road closure to limit bridge construction impacts to one in-creek work season, conducting in-creek work between June 1 and October 15, widening the bridge opening so that it can convey the 100-year flow; utilizing soil bioengineering bank stabilization techniques; and minimizing the amount of RSP installed on the creek banks;

Mitigation: To mitigate for permanent impacts to Sarco Creek the Department shall construct a roughened ramp in the creek to enhance fish passage downstream of the sanitary sewer encasement and install soil bioengineering in combination with RSP to stabilize the disturbed creek banks.

To mitigate for temporary impacts to Sarco Creek, the Department shall restore temporarily impacted areas to previous or enhanced condition (see Condition 3).

To mitigate for impacts to riparian vegetation, the Department shall install 230 willow stakes throughout the bioengineered banks and plant 19 riparian trees at the top of bank within the project limits as described in the planting plan in the Attachment. An on-site riparian planting mitigation and monitoring plan shall be submitted for acceptance by the Executive Officer by April 15, 2016 (see Condition 2).

Roadway Pollutant Mitigation: As mitigation for increased pollutant loads associated with 0.16 acre of added and reworked impervious area for this Project, the Department shall construct a biofiltration swale to treat a minimum of 0.16 acre of impervious area along northbound SR 121, south of the bridge. The biofiltration swale shall be constructed as shown in the plan and details in the Attachment (see Condition 1).

CEQA Compliance: The Department evaluated the Project pursuant to the requirements of the California Environmental Quality Act (CEQA) in a Negative Declaration. The Department filed a Notice of Determination on July 2, 2012 (SCH No. 2012032073). The Water Board, as a responsible agency, has reviewed the Negative Declaration and concurs that it, in concert with the conditions in this Certification, appropriately addresses the reasonably foreseeable environmental impacts within the Water Board's purview.

EcoAtlas: It has been determined through regional, state, and national studies that tracking of mitigation/restoration projects must be improved to better assess the performance of these projects, following monitoring periods that last several years. In addition, to effectively carry out the State's Wetlands Conservation Policy of no net loss to wetlands, the State needs to closely track both wetland losses and mitigation/restoration project success. Therefore, we require that the applicant use the California Wetlands Form to provide Project information related to impacts and mitigation/restoration measures (see Condition No. 2 of this Certification). An electronic copy of the form and instructions can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. Project information concerning impacts and mitigation/restoration will be made available at the web link: http://ecoatlas.org.

Certification: I hereby issue an order certifying that any discharge from the referenced Project will comply with the applicable provisions of sections 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, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification," which requires compliance with all conditions of this Certification. The following conditions are associated with this Certification:

1. As mitigation for increased pollutant loads associated with impervious surface added and reworked with the Project, the Department shall construct, and subsequently operate and maintain for the life of the adjacent roadway, a biofiltration swale to provide treatment of stormwater runoff from no less than 0.16 acre of impervious area. The biofiltration swale shall be constructed as shown in the plans in the Attachment;

2. By April 15, 2016, the Department shall submit a riparian mitigation and monitoring plan (MMP) for acceptance by the Executive Officer. The MMP shall include, but not be limited to:

a. A planting plan showing installation of 230 willow stakes in the disturbed creek banks and planting of a total of 19 riparian trees at the top of bank upstream and downstream of the bridge (the planting plan has already been submitted and is included in the Certification Attachment);
b. An invasive species control plan;
c. Performance standards and success criteria for all plantings;
d. A monitoring period of no less than 10 years;
e. An adaptive management plan;
f. A plan to wait two full growing seasons after termination of supplemental irrigation before considering success of the associated plantings;
g. Final bank stabilization and soil bioengineering plans;
h. Photo and visual assessment of erosion (e.g. gullying, rilling, bank and toe instability); and
i. A plan to submit annual reports to the Water Board by January 31st of each year. At a minimum, mitigation monitoring reports shall be submitted for years 0 (as-built report), 1-6, 8 and 10. All monitoring reports shall include photo-documentation utilizing consistent photo vantage points. If the monitoring report includes management recommendations, then the report must express whether the Department shall implement those recommendations.

3. As mitigation for temporary impacts to Sarco Creek, the Department shall restore all jurisdictional wetlands and waters to their pre-project or improved conditions. All temporarily disturbed areas shall be re-vegetated using only native plant species;

4. As mitigation for permanent impacts to Sarco Creek, the Department shall construct a roughened ramp to improve fish passage downstream of the Sarco Creek Bridge. The roughened ramp shall be constructed in accordance with the plans in the Attachment;

5. The Department is required to use the standard California Wetlands Form to provide Project information describing impacts and restoration measures within 14 days from the date of this Certification. An electronic copy of the form can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed form shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both (1) the Water Board (see the address on the letterhead), to the attention of EcoAtlas and (2) the San Francisco Estuary Institute, 4911 Central Avenue, Richmond, CA 94804, to the attention of EcoAtlas;

6. Caltrans shall submit, subject to the acceptance of Water Board staff, a dewatering and/or diversion plan that appropriately describes the dewatered or diverted areas and how those areas will be handled during construction. The diversion/dewatering plans shall be submitted no later than 30 days prior to conducting the proposed activity. Diversion/dewatering activities shall be prohibited until Water Board staff

has accepted the dewatering/diversion plan for that specific water. Information submitted shall include the area or work to be diverted or dewatered and method of the proposed activity. All diversion or dewatering activities shall be designed to minimize the impact to waters of the State, avoid fish entrainment, and maintain natural flows upstream and downstream. All dewatering or diversion structures shall be installed in a manner that does not cause sedimentation, siltation or erosion upstream or downstream. All dewatering or diversion structures shall be removed immediately upon completion of Project activities;

7. Work in standing or flowing water is prohibited;

8. All Project activities and BMPs shall be implemented according to the submitted application package and the findings and conditions of this Certification. Subsequent changes to the Project that could significantly impact water quality shall first be submitted to Regional Water Board staff for prior review, consideration, and written concurrence. If the Regional Water Board is not notified of an alteration to the Project that results in an impact to water quality, it will be considered a violation of this Order, and Caltrans may be subject to Regional Water Board enforcement actions;

9. The Department shall adhere to the conditions imposed by Nationwide Permits No. 14 and 27 issued to the Department by the Corps, the Streambed Alteration Agreement issued to the Department by the California Department of Fish and Wildlife, the Biological Opinion issued to the Department by the U.S. Fish and Wildlife Service, and the Letter of Concurrence issued to the Department by the National Marine Fisheries Service;

10. Initial water pollution control training described in Caltrans 2010 Standard Specifications 13-1.01D(2), Training, shall apply to all Caltrans employees, contractors, and sub-contractors. Initial water pollution control training topics shall include Regional Water Board 401 certification and construction general permit requirements, identification of state waters and riparian areas, and violation avoidance and discharge reporting procedures.

    Caltrans shall maintain logs of all Caltrans staff, contractors, and sub-contractors trained pursuant to the Caltrans 2010 Standard Specifications 13-1.01D(2). The logs shall include the names of trainees, training dates, and summary of the scope of training. Caltrans shall provide evidence of this documentation upon the request of the Regional Water Board;

11. Concrete shall be excluded from contact with surface water for a period of 30 days after it is poured/sprayed. During that time the concrete shall be kept moist and runoff from the concrete shall not be allowed to enter State waters. Commercial sealants may be applied to the concrete surface in instances where 30 days of water exclusion is infeasible. If sealant is used, water shall be excluded from the

site until the sealant is cured. If groundwater comes into contact with fresh concrete, it shall be prevented from flowing towards surface water;

12. Gravel used in State waters shall be either 1) clean washed gravel or 2) native or engineered streambed material.

13. Clean washed gravel shall:
    a. Consist of mechanically-rounded and washed, and/or river run gravel legally obtained from a river or creek bed;
    b. Be clean, hard, sound, durable, uniform in quality, and free of disintegrated material, organic matter, and deleterious substances;
    c. Be composed entirely of particles that have no more than one fractured face;
    d. Have a cleanliness value of at least 85, using the Cleanness Value Test Method for California Test No. 227; and
    e. Have a diameter no less than 3/8 inches in diameter, and no greater than four inches in diameter.

    Exceptions to these criteria are subject to the review and acceptance of Regional Water Board staff.

14. Streambed material shall:
    a. Be either native streambed material obtained onsite from a similar location within the stream channel, or engineered streambed material designed to closely resemble the gradation of the native streambed material, or material approved by the resource agencies; and
    b. Can be compacted by water jetting with uncontaminated, non-chlorinated water to wash smaller particles down into voids in the streambed matrix, provided the water does not discharge to downstream waters.

    Exceptions to these criteria are subject to the review and acceptance of Regional Water Board staff.

15. Gravel bags used within State waters shall:
    a. Comply with Caltrans 2010 Standard Specifications sections 13-5.02G and 88-1.02F;
    b. Be immediately removed and replaced if the bags have developed or are developing holes or tears; and
    c. Be filled only with clean washed gravel.

    Exceptions to these criteria are subject to the review and acceptance of Regional Water Board staff.

16. All activities and best management practices (BMPs) shall be implemented according to the submitted application materials and the findings and conditions of this Certification. BMPs for erosion, sediment, turbidity and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other Project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. The BMPs shall be implemented in accordance with the Caltrans Construction Site Best Management Practice Manual (CCSBMPM) and all contractors and subcontractors shall comply with the CCSBMPM. BMPs for erosion and sediment control shall be utilized throughout all phases of construction, regardless of date, wherever sediment-laden runoff threatens to enter waters of the State. The Department shall stage erosion and sediment control materials at the work site. All BMPs shall be installed properly and in accordance with the manufacturer's specifications. If the Project Resident Engineer elects to install alternative BMPs for use on the project, the Department shall submit a proposal to Water Board staff for review and concurrence;

17. Caltrans shall not use or allow the use of erosion control products that contain synthetic materials within waters of the United States or waters of the State at any time, with the exception of plastic sheeting used in water diversion and dewatering activities. Caltrans shall first request approval from the Regional Water Board staff if an exception from this requirement is needed for a specific location;

18. Caltrans and their contractors shall comply with the activity restrictions detailed in Caltrans 2010 Standard Specifications 13-4.03C(1). In addition, fueling, maintenance, storage and staging of vehicles and equipment shall be prohibited within waters of the State (e.g., gravel bars, seeps, ephemeral streams) and riparian areas;

19. Except as expressly allowed in this Certification, the Department is prohibited from discharging waste to waters of the State. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or concrete washings, welding slag, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature, other than that authorized by this Certification, shall be allowed to enter into waters of the State. Except for temporary stockpiling of waste generated during demolition operations ("temporary" in this instance means generated and removed during the same working day), waste materials shall not be placed where the materials may be washed by rainfall into waters of the State;

20. This Certification does not allow for the take, or incidental take, of any special status species. The Department shall use the appropriate protocols, as approved by the California Department of Fish and Wildlife and the USFWS, to ensure that Project activities do not impact the Beneficial Use of the Preservation of Rare and

Endangered Species, as described in the San Francisco Bay Regional Water Quality Control Plan;

21. The Department shall maintain a copy of this Certification at the Project site to be available at all times to Project personnel. It is the responsibility of the Department to assure that all personnel (employees, contractors, and subcontractors) are adequately informed and trained regarding the conditions of this Certification;

22. The Water Board may add to or modify the conditions of this Certification, as appropriate, to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act;

23. This Certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Title 23 of the California Code of Regulations, Section 3867;

24. 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 California Code of Regulations Title 23, Subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought;

25. Within 30 days of completing project construction activities, the Applicant shall submit a Final Project Completion Report that includes: (a) the CIWQS Place ID for this Project (i.e., CWIQS Place ID 819871); and (b) the date Project construction activities were completed. The Final Project Completion Report shall be submitted to Derek Beauduy at derek.beauduy@waterboards.ca.gov, or the current Water Board staff member assigned to the Project.

26. Certification is conditioned upon total payment of the full fee required in State regulations (23 CCR Section 3833) and owed by the applicant. The Application fee for this Project is $2,260 and was paid in full on December 4, 2016. The Applicant shall pay an annual discharge fee (currently $600, but subject to change) to the Water Board each fiscal year (July 1–June 30) until Project construction activities are completed and an acceptable Final Project Completion Report is received by the Water Board (See Condition 22). Receipt of an acceptable Final Project Completion Report will initiate a change in fees from the annual active discharge fee to the annual monitoring fee (currently $300, but subject to change). The Applicant shall pay an annual monitoring fee each fiscal year until the monitoring reports required pursuant to Condition 2 have all been submitted.

We anticipate your cooperation in implementing these conditions. However, please be advised that any violation of water quality certification conditions is a violation of State law and subject to administrative civil liability pursuant to California Water Code (CWC) Section 13350. Failure to respond, inadequate response, late response, or failure to meet any condition of this Certification may subject you to civil liability imposed by the Water Board to a maximum of $5,000 per day per violation or $10 for each gallon of waste discharged in violation of this Certification.

Conditions 2, 6, 22, and 23 are requirements for information and/or reports. Any requirement for a report made as a condition to this action is a formal requirement pursuant to CWC section 13267, and failure or refusal to provide, or falsification of such required report is subject to civil liability as described in CWC Section 13268.

We anticipate no further action on this requires. Should new information come to our attention that indicates a water quality problem with this project, the Water Board may issue Waste Discharge Requirements pursuant to 23 CCR Section 3857.

If you have any question, please contact Derek Beauduy at (510) 622-2348 or via e-mail to derek.beauduy@waterboards.ca.gov.

Sincerely,

for Bruce H. Wolfe
Executive Officer

Attachment

Cc: SWRCB, DWQ, stateboard401@waterboards.ca.gov
U.S. EPA, Region IX, WTR-8, 401 Mailbox, r9-wtr8-mailbox@epa.gov
Corps, Holly Costa, holly.n.costa@usace.army.mil
Corps, Patricia Goodman, patricia.k.goodman@usace.army.mil
CDFW, Melissa Escaron, melissa.escaron@wildlife.ca.gov
Regional Water Board, Victor Aelion, victor.aelion@waterboards.ca.gov
Regional Water Board, Dale Bowyer, dale.bowyer@waterboards.ca.gov
Caltrans, Hardeep Takhar, hardeep.s.takhar@dot.ca.gov
Caltrans, Cyrus Vafai, cyrus.vafai@dot.ca.gov
Caltrans, Wilfung Martono wilfung.martono@dot.ca.gov

401 Certification Attachment

State Route 121 Sarco Creek Bridge
CIWQS Place No. 819871

Impact Map

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.2/9.4	16	A

REGISTERED CIVIL ENGINEER — DATE 2-18-16

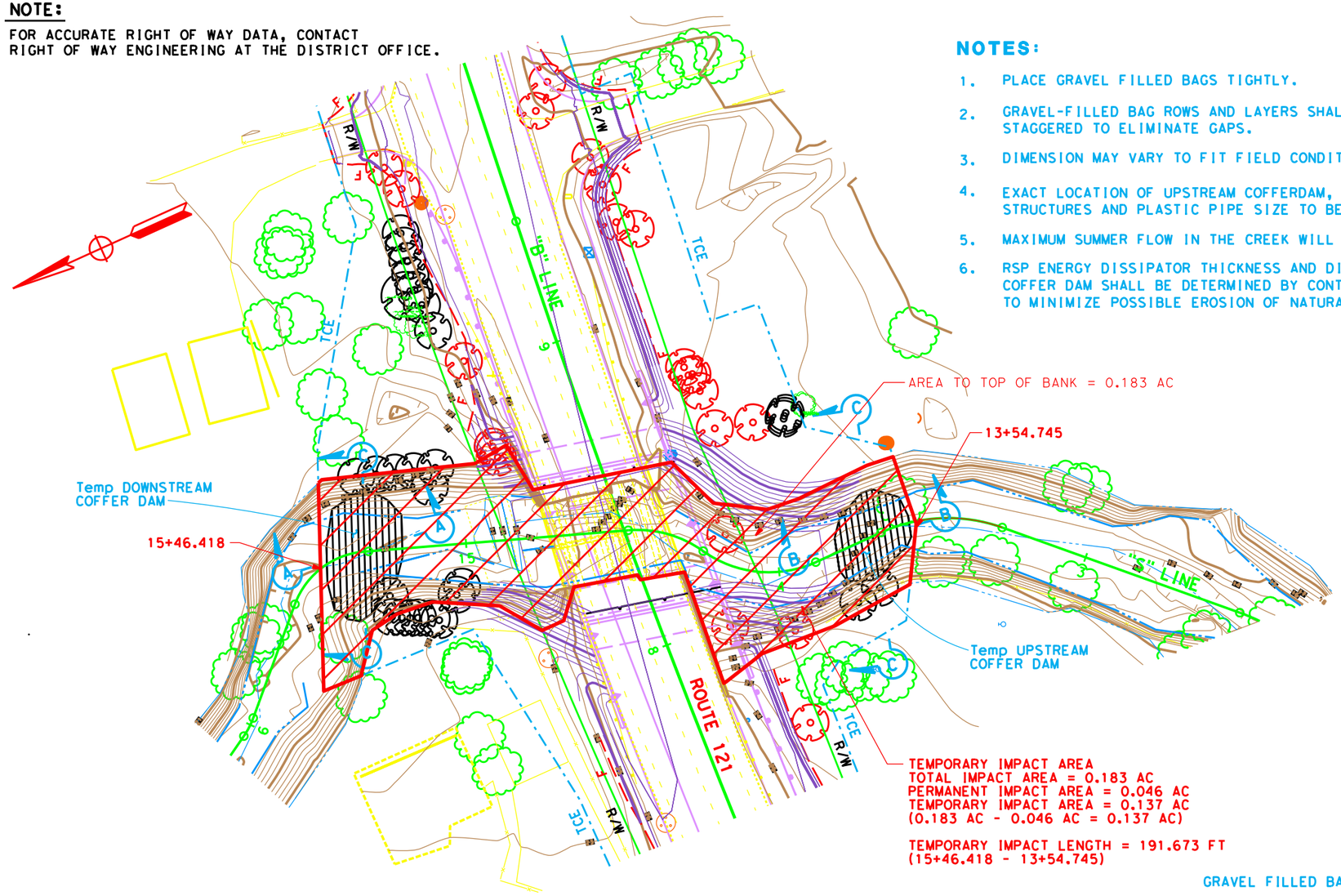
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Trang T. Hoang — No. 59917 — Exp. 12-31-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

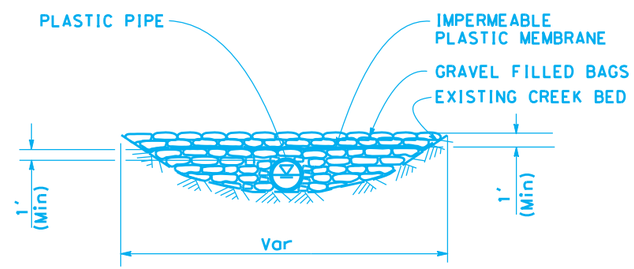
NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

