ALUM ROCK FISH PASSAGE PROJECT MITIGATION MONITORING REPORT YEAR TWO, 2014

PREPARED FOR:

Santa Clara Valley Transportation Authority
3331 North First Street Bldg. B-2
San Jose, CA 95143-1906
Contact: Ann Calnan
408.321.5976

PREPARED BY:

ICF International
75 E. Santa Clara Street, Suite 300
San Jose, CA 95113
Contact: Donna Maniscalco
408.216.2802

March 2015

ICF International. 2015. *Alum Rock Fish Passage Project Mitigation Monitoring Report, Year Two*. March. 2015 (ICF 00541.13.). San Jose, CA. Prepared for the Santa Clara Valley Transportation Authority.

Contents

Tables and Figures

Acronyms and Abbreviations

FAC	Facultative
FACW	Facultative Wetland
HMMP	Habitat Mitigation and Monitoring Plan
HTH	H. T. Harvey & Associates
OBL	Obligate
Plan	Fisheries Monitoring Plan
Project	VTA's Alum Rock Fish Passage Project
VTA	Valley Transportation Authority
YSI	Youth Science Institute

Alum Rock Fish Passage Project Mitigation Monitoring Report

This Mitigation Monitoring Report represents a full accounting of the required vegetation monitoring in accordance with the *Habitat Mitigation and Monitoring Plan – Alum Rock Park Bank Repair and Stream Restoration Projects* (Winzler & Kelly 2012, Appendix A) (HMMP) associated with VTA's Alum Rock Fish Passage Project (Project), which consists of several project elements contained in the City of San Jose's larger Alum Rock Park Bank Repair and Stream Restoration Project. This report also provides a summary of the Geomorphic/Physical Site Monitoring and Fish Passage Improvement Monitoring required under permit conditions for the Project. The full Geomorphic and Fish Passage Improvement Monitoring reports are attached to this report and in full represent a complete accounting of the required monitoring for 2014 and the status of the Project as related to achievement of performance objectives.

The Alum Rock Fish Passage Project is located in Alum Rock Park (Figure 1) and consists of four separate sites. Site 10 is a newly constructed floodplain about 120 feet long by 30 to 40 feet wide that begins just south of the Alum Rock Park Bridge L (Figure 2). Site 13 is a newly constructed fish passage located directly downstream of the Youth Science Institute (Figure 3). Site 3, consisting of removal of a rock wall downstream of Bridge L, and Site 5, consisting of repair of an eroded rill, are included in the Project; however, there are no monitoring requirements assigned specifically to these two sites.

Year Two, 2014

Executive Summary

Geomorphic Monitoring

Geomorphic monitoring of Sites 10 and 13 for the Project began in September 2013, will extend for a 5-year period, and is being conducted by Balance Hydrologics, Inc.

Site 10 Floodplain

Monitoring at Site 10 includes installation of level loggers that record water surface elevation depths every 15 minutes. Two loggers were installed on September 26, 2013 directly adjacent to Site 10. Two sedimentation plates were installed to provide a means to directly measure sedimentation on the floodplain. In addition to these passive methods of floodplain inundation measurements, two cross-sections and one floodplain 'longitudinal profile' were initially surveyed on October 17, 2013. These will be re-surveyed on a yearly basis to measure any changes to floodplain geometry at these locations. Photo point locations were established, with an initial set of photos taken to record existing conditions.

Visual assessment of geomorphic change on the floodplain was marked by vigorous growth of alders and willows. No other significant geomorphic changes were observed. The connections from the main channel to the constructed floodplain have not changed significantly, other than an increase in the vegetation growing around them. The depth of sediment accumulated on the floodplain

sedimentation plates was measured on September 24th, 2014. Both plates had accumulated several millimeters of duff and organic debris, but upon inspection, it appeared to have been dropped from the willows and alders that are overhanging the plates. This debris was cleared, revealing no sediment accumulation beneath it (0 mm). This is the expected result based on the hydrograph data, which showed that no flow reached the floodplain over the course of the year; therefore, there was no mechanism for transporting sediment onto the plates.

Comparisons of the September 2014 cross section survey to the October 2013 baseline survey generally confirm the results of the visual observations: little geomorphic change took place in the floodplain over WY2014. This result was expected due to the lack of high flow conditions. The comparison of the surveyed cross sections shows no evidence of channel widening, downcutting, or aggradation.

Site 13 Fish Passage

At Site 13, the uppermost step in the original channel design failed in the first year's set of storms (i.e. two large storms in December, 2012). The step was rebuilt in mid-September, 2013. All monitoring work commenced after the step was rebuilt. To monitor channel evolution, seven cross-sections and one longitudinal profile were initially surveyed on October 17, 2013. These sections will be re-surveyed on a yearly basis to measure any changes to channel geometry at these locations. Photo point locations were established, with an initial set of photos taken to record existing conditions.

Visual inspections and photo point comparisons of Project Site 13 show that the fish passage seems to be functioning as intended. Little to no erosion of the bed or construction elements was observed, and the structure was in good condition. Many fingerling fish were observed in pools throughout the reach. Bed substrates were of gravel to cobble size, with finer silts observed downstream. Some gravel appears to have been transported in the downstream sections of the fish passage. The thalweg at Cross Section 7 has developed a narrow gravel bar. Near Cross Section 6, a narrow channel with a gravel bar on the river left side has evolved, with a low floodway developing on the right bank. Gravel bars, along with increased riparian vegetation, are signs that habitat complexity is increasing within the pools and chutes of the structure.

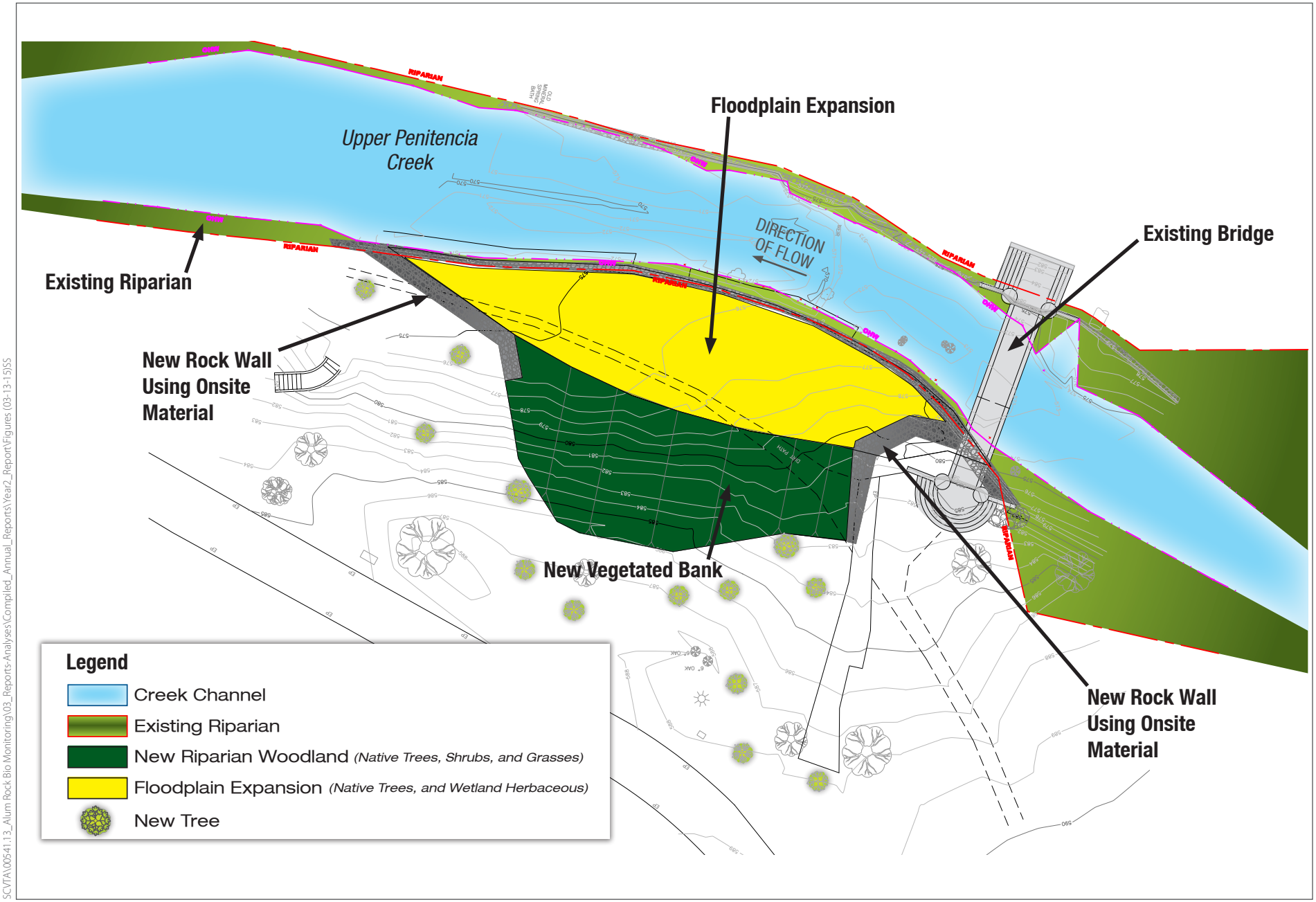
Comparison of this year's photo points to the base condition photos shows an increase in riparian vegetation as the main change to the fish passage condition over the course of the year. Again, this amount of vegetation is seen as a boon to habitat complexity and is not expected to interfere with channel conveyance during high flows. No significant erosion is evident from the photos, and no large wood has accumulated in the channel. The observed conditions are expected given the dry year and lack of large storms in WY2014.

Comparisons of September 2014 cross section survey data to October 2013 baseline survey data generally confirm the results of the visual observations – little geomorphic change took place in the fish passage over WY2014. This result was expected due to the lack of high flow conditions. The general shape of the surveys shows no evidence of bank widening, downcutting, or aggradation. (For details of the geomorphic site monitoring, refer to Appendix D.)

Fisheries Monitoring

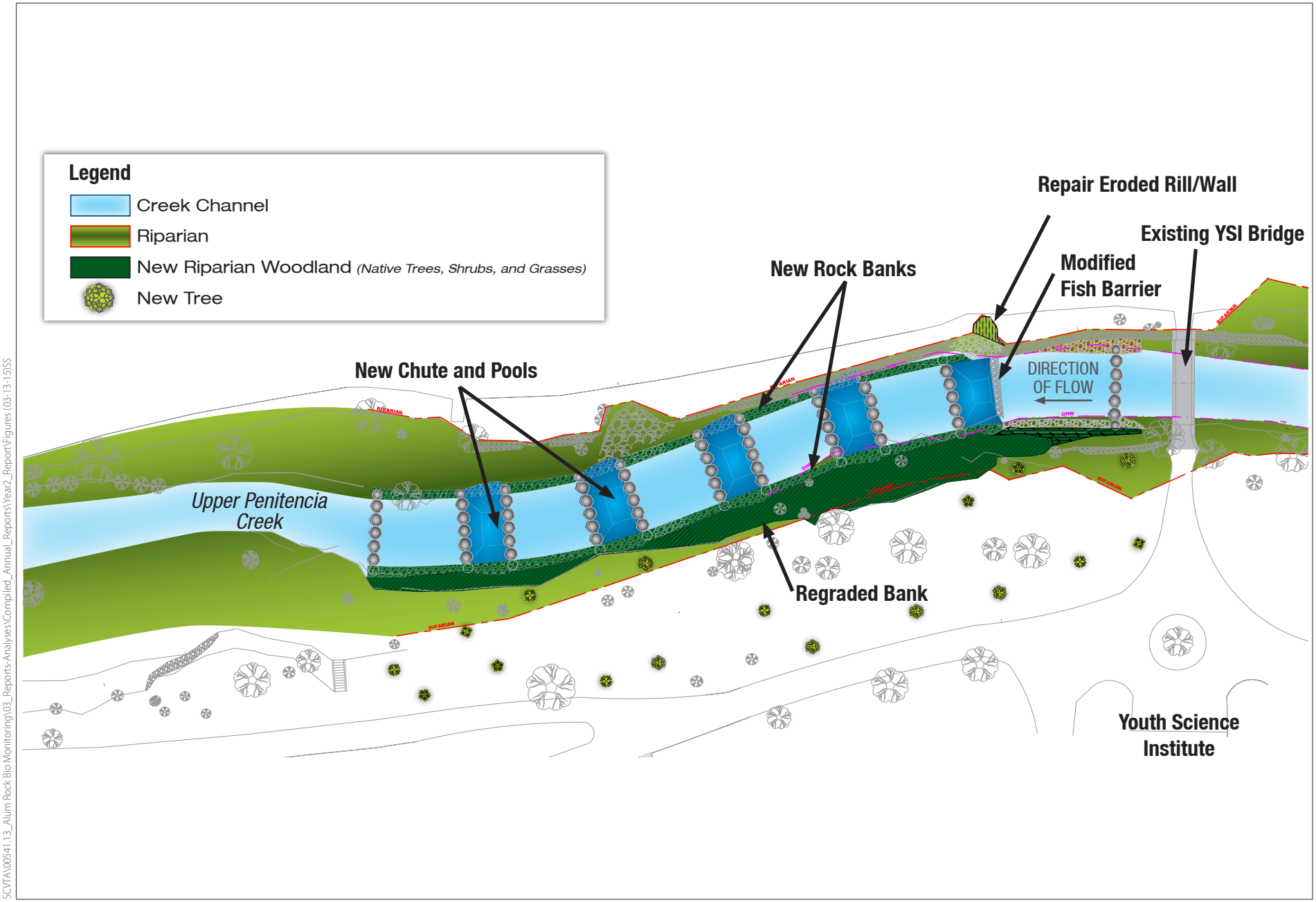
H. T. Harvey & Associates (HTH) developed and implemented a Fisheries Monitoring Plan (Plan) to meet the requirements of the Project's Biological Opinion prepared by the National Marine Fisheries

Figure 1
Project Location and Sites
Alum Rock Park Bank Repair and Stream Restoration Project
Santa Clara Valley Transportation Authority



SCVTA\00541.13_Alum Rock Bio Monitoring\03_Reports-Analyses\Compiled_Annual_Reports\Year2_Report\Figures (03-13-15)SS

Figure 2
Site 10 Floodplain Restoration
Alum Rock Park Bank Repair and Stream Restoration Project
Santa Clara Valley Transportation Authority



SCVTA\00541.13_Alum Rock Bio Monitoring\03_Reports-Analyses\Compiled_Annual_Reports\Year2_Report\Figures (03-13-15)SS

Figure 3
Site 13 Fish Passage Improvement Restoration
Alum Rock Park Bank Repair and Stream Restoration Project
Santa Clara Valley Transportation Authority

Service (May 31, 2012). Plan goals were to: 1) document the fish species occupying Site 13, and 2) document habitat associations at both project sites. Special attention was given to the occurrence of Central California Coast steelhead (*Oncorhynchus mykiss*) due to their special status.

Spring electrofishing surveys were conducted on May 1, 2014; HTH fish ecologists surveyed 18 contiguous habitat units at Site 13 and 10 non-contiguous habitat units at Site 10. Fall electrofishing surveys were conducted on November 4 and 5, 2014; HTH fish ecologists surveyed 19 contiguous habitat units at Site 13 and 10 non-contiguous habitat units at Site 10. The fish community documented during Year 2 surveys was composed of four native species: California roach (*Lavinia symetricus*), riffle sculpin (*Cottus gulosus*), Sacramento sucker (*Catostomus occidentalis*), and steelhead. Spring samples included four steelhead at Site 13 and four steelhead at Site 10; fall samples included two steelhead at Site 13 and three steelhead at Site 10. In total, 421 fish were captured during the spring and 780 fish were captured during fall. In the spring, three steelhead were captured in pocket water units, one steelhead was captured in a run unit, and four steelhead were captured in pool units. In the fall, five steelhead were captured in pool habitat units. The results of the 2014 Year 2 surveys indicate that the Project goals have been met; native fish, including steelhead, inhabit the Project and the Upstream reaches. (For details of the Fish Passage Improvement Monitoring and the Plan, refer to Appendix E.)

Vegetation Monitoring

The HMMP was completed for the Project to aid in mitigating the vegetation effects of the restoration activities. The HMMP states that once during the growing season herbaceous species will be monitored for five years and woody species for ten years to determine the success of the re-vegetation. ICF International biologists conducted the vegetation monitoring for Year-2 on October 14, 2014.

The Project met all performance objectives for Year-2 monitoring. Wetland species averaged a total of 62.5% aerial cover; the required aerial cover in the HMMP was 35%. Aerial cover of native plants averaged a total of 67.5% of the Project area; the required aerial cover in the HMMP was 25%. Survival of trees and woody plants averaged 101%; the required survival in the HMMP was 75%. Lastly, invasive species were not widespread during Year-2 monitoring and did not prevent the achievement of any performance objectives.

Management Recommendations

There are no management recommendations for Geomorphic Monitoring or Fisheries Monitoring.

To continue the high survival trend in following monitoring years, it is recommended that invasive species are assessed monthly and controlled, as described in the HMMP. Although these species did not prevent the achievement of the performance objectives in Year-2, with neglect, invasive species could spread quickly and become more difficult to control. Stinkwort invasion is the most urgent management issue in the Project area; its range currently extends along the northern bank in and near the cattails in Zone 4. It is recommended that stinkwort is either sprayed or pulled by hand prior to seeding next year (this species blooms from September to November). In Zone 2, removal of small pepper trees (*Schinus spp.)* and tamarisk (*Tamarix spp.*) is recommended before they grow larger.

Introduction

The Mission-Warren/Truck Rail project was completed by the Santa Clara Valley Transportation Authority (VTA) in 2012 and as mitigation, VTA constructed four mitigation projects along Upper Penitencia Creek known collectively as the Alum Rock Fish Passage Project (Project). These projects included removal of a rock wall downstream of Bridge L (Site 3) floodplain expansion downstream of Bridge L (Site 10) (Figure 2), fish passage improvement (Site 13) (Figure 3), and repair of eroded rill (Site 5). These projects served as compensatory mitigation for permanent, unavoidable impacts due to the Mission-Warren/Truck Rail project. Project Sites 3 and 10 excavated and graded the right bank (from the perspective of looking downstream), creating a 0.06 acre floodplain area (Figure 2). In Project Site 13, a stable roughened channel was created below an undercut weir in order to allow salmonids to migrate over the weir and access the upper part of Upper Penitencia Creek (Figure 3). The Project resulted in impacts to jurisdictional waters; mitigation for these impacts comprises revegetation of temporarily disturbed areas with native riparian, wetland, and herbaceous plant species.

Several monitoring activities associated with Sites 10 and 13 are required to ensure success of the Project. These include geomorphic (physical) and biological (fisheries) monitoring, which are required by the Project permits and Biological Opinion. Vegetation is in accordance with the *Habitat Mitigation and Monitoring Plan Alum Rock Park Bank Repair and Stream Restoration Projects* (Winzler & Kelly 2012, Appendix A) (HMMP). There are no monitoring requirements assigned specifically to Sites 3 and 5.

Project Location

The Project is located on Upper Penitencia Creek within Alum Rock Park in the County of Santa Clara, California; Latitude 37°23'301' N, Longitude 121°47'30" W; Assessor's Parcel Numbers: 595-07-01 5, 599-25-001, 612-46-001 (Figure 1). Alum Rock Park is a 720-acre municipal park run by the City of San Jose, Department of Parks, Recreation, and Neighborhood Services. The four projects, as described above, are grouped at two locations, the YSI (Youth Science Institute) Bridge and Bridge L along Upper Penitencia Creek. The YSI Bridge is located near a facility operated by the Youth Sciences Institute and Bridge L is located 1400 feet upstream. Sites 13 and 5 surround the YSI bridge and Sites 10 and 3 are located immediately downstream of Bridge L.

Geomorphic Monitoring

The 5-year geomorphic monitoring program (Appendix D) is intended to evaluate the restoration and enhancement of Sites 10 and 13 (Figures 2 and 3). Data collected is used to assess, on an annual basis, whether the sites meet the criteria for success set forth in the Biological Opinion, RWQCB 401 certification document, and HMMP, and to inform the response to any physical conditions that need immediate attention. The program includes monitoring the creek for bank stability and channel stability, as well as the new floodplain for inundation. Please refer to Appendix D for the complete geomorphic monitoring report.

Fisheries Monitoring

Fisheries monitoring at Sites 10 and 13 utilizes the electrofishing protocol specified in Appendix E. The purpose of this monitoring is to document the fish community at the project sites, with particular emphasis on the presence of Central California Coast steelhead (*Oncorhynchus mykiss*). Please refer to Appendix E for the complete fisheries monitoring report.

Vegetation Monitoring

The HMMP completed for the Project states that once during the growing season herbaceous species will be monitored for five years and woody species for ten years to determine the success of the re-vegetation.

In December 2012, native vegetation was planted to coincide with the onset of the rainy season. Construction and planting of the Project was fully completed February 5, 2013. Green Growth is currently performing landscape maintenance twice a week and has been continuous since March 2013. The monitoring for Year-2 was conducted on October 14, 2014 by Donna Maniscalco and Jillian Burns, ICF International biologists.

Methods

The methods for the Geomorphic and Fisheries monitoring are discussed in Appendices E and F.

The vegetation monitoring protocol was designed to evaluate the performance of native vegetation, as described in the HMMP. Additional modifications to the protocol are recommended as a result of Year-2 monitoring and are included in the Management Recommendations section below. A description of the study design and monitoring protocol follows.

Study Design

The study design for the Geomorphic and Fisheries monitoring is discussed in Appendices E and F.

Vegetation was counted and assessed in four zones: Zone 1, 2, 4, and 5 (Figure 4), which follow the zones in the Planting Site Plans for the Project (Appendix B) and the HMMP. Zones 1 and 2 comprise riparian woodland species planted along the mid to top of the left bank of Upper Penitencia Creek at Site 13 downstream of the YSI Bridge. Zones 4 and 5 comprise floodplain species at Site 10 immediately downstream of Bridge L. Note that Zone 3 comprises herbaceous species planted at Site 13. Zone 3 was planted with hydroseed, so plants were not counted. In each of the four zones, all living and dead trees, shrubs, and herbaceous species were counted individually and tallied in a notebook. Total aerial percent cover and percent cover of native species in each zone were estimated and invasive species were noted.

Trees and woody shrubs in the Project area were not tagged or numbered; rather the total number of individuals from each monitoring year will be compared to the total number originally planted to determine survival.

One or two permanent photo-documentation stations were established to document each zone, and monitoring photographs were taken at each location (Figure 5 and Appendix C). These locations

were marked with a Trimble GeoXT GPS Unit and, in most cases, demarcated on-site with a wooden stake or rebar. Photos will be taken from these locations in years two through ten. For Year-2, additional photos were taken to present a better picture of the project site. Bankside erosion was also documented in the vicinity of each zone.

Performance Objectives

The performance objectives for the geomorphic and fisheries monitoring are discussed in Appendices D and E. The objectives for the vegetation monitoring are discussed below.

Wetland Species

The HMMP requires a minimum of 35% aerial cover of native facultative and wetter species within both sites during Year-2 monitoring. Percent aerial cover was calculated individually for each zone and totaled for the entire Project area.

Native Species

The HMMP requires a minimum of 25% aerial cover of native species within the riparian and restored upland areas during Year-2 monitoring. Percent aerial cover was calculated individually for each zone and totaled for the entire Project area.

Trees and Woody Plants

The HMMP requires that at each annual monitoring event, the Project area will exhibit a 75% survival rate of trees and woody plants. Survival was calculated for each zone and totaled for the entire Project area.

Invasive Species

The HMMP requires that at each annual monitoring event, invasive species will be assessed and managed as appropriate to ensure the performance objectives described above are met.

Results

The results from this year's geomorphic and fisheries monitoring are discussed in Appendices E and F.

The results from this year's vegetation monitoring indicates that survival is high for both trees, woody plants, and herbaceous species, and restoration is exceeding the required performance objectives for Year-2. Specific results for each objective are summarized below.

Wetland Species - Objective One

Per the performance objectives in the HMMP, plants with a Facultative (FAC), Facultative Wetland (FACW), or Obligate (OBL) wetland indicator status must be present to determine site success of the floodplain and shrub/scrub and emergent floodplain areas. Species in the planting palette that meet this criterion include: California blackberry (*Rubus urnius*), mugwort (*Artemisia douglasiana*), white

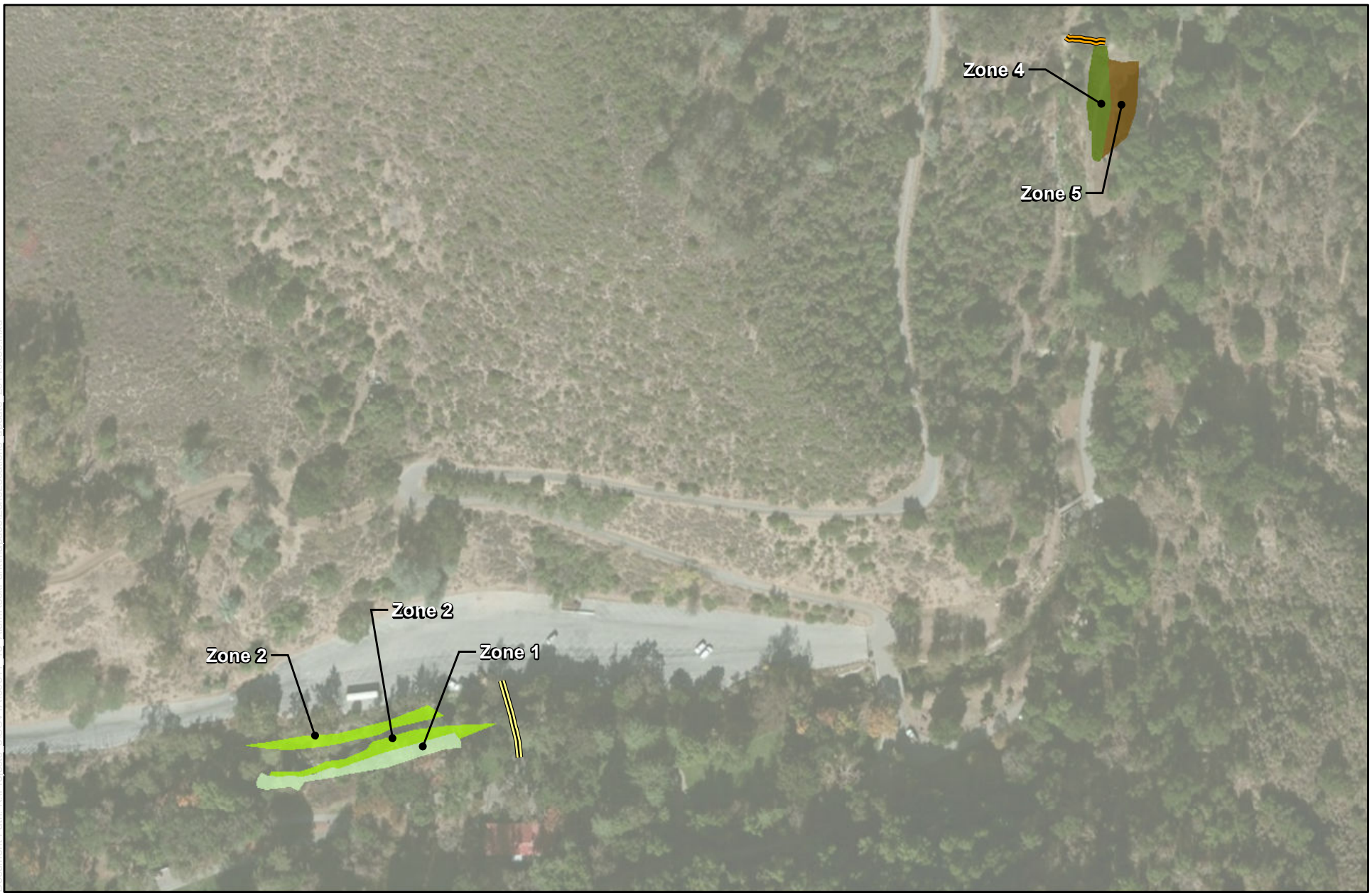


Figure 4
Planting Zones
Alum Rock Park Bank Repair and
Stream Restoration Project
Santa Clara Valley Transportation Authority

Figure 5
Photo Station Locations
Alum Rock Park Bank Repair and
Stream Restoration Project
Santa Clara Valley Transportation Authority

alder (*Alnus rhombifolia*), arroyo willow (*Salix lasiolepis*), snowberry (*Symphoricarphus alba*), common bulrush (*Scirpus robusts*), common monkeyflower (*Mimulus guttatus*), nut-sedge (C*yperus eragrostis*), slough sedge (*Carex obnupta*[1]), hedge nettle (*Stachys ajugoides*), California rose (*Rosa californica*), big leaf maple (*Acer macrophyllum*), and blue elderberry (*Sambucus mexicana*). The combined aerial percent cover of the above species is listed in Table 1 for each zone.

Table 1. Aerial Percent Cover of Wetland Species

	Year 1		Year 2	
Zone	Aerial % Cover	Criterion of 20% Met?	Aerial % Cover	Criterion of 35% Met?
Zone 1	30%	Yes	50%	Yes
Zone 2	75%	Yes	80%	Yes
Zone 4	80%	Yes	100%	Yes
Zone 5	15%	No	20%	No
Average	**50%**	Yes	**63%**	Yes

Note: For Year 2, the success criterion for Objective 1 is a minimum of 35% aerial cover of native facultative and wetter species within the re-established scrub/shrub and emergent floodplain area.

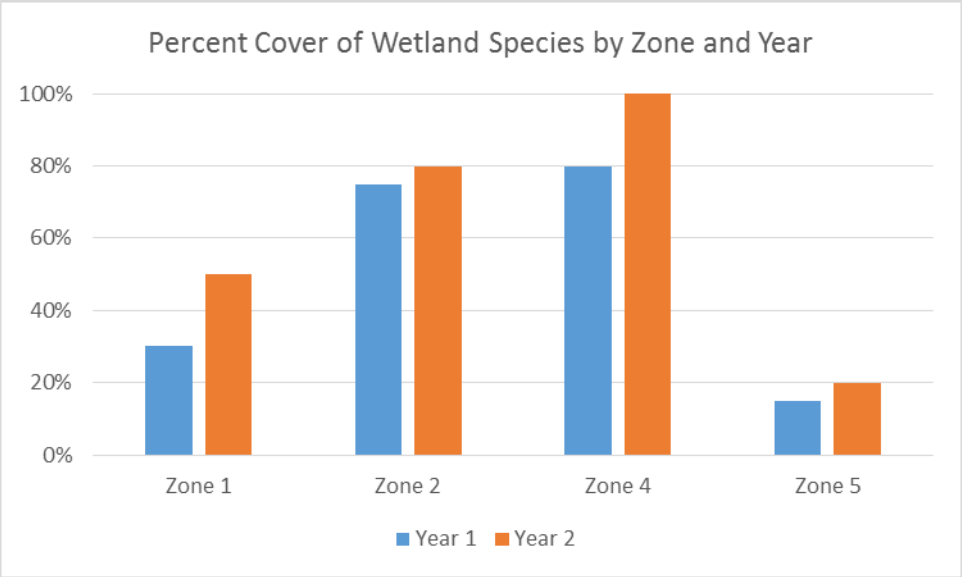


Figure 6. Percent Cover of Wetland Species by Zone and Year

[1] *Carex obnupta* was substituted for *Carex nudata* for the following reasons*:* the *Carex obnupta* delivered was collected for propagation in Alum Rock Park for riparian restoration, but was initially misidentified as *Carex nudata.* After researching, it was found that both species are native to the region and found in wetland-riparian communities locally according to Calflora and both are obligate wetland indicator species. For these reasons, VTA concluded that *Carex obnupta* was an appropriate substitute for *Carex nudata*.

Zone 5, mid to top of bank plants at Site 10, does not currently meet the Year-2 success criteria of 35% aerial cover. The reason for the lower percentage of aerial extent is because big leaf maple is not a fast growing tree and the increase in aerial extent is less than the other planted species. However, the entire Project area averages 62.5% aerial cover, which is over the criterion of 35%.

Native Species - Objective Two

Quantities of native herbaceous species, which include California rose, California blackberry, torrey melica (*Melica torreyana*), mugwort, nut-sedge, common bulrush, slough sedge, common monkeyflower, and hedge nettle, are shown in Table 2 and native trees and woody plants are shown in Table 3 (dead plants are not included). Zone 2 is not included in Table 2 because it contains only trees (alder and willow). Please see the HMMP for specific details regarding the seed mix (Appendix A).

Table 2. Extant Native Herbaceous Species

	Total Planted			Year 1 Survival			Year 2 Survival			Difference Between Total Planted and Year 2 Survival		
Species	Zone 1	Zone 4	Zone 5	Zone 1	Zone 4	Zone 5	Zone 1	Zone 4	Zone 5	Zone 1	Zone 4	Zone 5
California rose	7	0	4	6	0	6	8	0	4	1	0	0
California blackberry	18	0	2	19	0	2	15	0	2	-3	0	0
Torrey melica	11	0	0	8	0	0	0	0	0	-11	0	0
Mugwort	18	25	0	17	21	0	15	22	0	-3	-3	0
Nut-sedge	0	25	0	0	24	0	0	24	0	0	-1	0
Common bulrush	0	30	0	0	21	0	0	45	0	0	15	0
Slough sedge	0	25	0	0	18	0	0	23	0	0	-2	0
Hedge nettle	0	4	0	0	4	0	0	5	0	0	1	0
Common monkeyflower	0	4	0	0	0	0	0	0	0	0	-4	0
SUBTOTAL	54	113	6	50	88	8	38	119	6	-16	6	0
GRAND TOTAL			173			146			163		-10	
				Percent Survival		84%	Percent Survival		94%			

The aerial percent cover value in Table 3 includes the native herbaceous species in Table 2, native woody species, native seed mix species, and any natural recruitments. The entire Project area averages 68% aerial cover.

Table 3. Aerial Percent Cover of Native Species

	Year 1		Year 2	
Aerial Percent Cover of Native Species Zone	Aerial % Cover	Criterion of 10% Met?	Aerial % Cover	Criterion of 25% Met?
Zone 1	70%	Yes	85%	Yes
Zone 2	60%	Yes	80%	Yes
Zone 4	90%	Yes	95%	Yes
Zone 5	10%	Yes	10%	No
Average	58%	Yes	68%	Yes

Note: For Year 2, the success criterion for Objective 2 is a minimum of 25% aerial cover of all native species within the riparian and restored upland area.

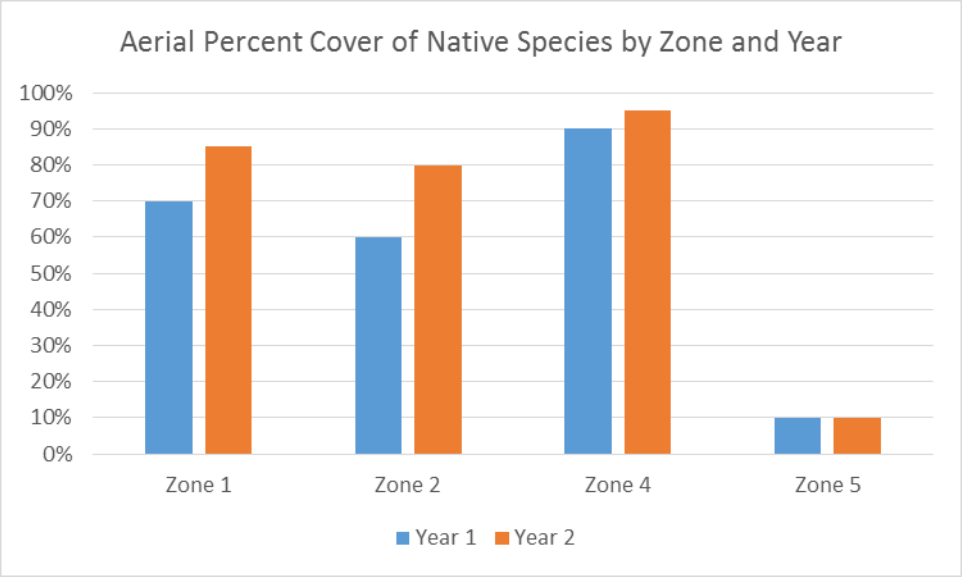


Figure 7. Percent Cover of Native Species by Zone and Year

Trees and Woody Plants- Objective Three

Trees and woody plants installed in the Project area include white alder, arroyo willow, coast live oak (*Quercus agrifolia*), big leaf maple, blue elderberry, toyon (*Heteromeles arbutifolia*), snowberry, and hollyleaf cherry (*Prunus ilicifolia*). See Table 4 for the quantity of each species present in individual zones during Year-2. Zone 2 is the only zone that is comprised exclusively of trees (alder and willow).

Dead trees and woody plants in each zone include two snowberry and four California blackberry in Zone 1, seven arroyo willows in Zone 2, two arroyo willow in Zone 4, and one elderberry, two toyon, and two California blackberry in Zone 5. There were additional species found in Zone 1 (one coast live oak, one big leaf maple, one blue elderberry, eight toyon, three hollyleaf cherry), Zone 2, (seven arroyo willow), Zone 4 (two white alder), and Zone 5 (three coast live oak, three big leaf maple, one snow berry). Including dead individuals in the Project area, the total number of trees and woody plants planted was 297 individuals, with 300 individuals surviving. The entire Project area demonstrated a 101% survival rate.

