



Application for a Central Valley Flood Protection Board  
Encroachment Permit

Levee Accreditation Project  
Robla Creek Woodland Mitigation  
and Enhancement Project

**Submitted By:**

Sacramento Flood Control Agency  
1007 7<sup>th</sup> Street, 7<sup>th</sup> Floor  
Sacramento, CA 95814

**Contact:**

Pete Ghelfi, Director of Engineering  
Phone: (916) 874-8733  
Fax: (916) 874-8289

October 20, 2017

# Application for a Central Valley Flood Protection Board

## Encroachment Permit

### Levee Accreditation Project

### Robla Creek Woodland Mitigation and Enhancement Project

#### **Contents:**

1. Application Form and Environmental Questionnaire
2. Work Description including Maps and Plans
3. California Environmental Quality Act (CEQA) Documentation

October 20, 2017

Ms. Leslie Gallagher  
 Executive Officer  
 Central Valley Flood Protection Board  
 3310 El Camino Avenue  
 Sacramento, CA 95821

Subject: Central Valley Flood Protection Board Encroachment Permit Application  
 Sacramento Area Flood Control Agency – Levee Accreditation Project  
 Robla Creek Woodland Mitigation and Enhancement Project

Dear Ms. Gallagher:

The Sacramento Area Flood Control Agency (SAFCA) is hereby submitting this Application for a Central Valley Flood Protection Board Encroachment Permit for work associated with the Robla Creek Woodland Mitigation and Enhancement Project. This application is for a mitigation component of the North Sacramento Streams Levee Improvement Project (Permit No. 19055, issued August 1, 2017).

As required, enclosed are two (2) copies of the Encroachment Permit Application (DWR 3615) and Environmental Questionnaire (DWR 3615a) with supporting documentation. This permit application is also available for download at:

[https://ftp.mbkengineers.com/public/folder/iSb3dT9NyECqWbe9xa0e-Q/Robla\\_Creek\\_Mitigation](https://ftp.mbkengineers.com/public/folder/iSb3dT9NyECqWbe9xa0e-Q/Robla_Creek_Mitigation)

Applicable environmental documents for the Levee Accreditation Project, of which the Robla Creek Woodland Mitigation and Enhancement Project is included, has been prepared and available for download at:

Draft Environmental Impact Report	<a href="http://www.safca.org/2015_MARCH_DEIR.htm">http://www.safca.org/2015_MARCH_DEIR.htm</a>
Final Environmental Impact Report	<a href="http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/LAP_FEIR_070816_web.pdf">http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/LAP_FEIR_070816_web.pdf</a>
Mitigation Monitoring and Reporting Program	<a href="http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/MMRP_070816_web.pdf">http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/MMRP_070816_web.pdf</a>
Findings for Fact and Statement of Overriding Considerations	<a href="http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/LAP_FindingsandSOC_20160711.pdf">http://www.safca.org/documents/Levee_Certification/2016.07_FEIR_NoArea_Streams/LAP_FindingsandSOC_20160711.pdf</a>

Permits from other agencies have been issued. Copies of the permits can be made available upon receipt.

Central Valley Flood Protection Board  
October 20, 2017  
Page 2

We trust that the information included herein is sufficient to facilitate your review. Should you have any questions regarding this permit application submission or require additional information, please contact me at (916) 874-8733 or [ghelfip@saccounty.net](mailto:ghelfip@saccounty.net).

Sincerely,

Sacramento Area Flood Control Agency

Pete Ghelfi  
Director of Engineering

Enclosures

cc: Tim Kerr, American River Flood Control District  
Ric Reinhardt, MBK Engineers

# 1. Application Form and Environmental Questionnaire

**APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD  
ENCROACHMENT PERMIT**

**Application No.** \_\_\_\_\_  
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.  
Levee Accreditation Project, Robla Creek Woodland Mitigation and Enhancement Project (see attached pages)  
\_\_\_\_\_  
\_\_\_\_\_

2. Project  
Location: Sacramento County, in Section (see attached)  
(N) (E)  
Township: (see attached) (S), Range: (see attached) (W), M. D. B. & M.  
Latitude: (see attached) Longitude: (see attached)  
Stream : Sacramento River , Levee : left (east) bank Designated Floodway: n/a  
APN: (see attached)

3. Sacramento Area Flood Control Agency of 1007 7th Street, 7th Floor  
Name of Applicant / Land Owner Address  
Sacramento CA 95814 916-874-7606  
City State Zip Code Telephone Number  
see below  
E-mail

4. Mr. Richard Johnson of Sacramento Area Flood Control Agency  
Name of Applicant's Representative Company  
Sacramento CA 95814 916-874-7606  
City State Zip Code Telephone Number  
ghelfip@SacCounty.net  
E-mail

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

We, the Trustees of City of Sacramento approve this plan, subject to the following conditions:  
Name of LMA

- Conditions listed on back of this form       Conditions Attached       No Conditions

See attached  
Trustee Date      Trustee Date

Trustee Date      Trustee Date

**APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD  
ENCROACHMENT PERMIT**

6. Names and addresses of adjacent property owners sharing a common boundary with the land upon which the contents of this application apply. If additional space is required, list names and addresses on back of the application form or an attached sheet.

Name	Address	Zip Code
See attached page(s)		

7. Has an environmental determination been made of the proposed work under the California Environmental Quality Act of 1970?  Yes  No  Pending

If yes or pending, give the name and address of the lead agency and State Clearinghouse Number:

North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Improvement Project.  
Lead Agency - SAFCA 1007 7th Street, 7th Floor, Sacramento, CA 95814  
SCH No. 2014052038

8. When is the project scheduled for construction? November 2017

9. Please check exhibits accompanying this application.

- A.  Regional and vicinity maps showing the location of the proposed work.
- B.  Drawings showing plan view(s) of the proposed work to include map scale.
- C.  Drawings showing the cross section dimensions and elevations (vertical datum?) of levees, berms, stream banks, flood plain,
- D.  Drawings showing the profile elevations (vertical datum?) of levees, berms, flood plain, low flow, etc.
- E.  A minimum of four photographs depicting the project site.

\_\_\_\_\_  
Signature of Applicant Date

Include any additional information:  
Attached Page(s) - For Items 1, 2 and 6, above  
CEQA and Environmental Documentation  
Work Description and Bufferlands Mitigation Maps and Plans

## ENVIRONMENTAL ASSESSMENT QUESTIONNAIRE FOR APPLICATIONS FOR CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMITS

This environmental assessment questionnaire must be completed for all Central Valley Flood Protection Board applications. Please provide an explanation where requested. Incomplete answers may result in delays in processing permit applications. Failure to complete the questionnaire may result in rejection of the application.

1. Has an environmental assessment or initial study been made or is one being made by a local or State permitting agency in accordance with the California Environmental Quality Act?  Yes  No

If yes, identify the Lead Agency, type of document prepared or which will be prepared, and the State Clearinghouse Number:

Environmental Impact Report for the North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project, SCH # 2014052038. Lead Agency: SAFCA

2. Will the project require certification, authorization or issuance of a permit by any local, State or federal environmental control agency?  Yes  No

List all other governmental permits or approvals necessary for this project or use, including U.S. Army Corps of Engineer' 404 and Section 10 permits, State Water Quality Certification, Department of Fish and Game 1600 agreement, etc. Attach copies of all applicable permits.

See attached Streambed Alteration Permit (1600)

3. Give the name and address of the owner of the property on which the project or use is located. Please submit a copy of your current Title Report (Grant Deed), if your proposed project includes a private residence.

Real estate interests are provided in Application Form 3615 (attached pages). The project will occur primarily on public lands. The project would affect a small portion of a private parcel. SAFCA will obtain the necessary rights of way to construct the project.

4. Will the project or use require issuance of a variance or conditional use permit by a city or county?

Yes  No

Explain:

5. Is the project or use currently operating under an existing use permit issued by a local agency?

Yes  No

Explain:



ENVIRONMENTAL ASSESSMENT QUESTIONNAIRE FOR APPLICATIONS <sup>Item 2</sup>  
FOR CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMITS

6. Describe all types of vegetation growing on the project site, including trees, brush, grass, etc.

The Robla Creek Woodland Mitigation and Enhancement Project site consists of approx. 6 acres in which the majority of the area is covered by wild oats grasslands and bordered by several valley oak trees. See Draft EIR Section 4.6 for detailed discussion.

7. Describe what type of wildlife or fish may use the project site or adjoining areas for habitat, food source, nesting sites, source of water, etc.

Refer to DRAFT EIR Sections 4.5 and 4.6 for detailed discussion.

8. Has the Department of Fish and Game, U.S. Fish and Wildlife Service, or National Marine Fisheries Service been consulted relative to the existence of, or impacts to, threatened or endangered species on or near the project site?

Yes       No

Explain:

There is no critical fish habitat designation or essential fish habitat in Robla Creek. Refer to DRAFT EIR Section 4.5 for detailed discussion.

9. Will the project or use significantly change present uses of the project area?

Yes       No

Explain:

The mitigation sites would convert approximately 6 acres of existing unimproved open space land with limited or no development. Refer to DRAFT EIR Section 4.13 for detailed discussion.

10. Will the project result in changes to scenic views or existing recreational opportunities?

Yes       No

Explain:

The mitigation site is located on lands not open to public use, and implementation of the proposed action would not result in a change to the scenic view or existing recreation opportunities. See Draft EIR section 4.2 for detailed discussion.

11. Will the project result in the discharge of silt or other materials into a body of water?

Yes       No

Explain:

The project will require discing and minor grading in the floodway. Best management practices such as silt fencing would be installed to ensure that soil does not enter Robla Creek.

ENVIRONMENTAL ASSESSMENT QUESTIONNAIRE FOR APPLICATIONS Item 2  
FOR CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMITS

12. Will the project involve the application, use, or disposal of hazardous materials?  Yes  No

If yes, list the types of materials, proposed use, and disposal plan. Provide copies of all applicable hazardous material handling plans.

Construction activities would use hazardous materials, such as fuels (gasoline and diesel), oils and lubricants, and cleaners (which could include solvents and corrosives in addition to soaps and detergents) that are commonly used in construction projects. SAFCA or its contractor will prepare and implement a spill prevention and control plan and secure all construction-related materials overnight. See Draft EIR section 4.11 for detailed discussion.

13. Will construction activities or the completed project generate significant amounts of noise?

Yes  No

Explain:

Project construction would generate short-term, temporary noise that exceeds local noise standards, although noise ordinances exempt construction noise during specified daytime hours; generate traffic noise above applicable thresholds; would expose people to excessive groundborne vibration or groundborne noise levels; and would result in an increase in ambient noise levels. There would be no substantial new noise sources following the completion of construction activities. See Draft EIR section 4.15 for detailed discussion.

14. Will construction activities or the completed project generate significant amounts of dust, ash, smoke, fumes, or odors?

Yes  No

Explain:

Construction would generate intermittent and temporary fumes and objectionable odors that would dissipate rapidly over distance; the proposed project would not expose sensitive receptors to significant amount of fumes or odorous emissions. Construction could result in significant levels of temporary pollutant emissions including dust. See Draft EIR Section 4.4 for detailed discussion.

15. Will the project activities or uses involve the burning of brush, trees, or construction materials, etc?

Yes  No

Explain, and identify safety and air pollution control measures:

No burning is proposed.

16. Will the project affect existing agricultural uses or result in the loss of existing agricultural lands?

Yes  No

Explain:

The mitigation sites would convert approximately 6 acres of existing unimproved open space land with limited or no development. Refer to DRAFT EIR Sections 4.3 and 4.13 for detailed discussion.

ENVIRONMENTAL ASSESSMENT QUESTIONNAIRE FOR APPLICATIONS Item 2  
FOR CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMITS

17. Have any other projects similar to the proposed project been planned or completed in the same general area as the proposed project?

Yes       No

Explain and identify any other similar projects:

SAFCA initiated the Natomas Levee Improvement Program (NLIP) in 2007 to provide flood risk reduction to the Natomas Basin. As part of the initial NLIP and the currently authorized American River Common Features Natomas Project, SAFCA has implemented 144 acres of woodland mitigation in the Natomas Basin with additional mitigation efforts underway.

18. Will the project have the potential to encourage, facilitate, or allow additional or new growth or development?

Yes       No

Explain:

There is no population growth associated with the proposed project. Levee improvements would result in flood protection of existing homes in project area. See Draft EIR section 6.1.

19. Will materials be excavated from the floodplain?  Yes    No   If yes, please answer the remaining questions.

**THE REMAINING QUESTIONS MUST ONLY BE ANSWERED IF THE ANSWER TO QUESTION  
NO. 19 WAS "YES". IF THE ANSWER TO QUESTION NO. 19 WAS "NO", YOU DO NOT  
NEED TO COMPLETE THE REMAINING QUESTIONS.**

A. What is the volume of material to be excavated?

Annually \_\_\_\_\_ Total \_\_\_\_\_

B. What types of materials will be excavated?

C. Will the project site include processing and stockpiling of material on site?

Yes    No

Explain:

D. What method and equipment will be used to excavate material?

ENVIRONMENTAL ASSESSMENT QUESTIONNAIRE FOR APPLICATIONS <sup>Item 2</sup>  
FOR CENTRAL VALLEY FLOOD PROTECTION BOARD ENCROACHMENT PERMITS

E. What is the water source for the project?

F. How will waste materials wash water, debris, and sediment be disposed of?

G. What is the proposed end land use for the project site?

H. Has a reclamation plan been prepared for this site in accordance with the Surface Mining and Reclamation Act of 1975?

Yes  No      If yes, please attach a copy.

## 2. Work Description including Maps and Plans

## 1. BACKGROUND

SAFCA is proposing the Robla Creek Woodland Mitigation and Enhancement Project (Project) to provide approximately 6 acres of riparian woodland and grassland habitat as part of the Levee Accreditation Project. The proposed project is included in the Environmental Impact Report (EIR) for the North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project, State Clearinghouse No. 2014052038. The purpose of the proposed project is to mitigate for impacts from the North Sacramento Streams Levee Improvement Project (CVFPB Permit Number 19055, issued on August 1, 2017).

## 2. PROJECT LOCATION

The Project is located in southern area of the Dry/Robla Creek floodplain, downstream of Rio Linda Boulevard, as shown on **Attachment A**.

## 3. DESCRIPTION OF EXISTING PROJECT

The mitigation site is located on property owned and managed by Sacramento Area Flood Control Agency (SAFCA) and designated in the Sacramento County General Plan as a floodplain. The site and the adjacent lands are flat and consist primarily of native grasses with patches of planted riparian and oak woodlands.

## 4. DESCRIPTION OF PROPOSED WORK

Approximately 6 acres of riparian woodland vegetation and perennial grasslands would be planted at the mitigation site adjacent to Robla Creek. Refer to **Attachment A** for the design drawings of the proposed work.

All plantings must comply with current USACE and DWR vegetation standards. A planting pallet is provided **Attachment A**. An irrigation system, compliant with current State and federal standards, would be installed within the mitigation site, as shown in **Attachment A**.

## 5. ENVIRONMENTAL COMPLIANCE

### CEQA

Compliance with the California Environmental Quality Act (CEQA) has been accomplished. SAFCA prepared an Environmental Impact Report (EIR) to support its Levee Accreditation Project. The *Final Environmental Impact Report [EIR], North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project*, was issued in July 2016. The State Clearinghouse Number is 2014052038. The Draft and Final EIR are available at [http://safca.org/Levee\\_Certification.html](http://safca.org/Levee_Certification.html). The Final EIR and corresponding documents were presented to the SAFCA Board of Directors for certification in July 2016.



## NEPA

Compliance with the National Environmental Policy Act is been accomplished by USACE through preparation of an Environmental Assessment (EA). USACE signed the Section 408 Finding of No Significant Impact in November 2016.