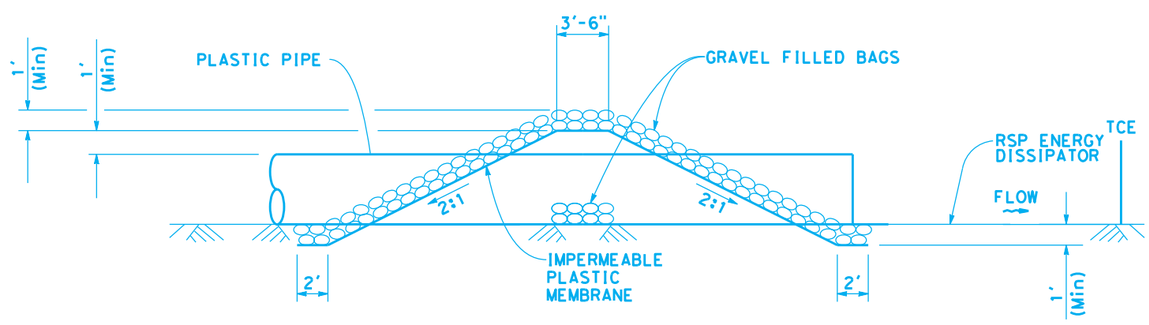


NOTES:

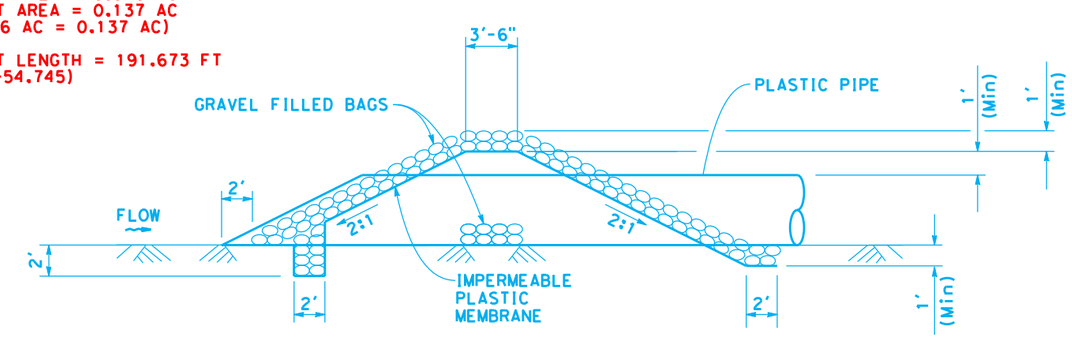
1. PLACE GRAVEL FILLED BAGS TIGHTLY.
2. GRAVEL-FILLED BAG ROWS AND LAYERS SHALL BE STAGGERED TO ELIMINATE GAPS.
3. DIMENSION MAY VARY TO FIT FIELD CONDITION.
4. EXACT LOCATION OF UPSTREAM COFFERDAM, DOWNSTREAM COFFERDAM, RELATED STRUCTURES AND PLASTIC PIPE SIZE TO BE DETERMINED BY CONTRACTOR'S OPERATION.
5. MAXIMUM SUMMER FLOW IN THE CREEK WILL BE 46.5 CFS.
6. RSP ENERGY DISSIPATOR THICKNESS AND DIMENSION AT THE DOWNSTREAM TEMPORARY COFFER DAM SHALL BE DETERMINED BY CONTRACTOR'S OPERATION TO MINIMIZE POSSIBLE EROSION OF NATURAL CREEK BED.



SECTION C-C
TEMPORARY COFFER DAM



SECTION A-A
TEMPORARY DOWNSTREAM COFFER DAM



SECTION B-B
TEMPORARY UPSTREAM COFFER DAM

TEMPORARY WATER POLLUTION CONTROL DETAILS

NO SCALE

WPCD-1

TRANG HOANG	REVISED BY	TH
KAMRAN NAKHJIRI	DATE REVISED	2-3-16
CALCULATED-DESIGNED BY		
CHECKED BY		
FUNCTIONAL SUPERVISOR		
KAMRAN NAKHJIRI		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
WATER QUALITY

Tree Removal Plan (Riparian tree impacts)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	NAP	121			

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

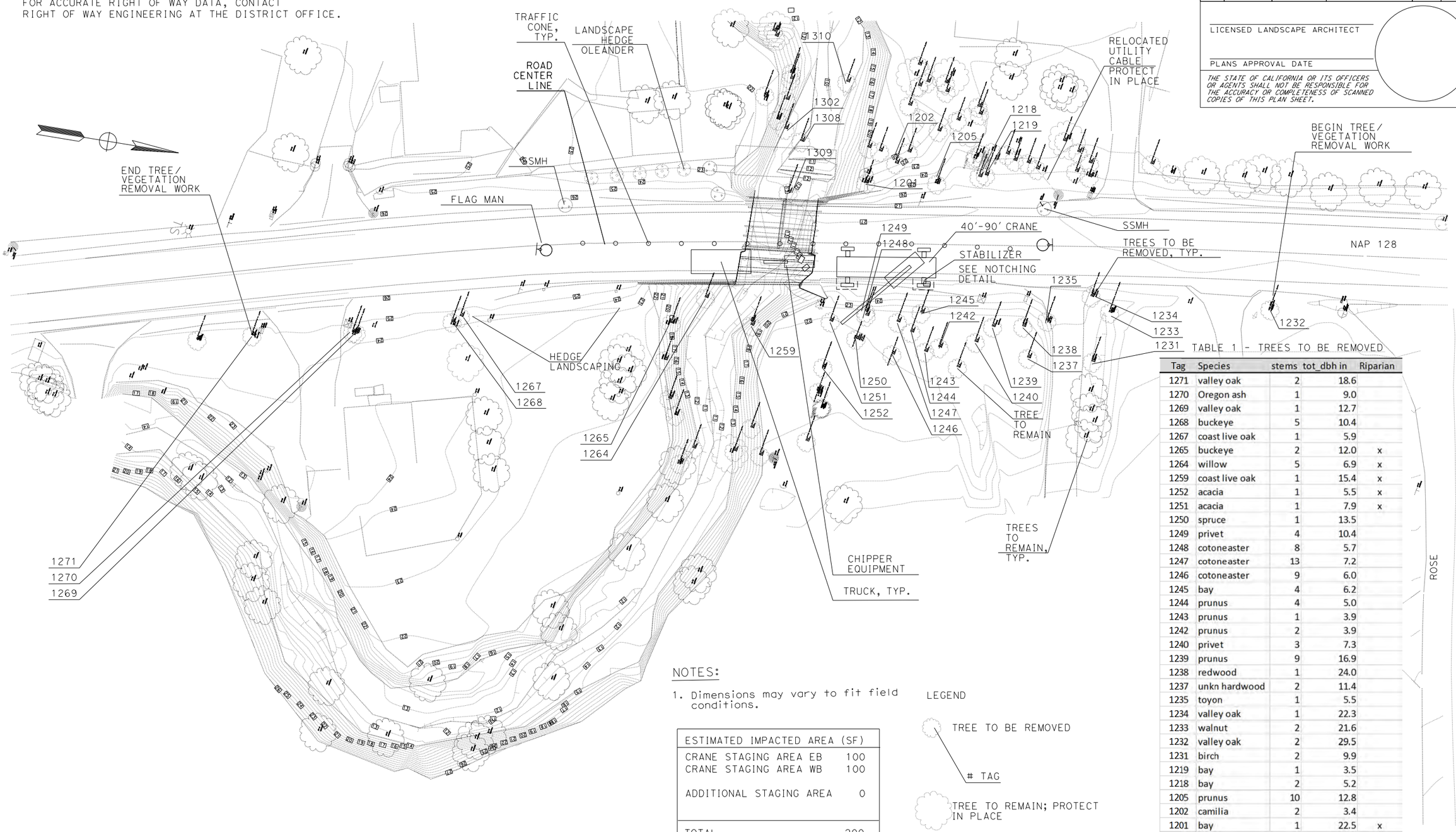


TABLE 1 - TREES TO BE REMOVED

Tag	Species	stems	tot_dbh in	Riparian
1271	valley oak	2	18.6	
1270	Oregon ash	1	9.0	
1269	valley oak	1	12.7	
1268	buckeye	5	10.4	
1267	coast live oak	1	5.9	
1265	buckeye	2	12.0	x
1264	willow	5	6.9	x
1259	coast live oak	1	15.4	x
1252	acacia	1	5.5	x
1251	acacia	1	7.9	x
1250	spruce	1	13.5	
1249	privet	4	10.4	
1248	cotoneaster	8	5.7	
1247	cotoneaster	13	7.2	
1246	cotoneaster	9	6.0	
1245	bay	4	6.2	
1244	prunus	4	5.0	
1243	prunus	1	3.9	
1242	prunus	2	3.9	
1240	privet	3	7.3	
1239	prunus	9	16.9	
1238	redwood	1	24.0	
1237	unkn hardwood	2	11.4	
1235	toyon	1	5.5	
1234	valley oak	1	22.3	
1233	walnut	2	21.6	
1232	valley oak	2	29.5	
1231	birch	2	9.9	
1219	bay	1	3.5	
1218	bay	2	5.2	
1205	prunus	10	12.8	
1202	camilia	2	3.4	
1201	bay	1	22.5	x
1302	acacia	2	10.6	x
1308	ash	1	4.5	x
1309	ash	6	4.9	x
1310	ash	2	7.8	x

NOTES:

1. Dimensions may vary to fit field conditions.

ESTIMATED IMPACTED AREA (SF)	
CRANE STAGING AREA EB	100
CRANE STAGING AREA WB	100
ADDITIONAL STAGING AREA	0
TOTAL	200

LEGEND

TREE TO BE REMOVED

TAG

TREE TO REMAIN; PROTECT IN PLACE

APPROVED FOR VEGETATION REMOVAL WORK ONLY

ADVANCED TREE REMOVAL

SCALE: 1"-20' **ATR-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans® **WATER QUALITY**

SENIOR LANDSCAPE ARCHITECT: DAVID YAM

CALCULATED-DESIGNED BY: BART VAN DER ZEEUW

CHECKED BY: LAUREN ROSS

REVISED BY

DATE REVISED

LAST REVISION 2-22-16

DATE PLOTTED => 2/25/2016

TIME PLOTTED => 7:58:55 AM

Stormwater Treatment Detail

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.2/9.4	A	A

REGISTERED CIVIL ENGINEER DATE

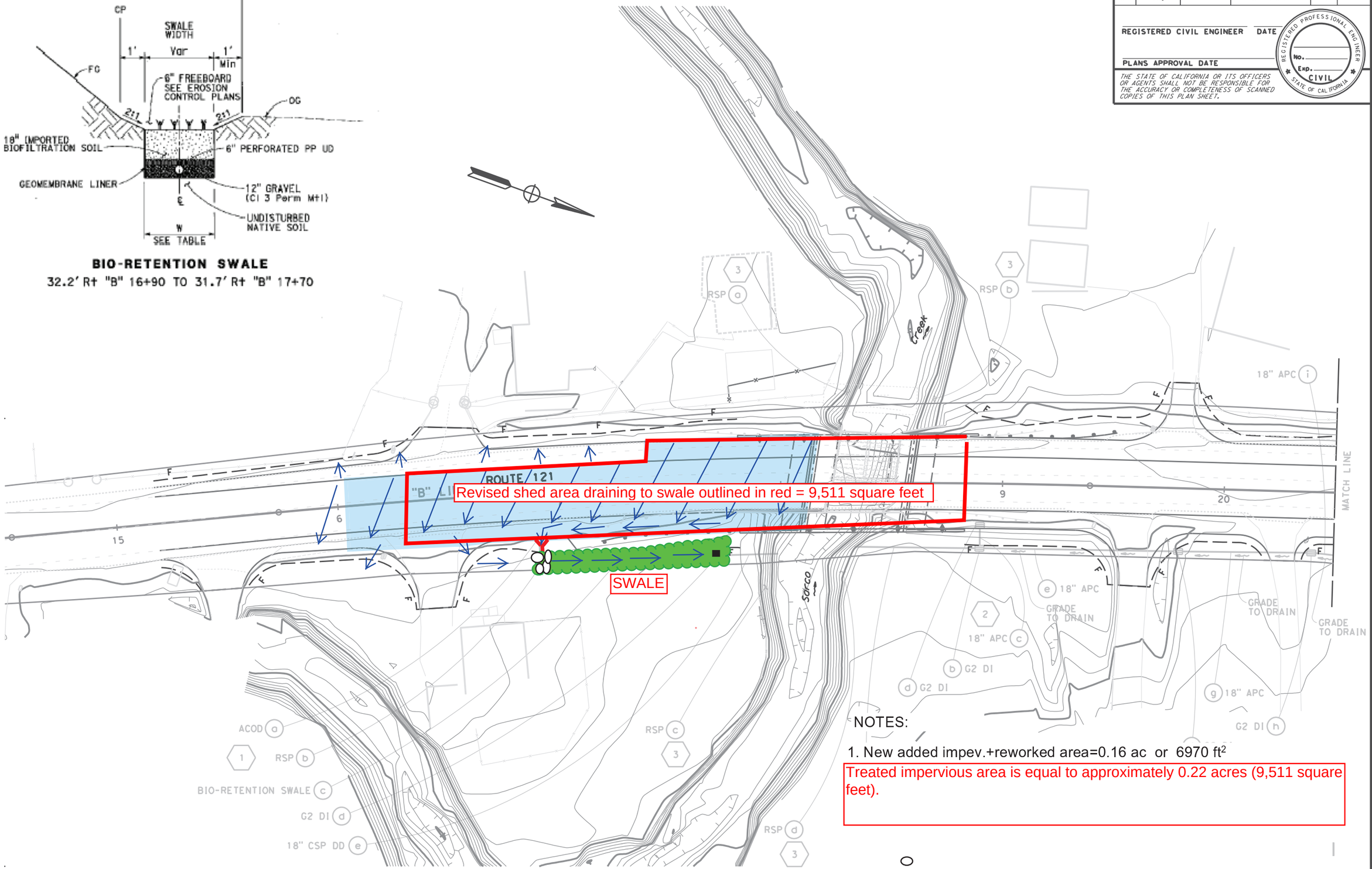
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

BIO-RETENTION SWALE

32.2' Rt "B" 16+90 TO 31.7' Rt "B" 17+70



NOTES:

1. New added impev.+reworked area=0.16 ac or 6970 ft^2

Treated impervious area is equal to approximately 0.22 acres (9,511 square feet).

APPROVED FOR DRAINAGE WORK ONLY

REVISED BY | DATE REVISED

CALCULATED- DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 01-27-16 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

Temporary Creek Diversion Plan

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	NAP	121	8.9/9.4		

REGISTERED CIVIL ENGINEER DATE

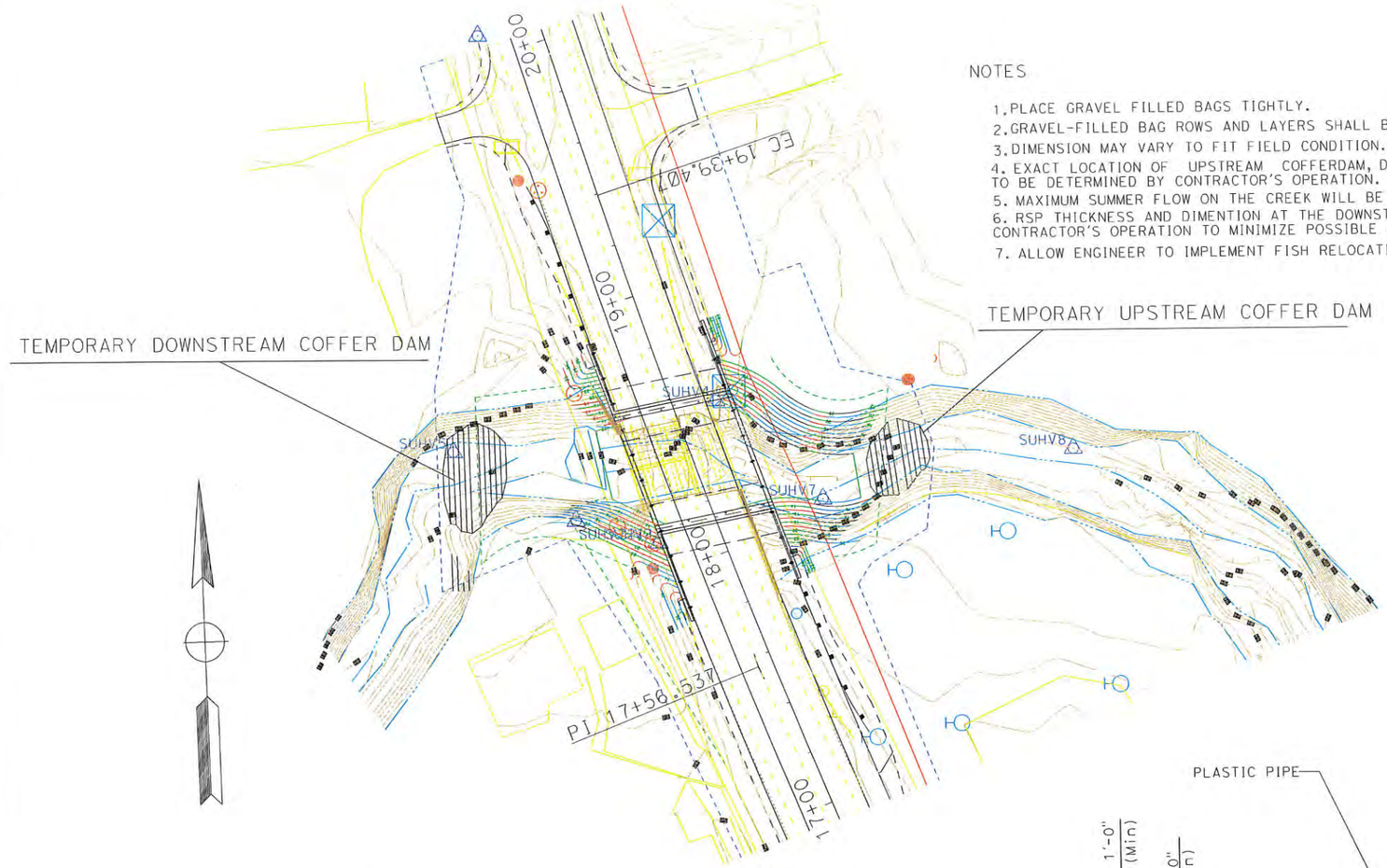
PLANS APPROVAL DATE

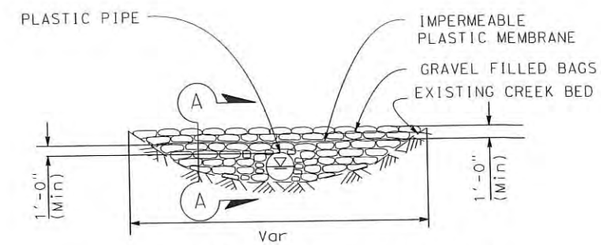
REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

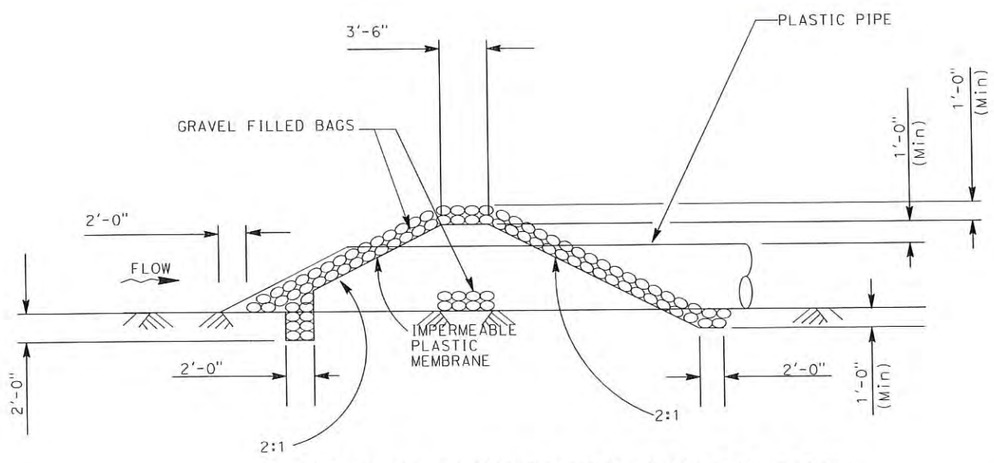
NOTES

1. PLACE GRAVEL FILLED BAGS TIGHTLY.
2. GRAVEL-FILLED BAG ROWS AND LAYERS SHALL BE STAGGERED TO ELIMINATE GAPS.
3. DIMENSION MAY VARY TO FIT FIELD CONDITION.
4. EXACT LOCATION OF UPSTREAM COFFERDAM, DOWNSTREAM COFFERDAM, AND PLASTIC PIPE SIZE TO BE DETERMINED BY CONTRACTOR'S OPERATION.
5. MAXIMUM SUMMER FLOW ON THE CREEK WILL BE 71.9 CFS.
6. RSP THICKNESS AND DIMENTION AT THE DOWNSTREAM TEMPORARY COFFER DAM SHALL BE DETERMINED BY CONTRACTOR'S OPERATION TO MINIMIZE POSSIBLE EROSION OF NATURAL CREEK BED
7. ALLOW ENGINEER TO IMPLEMENT FISH RELOCATION PLAN DEVELOPED BY THE DEPARTMENT.