Table 4. Extant Trees and Woody Plant Species

	Total Planted				Year 1 Survival				Year 2 Survival				Difference Between Total Planted and Year 2 Survival			
Species	Zone 1	Zone 2	Zone 4	Zone 5	Zone 1	Zone 2	Zone 4	Zone 5	Zone 1	Zone 2	Zone 4	Zone 5	Zone 1	Zone 2	Zone 4	Zone 5
white alder	0	26	49	0	0	24	47	0	0	24	49	0	0	2	0	0
Arroyo willow	0	78	73	0	0	71	75	0	0	78	73	0	0	0	0	0
coast live oak	2	0	0	2	1	0	0	0	2	0	0	3	0	0	0	-1
big leaf maple	6	0	0	6	5	0	0	0	6	0	0	3	0	0	0	3
blue elderberry	11	0	0	4	11	0	0	5	12	0	0	4	-1	0	0	0
toyon	4	0	0	7	3	0	0	7	11	0	0	5	-7	0	0	2
snowberry	4	0	0	7	5	0	0	7	3	0	0	8	1	0	0	-1
holly leaf cherry	18	0	0	0	16	0	0	0	19	0	0	0	-1	0	0	0
SUB TOTAL	45	104	122	26	41	95	122	19	53	102	122	23	-8	2	0	3
		Grand Total		297		Grand Total		277		Grand Total		300		Grand Total		-3
						Percent Survival		93%		Percent Survival		101%				

Note: At each annual monitoring event, there will be a minimum of 75% survival rate of planted trees and woody plants.

Invasive Species- Objective Four

Invasive species are present in the Project area. During Year-2 monitoring, these species were not widespread and did not prevent the achievement of the Year-2 performance objectives. Species rated as having a high or moderate negative ecological impact (California Invasive Plant Council 2013) that were observed in or near the mitigation areas and could prevent the achievement of the following year's success criteria include: yellow star thistle (*Centaurea solsitialis*), purple star thistle (*Centaurea calcitrapa*), stinkwort (*Dittrichia graveolens*), periwinkle (*Vinca major*), and black mustard (*Brassica nigra*). Pepper trees (*Schinus molle*) and tamarisk (*Tamarix spp*.) were also observed this year. Management recommendations for invasive species are discussed below.

Photo-Documentation

A map of the permanent photo-documentation stations and photos taken during Year-2 monitoring are included in Figure 5 and Appendix C. For consistency, each photo was assigned a general compass direction and zone, as shown in Table 5.

Table 5. Photo-Documentation Stations

Photo Station	Compass Direction	Zone	Latitude	Longitude
1	Southwest	Zone 2 (south bank)	37.396855	-121.799791
2	Southwest	Zone 1 & Zone 2 (south bank)	37.396829	-121.799954
3	Panorama (SW, NW, SE, NE)	Zone 1 & Zone 2	37.396671	-121.800495
4	Southeast	Zone 4 & Zone 5	37.399124	-121.797272

Natural Recruitment

Natural recruitment was observed in many of the planting zones (See Table 2 and Table 4). Small willow saplings and California sagebrush (*Artemesia californica*) were prevalent on the north bank of Zone 2 and pre-existing California blackberry was re-establishing in many of the exposed areas in Zones 1, 2 and 5. Hedge nettle, common bulrush and mugwort are also spreading in Zone 4. This trend is expected to continue in the following years and aid in the achievement of the performance objectives.

Erosion

Erosion was observed along the bank in Zone 1. The banks of the creek are on naturally erodible soil and maintenance activities may be causing the bank to erode more in some areas. Also, ground squirrel burrows were observed in Zone 1 and were increasing bank erosion.

Management Recommendations

There are no management recommendations for Geomorphic Monitoring or Fisheries Monitoring.

The Project area displayed a high level of success, surpassing the performance objective thresholds in Year-2 monitoring. To continue this trend in following monitoring years, it is recommended that invasive species are assessed monthly and controlled, as described in the HMMP. Although these species did not prevent the achievement of the performance objectives in Year-2, with neglect, invasive species could spread quickly and become more difficult to control. Stinkwort invasion is the most urgent management issue in the Project area; its range currently extends along the bank in Zone 4, slightly outside the project area. It is recommended that stinkwort is either sprayed or pulled by hand prior to seeding next year (this species blooms from September to November). Small pepper trees and tamarisk are in Zone 2. These should be removed before they become larger when removal would be more difficult. However, natural recruitment is occurring in the Project area, so great care should be taken during invasive species management to retain the maximum amount of native recruitments possible. Naturally erodible soil is present in Zone 1 of Site 13. Crews should be careful during weeding of this site and keep walking on the bank to a minimum.

Due to the fact that numerous plants were installed in each zone, a high percentage of those plants survived, and these plants will increase in both aerial cover and root establishment, Year-2 monitoring does not indicate a need for plant replacement.

References

California Invasive Plant Council. 2013. California Invasive Plant Inventory Database. Berkeley, CA. Available: http://www.cal-ipc.org/paf/. Accessed October 28, 2013.

Winzer and Kelly. 2012. Habitat Mitigation and Monitoring Plant for Alum Rock Park Bank Repair and Stream Restoration Project. Prepared for: City of San Jose, Parks, Recreation and Neighborhood Services, San Jose, CA.

Appendix A

Habitat Mitigation and Monitoring Plan

Habitat Mitigation and Monitoring Plan
Alum Rock Park Bank Repair
and Stream Restoration Projects

Prepared for:

City of San Jose
Parks, Recreation and Neighborhood Services
200 E. Santa Clara Street
San Jose, CA 95113
Phone (408) 793-5552

Revised June 2012

Prepared by:

WINZLER & KELLY
718 Third Street
Eureka, CA 95501
(707) 443-8326

TABLE OF CONTENTS

Attachments

I. PROJECT DESCRIPTION

Summary

The City of San José, Department of Parks, Recreation, and Neighborhoods Services proposes to implement 12 distinct stream and bank restoration activities on Upper Penitencia Creek within Alum Rock Park (Appendix A - Figure 1, Vicinity Map; Figure 2, Site Map). Proposed activities include bridge abutment repairs, creek bank repairs, floodplain restoration, and fish passage improvement. Several of the specific project elements are intended to restore riparian and aquatic habitat, reduce erosion and sedimentation in the creek, and repair damage to historic structures. Impacts to jurisdictional waters would occur as a result of the project and would be mitigated by on-site restoration and creation (see Table 1, below). This Habitat Mitigation and Monitoring Plan (HMMP) addresses only the three individual projects which are proposed for compensatory mitigation, including Project 3/10, Project 11, and Project 13/CEMAR. The complete project is described and the environmental impacts are analyzed in the CEQA Initial Study for the project. All regulatory permitting for the project, including the mitigation components, will be processed concurrently.

Project components which create or restore habitat or jurisdictional features are proposed for compensatory mitigation for areas of permanent unavoidable project impacts. Project 3/10 and Project 11 will create approximately 0.1 acres (6,329 ft^2) of new floodplain. Project 13/CEMAR includes "self-mitigating" reconfiguration of approximately 0.2 acres (8,527 ft^2) of creek channel and will remove an existing salmonid migration barrier. The purpose of this HMMP is to describe methods of construction, revegetation, maintenance, monitoring, success criteria, and reporting for mitigation areas which are intended to result in a long-term net gain in habitat area and functions. This plan includes additional revegetation specifications for all areas of upland disturbance created by the project.

Responsible Parties

The applicant and responsible party is the City of San José, Department of Parks, Recreation, and Neighborhood Services, 200 E. Santa Clara Street, San José, CA, 95113. The contact person is Evelyn Velez-Rosario, (408) 793-5552. This Habitat Mitigation and Monitoring Plan was prepared by Winzler & Kelly, 718 Third Street, Eureka, CA, 95501. The contact person is Misha Schwarz, (707) 443-8326.

Project Location

The project site is located along Upper Penitencia Creek within the 720-acre Alum Rock Park, in the foothills of the Diablo Range just east of San José (Appendix A - Figure 1, Vicinity Map). APN No. 595-07-015, 599-25-001, 612-46-001.

Site Characteristics

Upper Penitencia Creek flows through the park, and is bordered on both sides by steep upland terrain. The park was extensively modified beginning in the late 1800s, with stone bridges crossing the creek, stone grottoes covering some of the associated springs, and stone walls constraining the course of the creek. Although in the 1970s some of the structures were removed in an effort to return portions of the park to a more natural condition, many of the structures remain. (Continued on page 4)

Table 1: Temporary Impacts to Waters and Area of Restoration[1]							
Site Number	**Location**	**Description**	**Temporary Impacts to Active Channel[2]**	**Temporary Impacts to Vegetated Creek Banks[3]**	**Restoration for Temporary Impacts to Active Channel**	**Restoration for Temporary Impacts to Vegetated Creek Banks**	**Temporary Length of Project (Dewatering)**
3 and 10 (VTA Flood-Plain Expansion)	Downstream of Bridge L	Floodplain expansion, wall removal	0.1486 ac 6,473 sf	0.034 ac 1,498 sf	0.1486 ac 6,473 sf	0.141 ac 6,182 sf	100 LF
2	YSI Bridge	Abutment repair	0.091 ac 3,957 sf	0.03 1,307	0.091 ac 3,957 sf	0.03 1,307	Included in project 13/CEMAR (VTA Fish Passage)
13/CEMAR (VTA Fish Passage)	Downstream of YSI Bridge	Fish passage improvement	0.0046 ac 200 sf	0.047 ac 2,051 sf	0.0046 ac 200 sf	0.047 ac 2,051 sf	500 LF
5[4]	Downstream of YSI Bridge	Repair eroded rill/wall	See 13/CEMAR	0.002 ac 70 sf	See 13/CEMAR	0.002 ac 70 sf	Included in project 13/CEMAR (VTA Fish Passage)
TOTAL			**0.24 ac ~10,630 sf**	**0.113 ac ~4,926 sf**	**0.24 ac ~10,630 sf**	**0.113 ac ~4,926 sf**	**600 LF**

Table 1 Notes:

1 All numbers approximate based upon surveyed topography and best available design accuracy and information.

2 Temporary impacts to Active Channel include entire active channel area to be dewatered during construction. Note: Dewatered areas are considered self-mitigating temporary impact because natural flow will be restored upon completion of project. These temporary impacts are, therefore included in the calculation of mitigated areas in Active Channel.

3 Temporary impacts to Vegetated Creek Banks include areas where some work may disturb existing vegetation and ground, but no cut or fill is possible. The actual area of temporary impacts may be less than stated. These impacts would typically be caused by equipment access routes, installation of irrigation lines, and other minor surface disturbance. These areas would be revegetated with hydroseed following construction.

4 Shown as part of the fish passage and rill repair site in VTA plans

Table 2: Permanents Impacts to Waters and Area of Restoration[1]							
Site Number	**Location**	**Description**	**Permanent Impacts to Active Channel[2]**	**Permanent Impacts to Vegetated Creek Banks[3]**	**Restoration for Permanent Impacts to Active Channel**	**Restoration for Permanent Impacts to Vegetated Creek Banks**	**Permanent Length of Project**
3 and 10 (VTA Flood-Plain Expansion)	Downstream of Bridge L	Floodplain expansion, wall removal	0	0.107 ac 4,684 sf	0.0614 ac[4] 2,657 sf[4]	0.107 ac 4,684 sf	136 LF
2	YSI Bridge	Abutment repair	0	0	0	0	50 LF
13/CEMAR (VTA Fish Passage)	Downstream of YSI Bridge	Fish passage improvement	0.197 ac 8,572 sf	0.095 ac 4,130 sf	N/A[5]	0.095 ac 4,130 sf	310 LF
5[6]	Downstream of YSI Bridge	Repair eroded rill/wall	0.0015 ac 65 sf	0	See 13/CEMAR	0	Included with 13/CEMAR (VTA Fish Passage)
TOTAL			**0.198 ac ~8,637 sf**	**0.202ac ~8,814 sf**	**0.258 ac ~11,229 sf**	**0.202ac ~8,814 sf**	**496 LF**

Table 2 Notes:

1 All numbers approximate based upon surveyed topography and best available design accuracy and information.

2 Permanent impacts in Active Channel .include permanent fill or alteration of streambed in Active Channel.

3 Permanent impacts in Vegetated Creek Bank include areas where cut, fill, or the installation of hardscape will occur. These areas would be revegetated pursuant to project planting plans.

4 Includes creation of floodplain. Projects 3 and 10 provide mitigation for temporal impacts associated with the Santa Clara Valley Transportation Authority's Mission-Warren Truck Rail Project (Site No. 02-01-C1108; CIWQX Place ID No. 766825; ACOE File No. 2011-00181S), which received Certification on July 5, 2011.

5 Not Applicable. This project element requires the permanent placement of fill in the creek channel to provide an appropriate channel grade for fish passage. Because of this, mitigation is not required for permanent fill of waters of the state at Project 13. Project 13 provides mitigation for the culverting of 155 linear feet of concrete channels, the loss of 452 linear feet of culverted channel, and the permanent fill of 571linear feet of concrete-lined channels associated with the Santa Clara Valley Transportation Authority's Mission-Warren Truck Rail Project (Site No. 02-01-C1108; CIWQX Place ID No. 766825; ACOE File No. 2011-00181S), which received Certification on July 5, 2011.

6 Shown as part of the fish passage and rill repair site in VTA plans

(Continued from page 1)

Upper Penitencia Creek is characterized by coarse substrate including boulder, cobble and gravel. Although sediment input into the stream is thought to be considerable, high winter flows carry most fine sediment through the system and there are relatively few side channels or quiet backwaters to trap sediment.

The stream is predominantly bordered by a narrow band of riparian forest dominated by willows, California sycamore, and oaks. Nearby upland slopes are characterized by Diablo sage scrub, oak woodland, and small areas of conifer forest. A variety of disturbed community types are present in more heavily used portions of the park. The park provides habitat for two federally threatened species, steelhead and California red-legged frog, as well as for state special concern species including the foothill yellow-legged frog. However, existing degraded habitat conditions limit these species. A relative scarcity of sediment-free interstitial spaces in cobble substrate has been identified as the primary limiting factor for second-year juvenile steelhead (Stillwater Sciences, 2006). At the proposed Project 13/CEMAR site, an existing weir downstream of the YSI Bridge is also a barrier to steelhead migration. The confined, seasonally fast-flowing character of the stream and a corresponding rarity of quiet, densely vegetated pool habitat is one of several factors limiting red-legged frogs.

Mitigation Site Suitability

Project 3/10 and Project 11 will remove historic fill from areas believed to have been floodplain prior to extensive creek modification in the early 1900s. As such, the areas are likely to contain native substrate which is highly suitable for the re-creation of floodplain. Project 13/CEMAR will replace the existing weir and scour pool grade change within the creek channel with a more gradual and fish-friendly roughened channel. All three mitigation sites have suitable natural hydrology, in the form of the creek itself, to support the proposed mitigation designs. Each mitigation site is also situated within or immediately adjacent to the creek, which has been identified as habitat for steelhead and the California red-legged frog, in addition to other fish and wildlife species. Project 13/CEMAR is especially valuable in that it will link suitable upstream and downstream steelhead habitat by removing a barrier to migration.

Jurisdictional Wetlands and Waters

The project sites are located along Upper Penitencia Creek, a tributary of Coyote Creek. The entire stream segment within Alum Rock Park is perennial, in part due to controlled releases from an impoundment upstream of the park boundary. Winzler & Kelly conducted an *Ordinary High Water Mark (OHWM) and Riparian Habitat Delineation* in 2010 (W&K, 2010b). The Ordinary High Water Mark ("waters" of the U.S) definition follows USACE (2005).The OHWM delineation was verified by the USACE on November 23, 2010. Impact calculations for the project are shown in Table 1 and are based upon the verified delineations.

In addition to wetlands and waters of the U.S. within federal jurisdiction, the Regional Water Quality Control Board is responsible for 401 Water Quality Certifications, and also regulates wetlands under the Porter-Cologne Act. For this project, RWQCB jurisdiction extends to top of bank and thus differs from the USACE jurisdiction. The California Department of Fish and Game also has jurisdiction, which typically extends to the limits of the riparian zone. CDFG jurisdiction is addressed in a Streambank Alteration Agreement.

Delineated wetlands are generally small, isolated, and confined below the OHWM of Upper Penitencia Creek. In most locations the creek is narrowly constrained within rock outcrops, stone walls or steep banks. In a few locations narrow bands of bordering wetlands are present along depressions in the streambank. More typically, wetlands occur as vegetated areas on low gravel bars within the perennial channel. Wetlands are inclusive within the area delineated by the OHWM, and no isolated wetlands were identified within the project boundaries.

Project 13/CEMAR will impact and subsequently restore the entire OHWM jurisdictional channel in the 300-foot long project area, causing no net loss or jurisdictional area. Project 3/10 and Project 11 will commence at the edge of the OHWM jurisdictional channel and create new jurisdictional floodplain within existing disturbed upland habitat.

In addition to the OHWM delineation, the spatial distribution of riparian habitat was also conducted in February of 2010. Riparian habitat is composed of the trees and other vegetation and physical features normally found on the stream banks and flood plains associated with streams, lakes or other bodies of water. The riparian habitat delineated was based on individual riparian species outer edge drip line adjacent to the proposed in-stream or stream bank work.

Riparian delineation included landscaped vegetation which provides shade to Penitencia Creek, and was not necessarily restricted to those trees normally (or naturally) found on California water ways. Therefore long standing Alum Rock landscape trees planted along Penitencia Creek were also recognized as providing riparian-like shade quality.

II. MITIGATION PROJECT DESCRIPTION

Goals and Objectives

The goal of the proposed compensatory mitigation is to replace and enhance wetland/waters types, acreage, and functions which will be lost due to impacts to waters of the U.S. associated with the proposed project, as well as implement wetland and watershed goals identified by the Alum Rock Park Riparian Management Plan (Biotic Resources Group, 2001). The Management Plan identified a broad goal to "restore and enhance the riparian and aquatic resources along Upper Penitencia Creek to enhance native aquatic and riparian species, restore stream functions and protect public health and safety." More specifically, the plan calls for: preservation and restoration of the ecological resources of the riparian and aquatic habitat along Upper Penitencia Creek; and restoration of natural hydrologic functions, to the extent possible, to the channel and stream banks of Upper Penitencia Creek, to reduce erosion and bank instability, allow habitat restoration and protect public safety and Park property.

Project 3/10 and Project 11 are intended to re-establish a palustrine, emergent/palustrine, scrub-shrub riverine wetland complex that provides natural floodplain functions for the adjacent creek. Project 13/CEMAR is intended to enhance a riverine, upper perennial, unconsolidated bottom creek section.

The re-established floodplain and enhanced creek section are anticipated to provide the following functions and values:

- **Provide flood flow attenuation**: The floodplain mitigation sites provide the widest floodplain area for some distance up and downstream of the project areas. This function may decrease erosive forces in more unstable sections of the stream channel downstream.

- **Provide opportunities for natural sediment removal:** The floodplain benches will be graded and planted to provide the ability to naturally trap suspended sediments from seasonal floodwater entering the site.

- **Provide erosion control and shoreline stabilization**: Establishment of herbaceous and woody vegetation within the mitigation areas and associated streambanks will minimize erosion and stabilize the low flow and high water stream edges. Dense vegetation can also reduce the water velocity near the bank, further reducing erosion and promoting long term stability.

- **Provide increased aquatic habitat suitability:** As part of a much larger riparian corridor, the floodplain benches and fish passage improvements will maintain and enhance the corridor's function as a natural fish and wildlife conduit. The areas may also provide for fish and wildlife feeding, access water, cover, and nesting.

- **Provide improved and increased aquatic habitat:** Project 13/CEMAR will eliminate an existing fish barrier and improve overall fish passage. Project 3/10, 11, and several of the other concurrent streambank projects will promote and provide bank stability and complexity, shade, cover, and food chain support to aquatic species in the creek. The floodplain creation projects will increase aquatic habitat complexity and provide refugia functions in high flow events.

Mitigation Projects

Although several additional proposed projects will address ongoing erosion, bank failures, and structural failures that have been designed to improve the habitat conditions of the creek, only the projects described below are proposed for compensatory mitigation for project impacts below the OHWM and within COE jurisdiction. These projects will expand or enhance COE jurisdictional waters.

Project 11 –Expansion of Floodplain

Floodplain expansion and re-establishment is proposed along the east bank downstream of the Creekside Bridge (see Appendix B, Appendix C – Project 11 Photos) A stream segment from 200 to 300 feet downstream of the bridge is currently constrained by a stacked rock wall which functions as a retaining wall for an adjacent picnic area. The project would remove the wall, relocate the existing picnic area, and re-establish what is believed to be historic floodplain by grading the left (east) bank to an elevation that would be inundated under ordinary high water flows. There would be no placement of fill or impacts to existing wetlands or within the current OHWM of the creek. The project would require the removal of one large sycamore tree, which will be replaced with five 24-inch box replacement sycamore trees in the general vicinity of the

tree removal. The floodplain area would be replanted with scrub-shrub and emergent wetland plants following grading, pursuant to the planting plan presented in Table 2, below. The re-establishment action would create approximately 1986 sf^2 (0.045 acre) of new floodplain and COE jurisdictional waters.

Project 3/10 - Removal of Rock Wall and Expansion of Floodplain
Project 3 consists of removal of an approximately 120-foot long section of existing undercut mortared stone retaining wall located on the left (east) overbank immediately downstream of an historic foot bridge, Bridge L (Appendix B, Appendix C –Project 3/10 Photos). The stream channel is confined by grouted rock walls on both sides. The encroachment of the wall on the stream channel has increased the channel velocity and caused undercutting. The rock wall is undercut for approximately 25 feet. In some locations the wall has been separated from its poured concrete footing and hangs unsupported above the creek. Rock removed from the wall will be salvaged for use on current and future repairs to rock structures within the park.

Project 10 includes widening of the floodplain for high flow relief, sediment exchange, and creation of refugia for juvenile steelhead. Project 10 would occur in the same location as Project 3, following rock wall removal. Grading would commence during the summer season just below ordinary high water with the resulting floodplain extending approximately 120 feet along the creek with a maximum width of 30 feet. The floodplain area would be replanted with scrub-shrub and emergent wetland plants following grading, pursuant to the planting plan presented in Table 2, below. This would create an estimated 2,590 square feet (.06 acre) of new floodplain and COE jurisdictional waters.

Project 13/CEMAR fish passage improvement project (Self-Mitigating Design)
Project 13/CEMAR would allow fish migration around an existing undercut weir that serves as a grade control structure 75 feet downstream of the YSI Bridge (Appendix B, Appendix C – Project 13/CEMAR Photos). The existing weir has caused a scour pool and a 4.5-foot vertical drop from the crest of the weir to the normal pool surface, creating a salmonid migration barrier. Weir removal could trigger upstream channel degradation and threaten the structural integrity of the bridge. This project proposes to leave the weir in place and to create a stable roughened channel suitable for fish passage.

The project will modify the existing concrete grade control structure and install a roughened channel. The roughened channel will extend approximately 48 linear feet upstream and 254 downstream of the modified concrete grade control structure. The roughened channel includes 12 rock band structures to control grade and six chutes and five pool structures. The overall slope of the channel would be approximately 4%. The new streambed would be compacted with tamping and water jetting to reduce subsurface flow; water used for jetting would be captured and recycled to prevent downstream escape of sediments.

The project includes placement of approximately 1,430 cubic yards of rock fill over 300 linear feet and an area of 0.19 acres within the creek channel. As a result of the channel design, the OHW line would be elevated through the restored channel reach. There would be no significant net change in channel cross section, area of jurisdictional waters, or wetted area other than a slightly increased elevation of both channel bed and OHW line. There would be a significant

improvement in fish migration capability, and there would also be a net gain in aquatic habitat quality.

Associated bank improvements include slope regrading, rock wall removal, and revegetation in the downstream part of the project reach, with some rock protection placed at the toe of slope.

Project Activities and Schedule

Construction would begin upon acquisition of regulatory permits and program funding and would be implemented over a five-year period from 2012 to 2017. Construction shall be limited to daylight hours in the period between June 15th and October 15th unless extended in writing by the permitting agencies. Hand planting and low impact revegetation activities may occur between October 15th and June 15th in order to establish plants in the planting season. It is anticipated that the three mitigation projects discussed herein will occur in the initial year of project construction. Mitigation projects shall occur prior to or concurrent with any project which impacts jurisdictional waters.

Work would occur in and around Upper Penitencia Creek. Equipment would normally stage on uplands away from the stream, on nearby paved parking areas when possible. Only essential construction activities would occur in or immediately adjacent to the streambed while the channel is dewatered. Floodplain re-establishment construction would extend as much as 40 feet away from the existing bank; most other project activities would not extend beyond top of bank except for vehicle parking, temporary stockpiling of materials, and use of construction equipment. Details regarding specific BMPs, dewatering protocol, and protection of special-status species may be found in the CEQA Initial Study and Biological Assessment for the project.

Excavation and repair activities would utilize standard construction equipment including an excavator, a dump truck, a dozer, a backhoe, a gas powered generator, and tamper. Revegetation within floodplain areas would typically be conducted using hand tools. Hydroseed equipment would be used in disturbed upland locations.

III. PLANTING PLAN

Detailed information regarding revegetation can be found as follows:

For Projects 1, 3/10, 5, and 13/CEMAR, refer to Santa Clara Valley Transportation Authority C111 Alum Rock Fish Passage Project Plans and Specifications Plans and Specifications.

For Projects 4, 6, 7, 8, 9, and 11 refer to 65% City of San Jose, Department of Public Works, City Facilities Architectural Services Plans for the Construction of Alum Rock Park Nine Streambank Repair and Floodplain Expansion Projects.

For Project 2, refer to City of San Jose, Department of Public Works, City Facilities Architectural Services Plans for the Construction of Alum Rock Park Bridge Protection and Bank Repair Creekside Bridge and specifications.

All planting areas shall be cleared of targeted invasive and non-desired weed species. Invasive plants shall be removed manually or mechanically in the riparian woodland and floodplain expansion area. Remaining native trees (oak, sycamore, bay, fir, alder, and maple) and remaining native shrubs shall be protected with orange mesh exclusion fencing

Upland Hydroseeding
Upon completion of construction, all barren soil outside the stream channel within each project site will be hydroseeded with the specified native seed mix and stabilizing emulsion and/or covered with rice straw (at hydroseed contractor discretion) to minimize the risk of erosion.

Riparian Woodland Planting
Refer to Tables 3, 5 and 6 for the planting pallets for the Riparian Woodland area.

Floodplain Re-establishment Area Planting Plan
Refer to Tables 4 and 6 for the planting pallets for the Flood Plain Re-establishment area. A native seed mix shall be broadcasted to ensure no bare soil is left exposed after construction and revegetation outplanting.

Plants Substitutions
Subsequent to the preparation of the design sheets in the Mission / Warren Freight Railroad Relocation C111 (11049) – Alum Rock Fish Passage (Winzler &Kelly, March 16, 2012), several plants species in these plans were replaced with substitute species, because seeds were not available for some of the originally proposed plants. The requirements for planting sycamore trees were also modified because the Project has been modified to avoid removing a mature sycamore and because of the uncertainties associated with successfully planting sycamores from cuttings.

Tables 3 through 6 below show the planting pallets for each project and the large mitigation trees proposed for the projects.

Table 3. Planting Palette for the Alum Rock Park Project 13 Fish Passage and Project 5 Rill Repair Sites

Species Name	Common Name	Quantity[1]	Individual Spacing	Propogule[2]	Planting Plan Sheet No.[3]	Zone No. (shown on planting sheets)
Riparian Woodland Plants						
Quercus agrifolia	coast live oak	2	36 feet	treepot 4	L002, L003	Zone 1
Acer macrophyllum	big leaf maple	6	36 feet	treepot 4	L002, L003	Zone 1
Sambucus mexicana	blue elderberry	11	15 feet	deepot 16	L002, L003	Zone 1
Heteromeles arbutifolia	toyon	4	26 feet	deepot 40	L002, L003	Zone 1
Symphoricarpus alba	snowberry	4	26 feet	deepot 40	L002, L003	Zone 1
Prunus ilicifolia	holly leaf cherry	18	12 feet	treepot 4	L002, L003	Zone 1
Rosa californica	California rose	7	19 feet	deepot 40	L002, L003	Zone 1
Rubus ursinus	California blackberry	18	12 feet	deepot 16	L002, L003	Zone 1
Melica torreyana	Torrey melica	11	15 feet	4-inch plug	L002, L003	Zone 1
Artemesia douglasiana	mugwort	18	12 feet	deepot 16	L002, L003	Zone 1
Alnus rhombifolia	white alder	26	10 feet	treepot 4	L002, L003	Zone 2
Salix lasiolepis	Arroyo willow	78	6 feet	livestakes	L002, L003	Zone 2
	Total	**203**				
Riparian Woodland Seed Mix						
Bromus carinatus	California brome	3	n/a	Seed	L002, L003	Zone 3
Elymus glaucus	blue wild rye	6	n/a	Seed	L002, L003	Zone 3
Vulpia microstachys	three week fescue	5.5	n/a	Seed	L002, L003	Zone 3
Hordeum branchyantherum	meadow barley	6	n/a	Seed	L002, L003	Zone 3
Tritolium tridentantum	Tomcat clover	2	n/a	Seed	L002, L003	Zone 3
Lupinus nanus	sky lupine	3	n/a	Seed	L002, L003	Zone 3
Eschscholtzia california	California poppy	1.5	n/a	Seed	L002, L003	Zone 3
Hordeum californium	California barley	3	n/a	Seed	L002, L003	Zone 3
	Total	**30**				

Notes:

[1] Quantity refers to number of plants or pounds of seed to be used at Project Sites 5 and 13..

[2] Propagule container size dimensions:

- Treepot 4 – 4inches square by 14 inches deep, 168 cubic inches in volume.
- Deepot 16 – 2 inches in diameter by 7 inches deep, 16 cubic inches in volume.
- Deepot 40 – 2.5 inches in diameter by 10 inches deep, 40 cubic inches in volume.
- 4-inch plug – small container plants in a multi-cell containers.
- Livestakes – cuttings from branches of a parent plant that are immediately planted into moist soil, such as near a creek.

[3] Sheet Nos. are from *Mission / Warren Freight Railroad Relocation C111 (11049) – Alum Rock Fish Passage* (Winzler & Kelly, March 16, 2012).

Table 4. Planting Palette for the Alum Rock Park for Project 10 Floodplain Expansion and Project 3 Rock Wall Removal

Species Name	Common Name	Quantity[1]	Individual Spacing	Propogule[2]	Planting Plan Sheet No.[3]	Zone No. (shown on planting sheets)
Floodplain Plants						
Alnus rhombifolia	white alder	49	8 feet	treepot 4	L006	Zone 4
Salix lasiolepis	Arroyo willow	73	6 feet	livestakes	L006	Zone 4
Scirpus robustus	common bulrush	30	10 feet	tree band 2	L006	Zone 4
Artemisia douglasiana	mugwort	25	11 feet	Deepot 16	L006	Zone 4
Mimulus guttatus	common monkeyflower	4	28 feet	4-inch plug	L006	Zone 4
Cyperus eragrostis	nut-sedge	25	11 feet	tree band 2	L006	Zone 4
Carex nudata	torrent sedge	25	11 feet	tree band 2	L006	Zone 4
Stachys ajugoides	hedge nettle	4	28 feet	tree band 2	L006	Zone 4
	Total	**235**				
Mid-Top of Bank Plants						
Quercus agrifolia	coast live oak	2	35 feet	treepot 4	L006	Zone 5
Acer macrophyllum	big leaf maple	6	35 feet	treepot 4	L006	Zone 5
Sambucus mexicana	blue elderberry	4	25 feet	Deepot 16	L006	Zone 5
Heteromeles arbutifolia	toyon	7	19 feet	Deepot 40	L006	Zone 5
Symphoricarpus alba	snowberry	7	19 feet	Deepot 40	L006	Zone 5
Rosa californica	California rose	4	25 feet	Deepot 40	L006	Zone 5
Rubus ursinus	California blackberry	2	35 feet	Deepot 16	L006	Zone 5
	Total	**32**				
Floodplain Seed Mix						
Bromus carinatus	California brome	0.48	n/a	Seed	L006	Zone 3
Elymus glaucus	blue wild rye	0.6	n/a	Seed	L006	Zone 3
Vulpia microstachys	three week fescue	0.72	n/a	Seed	L006	Zone 3
Hordeum branchyantherum	meadow barley	0.6	n/a	Seed	L006	Zone 3
Eschscholtzia californica	California poppy	0.25	n/a	Seed	L006	Zone 3
Lupinus nanus	sky lupine	0.36	n/a	Seed	L006	Zone 3
Tritolium tridentantum	Tomcat clover	0.12	n/a	Seed	L006	Zone 3
Hordeum californium	California barley	0.48	n/a	Seed	L006	Zone 3
	Total	**3.61**				

Notes:

[1] Quantity refers to number of plants or pounds of seed to be used at Project Sites 3 and 10..

[2] Propagule container size dimensions:

- Treepot 4 – 4 inches square by 14 inches deep, 168 cubic inches in volume.
- Deepot 16 – 2 inches in diameter by 7 inches deep, 16 cubic inches in volume.
- Deepot 40 – 2.5 inches in diameter by 10 inches deep, 40 cubic inches in volume.
- Treeband 2 – 2.25 inches square by 3.75 inches deep 19 cubic inches in volume.
- 4-inch plug – small container plants in a multi-cell containers.
- Livestakes – cuttings from branches of a parent plant that are immediately planted into moist soil, such as near a creek.

[3] Sheet Nos. are from *Mission / Warren Freight Railroad Relocation C111 (11049) – Alum Rock Fish Passage* (Winzler & Kelly, March 16, 2012).

Table 5. Planting Palette for Project 2 Youth Sciences Institute Bridge

Species Name	Common Name	Quantity[1]	Individual Spacing	Propogule[2]	Planting Plan Sheet No.	Zone No. (shown on planting sheets)
YSI Bridge Plants						
Rosa californica	California rose	3	17 feet	tree band	L-2	n/a
Heteromeles arbutifolia	toyon	3	17 feet	tree band	L-2	n/a
Amelanchier alnifolia	serviceberry	3	17 feet	tree band	L-2	n/a
Ribes sanguineum	red-flowering current	3	17 feet	tree band	L-2	n/a
Symphoricarpos albus	snowberry	3	17 feet	tree band	L-2	n/a
Asarum caudatum	wild ginger	8	10 feet	tree band	L-2	n/a
Iris douglasiana	Douglas iris	8	10 feet	tree band	L-2	n/a
Melica torreyana	Torrey melica	8	10 feet	4-inch plug	L-2	n/a
	Total	**235**				
YSI Bridge Seed Mix						
Bromus carinatus	California brome	0.18	n/a	Seed	L-2	n/a
Elymus glaucus	blue wild rye	0.36	n/a	Seed	L-2	n/a
Vulpia microstachys	three week fescue	0.33	n/a	Seed	L-2	n/a
Hordeum branchyantherum	meadow barley	0.36	n/a	Seed	L-2	n/a
Eschscholtzia californica	California poppy	0.09	n/a	Seed	L-2	n/a
Lupinus nanus	sky lupine	0.18	n/a	Seed	L-2	n/a
Tritolium tridentantum	Tomcat clover	0.12	n/a	Seed	L-2	n/a
Hordeum californium	California barley	0.18	n/a	Seed	L-2	n/a
Symphyotrichum chilense	Pacific aster	0.3	n/a	Seed	L-2	n/a
	Total	**2.1**				

Notes:

[1] Quantity refers to number of plants or pounds of seed to be used at Project Site 2.

[2] Propagule container size dimensions:

- Treeband – 2.5 inches by 5 inches deep.
- Livestakes – cuttings from branches of a parent plant that are immediately planted into moist soil, such as near a creek.

[3] Sheet Nos. are from *Mission / Warren Freight Railroad Relocation C111 (11049) – Alum Rock Fish Passage* (Winzler & Kelly, March 16, 2012).

Table 6. Large Mitigation Trees

Species Name	Common Name	Quantity[1]	Individual Spacing	Propogule[2]	Planting Plan Sheet No.[3]	Zone No. (shown on planting sheets)
Large Mitigation trees						
Quercus agrifolia	Coast Live Oak	15	see L002, L003 and L006	15 gallon pot	L002, L003 and L006	n/a
Acer macrophyllum	Big Leaf Maple	8	see L002, L003 and L006	15 gallon pot	L002, L003 and L006	n/a
Umbellularia californica	California Bay	7	see L002, L003 and L006	15 gallon pot	L002, L003 and L006	n/a
	Total	**30**				

Notes:
[1] Quantity refers to number of plants
[2] Propagule container size dimensions:
- 15 gallon pot – 17 inches in diameter by 18.5 inches deep, 4,032 cubic inches in volume

[3] Sheet Nos. are from *Mission / Warren Freight Railroad Relocation C111 (11049) – Alum Rock Fish Passage* (Winzler & Kelly, March 16, 2012).
-

IV. MONITORING

Target Functions and Values

See also Section II. Mitigation Project Description - Goals and Objectives, above.

Floodplain Re-establishment: The primary target functions and values for floodplain re-establishment are to expand the available floodplain area and provide vegetated cover as well as slower water refugia for steelhead, California red-legged frogs, and other aquatic and semi-aquatic wildlife during winter high-flow events. Additionally, the floodplains should provide vegetated floodplain areas to trap sediment during storm events.