## Permitting

No other permits are required that are specific to the Project. Permits for the North Sacramento Streams Levee Improvement Project (permit no. 19055), for which the Project will serve as the mitigation component, are available upon request.

## 6. HYDRAULIC STATEMENT

The Project, as proposed, would result in no significant impact to the Sacramento River Flood Control Project. The areas being planted are located in an ineffective flow area (low velocity, backwater conditions) during a large flood event (i.e. 100 and 200-year). The project has been designed to promote new vegetation recruitment and become a riparian forest. The proposed plantings would be located within the designated floodway adjacent to the waterside levee toe. See **Attachment B** for the Hydraulic Impact Evaluation technical memorandum, prepared by MBK Engineers, July 2015.

## 7. OPERATION AND MAINTENANCE

The mitigation sites would be managed by SAFCA.

## ATTACHMENTS

- A. Robla Creek Woodland Mitigation and Enhancement Project Design Drawings and Specifications
- B. Hydraulic Impact Evaluation of the Robla Creek Aquatic and Riparian Habitat Creation Project



# Attachment A



# SACRAMENTO AREA FLOOD CONTROL AGENCY

## PROJECT PLANS FOR CONSTRUCTION OF Levee Accreditation Program

### North Area Streams Robla Creek Woodland Mitigation and Enhancement Project

Issued For Bid

June 22, 2017

**PREPARED FOR**

Sacramento Area Flood Control Agency  
1007 7th Street  
7th Floor  
Sacramento, CA 95814  
(916) 874-7606  
Contact: Peter Buck, Director, Natural Resources

**PROJECT LANDSCAPE ARCHITECT:**

GEI Consultants  
2868 Prospect Park Drive, Suite 400  
Rancho Cordova, CA 95670  
(916) 631-4500  
Contact: Lynn Hermansen, Senior Restoration Ecologist  
Stephen Ramirez, Landscape Designer

**PROJECT OVERVIEW**

The Robla Creek Woodland Mitigation and Enhancement Project proposes to create riparian woodland and native perennial grassland along the north bank of Robla Creek to mitigate for unavoidable tree removal during construction of the North Sacramento Streams Levee Accreditation Project. The footprint of the 6-acre mitigation site extends for approximately 1,800 feet in length and 100 to 165 feet in width adjacent to Robla Creek, immediately downstream of Rio Linda Blvd. Mitigation construction would consist of site preparation including deep ripping and discing the site, planting with native riparian trees and shrubs, and seeding native perennial grasses and forbs. Establishing woodland plantings would increase structural diversity and improve habitat functions and values in this open space corridor.

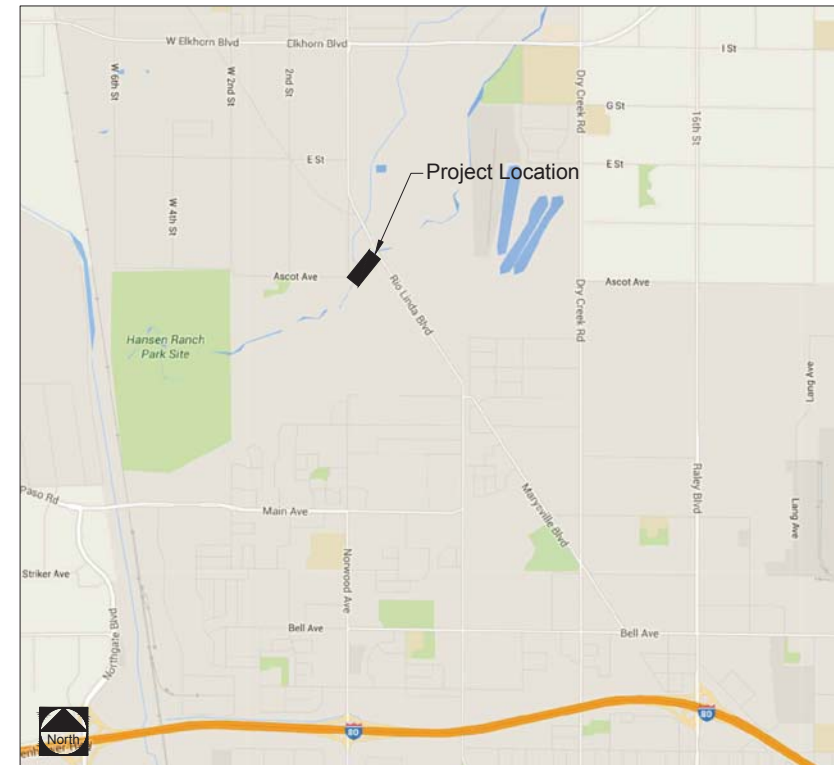
**PAGE DRAWING INDEX**

1	L-1	Cover Sheet
2	L-2	General Notes and Symbols
3	L-3	Site Access and Staging Area Map
4	L-4	Irrigation Plan
5	L-5	Planting Plan
6	L-6	Irrigation and Fencing Details
7	L-7	Planting Details

**VICINITY MAP**



**LOCATION MAP**



Accepted By: *Steph Ramirez* Date: June 22, 2017

Accepted By: \_\_\_\_\_ Date: \_\_\_\_\_

Contract Number: C4383

Approved On: June 15, 2017 By: SAFCA Board of Directors

Resolution No: \_\_\_\_\_ Clerk of the Board

Issued For Bid

NO.	DATE	ISSUE/REVISION	APP

Designed: VH, LH, SR  
Checked: VH  
Drawn: SR  
Submitted By: VH, LH, SR  
P.E. No.: -  
Submittal Date: 06/22/2017

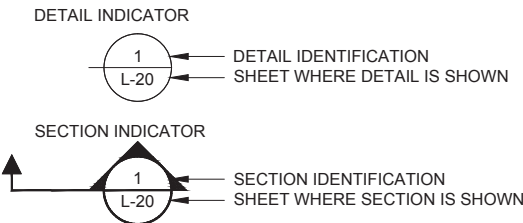
**GEI** Consultants  
2868 PROSPECT PARK DRIVE  
SUITE 400  
RANCHO CORDOVA, CA 95670  
(916) 631-4500

**SAFCA**  
Sacramento Area Flood Control Agency  
GEI Project 1601100

North Area Streams Robla Creek Woodland Mitigation and Enhancement Project	DWG. NO. L-1
COVER SHEET Page 17	REV 0

Attention: \_\_\_\_\_  
0 1"  
If this scale bar does not measure 1" then drawing is not original scale.

**LANDSCAPE SYMBOLS**



**GENERAL NOTES**

- ALL WORK SHALL BE PERFORMED BY A LICENSED CONTRACTOR AND WORKERS EXPERIENCED IN HABITAT RESTORATION AND MITIGATION SITE CONSTRUCTION. THE CONTRACTOR SHALL CONFORM TO ALL FEDERAL, STATE, AND LOCAL CODES AND OBTAIN ALL PERMITS NECESSARY TO COMPLETE WORK.
- THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING CONSTRUCTION EQUIPMENT AND MATERIALS FROM THEFT AND VANDALISM DURING THE CONTRACT PERIOD.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE PROJECT SITE TO VERIFY SITE CONDITIONS AND COMPLETELY UNDERSTAND THE REQUIRED SCOPE OF WORK SHOWN ON THESE DRAWINGS AND CONTAINED IN THE PROJECT SPECIFICATIONS.
- ALL AREAS OF PLANTING ARE SUBJECT TO IN-FIELD DESIGN VERIFICATION AND ADJUSTMENTS AS DIRECTED BY THE AGENCY.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES BEFORE THE START OF ANY CONSTRUCTION OPERATIONS, INCLUDING AND NOT LIMITED TO EXCAVATION OR TRENCHING. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT (U.S.A.) AT 811/1-800-227-2600. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 48 HOURS ADVANCE NOTICE FOR LOCATING UTILITIES.
- THE CONTRACTOR SHALL CONTACT THE AGENCY IMMEDIATELY UPON FINDING ANY FIELD CONDITIONS THAT WOULD CONFLICT WITH THE INFORMATION INDICATED ON THESE DRAWINGS OR THE PROJECT SPECIFICATIONS. ALL FIELD ADJUSTMENTS MUST BE APPROVED BY THE AGENCY BEFORE CONSTRUCTION OF SAID ADJUSTMENTS; FAILURE TO DO SO SHALL RESULT IN THE CONTRACTOR ASSUMING FULL RESPONSIBILITY FOR ANY REQUIRED REVISIONS OR FIELD MODIFICATIONS, AS DIRECTED BY THE AGENCY, AT NO ADDITIONAL COST.
- ALL STORAGE OF EQUIPMENT AND MATERIALS SHALL OCCUR WITHIN THE STAGING AREA AS PRESCRIBED ON THESE DRAWINGS AND IN THE SPECIFICATIONS. ALL LUBRICATION, REFUELING OR MAINTENANCE OF CONSTRUCTION VEHICLES SHALL BE CONDUCTED WITHIN APPROVED CONSTRUCTION STAGING AREAS.
- TEMPORARY PROTECTIVE FENCING SHALL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR AROUND THE PERIMETER OF THE PROJECT AREA AND AT OTHER LOCATIONS DEEMED NECESSARY BY THE CONTRACTOR. NO WORK OUTSIDE OF THE DESIGNATED LIMIT OF WORK AREA WILL BE PERMITTED WITHOUT THE APPROVAL OF THE AGENCY. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- CONFORM TO EXISTING GRADES AND CONDITIONS WHENEVER POSSIBLE. ANY ADJACENT OR OFFSITE AREAS DISTURBED BY THE CONTRACTOR'S OPERATION MUST BE RESTORED BY THE CONTRACTOR TO THE PREDISTURBANCE CONDITION TO THE SATISFACTION OF THE AGENCY.
- IF ARTIFACTS, FOREIGN OBJECTS, BONE, OR UNKNOWN MATERIALS ARE ENCOUNTERED WHILE DIGGING OR EXCAVATING ON SITE, THE CONTRACTOR SHALL SUSPEND WORK WITHIN 50 FEET OF THE LOCATION UNTIL A QUALIFIED ARCHAEOLOGIST IS ABLE TO ASSESS THE SITE AND FINDINGS TO DETERMINE SIGNIFICANCE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION CONTROL MEASURES THAT ARE REQUIRED THROUGH THE DURATION OF THE CONTRACT PERIOD. SHOULD SOIL EROSION CONDITIONS EXIST WHEN THE CONTRACTOR INITIALLY ACCEPTS THE SITE, THE AGENCY SHALL BE CONTACTED. FAILURE OF THE CONTRACTOR TO NOTIFY THE AGENCY IMPLIES ACCEPTANCE OF THE SITE BY THE CONTRACTOR IN ITS EXISTING CONDITION. ALL COSTS NECESSARY TO MITIGATE EXISTING EROSION CONTROL PROBLEMS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AT NO ADDITIONAL COST TO THE AGENCY OR INCREASE IN ORIGINAL BID PRICE SHALL BE PERMITTED.
- THE PROJECT SITE IS LOCATED WITHIN THE ROBLA CREEK FLOODPLAIN AND, THEREFORE, SUBJECT TO INUNDATION. THE CONTRACTOR IS HEREBY NOTICED TO MONITOR LOCAL WEATHER AND RIVER FLOW CONDITIONS TO ENSURE PEOPLE, EQUIPMENT, AND SUPPLIES ARE MOVED TO HIGHER GROUND IN CASE OF A FLOOD EVENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE PROJECT SITE IN A NEAT AND ORDERLY CONDITION, FREE OF RUBBISH AND DEBRIS; REMOVE AT ALL TIMES; REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL SITE CLEANUP REQUIREMENTS.
- AT ANY TIME, THE CONTRACTOR'S OPERATIONS AND CONSTRUCTION SHALL BE SUBJECT TO OBSERVATION BY THE AGENCY; REFER TO THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- ALL WRITTEN DIMENSIONS SUPERCEDE SCALED DIMENSIONS.
- REFER TO THE PROJECT SPECIFICATIONS AND THE DETAILS ON THE DRAWINGS FOR ADDITIONAL INFORMATION.
- DRAWINGS AND SPECIFICATIONS ARE PART OF THE FULL CONSTRUCTION DOCUMENTATION. CONTRACTOR IS RESPONSIBLE TO UNDERSTAND THE REQUIREMENTS OF EACH IN CONSTRUCTION OF THE PROJECT.

**CONSTRUCTION ACCESS**

- ALL HAUL AND ACCESS ROUTES SHALL BE ON EXISTING ROADS AS DIRECTED FOR SUCH USE BY THE AGENCY. MOVEMENT OF HEAVY EQUIPMENT TO AND FROM THE PROJECT SITE SHALL BE RESTRICTED TO ESTABLISHED ROADWAYS. THE CONTRACTOR'S CONSTRUCTION ACCESS POINTS SHALL BE LIMITED TO THOSE SHOWN ON THE DRAWINGS OR DEFINED IN THE SPECIFICATIONS, OR AS DIRECTED IN THE FIELD BY THE AGENCY. PAVED AREAS AT THESE ACCESS POINTS SHALL BE SWEEPED, AS NECESSARY, BY THE CONTRACTOR TO CONTROL DUST AND DIRT AND CLEANUP MATERIAL TRACKED OR SPILLED ON SAID PAVED AREAS. THE CONTRACTOR SHALL CONFORM TO ALL GOVERNING CODES, LAWS AND ORDINANCES.
- EXCEPT AS SPECIFIED HEREIN, OR AS SHOWN ON THE DRAWINGS, EXISTING STRUCTURES OR OTHER IMPROVEMENTS IN THE AREA ADJACENT TO THE WORK AREA SHALL NOT BE DISTURBED, DAMAGED, OR UNDERMINED BY THE CONTRACTOR, EXCEPT WHERE IN THE OPINION OF THE AGENCY IT IS ESSENTIAL TO RELOCATE SUCH IMPROVEMENTS. IF RELOCATION OF ANY FACILITY IS REQUIRED, THE CONTRACTOR SHALL RELOCATE THE IMPROVEMENTS SO AS TO BE AT LEAST EQUAL IN CONDITION AND UTILITY TO THE ORIGINAL. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT ANY DAMAGE TO EXISTING FACILITIES. SHOULD DAMAGE OR INJURY OCCUR AS A RESULT OF THE CONTRACTOR'S OPERATIONS, THE CONTRACTOR SHALL REPAIR OR REPLACE SUCH DAMAGED FACILITIES TO THE AGENCY'S SATISFACTION AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED TO EXISTING INFRASTRUCTURE, IRRIGATION OR PUMPING FACILITIES, STORM DRAIN PIPES, PAVEMENT, PUBLIC STREETS, OR OTHER UTILITIES AND IMPROVEMENTS RESULTING FROM THE CONTRACTOR'S OPERATIONS.
- SEE THE GENERAL NOTES AND PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**IRRIGATION NOTES**

- IRRIGATION SYSTEM LAYOUT IS A GRAPHICAL REPRESENTATION SHOWN FOR INFORMATIONAL USE ONLY. THE CONTRACTOR SHALL PROVIDE AN IRRIGATION LAYOUT DESIGN FOR AGENCY APPROVAL PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF A COMPLETE AND FULLY OPERATIONAL IRRIGATION SYSTEM TO SUPPORT MEETING THE PERFORMANCE CRITERIA FOR PLANT SURVIVORSHIP AS PRESCRIBED IN THE PROJECT SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARITY WITH EXISTING AND PROPOSED GRADE CONDITIONS, FENCE LOCATIONS, AND EXISTING VEGETATION TO BE PRESERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF SITE CONDITIONS AND AGENCY REQUIREMENTS BEFORE DESIGN AND LAYOUT OF IRRIGATION SYSTEM.
- THE CONTRACTOR SHALL COORDINATE THEIR OPERATIONS WITH THE AGENCY FOR THE PLACEMENT OF PIPING AND OTHER IRRIGATION EQUIPMENT, WHEN REQUIRED. ADDITIONALLY, THE CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES AND OTHER CONTRACTORS ON OR ADJACENT TO THE PROJECT SITE.
- CONTRACTOR SHALL COORDINATE WITH THE AGENCY TO OBTAIN THE WELL REACTIVATION PERMIT(S).
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE IRRIGATION SYSTEM FROM THEFT, VANDALISM, AND DAMAGE BY WILDLIFE; AND PROMPT REPLACEMENT OF DAMAGED OR MISSING PARTS AND EQUIPMENT.
- SEE THE GENERAL NOTES AND PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**PROTECTIVE FENCING**

- AT NO TIME SHALL CONSTRUCTION OPERATIONS, VEHICLE OR EQUIPMENT PARKING, PLACEMENT OF STRUCTURES, OR ANY OTHER ACTIVITY OCCUR WITHIN AREAS TO BE PRESERVED OR CONTAINED BY PROTECTIVE FENCING UNLESS OTHERWISE NOTED ON THE DRAWINGS AND APPROVED BY THE AGENCY. ALL AREAS SHOWN ON THE DRAWINGS AS PRESERVATION AREAS SHALL HAVE RESTRICTED ACCESS AND SHALL BE PROTECTED WITH PROTECTIVE FENCING ACCORDING TO THE SPECIFICATIONS. WITHIN THE PROJECT AREAS TO BE PRESERVED, NO EXCAVATIONS SHALL BE MADE, NO MATERIALS OR EQUIPMENT SHALL BE STORED, AND NO HEAVY EQUIPMENT OR VEHICLES SHALL BE OPERATED OR PARKED.