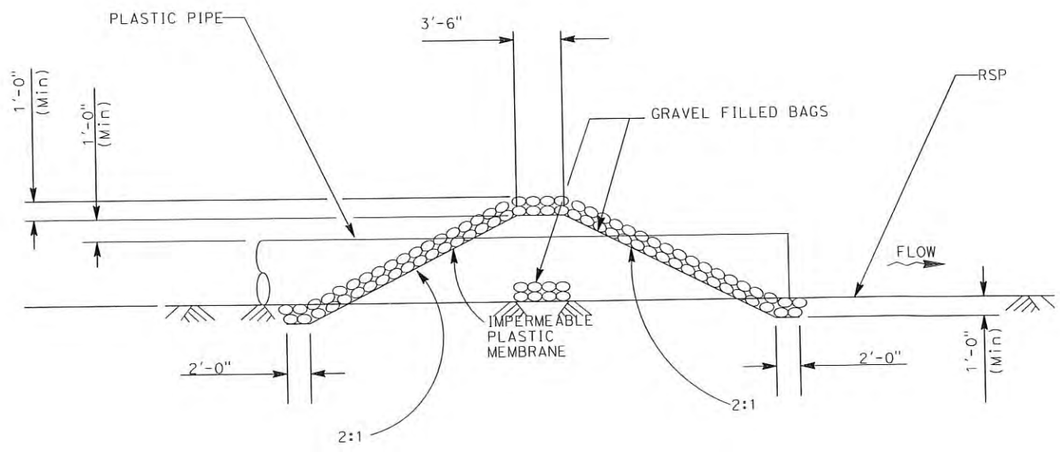




TEMPORARY COFFER DAM



UPSTREAM TEMPORARY COFFER DAM



DOWNSTREAM TEMPORARY COFFER DAM

NO SCALE

TEMPORARY CREEK DIVERSION DETAILS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY

DATE REVISED

LAST REVISION 04-19-11

DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => $USER
DGN FILE => $REQUEST

CU 0786

EA 2A320

Fish Passage Improvement Plan – Roughened Ramp

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.3	A	A

REGISTERED CIVIL ENGINEER — DATE xx/xx/xx

PLANS APPROVAL DATE

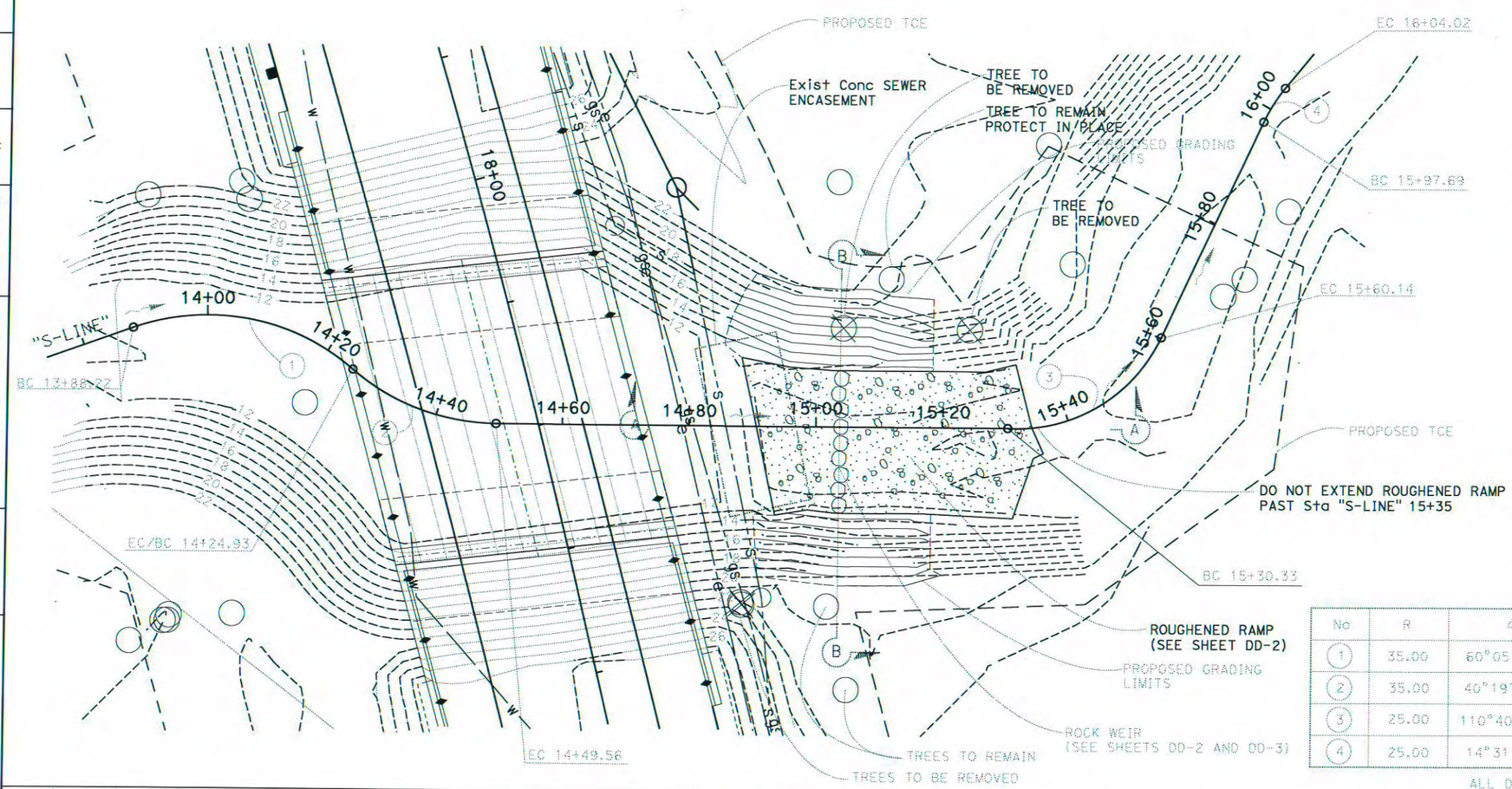
REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

CALTRANS
111 GRAND AVENUE
OAKLAND, CA 94612

NOTE: SEE SHEETS DD-2 AND DD-3 FOR SECTIONS.



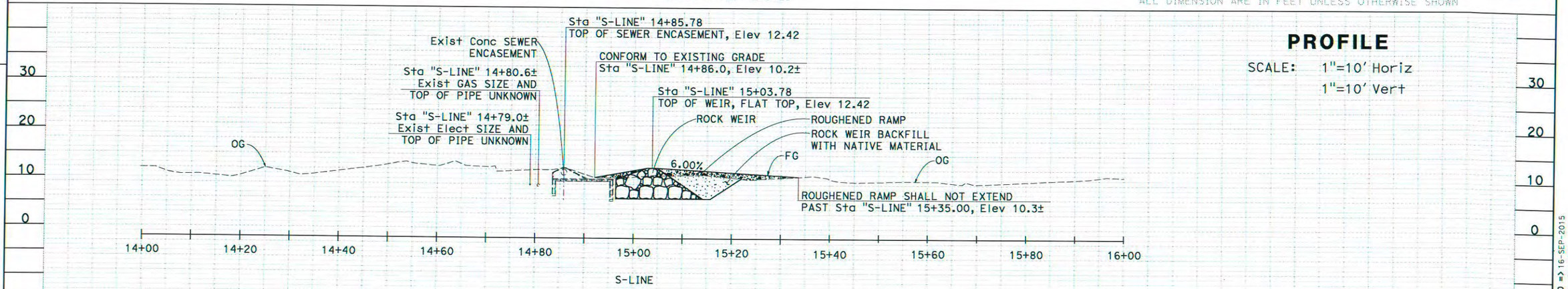
PLAN

SCALE 1"= 10'

CURVE DATA

No	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	35.00	60°05'49.64"	20.25	36.71	1879715.29	6483293.99
2	35.00	40°19'02.86	12.85	24.23	1879658.43	6483253.17
3	25.00	110°40'24.68"	16.97	29.81	1879661.78	6483170.51
4	25.00	14°31'53.51	3.19	6.34	1879643.75	6483110.64

ALL DIMENSION ARE IN FEET UNLESS OTHERWISE SHOWN



PROFILE

SCALE: 1"=10' Horiz
1"=10' Vert

PRELIMINARY DRAINAGE DETAILS
SARCO CREEK
FISH PASSAGE IMPROVEMENT

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

DD-1

REVISED BY	DATE REVISED
A	A

CALCULATED-DESIGNED BY: JAMES GO
CHECKED BY: ANALETTE OCHOA
CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 12-17-13
DATE PLOTTED => 16-SEP-2015
TIME PLOTTED => 11:00

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.3	A	A

REGISTERED CIVIL ENGINEER — DATE xx/xx/xx

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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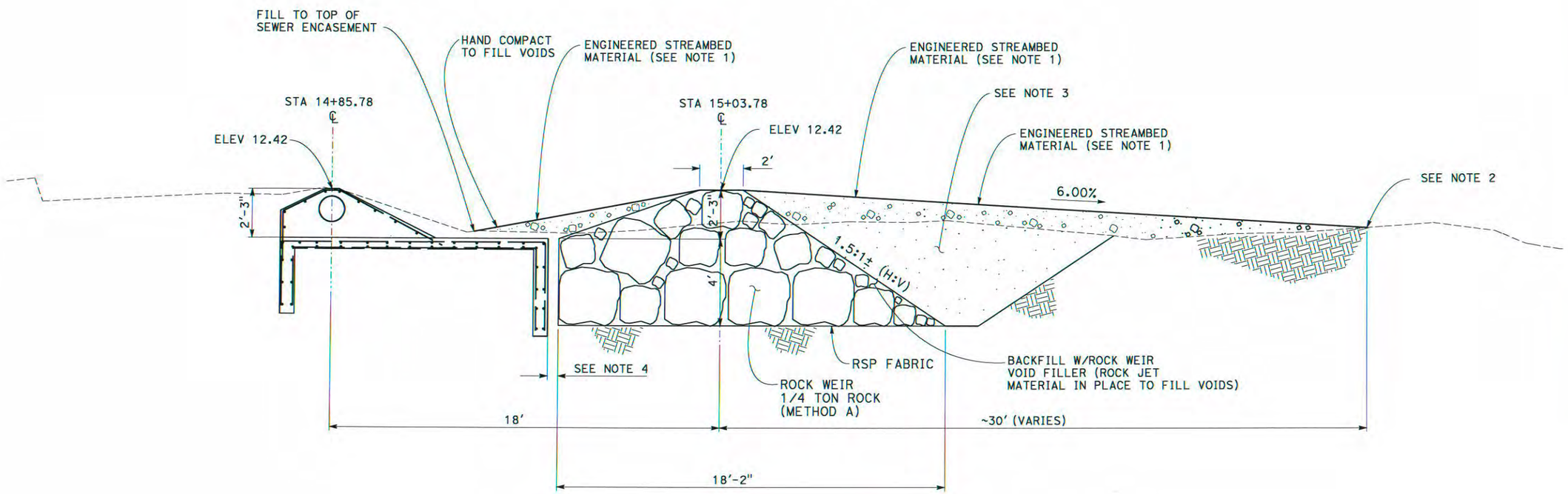
WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

CALTRANS
111 GRAND AVENUE
OAKLAND, CA 94612

NOTES:

1. ENGINEERED STREAMBED MATERIAL SHALL BE DESIGNED PER PART IX OF THE CDFG, CALIFORNIA SALMONID STREAM HABITAT RESTORATION MANUAL, AND SHALL BE MIXED WITH UPPER 1 FT OF NATIVE SOIL TO AID IN HABITAT RESTORATION.
2. ROUGHENED RAMP SHALL NOT EXTEND PAST STATION "S-LINE" 15+35.
3. EXCAVATION LIMITS FOR ROCK WEIR VARY. BACKFILL EXCAVATED AREA TO ORIGINAL GRADE WITH NATIVE MATERIAL.
4. ADD A 6 IN. MINIMUM SEPARATION BETWEEN CONCRETE ENCASEMENT AND BEGINNING OF ROCK WEIR.



SECTION A-A

LONGITUDINAL CROSS SECTION OF ROCK WEIR/ROUGHNED RAMP

ALL DIMENSION ARE IN FEET UNLESS OTHERWISE SHOWN

DRAINAGE DETAILS

SCALE 1"= 2.5'

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

DD-2

REVISED BY	A
DATE REVISED	A
JAMES GO	
ANALETTE OCHOA	
CALCULATED-DESIGNED BY	
CHECKED BY	
CONSULTANT FUNCTIONAL SUPERVISOR	
HAN-BIN LIANG	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 12-17-13 | DATE PLOTTED => 16-SEP-2015 | TIME PLOTTED => 11:00

Planting Plan

NOTE: 1. FOR ACCURATE RIGHT OF WAY, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE

2. FOR SAL LAS PLANTING, SEE CONSTRUCTION DETAILS

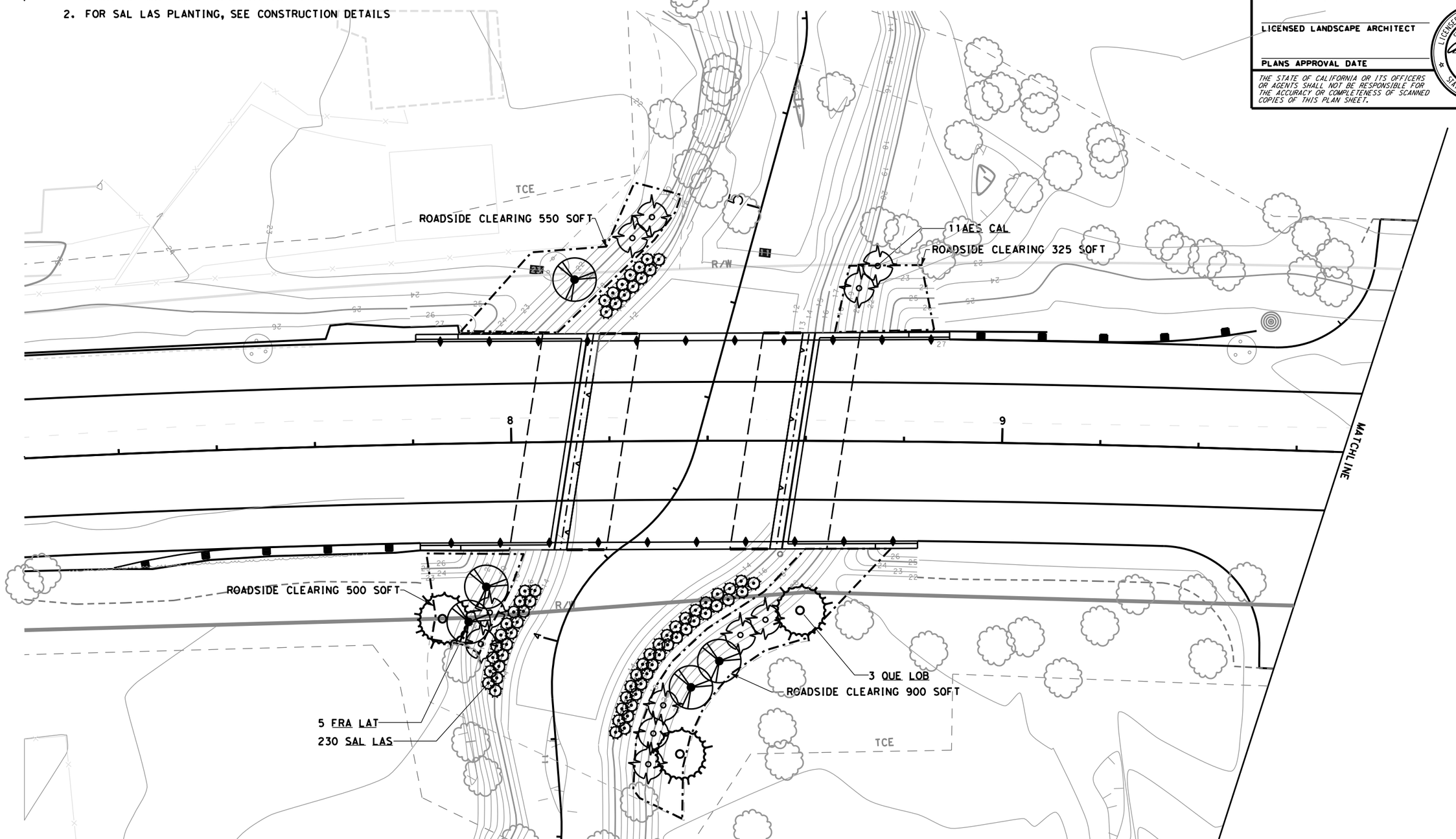
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.2/9.4	XX	XX