***Fish Passage Improvement*:** The primary target functions and values for fish passage improvement are to remove barriers to steelhead migration and provide improved fish habitat. The roughened channel construction should create a fish-friendly stream section with a chute and pool design.

Target Hydrological Regime

Floodplain re-establishment areas will be graded to below the OHWM allowing periodic inundation during the wet season. Target flow velocities will allow for increased habitat diversity and the periodic accumulation of sediment within floodplain areas.

Target Jurisdictional Acreages

Floodplain re-establishment is intended to restore an additional approximately 0.1 acres (4,356 ft^2) of floodplain, leading to a net gain of 0.09 acres (4,000 ft^2) jurisdictional waters. Fish Passage improvement is intended to disturb and subsequently restore 0.197 acres (8,527ft^2) of instream habitat (no net change).

Vegetation and Wetland Hydrology Performance Objectives and Success Standards

The following section describes the thresholds that will determine site success and guide management. These standards may be adjusted with additional information following site construction, subject to review and approval from the COE.

Vegetation and Wetland Hydrology Performance Objective 1:

Presence of native scrub/shrub and emergent wetland areas on re-established floodplain areas of the mitigation site.

- Success Standard 1.a: At monitoring year 1, there will be a minimum of 20% aerial cover of native facultative and wetter species within the re-established scrub/shrub and emergent floodplain area.
- Success Standard 1.b: At monitoring year 2, there will be a minimum of 35% aerial cover of native facultative and wetter species within the re-established scrub/shrub and emergent floodplain area.
- Success Standard 1.c: At monitoring year 3, there will be a minimum of 40% aerial cover of native facultative and wetter species within the re-established scrub/shrub and emergent floodplain area.

• Success Standard 1.d: At monitoring year 4, there will be a minimum of 45% aerial cover of native facultative and wetter species within the re-established scrub/shrub and emergent floodplain area.
• Success Standard 1.e: At monitoring year 5, there will be a minimum of 50% aerial cover of native facultative and wetter species within the scrub/shrub and emergent floodplain area.

Vegetation and Wetland Hydrology Performance Objective 2:
Presence of native species (including riparian seed mix and hydroseeded upland herbaceous species) on restored riparian and upland areas of the mitigation site.
• Success Standard 2.a: At monitoring year 1, there will be a minimum of 10% aerial cover of native species within the riparian and restored upland area.
• Success Standard 2.b: At monitoring year 2, there will be a minimum of 25% aerial cover of native species within the riparian and restored upland area
• Success Standard 2.c: At monitoring year 3, there will be a minimum of 30% aerial cover of species within the riparian and restored upland area.
• Success Standard 2.d: At monitoring year 4, there will be a minimum of 35% aerial cover of species within the riparian and restored upland area.
• Success Standard 2.e: At monitoring year 5, there will be a minimum of 40% aerial cover of species within the riparian and restored upland area.

Vegetation and Wetland Hydrology Performance Objective 3:
Ten year survival of at least 75% of all woody plants planted as a result of the project.
• Success Standard 3: At each annual monitoring event, there will be a minimum of 75% survival rate of planted trees and woody plants.

Vegetation and Wetland Hydrology Performance Objective 4:
Growth and spread of invasive and nuisance species will be limited throughout the mitigation site to ensure the success of Vegetation and Wetland Hydrology Performance Objectives 1, 2 and 3.
• Success Standard 4: At a minimum of once in each monitoring year, invasive species will be controlled in the mitigation site to the extent necessary to ensure compliance with Vegetation and Wetland Hydrology Objectives 1, 2 and 3.

Vegetation and Wetland Hydrology Performance Objective 5:
The mitigation sites will achieve sufficient hydrologic flow to meet the USACE OHWM definition.
• Success Standard 5: Finished grades will be appropriate such that mitigation areas are below the OHWM definition in CWA 33 CFR 328.3(e), which states: "The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

Monitoring
Vegetation monitoring will be conducted once each year during the growing season for five years (herbaceous species) and 10 years (woody species). Information collected will include total

percent cover, percent cover of native species, and a list of all native species present within plots. Any invasive species present will also be noted. Monitoring will be conducted in the same month(s) each year for consistency.

Photo stations will be established at representative locations, and photographs taken each year at each location.

Once each year during the monitoring period, the entire project length will be walked and the banks inspected for erosion. If any erosion is observed in the vicinity of the mitigation sites, conditions will be documented and appropriate actions identified and brought to the attention of the agencies.

V. REPORTING REQUIREMENTS

Annual reports of monitoring results will be submitted to the USACE, San Francisco RWQCB, and DFG. The reports will assess attainment of yearly target criteria and progress toward final success criteria. The annual report shall be delivered by November 1 of each year following the first growing season after planting, and shall contain the following information:

A. Project Information
1. Project Name
2. Applicant name, address, and phone number
3. Consultant name, address, and phone number
4. Corps permit file number
5. Acres of impact and type(s) of habitat impacted
6. Date project construction commenced
7. Location of the project and directions to site (including latitude/longitude or UTM coordinates)
8. Date of the report and the corresponding permit conditions pertaining to the compensatory mitigation
9. Amount and information on any required performance bond or surety

B. Compensatory Mitigation Site Information
1. Location and directions to the site (including latitude/longitude or UTM coordinates)
2. Size and type(s) of habitat existing at the site and proposed for restoration, enhancement, establishment (creation), and/or preservation
3. Specific purpose/goals for the compensatory mitigation site
4. Date site construction and planting completed (fully implemented)
5. Dates of previous maintenance and monitoring visits
6. Name, address, and contact number of responsible parties for the site
7. Name, address, and contact number for designer

C. Brief Summary of Remedial Action(s) and Maintenance of the Compensatory Mitigation Site

D. Map of the compensatory mitigation site

1. Habitat types (as constructed)
2. Locations of photographic record stations
3. Landmarks
4. Inset defining location of the site

E. List of Corps-approved success criteria

F. Table of results from the monitoring visits versus performance standards for specified target dates

G. Photographic record of the site during most recent monitoring visit at record stations

H. Summary of field data taken to determine compliance with performance standards and success criteria

I. Summary of any significant events that occurred on the site that may affect ultimate compensatory mitigation success.

VI. MAINTENANCE

Weed Control: At a minimum, monthly inspections of the site during the spring and early summer for five years following planting will be conducted to identify establishment of exotic plants. If identified in inspections, removal of any immature exotic plants shall occur a minimum of once per year until Vegetation and Wetland Hydrology Performance Objective 1 and 2, above, are met. Hand weeding, string trimmers, and other hand and power tools will be used to weed around riparian plantings in floodplain expansion areas, as needed. Stakes and mulch collars may be used to keep weeds away from plantings.

Planting Replacement: Vegetation surveys resulting from the annual monitoring events will form the basis for subsequent replanting. If the sites fall below the vegetation coverage or survival performance criteria (Vegetation and Wetland Hydrology Performance Objective 1, 2 and 3), the applicant shall be responsible for replanting such that the site meets the criteria in the planting season following the monitoring event. Plants to be replanted shall follow the original planting plan or USACE, RWQCB, and DFG approved substitution based on plant habitat conditions and observed survival rates.

VII. COMPLETION OF COMPENSATORY MITIGATION

The applicant shall notify the USACE, RWQCB, and DFG in writing when the 5 and 10 year monitoring periods are complete and the agency-approved success criteria have been met. A final delineation of waters of the U.S. and other areas enhanced, re-established, established, or preserved as part of the compensatory mitigation program shall be submitted to the USACE. Following receipt of the final report, the agencies will contact the applicant (or agent) as soon as possible to schedule a site visit to confirm the completion of the compensatory mitigation effort and any jurisdictional delineation. The compensatory mitigation will not be considered complete

without an on-site inspection by the agencies and/or written confirmation that approved success criteria have been achieved.

VIII. CONTINGENCY MEASURES

A brief discussion of the following items shall be part of each annual and the final compensatory mitigation monitoring report, unless the compensatory mitigation site is achieving or has achieved all specified success criteria:

A. If annual Vegetation and Wetland Hydrology Performance Objectives or success standards are not met for all or any portion of the compensatory mitigation project in any year, the applicant shall prepare an analysis of the cause(s) of failure(s) and, if determined necessary by the USACE, RWQCB, or DFG, propose remedial actions for approval. If the compensatory mitigation site has not met one or more of the Vegetation and Wetland Hydrology Performance Objectives or success standards, the responsible party's maintenance and monitoring obligations shall continue until the agencies give final approval that the compensatory mitigation obligations have been satisfied.

B. Alternative Locations for Contingency Compensatory Mitigation. Indicate specific alternative compensatory mitigation locations that may be used in the event that compensatory mitigation cannot be successfully achieved at the intended compensatory mitigation site. Include current ownership information, if offsite.

C. Funding Mechanism. Indicate what funds will be available to pay for planning, implementing, maintaining, and monitoring of any contingency measures that may be required to achieve compensatory mitigation goals.

D. Responsible Parties. List names, addresses, and phone numbers of persons/entities responsible for implementing, maintaining, and monitoring contingency measures.

IX. LITERATURE CITED

Biotic Resources Group, 2001a. Alum Rock Park riparian management plan.

Biotic Resources Group. 2001b. Alum Rock Park, Quail Hollow bridge replacement and stream restoration project. Delineation of Waters of the United States. 8p. + appendices.

Hibma, Michael R. and Christian Gerike 2008. *Alum Rock Park Historic Resources Report, San José, Santa Clara County, California*. Produced by LSA Associates, Inc., Point Richmond, California, for the City of San José Community Facilities Department, Santa Clara County, California.

Hickman, J. C. 1993. *The Jepson Manual: Higher Plants of California.* University of California Press. Berkeley CA.

Massey, Sandra 2008. *An Archaeological Inventory for the Alum Rock Park Bank and Stream Restoration Project, City of San José, Santa Clara County, California*. Prepared for Winzler & Kelly Consulting Engineers, Eureka, California. Anthropological Studies Center Sonoma State University, Rohnert Park, California.

Massey et. Al. 2008. *Draft National Register of Historic Places Evaluation of the Bridge L Historic-Period Archaeological Site, Alum Rock Park, San José, California*. Prepared for Winzler & Kelly Consulting Engineers, Eureka, California. Anthropological Studies Center Sonoma State University, Rohnert Park, California.

Newton and Claassen, 2003. Rehabilitation of Disturbed Lands in California: A Manual for Decision Making.

Stillwater Sciences, 2006. Upper Penitencia Creek limiting factors analysis. Final technical report.

Swanson Hydrology and Geomorphology. 2001. Quail Hollow revegetation plan.

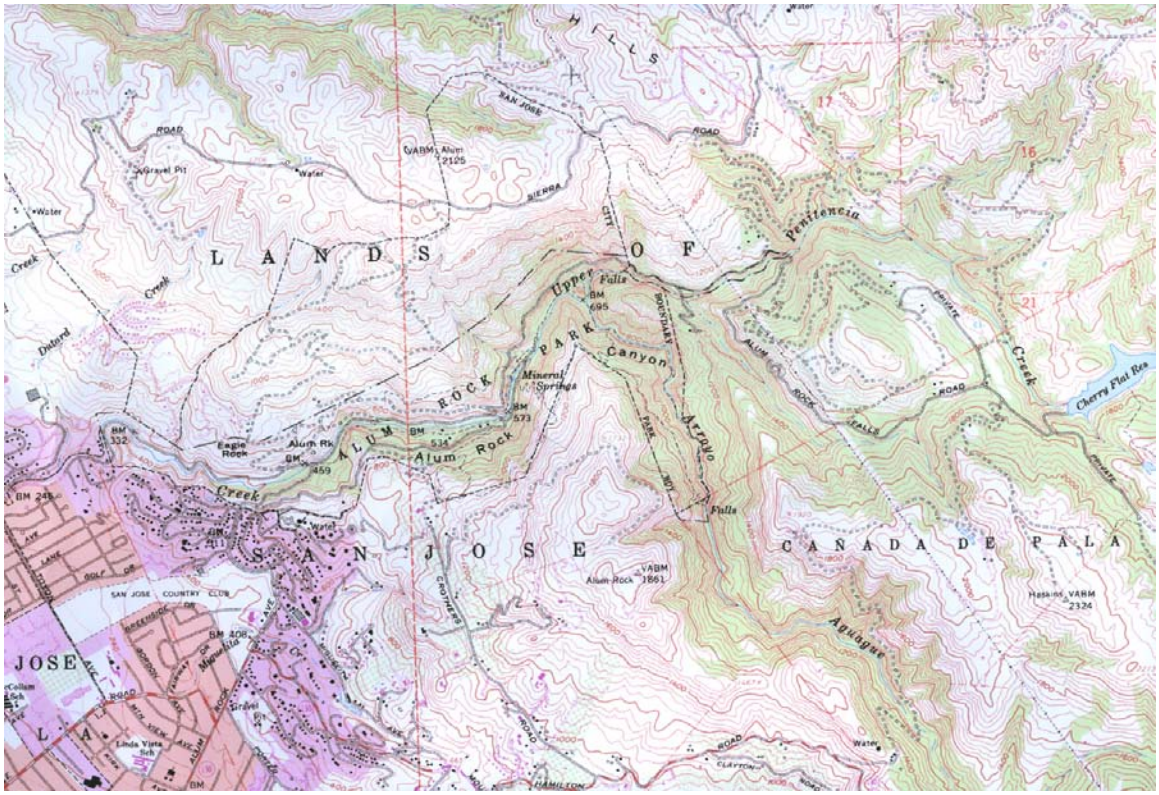
Winzler & Kelly 2008. Botanical Survey for the Proposed Improvements at Alum Rock Park, San José, California.

Winzler & Kelly 2010a. *Alum Rock Park Biological Assessment.* Prepared for the City of San José Parks, Recreation and Neighborhood Services.

Winzler & Kelly 2010b. *Delineation of Ordinary High Water Mark and Riparian Habitat for the Alum Rock Park Proposed Project Areas 1-11, San José, California.*

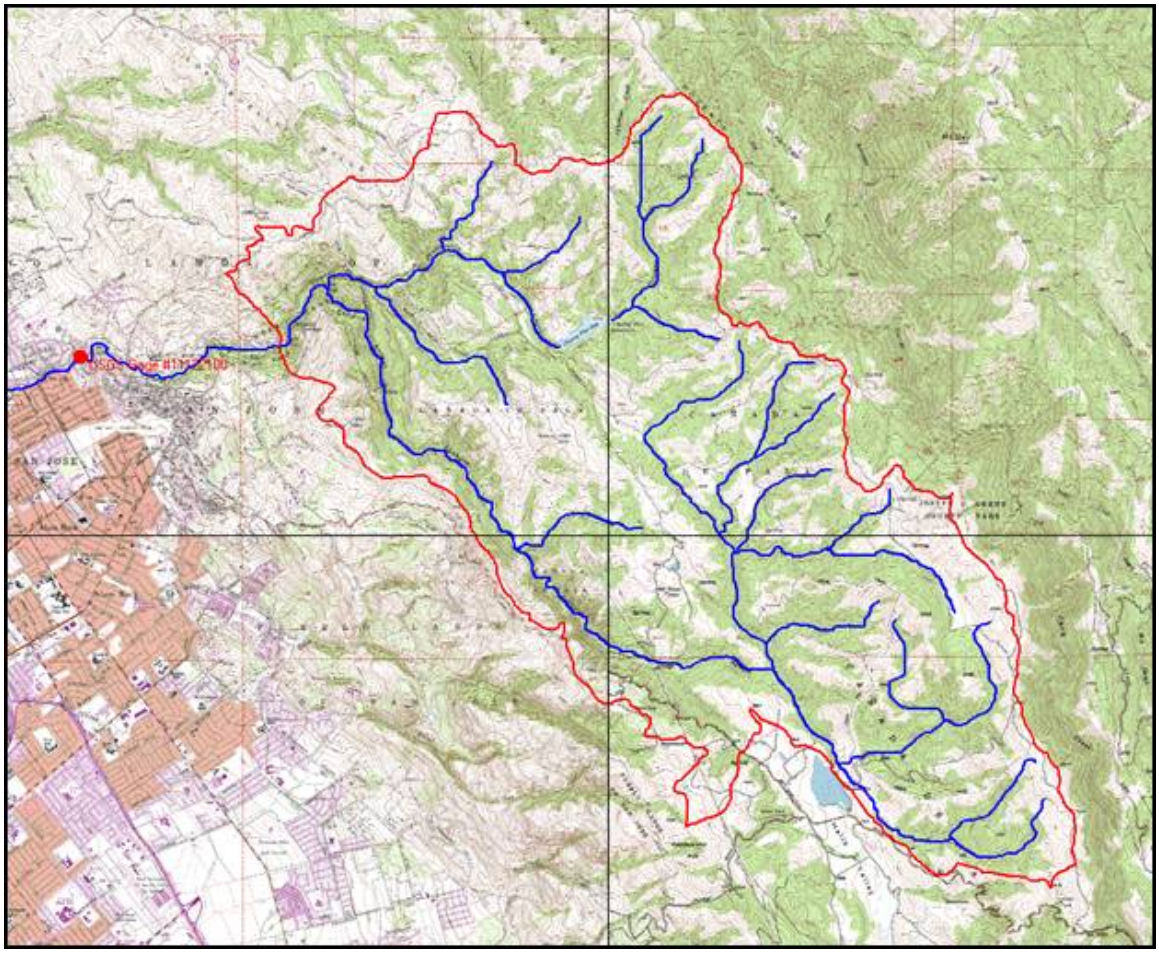
Appendix A
Figures

Source: California State Geological Survey



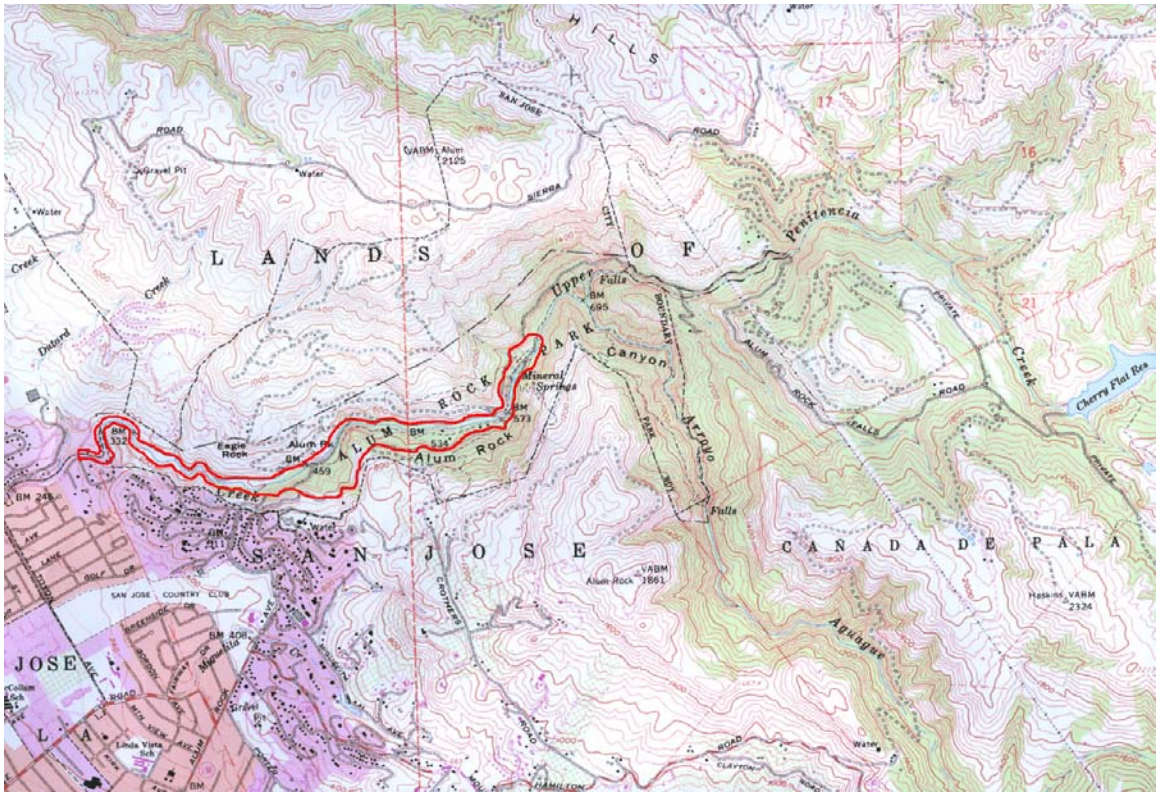
Source: USGS Calaveras Reservoir topographic quadrangle.

Figure 1. Location and Vicinity Maps



Source: USGS Calaveras Reservoir 7.5' topographic quadrangle

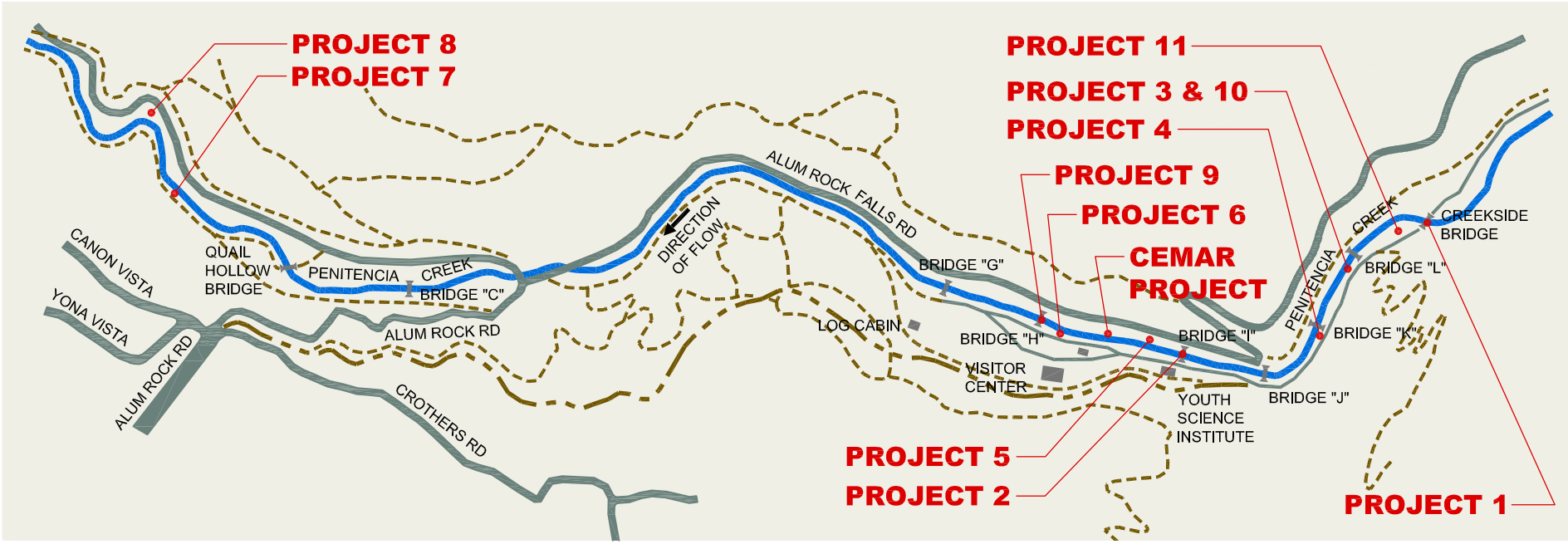
Figure 2. Watershed Map, showing the Upper Penitencia Creek drainage above the project site.



Source: USGS Calaveras Reservoir 7.5' topographic quadrangle

Figure 3. Action Area.

Appendix B
Plans



PROJECT 1
Creekside bridge repair: retaining wall, new concrete apron, revetment slope, grading.

PROJECT 2
Youth Science Institute bridge repair: retaining wall, new asphalt concrete pavement, revetment slope, grading.

PROJECTS 3 AND 10
Repair of rock wall (Project 3) and expansion of floodplain on east bank immediately downstream of historic foot bridge "L" (Project 10).

PROJECT 4
Repair of undercut section of rock wall on east bank immediately downstream of historic foot bridge "K".

PROJECT 5
Repair of eroded rill at end of north bank vertical rock wall directly adjacent to grade control structure.

PROJECT 6
Repair of failed bank protection project adjacent to Visitors Center. This project was originally constructed as part of the Phase II projects in 2001 (RMP, "Site #18").

PROJECT 7
Repair/protect failing south bank along trail downstream of Quail Hollow Bridge.

PROJECT 8
Repair of failing north bank sack concrete wall at sharp bend in top of bank road.

PROJECT 9
Repair/protection of the abutments/footings, repair of the rock railing, and bank repair at the Visitors Center Bridge (Bridge "H").

PROJECT 11
Expansion of floodplain immediately downstream of Creek Side Bridge.

PROJECT 13
CEMAR fish passage improvement project.

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

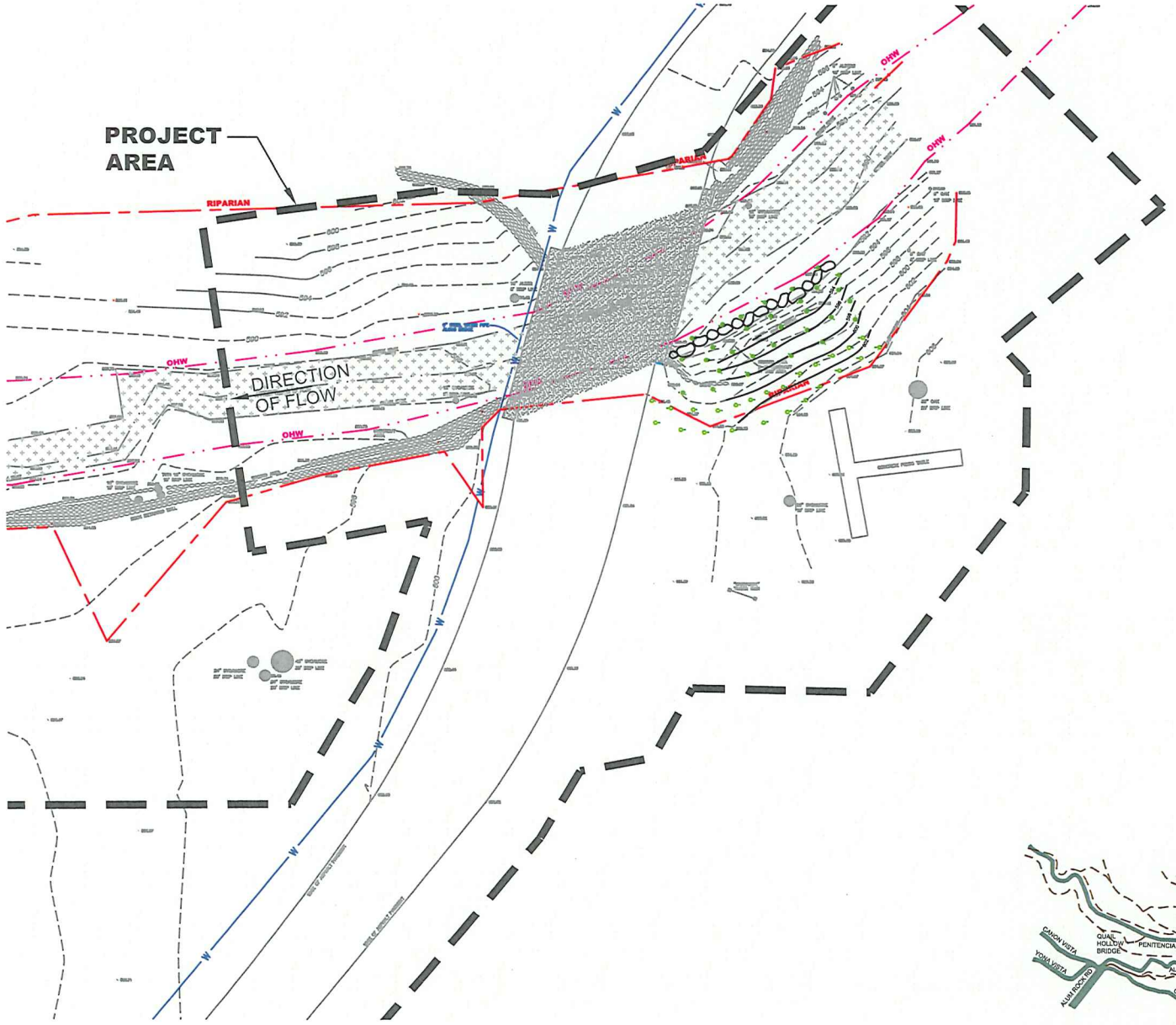
1"=900'
0' 450' 900' 1800'

NORTH

FIGURE 1
PROJECT KEYMAP
SCALE: 1"=900'

WINZLER&KELLY

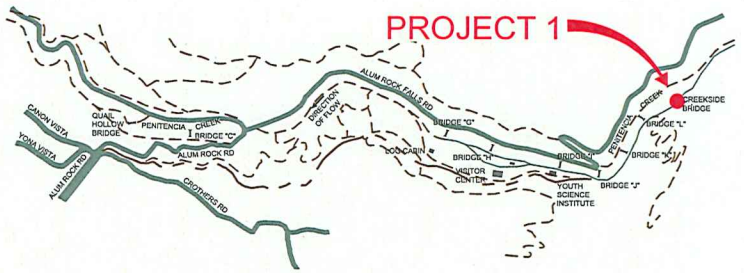
\\corp\WKProjects\SFO\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Fig1_Overall.dwg



SITE PLAN

SCALE: 1"=30'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

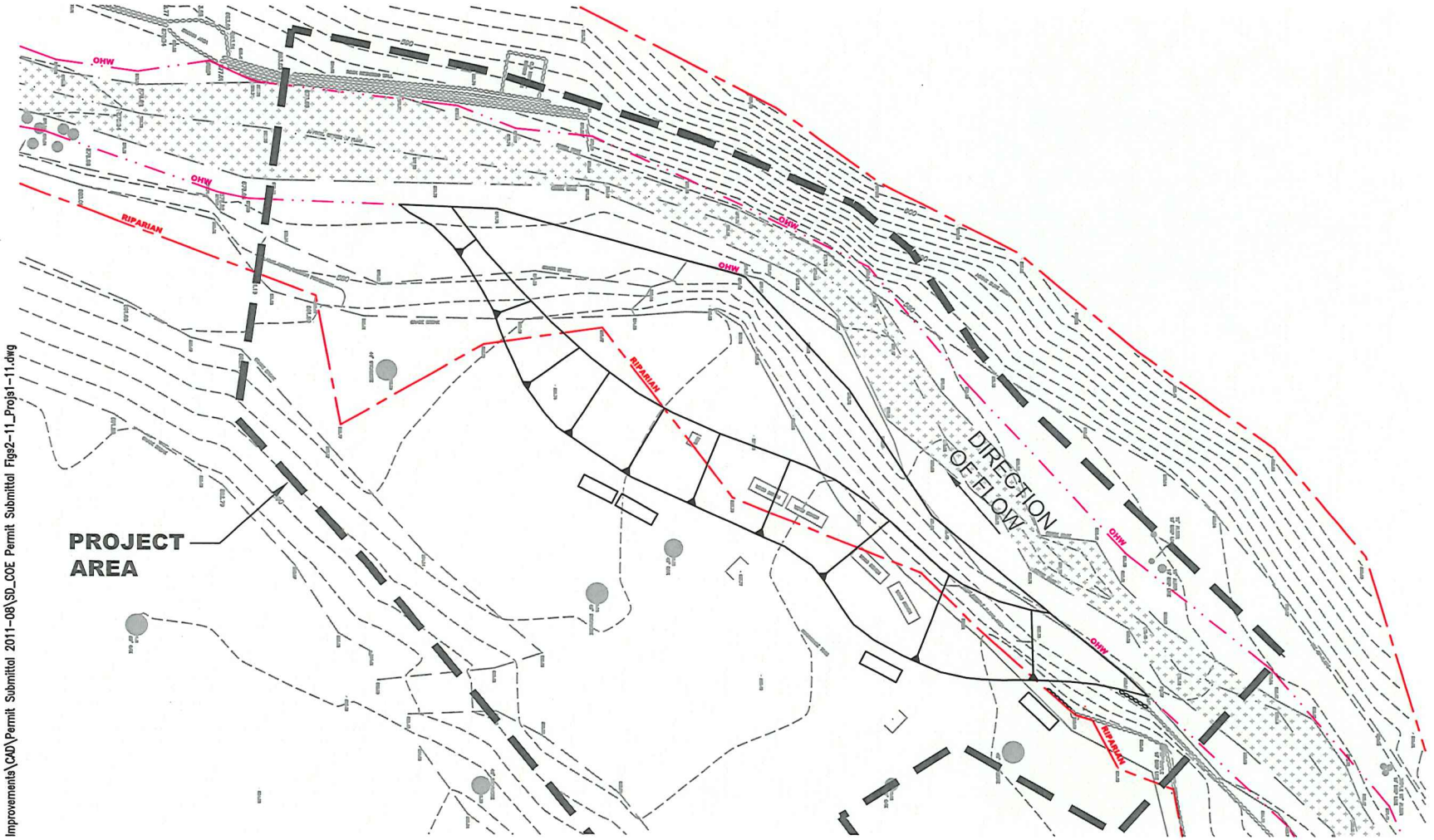
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 15' 30' 60'
1"=30'

FIGURE 2
PROJECT 1
CREEKSIDE BRIDGE REPAIR

WINZLER & KELLY

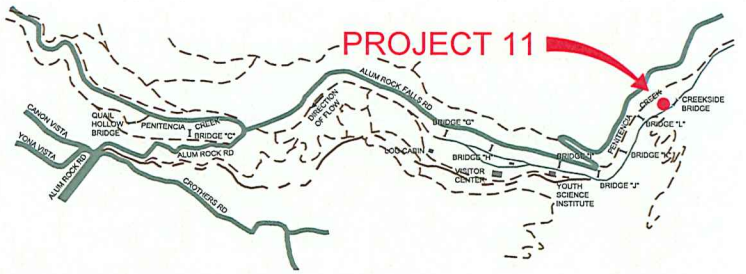
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=30'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

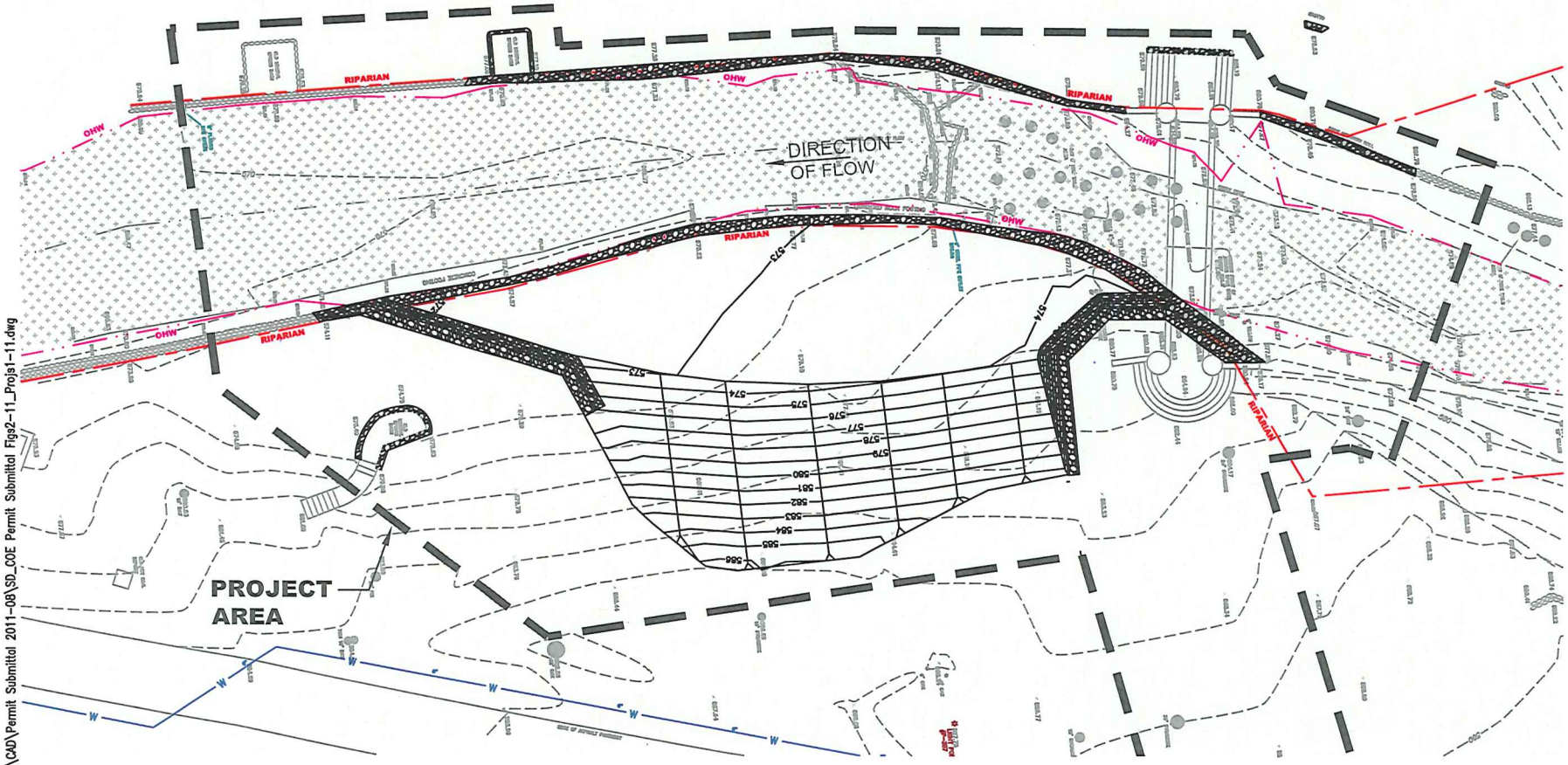
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 15' 30' 60'
1"=30'