**PLANTING NOTES**

- PLANT QUANTITIES SHOWN IN THE PROJECT PLANT LEGEND ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AND PROVIDE THE ACTUAL PLANT QUANTITIES NEEDED TO IMPLEMENT THE PLANTING SCHEME AS SHOWN IN THESE DRAWING AND THE PROJECT SPECIFICATIONS.
- PLANTS AND SEEDED AREAS SHALL BE LOCATED BY THE CONTRACTOR ACCORDING TO THE LAYOUT SHOWN ON THE DRAWINGS AND FLAGGED IN THE FIELD. PLANTS SHALL BE DISTRIBUTED WITHIN EACH PLANTING ZONE TO MIMIC NATURAL CONDITIONS SUPPORTED BY THE SITE. CONTRACTOR SHALL IDENTIFY INDIVIDUAL PLANT LOCATIONS BY SPECIES FOR VERIFICATION AND APPROVAL BY THE AGENCY PRIOR TO PLANT INSTALLATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING POSITIVE DRAINAGE IN ALL PLANTING AREAS AND AT INDIVIDUAL PLANT LOCATIONS. THE CONTRACTOR SHALL RECEIVE APPROVAL FOR ALL METHODS TO BE USED TO CORRECT DRAINAGE PROBLEMS BEFORE IMPLEMENTATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A 2% MINIMUM CROSS-SLOPE AROUND EACH PLANT TO ENSURE POSITIVE DRAINAGE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE PLANTS IN A HEALTHY CONDITION THROUGHOUT THE MAINTENANCE PERIOD ACCORDING TO THE PROJECT SPECIFICATIONS.
- PLANTING MATERIALS SHALL BE TREEPOT4, DEEPOTS, 1-GALLON, AND TREEBANDS AS DESIGNATED ON THE PLANT LEGEND.
- SEE THE GENERAL NOTES AND PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**MAINTENANCE NOTES**

- THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS DURING THE MAINTENANCE PERIOD. REPAIRS DUE TO NATURAL DISASTERS, SUCH AS SEVERE FLOODING (I.E.,  $\geq$  100 YEAR RECURRENCE INTERVAL), SHALL NOT BE A MAINTENANCE RESPONSIBILITY OF THE CONTRACTOR. SITE IS LOCATED IN DRY CREEK/ROBLA CREEK FLOODPLAIN AND EXPERIENCES REGULAR (ANNUAL TO 2-YEAR OCCURRENCE INTERVAL) FLOODING. ALL MAINTENANCE ACTIVITIES SHALL BE COORDINATED WITH THE AGENCY. THE MAINTENANCE OPERATIONS SHALL INCLUDE, BUT NOT BE LIMITED TO:
  - MAINTAINING PLANTED AND SEEDED AREAS AND CONDUCTING WEED CONTROL, WATERING IF REQUIRED, AND DEBRIS REMOVAL FOR THE DURATION OF THE CONTRACT PERIOD;
  - REPLACING ALL DEAD OR SEVERELY STRESSED PLANTS, UNDER PERFORMING SEEDED AREAS AND OTHER MATERIALS, AS REQUIRED;
  - MAINTAINING ALL WATERING BASINS AND SEEDED AREAS TO BE WEED FREE AND REMOVING ALL NOXIOUS WEEDS AND ALL OTHER UNWANTED, NON-NATIVE PLANTS FROM PROJECT SITE, AS DIRECTED BY THE AGENCY;
  - KEEPING UP-TO-DATE "AS-BUILT" DRAWINGS DURING THE MAINTENANCE PERIOD.
- CONTRACTOR SHALL REMOVE ALL THE PROTECTIVE FENCING THAT THEY INSTALLED PRIOR TO ONSET OF THE FLOOD SEASON AND AT THE END OF THE CONTRACT.
- SEE THE GENERAL NOTES AND PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION

**ABBREVIATIONS**

&	AND
FT.	FEET
G.P.M.	GALLONS PER MINUTE
LF	LINEAR FEET
L.O.W.	LIMIT OF WORK
N	NORTH
N.T.C.	NOT TO SCALE
O.C.	ON CENTER
SQ.	SQUARE
TYP.	TYPICAL

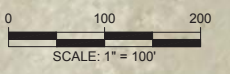
Attention:				
NO.	DATE	ISSUE/REVISION	APP	

Designed:	VH, SR
Checked:	VH
Drawn:	SR
Submitted By:	VH, SR
P.E. No.:	-
Submittal Date:	06/22/2017

North Area Streams Robla Creek Woodland Mitigation and Enhancement Project	DWG. NO. <b>L-2</b>
GENERAL NOTES AND SYMBOLS Page 18	REV <b>0</b>

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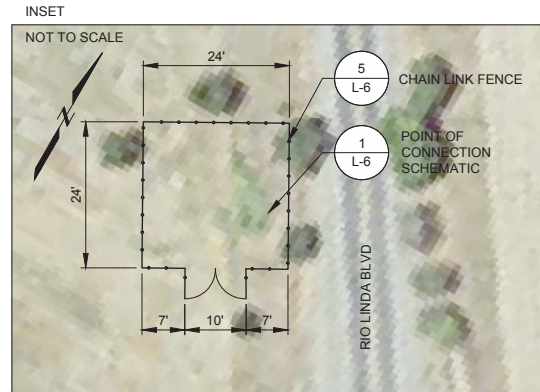


VALVE NO 1  
PROVIDE 13.2 GPM  
440 PLANTS TOTAL

CONTRACTOR TO  
AVOID EDGE OF BANK

**LEGEND:**

- WATER SOURCE
- MAIN LINE (1100 FT)
- LATERAL LINE (1370 FT)
- SHUT OFF VALVE
- CONTROL VALVE
- FLUSH OUT
- LIMIT OF WORK (L.O.W.)
- CHAIN LINK FENCE



- NOTES**
1. THIS PLAN IS DIAGRAMMATIC TO INDICATE THE GENERAL IRRIGATION DESIGN INTENT.
  2. AERIAL PHOTO SOURCE: AECOM 2015, UPDATED BY GEI CONSULTANTS, IN 2016.
  3. REFER TO SHEET L-6 FOR IRRIGATION DETAILS.
  4. REFER TO SHEET L-5 FOR PLANTING PLAN INFORMATION.

NO.	DATE	ISSUE/REVISION	APP

Attention:

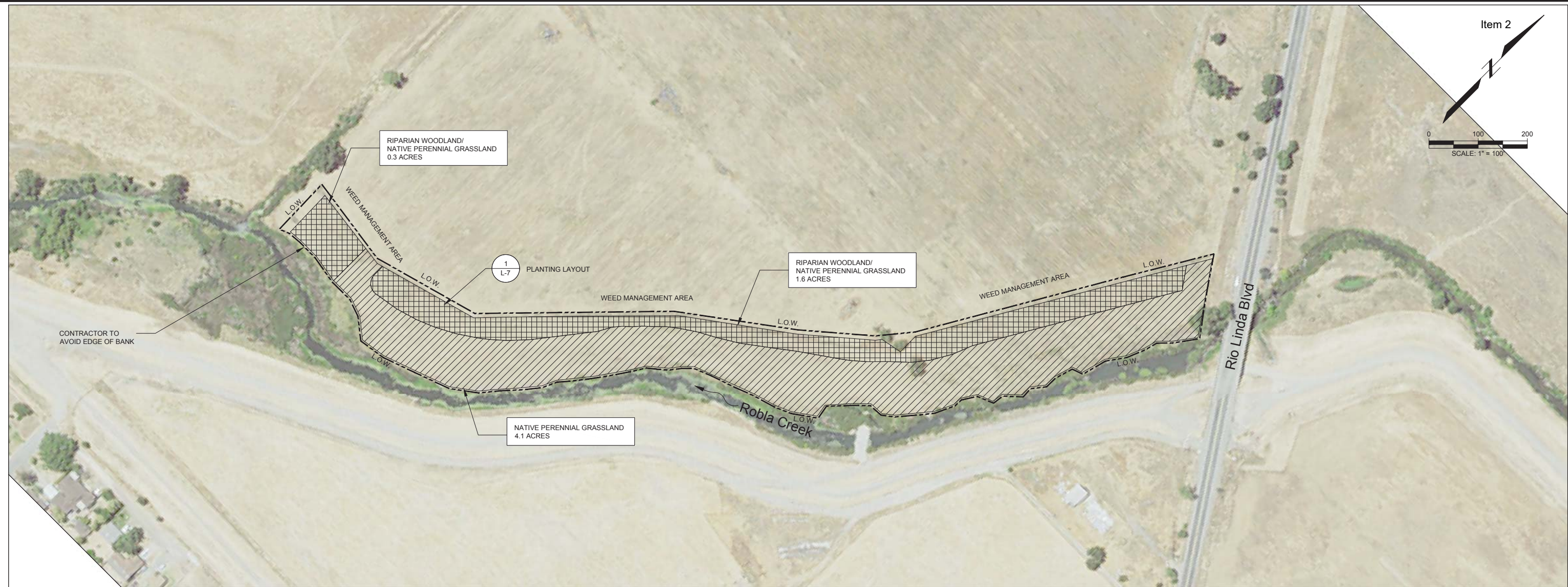
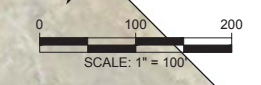
Designed: VH, LH, SR  
 Checked: VH  
 Drawn: SR  
 Submitted By: VH, LH, SR  
 P.E. No.: -  
 Submittal Date: 06/22/2017

**GEI** Consultants  
 2868 PROSPECT PARK DRIVE  
 SUITE 400  
 RANCHO CORDOVA, CA 95670  
 (916)631-4500

**SARCA**  
 Sacramento  
 Area Flood  
 Control  
 Agency  
 GEI Project 1601100

North Area Streams Robla Creek  
 Woodland Mitigation and  
 Enhancement Project  
 IRRIGATION PLAN  
 Page 20

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 DWG. NO.  
**L-4**  
 REV  
**0**



**LEGEND**

- RIPARIAN WOODLAND/ NATIVE PERENNIAL GRASSLAND
- NATIVE PERENNIAL GRASSLAND
- LIMIT OF WORK

**NOTES**

1. THIS PLAN IS DIAGRAMMATIC TO INDICATE THE GENERAL PLANTING INTENT.
2. AERIAL PHOTO SOURCE: AECOM 2015, UPDATED BY GEI CONSULTANTS, IN 2016.
3. REFER TO SHEET L-7 FOR PLANTING DETAILS AND PLANTING LAYOUT.
4. WEED MANAGEMENT AREA EXTENDS 100' FROM THE NORTHWEST BOUNDARY OF PLANTING.

**ROBLA CREEK PROJECT**

TOTAL AREA: 264,300 SQUARE FEET

WOODLAND AREA: 84,271 SQUARE FEET

GRASSLAND AREA: 264,300 SQUARE FEET

PLANTING AREA	BOTANICAL NAME	COMMON NAME			QUANTITIES	PROPORTION OF PALETTE (PERCENT)	O.C. SPACING WITHIN ROWS (FEET)
RIPARIAN WOODLAND	ACER NEGUNDO	BOXELDER	AC NE	TREEPOT 4	53	15	15
	BACCHARIS PILULARIS	COYOTE BRUSH	BA PI	DEEPOT	40	7.5	10
	HETEROMELES ARBUTIFOLIA	TOYON	HE AR	TREEPOT 4	40	7.5	10
	ERIOGONUM NUDUM	NAKED BUCKWHEAT	ER NU	DEEPOT	53	5	5
	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	PL RA	TREEPOT 4	11	5	25
	POPULUS FREMONTII	FREMONT COTTONWOOD	PO FR	TREEPOT 4	53	5	20
	QUERCUS LOBATA	VALLEY OAK	QU LO	TREEPOT 4	63	30	25
	QUERCUS WISLIZENI	INTERIOR LIVE OAK	QU WI	TREEPOT 4	21	10	25
	ROSA CALIFORNICA	CALIFORNIA ROSE	RO CA	DEEPOT	53	5	5
	SAMBUCUS NIGRA SPP. CAERULEA	BLUE ELDERBERRY	SA NI	TREEPOT 4	53	10	10
<b>TOTAL</b>					<b>440</b>	<b>100</b>	

PLANTING AREA	BOTANICAL NAME	COMMON NAME		PLS POUNDS / ACRE
NATIVE PERENNIAL GRASSLAND MIX	ELYMUS GLAUCUS	BLUE WILD-RYE	EL GL	6
	ELYMUS TRACHYCAULUS	SLENDER WHEAT GRASS	EL TR	6
	MELICA CALIFORNICA	CALIFORNIA MELIC	ME CA	2
	STIPA PULCHRA	PURPLE NEEDLE GRASS	ST PUL	8
<b>Total</b>				<b>22</b>

PLANTING AREA	BOTANICAL NAME	COMMON NAME		PLS POUNDS / ACRE
NATIVE FORB MIX	ACHILLEA MILLEFOLIUM	COMMON YARROW	AC MI	0.20
	ARTEMESIA DOUGLASIANA	MUGWORT	AR DO	0.75
	CLARKIA UNGUICULATA	ELEGANT CLARKIA	CL UN	0.15
	COLLINSIA HETEROPHYLLA	CHINESE-HOUSES	CO HE	0.35
	ERIOPHYLLUM LANATUM	COMMON WOOLY SUNFLOWER	ER LA	0.20
	ESCHSCHOLZIA CALIFORNICA	CALIFORNIA POPPY	ES CA	0.20
	GRINDELIA CAMPORUM	COMMON GUMPLANT	GR CA	0.55
	HELIANTHUS ANNUUS	COMMON SUNFLOWER	HE AN	0.75
	LUPINUS MICROCARPUS VAR. DENSIFLORUS	ANNUAL LUPINE	LU MI DE	5.00
	LUPINUS SUCCULENTUS	ARROYO LUPINE	LU SU	4.00
	PHACELIA CALIFORNICA	CALIFORNIA PHACELIA	PH CA	0.75
	PHACELIA TANACETIFOLIA	LACY PHACELIA	PH TA	0.75
	SYMPHYOTRICHUM CHILENSE	PACIFIC ASTER	SY CH	0.35
	<b>Total</b>			