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

LICENSED LANDSCAPE ARCHITECT CHRIS PADICK No. 4755 Signature 11-30-16 Renewal Date Date STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



PLANTING PLAN

SCALE 1"=10'

PP-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	
Caltrans® WATER QUALITY	
SENIOR LANDSCAPE ARCHITECT	DAVID YAM
CALCULATED-DESIGNED BY	CHRIS PADICK
CHECKED BY	ALEX MCDONALD
REVISED BY	CP
DATE REVISED	02-18-16

LAST REVISION 02-18-16 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.2/9.4	XX	XX

LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE

LICENSED LANDSCAPE ARCHITECT CHRIS PADICK No. 4232 Signature 11-30-16 Renewal Date Date STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

PLANT GROUP	PLANT No.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE (13)	QUANTITY EACH	HOLE SIZE (INCH) Dia	HOLE SIZE (INCH) DEPTH	BASIN TYPE	SOIL AMENDMENT (1) TYPE	SOIL AMENDMENT (1) RATE	IRON SULFATE (1) RATE	COMMERCIAL FERTILIZER (1) PLANTING	COMMERCIAL FERTILIZER (1) PLT ESTB	BASIN MULCH TYPE	BASIN MULCH CY	STAKING	PLANTING LIMITS MINIMUM DISTANCE (ft) FROM ETW	Pvmt	FENCE	WALL	PAVED DITCH	EARTH DITCH	ON CENTER (ft)	REMARKS
I	1		AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	POT	11	24	24	I	C	2 CF	-	-	-	WC	0.04	-	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(9) TREE
	2		FRAXINUS LATIFOLIA	OREGON ASH	POT	5	24	24	I	C	2 CF	-	-	-	WC	0.04	-	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(9) TREE
	3		QUERCUS LOBATA	VALLEY OAK	POT	3	24	24	I	C	2 CF	-	-	-	WC	0.04	-	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(9) TREE

APPLICABLE WHEN CIRCLED:

(1) - QUANTITIES SHOWN ARE "PER PLANT" UNLESS SHOWN AS SOFT OR SOYD APPLICATION RATES
2 - BASIN MULCH IS INCLUDED WITH MULCH QUANTITIES SHOWN ON PLANTING PLAN
3 - SUFFICIENT TO RECEIVE ROOT BALL AND AMENDMENTS IF REQUIRED
4 - SEE DETAIL
5 - SEE SPECIAL PROVISIONS
6 - SEE STANDARD SPECIFICATIONS
(7) - AS SHOWN ON PLANS
8 - UNLESS OTHERWISE SHOWN ON PLANS
(9) - FOLIAGE PROTECTOR REQUIRED
10 - ROOT PROTECTOR REQUIRED
11 - ROOT BARRIER REQUIRED
12 - DEPARTMENT-FURNISHED
(13) - POT SIZE- 4"-4"-14" Min

ABBREVIATIONS:

C - COMPOST
S - SPHAGNUM PEAT MOSS
N - NITROLIZED FIR BARK
V - VERMICULITE
P - PERLITE
TB - TREE BARK
WC - WOOD CHIP
SB - SHREDDED BARK
TT - TREE TRIMMING

NOTE:

UNDERLINED PORTIONS OF BOTANICAL NAME INDICATE ABBREVIATIONS USED ON PLANTING PLANS.

PLANTING LEGEND

SCALE 1"=10'

PL-1

REVISED BY CP
DATE REVISED 02-18-16
CHRIS PADICK
ALEX MCDONALD
CALCULATED-DESIGNED BY
CHECKED BY
SENIOR LANDSCAPE ARCHITECT
DAVID YAM
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
WATER QUALITY

LAST REVISION 02-18-16
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	NAP	121	8.9/9.4		

NOTES:

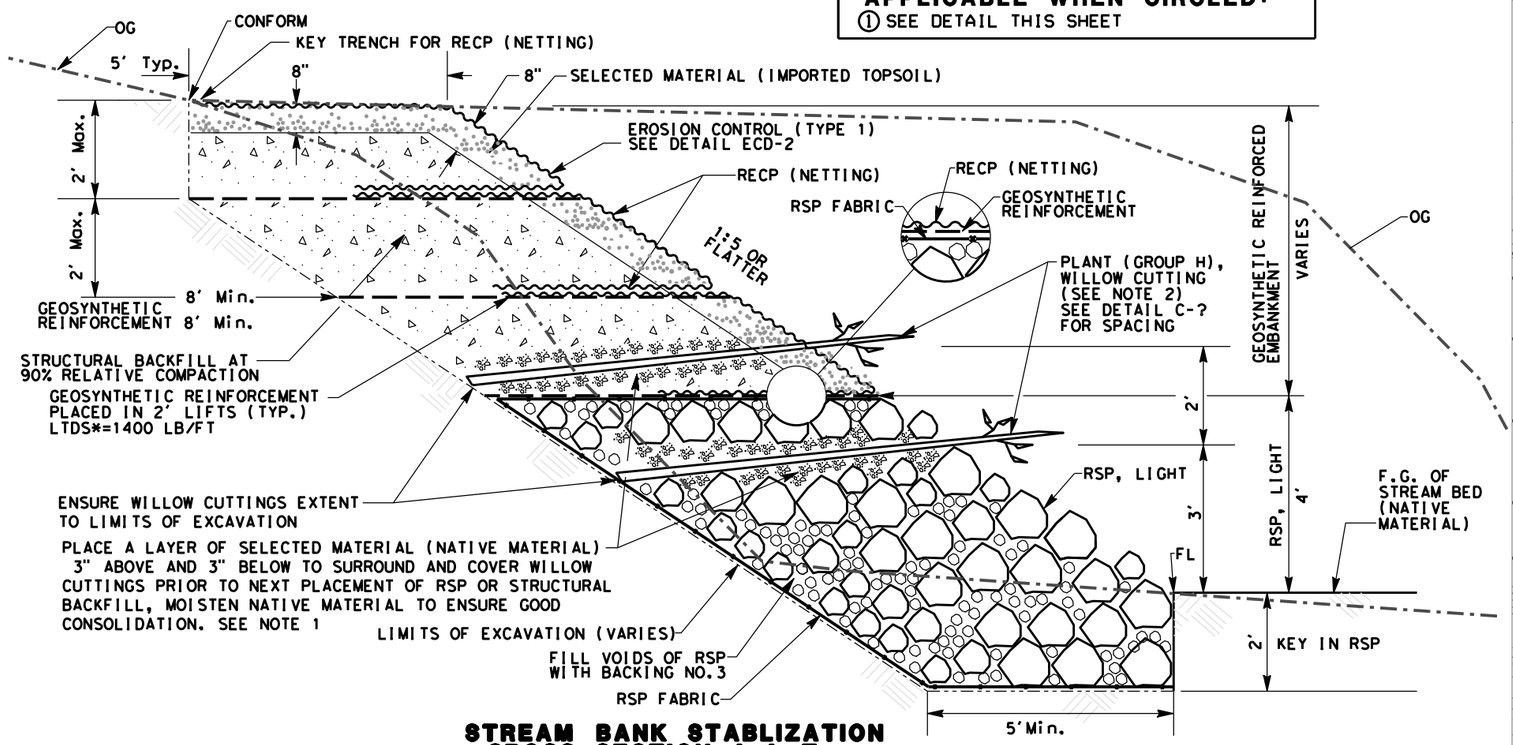
1. EXCAVATE AND STOCKPILE SELECTED MATERIAL (NATIVE MATERIAL) FROM LIMITS OF EXCAVATION.
2. PLANT GROUP H.WILLOW CUTTING TO BE PLACED AT 5-10% OFF LEVEL. EXTEND BACK TO LIMITS OF EXCAVATION AND EXTEND NO MORE THAN 12" BEYOND FG
3. DETAILS SHOW TYPICAL TREATMENT FOR LEFT SIDE OF'S' LINE. MIRROW DETAILS FOR TREATMENT ON RIGHT SIDE OF 'S' LINE

ABBR.

LTDS -LONG TERM DESIGN STRENGTH
RECP(NETTING)-ROLLED EROSION CONTROL PRODUCT (NETTING)

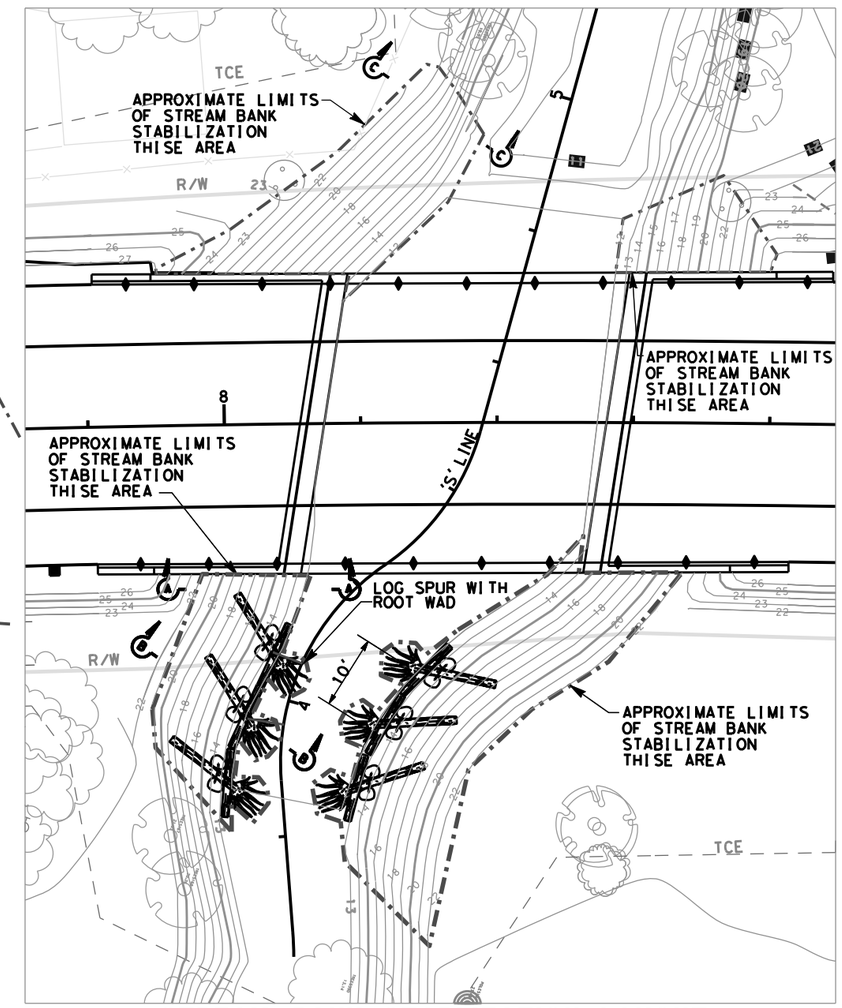
PLANT GROUP	PLANT No.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY EACH	HOLE SIZE (INCH)		BASIN TYPE	SOIL AMENDMENT		IRON SULFATE	COMMERCIAL FERTILIZER		BASIN MULCH		STAKING	PLANTING LIMITS							REMARKS
																		MINIMUM DISTANCE (ft) FROM						ON CENTER (ft)	
							Dia	DEPTH		TYPE	RATE	RATE	PLANTING	PLT ESTB	TYPE	CY		ETW	Pvmt	FENCE	WALL	PAVED DITCH	EARTH DITCH		
H	1	⊕	SALIX LAEVIGATA	RED WILLOW	①	230	①	①	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	1	TREE

APPLICABLE WHEN CIRCLED:
① SEE DETAIL THIS SHEET



STREAM BANK STABLIZATION CROSS SECTION A-A Typ.

'S' LINE STA 13+80 LT TO 'S' LINE STA 14+18 LT
'S' LINE STA 13+70 RT TO 'S' LINE STA 14+20 RT
'S' LINE STA 14+65 LT TO 'S' LINE STA 14+85 LT
'S' LINE STA 14+75 RT TO 'S' LINE STA 14+95 RT



STREAM BANK STABLIZATION LAYOUT PLAN.

LEGEND

ROLLED EROSION CONTROL PRODUCT (RECP (NETTING))
GEOSYNTHETIC REINFORCEMNT
RSP FABRIC
LIMITS OF EXCAVATION

CONSTRUCTION DETAIL C-6

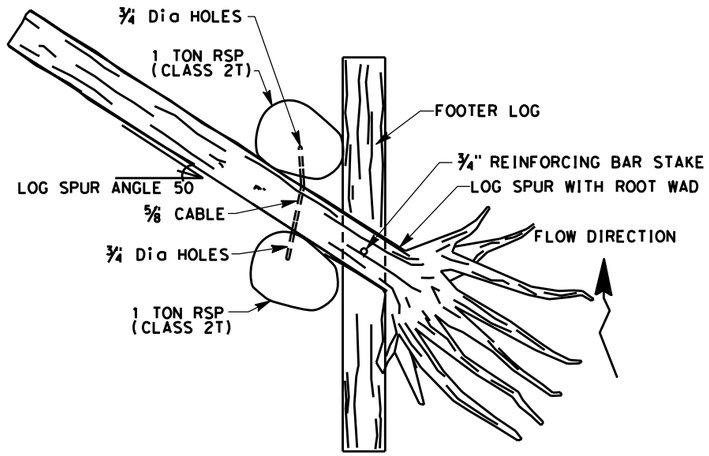
REVISED BY | DATE REVISED
CHRIS PADICK | ALEX MCDONALD
CALCULATED-DESIGNED BY | CHECKED BY
SENIOR LANDSCAPE ARCHITECT | DAVID YAM
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® WATER QUALITY

LAST REVISION 1-29-16 | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

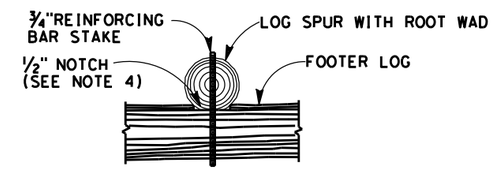
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	NAP	121	8.9/9.4		

NOTES:

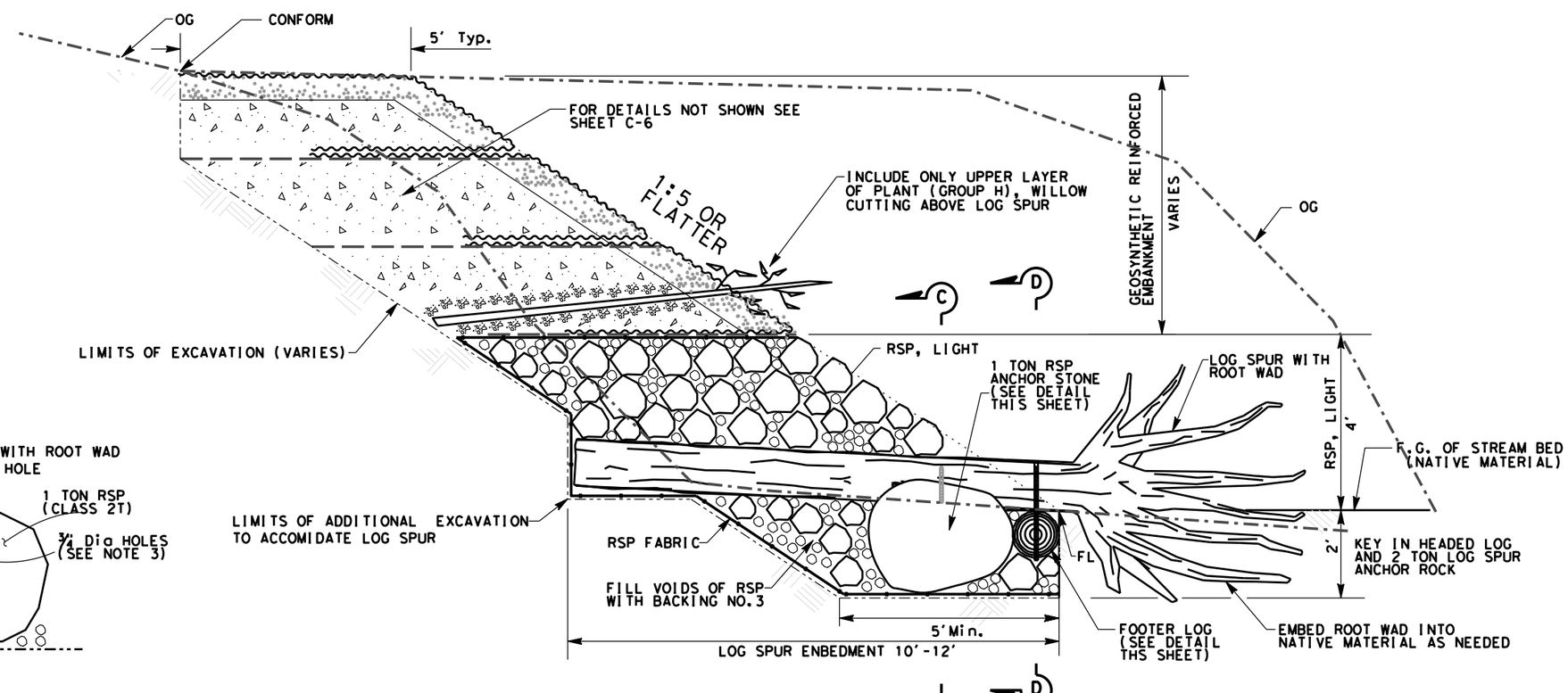
1. EXCAVATE AND STOCKPILE SELECTED MATERIAL (NATIVE MATERIAL) FROM LIMITS OF EXCAVATION.
2. PLANT GROUP H.WILLOW CUTTING TO BE PLACED AT 5-10% OFF LEVEL. EXTEND BACK TO LIMITS OF EXCAVATION AND EXTEND NO MORE THAN 12" BEYOND FG
3. FILL HOLE APPROXIMATELY 2/3 FULL WITH EPOXY AND INSERT CABLE INTO HOLE UNTIL IT REACHES BOTTOM.
4. CUT NOTCHES AT THE LOCATION WHERE THE LOG SPUR WITH ROOT WAD OVERLAPS THE FOOTER LOG TO ENSURE A STABLE JOINT.
5. DETAILS SHOW TYPICAL TREATMENT FOR LEFT SIDE OF'S' LINE. MIRROW DETAILS FOR TREATMENT ON RIGHT SIDE OF 'S' LINE

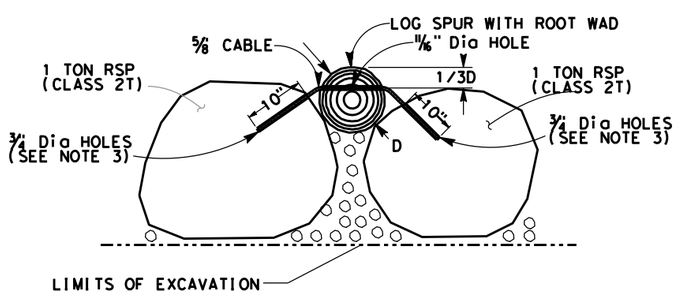


LOG SPUR WITH ROOTWAD PLAN



FOOTER LOG CROSS SECTION D-D





1 TON RSP ANCHOR STONE CROSS SECTION C-C

STREAM BANK STABLIZATION WITH LOG SPUR ROOT WADS CROSS SECTION B-B Typ.