FIGURE 3
PROJECT 11
PROPOSED EROSION REPAIRS

WINZLER&KELLY

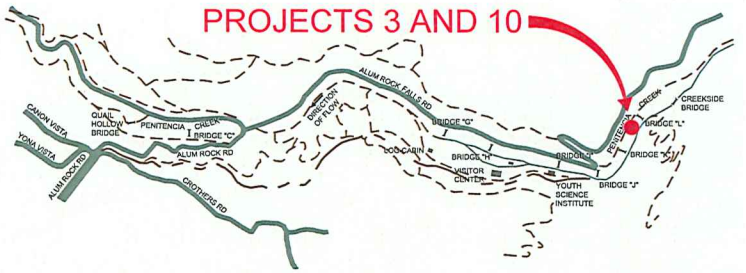
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=30'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

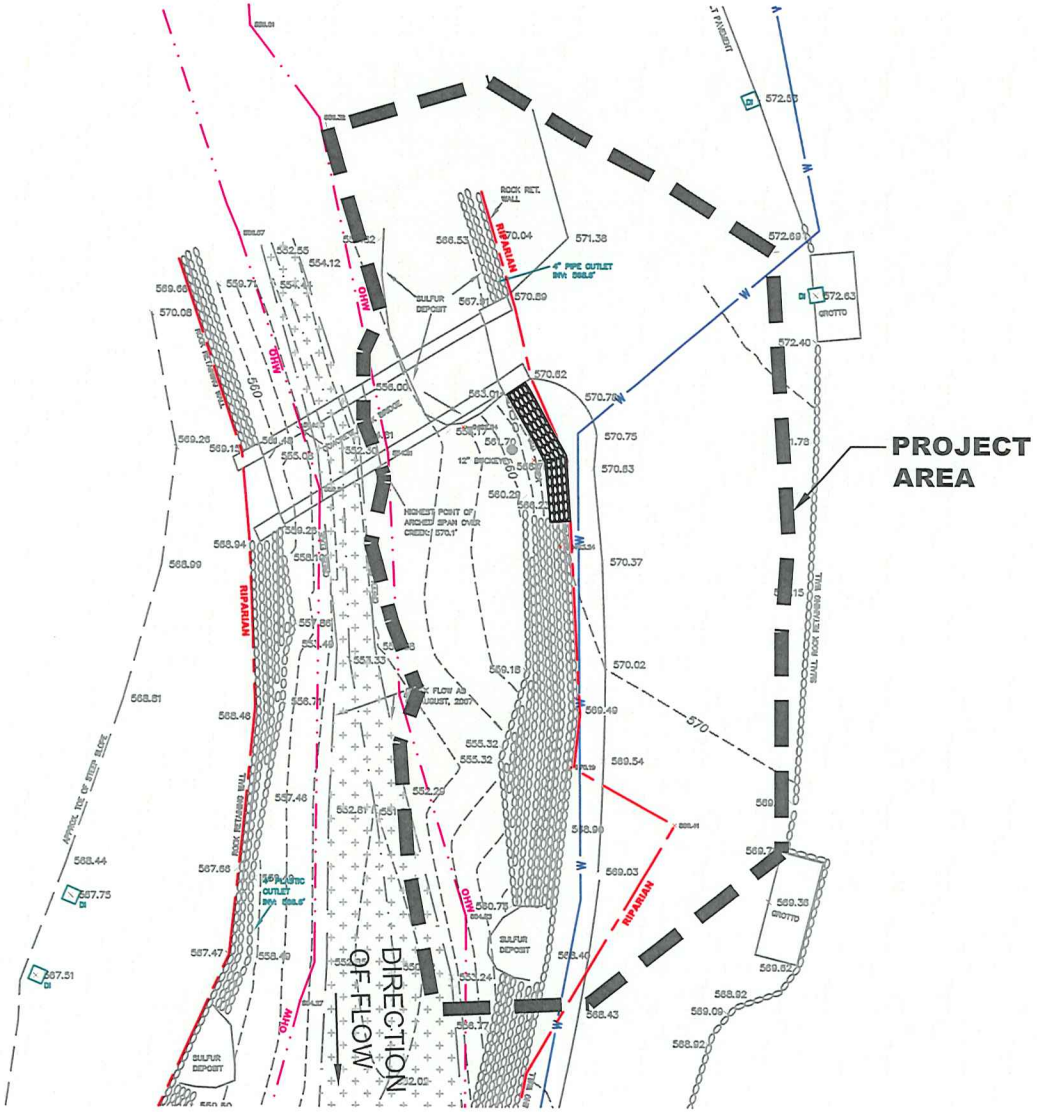
1"=30'

0' 15' 30' 60'

FIGURE 4
PROJECTS 3 AND 10
PROPOSED EROSION REPAIRS

WINZLER&KELLY

P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Projs1-11.dwg



SITE PLAN

SCALE: 1"=20'

NORTH

KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

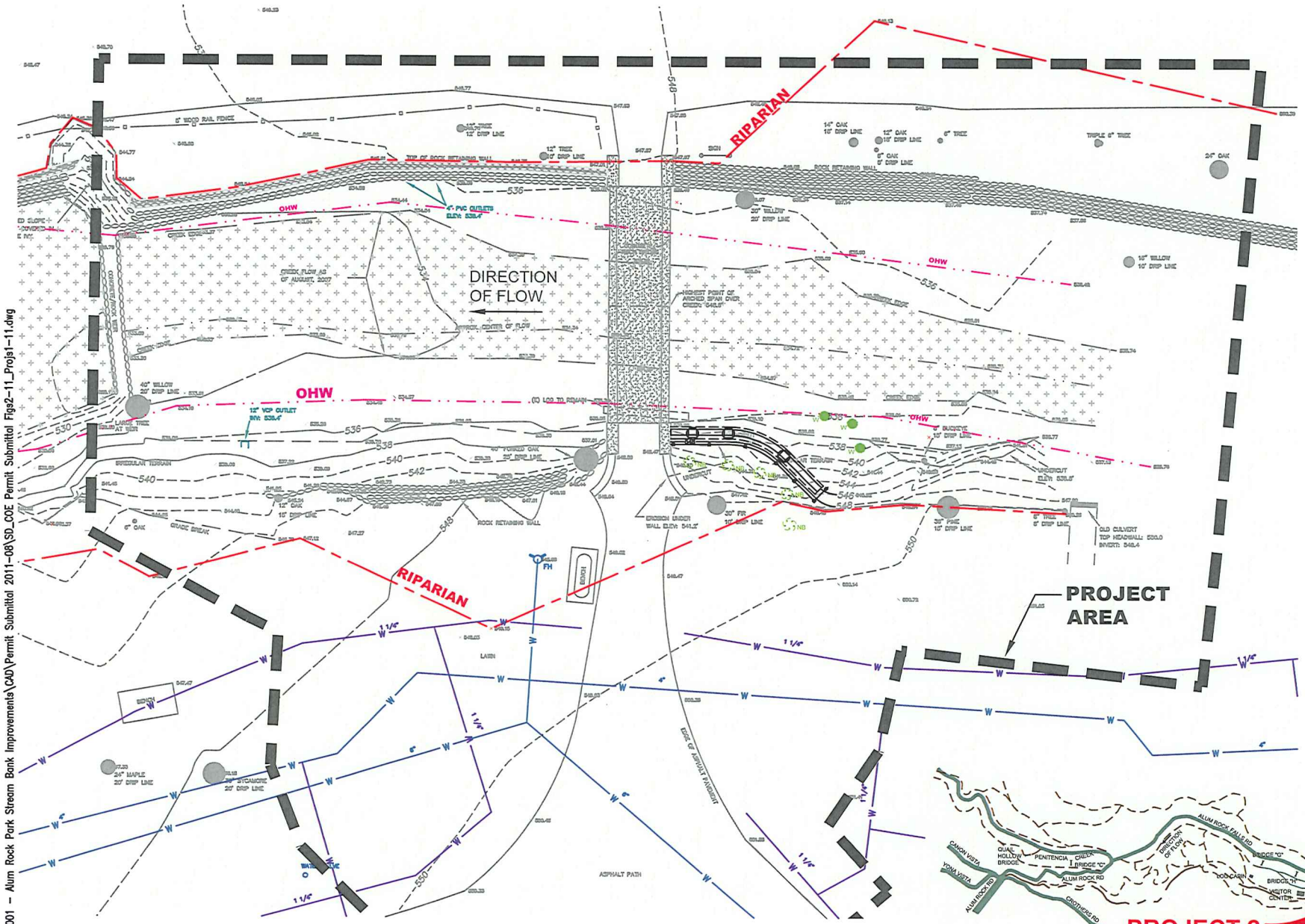
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 10' 20' 40'
1"=20'

FIGURE 5
PROJECT 4
PROPOSED DAMAGED WALL REPAIR

WINZLER & KELLY

P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Projs1-11.dwg



SITE PLAN

SCALE: 1"=20'

KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

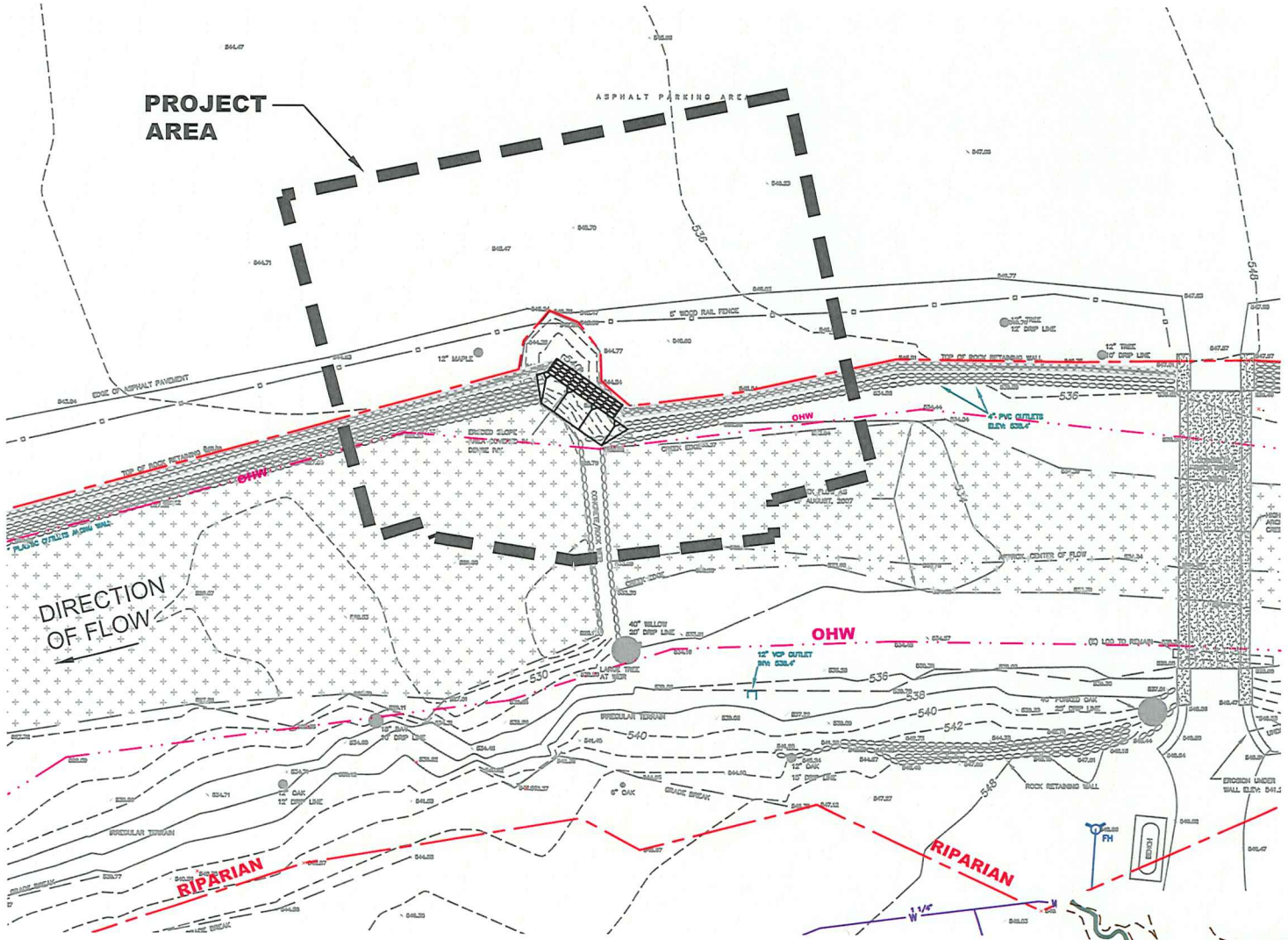
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 10' 20' 40'
1"=20'

FIGURE 6
PROJECT 2
Y.S.I. BRIDGE REPAIRS

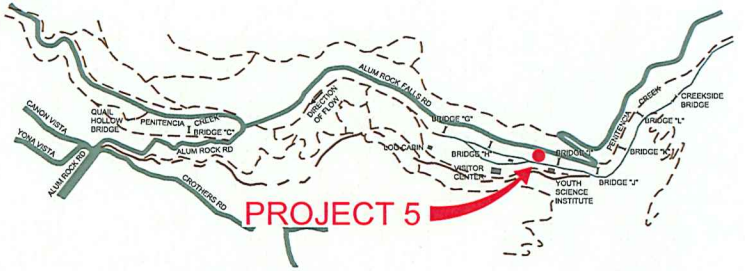
WINZLER & KELLY

P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=20'



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

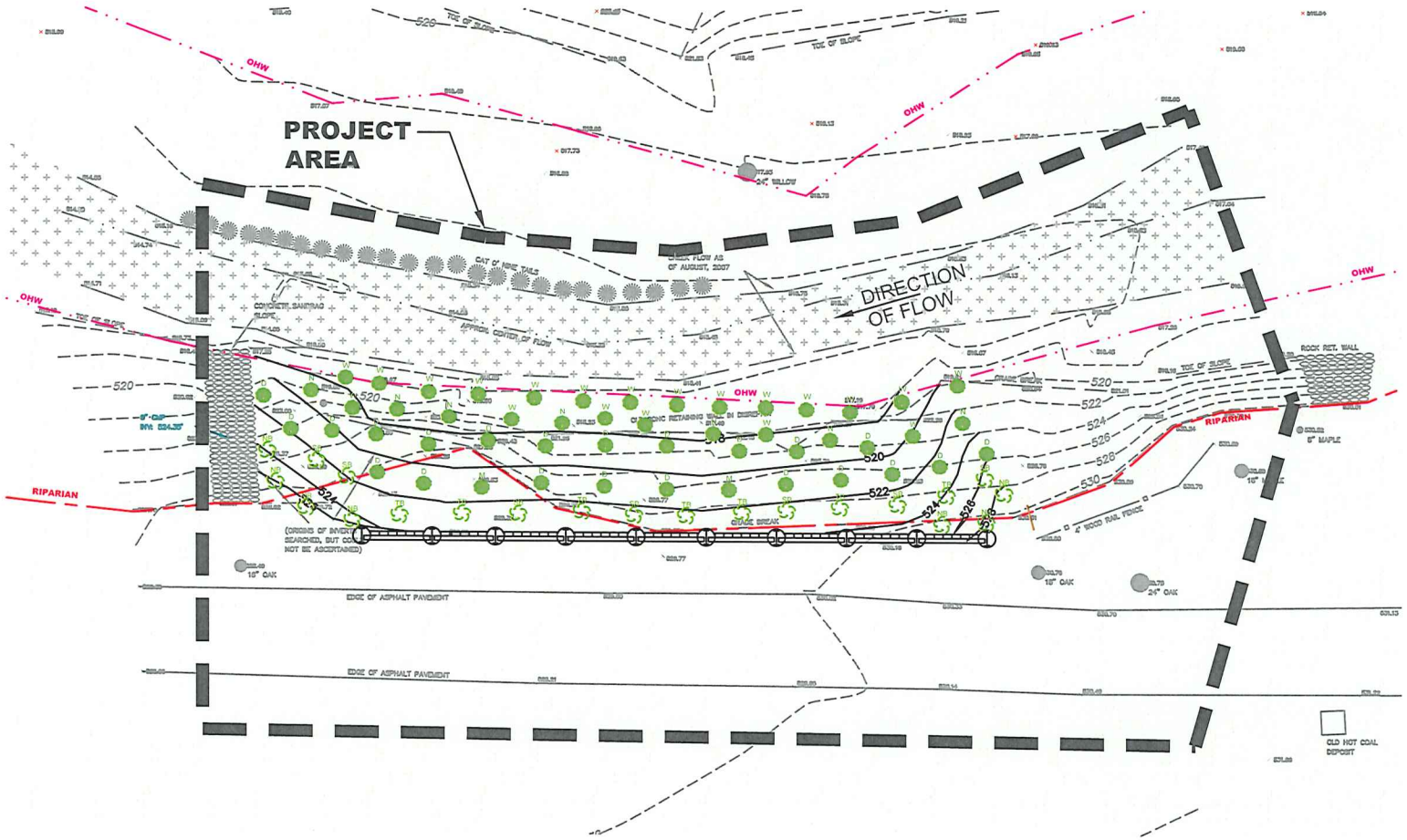
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 10' 20' 40'
1"=20'

FIGURE 7
PROJECT 5
PROPOSED EROSION REPAIR

WINZLER&KELLY

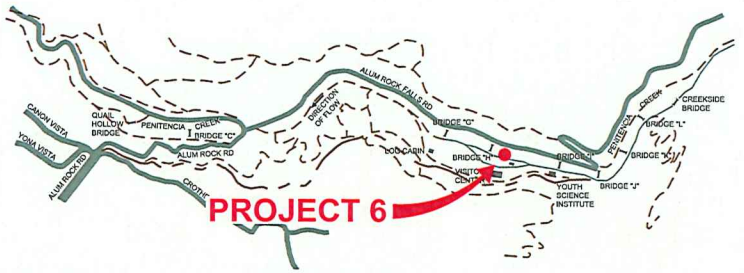
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

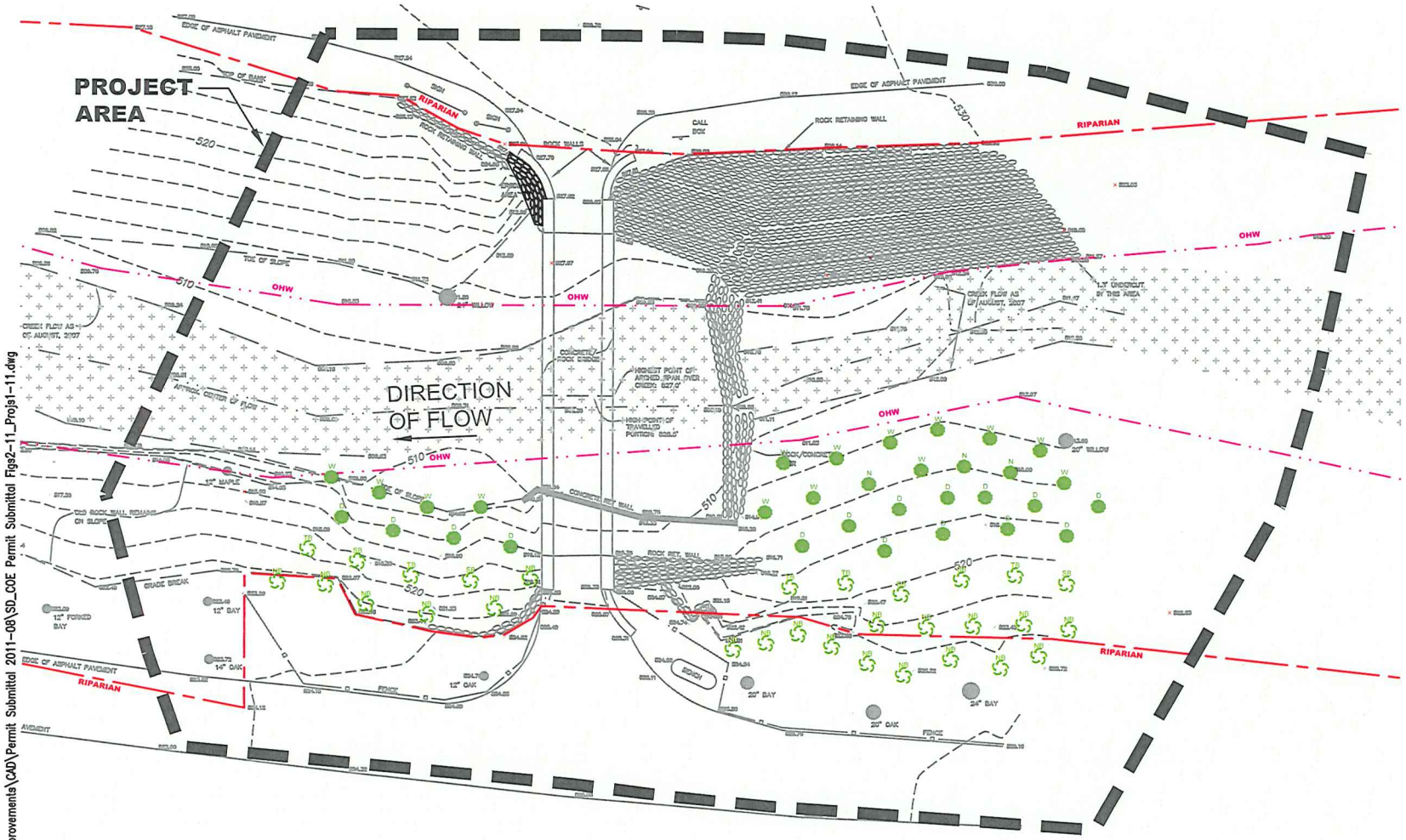
1"=20'

0' 10' 20' 40'

FIGURE 8
PROJECT 6
PROPOSED EROSION REPAIRS

WINZLER&KELLY

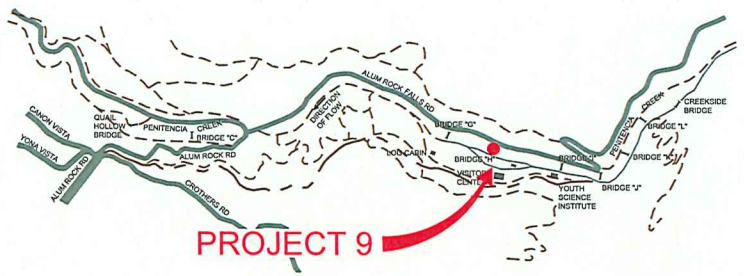
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

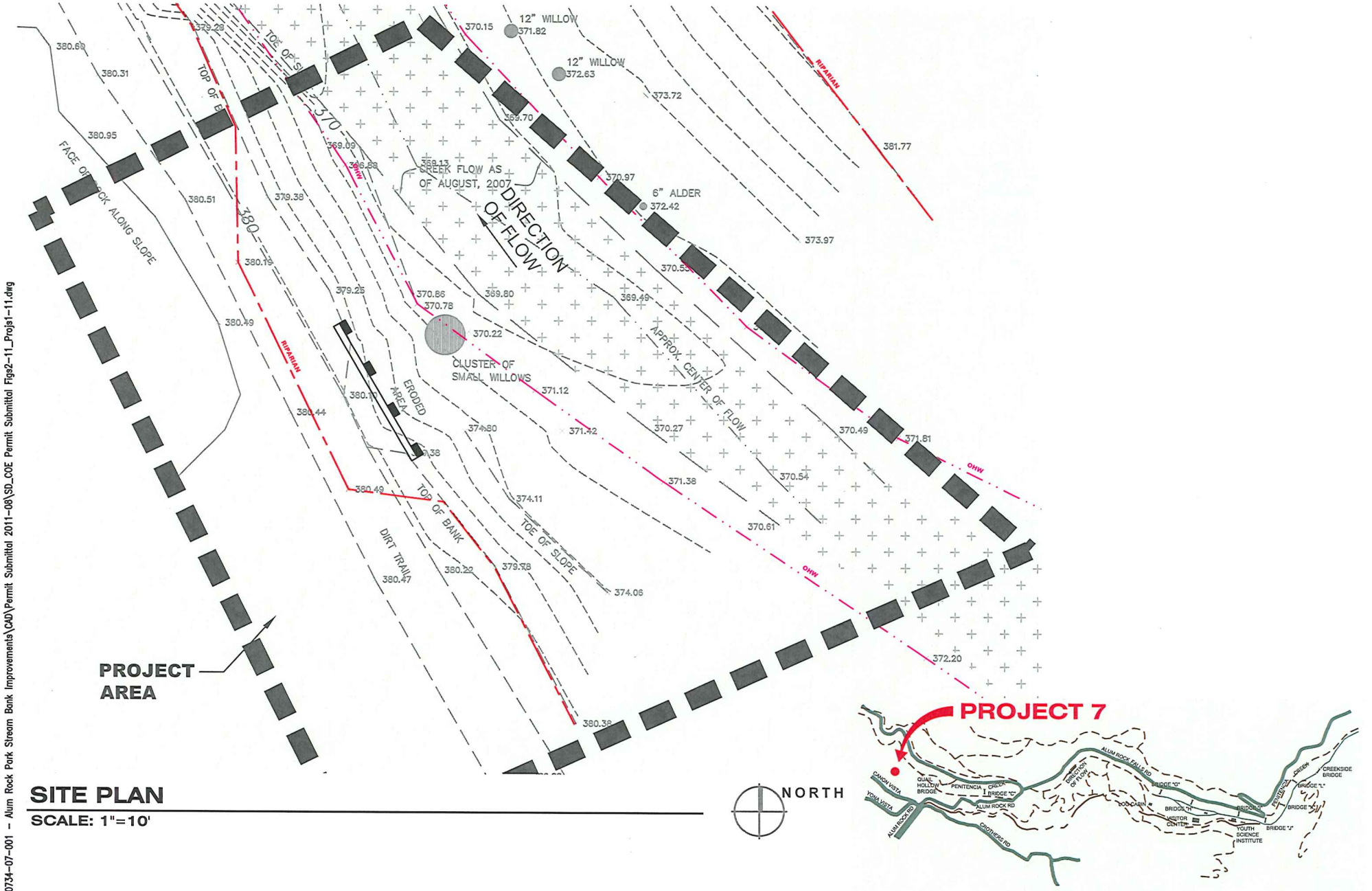
1"=20'

0' 10' 20' 40'

FIGURE 9
PROJECT 9
PROPOSED EROSION REPAIR

WINZLER&KELLY

P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=10'

NORTH

KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

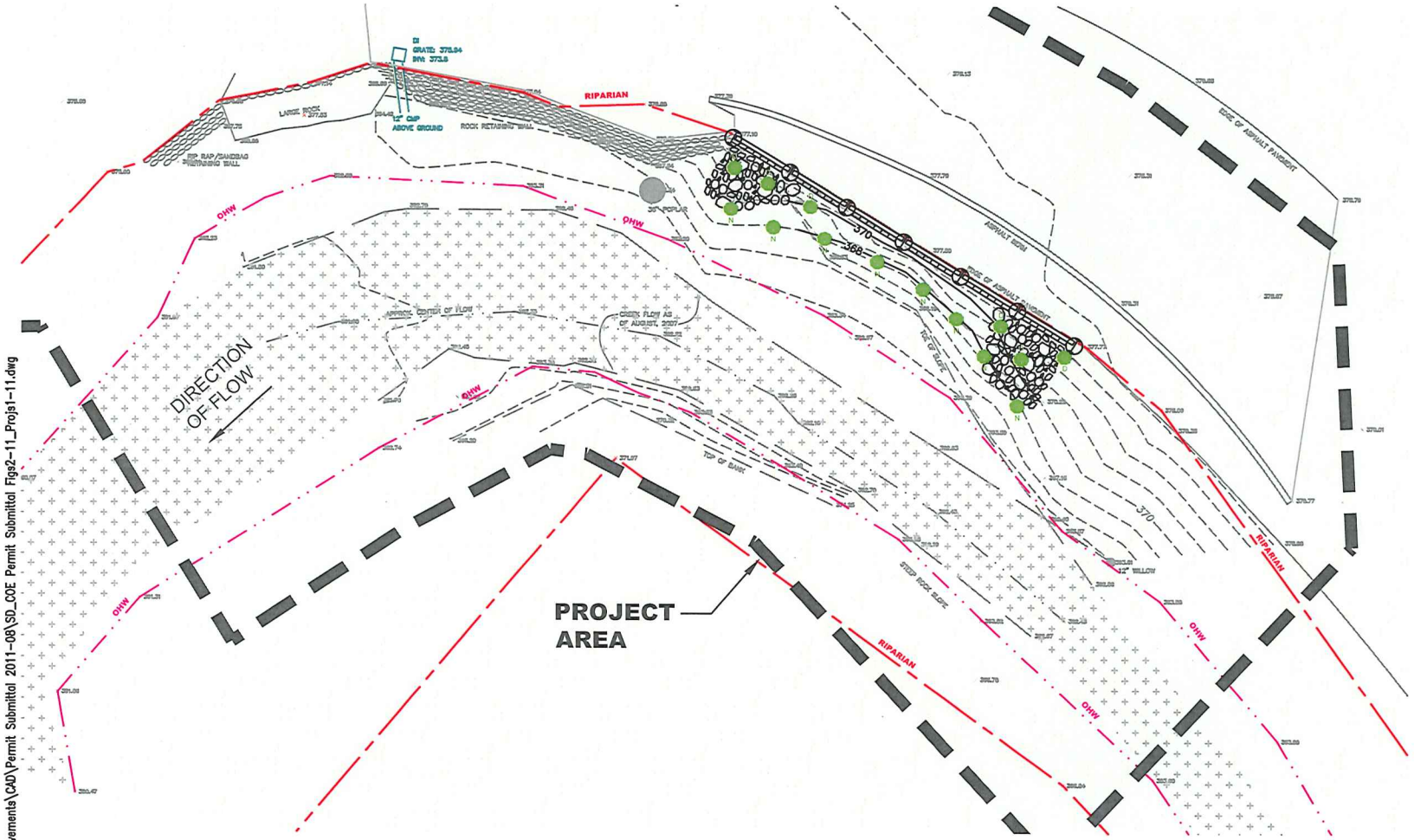
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 5 10' 20'
1"=10'

FIGURE 10
PROJECT 7
PROPOSED EROSION REPAIR

WINZLER&KELLY

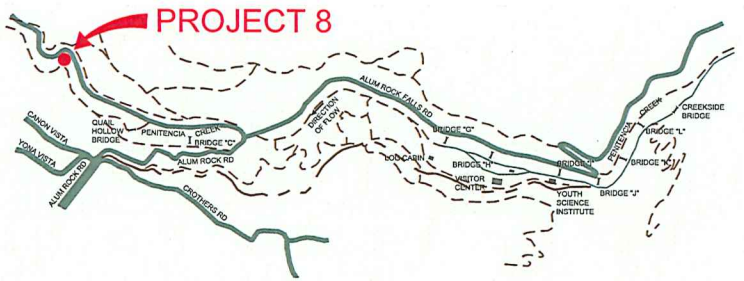
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=20"

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

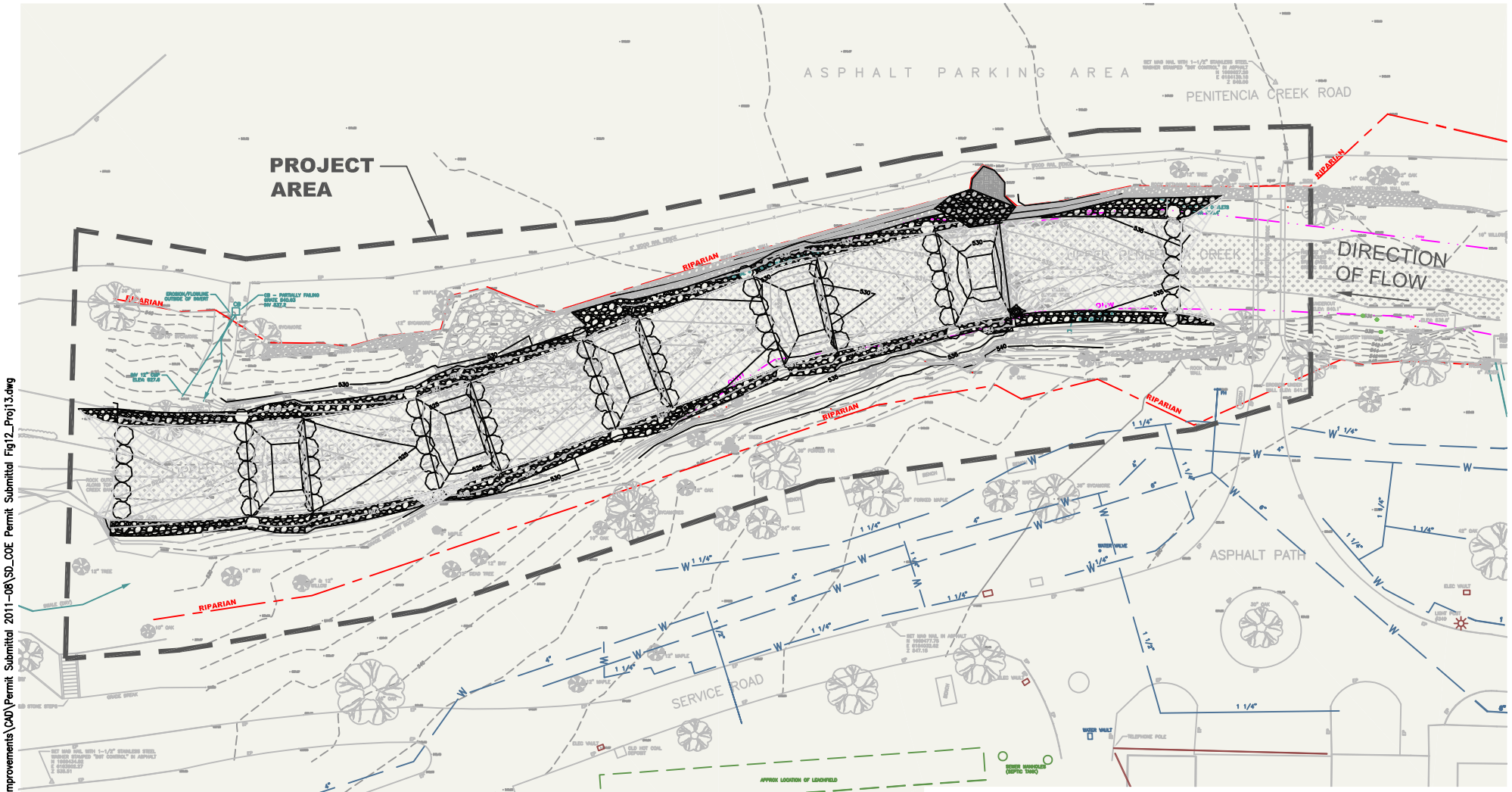
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 10' 20' 40'
1"=20'

FIGURE 11
PROJECT 8
PROPOSED EROSION REPAIR

WINZLER&KELLY

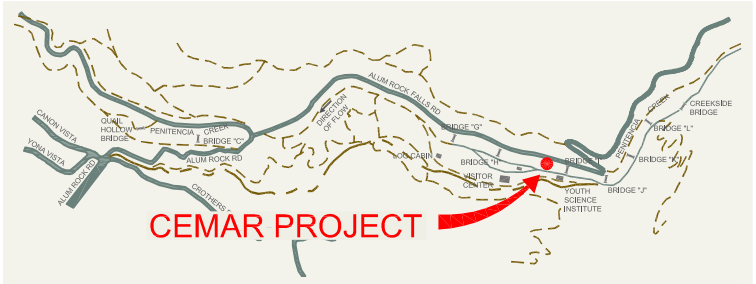
P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Figs2-11_Proj1-11.dwg



SITE PLAN

SCALE: 1"=40'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

0' 20' 40' 80'
1"=40'

FIGURE 12
PROJECT 13
CEMAR FISH PASSAGE IMPROVEMENT

WINZLER & KELLY

P:\10734 City of San Jose\10734-07-001 - Alum Rock Park Stream Bank Improvements\CAD\Permit Submittal 2011-08\SD_COE Permit Submittal Fig12_Proj13.dwg

Appendix C
Photographs

Project 11: Mature Sycamore Tree and Picnic Area

Project 11: Degraded Bank Near Mature Sycamore Tree

Project 3 and 10: Rock Wall Looking Upstream

Project 3 and 10: Rock Wall Looking Downstream

Project 3 and 10: Overview of Floodplain Re-establishment Area

Project 5 and 13/CEMAR: Weir Area, Plunge Pool

Appendix D
OHMW Delineation

10734-07001-33070

DELINEATION OF ORDINARY HIGH WATER, AND RIPARIAN HABITAT FOR THE ALUM ROCK PARK PROPOSED PROJECT AREAS 1-11 SAN JOSE, CALIFORNIA APNs 595-07-015, 599-25-001 & 612-46-001

March 2010

Prepared for:

City of San Jose
Parks, Recreation and Neighborhood Services
200 E. Santa Clara Street
San Jose, CA 95113
Phone (408) 793-5552

Prepared by:

Winzler & Kelly
633 Third Street
Eureka, CA 95501-0417
(707) 443-8326

TABLE OF CONTENTS

APPENDICES

**DELINEATION OF THE ORDINARY HIGH WATER MARK,
AND RIPARIAN HABITAT FOR THE
ALUM ROCK PARK
PROPOSED PROJECT AREAS 1-11
SAN JOSE, CALIFORNIA
APNs #595-07-015, 599-25-001 & 612-46-001**

I. SUMMARY

On February 9-10, 2010, a delineation of the Ordinary High Water Mark (OHWM) and riparian habitat was conducted for the City of San Jose Parks, Recreation and Neighborhood Services Department at eleven proposed project sites on Penitencia Creek in Alum Rock Park, San Jose, CA in City owner properties, Assessor's Parcel Numbers (APNs) 595-07-015, 599-25-001 and 612-46-001. The OHWM location procedure was completed pursuant to the U.S. Army Corps of Engineers (USACE) guidance for OHWM identification using physical characteristics criteria for making OHWM determinations (USACE, 2005). The identification for riparian habitat (WCB, 2010) was made by on-site establishment of the average outer tree drip line (away from the stream), for those individual trees established adjacent to proposed bank or in-stream work, which appear to provide sufficient creek shading. Wetlands generally occur as small and isolated inclusions within the delineated OHWM and typically consist of vegetated portions of gravel bars or, occasionally, as small terraces along a stream bank. Because much of Upper Penitencia Creek, within the project area, is constrained by rock walls, rock outcrops, or steep banks, bordering wetlands are not common and they occur within the OHWM limits.