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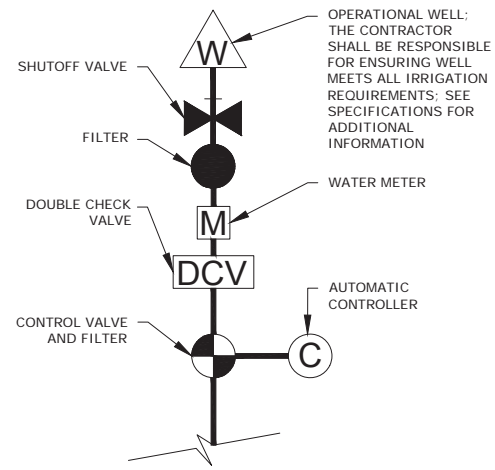
Attention:				
NO.	DATE	ISSUE/REVISION	APP	

Designed: VH, LH, SR  
 Checked: VH  
 Drawn: SR  
 Submitted By: VH, LH, SR  
 P.E. No.: -  
 Submittal Date: 06/22/2017

**GEI** Consultants  
 2888 PROSPECT PARK DRIVE SUITE 400  
 RANCHO CORDOVA, CA 95670  
 (916) 631-4500

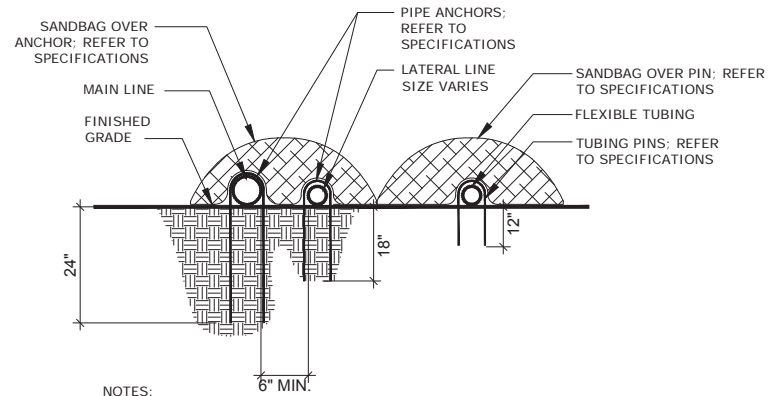
**SARCA**  
 Sacramento Area Flood Control Agency  
 GEI Project 1601100

North Area Streams Robla Creek Woodland Mitigation and Enhancement Project  
**PLANTING PLAN**  
 Page 21  
 DWG. NO. L-5  
 REV 0



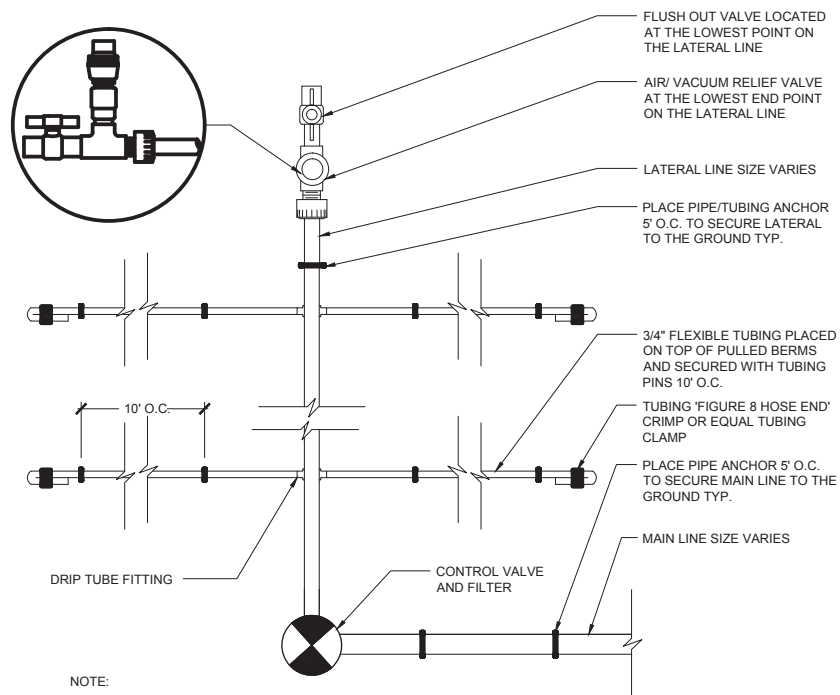
- OPERATIONAL WELL: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING WELL MEETS ALL IRRIGATION REQUIREMENTS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- NOTES:
1. SHUT-OFF VALVE SHALL BE WATERMAN BBE2-W (OR EQUAL) 4-INCH LEVER-OPERATED RUBBER-SEATED BUTTERFLY VALVE MEETING AWWA C504.
  2. REFER TO IRRIGATION NOTES AND THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  3. THE CONTRACTOR SHALL CONFIRM WITH AGENCY PRIOR TO ACQUIRING ANY MATERIALS FOR CONNECTION TO THE POINT OF CONNECTION.

**1 POINT OF CONNECTION SCHEMATIC**  
L-6 SCALE: N.T.S.



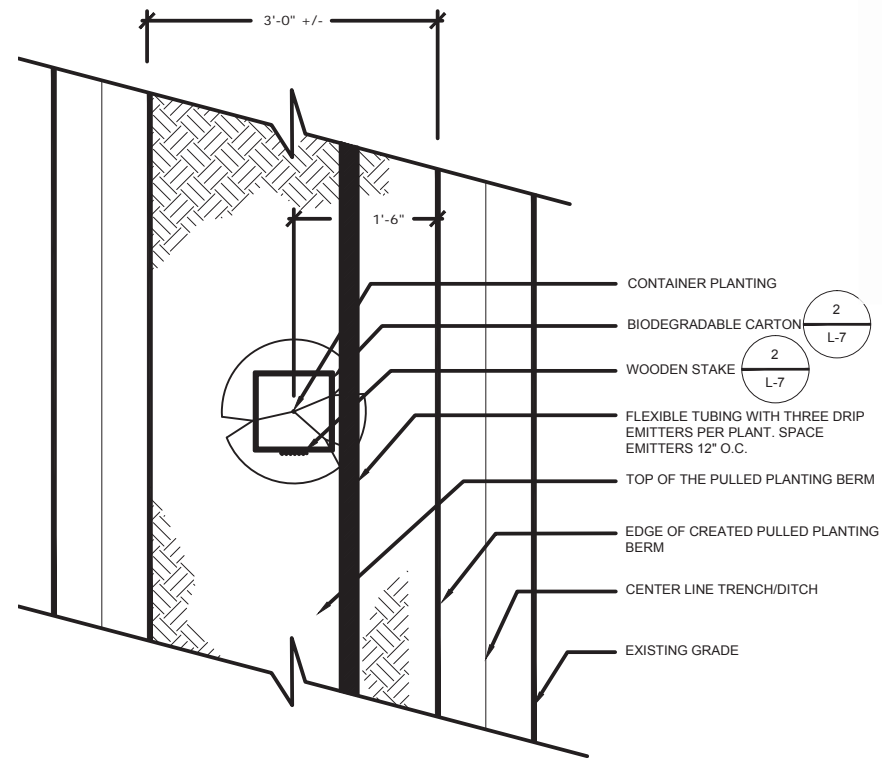
- NOTES:
1. PROVIDE 6" MIN. HORIZONTAL DISTANCE BETWEEN PARALLEL PIPES.
  2. REFER TO THE IRRIGATION NOTES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**3 PARALLEL PIPE INSTALLATION**  
L-6 SCALE: N.T.S.

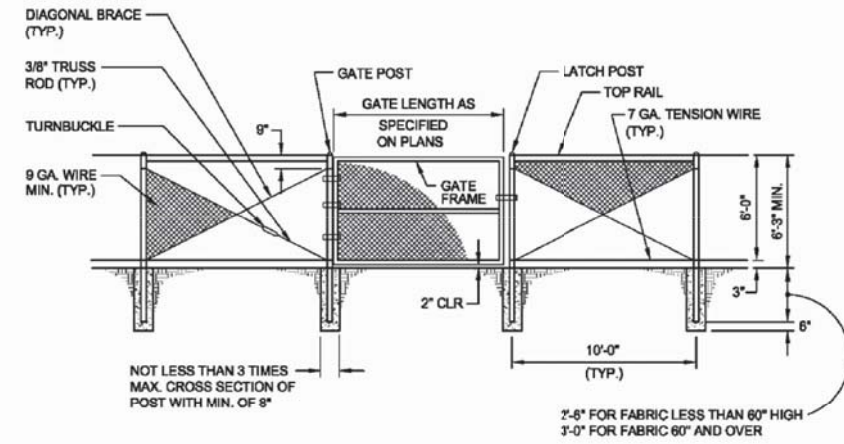


- NOTE:
1. REFER TO IRRIGATION NOTES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**2 TYPICAL DRIP IRRIGATION LAYOUT**  
L-6 SCALE: N.T.S.

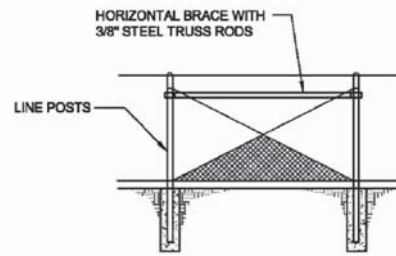


**4 DRIP ALONG CONTAINER PLANTING**  
L-6 SCALE: N.T.S.

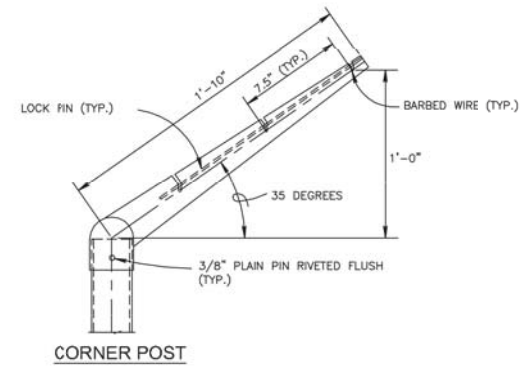
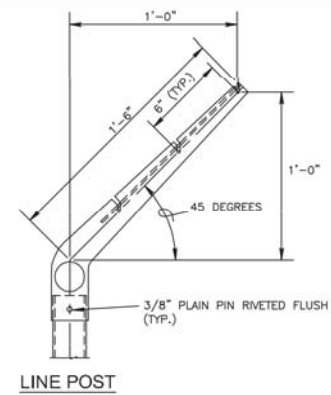
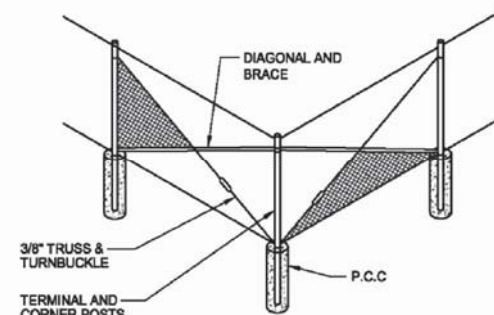


NOT LESS THAN 3 TIMES MAX. CROSS SECTION OF POST WITH MIN. OF 8"

2'-8" FOR FABRIC LESS THAN 60" HIGH  
3'-0" FOR FABRIC 60" AND OVER



- NOTES:
1. FENCE LOCATION AS SHOWN ON PLANS.
  2. ALL CONSTRUCTION AND MATERIALS IN CONFORMANCE WITH SECTION 10-38 OF THE STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION (CALTRANS).



**BARBED WIRE EXTENSION ARM DETAILS**

**5 CHAIN LINK FENCE**  
L-6 SCALE: N.T.S.

- CONSTRUCTION NOTES:
1. BARBED WIRE EXTENSION ARMS SHALL BE USED WHERE BARBED WIRE CHAIN LINK FENCING IS REQUIRED ON THE PLANS.

NO.	DATE	ISSUE/REVISION	APP

Attention:

Designed: VH, LH, SR  
Checked: VH  
Drawn: SR  
Submitted By: VH, LH, SR  
P.E. No.: -  
Submittal Date: 06/22/2017