'S' LINE STA 13+86 LT 'S' LINE STA 13+88 RT
'S' LINE STA 13+95 LT 'S' LINE STA 13+98 RT
'S' LINE STA 14+05 LT 'S' LINE STA 14+10 RT

CONSTRUCTION DETAIL C-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
WATER QUALITY

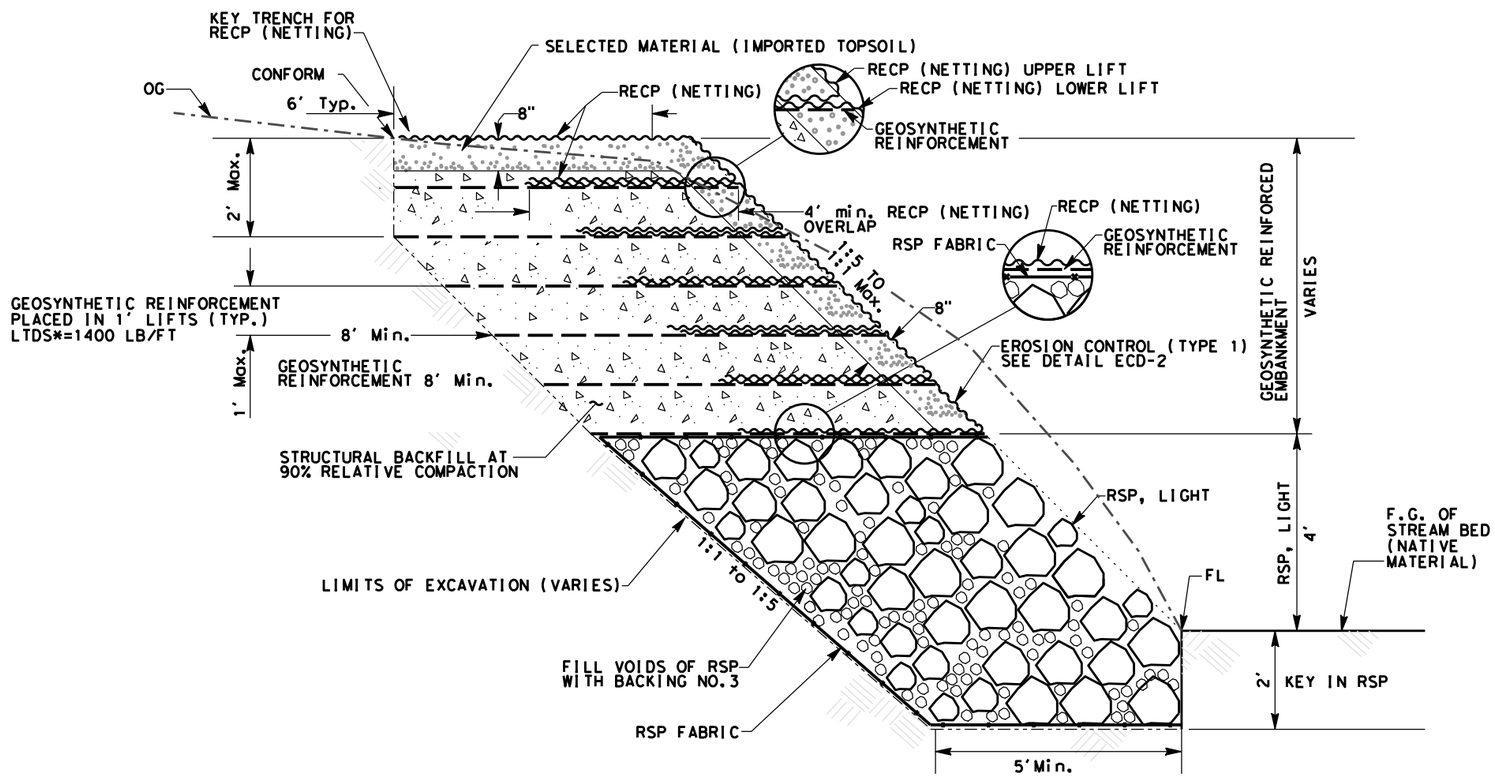
SENIOR LANDSCAPE ARCHITECT: DAVID YAM
CALCULATED-DESIGNED BY: CHRIS PADICK
CHECKED BY: ALEX MCDONALD
REVISED BY
DATE REVISED

LAST REVISION 1-29-16
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	NAP	121	8.9/9.4		

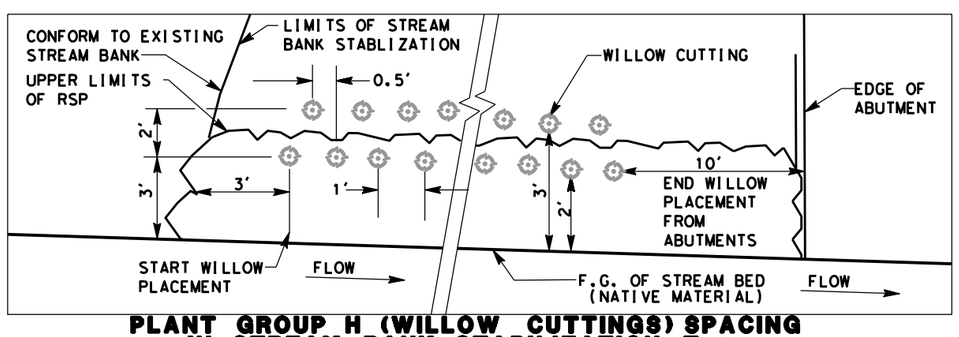
NOTES:

1. DETAILS SHOW TREATMENT TYPICAL FOR LEFT SIDE OF 'S' LINE. MIRROW DETAILS FOR TREATMENT ON RIGHT SIDE OF 'S' LINE



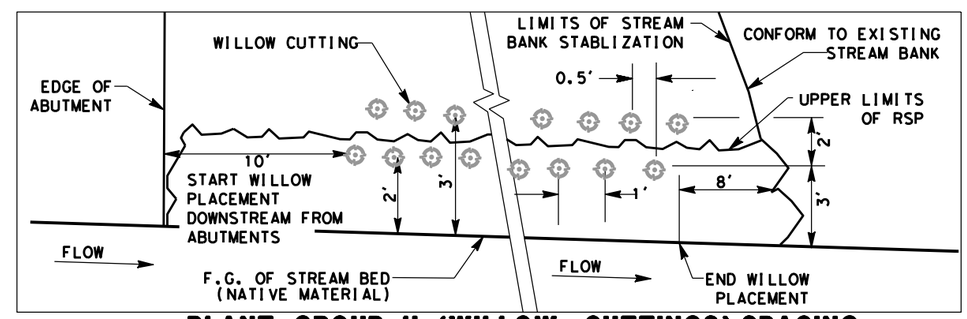
STREAM BANK STABLIZATION CROSS SECTION C-C Typ.

'S' LINE STA 14+85 LT TO STA 14+95 LT



PLANT GROUP H (WILLOW CUTTINGS) SPACING IN STREAM BANK STABILIZATION, Typ. ELEVATION

'S' LINE STA 13+80 LT TO 'S' LINE STA 14+18 LT
'S' LINE STA 13+70 RT TO 'S' LINE STA 14+20 RT



PLANT GROUP H (WILLOW CUTTINGS) SPACING IN STREAM BANK STABILIZATION, Typ. ELEVATION

'S' LINE STA 14+65 LT TO 'S' LINE STA 14+95 LT

CONSTRUCTION DETAIL
C-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
WATER QUALITY

SENIOR LANDSCAPE ARCHITECT: DAVID YAM
CALCULATED-DESIGNED BY: CHRIS PADICK
CHECKED BY: ALEX MCDONALD
REVISED BY
DATE REVISED

LAST REVISION 1-29-16
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16TH FLOOR
SAN FRANCISCO, CALIFORNIA 94103-1398

MAR 10 2015

Regulatory Division

Subject: File Number 2011-00190N

Christopher Herbst
California Department of Transportation
111 Grand Avenue
Oakland, California 94623

Dear Mr. Herbst:

This correspondence is in reference to your submittal of July 24, 2014, concerning Department of the Army (DA) authorization to replace the roadway bridge located at Post Mile 9.3 of route 121 over Sarco Creek in the City of Napa, Napa County, California (38.323544 N, -122.273423; APN 491-9000-1000).

Work within U.S. Army Corps of Engineers' (Corps) jurisdiction will include removal of the existing two-span Sarco Creek bridge and replacement with a single span concrete structure. This work will also include roadway widening and construction of fish passage downstream of the bridge. The fish passage consists of a roughened rock weir immediately downstream of the bridge. A temporary water diversion system, consisting of an upstream cofferdam and a PVC water conveyance pipe, would be in place during the in-creek construction period. Work will require temporary placement of clean washed gravel bags and PVC pipe within 0.12 acre and 110 linear feet of Sarco Creek. Work will require permanent placement of 100 cubic yards of rock slope protection (RSP) and 596 cubic yards of local soil material in 0.12 acres and 160 linear feet of Sarco Creek. All work shall be completed in accordance with the plans and drawings titled "USACE File #2011-00190N, Sarco Creek Bridge, March 5, 2015, Figure 1 to 6" provided as enclosure 1.

Section 404 of the Clean Water Act (CWA) generally regulates the discharge of dredged or fill material below the plane of ordinary high water in non-tidal waters of the United States, below the high tide line in tidal waters of the United States, and within the lateral extent of wetlands adjacent to these waters. Section 10 of the Rivers and Harbors Act generally regulates construction of structures and work, including excavation, dredging, and discharges of dredged or fill material, occurring below the plane of mean high water in tidal waters of the United States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future

use to transport interstate or foreign commerce. An approved jurisdictional determination for this location was completed and dated certified June 25, 2012.

Based on a review of the information in your submittal and the current condition of the site, as verified during a field investigation on May 26, 2011, the project qualifies for authorization under Department of the Army Nationwide Permits (NWPs) 14 for Linear Transportation and 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities, 77 Fed. Reg. 10,184 (Feb. 21, 2012) (enclosure 2), pursuant to Section 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq.*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 3. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

This verification will remain valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon a NWP will remain authorized provided the activity is completed within 12 months of the date of a NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 C.F.R. § 330.4(e) and 33 C.F.R. § 330.5 (c) or (d). This verification will remain valid if, during the time period between now and March 18, 2017, the activity complies with any subsequent modification of the NWP authorization. The Chief of Engineers will periodically review NWPs and their conditions and will decide to modify, reissue, or revoke the permits. If a NWP is not modified or reissued within five years of its effective date, it automatically expires and becomes null and void. It is incumbent upon you to remain informed of any changes to the NWPs. Changes to the NWPs would be announced by Public Notice posted on our website (http://www.spn.usace.army.mil/Missions/RegulatoryPublicNotices.aspx). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 4, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification to the Corps prior to the commencement of work.

General Condition 18 stipulates that project authorization under a NWP does not allow for the incidental take of any federally-listed species in the absence of a biological opinion with incidental take provisions. As the principal federal lead agency for this project, Caltrans initiated consultation with the National Marine Fisheries Service (NMFS) to address project related impacts to listed species, pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq*). By letter of October 24, 2011, NMFS Letter of Concurrence No. 2011/03131, NMFS concurred with the determination that the project was not likely to adversely affect California Central Coast (CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat for this species.

In order to ensure compliance with this NWP authorization, the following special conditions shall be implemented:

1. The NMFS concurred with the determination that the project was not likely to adversely affect California Central Coast (CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat for this species. This concurrence was premised, in part, on project work restrictions outlined in NMFS Letter of Concurrence No. 2011/03131. These work restrictions are incorporated as special conditions to the NWP authorization for your project to ensure unauthorized incidental take of species and loss of critical habitat does not occur.

2. In-water work shall be restricted to the time between June 1 and October 15.

3. Caltrans will provide water quality monitoring and sampling once every two hours upstream and downstream of the diversion system during the in-creek work to ensure water quality objectives are not exceeded.

4. All standard Best Management Practices shall be implemented to prevent the movement of sediment downstream. No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products, or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into the waterways.

5. A post construction report shall be submitted 45 days after the conclusion of construction activities. The report shall document construction activities and contain as-built drawings (if different from drawings submitted with application) and include before and after photos.

6. A copy of this NWP authorization, and all other state and federal authorizations, shall be onsite during all work activities and will be available to USACE representatives upon request.

7. The permittee must allow representatives from the San Francisco USACE office or any other person(s) designated by USACE, to inspect the authorized activity at any time deemed necessary to ensure the project is being or has been accomplished in accordance with the terms and conditions of the NWP authorization.

You may refer any questions on this matter to Sahrye Cohen of my Regulatory staff by telephone at 415-503-6779 or by e-mail at Sahrye.E.Cohen@usace.army.mil. All correspondence should be addressed to the Regulatory Division, North Branch, referencing the file number at the head of this letter.

The San Francisco District is committed to improving service to our customers. My Regulatory staff seeks to achieve the goals of the Regulatory Program in an efficient and cooperative manner, while preserving and protecting our nation's aquatic resources. If you would like to provide comments on our Regulatory Program, please complete the Customer Service Survey Form available on our website: http://www.spn.usace.army.mil/Missions/Regulatory.aspx

Sincerely,

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copy Furnished (w/o encls)

CA RWQCB, Oakland, CA
NMFS, Santa Rosa, CA

Nationwide Permit 14 - *Linear Transportation Projects*

Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project. This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 31.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Federal Register /Vol. 77, No. 34 /Tuesday, February 21, 2012 /Notices **10269**

INDEX OF PLANS

USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Enclosure 1

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Page 1 of 6

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

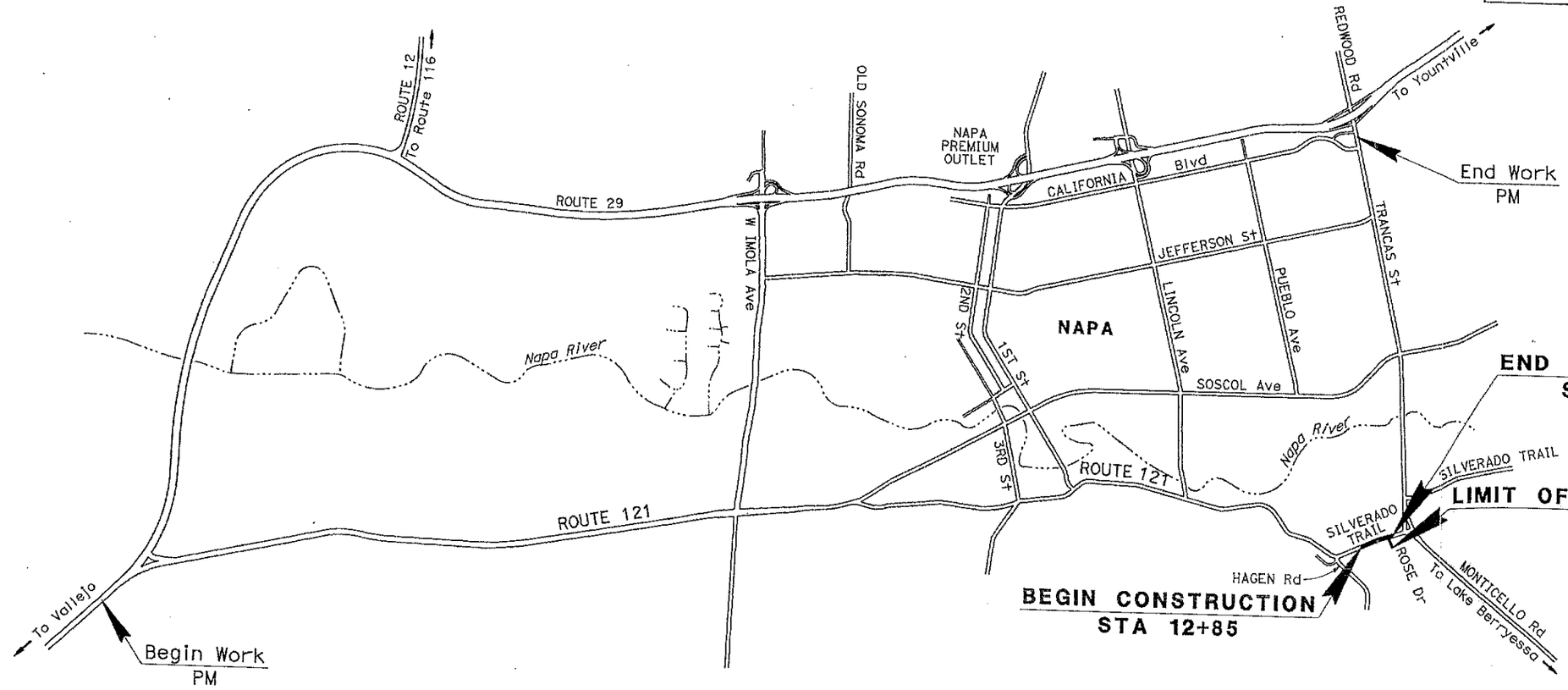
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN NAPA COUNTY
IN NAPA
AT SILVERADO TRAIL ROAD

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.
04	Nap	121	8.9/9.4	

LOCATION MAP



PROJECT MANAGER	AHAMD RAHIMI
DESIGN MANAGER	HILLAL HAMDAN

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

NO SCALE

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

CONTRACT No.