II. INTRODUCTION

The overall project includes 12 sub-project locations within Alum Rock Park to be implemented over a four-year period (2010-2013). Proposed activities include two bridge abutment repairs, ten bank repair sites, floodplain restoration and a fish passage improvement project. Several of the specific project elements are intended to restore habitat in ways likely to benefit aquatic and semi-aquatic species (floodplain restoration, weir modification and stream channel roughing to enhance fish passage) or prevent future impacts from occurring (bank repair, bridge abutment and footing repair). Project related construction has the potential to result in temporary impacts, many of which can be avoided or minimized.

Work would generally occur in immediate proximity to Upper Penitencia Creek. Floodplain restoration would extend as much as 40 feet away from the existing bank; most other project activities would not extend beyond top of bank except for vehicle parking and temporary stockpiling of materials. Most individual project activities are very limited in spatial extent.

For clarity, project activities are presented in spatial (not numerical) sequence from upstream to downstream, and are grouped into three distinct clusters. The upstream cluster extends over an area of about 1,000 linear feet, from the Creekside Bridge to just below Bridge K, and includes Sites 1, 11, 3, 10, and 4. The middle cluster begins about 1,000 feet downstream, extends about 1,200 feet from Bridge I to about 250 feet below the Visitor's Center Bridge, and includes Sites

2, 5, 6, and 9 (including the CEMAR fish passage improvement project). The downstream cluster begins nearly a mile below the middle cluster, extends for about 600 feet, and includes Site 7 and 8. The sub-projects have been individually described in the City of San Jose's Alum Rock Park Bridge and Bank Repair and Stream Restoration Projects Intial Study (2008).

The locations and extent of the OHWM and the limits of the riparian habitat of the various projects are presented on Figures located in Appendix A.

III. ORDINARY HIGH WATER MARK and RIPARIAN DELINEATION METHODOLOGY

The OHWM and riparian habitat delineation was conducted by Winzler & Kelly following the USACE (2005) OHWM guidance criteria. Field Work for the OHWM and riparian habitat delineation was completed by Gary Lester of Winzler & Kelly on February 9-10, 2010. This delineation report includes a discussion of site conditions, sampling methodology, sampling results, and conclusions as well as a map delineating wetland boundaries, and riparian boundaries in the eleven project areas. A set of project location figures illustrating the extent of the OHWM and riparian habitat within each project site is included in Appendix A.

A. Ordinary High Water Mark Identification Methodology

USACE (2005) defines the term "ordinary high water mark" as:

"…that line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris or other appropriate means that consider the characteristics of the surrounding areas."

In practice, the means used at the time of this survey was the existing Penitencia Creek flow line and recent flow lines marked by matted down vegetation.

B. Riparian Habitat Identification Methodology

Riparian habitat is composed of the trees and other vegetation and physical features normally found on the stream banks and flood plains associated with streams, lakes or other bodies of water (WCB, 2010). Further interpretation of riparian vegetation was made on-site for trees which would provide creek water cover or shade, not necessarily restricted to those trees normally (or naturally) found on California water ways. Therefore long standing Alum Rock landscape trees planted along Penitencia Creek were also recognized as providing riparian-like shade quality. Care was taken to determine the extent of these riparian habitat features at the farthest limits away from the established OHWM. The extent was determined to be the average edge of the riparian tree or shrub drip-line.

Once OHWM and riparian habitat characteristics were determined for a specific project area, a flag was placed to delineate the limits of the boundary. Point numbers for the OHWM boundary or extent of riparian average drip-line were written on flags. Points were based on field determinations to mark a change in the direction of the boundary and

were not predetermined by aerial or topographic maps. Flag locations were surveyed by BGT Land Surveying, the results of which are provided in the figures in Appendix A.

IV. RESULTS OF ORDINARY HIGH WATER MARK AND RIPARIAN HABITAT DELINEATION

The sub-projects are individually discussed in detail below. The project locations, survey of the OHWM and outer extent of riparian habitat identified at the project locations are presented in figures located in Appendix A. The OHWM is identified on each bank of the creek. Riparian is identified on the bank where the project will take place or was delineated on both stream banks in significant project areas where in-stream activities, such as diversions or coffer dams will be temporarily employed.

Project 1. Creekside Bridge Abutment Repair

Project 1 is located at the upstream section of the Creekside Bridge along the existing left (south) bank. The left bank at this location is the outside bank at the end of a minor bend. This bend is causing erosion to occur at the left (south) abutment just before the entrance of the bridge. The erosion is causing riprap that was placed as artifical fill during the bridge construction to be exposed and migrate downstream. The erosion of the riprap and fill on the left bank is exposing the left abutment and has the potential to undermine the abutment and cause the bridge to fail.

The riparian habitat was delineated at the Project 1 location on each bank of Penitencia Creek for approximately 100 feet above Creekside Bridge and 100 feet below. The riparian habitat primarily consisted of small white alders (*Alnus rhombifolia*) and a few larger California sycamores (*Platanus racemosa*) and California bays (*Umbellularia californica*).

Project 11: Creekside Bridge Floodplain Expansion

This sub-project consists of expansion of the floodplain immediately downstream of Creekside Bridge. A segment 200 to 300 feet downstream of the Creekside Bridge currently has a stacked rock wall on the left (east) bank. Much of the eastern bank consists of old fill material and presently supports a picnic area. Floodplain restoration is proposed along the east bank downstream of the bridge. Fill will be excavated and removed, and the area will be graded to an elevation equal to the 1.5-year design flow. All existing walls will be removed, and the picnic area relocated.

The riparian habitat was delineated on the left bank of Penitencia Creek for approximately 100 feet above the floodplain expansion and extending through Project Areas 3 and 10 below. The riparian habitat primarily consisted of small white alders, a few larger California sycamores and the canopy of a few larger coast live oaks (*Quercus agrifolia*). One tree, a sycamore within the delineated riparian habitat, will be removed.

Projects 3 and 10: Bridge L Wall Repair and Floodplain Expansion

This sub-project consists of repair of the rock wall and expansion of floodplain downstream of Bridge L. Immediately downstream of Bridge L, a rock wall on the east bank is undercut for a length of approximately 25 feet. The wall constrains the stream, which is only 25 feet wide at this location, which results in increased channel velocity and scour. The restoration action at site

3 includes re-establishing the natural width of the channel by removing the rock and concrete wall downstream of the bridge, and creating approximately 0.14-acres of floodplain (up to 40 feet wide) along the eastern bank. There will be no fill or increase in water surface. A new section of wall will be constructed to protect the existing bridge footing.

The riparian habitat was delineated on the left bank of Penitencia Creek above Bridge L contiguous with Project 11 and extending below Project Areas 3 and 10 for approximately 100 feet. The riparian habitat primarily consisted of only a few scattered small white alders and willows (*Salix* spp.), growing within the OHWM.

Project 4: Bridge K Rock Wall Repair
This sub-project consists of repair of an undercut section of rock wall on the east bank downstream of historic Bridge K. A rock and morter wall immediately downstream of Bridge K has failed, exposing unstable soil and making additional sections of wall and a nearby asphalt path vulnerable to storm damage. In-kind repair is proposed, using native rocks and mortar and with the addition of weep holes. The project is more than 15 horizontal feet and 7 vertical feet away from the ordinary high water line of Upper Penitencia Creek and is limited to bank repair work. There will be no impacts to waters or wetlands. The repair activities will reduce the future risk of erosion and sedimentation.

A small extent of riparian habitat formed by California buckeyes (*Aesculus californicus*) located on the left bank, was delineated 100 feet above and below Project 4.

Project 2: Youth Sciences Institute Bridge Abutment Repair
At the Youth Sciences Institute (YSI) Bridge along the left (south) bank, just upstream of the bridge the existing left abutment is constricting the flow of the creek as it passes underneath the bridge. High velocities from turbulence associated with flow constrictions are the likely cause of the erosion located just upstream of the abutment and potential undermining of the abutment. The erosion extends to the top of the bank, where erosion is occurring underneath the wall.

The riparian habitat was delineated at the Project 2 location on each bank of Penitencia Creek for approximately 100 feet above the YSI Bridge and contiguous with Project Area 5 below. The riparian habitat consisted primarily of mature coast live oaks and a few California bays.

Project 5. Repair Eroded Rill and Wall Downstream of YSI Bridge
This sub-project consists of repair of eroded rill at the end of the north bank vertical rock wall adjacent to a grade control structure.

The riparian habitat was delineated at the Project 5 location on each bank of Penitencia Creek for approximately 100 feet below the Project Area 5 area and contiguous with the YSI Bridge habitat delineation above. The riparian habitat consisted primarily of mature coast live oaks and a few California bays and a big-leaf maple (*Acer macrocarpa*).

CEMAR Fish Passage Improvement
Design details for these proposed activities is described in the *Final Design Report for a Fish Passage Improvement Project on Upper Penitencia Creek* (Winzler & Kelly, 2008), and was

completed for the Center for Ecosystem Management and Restoration (CEMAR). An undercut weir serving as a grade control structure 75 feet downstream of the YSI bridge has caused a scour pool and a 4.5-foot vertical drop from the crest of the weir to the normal pool surface, creating a salmonid migration barrier. Simple weir removal could allow upstream channel degradation and threaten the structural integrity of the bridge. This project proposes to leave the weir in place and to create a stable roughened channel suitable for fish passage. The new roughened channel will extend for 225 linear feet, with a chute and pool design to allow fish resting places. As a result of the channel design, the OHWM will be elevated through the restored channel reach. There will be no net change in channel cross section, area of jurisdictional waters, or wetted area other than a slightly increased elevation of both channel bed and the OHWM. There will be a significant improvement in fish migration capability, and there will also be a net gain in aquatic habitat quality.

Associated bank improvements include slope regrading, rock wall removal, and revegetation in the downstream part of the project reach, with some rock protection placed at the toe of slope. The riparian habitat present at the CEMAR Fish Passage Project location for approximately 100 feet below the area and contiguous with the Project 5 habitat delineation above consists of scattered mature coast live oaks, several California bays, California sycamores and clusters of small willows. Much of the entire right bank opposite the project is existing frontage of visitor parking and steep creek banks, lacking significant riparian cover.

Project 6: Visitor's Center Bank Protection Repair
This sub-project consists of repair of failed bank protection adjacent to the Visitor's Center. About 175 feet upstream of the Visitor Center Bridge, a previous bank protection project on the south bank has failed, possibly because of runoff from the adjacent parking lot. An approximately 50-foot long by 5-foot high crib wall has broken and no longer retains the slope. About 30 feet upstream a 6 by 15-foot rock and mortar wall has failed and slid into the channel. Downstream of the crib wall, a 7-by-20-foot section of rock and mortar bank facing has been undercut by erosion and has slid down to the edge of the stream. In this area of multiple failures, a 30-to-40 foot long section of the bank protrudes into the channel and is near vertical.

The riparian habitat was delineated on both banks of Penitencia Creek above the Visitor's Center Bridge the length of Project 6 to approximately 100 feet above and extending below to Project Area 9. The riparian habitat primarily consisted of both dense small willows and mature coast live oaks.

Project 9: Visitor's Center Bridge Abutments Repair and Fish Passage Improvement
This sub-project consists of repair/protection of bridge abutments/footings, repair of the rock railing, bank repair, and fish passage improvement at the Visitor's Center Bridge. The Visitor's Center Bridge is a rock and mortar arch footbridge with a 40-foot span supported on approximately 9-by-4 foot rock and mortar abutments. Damage to the north abutment includes undercutting of the upstream edge of the footing. A rock and mortar bank wall upstream of the bridge has also been undercut. Damage to the south abutment includes erosion of the footing and rock railing. A concrete and rock and mortar weir is present 12 feet upstream of the bridge. The weir is undercut, is in marginal condition, and has been identified as a potential barrier to

salmonid migration under certain flow conditions. The weir has caused a scour pool and contributed to the failures identified above.

The riparian habitat was delineated at the Project 9 location on each bank of Penitencia Creek for approximately 100 feet below the Project Area 9 area and contiguous with the Visitor's Center Bridge habitat delineation above. The riparian habitat consisted primarily of mature coast live oaks, white alders, California bays and big-leaf maples.

Project 7: Bank Repair Downstream of Quail Hollow
This sub-project consists of repairing/protecting the failing south bank along a trail downstream of Quail Hollow. Just downstream of Quail Hollow, a 10-foot section of bank has failed on the outside of a bend in the channel. Repair will include minor excavation of the upper slope, replacement of excavated material with rip rap, and filling of voids with soil to promote growth of vegetation. Work will take place well above the ordinary high water mark, and there will be no impacts to waters or wetlands.

A small extent of riparian habitat formed by white alders located on the left bank, was delineated 100 feet above and below Project 7.

Project 8: Repair Concrete Wall Downstream of Quail Hollow
This sub-project consists of repairs to a failing north bank sack concrete wall. On the outer bank of a 90-degree bend in the stream a 40-foot long sack concrete wall has been undercut, exposing the concrete footing. A large culvert extends through the undercut wall. A 50-foot long adjacent upstream section of bank has failed, damaging a portion of the pavement edge of a roadway on top of the bank. The road has been relocated. The banks opposite and downstream are constrained by large bedrock outcrops. The proposed action includes placement of rip rap protection along the exposed footing of the sack concrete wall, which is otherwise in good condition. The failed bank will be repaired with a vertical Hilfiker Retaining Wall system.

Extensive riparian habitat formed by numerous species (primarily white alders, coast live oaks and willows) located on both banks, was delineated 100 feet above and below Project 8.

V. CONCLUSIONS

The OHWM and riparian habitat delineation of February 9-10, 2010, delineated the OHWM and riparian habitat outside of the OHWM on 12 project areas in Alum Rock Park. The OHWM and the riparian habitats were delineated during the same period. The riparian habitat was identified as per the WCB (2010) definition and the U.S. Army Corps of Engineers Ordinary High Water Mark ("waters" of the U.S) definition by USACE (2005). All delineated boundaries as well as recorded transect points can be identified on Figures 1-6 (Appendix A).

VI. RECOMMENDATIONS

It is recommended that a Jurisdictional Determination by the COE and Stream Alteration Agreement from DFG be obtained and documented in regards to this delineation before proceeding with construction and causing potential disturbance to the waters or buffer areas associated with the

delineated OHWM or riparian vegetation.

VII. SPECIAL TERMS AND CONDITIONS

To achieve the delineation objectives stated in this report, we based our conclusions on the information available during the period of the investigation, February 9-10, 2010. This report does not authorize any individuals to develop, fill or alter the waters or riparian habitat delineated. Verification of the delineation by jurisdictional agencies, including the U. S. Army Corps of Engineers, the California Department of Fish and Game, the California Regional Water Quality Control Board and the City of San Jose is necessary prior to the use of this report for site development purposes. Permits to affect wetlands must be obtained from the involved government agencies. If permits are obtained to develop the delineated wetlands after agency review and written verification, the delineation is given a 5-year expiration period. Land use practices and regulations can change thereby affecting current conditions and delineation results.

This report was prepared for the exclusive use of the City of San Jose. Winzler & Kelly is not liable for any action arising out of the reliance of any third party on the information contained within this report.

VIII. REFERENCES

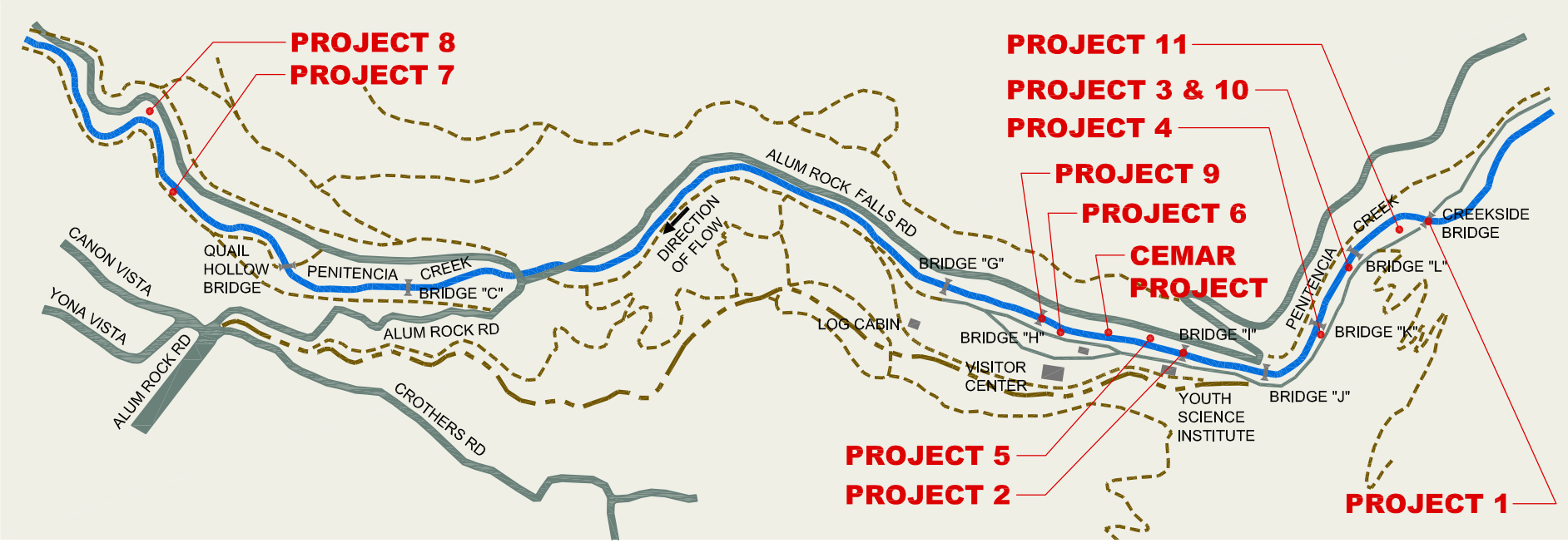
City of San Jose, 2008**.** Alum Rock Park Bridge and Bank Repair and Stream Restoration Projects, Intial Study. San Jose, CA.

United States Department of the Army Corps of Engineers, Regulatory Guidance Letter, Ordinary High Water Identification, No. 05-05, December 2005.

Wildlife Conservation Board, 2010. State of California. California Riparian Habitat Conservation Program. Sacramento, CA. http://www.wcb.ca.gov/Pages/california_riparian_habitat_conservation_program.asp.

Winzler & Kelly, 2008. *Final Design Report for a Fish Passage Improvement Project on Upper Penitencia Creek*. Center for Ecosystem Management and Restoration. Oakland, CA.

Appendix A
Figures



PROJECT 1
Creekside bridge repair: retaining wall, new concrete apron, revetment slope, grading.

PROJECT 2
Youth Science Insttute bridge repair: retaining wall, new asphalt concrete pavement, revetment slope, grading.

PROJECTS 3 AND 10
Repair of rock wall (Project 3) and expansion of floodplain on east bank immediately downstream of historic foot bridge "L" (Project 10).

PROJECT 4
Repair of undercut section of rock wall on east bank immediately downstream of historic foot bridge "K".

PROJECT 5
Repair of eroded rill at end of north bank vertical rock wall directly adjacent to grade control structure.

PROJECT 6
Repair of failed bank protection project adjacent to Visitors Center. This project was originally constructed as part of the Phase II projects in 2001 (RMP, "Site #18").

PROJECT 7
Repair/protect failing south bank along trail downstream of Quail Hollow Bridge.

PROJECT 8
Repair of failing north bank sack concrete wall at sharp bend in top of bank road.

PROJECT 9
Repair/protection of the abutments/footings, repair of the rock railing, and bank repair at the Visitors Center Bridge (Bridge "H").

PROJECT 11
Expansion of floodplain immediately downstream of Creek Side Bridge.

CEMAR PROJECT
Create a fish passage.

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

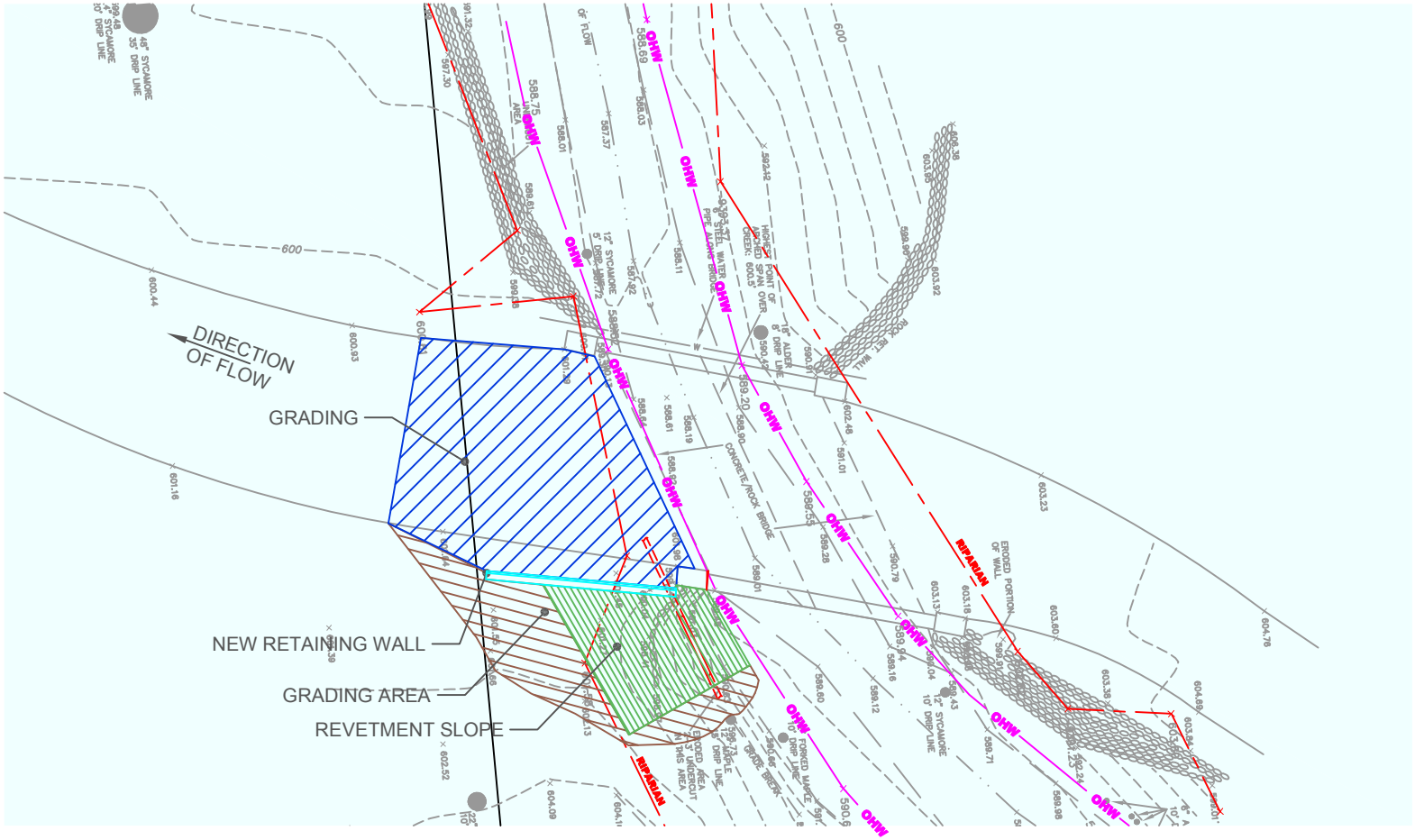
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

1"=900' 0' 450' 900' 1800'

NORTH

FIGURE 1
PROJECT KEYMAP
SCALE: 1"=900'

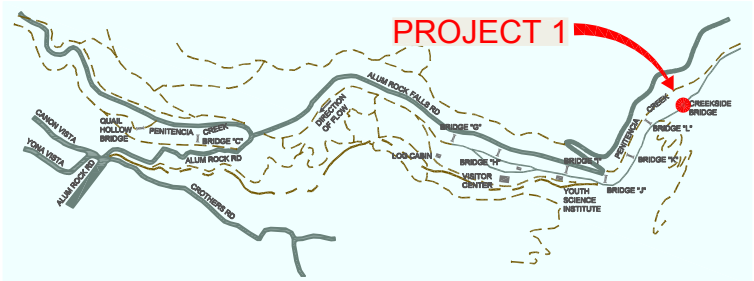
WINZLER&KELLY



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

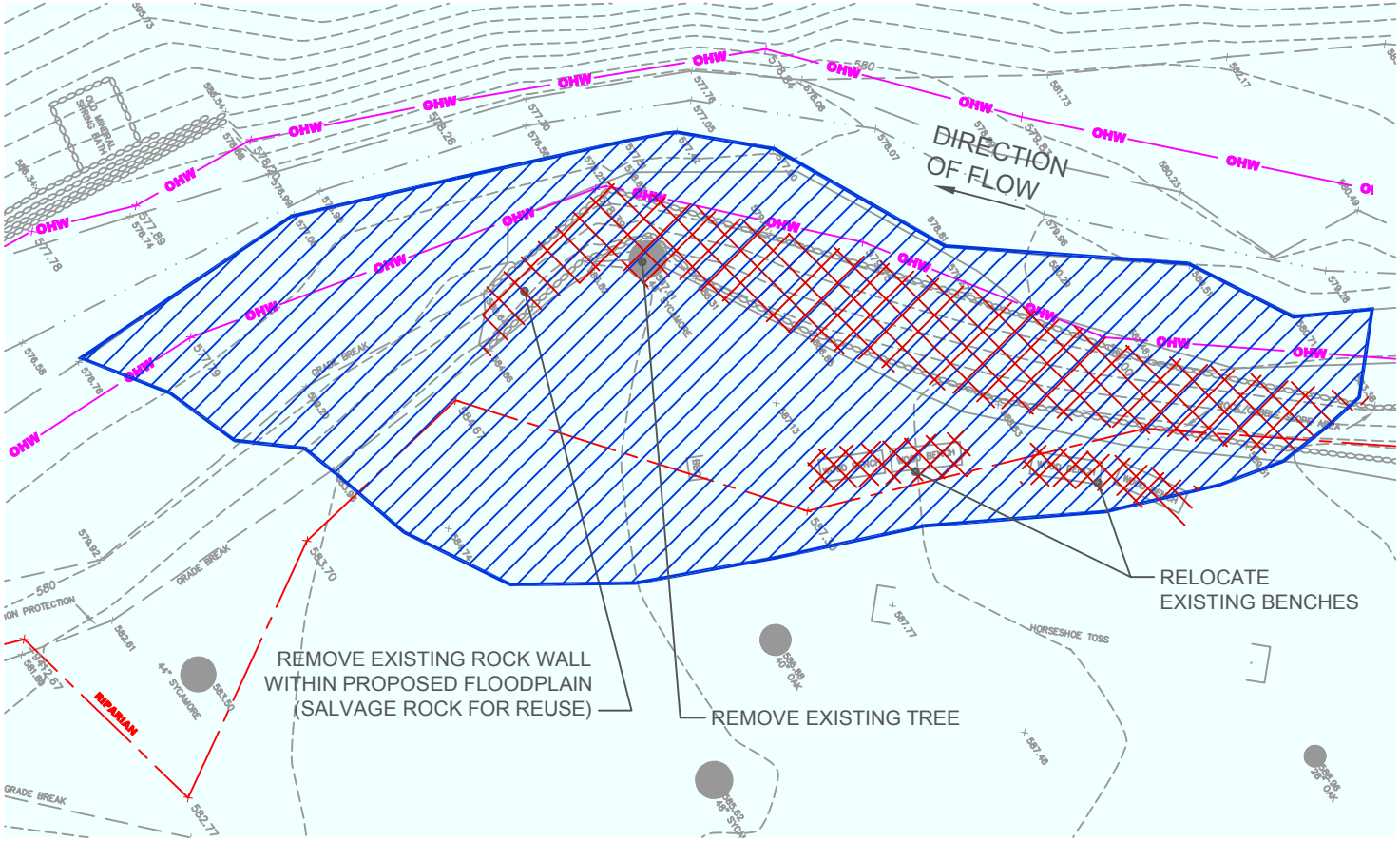
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

1"=20'

0' 10' 20' 40'

FIGURE 2
PROJECT 1
CREEKSIDE BRIDGE REPAIR

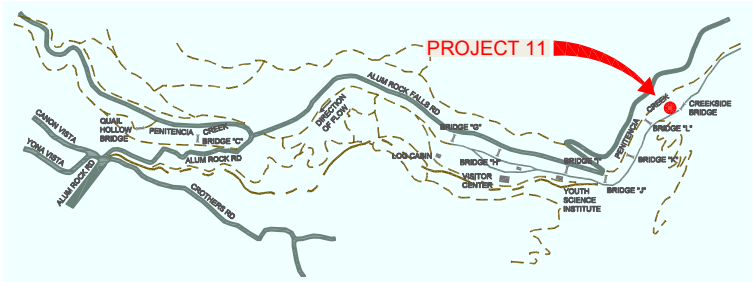
WINZLER & KELLY



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

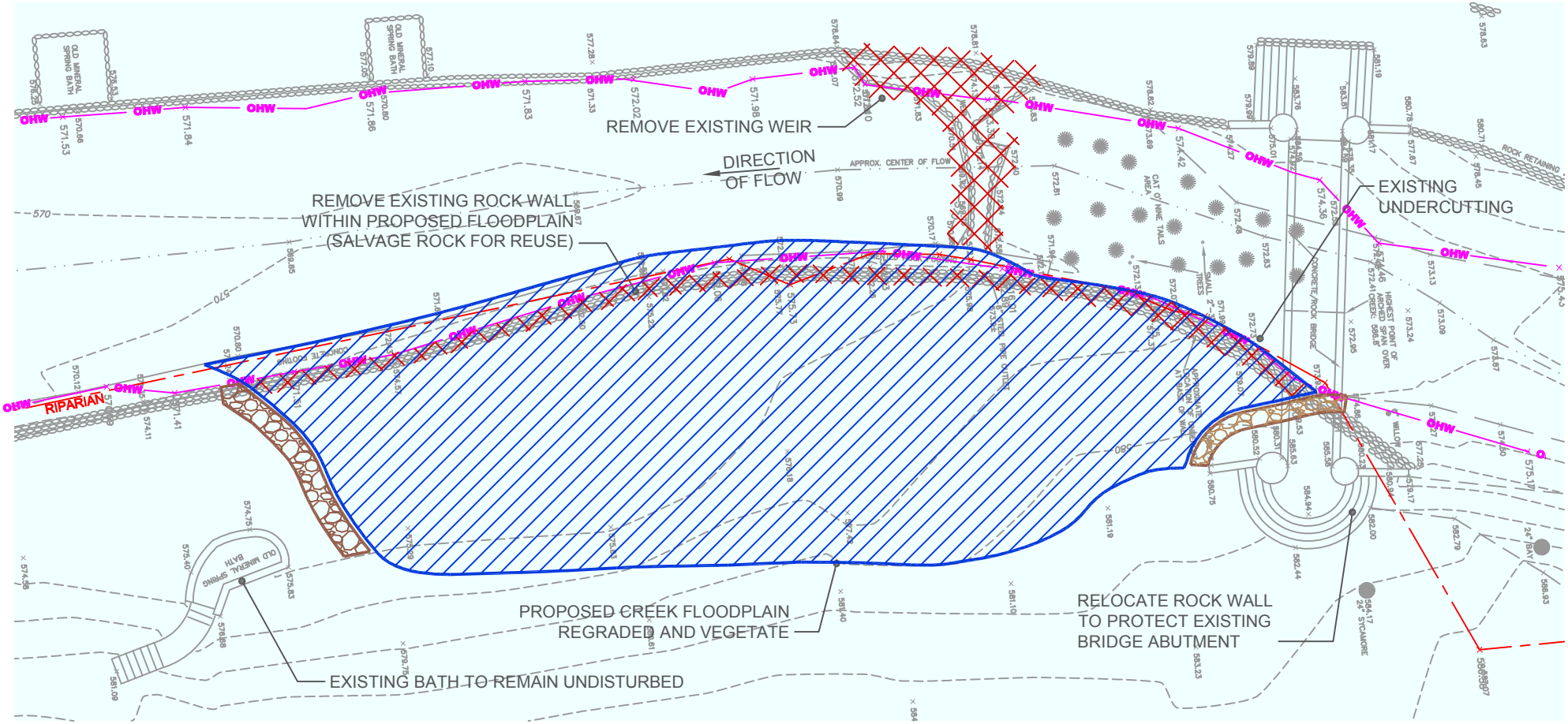
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 3
PROJECT 11
PROPOSED EROSION REPAIRS

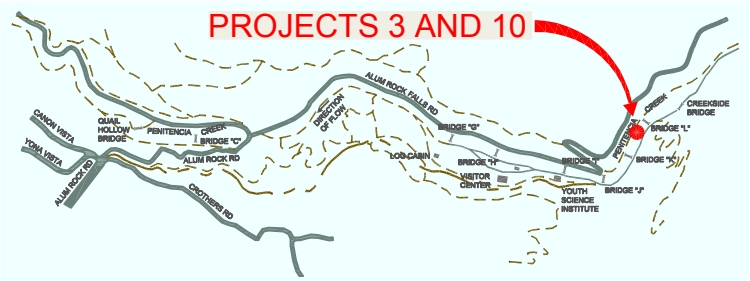
WINZLER & KELLY



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

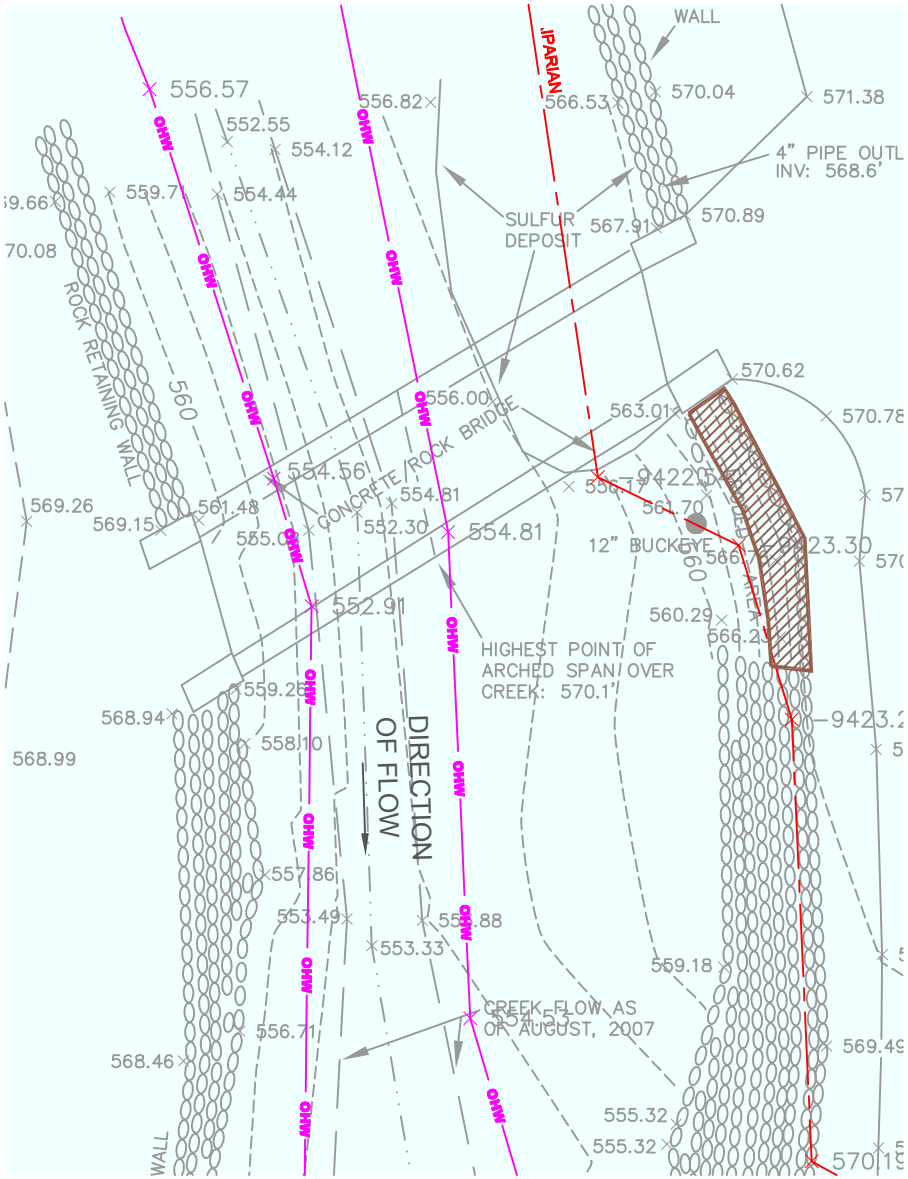
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