**GEI** Consultants  
2868 PROSPECT PARK DRIVE  
SUITE 400  
RANCHO CORDOVA, CA 95670  
(916)631-4500

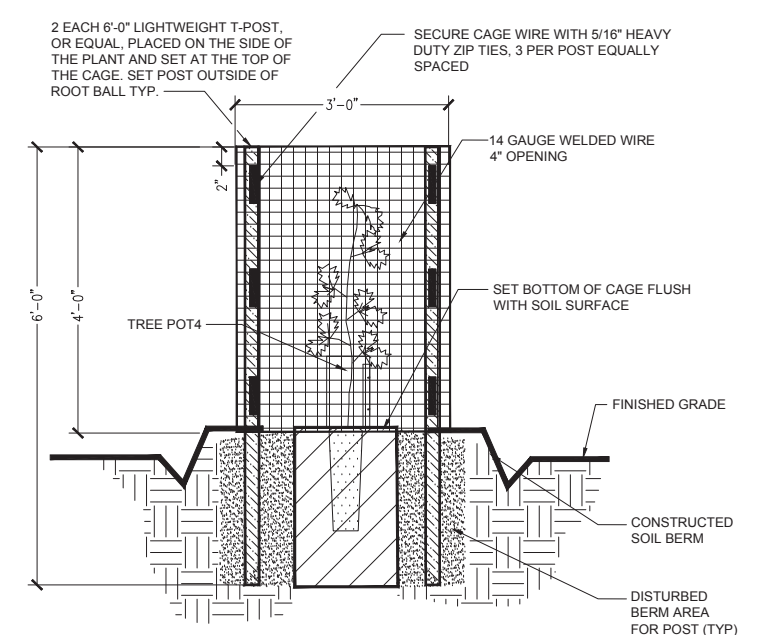
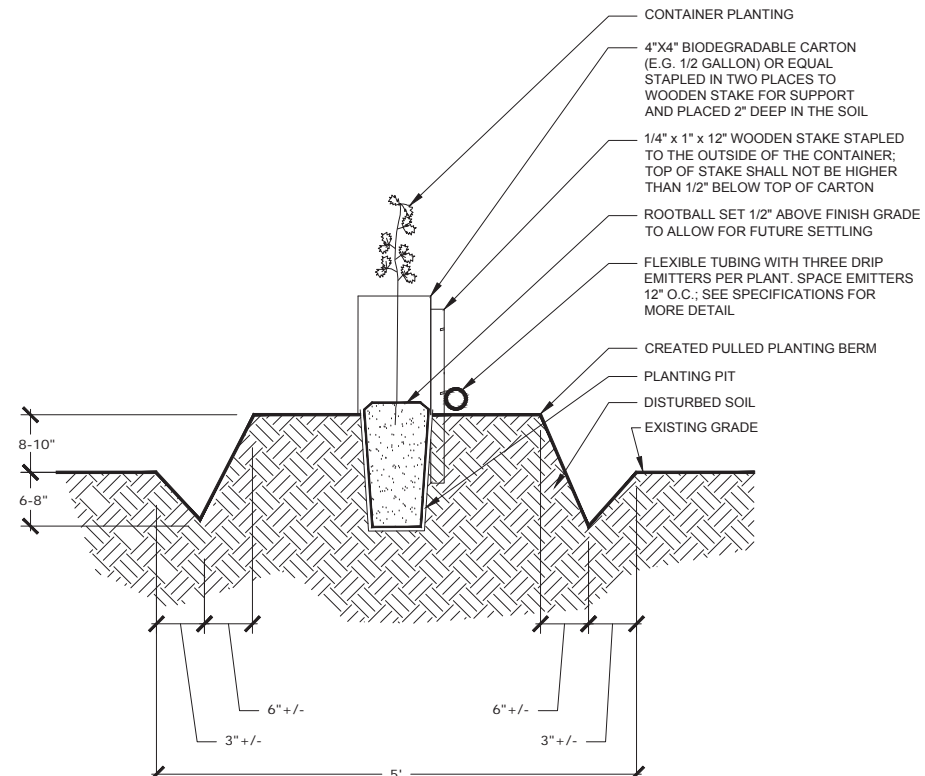
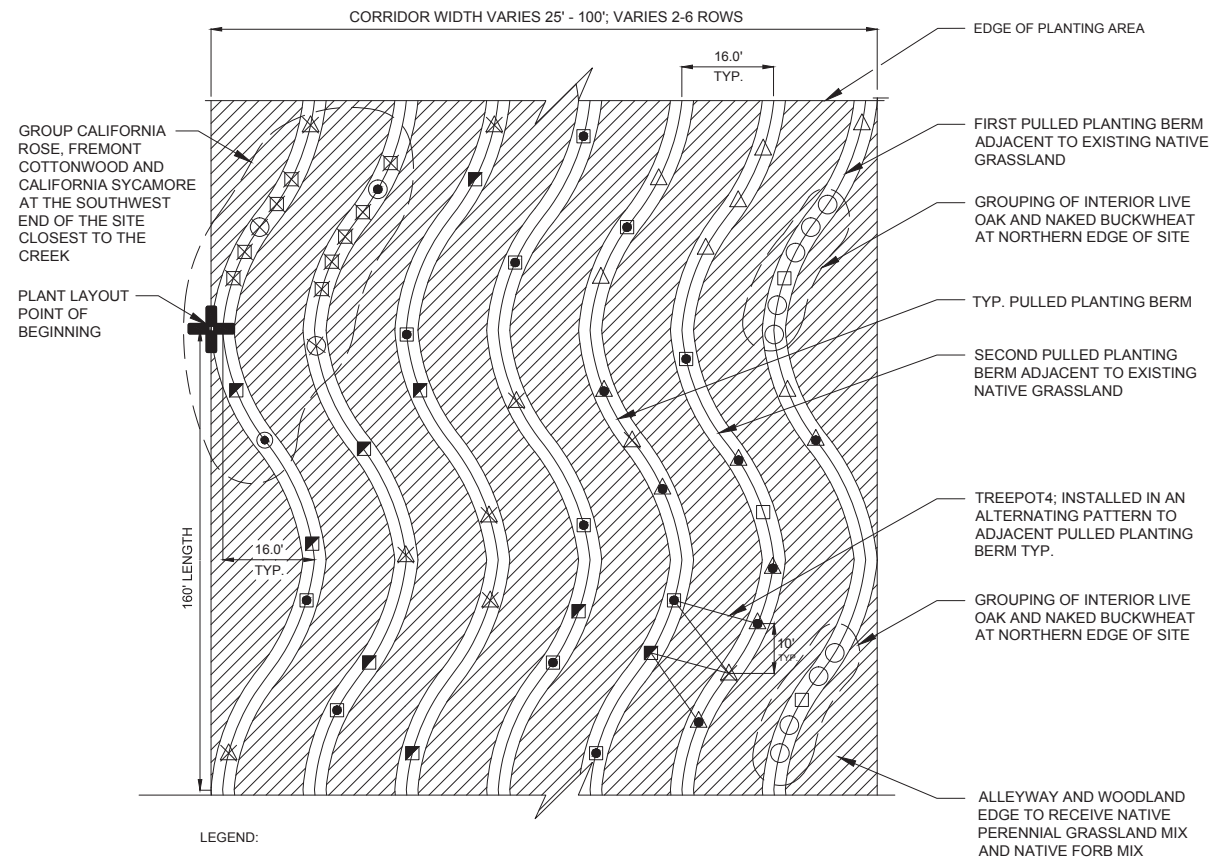
**SACFA**  
Sacramento Area Flood Control Agency

GEI Project 1601100

North Area Streams Robla Creek Woodland Mitigation and Enhancement Project

IRRIGATION AND FENCING DETAILS Page 22

DWG. NO. L-6  
REV 0



- NOTES:**
- INSTALL LIGHTWEIGHT T-POST OR EQUAL, IN TWO PLACES FOR BEST FIT TO AVOID INSTALLED IRRIGATION TUBING AND ROOTBALL.
  - PLANT PROTECTION CAGES SHALL BE INSTALLED ON VALLEY OAKS, INTERIOR LIVE OAKS, FREMONT COTTONWOODS, AND SYCAMORES.

**1 PLANTING LAYOUT**  
L-7 SCALE: N.T.S.

NO.	DATE	ISSUE/REVISION	APP

Designed: VH, LH, SR  
 Checked: VH  
 Drawn: SR  
 Submitted By: VH, LH, SR  
 P.E. No.: -  
 Submittal Date: 06/22/2017



North Area Streams Robla Creek Woodland Mitigation and Enhancement Project  
 PLANTING DETAILS  
 DWG. NO. L-7  
 REV 0

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# Attachment B





Water Resources ♦ Flood Control ♦ Water Rights

## TECHNICAL MEMORANDUM

**DATE:** July 28, 2015

**SUBJECT:** Hydraulic Impact Evaluation of the Robla Creek Aquatic and Riparian Habitat Creation Project

**PREPARED BY:** Michael Archer, P.E.

**REVIEWED BY:** Don Trieu, P.E.

Signed and sealed July 28, 2015.



The Robla Creek Aquatic and Riparian Habitat Creation Project (ARHCP) is located along Robla Creek immediately downstream of Rio Linda Boulevard (see Figure 1). The ARHCP consists of regrading and revegetating the right bank of Robla Creek for a length of approximately 2,000 feet. Also included is an approximately 1-acre site (see "staging area & P.O.C." in Figure 1) that will consist of a pad constructed with 2 to 3 feet of fill.

This Technical Memorandum documents a hydraulic impact analysis performed for the Robla Creek ARHCP.

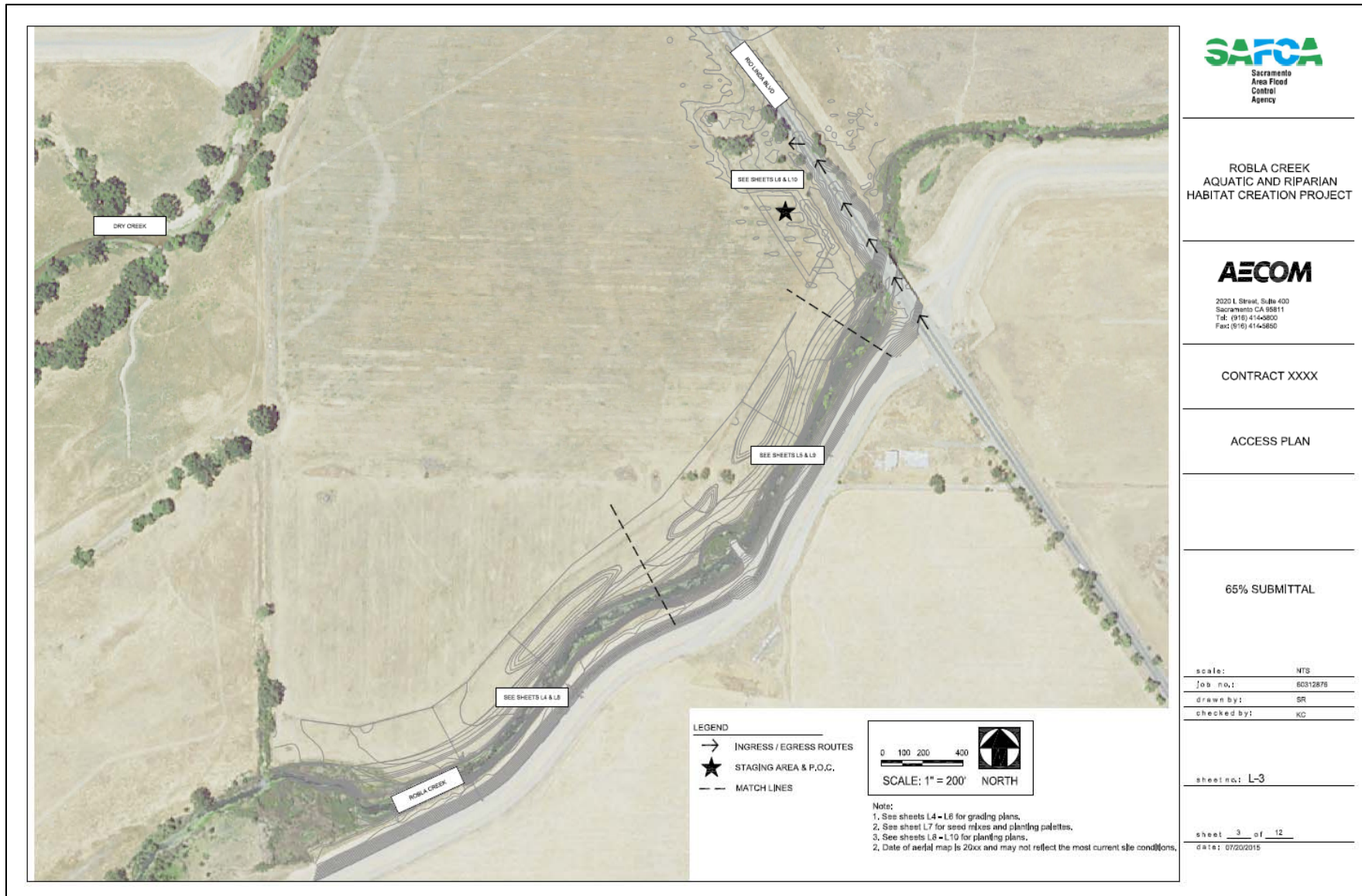


Figure 1. Robla Creek Aquatic and Riparian Habitat Creation Project (ARHCP)

## Hydraulic Model

A HEC-RAS hydraulic model of Dry Creek, Robla Creek, and Steelhead Creek<sup>1</sup> was developed for this analysis by extracting those reaches from the MBK version of Release 4 of the U.S. Army Corps of Engineers (USACE) Sacramento River HEC-RAS model. The upstream boundaries of the model are Dry Creek at Q Street, Robla Creek at E Street, and Magpie Creek at Patrol Road. The downstream boundary is Steelhead Creek at the American River north levee. HEC-RAS, developed by the USACE Hydrologic Engineering Center, is software designed to perform one-dimensional (1D) hydraulic calculations for a full network of natural and constructed channels. Version 4.1 of HEC-RAS was used for the analysis. The 1D model simulates unsteady flow conditions.

The hydraulic model for these reaches was originally developed for USACE by WEST Consulting Engineers (WEST Consultants, 2010).

Thirteen cross sections were added to the hydraulic model to capture the existing terrain and the terrain changes due to the project, as shown in Figure 2. The first five new cross sections downstream of Rio Linda Boulevard were developed from LiDAR topographic data from the California Central Valley Floodplain Evaluation and Delineation Program. The eight remaining new cross sections were developed using the HEC-RAS cross section interpolation process.

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<sup>1</sup> Steelhead Creek is also known as the Natomas East Main Drainage Canal, or NEMDC.

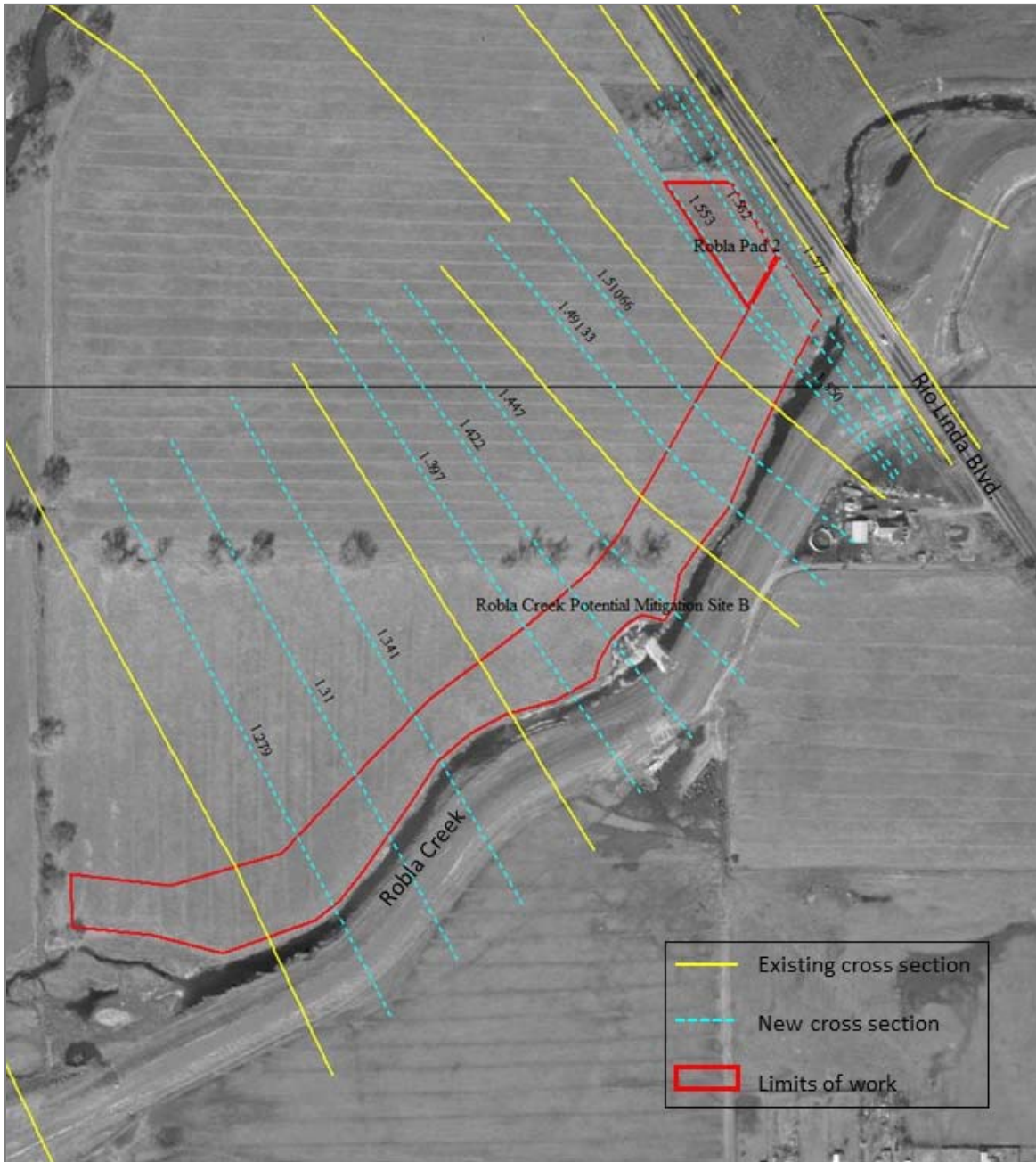


Figure 2. Hydraulic Model Cross Sections in Project Area

### Hydrologic Conditions

The effect of the ARHCP was evaluated for the following hydrologic conditions:

1. 1957 Profile: Sacramento River Flood Control Project design condition.
2. Urban Levee Design Criteria (ULDC): California ULDC condition; 1-in-200 annual exceedance probability (AEP) flood, also referred to as the 200-year flood; levees are assumed to act as weirs without failing if overtopped.

The peak combined flows for Dry Creek and Robla Creek downstream of Rio Linda Boulevard, along with the peak stages at the downstream boundary of the model, are summarized in Table 1.