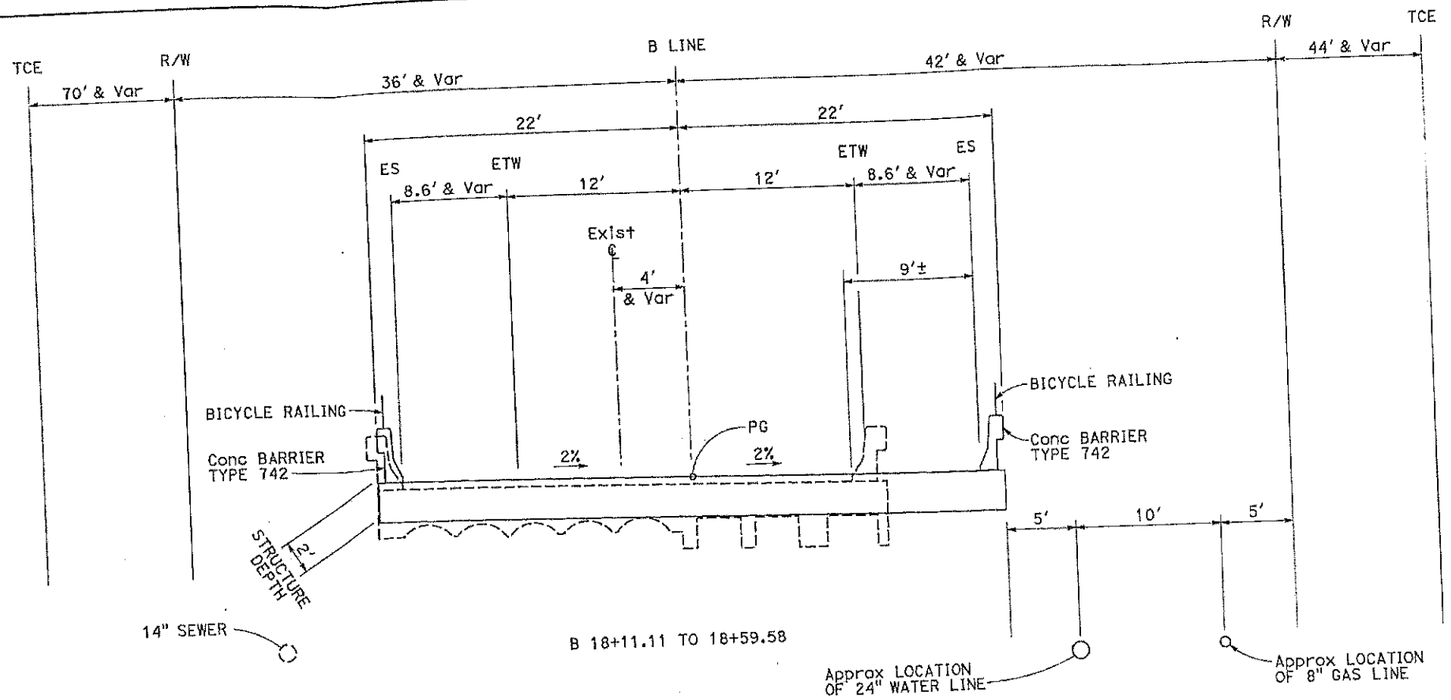
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	8.9/9.4		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

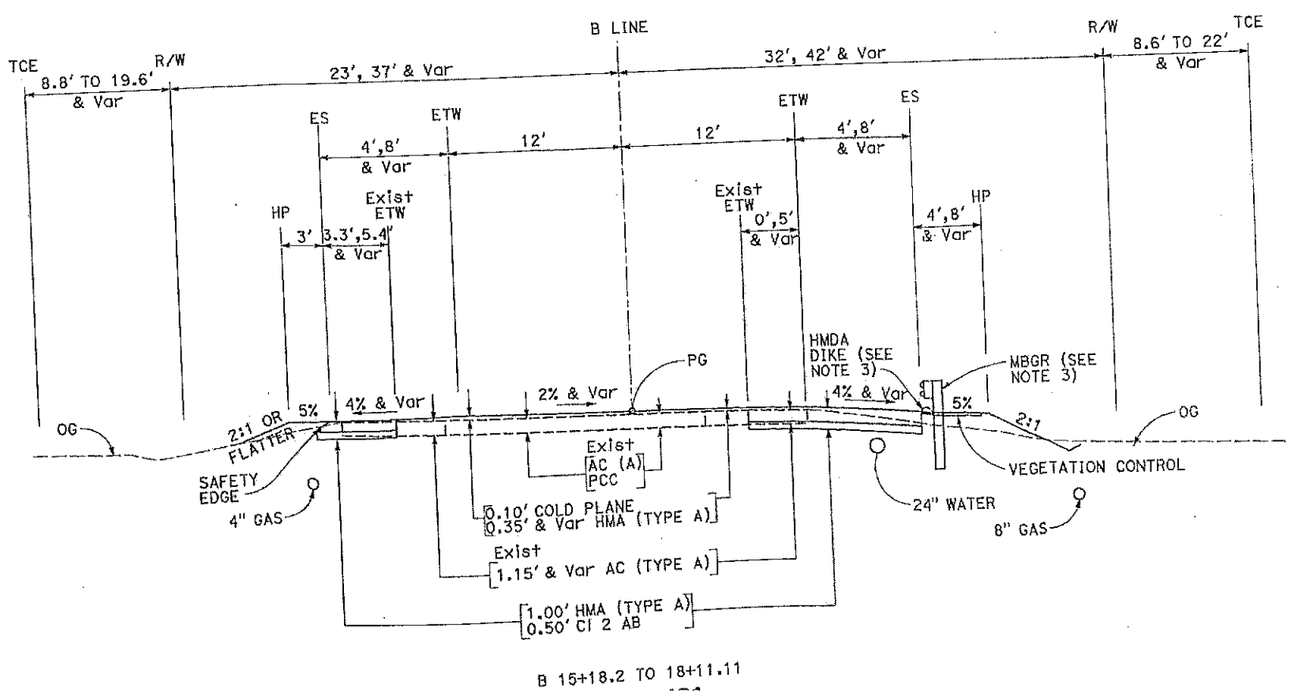


NOTES:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATIONS ARE SHOWN ON THE SUPERELEVATION DIAGRAMS.
3. EXACT LOCATIONS AND TYPES OF DIKES, GUARD RAILING ARE SHOWN ON THE LAYOUTS AND THE SUMMARY OF QUANTITIES SHEETS.
4. FOR Pvmt EDGE TREATMENTS, SEE RSP's P74, P75 & P76.
5. FOR STRUCTURE DETAILS, SEE STRUCTURE PLANS.

DESIGN DESIGNATION (ROUTE 121)

TI=
T=
V=



USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Page 2 of 6

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

TYPICAL CROSS SECTIONS

NO SCALE

X-1

REVISED BY	FM	CALCULATED-DESIGNED BY	FARHAD MOSTAGHIM
DATE REVISED	10/31/13	CHECKED BY	HASSEN BOLANOS
FUNCTIONAL SUPERVISOR	HILLAL HAMDAN		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN

Caltrans

DATE PLOTTED => 14-JUL-2014

LAST REVISION

REVISED BY	FM	CALCULATED-DESIGNED BY	FARHAD MOSTAGHIM
FUNCTIONAL SUPERVISOR	HILLAL HAMDAN		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN

Caltrans

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	9.3		

REGISTERED CIVIL ENGINEER — DATE XX/XX/XX

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

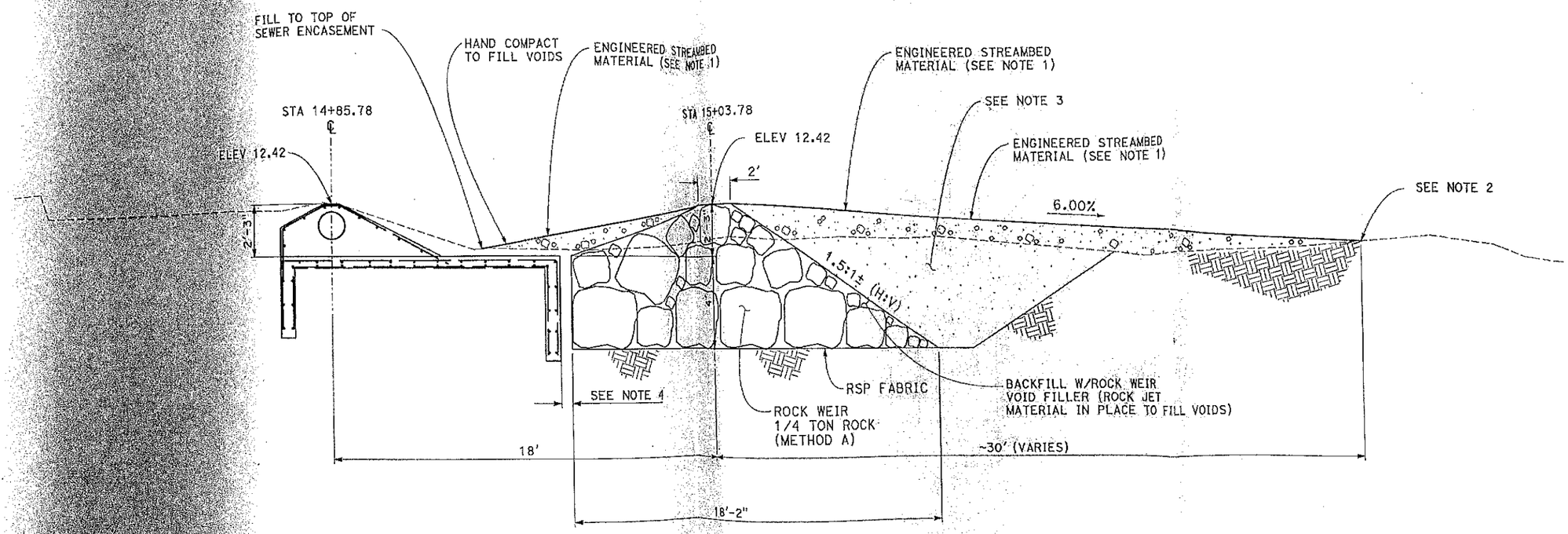
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

CALTRANS
111 GRAND AVENUE
OAKLAND, CA 94612

NOTES:

1. ENGINEERED STREAMBED MATERIAL SHALL BE DESIGNED PER PART IX OF THE CDFG, CALIFORNIA SALMONID STREAM HABITAT RESTORATION MANUAL, AND SHALL BE MIXED WITH UPPER 1 FT OF NATIVE SOIL TO AID IN HABITAT RESTORATION.
2. ROUGHENED RAMP SHALL NOT EXTEND PAST STATION "S-LINE" 15+35.
3. EXCAVATION LIMITS FOR ROCK WEIR VARY. BACKFILL EXCAVATED AREA TO ORIGINAL GRADE WITH NATIVE MATERIAL.
4. ADD A 6 IN. MINIMUM SEPARATION BETWEEN CONCRETE ENCASEMENT AND BEGINNING OF ROCK WEIR.



SECTION A-A

LONGITUDINAL CROSS SECTION OF ROCK WEIR/ROUGHNED RAMP

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Page 5 of 6

ALL DIMENSION ARE IN FEET UNLESS OTHERWISE SHOWN
SCALE 1"= 2.5'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG
CALCULATED-DESIGNED BY: JAMES GO
CHECKED BY: ANALETTE OCHOA
REVISED BY
DATE REVISED

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

UNIT 0714

DD-2

LAST REVISION | DATE PLOTTED => 14-JUL-2014

DIST	COUNTY	ROUTE
04	Nap	121

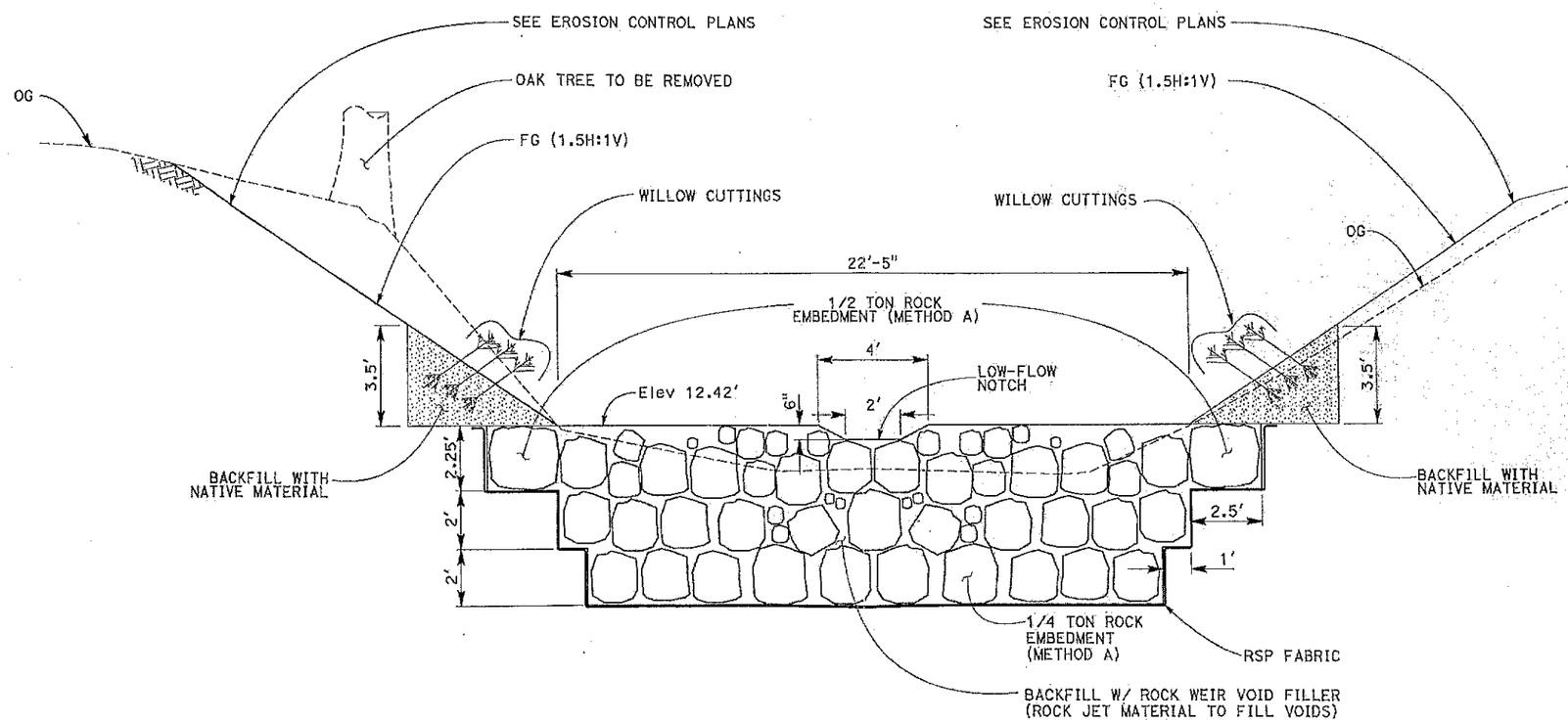
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF COPIES OF THIS PLAN SHEET.

SWECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

RATE RIGHT OF WAY DAT
WAY ENGINEERING AT TI



SECTION B-B

CROSS SECTION THROUGH ROCK WEIR AT STA 15+03.78

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Page 6 of 6

ALL DIMENSIONS ARE IN FEET UNLESS OTHER SHOWN

SCALE: 1"= 2.5'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN JIANG

CALCULATED-DESIGNED BY: JAMES GO

CHECKED BY: ANALETTE SCHOR

REVISED BY

DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	121	8.9/9.4		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

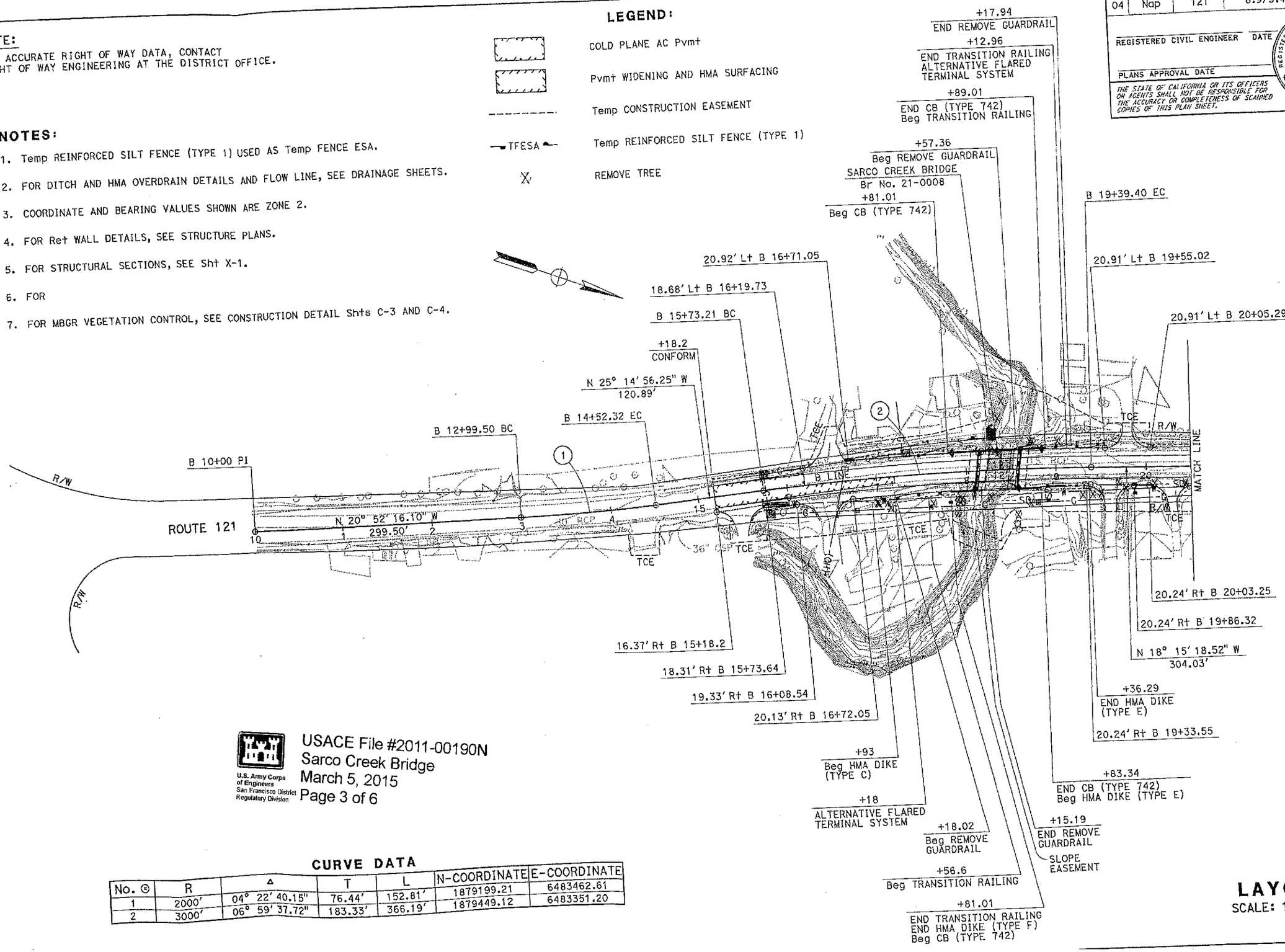
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

NOTES:

1. Temp REINFORCED SILT FENCE (TYPE 1) USED AS Temp FENCE ESA.
2. FOR DITCH AND HMA OVERDRAIN DETAILS AND FLOW LINE, SEE DRAINAGE SHEETS.
3. COORDINATE AND BEARING VALUES SHOWN ARE ZONE 2.
4. FOR Ret WALL DETAILS, SEE STRUCTURE PLANS.
5. FOR STRUCTURAL SECTIONS, SEE Sht X-1.
6. FOR
7. FOR MBGR VEGETATION CONTROL, SEE CONSTRUCTION DETAIL Shts C-3 AND C-4.