1"=20'

0' 10' 20' 40'

FIGURE 4
PROJECTS 3 AND 10
PROPOSED EROSION REPAIRS

WINZLER & KELLY



SITE PLAN

SCALE: 1"=10'

NORTH

KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

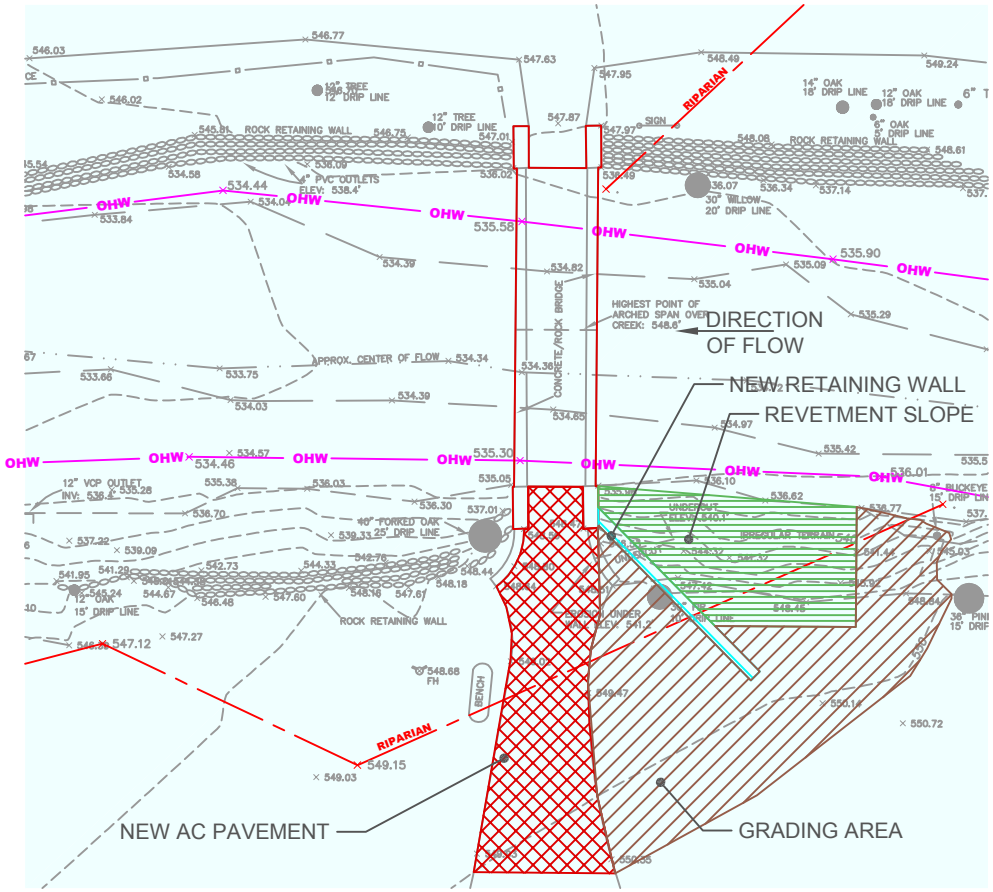
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

1"=10'

0' 5 10' 20'

FIGURE 5
PROJECT 4
PROPOSED DAMAGED WALL REPAIR

WINZLER & KELLY



SITE PLAN

SCALE: 1"=20'

NORTH

KEY MAP - ALUM ROCK PARK

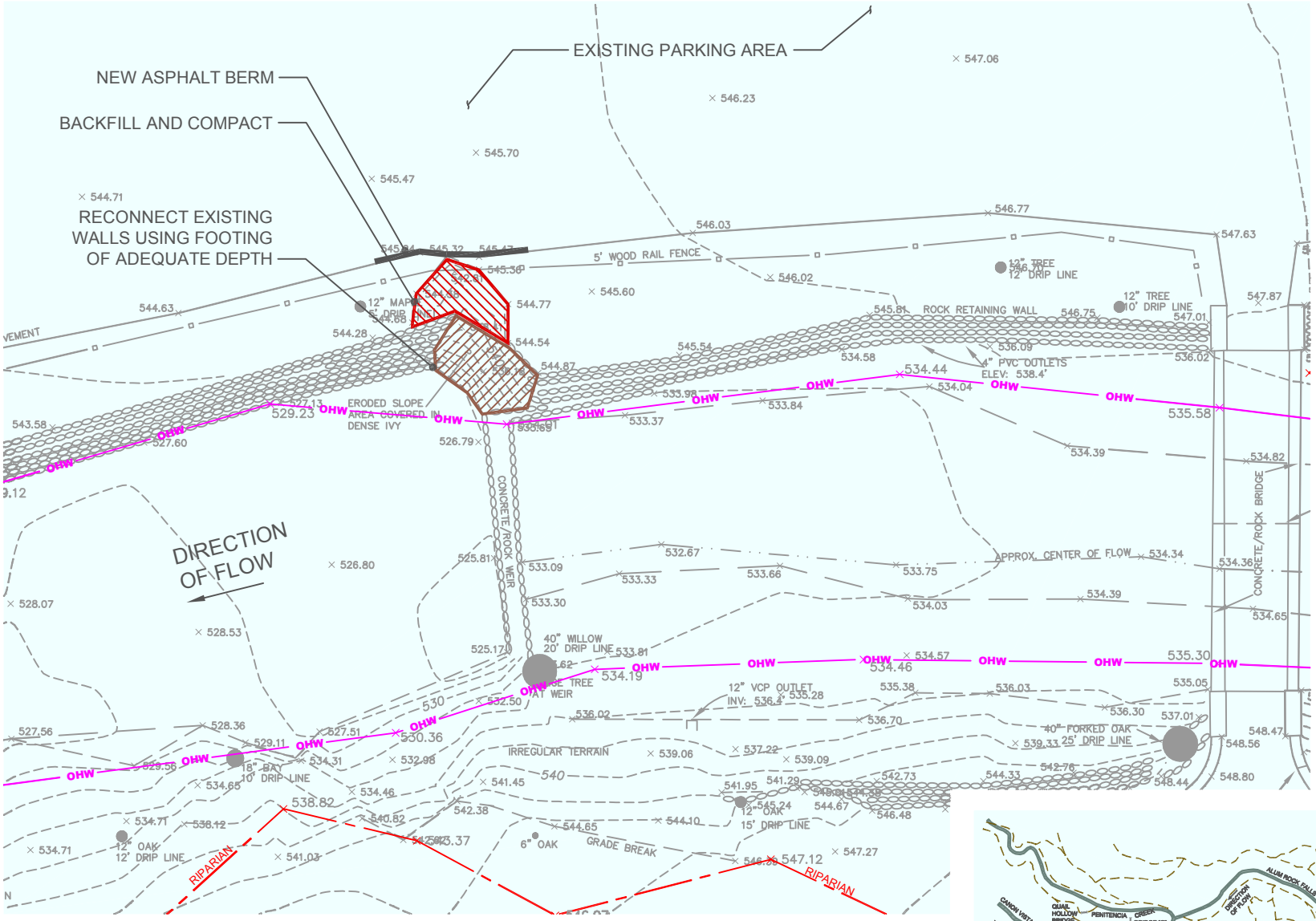
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 6
PROJECT 2
Y.S.I. BRIDGE REPAIRS

WINZLER & KELLY



SITE PLAN

SCALE: 1"=15'

NORTH

KEY MAP - ALUM ROCK PARK

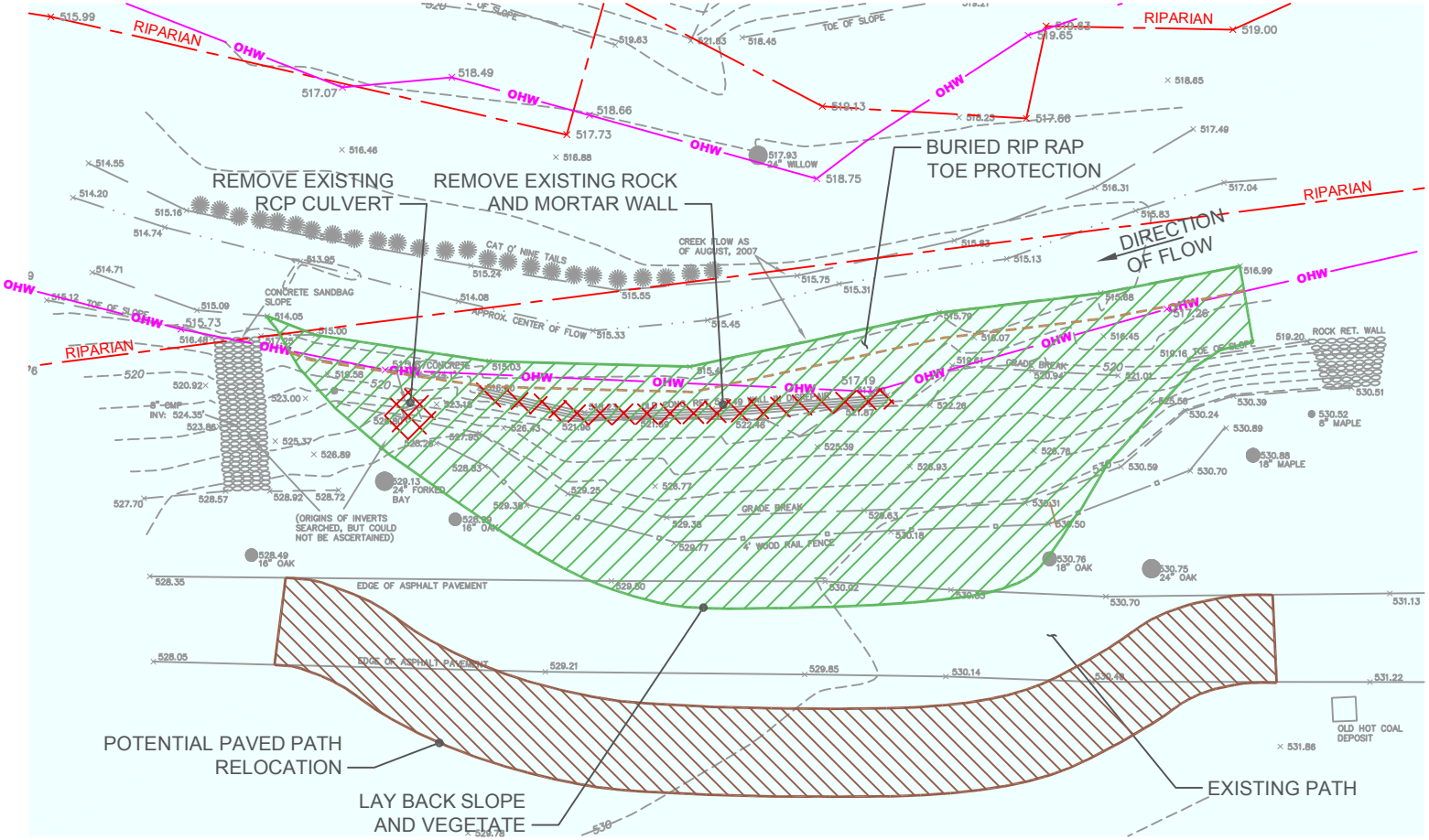
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 7
PROJECT 5
PROPOSED EROSION REPAIR

WINZLER & KELLY



SITE PLAN

SCALE: 1"=20'

NORTH

KEY MAP - ALUM ROCK PARK

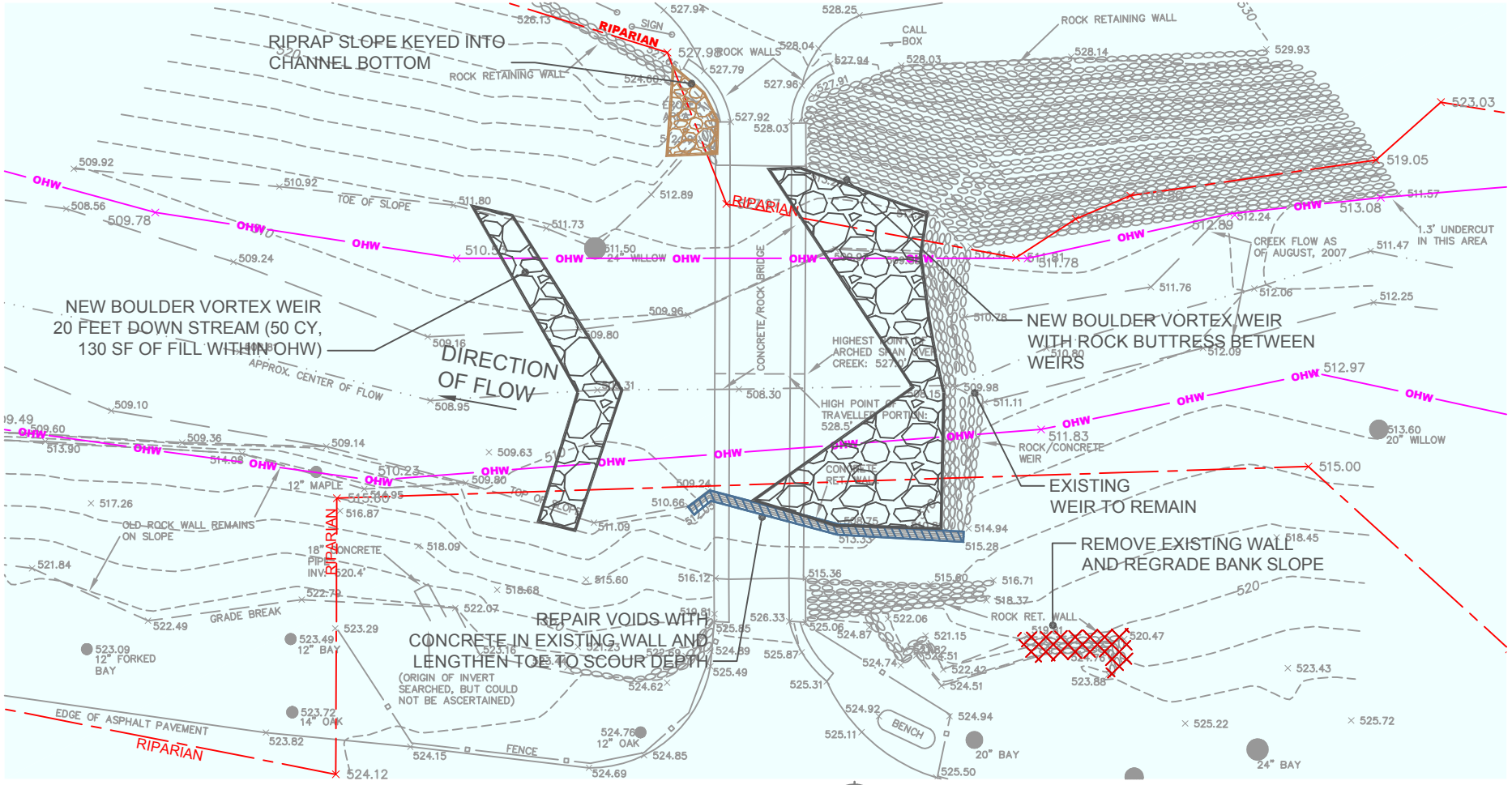
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 8
PROJECT 6
PROPOSED EROSION REPAIRS

WINZLER & KELLY



SITE PLAN

SCALE: 1"=15'

NORTH

KEY MAP - ALUM ROCK PARK

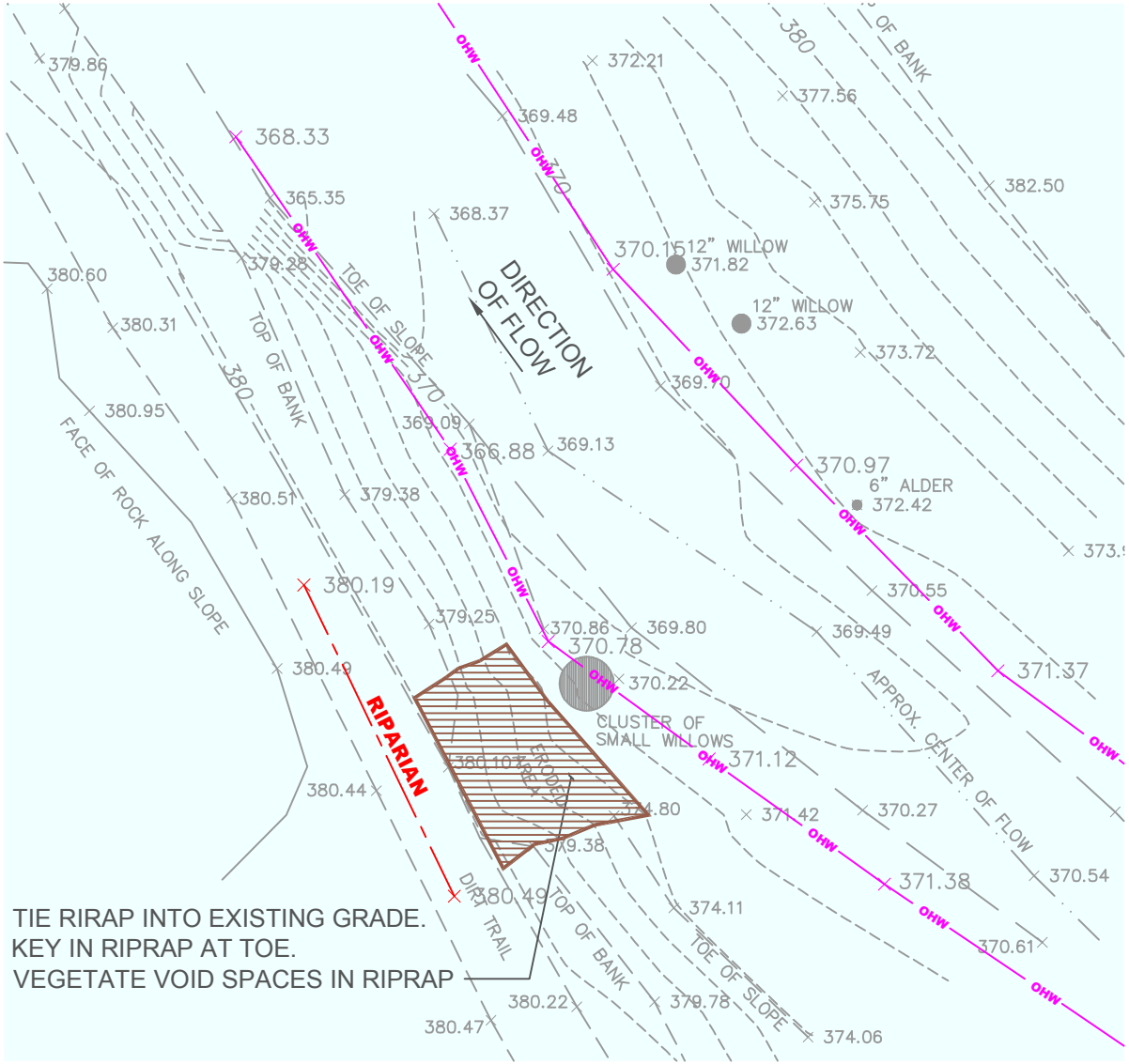
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 9
PROJECT 9
PROPOSED EROSION REPAIR

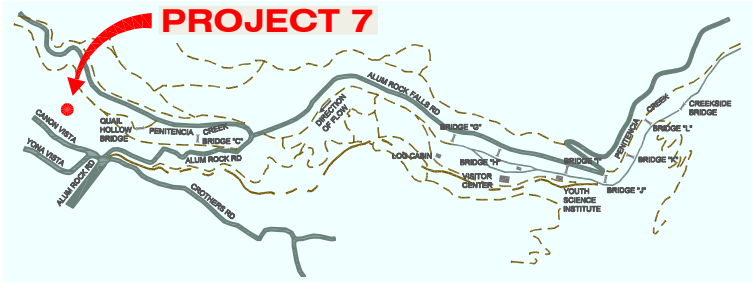
WINZLER & KELLY



SITE PLAN

SCALE: 1"=10'

NORTH



KEY MAP - ALUM ROCK PARK

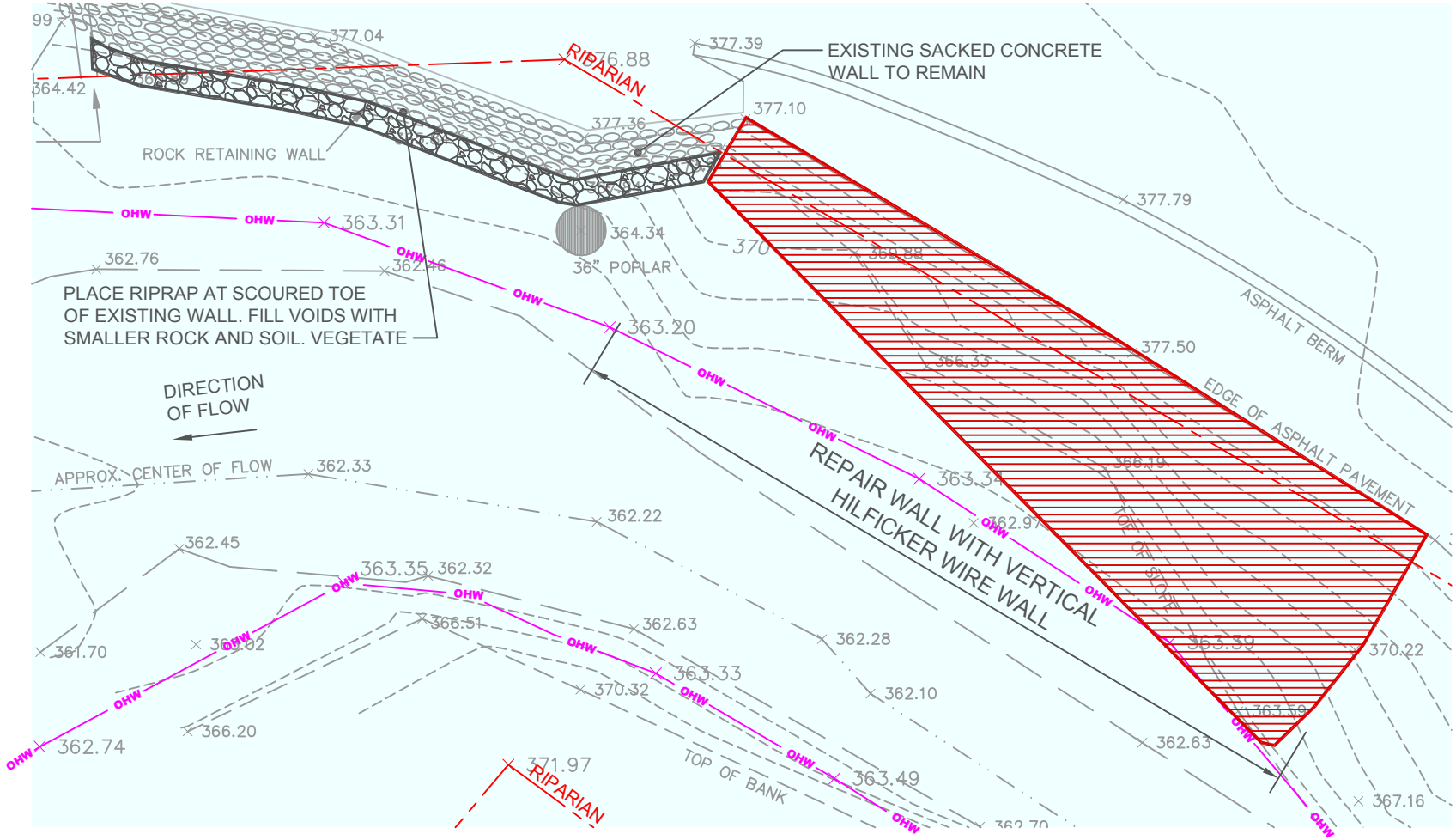
NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 6
PROJECT 7
PROPOSED EROSION REPAIR

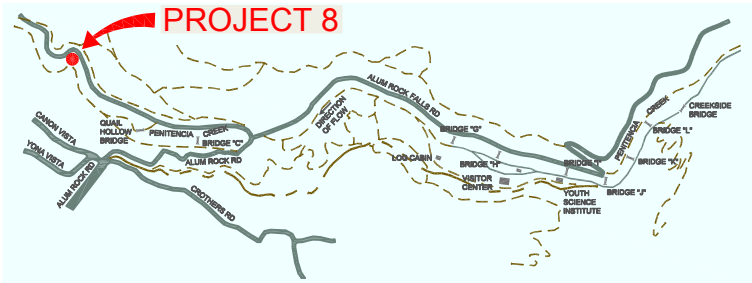
WINZLER & KELLY



SITE PLAN

SCALE: 1"=10'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

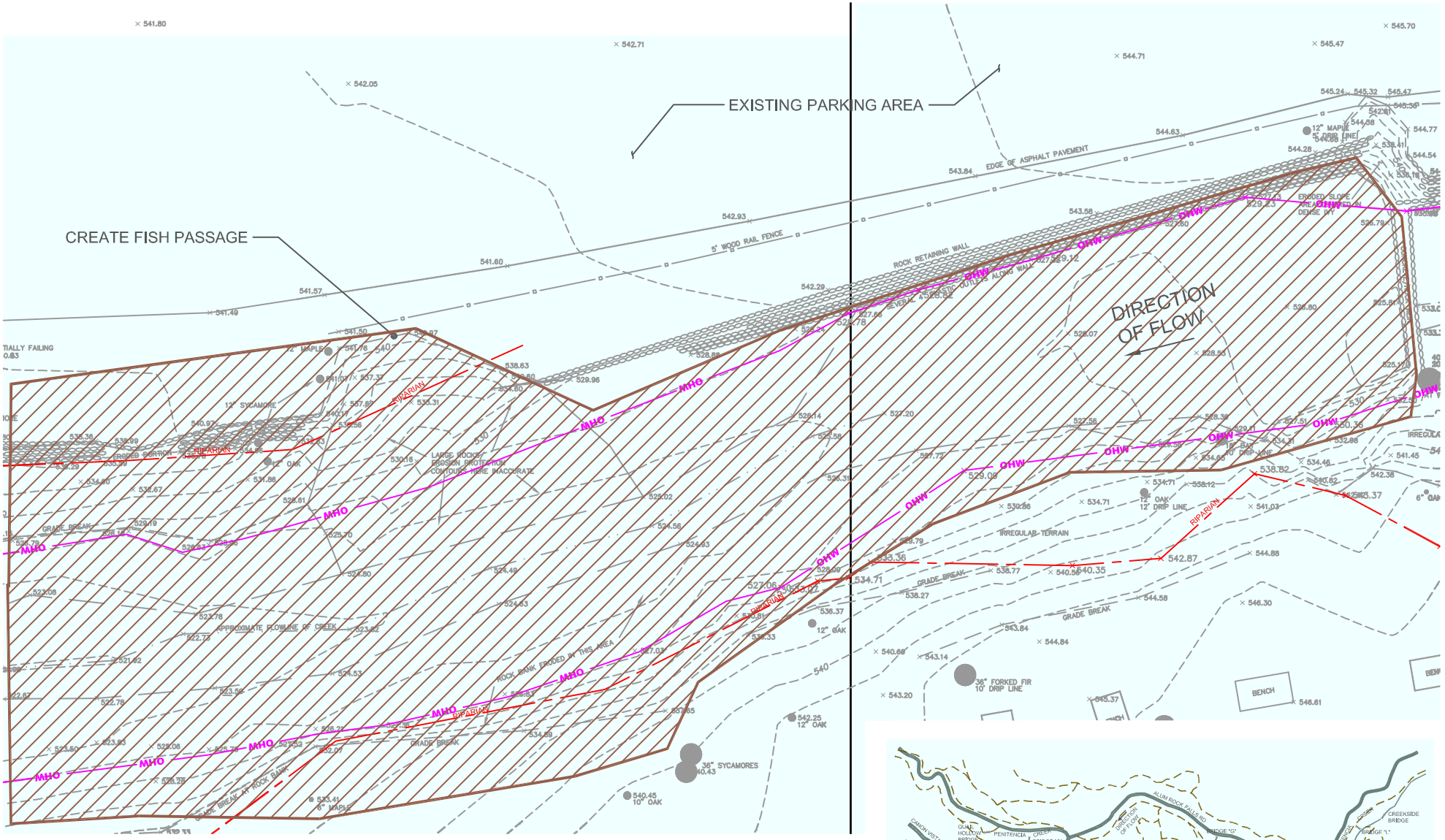
CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 11
PROJECT 8
PROPOSED EROSION REPAIR

WINZLER & KELLY

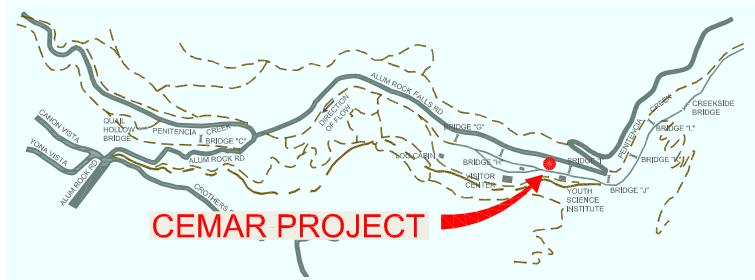
EXISTING GRADE



SITE PLAN

SCALE: 1"=20'

NORTH



KEY MAP - ALUM ROCK PARK

NORTH

CITY OF SAN JOSE
PARKS, RECREATION, AND NEIGHBORHOOD SERVICES
ALUM ROCK PARK

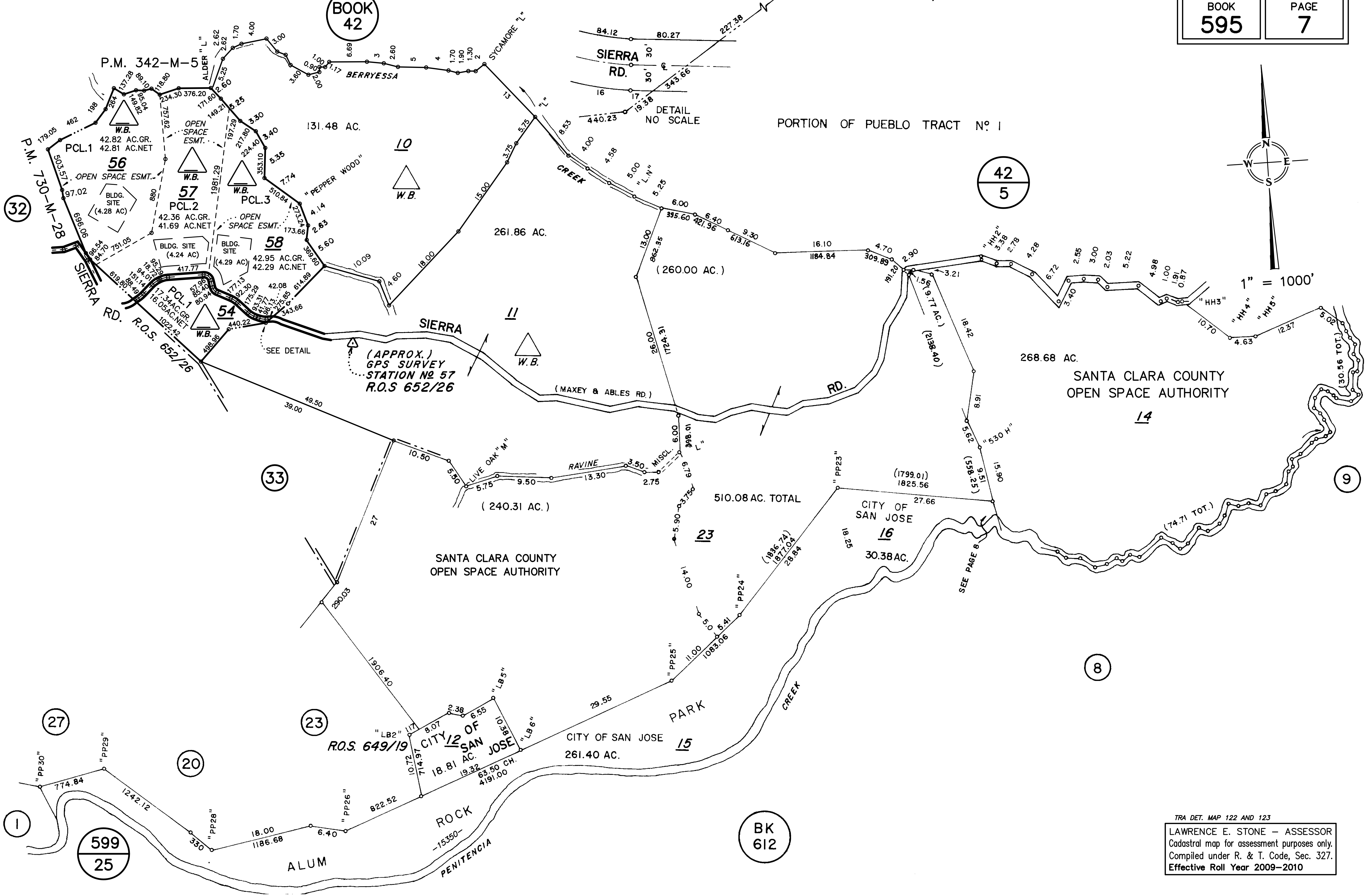
CONCEPTUAL PLANS
NOT FOR CONSTRUCTION

FIGURE 12
CEMAR PROJECT
PROPOSED FISH PASSAGE

WINZLER & KELLY

OFFICE OF COUNTY ASSESSOR — SANTA CLARA COUNTY, CALIFORNIA

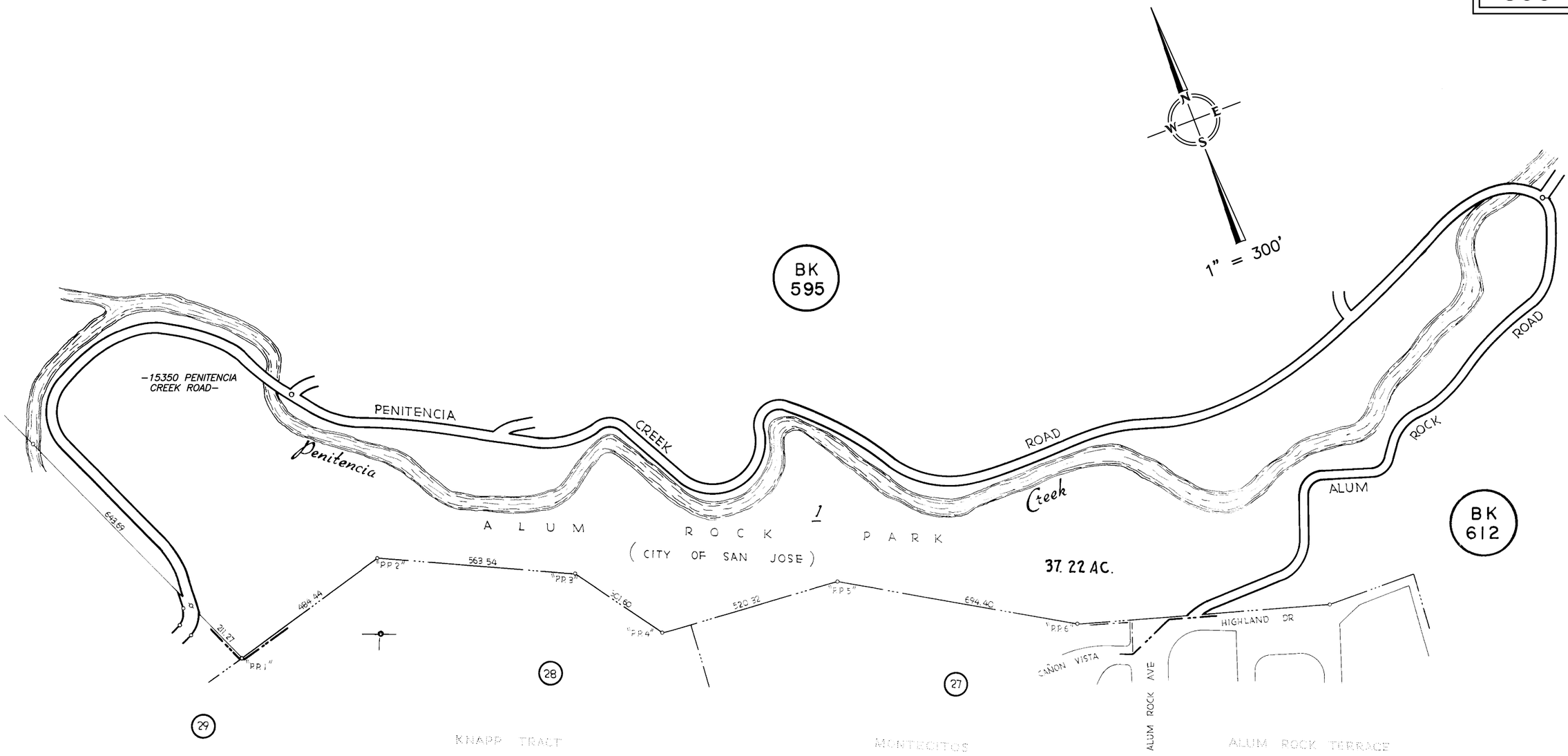
BOOK	PAGE
595	7



TRA DET. MAP 122 AND 123

LAWRENCE E. STONE – ASSESSOR
Cadastral map for assessment purposes only.
Compiled under R. & T. Code, Sec. 327.
Effective Roll Year 2009–2010

BOOK	PAGE
599	25



TRA DET. MAP 123

LAWRENCE E. STONE – ASSESSOR
Cadastral map for assessment purposes only.
Compiled under R. & T. Code, Sec. 327.
Effective Roll Year 2009–2010

OFFICE OF COUNTY ASSESSOR — SANTA CLARA COUNTY, CALIFORNIA

BOOK	PAGE
612	46

595

599

CITY of SAN JOSE

0.13 AC. 2

EXT OF ALUM ROCK

PENITENCIA CREEK

PENITENCIA

ROAD

ALUM ROCK FALLS ROAD

CREEK

1" = 600'

3

3.70 Ac. M
3
CITY OF S.J. (ALUM ROCK PARK)

UPPER PARK

EXIT

CROTHERS ROAD

45

2

4

—16260 Penitencia Creek Rd—

1
435.60 AC.