**Table 1. Summary of Hydrologic Conditions Evaluated**

Hydrologic Condition	Peak Combined Flow, Dry Creek and Robla Creek downstream of Rio Linda Boulevard (cfs)	Peak Stage, Steelhead Creek at American River North Levee (feet NAVD88)
1957 Profile	15,000	34.8
ULDC	18,000	38.0

The source of the hydrologic flow data was hydrology developed by USACE for the American River Common Features Project General Reevaluation Report (USACE, 2010). The 1957 Profile condition used the USACE 1-in-100 AEP hydrology increased by 2.6 percent to produce the 15,000 cubic feet per second (cfs) 1957 design flow downstream of Rio Linda Boulevard.

## Project Conditions

The Robla Creek ARHCP was represented in the hydraulic model by modifying the cross sections in the project area to account for the proposed grading and adjusting roughness values for the proposed vegetation changes. The changes to the cross sections are shown in plots provided in Appendix A. The 1-acre pad area adjacent to Rio Linda Boulevard was assumed for the purpose of the analysis to have a top elevation of 40 feet (NAVD88), representing a fill depth of up to 3 feet. The effects of the proposed vegetation changes on the Manning's roughness coefficient (n-value) are less certain, therefore, for the purpose of this analysis the roughness in the riparian project area was conservatively increased by almost 50 percent, from 0.068 to 0.10.

## Results

The maximum computed water surface elevation increases at the edge of the floodway due to the project are summarized in Table 2. The greatest change is localized at the Robla Creek south levee in the vicinity of Rio Linda Boulevard. Profile plots of the computed maximum water surface elevations for the profile locations in Figure 3 are provided in Figure 4 through Figure 7.

**Table 2. Summary of Maximum Computed Water Surface Elevation Increased Due to the Project**

Hydrologic Condition	Maximum Computed Water Surface Elevation Increase (feet)	Location
1957 Profile	0.08	At Rio Linda Boulevard
ULDC	0.03	At Rio Linda Boulevard

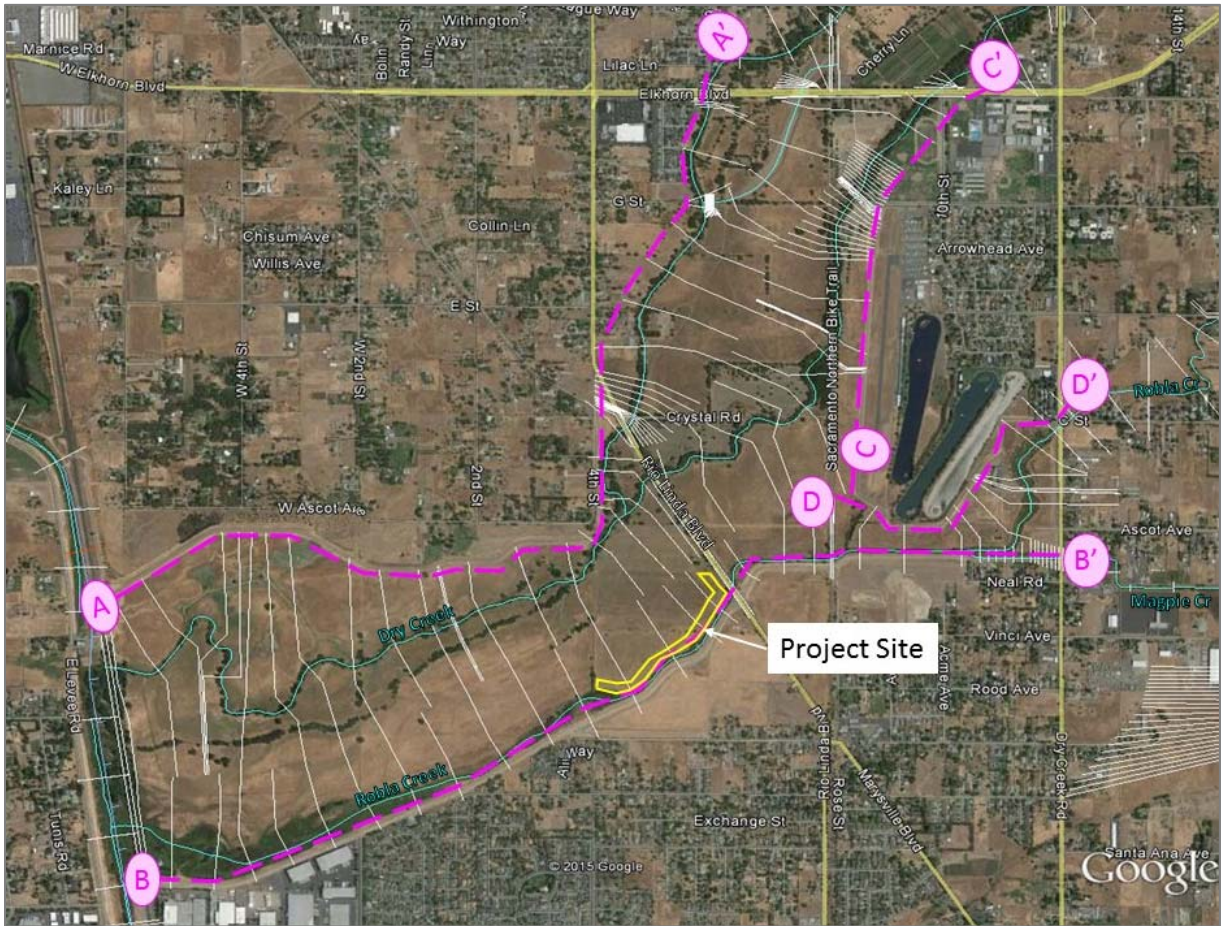


Figure 3. Water Surface Elevation Impact Profile Locations

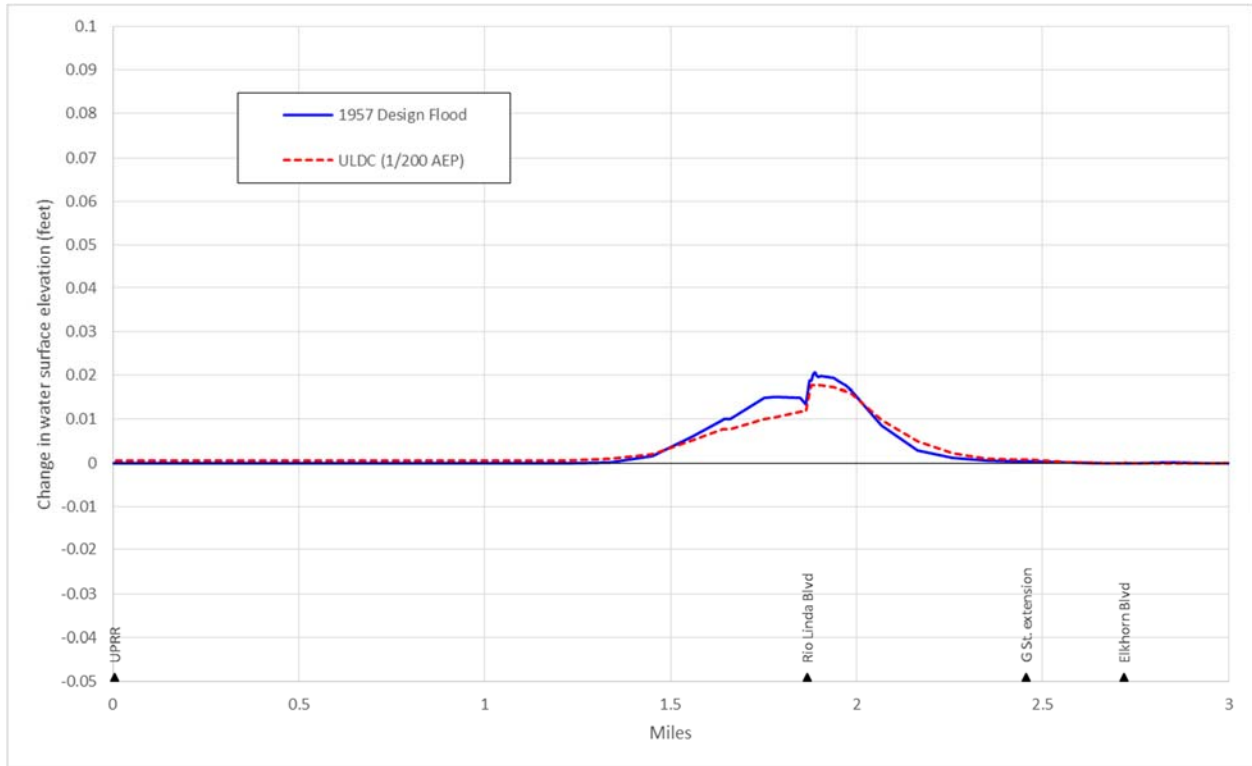


Figure 4. Water Surface Elevation Change along North and West Side of Dry Creek (Profile A-A')

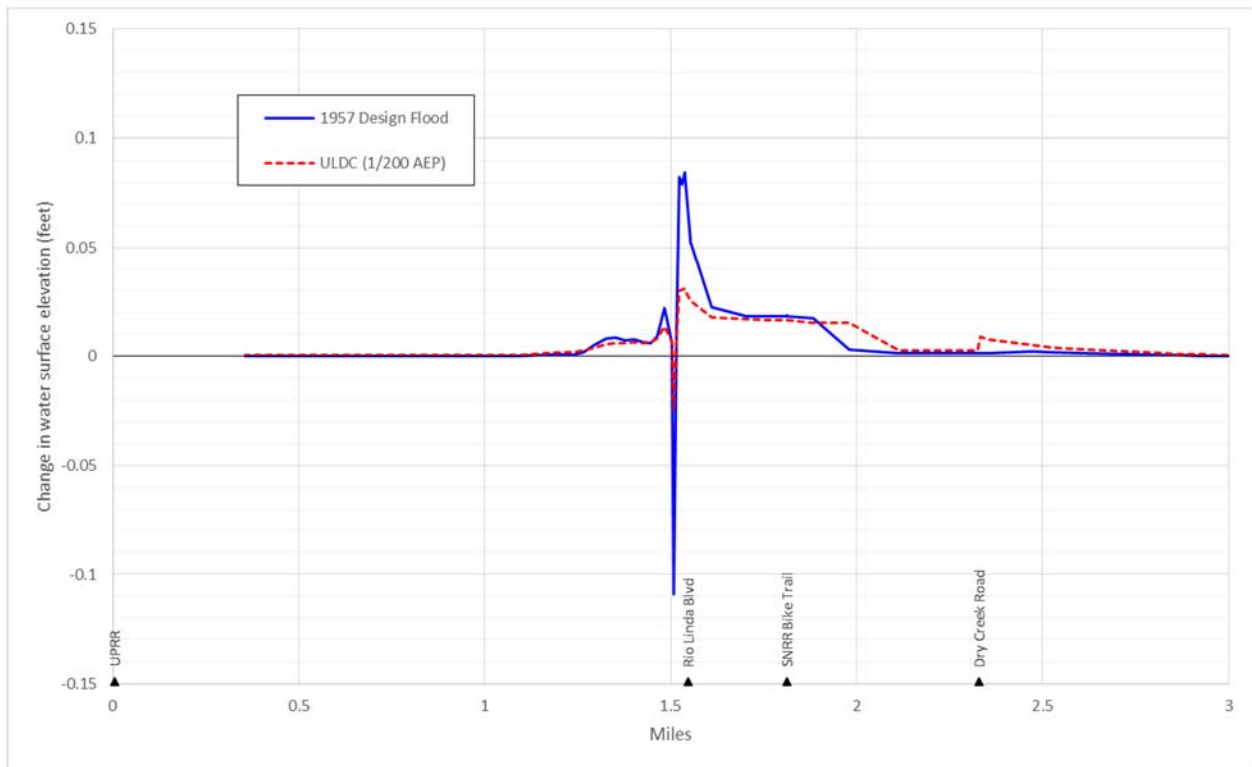


Figure 5. Water Surface Elevation Change along South Side of Robla Creek (Profile B-B')

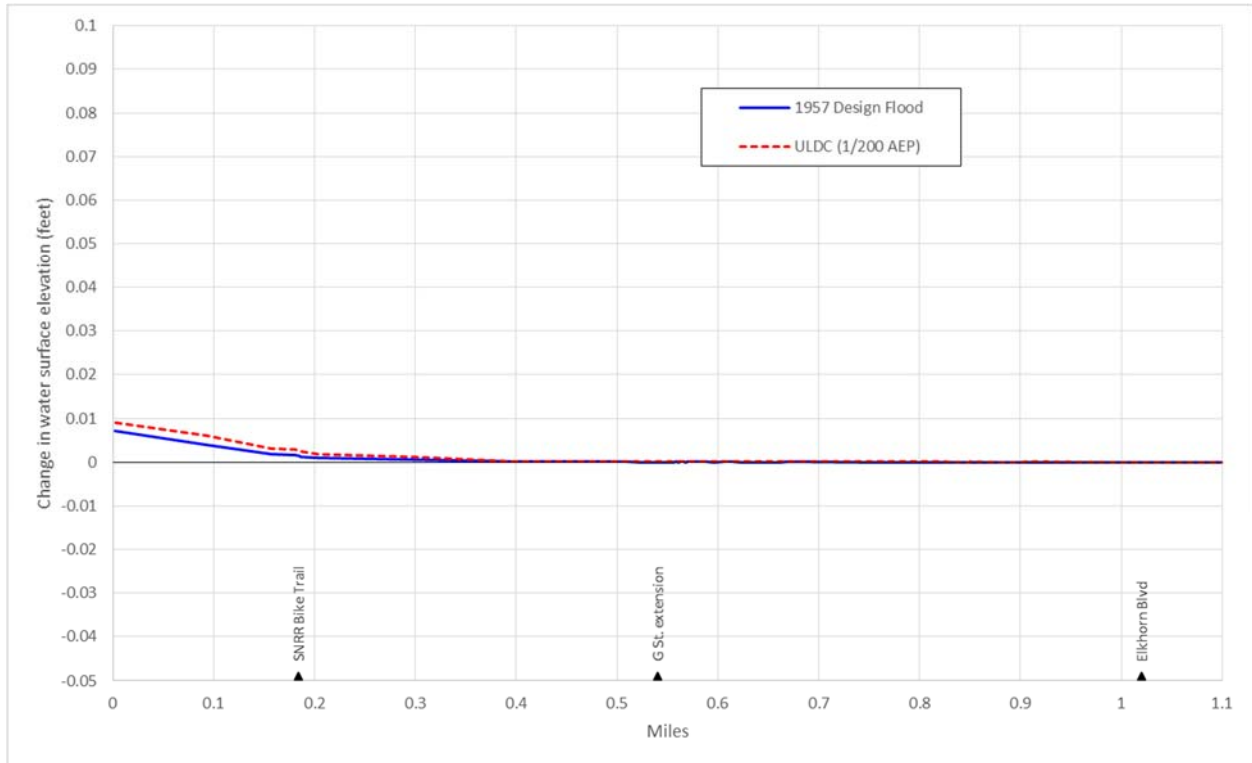


Figure 6. Water Surface Elevation Change along East Side of Dry Creek (Profile C-C')