LEGEND:

- COLD PLANE AC Pvmt
- Pvmt WIDENING AND HMA SURFACING
- Temp CONSTRUCTION EASEMENT
- TFESA — Temp REINFORCED SILT FENCE (TYPE 1)
- X — REMOVE TREE



USACE File #2011-00190N
Sarco Creek Bridge
March 5, 2015
Page 3 of 6

U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

CURVE DATA

No. ⊙	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	2000'	04° 22' 40.15"	76.44'	152.81'	1879199.21	6483462.61
2	3000'	06° 59' 37.72"	183.33'	366.19'	1879449.12	6483351.20

LAYOUT
SCALE: 1" = 50'

L-

FM	10/31/13	FARHAD MOSTAGHIM	HASSEN BOLANOS
REVISED BY	DATE REVISED	CALCULATED-DESIGNED BY	CHECKED BY

FUNCTIONAL SUPERVISOR: HILLAL HAMDAN

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN

Caltrans

Dist	COUNTY	ROUTE	POST MILE TOTAL PROJ
04	Nap	121	9.3

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

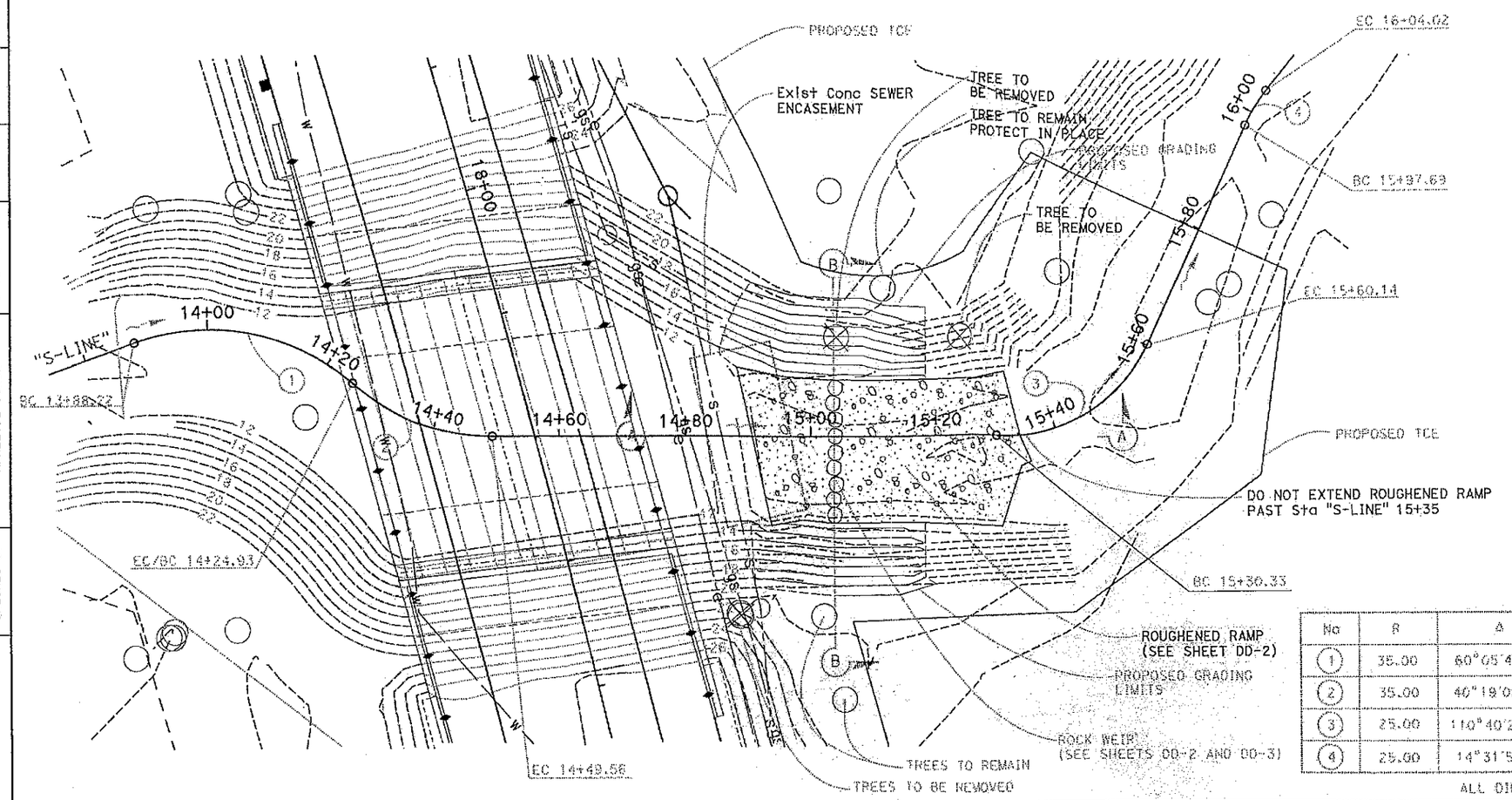
WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

CALTRANS
111 GRA
OAKLAND

NOTES:

1. ENGINEERED PER PART I HABITAT RE UPPER 1 FT
2. ROUGHENED
3. EXCAVATION AREA TO OR
4. ADD A 6 IN. BEGINNING

NOTE: SEE SHEETS DD-2 AND DD-3



PLAN

SCALE 1"=10'

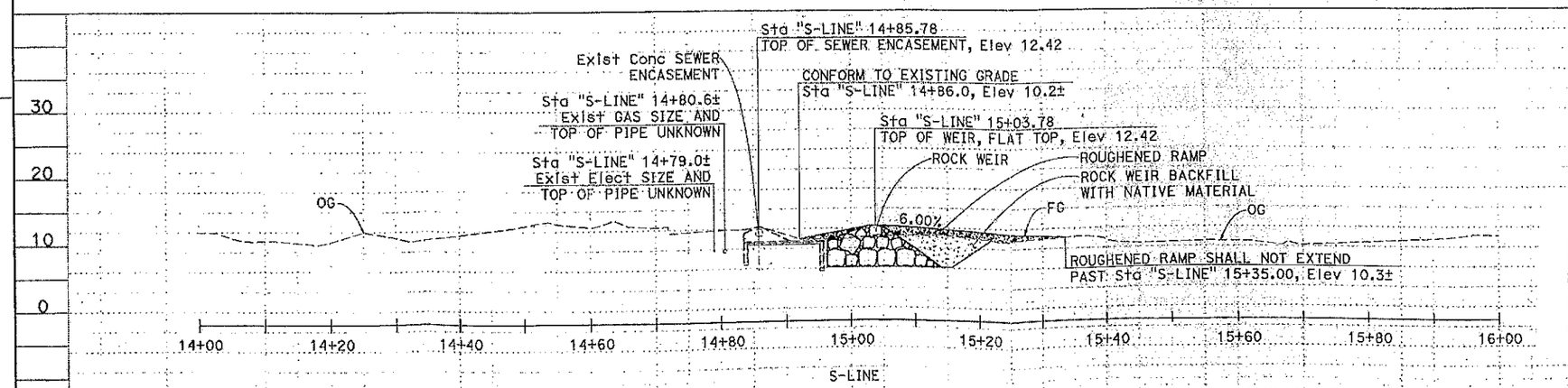
CURVE DATA

No	R	Δ	T	L	N-COORDINATE
1	35.00	60°05'49.64"	20.25	36.71	1879715.29
2	35.00	40°19'02.86	12.85	24.23	1879658.13
3	25.00	110°40'24.68"	16.97	29.81	1879661.18
4	25.00	14°31'53.51	3.19	6.34	1879643.15

ALL DIMENSION ARE IN FEET UNLESS OTHERWISE SHOWN

PROFILE

SCALE: 1"=10' HORIZ
1"=10' VERT



U.S. Army Corps of Engineers
San Francisco District
Regulatory Division

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Sarco Creek Bridge
March 5, 2015
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PRELIMINARY DRAINAGE DETAILS
SARCO CREEK
FISH PASSAGE IMPROVEMENT

DD

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: JAMES GO

CHECKED BY: ANALETTE OCHOA

REVISED BY

DATE REVISED

RELATIVE BORDER SCALE 0 1 2 3

UNIT 0714

PROJECT NUMBER & PHASE

7/2/2010

Nationwide Permit 27 - *Aquatic Habitat Restoration, Establishment, and Enhancement Activities*

Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms, as well as discharges of dredged or fill material to restore appropriate stream channel configurations after small water control structures, dikes, and berms, are removed; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels; the removal of existing drainage structures, such as drain tiles, and the filling, blocking, or reshaping of drainage ditches to restore wetland hydrology; the installation of structures or fills necessary to establish or re-establish wetland or stream hydrology; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; re-establishment of submerged aquatic vegetation in areas where those plant communities previously existed; re-establishment of tidal wetlands in tidal waters where those wetlands previously existed; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services. Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa) or uplands. Changes in wetland plant communities that occur when wetland hydrology is more fully restored during wetland rehabilitation activities are not considered a conversion to another aquatic habitat type. This NWP does not authorize stream channelization. This NWP does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments. Compensatory mitigation is not required for activities authorized by this NWP since these activities must result in net increases in aquatic resource functions and services.

Reversion. For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding stream or wetland enhancement or restoration agreement, or a wetland establishment agreement, between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), U.S. Forest Service (USFS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) or the applicable state agency, this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or establishment activities). The reversion must occur within five years after expiration of a limited term wetland restoration or establishment agreement or permit, and is authorized in these circumstances even if the discharge occurs after this NWP expires. The five-year reversion limit does not apply to agreements without time limits reached between the landowner and the FWS, NRCS, FSA, NMFS, NOS, USFS, or an appropriate state cooperating agency. This NWP also authorizes discharges of dredged or fill material in waters of the United States for the reversion of wetlands that were restored, enhanced, or established on prior-converted cropland or on uplands, in accordance with a binding agreement between the landowner and NRCS, FSA, FWS, or their designated state cooperating agencies (even though the restoration, enhancement, or establishment activity did not require a section 404 permit). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before conducting any reversion activity the permittee or the appropriate Federal or state agency must notify the district engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements are applicable to that type of land at the time. The requirement that the activity results in a net increase in aquatic resource functions and services does not apply to reversion activities meeting the above conditions. Except for the activities described above, this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion.

ENCLOSURE 3

Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States. (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied. (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed. (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and

necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the

proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed project; (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans); (4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate; (5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. (2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated

San Francisco District Regional Conditions

A. General Regional Conditions that apply to all NWPs in the Sacramento, San Francisco, and Los Angeles Districts:

1. When pre-construction notification (PCN) is required, the permittee shall notify the U.S. Army Corps of Engineers, San Francisco District (Corps) in accordance with General Condition 31 using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. In addition, the PCN shall include:

    a. A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

    b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity, as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings for activities located within the boundaries of the Los Angeles District shall comply with the September 15, 2010 Special Public Notice: *Map and Drawing Standards for the Los Angeles District Regulatory Division*, (available on the Los Angeles District Regulatory Division website at: www.spl.usace.army.mil/regulatory/); and

    c. Numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the site, and all waters of the U.S. proposed to be avoided on and immediately adjacent to the activities site. The compass angle and position of each photograph shall be identified on the plan-view drawing(s) required in subpart b of this Regional Condition.

2. The permittee shall submit a PCN, in accordance with General Condition 31, For all activities located in areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007, 72 C.F.R. 11,092, in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. Examples of EFH habitat assessments can be found at: http://www.swr.noaa.gov/efh.htm.

3. For activities in which the Corps designates another Federal agency as the lead for compliance with Section 7 of the Endangered Species Act (ESA) of 1973 as amended, 16 U.S.C. §§ 1531-1544, Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (EFH), 16 U.S.C. § 1855(b)(4)(B) and/or Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended , 16 U.S.C. §§ 470-470h, the lead Federal agency shall provide all relevant documentation to the appropriate Corps demonstrating any previous consultation efforts, as it pertains to the Corps Regulatory permit area (for Section 7 and EFH compliance) and the Corps Regulatory area of potential effect (APE) (for Section 106 compliance). For activities requiring a PCN, this information shall be submitted with the PCN. If the Corps does not designate another Federal agency as the lead for ESA, EFH and/or NHPA, the Corps will initiate consultation for compliance, as appropriate.

to Eelgrass Beds are required for any activity permitted by NWP if it will take place within or adjacent to **Eelgrass Beds.**

C. Regional Conditions that apply to specific NWPs in the San Francisco District:

3. MAINTENANCE:

1. To the extent practicable, excavation equipment shall work from an upland site (e.g., from the top of the bank, the road bed of the bridge, or culverted road crossing) to minimize adding fill into waters of the U.S. If it is not practicable to work from an upland site, or if working from the upland site would cause more environmental damage than working in the stream channel, the excavation equipment can be located within the stream channel but it must minimize disturbance to the channel (other than the removal of accumulated sediments or debris). As part of the notification to the Corps (in accordance with General Condition No. 31), an explanation as to the need to place excavation equipment in waters of the U.S. is required, as well as a statement of any additional necessary fill (e.g., cofferdams, access road, fill below the OHW mark for a staging area, etc.).

2. If the activity is proposed in a special aquatic site, the notification to the Corps (in accordance with General Condition No. 31) shall include an explanation of why the special aquatic site cannot be avoided, and the measures to be taken to minimize impacts to the special aquatic site.

11. TEMPORARY RECREATIONAL STRUCTURES:

1. Notification to the Corps (in accordance with General Condition No. 31) is required if any temporary structures are proposed in wetlands or vegetated shallow water areas (e.g. in eelgrass beds). The notification shall include the type of habitat and areal extent affected by the structures.

12. UTILITY LINE ACTIVITIES:

1. Excess material removed from a trench, associated with utility line construction, shall be disposed of at an upland site away from any wetlands or other waters of the U.S. so as to prevent this material from being washed into aquatic areas.

2. This NWP permit does not authorize the construction of substation facilities. Utility line substations can usually be constructed in uplands.

13. BANK STABILIZATION:

1. Notification to the Corps (in accordance with General Condition No. 31) is required for all activities stabilizing greater than 300 linear feet of channel. Where the removal of wetland vegetation (including riparian wetland trees, shrubs and other plants) or submerged, rooted, aquatic plants over a cumulative area greater than 1/10 acre or 300 linear feet is proposed, the Corps shall be notified (in accordance with General Condition No. 31). The notification shall include the type of vegetation and extent (e.g., areal dimension or number of trees) of the proposed removal. The notification shall also address the effect of the bank stabilization on the stability of the opposite side of the streambank (if it is not part of the stabilization activity), and on adjacent property upstream and downstream of the activity.

2. This permit allows excavating a toe trench in waters of the U.S., and, if necessary, to use the material for backfill behind the stabilizing structure. Excess material is to be disposed of in a manner that will have only minimal impacts to the aquatic environment. The notification to the Corps (in accordance with General Condition No. 31) shall include location of the disposal site.

3. For man-made banks, roads, or levees damaged by storms or high flows, the one cubic yard per running foot limit is counted only for that additional fill which encroaches (extends) beyond the pre-flood or pre-storm shoreline condition of the waterway. It is not counted for

f. a clear and concise description of all project impacts including, but not necessarily limited to:
   1. quantification and description of permanent project impacts to areas within Corps jurisdiction,
   2. quantification and description of temporary impacts to areas within Corps jurisdiction, and
   3. linear extent of Corps jurisdiction affected by the project;

g. a general description of activities covered by the Cat/Ex that do not require Corps authorization but are connected or related to the activities in Corps jurisdiction;

h. a complete description of any proposed mitigation and/or restoration including, but not necessarily limited to, locations of any proposed planting, short- and long-term maintenance, proposed monitoring, success criteria and contingency plans;

i. written justification of how the project complies with the Nationwide Permit Program including less than minimal impact to the aquatic environment and compliance with the General Conditions.

j. For Federal Highway Administration (FHWA) Cat/Ex projects, the notification should describe how activities described in the Cat/Ex meet the description of the Cat/Ex project published in the August 28,1987 Federal Register part 771.117 (a)(b)(c) and (d) (Volume 52, No. 167) or any updated version published in the Federal Register.

2. Only activities specifically described in the Cat/Ex project description will be covered by the NWP 23 authorization. If other activities not described in the Cat/Ex project description will be performed (e.g., dewatering, slope protection, etc.), these activities must receive separate NWP authorizations.

3. Notification to the Corps (in accordance with General Condition 31) must include a copy of the signed Cat/Ex document and final agency determinations regarding compliance with Section 7 of the Endangered Species Act (ESA), Essential Fish Habitat (EFH) under the Magnussen-Stevens Act, and Section 106 of the National Historic Preservation Act.

27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities

1. Notification to the Corps (in accordance with General Condition 31) must include documentation of a review of project impacts to demonstrate that at the conclusion of the work that the project would result in a net increase in aquatic function. Additionally, the documentation must include a review of project impacts on adjacent properties or structures and must also discuss cumulative impacts associated with the project.

29. Residential Developments:

1. When discharge of fill results in the replacement of wetlands or waters of the U.S. with impervious surfaces, to ensure that the authorized activity does not result in more than minimal degradation of water quality (in accordance with General Condition 25), the residential development shall incorporate low impact development concepts (e.g. native landscaping, bioretention and infiltration techniques, and constructed green spaces) to the extent practicable. A description of the low impact development concepts proposed in the project shall be included with the permit application. More information including low impact development concepts and definitions is available at the following website: http://www.epa.gov/owow/NPS/lid/.

2. Use of this NWP is prohibited within the San Francisco Bay diked baylands (undeveloped areas currently behind levees that are within the historic margin of the Bay. Diked historic baylands are those areas on the Nichols and Wright map (see figure 1) below the 5-foot

estimated quantities for overdepth dredging. **All surveys shall be signed by the permittee to certify their accuracy. Please include the Corps file number.**

c. Solid Debris Management Plan: Submit no earlier than 60 calendar days and no later than 20 calendar days before commencement of work, a plan which describes measures to ensure that solid debris generated during any dredging operation is retained and properly disposed in areas not under Corps jurisdiction. **At a minimum, the plan shall include the following: source and expected type of debris; debris retrieval method; Corps file number; disposal method and site; schedule of disposal operations; and debris containment method to be used, if floatable debris is involved. (Please note that failure to provide all of the information requested in a, b, and c above may result in delays to your project. When your Dredge Operation Plan has been approved, you will receive a written authorization to commence with your project.)**

d. Post-Dredge Survey: Submit, **within 30 days of the last disposal activity** ("last" is defined as that activity after which no further activity occurs for 15 calendar days), a survey with accuracy to one-tenth foot that delineates and labels the areas dredged and provides the dredged depths. **Also, include the Corps file number, actual dates of dredging commencement and completion, actual quantities dredged for the project to the design depth, and actual quantities of overdepth.** The permittee shall substantiate the total quantity dredged by including calculations used to determine the volume difference (in cubic yards) between the Pre- and Post-Dredge Surveys and **explain any variation in quantities greater than 15% beyond estimated quantities or dredging deeper than is permitted (design plus overdepth allowance). All surveys shall be accomplished by a licensed surveyor and signed by the permittee to certify their accuracy.** A copy of the post dredge survey should be sent to the National Ocean Service for chart updating:

NOAA/National Ocean Service,
Nautical Data Branch
N/CS26, SSMC3, Room 7230
1315 East-West Highway
Silver Spring, Maryland 20910-3282.