Alum Rock Park

CITY OF SAN JOSE

45

BK 595

BK 627

TRA DET. MAP 123

LAWRENCE E. STONE – ASSESSOR
Cadastral map for assessment purposes only.
Compiled under R. & T. Code, Sec. 327.
Effective Roll Year 2009–2010

Appendix B

Planting Site Plans

PLANT AND COMPOSITION SCHEDULE

RIPARIAN WOODLAND FISH PASSAGE — ACRES 0.06

OVERALL SPACING (FEET OFF CENTER)	QUANTITY PER ACRE	FREQUENCY (%)	SPECIES QUANTITY	VEGETATION STRATA/ SPECIES NAME	COMMON NAME	UNIT	SPACING TYPE	INDIVIDUAL SPACING (FT.)
ZONE 1								
18	134							
		30	2	*Quercus agrifolia*	COASTAL LIVE OAK	DP	RANDOM	36
		70	6	*Acer macrophyllum*	BIG LEAF MAPLE	DP	RANDOM	36
		100	8	= TOTAL				
12	303							
		60	11	*Sambucus mexicana*	BLUE ELDERBERRY	D6	RANDOM	15
		20	4	*Heteromeles arbutifolia*	TOYON	DP	RANDOM	26
		20	4	*Symphoricarpus alba*	SNOWBERRY	DP	RANDOM	26
		100	19	= TOTAL				
6	1210							
		25	18	*Prunus ilicifolia*	HOLLY LEAF CHERRY	TP	RANDOM	12
		10	7	*Rosa californica*	CALIFORNIA ROSE	DP	RANDOM	19
		25	18	*Rubus ursinus*	CALIFORNIA BLACKBERRY	D6	RANDOM	12
		15	11	*Melica torreyana*	TORREY MELICA	4" PLUG	RANDOM	15
		25	18	*Artemesia douglasiana*	MUGWORT	D6	RANDOM	12
		100	72	= TOTAL				
ZONE 2[1]								
5	1742						ACRES	0.05
		25	26	*Alnus rhombifolia*	WHITE ALDER	TP	CLUSTER	10
		75	78	*Salix lasiolepis*	ARROYO WILLOW	LIVESTAKES	CLUSTER	6
		100	104	= TOTAL				

1. ZONE TWO LIVESTAKE PLANTING IN CLUSTERS OF 2–3 STAKES AROUND THE BANKROCK

CONTAINER NAME SIZE USES

DP = DEEPOT 40 = 2 1/2" DIAMETER x 10" LONG
D6 = DEEPOT 16 = 2" DIAMETER x 7" LONG
TP = TREEPOT 4 = 4' SQUARE x 14" DEEP

PLANT AND COMPOSITION SCHEDULE

RIPARIAN WOODLAND EROSION CONTROL SEEDING LIST — ACRES 0.50

OVERALL SPACING (FEET OFF CENTER)	QUANTITY PER ACRE	FREQUENCY (%)	SPECIES QUANTITY	VEGETATION STRATA/ SPECIES NAME	COMMON NAME	UNIT	SPACING TYPE	INDIVIDUAL SPACING (FT.)
ZONE 3[1]								
NA	60							
		6 LBS/ACRE	3	*Bromus carinatus*	CALIFORNIA BROME	LB OF P.L.S. 76%	SEED	NA
		12 LBS/ACRE	6	*Elymus glaucus*	BLUE WILD RYE	LB OF P.L.S. 76%	SEED	NA
		11 LBS/ACRE	5.5	*Vulpia micorstachys*	THREE WEEK FESCUE	LB OF P.L.S. 76%	SEED	NA
		12 LBS/ACRE	6	*Hordeum branchyantherum*	MEADOW BARLEY	LB OF P.L.S. 76%	SEED	NA
		4 LBS/ACRE	2	*Tritolium tridentantum*	TOMCAT CLOVER	LB OF P.L.S. 76%	SEED	NA
		6 LBS/ACRE	3	*Lupinus nanus*	SKY LUPINE	LB OF P.L.S. 76%	SEED	NA
		3 LBS/ACRE	1.5	*Eschscholtzia california*	CALIFORNIA POPPY	LB OF P.L.S. 76%	SEED	NA
		6 LBS/ACRE	3	*Hordeum californium*	CALIFORNIA BARLEY	LB OF P.L.S. 76%	SEED	NA
		60 LBS/ACRE	30	= TOTAL				

1. EROSION CONTROL MIX SHALL BE APPLIED ON AREAS DEPICTED ON THE DRAWINGS AND IN ANY LOCATIONS THAT HAS DISTURBED OR BARE SOIL RESULTING FROM CONSTRUCTION (INCLUDING SKID ROUTES).

PLANT AND COMPOSITION SCHEDULE

FLOODPLAIN CREATION AREA

OVERALL SPACING (FEET OFF CENTER)	QUANTITY PER ACRE	FREQUENCY (%)	SPECIES QUANTITY	VEGETATION STRATA/ SPECIES NAME	COMMON NAME	UNIT	SPACING TYPE	INDIVIDUAL SPACING (FT.)
ZONE 4 (FLOODPLAIN)								
5	1742						ACRES	0.05
		40	49	*Alnus rhombifolia*	WHITE ALDER	TP	TRIANGULAR	8
		60	73	*Salix lasiolepis*	ARROYO WILLOW	LIVESTAKES	TRIANGULAR	6
		100	122	= TOTAL				
10	436						ACRES	0.07
		100	30	*Scirpus robustus*	COMMON BULRUSH	TB	RANDOM	10
		100	30					
6	1210							
		30	25	*Artemesia douglasiana*	MUGWORT	D6	RANDOM	11
		5	4	*Mimulus guttatus*	COMMON MONKEYFLOWER	4" PLUG	RANDOM	28
		30	25	*Cyperus eragrostis*	NUT–SEDGE	TB	RANDOM	11
		30	25	*Carex nudata*	TORRENT SEDGE	TB	RANDOM	11
		5	4	*Stachys ajugoides*	HEDGE NETTLE	TB	RANDOM	28
		100	83	= TOTAL				
ZONE 5 (MID–TOP OF BANK)								
18	134						ACRES	0.06
		20	2	*Quercus agrifolia*	COASTAL LIVE OAK	TP	SCATTERED	35
		80	6	*Acer macrophyllum*	BIG LEAF MAPLE	TP	RANDOM	35
		100	8	= TOTAL				
10	436							
		15	4	*Sambucus mexicana*	BLUE ELDERBERRY	D6	RANDOM	25
		30	7	*Heteromeles arbutifolia*	TOYON	DP	RANDOM	19
		30	7	*Symphoricarpus alba*	SNOWBERRY	DP	RANDOM	19
		15	4	*Rosa californica*	CALIFORNIA ROSE	DP	RANDOM	25
		10	2	*Rubus ursinus*	CALIFORNIA BLACKBERRY	D6	RANDOM	35
		100	24	= TOTAL				
NA	60							
		8 LBS/ACRE	0.48	*Bromus carinatus*	CALIFORNIA BROME	LB OF P.L.S. 76%	SEED	NA
		10 LBS/ACRE	0.6	*Elymus glaucus*	BLUE WILD RYE	LB OF P.L.S. 76%	SEED	NA
		12 LBS/ACRE	0.72	*Vulpia micorstachys*	THREE WEEK FESCUE	LB OF P.L.S. 76%	SEED	NA
		10 LBS/ACRE	0.6	*Hordeum branchyantherum*	MEADOW BARLEY	LB OF P.L.S. 76%	SEED	NA
		4 LBS/ACRE	0.25	*Eschscholtzia california*	CALIFORNIA POPPY	LB OF P.L.S. 76%	SEED	NA
		6 LBS/ACRE	0.36	*Lupinus nanus*	SKY LUPINE	LB OF P.L.S. 76%	SEED	NA
		2 LBS/ACRE	0.12	*Tritolium tridentantum*	TOMCAT CLOVER	LB OF P.L.S. 76%	SEED	NA
		8 LBS/ACRE	0.48	*Hordeum californium*	CALIFORNIA BARLEY	LB OF P.L.S. 76%	SEED	NA
		60 LBS/ACRE	3.61	= TOTAL				

DP = DEEPOT 40 = 2 1/2" DIAMETER x 10" LONG
D6 = DEEPOT 16 = 2" DIAMETER x 7" LONG
TP = TREEPOT 4 = 4' SQUARE x 14" DEEP
TB = TREEBAND 2 = 2.25" SQUARE x 3.75" DEEP

PLANT AND COMPOSITION SCHEDULE

MITIGATION TREES — ACRES NA

SPECIES QUANTITY	VEGETATION STRATA/ SPECIES NAME	COMMON NAME	UNIT	SPACING TYPE
15	*Quercus agifolia*	COASTAL LIVE OAK	15–GALLON CONTAINER	AS SHOWN ON DRAWINGS FP–L002, FP–L003 AND FP–L006
8	*Acer macrophyllum*	BIG LEAF MAPLE	15–GALLON CONTAINER	AS SHOWN ON DRAWINGS FP–L002, FP–L003 AND FP–L006
7	*Umbellularia californica*	CALIFORNIA BAY	15–GALLON CONTAINER	AS SHOWN ON DRAWINGS FP–L002, FP–L003 AND FP–L006
30	= TOTAL			

LEGEND

- ZONE 1 PLANTING, SEE TABLES
- ZONE 2 PLANTING, SEE TABLES
- ZONE 3 PLANTING, SEE TABLES
- ZONE 4 PLANTING, SEE TABLES
- ZONE 5 PLANTING, SEE TABLES

SYMBOLS FOR MITIGATION TREES

- (N) OAK TREE
- (N) MAPLE TREE
- (N) BAY TREE
- —W— DOMESTIC WATER IRRIGATION PIPING
- UTILITY BOX

ABBREVIATIONS

LB	POUNDS
PLS	PURE LIVE SEED

FOR REFERENCE ONLY

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20131024	AT	MN	RK	REQUEST FOR PROPOSAL

DESIGNED BY R. KEISH
DRAWN BY A. TOLENTINO
CHECKED BY M. NG
IN CHARGE R. KEISH
DATE

HNTB Corporation
Engineers Architects Planners
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005
Tel (408) 451-7300
Fax (408) 451-6942

SUBMITTED _____ APPROVED _____

NOT FOR CONSTRUCTION

BART SILICON VALLEY BERRYESSA EXTENSION

SVRT ENVIRONMENTAL
MITIGATION – PLANT ESTABLISHMENT
ATTACHEMENT B
REFERENCE DRAWINGS – ALUM SITE
PLANTING & IRRIGATION LEGEND
SHEET 6 OF 15

CADD FILENAME C801–S–DD–L001.dwg
SIZE D | SCALE NONE
CONTRACT NO. C801 | REV. A
AREA CODE DD | SHEET NO. L001 | PAGE NO. 06

Tolentino_A Oct 22, 2013 – 9:13am V:\Phase 2 Design\ARCHIVE–CADD\C801\DD – REFERENCE DRAWINGS – ALUM ROCK SITE\C801–S–DD–L001.dwg

NOTE:

FOR LEGEND, SYMBOLS, AND ABBREVIATIONS, SEE DRAWINGS DD–L001 & DD–X003

N

APPROXIMATE LIMITS OF PROJECT, TYP

APPROXIMATE LIMITS OF DISTURBANCE, TYP

MATCH LINE SEE DWG NO. DD–L003

CB

APPROXIMATELY 433 SF (ZONE 2)

RED WILLOWS

QUANTITIES ARE SHOWN THROUGH STA 3+90, TYP

APPROXIMATELY 484 SF (ZONE 2)

RED WILLOWS

APPROXIMATELY 564 SF (ZONE 1)

APPROXIMATELY 1525 SF (ACCESS RD – ZONE 3)

APPROXIMATELY 458 SF TO MATCHLINE (ZONE 3 – IRRIGATION TRENCHES)

8 WILLOW CUTTINGS

WOOD RAIL FENCE

SITE ACCESS VIA SERVICE ROAD, SEE DRAWING DD–C002

1+00 1+50 2+00 2+50 3+00 3+50

PLAN
SCALE: 1"=10'

FOR REFERENCE ONLY

10' 0' 10' 20'
GRAPHIC SCALE

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20131024	AT	MN	RK	REQUEST FOR PROPOSAL

DESIGNED BY R. KEISH
DRAWN BY A. TOLENTINO
CHECKED BY M. NG
IN CHARGE R. KEISH
DATE

HNTB Corporation
Engineers Architects Planners
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005
Tel (408) 451-7300
Fax (408) 451-6942

SUBMITTED _____ APPROVED _____

NOT FOR CONSTRUCTION

BART SILICON VALLEY BERRYESSA EXTENSION

SVRT ENVIRONMENTAL MITIGATION – PLANT ESTABLISHMENT
ATTACHMENT B
REFERENCE DRAWINGS – ALUM ROCK SITE
PLANTING PLAN: FISH PASSAGE & RILL REPAIR SITE
SHEET 7 OF 15

CADD FILENAME			
C801–S–DD–L002.dwg			
SIZE	SCALE		
D	1"=10'		
CONTRACT NO.		REV.	
C801		A	
AREA CODE	SHEET NO.	PAGE NO.	
DD	L002	07	

Tolentino_A Oct 22, 2013 – 9:13am V:\Phase 2 Design\ARCHIVE–CADD\C801\DD – REFERENCE DRAWINGS – ALUM ROCK SITE\C801–S–DD–L002.dwg

NOTE:

FOR LEGEND, SYMBOLS, AND ABBREVIATIONS, SEE DRAWINGS DD–L001 & DD–X003.

N

MATCH LINE
SEE DWG NO. DD–L002

APPROXIMATE LIMITS OF PROJECT, TYP

APPROXIMATELY
70 SF (ZONE 3)

APPROXIMATE LIMITS
OF DISTURBANCE, TYP

APPROXIMATELY
512 SF (ZONE 2)

YELLOW WILLOW

YELLOW WILLOW

QUANTITIES ARE SHOWN
FROM STA 3+90, TYP

APPROXIMATELY
527 SF (ZONE 2)

RED WILLOW

RED WILLOW

APPROXIMATELY
1958 SF (ZONE 1)

APPROXIMATELY
179 SF
(ZONE 2)

4+00

4+50

5+00

5+50

6+00

6+50

APPROX 189 SF
(ZONE 3 –
IRRIGATION TRENCH)

WOOD RAIL FENCE

WOOD RAIL FENCE

APPROX 48 SF TO MATCHLINE
(ZONE 3 – IRRIGATION
TRENCH)

APPROX 289 SF
(ZONE 3 –
IRRIGATION TRENCH)

WATER VALVE

SITE ACCESS VIA SERVICE ROAD,
SEE DRAWING DD–C002

PLAN
SCALE: 1"=10'

FOR REFERENCE ONLY

10' 0' 10' 20'
GRAPHIC SCALE

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20131024	AT	MN	RK	REQUEST FOR PROPOSAL

DESIGNED BY R. KEISH
DRAWN BY A. TOLENTINO
CHECKED BY M. NG
IN CHARGE R. KEISH
DATE

HNTB Corporation
Engineers Architects Planners
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005
Tel (408) 451-7300
Fax (408) 451-6942

SUBMITTED _____ APPROVED _____

NOT FOR CONSTRUCTION

BART SILICON VALLEY BERRYESSA EXTENSION

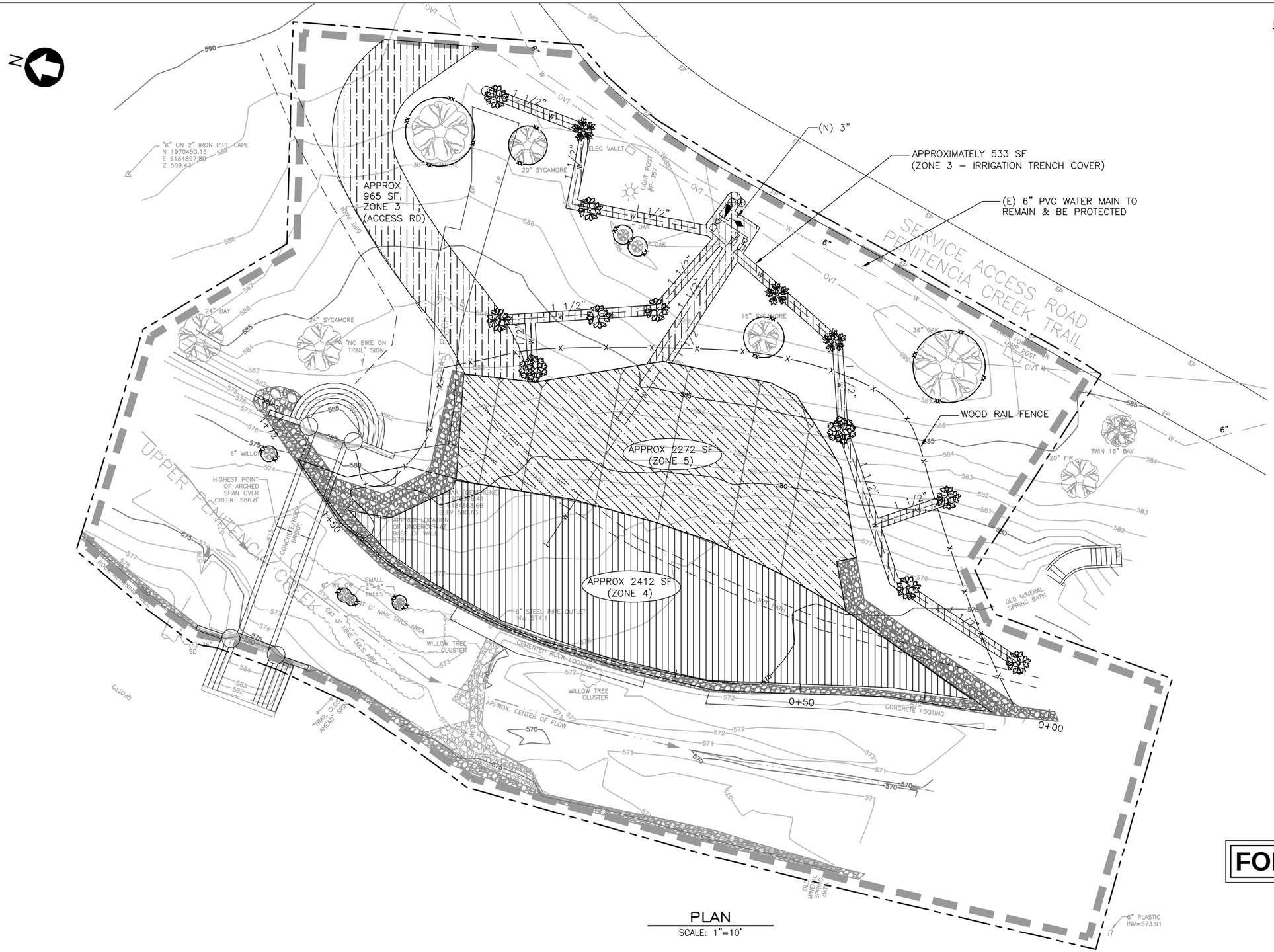
SVRT ENVIRONMENTAL
MITIGATION – PLANT ESTABLISHMENT
ATTACHMENT B
REFERENCE DRAWINGS – ALUM ROCK SITE
PLANTING PLAN: FISH PASSAGE & RILL REPAIR SITE
SHEET 8 OF 15

CADD FILENAME C801–S–DD–L003.dwg
SIZE D | SCALE 1"=10'
CONTRACT NO. C801 | REV. A
AREA CODE DD | SHEET NO. L003 | PAGE NO. 08

Oct 22, 2013 – 9:13am M:\Phase 2 Design\ARCHIVE–CADD\C801\DD – REFERENCE DRAWINGS – ALUM ROCK SITE\C801–S–DD–L003.dwg
Tolentino_A

NOTE:

FOR LEGEND, SYMBOLS, AND ABBREVIATIONS, SEE DRAWINGS DD-L001 AND DD-X003.



PLAN
SCALE: 1"=10'

FOR REFERENCE ONLY

10' 0' 10' 20'
GRAPHIC SCALE

REV	DATE	BY	SUB	APP	DESCRIPTION
A	20131024	AT	MN	RK	REQUEST FOR PROPOSAL

DESIGNED BY R. KEISH
DRAWN BY A. TOLENTINO
CHECKED BY M. NG
IN CHARGE R. KEISH
DATE

HNTB Corporation
Engineers Architects Planners
1735 Technology Drive, Suite 650
San Jose, CA 95110-1005
Tel (408) 451-7300
Fax (408) 451-6942

SUBMITTED _____ APPROVED _____

NOT FOR CONSTRUCTION

BART SILICON VALLEY
BART SILICON VALLEY BERRYESSA EXTENSION

SVRT ENVIRONMENTAL
MITIGATION – PLANT ESTABLISHMENT
ATTACHMENT B
REFERENCE DRAWINGS – ALUM ROCK SITE
PLANTING PLAN: FLOOD PLAIN EXPANSION SITE
SHEET 11 OF 15

CADD FILENAME C801-S-DD-L006.dwg
SIZE D | SCALE 1"=10'
CONTRACT NO. C801 | REV. A
AREA CODE DD | SHEET NO. L006 | PAGE NO. 11

Tolentino_A Oct 22, 2013 - 3:47pm C:\Documents and Settings\tolentino_a\My Documents\PLOT\C801-S-DD-L006.dwg

Appendix C

Permanent Photo Documentation Stations and Miscellaneous Site Photos

Photo Station 1

Photo Station 2

Photo Station 3 (Panorama). In order: SW, NW, SE, NE

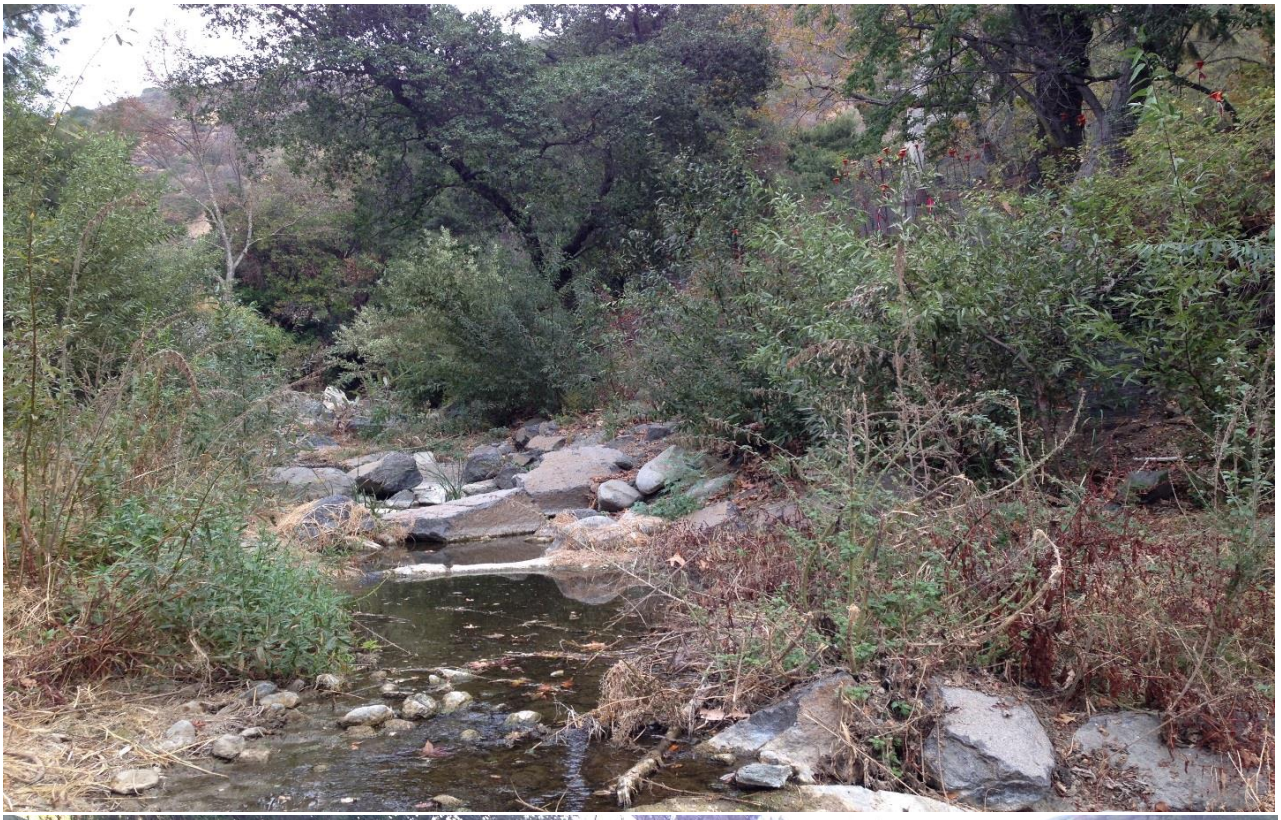


Photo Station 4

Miscellaneous Photos

Photo 1. Looking west from YSI Bridge (Zones 1 and 2)

Photo 2. Looking southwest from north bank (Zones 1 and 2)

Photo 3. Looking northeast to floodplain from pedestrian path (Zones 4 and 5).

Photo 4. Looking south at Zone 4 from north bank of creek.

Appendix D

Geomorphic Monitoring Report and Monitoring Plan

Balance Hydrologics, Inc.®

800 Bancroft Way • Suite 101 • Berkeley, CA 94710 • (510) 704-1000
224 Walnut Avenue • Suite E • Santa Cruz, CA 95060 • (831) 457-9900
PO Box 1077 • Truckee, CA 96160 • (530) 550-9776
www.balancehydro.com • email: office@balancehydro.com

February 9, 2015

Ms. Ann Calnan
Senior Environmental Planner
Santa Clara Valley Transportation Authority
3331 North First Street, Building B-2
San Jose, California 95134-1927

Submitted via email

Dear Ms. Calnan,

We are pleased to provide you with the annual report for Water Year[1] 2014 (WY2014) geomorphic and hydrologic monitoring of the Alum Rock Fish Passage Project along Upper Penitencia Creek in Alum Rock Park in the City of San Jose. The project provides mitigation for the Santa Clara Valley Transportation Authority (VTA) Mission-Warren Truck Rail Project.

Geomorphic monitoring of this mitigation project began in September 2013 and will extend for a 5-year period through WY2018. The work is being conducted by Balance Hydrologics, Inc. staff geomorphologists and hydrologists. The following provides a brief description of the project sites, the monitoring methods established at these sites, and discussion of the data collected in September, 2014 in relation to baseline conditions.

Site Description and Monitoring Criteria

Project Site 13 is a recently constructed (Summer 2012) fish passage project located directly downstream of the Youth Science Institute (YSI) Bridge (**Figure 1**). The fish passage is situated in a straight, deeply incised portion of the channel that is adjacent to a parking lot on the right bank, and the grounds of YSI on the left bank[2]. The passage is about 300 feet in length, and consists of a series of pools, chutes, rock band structures, and one modified concrete grade control structure, designed to slow water velocity through the reach, prevent erosion, and control grade. The uppermost rock band structure in the original channel design failed in the first year's set of storms (i.e. two large storms in December, 2012). The rock bank structure was rebuilt in mid-September, 2013, after which all monitoring work commenced.

Project Site 10 is a recently constructed (Summer 2012) floodplain about 120 feet long by 30 to 40 feet wide that begins just south of Bridge L (**Figure 2**). The elevated floodplain has been designed to be

[1] A Water Year (WY) is defined as that period from October 1st of a preceding year through September 30th of the following year, and is named according to the following year. For example, WY 2014 occurred from October 1, 2013 through September 30, 2014.
[2] Right and left bank orientation referred to in this document is from the perspective of looking downstream.

inundated periodically during high flows, and has been planted with riparian vegetation, including willow and alder saplings.

Per the National Marine Fisheries Service (NMFS) Biological Opinion (June 2012) and the Regional Water Quality Control Board (RWQCB) 401 certification (July 2012), the mitigation project has several success criteria that are characterized by the development of post-construction conditions, which must be assessed through qualitative and quantitative monitoring techniques. Each year, the monitoring program will focus on assessing geomorphic conditions of the project sites, characterizing hydrologic conditions over the past water year, and using these data and observations to assess the evolution, condition, and functionality of the fish passage and floodplain. The end of water year geomorphic and hydrologic monitoring is designed to address the following questions:

- Will the sizes and shapes of the pools, chutes, rock band structures, and floodplain benches evolve? Will the riffles or pools aggrade or scour?
- Will connections of the main channel to the newly constructed floodplain change significantly over the short term?
- Will the bed composition of the channel change based on visual assessments? Will sedimentation on the floodplain affect its functionality?
- Will the floodplain flood every 1 to 2 years? Will the creek corridor thalweg, pools and riffles, floodplain benches, banks and backwater wetlands be stable?
- Will the stream corridor increase in habitat complexity? Will woody debris be deposited in the reach?

Assessment of these questions will be undertaken with the geomorphic and hydrologic monitoring methods described below.

Monitoring Methods

Hydrologic Monitoring

Because high flows in storm events are the main agent of geomorphic change in the project sites, and the most important test of the functionality of the fish passage and floodplain, hydrologic data is monitored over the course of the year. These data include water level measurements within the channel and summaries of year-round precipitation measurements from area gages. To provide context for the hydrologic and geomorphic data collected at Alum Rock, we present precipitation data from two nearby stations: the California Irrigation Management Information System (CIMIS) station in Union City (Station 171) and the Weather Underground Station KCASANJO17 (Berryessa, hereafter). The Berryessa weather station is located approximately 4 miles west of the Alum Rock mitigation site and the Union City CIMIS station is approximately 19 miles northwest of the mitigation site. The Berryessa and Union City rainfall station locations are characterized by a mean annual rainfall total similar to that for the Alum Rock mitigation site. The records from these stations will be compared to each other to check for consistency, as well as compared with other area gages as needed. The San Jose Airport station (KSJC) precipitation record is used for comparing WY2014 precipitation records to long-term averages; however,

this record will not be used for analysis of individual storms as it was found to have missing values in WY2012 and WY2013.

Monitoring efforts at Project Site 10 included installation of two gages. Each gage consists of a self-contained water level recorder that records water depth and temperature[3] every 15 minutes, paired with a staff plate, a vertical ruler adjacent to the logger that is used for manual readings of water level. Staff plate readings are used to calibrate the depth data continuously recorded by the logger. The two gages were installed on September 26, 2013 directly adjacent to the floodplain. Locations of these gages are shown in **Figure 2**. One gage, referred to hereafter as the "in-channel gage", was positioned to continuously record water surface elevations at baseflow conditions. Because the bank geometry is complex and dense riparian vegetation is present, which may deflect flows and obscure our understanding of floodplain inundation, a second gage was positioned up-slope with the intent that it will capture any overbank water surface elevations that are inundating the floodplain during high flow events. This gage is hereafter referred to as the "overbank gage".

The water levels recorded at the project site will be compared to those recorded at the Santa Clara Valley Water District's Upper Penitencia Creek at Dorel Drive gage (Dorel, hereafter). This is a low-flow gage that has been operated by the SCVWD since 1935, excepting a period from 1961 to 1987 when it was operated by the USGS. Records of 15 minute stage and discharge extend from 1935 to the present. The Dorel WY2014 record will be compared to the project site gages to check for consistency, and to estimate discharge at the project site.

Geomorphic Monitoring, Project Site 13 (Fish Passage)

Quantitative surveys

Monitoring criteria for channel evolution asks if the of pools, chutes, rock band structures, and floodplain benches evolved and if aggradation or scour took place over the year. To quantitatively address these questions, seven cross-sections and one longitudinal profile were surveyed within the fish passage site on September 23, 2014 (shown in planview, **Figure 1**). These profiles were originally established and surveyed in September 2013 for the purpose of establishing baseline conditions and documenting channel form soon after construction. All subsequent surveys, including the September 2014 survey, will be compared to the baseline survey as a quantitative method for tracking aggradation and scour in the channel and assessing damage, if any, to constructed elements such as rock band structures and pools. Cross sections (XS) were selected to represent a range of constructed geomorphic structures: XS 1 and XS 4 cross the channel at the upstream portion of chutes. XS 2, 3 and 5 cross the channel through portions of pools 1, 2, and 4, respectively. XS 6 was established at the rock structure that forms the upstream edge of pool 5. XS 7 crosses at the downstream end of the final chute. The longitudinal profile survey begins at pedestrian bridge "L" (Station 0 feet) and continues downstream approximately 300 feet through five constructed pools and six constructed chutes.

The September 2014 survey was performed using the existing project benchmarks and datum established during construction, as well as temporary benchmarks established by Balance during the September 2013

[3] Temperature data is not presented here, but has been archived and is available upon request.

survey. The survey was conducted with total station equipment. Survey was based on site control established during the construction phase, and therefore elevations and locations are in the project datum. Microsoft Excel™ and GIS software were used to compare this year's survey to the baseline survey. Cross sections and longitudinal profile repeated in this year's survey were plotted against the benchmark survey profiles as a visual assessment of geomorphic change.

Geomorphic Visual Observations

Ten photo point locations were established in the fall of 2013 (**Figure 1**, PP #1 to #10), with an initial set of photos taken to record existing conditions. Repeat photographs were taken at each of the photo points to document year-to-year geomorphic change. Additional observations were noted, including composition of the bed, the presence of woody debris, and habitat complexity for steelhead, as well as the geomorphic evolution of pools and rock band structures.

Geomorphic Monitoring, Project Site 10 (Floodplain)

Quantitative Surveys

Two cross-sections and one floodplain elevational profile were surveyed on September 23, 2014. At this site, the term floodplain elevational profile, or elevational profile, is used to distinguish it as a profile that extends across the floodplain, parallel to but not within the channel. This is distinct from a longitudinal profile, a term used to refer to a survey of the deepest part of a channel, or thalweg. The elevational profile survey for the Site 10 floodplain was conducted in the central portion of the floodplain, parallel to the channel, showing the overall slope and topography. Cross sectional profiles 101 and 102 (**Figure 2**) were taken at the upstream and downstream ends of the floodplain, and included the floodplain, the rock wall that bounds the floodplain near the creek, the active channel, and then across the existing pathway on river right and onto the adjacent hillslope. These profiles will be re-surveyed on a yearly basis to measure any potential changes to floodplain geometry.

To directly measure sedimentation on the floodplain, Balance staff installed two sedimentation plates (~square-foot plates mounted at the ground surface on a shaft driven into the floodplain) at the site (shown in **Figure 2**). On September 23, 2014 Balance staff measured the depth of accumulated sediment (not including organic litter) at four locations on each plate, one at each of the four cardinal directions. The average depth of accumulated sediment for each sedimentation plate location is presented in the results.

Geomorphic Visual Observations

Six photo point locations were established in the fall of 2013, with an initial set of photos taken to record existing conditions. Repeat photographs were taken at each of the photo points to document year-to-year geomorphic change on the floodplain, and compared to the baseline photos.

Overview of Annual Conditions

Overall, WY2014 was characterized by dry conditions, with a few intermittent small storms elevating water levels slightly in the project sites. These storms had little ability to transport sediment, and as a result, geomorphic changes such as aggradation and scour were not observed in the project sites. The

precipitation received over the year was enough, however, to encourage vigorous vegetation growth at both sites, increasing habitat complexity and encouraging geomorphic stability in future years.

Hydrologic Monitoring Results

WY2014 was characterized by dry conditions in the Alum Rock Park area, with only about half of the average annual precipitation falling at nearby stations. Berryessa station received 8.41 inches of rainfall (**Figure 3**) equating to 6.68 inches less than the long-term average of 15.09 inches for the San Jose International Airport (KSJC), the closest long-term station. This station is only used for long-term averages, as in recent years storm precipitation records at this gage have been inconsistent. Union City CIMIS station received 7.97 inches of rainfall (**Figure 4**) or 7.12 less than the long-term average for at that location. The largest daily rainfall totals for the Union City station were recorded on November 20, 2013 (0.74 inches), February 28, 2014 (1.17 inches), and March 26, 2014 (0.62 inches). The Berryessa station's largest storms were on February 6, 2014 (0.76 inches), February 26, 2014 (0.70 inches), and February 28, 2014 (1.48 inches).A comparison of precipitation over time between both stations show peaks of similar size and duration during storm events.