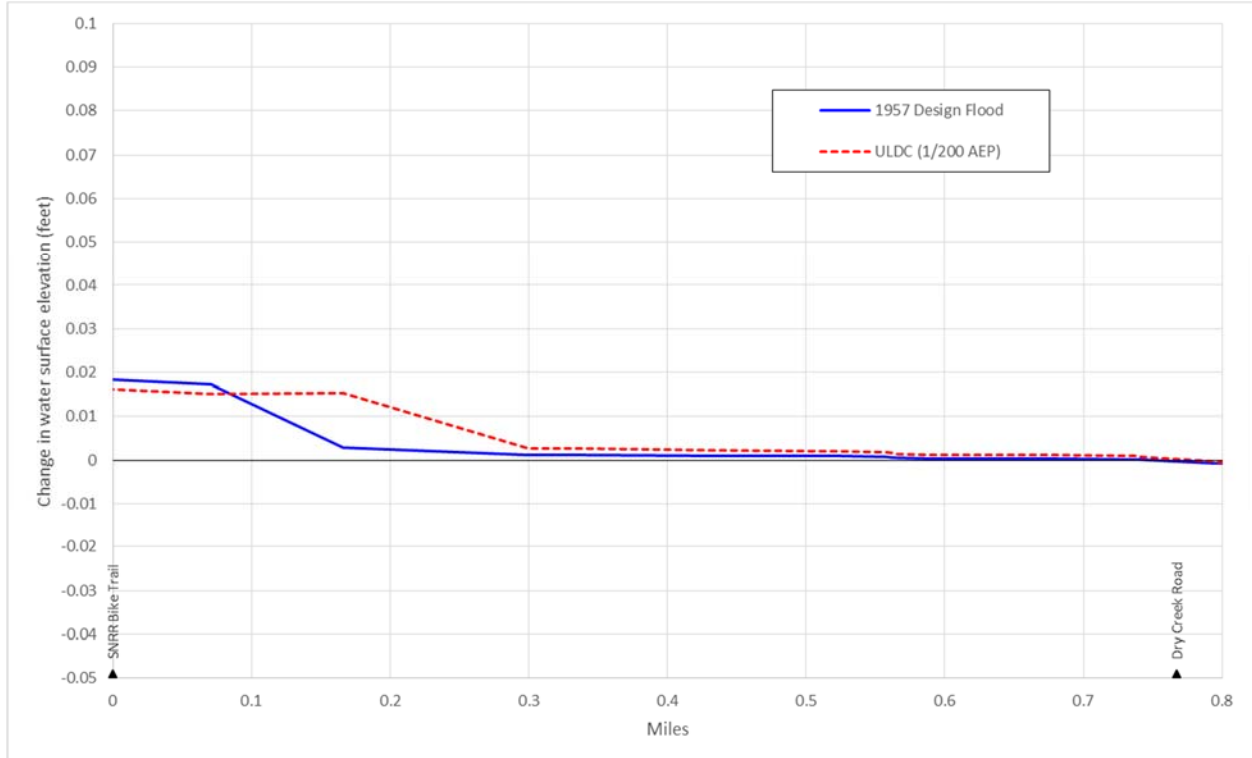
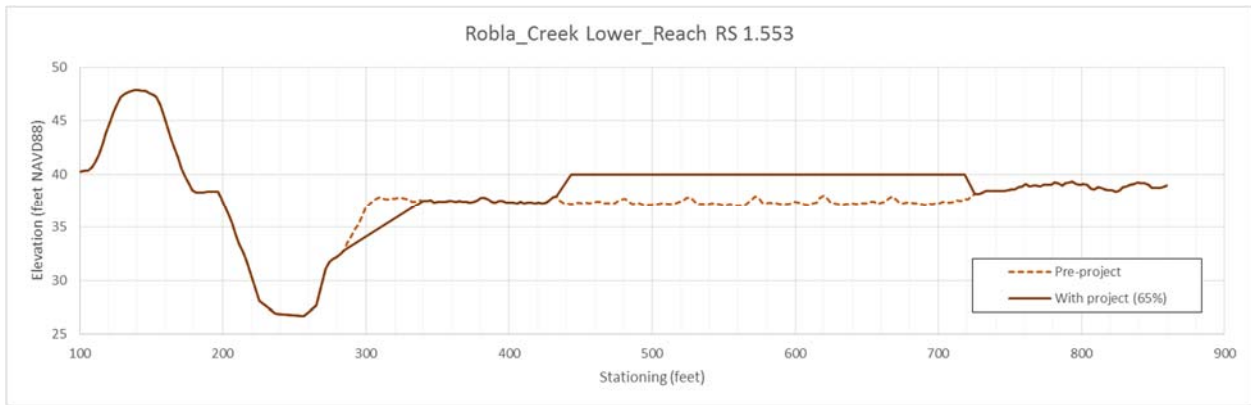
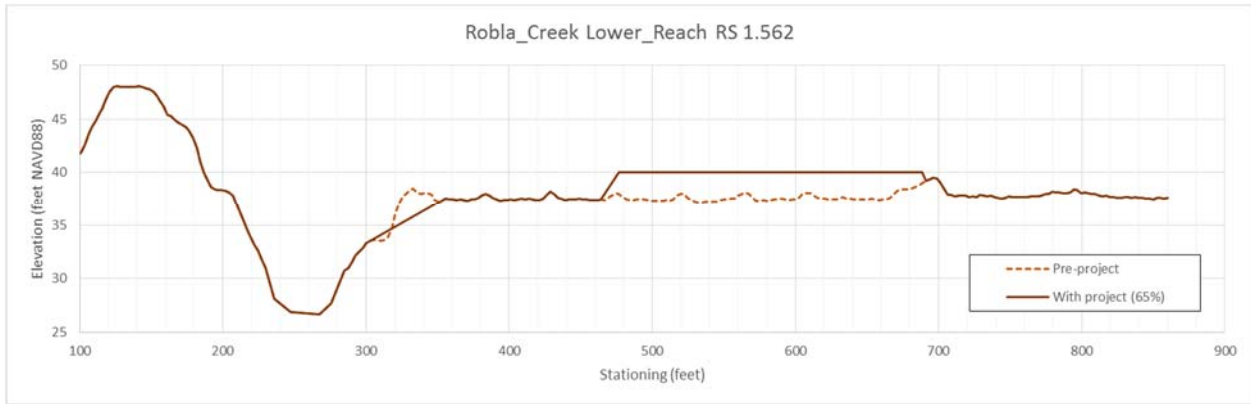
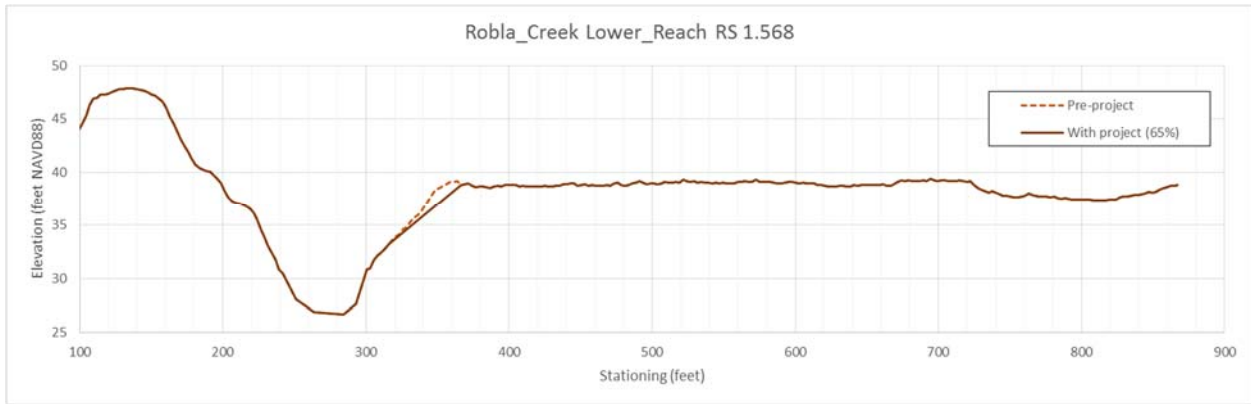
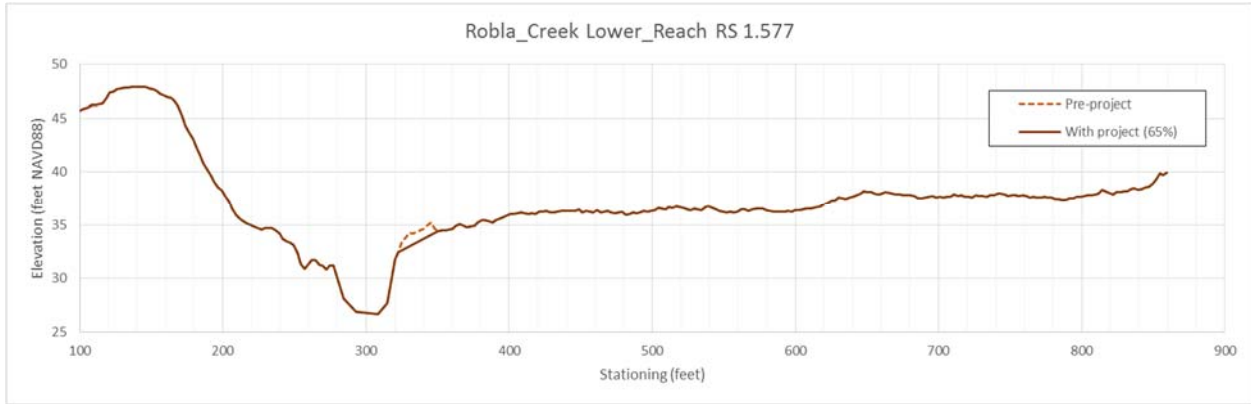


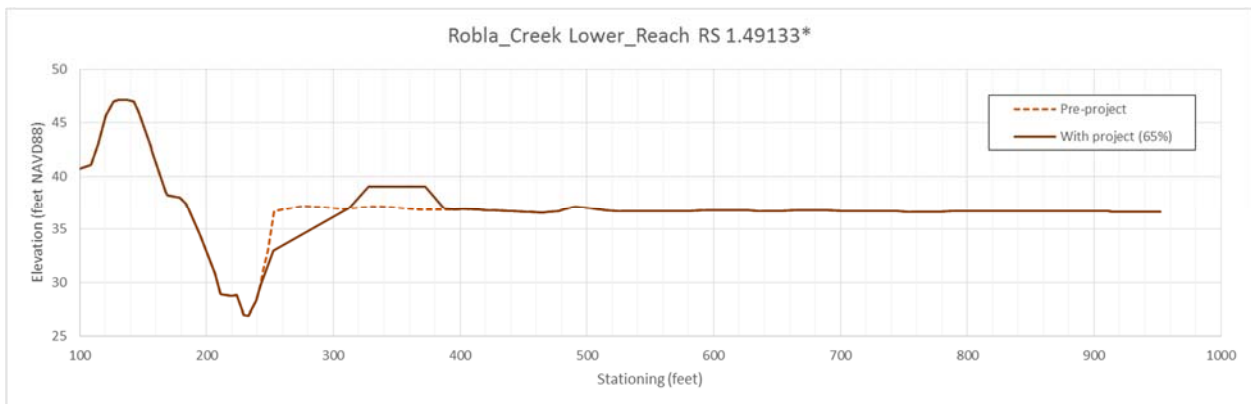
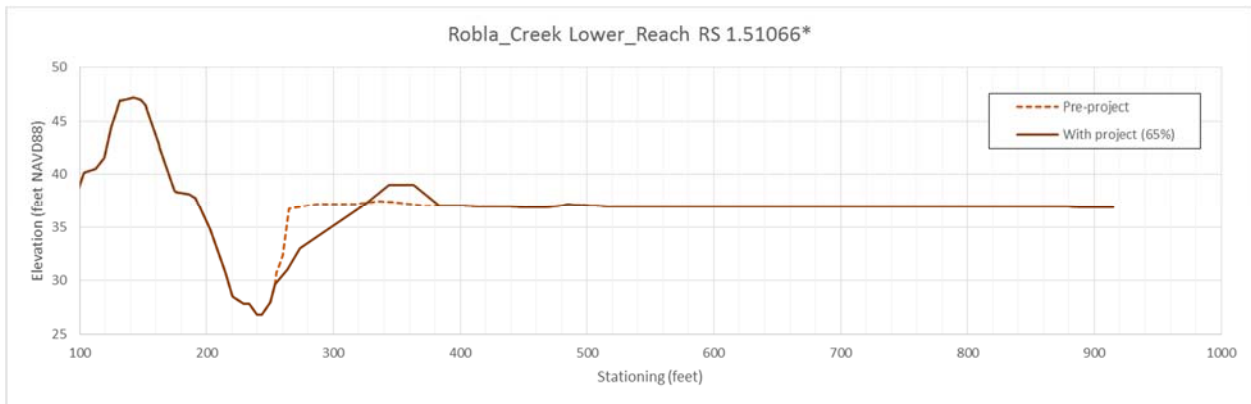
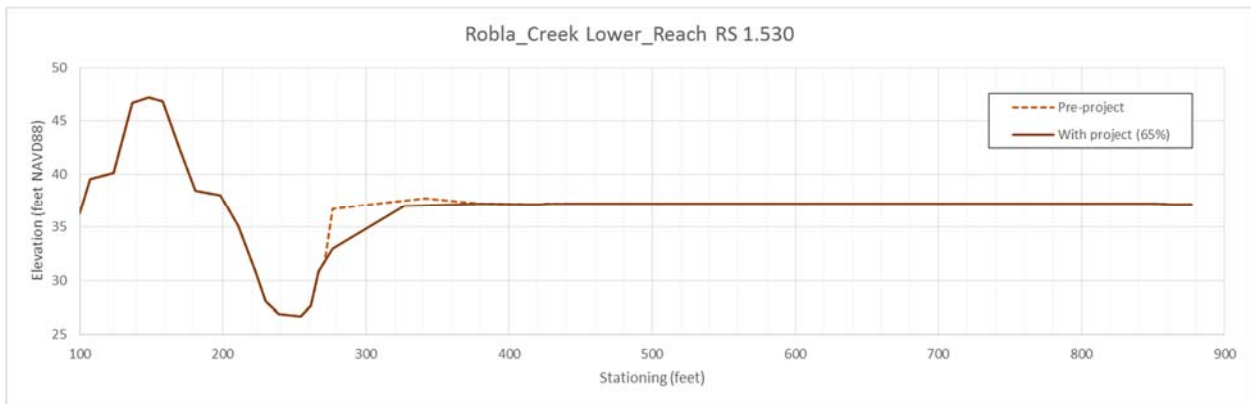
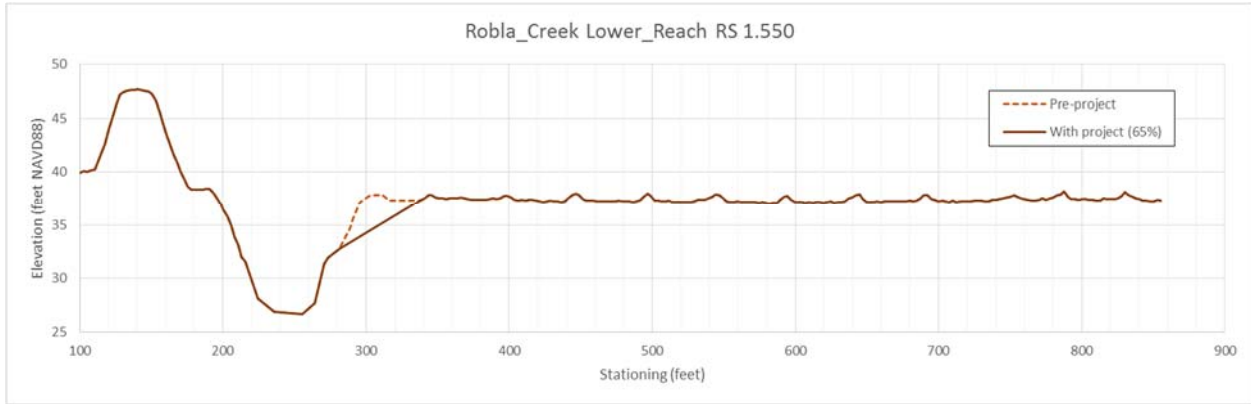
Figure 7. Water Surface Elevation Change along North Side of Robla Creek (Profile D-D')