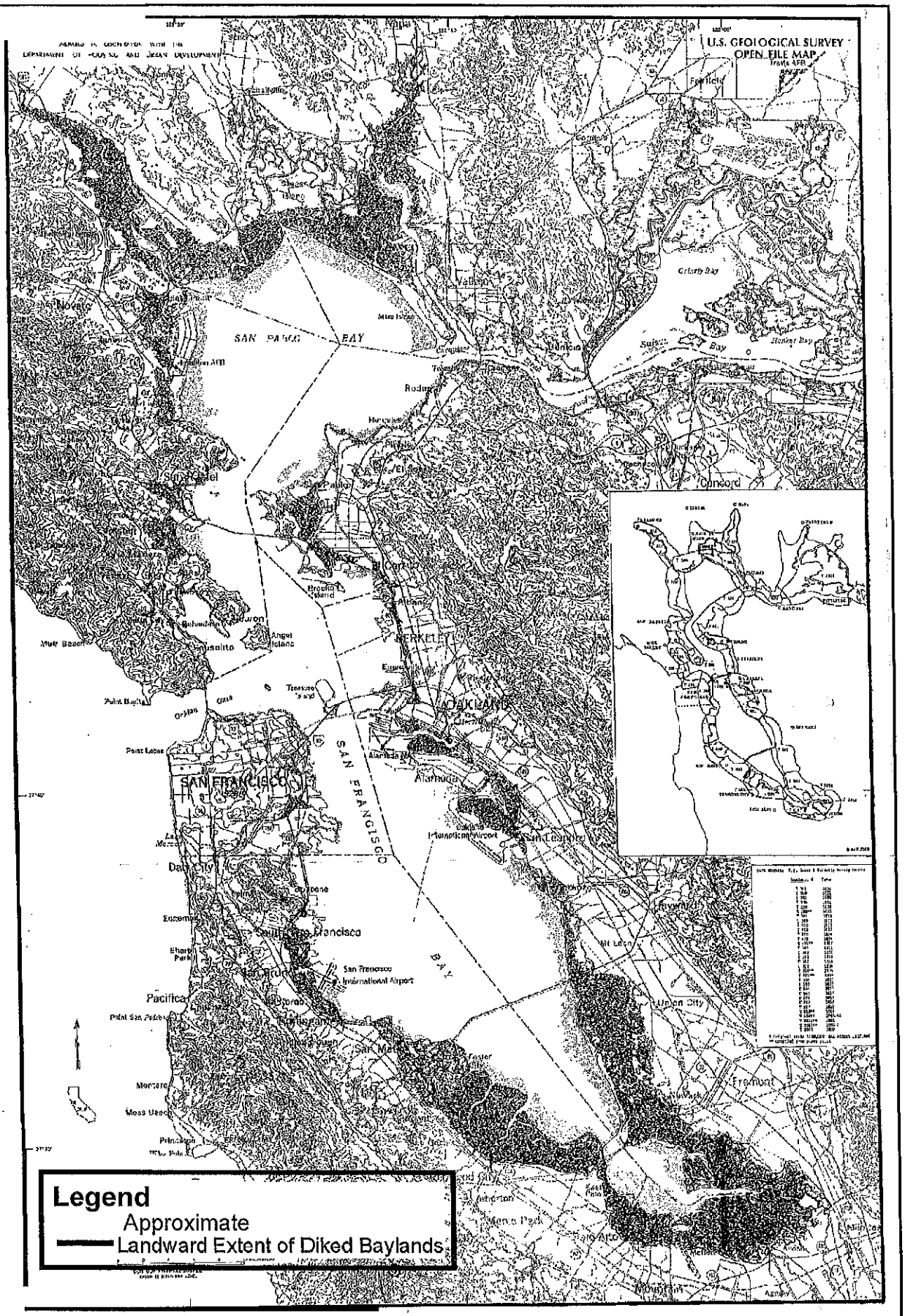
e. **The permittee or dredge contractor shall inform this office when: 1) a dredge episode actually commences, 2) when dredging is suspended (suspension is when the dredge contractor leaves the dredge site for more than 48 hours for reasons other than equipment maintenance), 3) when dredging is restarted, and 4) when dredging is complete. Each notification should include the Corps file number.** Details for submitting these notifications will be provided in the verification letter (to whom and how).

39. Commercial and Institutional Developments:

1. When discharge of fill results in the replacement of wetlands or waters of the U.S. with impervious surfaces, to ensure that the authorized activity does not result in more than minimal degradation of water quality (in accordance with General Condition 25), the commercial and institutional development shall incorporate low impact development concepts (e.g. native landscaping, bioretention and infiltration techniques, and constructed green spaces) to the extent practicable. A description of the low impact development concepts proposed in the project shall be included with the permit application. More information including low impact development concepts and definitions is available at the following website: http://www.epa.gov/owow/NPS/lid/.

2. Use of this NWP is prohibited within the San Francisco Bay diked baylands (undeveloped areas currently behind levees that are within the historic margin of the Bay. Diked historic baylands are those areas on the Nichols and Wright map (see figure 1) below the 5-foot

Figure 1 Map of Diked Baylands



PRELIMINARY MAP OF HISTORIC MARGINS OF MARSHLAND
SAN FRANCISCO BAY, CALIFORNIA

By

Gordon R. Nichols and Nancy A. Wright

Enclosure 4

Permittee: Ahmad Rahimi, California Department of Transportation

File Number: 2011-00190N

Certification of Compliance
for
Nationwide Permit

"I hereby certify that the work authorized by the above referenced File Number and all required mitigation have been completed in accordance with the terms and conditions of this Nationwide Permit authorization."

_____ _____
(Permittee) (Date)

Return to:

Sahrye Cohen
U.S. Army, Corps of Engineers
San Francisco District
Regulatory Division, CESPN-R-S
1455 Market Street
San Francisco, CA 94103-1398

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16TH FLOOR
SAN FRANCISCO, CALIFORNIA 94103-1398

Regulatory Division

Subject: File Number 2011-00190N

APR 21 2016

Mr. John Yeakel
California Department of Transportation
111 Grand Avenue
Oakland, California 94623

Dear Mr. Yeakel:

This correspondence is in reference to your submittal of July 24, 2014, concerning Department of the Army (DA) authorization to replace the roadway bridge located at Post Mile 9.3 of route 121 over Sarco Creek in the City of Napa, Napa County, California (38.323544 N, -122.273423; APN 491-9000-1000).

Work within U.S. Army Corps of Engineers' (Corps) jurisdiction will include removal of the existing two-span Sarco Creek bridge and replacement with a single span concrete structure. This work will also include roadway widening and construction of fish passage downstream of the bridge. All four corners of the bridge abutment will be treated with a bioengineered geosynthetic reinforced embankment consisting of RSP along the toe, a geosynthetic reinforced embankment and willow brush layering. Log spur root wads will be included as stream bank enhancement. The fish passage consists of a roughened rock weir immediately downstream of the bridge. A temporary water diversion system, consisting of an upstream cofferdam and a PVC water conveyance pipe, would be in place during the in-creek construction period. Work will require temporary placement of clean washed gravel bags and PVC pipe within 0.12 acre and 110 linear feet of Sarco Creek. Work will require permanent placement of 180 cubic yards of rock slope protection (RSP) and 596 cubic yards of local soil material in 0.12 acres and 160 linear feet of Sarco Creek. All work shall be completed in accordance with the plans and drawings titled "USACE File #2011-00190N, Sarco Creek Bridge, March 5, 2015, Sheets 1 to 6" provided as enclosure 1.

Section 404 of the Clean Water Act (CWA) generally regulates the discharge of dredged or fill material below the plane of ordinary high water in non-tidal waters of the United States, below the high tide line in tidal waters of the United States, and within the lateral extent of wetlands adjacent to these waters. Section 10 of the Rivers and Harbors Act generally regulates construction of structures and work, including excavation, dredging, and discharges of dredged or fill material, occurring below the plane of mean high water in tidal waters of the United States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide;

and/or all waters presently used, or have been used in the past, or may be susceptible for future use to transport interstate or foreign commerce. An approved jurisdictional determination for this location was completed and dated certified June 25, 2012.

Based on a review of the information in your submittal and the current condition of the site, as verified during a field investigation on May 26, 2011, the project qualifies for authorization under Department of the Army Nationwide Permits (NWPs) 14 for Linear Transportation and 27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities, 77 Fed. Reg. 10,184 (Feb. 21, 2012) (enclosure 2), pursuant to Section 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq.*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 3. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

This verification will remain valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon a NWP will remain authorized provided the activity is completed within 12 months of the date of a NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 C.F.R. § 330.4(e) and 33 C.F.R. § 330.5 (c) or (d). This verification will remain valid if, during the time period between now and March 18, 2017, the activity complies with any subsequent modification of the NWP authorization. The Chief of Engineers will periodically review NWPs and their conditions and will decide to modify, reissue, or revoke the permits. If a NWP is not modified or reissued within five years of its effective date, it automatically expires and becomes null and void. It is incumbent upon you to remain informed of any changes to the NWPs. Changes to the NWPs would be announced by Public Notice posted on our website (http://www.spn.usace.army.mil/Missions/RegulatoryPublicNotices.aspx). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 4, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification to the Corps prior to the commencement of work.

General Condition 18 stipulates that project authorization under a NWP does not allow for the incidental take of any federally-listed species in the absence of a biological opinion with incidental take provisions. As the principal federal lead agency for this project, Caltrans initiated consultation with the National Marine Fisheries Service (NMFS) to address project related impacts to listed species, pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq*). By letter of October 24, 2011, NMFS Letter of Concurrence No. 2011/03131, NMFS concurred with the determination that the project was not likely to adversely affect California Central Coast (CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat for this species.

In order to ensure compliance with this NWP authorization, the following special conditions shall be implemented:

1. The NMFS concurred with the determination that the project was not likely to adversely affect California Central Coast (CCC) steelhead (*Oncorhynchus mykiss*) and designated critical habitat for this species. This concurrence was premised, in part, on project work restrictions outlined in NMFS Letter of Concurrence No. 2011/03131. These work restrictions are incorporated as special conditions to the NWP authorization for your project to ensure unauthorized incidental take of species and loss of critical habitat does not occur.

2. Incidents where any individuals of Central California Coastal Steelhead listed by NOAA Fisheries under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the United States or structures or work in navigable waters of the United States authorized by this NWP shall be reported to NOAA Fisheries, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the San Francisco District of the U.S. Army Corps of Engineers at (415) 503-6795. The finder should leave the plant or animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure, or some unnatural cause. The finder may be asked to carry out instructions provided by NOAA Fisheries, Office of Protected Resources, to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

3. In-water work shall be restricted to the time between June 1 and October 15.

4. Caltrans will provide water quality monitoring and sampling once every two hours upstream and downstream of the diversion system during the in-creek work to ensure water quality objectives are not exceeded.

5. All standard Best Management Practices shall be implemented to prevent the movement of sediment downstream. No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products, or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into the waterways.

6. A post construction report shall be submitted 45 days after the conclusion of construction activities. The report shall document construction activities and contain as-built drawings (if different from drawings submitted with application) and include before and after photos.

7. A copy of this NWP authorization, and all other state and federal authorizations, shall be onsite during all work activities and will be available to USACE representatives upon request.

8. The permittee must allow representatives from the San Francisco USACE office or any other person(s) designated by USACE, to inspect the authorized activity at any time deemed necessary to ensure the project is being or has been accomplished in accordance with the terms and conditions of the NWP authorization.

You may refer any questions on this matter to Sahrye Cohen of my Regulatory staff by telephone at 415-503-6779 or by e-mail at Sahrye.E.Cohen@usace.army.mil. All correspondence should be addressed to the Regulatory Division, North Branch, referencing the file number at the head of this letter.

The San Francisco District is committed to improving service to our customers. My Regulatory staff seeks to achieve the goals of the Regulatory Program in an efficient and cooperative manner, while preserving and protecting our nation's aquatic resources. If you would like to provide comments on our Regulatory Program, please complete the Customer Service Survey Form available on our website: http://www.spn.usace.army.mil/Missions/Regulatory.aspx

Sincerely,

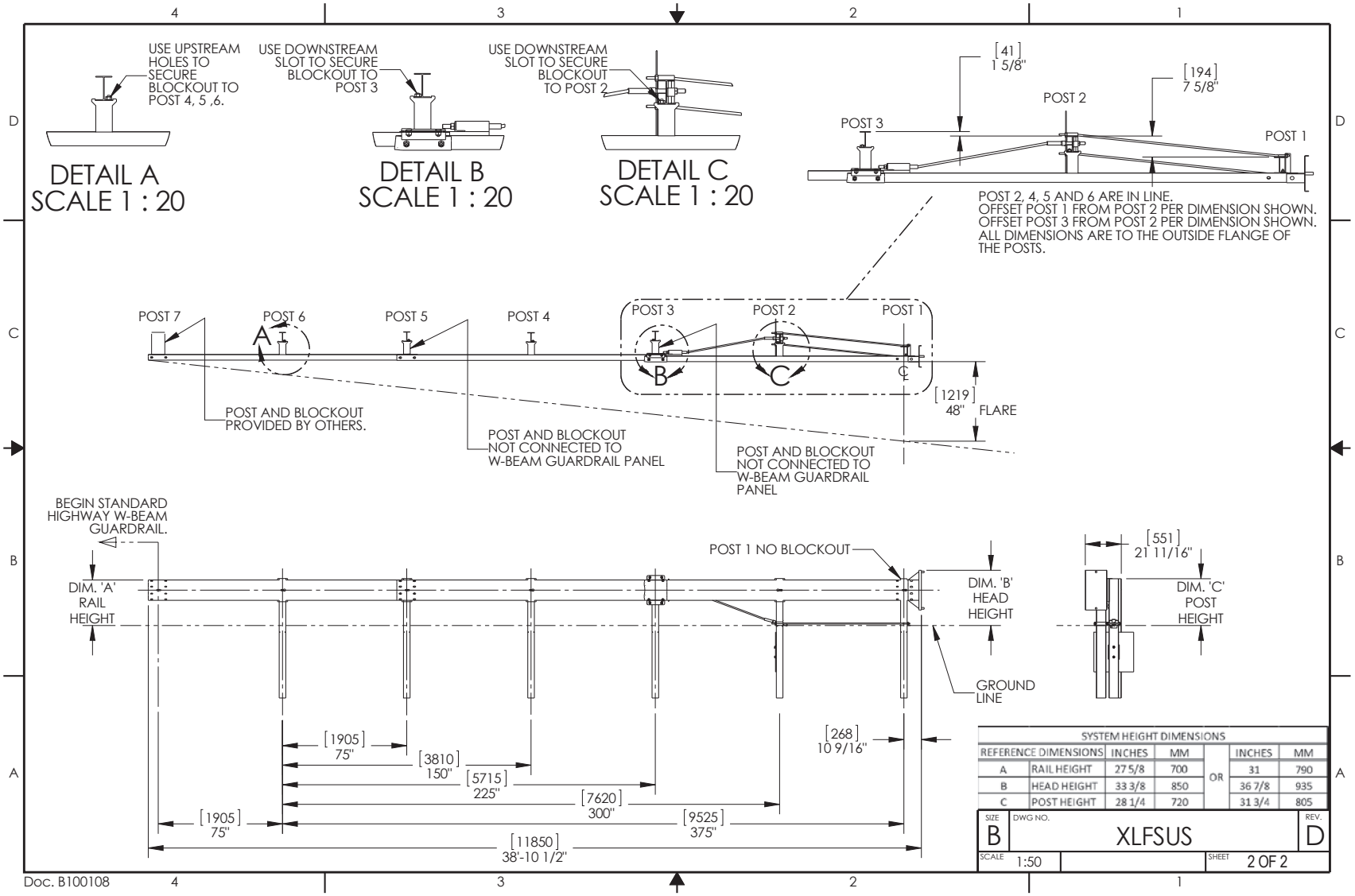
Mark D. Quigno for

Aaron O. Allen, Ph.D.
Acting Chief, Regulatory Division

Enclosures

Copies Furnished (w/o encls)

CA RWQCB, Oakland, CA
NMFS, Santa Rosa, CA


USE UPSTREAM HOLES TO SECURE BLOCKOUT TO POST 4, 5 ,6.
DETAIL A
SCALE 1 : 20
USE DOWNSTREAM SLOT TO SECURE BLOCKOUT TO POST 3
DETAIL B
SCALE 1 : 20
USE DOWNSTREAM SLOT TO SECURE BLOCKOUT TO POST 2
DETAIL C
SCALE 1 : 20
[41] 1 5/8"
[194] 7 5/8"
POST 3
POST 2
POST 1
POST 2, 4, 5 AND 6 ARE IN LINE.
OFFSET POST 1 FROM POST 2 PER DIMENSION SHOWN.
OFFSET POST 3 FROM POST 2 PER DIMENSION SHOWN.
ALL DIMENSIONS ARE TO THE OUTSIDE FLANGE OF THE POSTS.
POST 7
POST 6
POST 5
POST 4
POST 3
POST 2
POST 1
A
B
C
[1219] 48" FLARE
POST AND BLOCKOUT PROVIDED BY OTHERS.
POST AND BLOCKOUT NOT CONNECTED TO W-BEAM GUARDRAIL PANEL
POST AND BLOCKOUT NOT CONNECTED TO W-BEAM GUARDRAIL PANEL
BEGIN STANDARD HIGHWAY W-BEAM GUARDRAIL.
POST 1 NO BLOCKOUT
DIM. 'A' RAIL HEIGHT
DIM. 'B' HEAD HEIGHT
GROUND LINE
[551] 21 11/16"
DIM. 'C' POST HEIGHT
[1905] 75"
[3810] 150"
[5715] 225"
[7620] 300"
[9525] 375"
[11850] 38'-10 1/2"
[268] 10 9/16"
SYSTEM HEIGHT DIMENSIONS
REFERENCE DIMENSIONS | INCHES | MM | OR | INCHES | MM
A RAIL HEIGHT 27 5/8 700 OR 31 790
B HEAD HEIGHT 33 3/8 850 OR 36 7/8 935
C POST HEIGHT 28 1/4 720 OR 31 3/4 805
SIZE B
DWG NO. XLFSUS
REV. D
SCALE 1:50
SHEET 2 OF 2
Doc. B100108