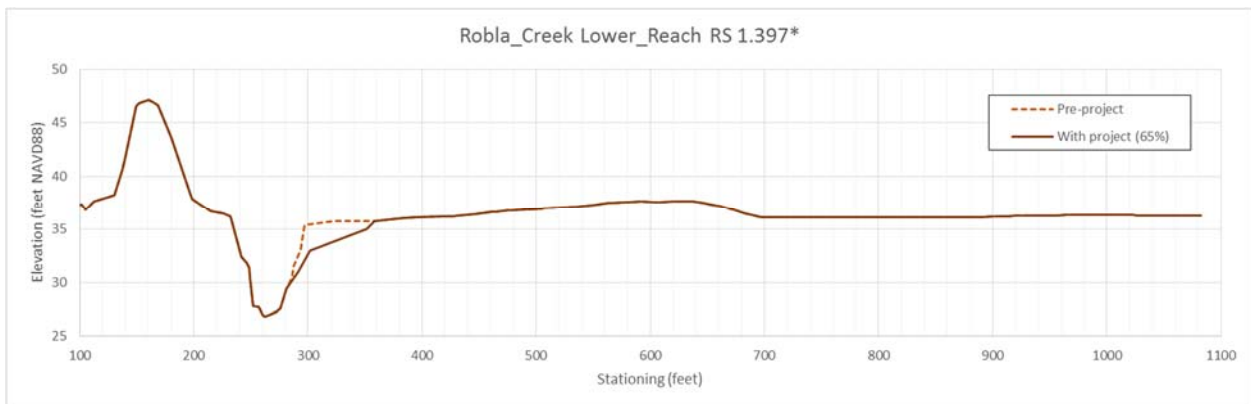
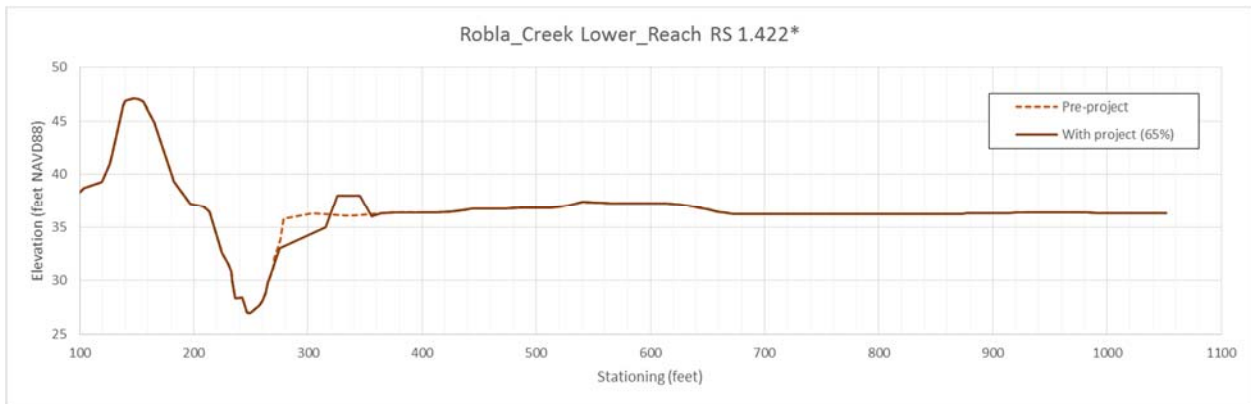
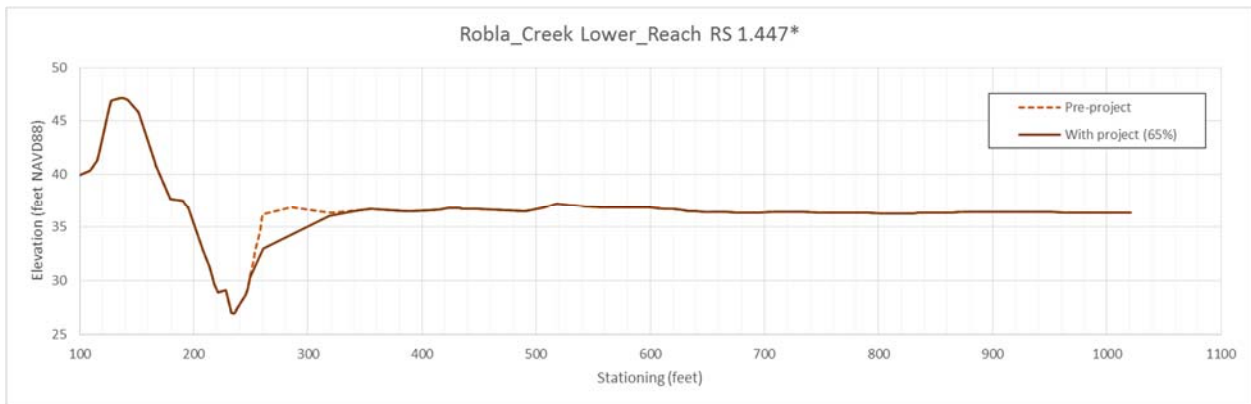
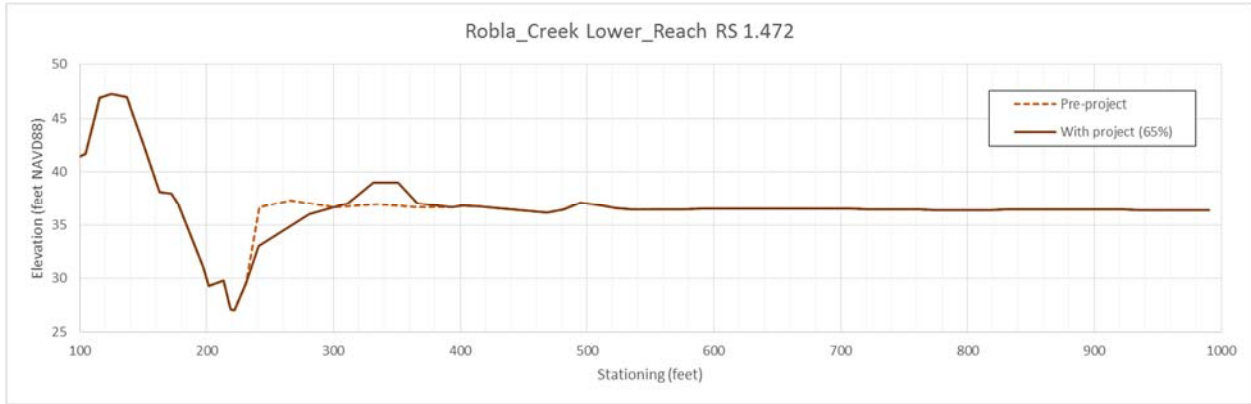


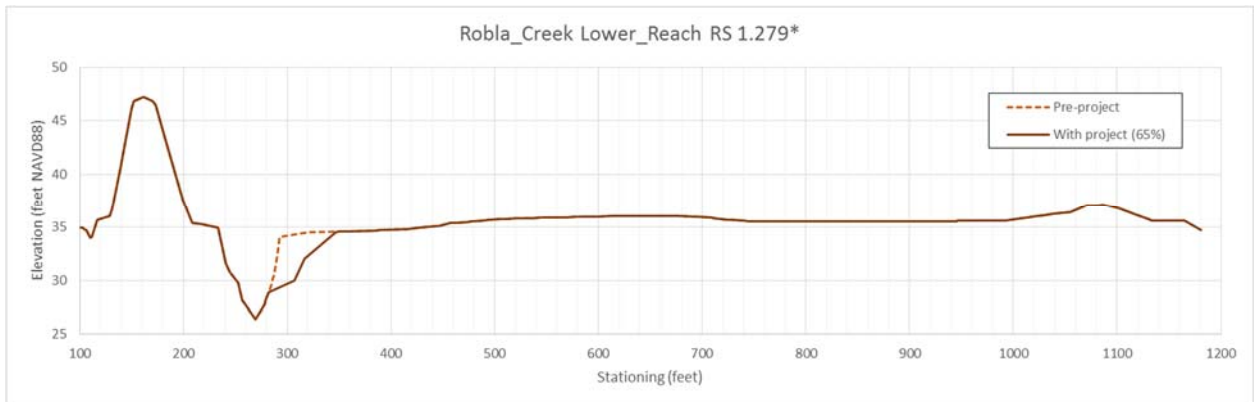
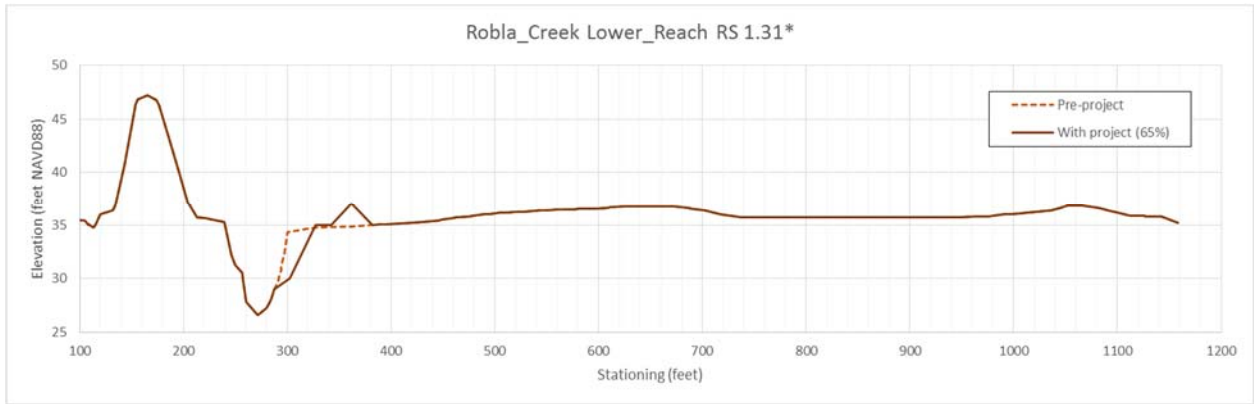
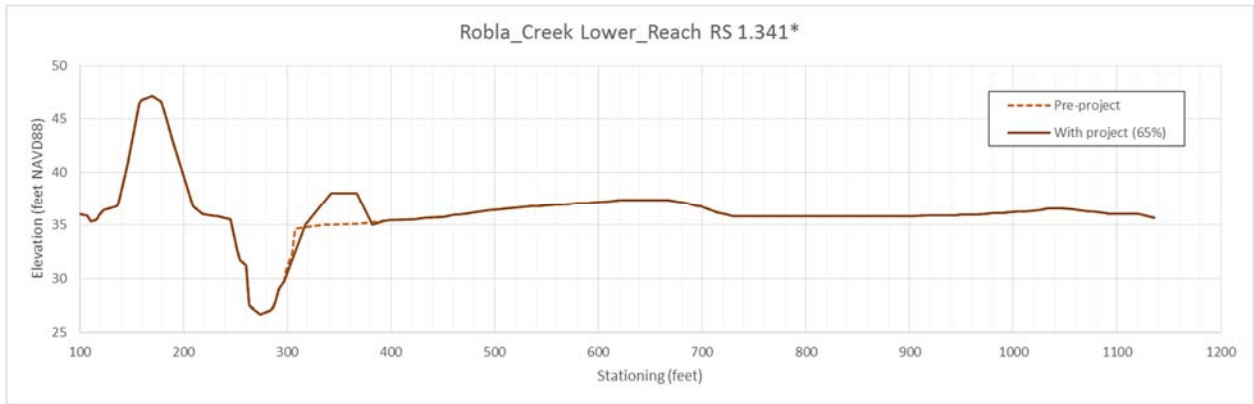
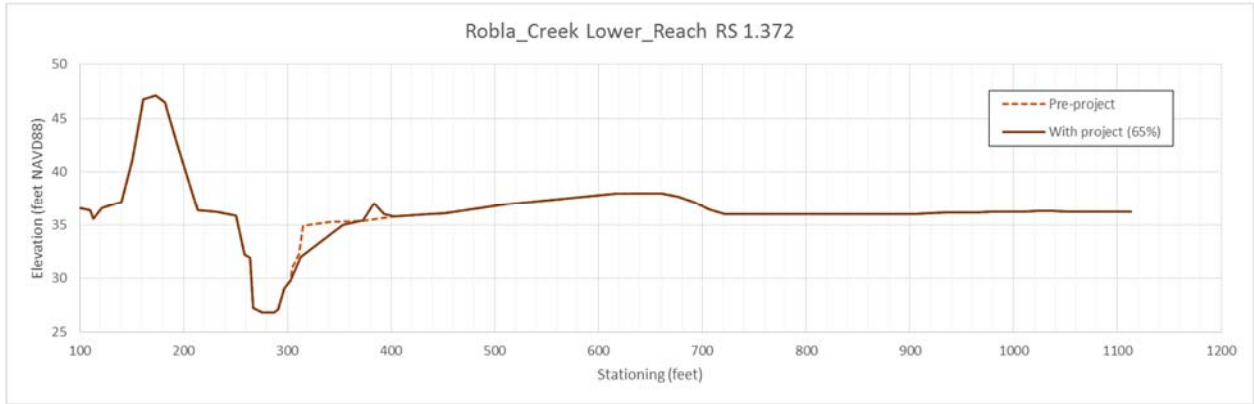
## **Appendix A**

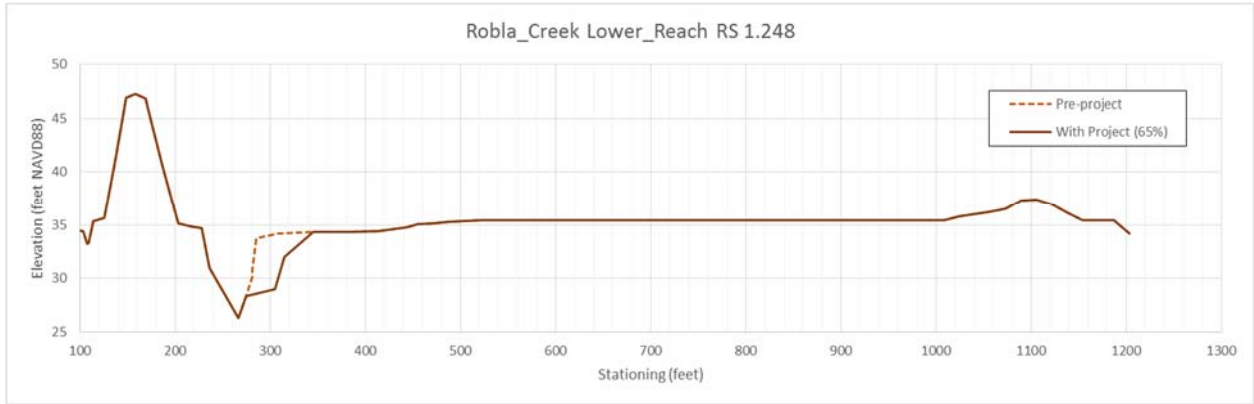
# **Hydraulic Model Cross Section Modifications for Project Conditions**











### 3. CEQA Documentation

Final  
Environmental Impact Report  
North Sacramento Streams,  
Sacramento River East Levee, Lower American River,  
and Related Flood Improvements Project



State Clearinghouse No. 2014052038

Prepared for:



Prepared by:



July 2016



# Mitigation Monitoring and Reporting Program for the North Sacramento Streams, Sacramento River East Levee, Lower American River, and Related Flood Improvements Project



State Clearinghouse No. 2014052038

Prepared for:



July 2016