Balance visited the site a total of six times during the rainy season to calibrate and download on-site logging pressure transducers. These data were used to create a continuous stage record for the site **(Figure 5).** Stage at the in-channel gage is plotted against time for the duration of the water year. Stage observations, superimposed as red squares on the time series, show stage observations used in calibrating the record. Also plotted is the stage record for the nearby Dorel gaging station. In general, stage at the in-channel gage and Dorel are well correlated, with similar response patterns to rainfall events.

Figure 5 also shows the relationship between precipitation and water levels recorded at the gaging station. In early- and mid-season (October to mid-February), peaks in the stage recorded and peaks in the precipitation record do not correlate in every event. For example, early season rain events (November 20, February 6) either do not produce peaks in stage, or produce very small peaks, at the in-channel gage. We surmise that the watershed was wetting up during this time period, and that soils were not saturated enough to produce a response in the channel at the gaging location. Also, there are some peaks in the stage record that do not have a corresponding precipitation event, or have a very small amount of precipitation associated with them (most notably on 12/8/2013, 12/16/2013 and 1/15/2014). In these instances, an increase in discharge can also be seen at Dorel. This may be the results of small isolated rainfall events that produce pockets of showers rather than widespread rain. The complex terrain of the hills near the Alum Rock stations may enhance this affect. It is possible that the creek rose due to a rain event that produced locally substantial precipitation in the watershed, but did not have the spatial extent to precipitate at nearby rain gages. It is also possible that the numerous seeps and springs in the Penitencia Creek Canyon are affecting baseflows in the channel. It is also possible that these flows are caused by releases from the upstream Cherry Flat Reservoir, which is owned and operated by the city of San Jose. Current beneficial uses of the reservoir's water include domestic, municipal and agricultural supply, fish spawning and freshwater habitat (Schaaf and Wheeler, 2009). Releases to Upper Penitencia Creek that may affect the Project Site may occur in relation to those beneficial uses, however the timing and volume of releases during WY14 is presently unknown.

The greatest response in stage to rainfall events at the Alum Rock in-channel gage are on 12/8/2013, and 4/1/2014, in which the stage peaked 1.26 feet and 1.33 feet, respectively.

Figure 6 shows the Alum Rock in-channel stage data converted to elevation in feet NAVD 88, from which displays the flow in the context of the elevation of the floodplain. Superimposed on this plot are portions of the flow record from the overbank gage. Due to the extremely dry year, this gage was out of the water for most of the year. Data recorded during these times were removed, and the peaks that represent inundation of the overbank gage are displayed in blue. Peaks at this gage do not necessarily represent inundation of the floodplain.

WY2014 was an exceptionally dry year, and runoff in the project area was primarily characterized as short-duration events (sometimes flow was elevated for as little as one hour). As a result, Balance staff were not able to be on site when the overbank gage was inundated and could not calibrate the logging pressure transducer record to the staff plate readings at the overbank gage. To tie in the gage to floodplain elevation, the elevation of the overbank peaks was matched to those recorded at the in-channel gage. The upper and lower extent of floodplain elevations adjacent to the gage are plotted with green dashed lines (**Figure 6**). This shows that while runoff events sometimes produced flow at the overbank gage, the floodplain, which is one to two feet above this gage, was not inundated this water year. We will endeavor to calibrate the overbank gage in the coming water year monitoring, and expect that the future years' data at the overbank gage will be calibrated to the staff plate and the project datum (NAVD 88).

A small daily fluctuation in water level is present in the in-channel gage stage record. The cause of this fluctuation is presently unknown, but we commonly observe natural daily fluctuations in stage during low flow periods due to changes in evapotranspiration, and even direct evaporation. We will continue to monitor these fluctuations during future site visits to assess the potential cause(s).

Hourly discharge records available from the Dorel gage can be used to approximate discharge at the Alum Rock sites. Maps of the watershed area were used to calculate the difference in drainage area between Balance's gage locations (in-channel and overbank) and the Dorel gage – Balance's gage locations are located at a drainage area of approximately 21 square miles, and the Dorel gage, located 2.5 miles downstream, is located at a drainage area of 22.3 or 22.3 square miles, and additional 1.3 square miles. In order to provide some context for flows to evaluate inundation at Project Site 10, the Dorel discharge record can be scaled by a factor of 0.94 to serve as rough estimate for discharge[4]. When flow reaches the overbank gage, the corresponding discharge at Dorel Creek is approximately 2.4 cubic feet per second (cfs). The corresponding scaled discharge required to inundate the overbank gage is 2.26 cfs.

As discussed above, the greatest peaks in stage at Project Site 10 occurred on 12/8/2013 and 4/1/2014. These stage peaks correspond to scaled discharges of 3.43 cfs on 12/8/2013 and 1.41 cfs on 4/1/2014.

[4] Stage and discharge data available through the SCVWD ALERT website is preliminary; information was not available on the Dorel gage flow rating curve and maintenance record. These data are used here for information purposes only.

Using Dorel discharge data to estimate flows at this site was necessary, as the short-duration runoff events and dry year precluded us from directly measuring discharge in WY2014. This, as well as recording staff plate measurements at Project Site 10, will be a priority in WY2015.

Geomorphic Monitoring Results, Project Site 13 (Fish Passage)

Visual Geomorphic Observations, Project Site 13

Visual inspections and photo point comparisons **(Figures 7-16)** of Project Site 13 show that the fish passage seems to be functioning as intended. Little to no erosion of the bed or construction elements was observed, and the structure was in good condition. Many fingerling fish were observed in pools throughout the reach. Bed substrates were of gravel to cobble size, with finer silts observed downstream. Some thin layers of "crunchy" bed materials were noticed on the bed at the top of reach about 50 feet downstream of the bridge; these may be mineral deposits from the flowing water that formed into hardened layers. However, because they were thin and not extensive, they are unlikely to have an effect on bed conditions. Thick algal mats were growing in some pools, and riparian vegetation growth was generally vigorous from the edges of the channel to the toe of the steepened slopes.

Some gravel appears to have been transported in the downstream sections of the fish passage. The thalweg at XS 7 has developed a narrow gravel bar. Near XS 6, a narrow channel with a gravel bar on the river left side has evolved, with a low floodway developing on the right bank. Gravel bars, along with increased riparian vegetation, are signs that habitat complexity is increasing within the pools and chutes of the structure.

Comparison of this year's photo points to the base condition photos shows an increase in riparian vegetation as the main change to the fish passage condition over the course of the year. Again, this amount of vegetation is seen as a boon to habitat complexity and is not expected to interfere with channel conveyance during high flows. No significant erosion is evident from the photos, and no large wood has accumulated in the channel. The observed conditions are expected given the dry year and lack of large storms in WY2014.

Quantitative Geomorphic Observations, Project Site 13

Figures 17-23 show the results of the September 2014 cross sections surveys. Comparisons of September 2014 survey data to baseline survey data generally confirm the results of the visual observations – little geomorphic change took place in the fish passage over WY2014. This result was expected due to the lack of high flow conditions. The general shape of the surveys shows no evidence of bank widening, downcutting, or aggradation. Some details of the channel bed vary from year to year, for example, XS 2 and XS 4 show such variations. However, based on visual assessment of the cross sections, it is believed this is due to inconsistencies with which rocks and boulders were included in the bed survey, rather than to geomorphic change.

Figure 24 shows the results of the 2014 longitudinal profile survey. The depth of pools and heights of rock band structures appear to be consistent from the baseline survey to the present, suggesting little to no downcutting or aggradation. These surveyed profiles suggest geomorphic stability within the channel at Project Site 13.

Geomorphic Monitoring Results, Project Site 10 (Floodplain)

Visual Geomorphic Observations, Project Site 10

Visual assessment of geomorphic change on the floodplain was marked by vigorous growth of alders and willows, as is evident in the photo points (**Figures 25-30**). No other significant geomorphic changes were observed. The connections from the main channel to the constructed floodplain have not changed significantly, other than an increase in the vegetation growing around them. The thickness of this vegetation may have the capacity to divert most of the high flows away from the floodplain, protecting it from erosion, but may strongly divert flows into the opposite bank, increasing the potential for erosion. Such flow patterns and bank changes will be assessed visually during and/or following high flows in the upcoming water years.

Quantitative Geomorphic Observations, Project Site 10

Table 1 gives a summary of the depths of sediment accumulated on the sedimentation plates installed on the floodplain.

Table 1. Summary of sediment accumulation on sedimentation plates 1 and 2.

	Sedimentation Plate 1 *mm of accumulation*	**Sedimentation Plate 2** *mm of accumulation*
Year 1 - WY2014	0 mm	0 mm

The depth of sediment accumulated on the floodplain sedimentation plates was measured on September 24th, 2014. Both plates had accumulated several millimeters of duff and organic debris, but upon inspection, it appeared to have been dropped from the willows and alders that are overhanging the plates. This debris was cleared, revealing no sediment accumulation beneath it (0 mm). This is the expected result based on the hydrograph data, which showed that no flow reached the floodplain over the course of the year; therefore, there was no mechanism for transporting sediment onto the plates. The effect of overbank flows on floodplain sedimentation remains unknown, and will be carefully monitored in the upcoming years.

Figures 31-32 show the results of the September 2014 cross sections surveys. Comparisons of the September 2014 survey to the baseline survey generally confirm the results of the visual observations: little geomorphic change took place in the floodplain over WY2014. This result was expected due to the lack of high flow conditions. The comparison of the surveyed cross sections shows no evidence of channel widening, downcutting, or aggradation. Some of the details of the channel bed vary from year to year, but these changes are relatively minor. The floodplain is included in the survey of XS 101.We did not survey the right channel bank or channel thalweg during the September 2014 surveys. XS 102 shows

a different profile to the rock wall, due to the survey line crossing it in a slightly different place to avoid thick vegetation.

Figure 33 shows the results of the 2014 floodplain elevational survey. The elevation of the floodplain generally appears to be consistent from the baseline survey to the present, suggesting little to no downcutting or aggradation. The surveyed profile suggests geomorphic stability within Project Site 10.

Conclusions

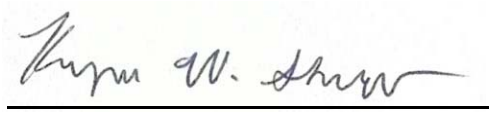
Overall, as of the end of WY2014, the Alum Rock Park mitigation projects at Project Sites 10 and 13 remain in a condition very similar to that of the constructed condition. The fish passage has increased in habitat complexity, largely through continued vigorous growth of planted and volunteer vegetation. The floodplain did not change geomorphically in appreciable ways. We presently do not have enough data to know if it will flood every one to two years. Monitoring high flows at these sites is a priority for the upcoming water year.

Closing

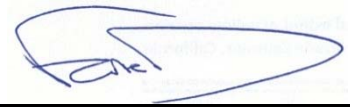
We greatly appreciate the opportunity to assist you with this monitoring effort and look forward to reporting on the geomorphic and hydrologic monitoring efforts one year from now.

Sincerely,

BALANCE HYDROLOGICS, Inc.



Krysia Skorko, M.S.
Geomorphologist



Eric Donaldson, P.G.
Project Manager

Shawn Chartrand, M.S., P.G., CEG
Principal-in-charge

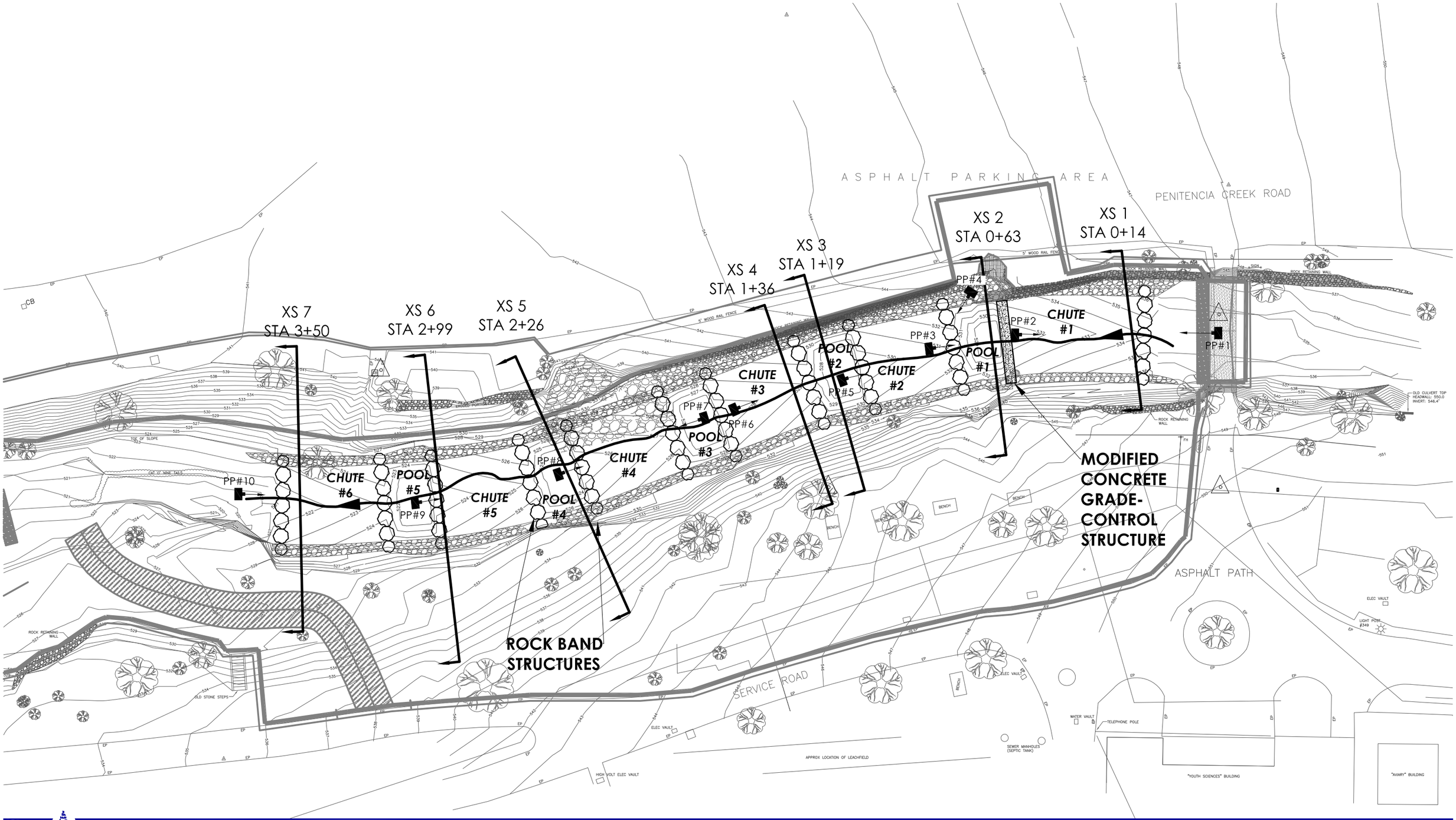
Encl. Figures 1 through 33

References

Biological Opinion for the Upper Penitencia Creek Bank Repair and Stream Restoration Project in San Jose, Santa Clara County, California. National Marine Fisheries Service Report no. 08ESMF00-2012-F-0235. June 01, 2012.

Hydrology and Water Quality Existing Conditions for San José California. Schaaf and Wheeler Consulting Civil Engineers Report. May 18, 2009.

Water Quality Certification for Project Sites 2, 3, 5, 10, and 13 of the Alum Rock Park Bank Repair and Stream Restoration Project in the City of San Jose in Santa Clara County. San Francisco Bay Regional Water Quality Control Board File No. 2009-00193S. July 03, 2012.



Balance Hydrologics, Inc.

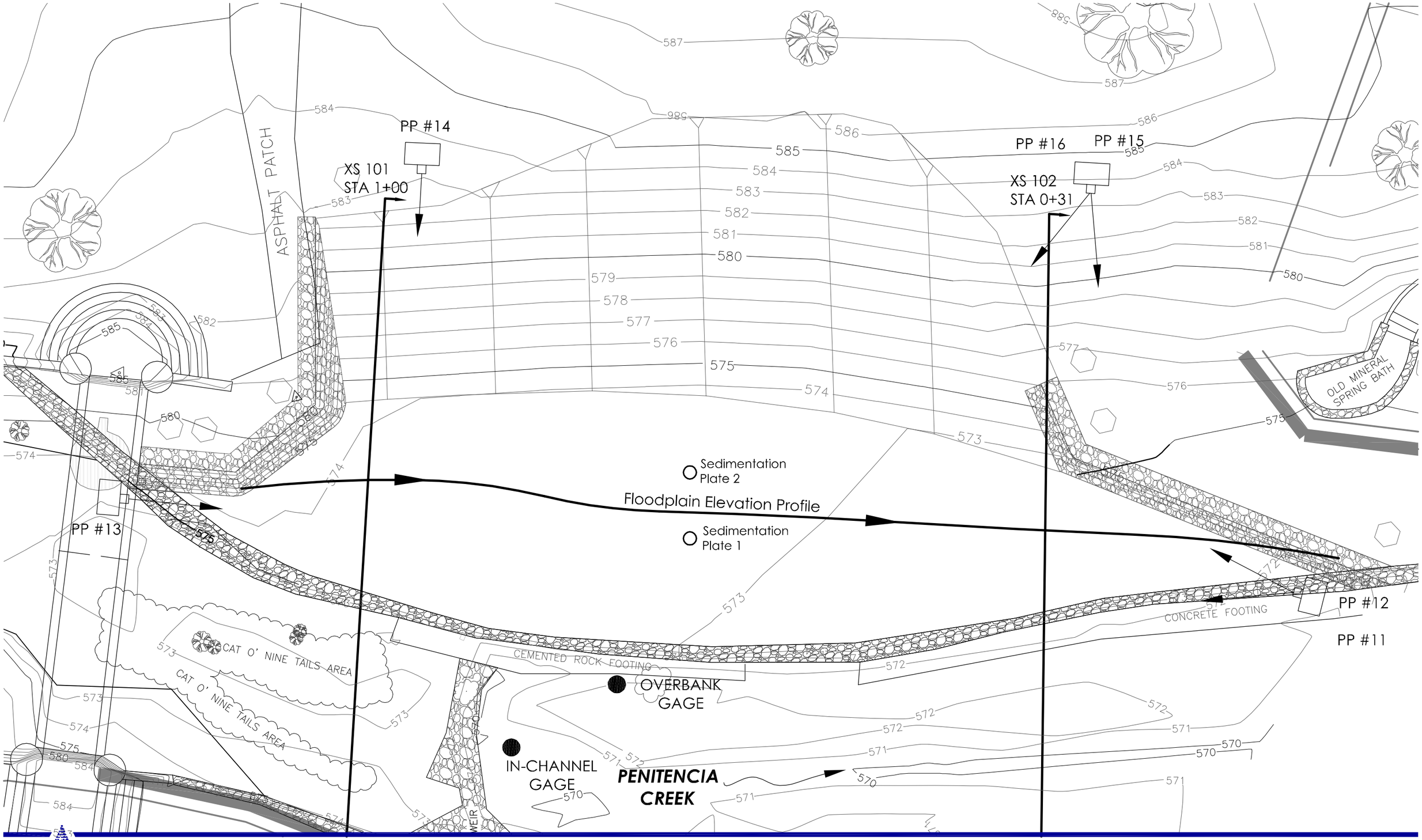
213017 monitoring workmap.dwg

Figure 1. Upper Penitencia Creek, Alum Rock Monitoring, Santa Clara County, California. Project Site 13, a 300-foot long fish passage improvement project.

0' 15' 30' 60'

SCALE: 1" = 30'

N



Balance Hydrologics, Inc.

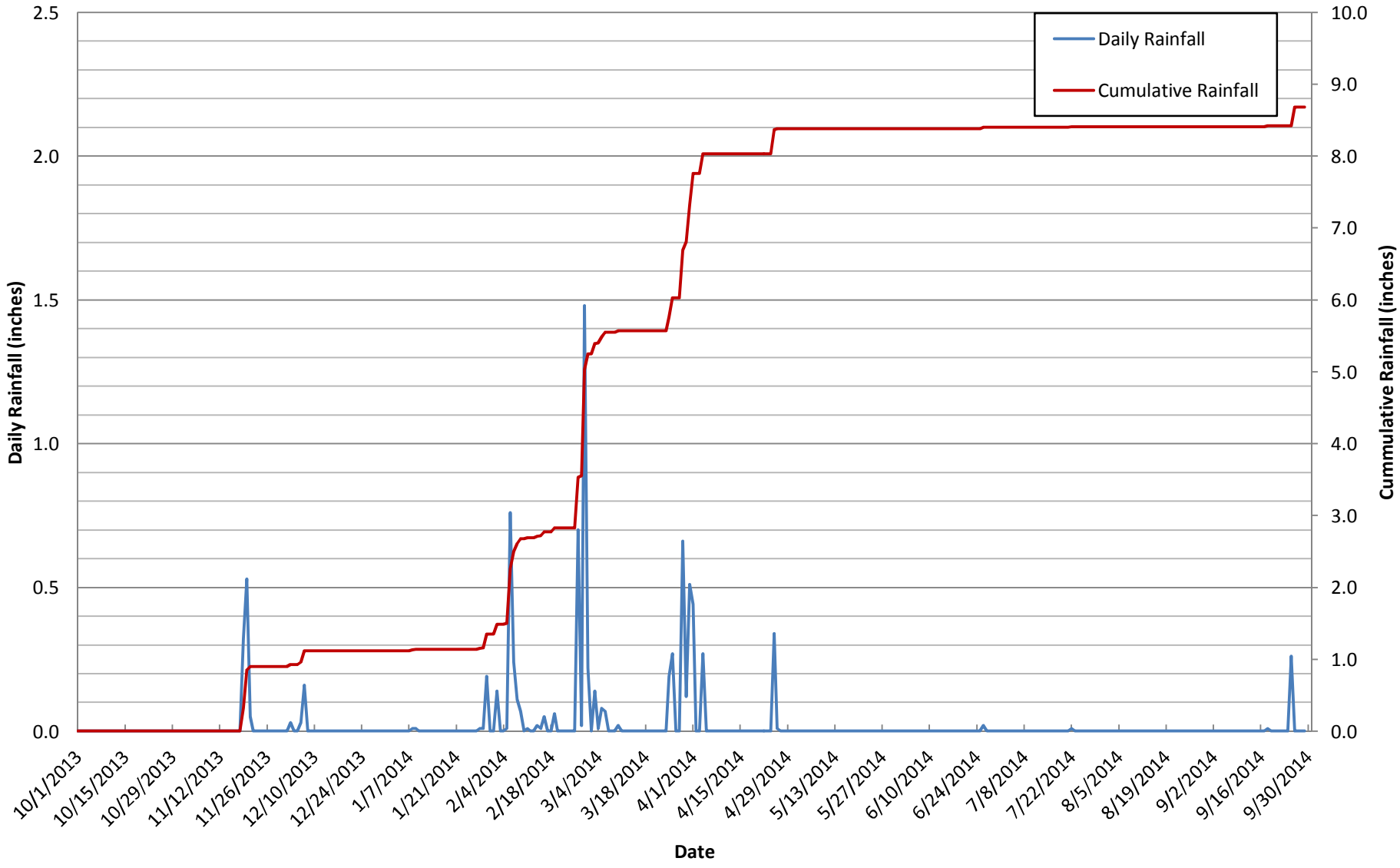
213017 monitoring workmap.dwg

Figure 2. Upper Penitencia Creek, Alum Rock Monitoring, Santa Clara County, California. Project Site 10, a 120-foot long, 30-40 foot wide newly constructed floodplain.

0' 5' 10' 20'

SCALE: 1" = 10'

N

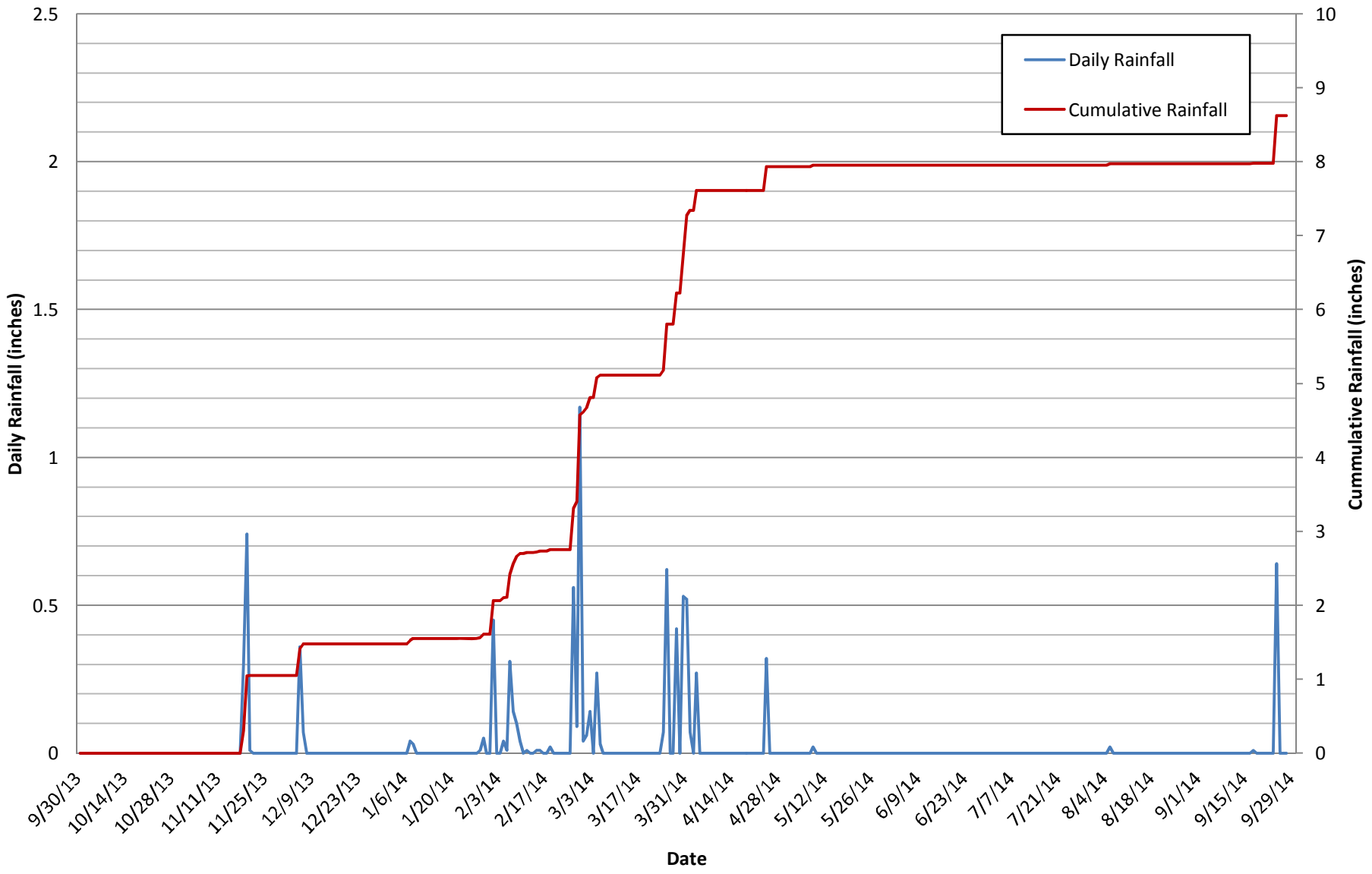


Source: Weather Underground, downloaded on 09/30/14

Balance Hydrologics, Inc.

Figure 3. Daily Rainfall and Cumulative Rainfall, Berryessa, California (Weather Underground Station KCANSANJO17) Water Year 2014, Alum Rock Monitoring, Santa Clara County, California.

Rainfall_WY2014.xls

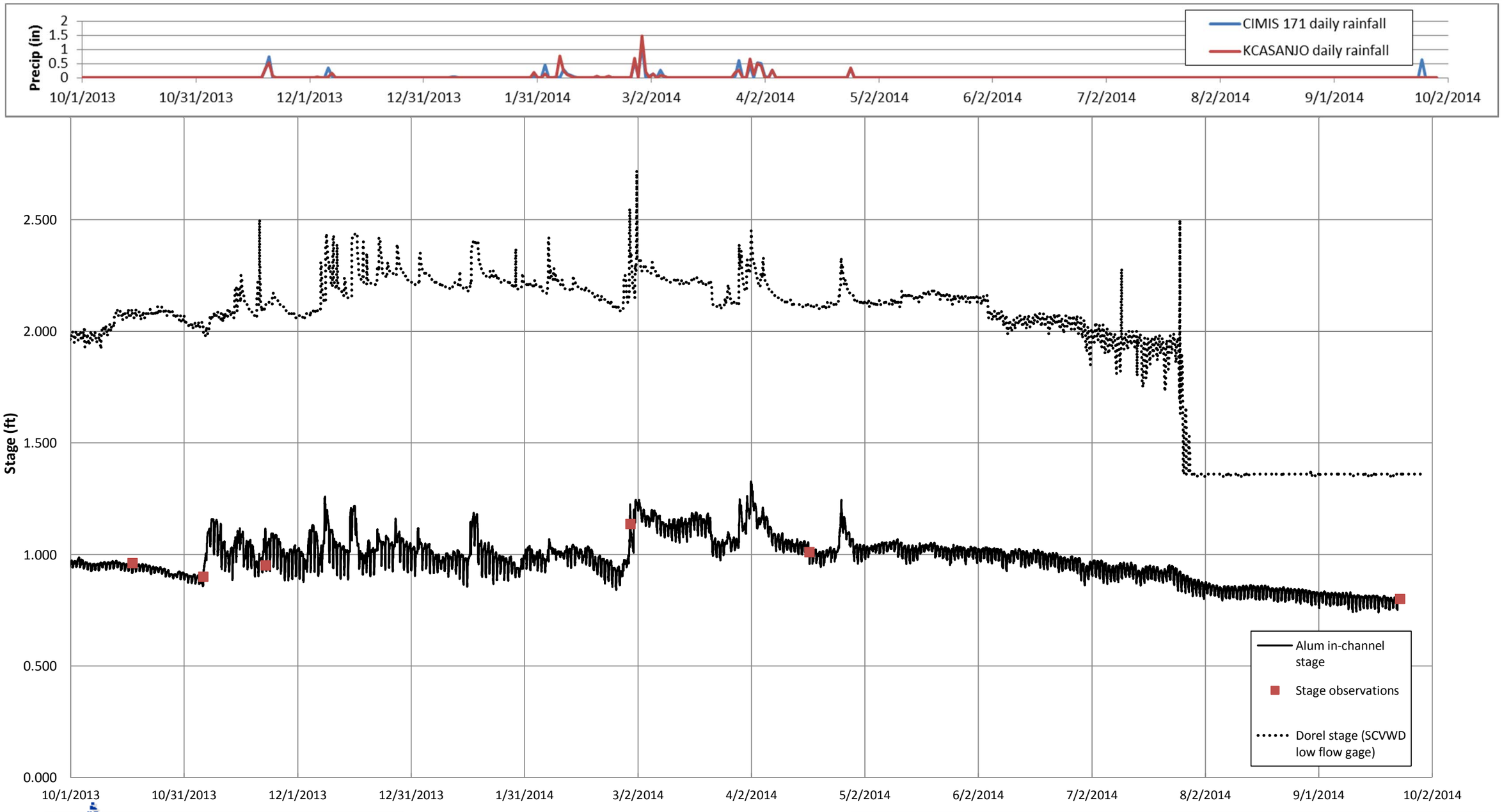


Source: CIMIS , downloaded on 09/30/14

Balance Hydrologics, Inc.

Figure 4. **Daily Rainfall and Cumulative Rainfall, Union City (CIMIS 171), Water Year 2014. Alum Rock Monitoring, Santa Clara County, California.**

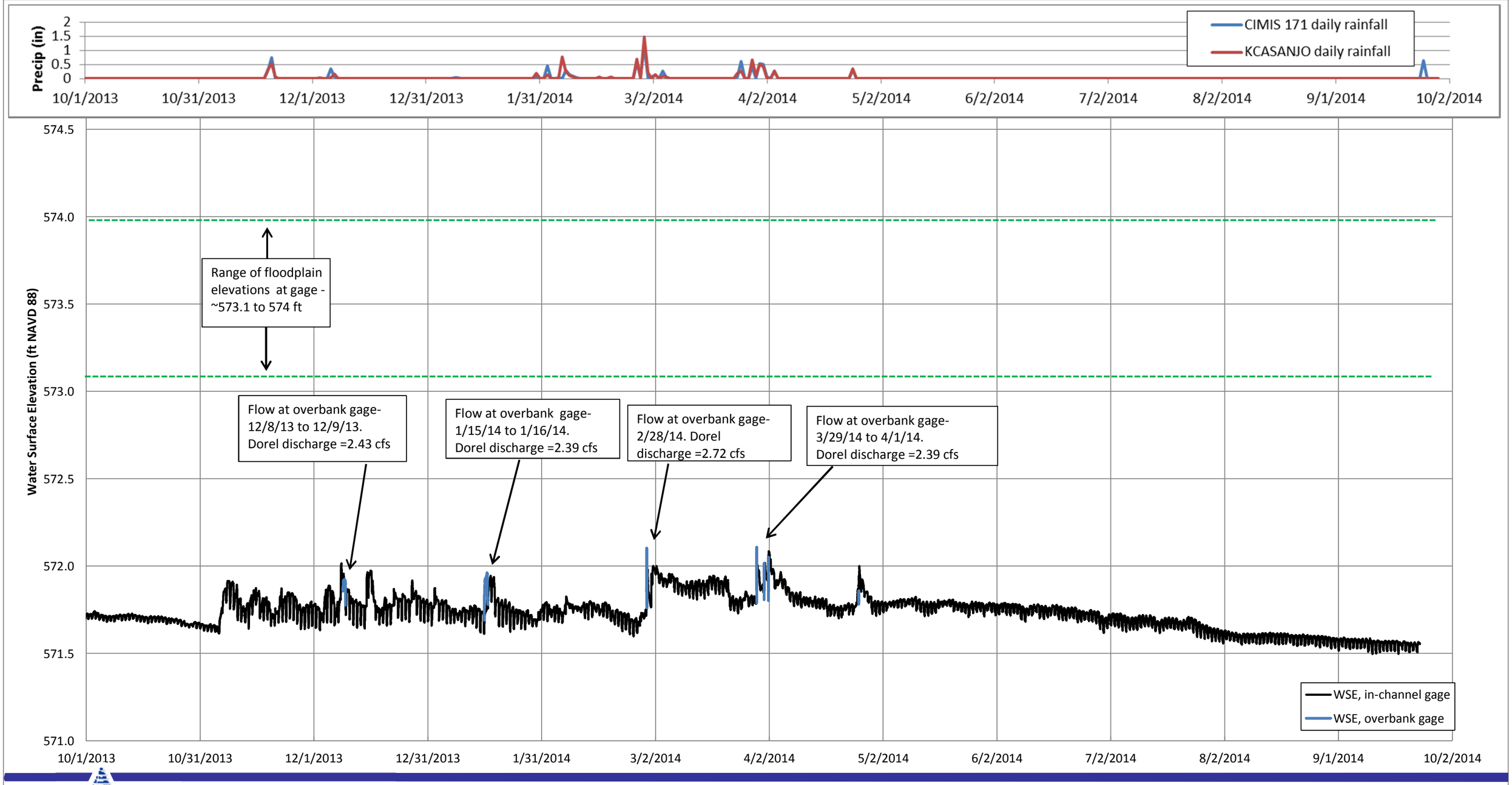
Rainfall_WY2014



Balance Hydrologics, Inc.

Figure 5 . **Alum Rock 15 minute stage record from upstream channel-bottom pressure tranducer (solid line), Alum Rock monitoring, Santa Clara County, California.** Red squares mark manual readings from the upstream staff plate. These data are compared with hourly stage data from the Dorel gage (dashed line), located approximately 2.5 km downstream from project sites 10 and 13. Precipitation from nearby gages (KCASANJ17, CIMUS171 are shown above.

Sources: Balance Hydrologics and http://alert.valleywater.org/sgi.php, downloaded 9/30/2014



Balance Hydrologics, Inc.

Sources: Balance Hydrologics and http://alert.valleywater.org/sgi.php, downloaded 9/30/2014

Figure 6. **Alum Rock water surface elevations measured within the channel and on the floodplain, Alum Rock monitoring, Santa Clara County, California.** In-channel water surface elevation (WSE) is calculated from surveys of the staff plate at the upstream datalogger. Floodplain WSE is approximated by adjusting flow records to match flooding peaks in the in-channel record. Floodplain flow records are only plotted during times of innundation. According to stage-discharge records for the SCVWD Dorel gage, a flow of approximately 2.4 cfs is needed to see a response at the overbank gage. When scaled for watershed size, Dorel discharge can be used to estimate Alum Rock discharge, a necessity because WY14 was dry and no field observations occured while the floodplain staff plate was submerged. Efforts will be made to calibrate the floodplain staff during WY15.

Balance Hydrologics, Inc.

Figure 7. Photo point 1 photographs taken from pedestrian bridge, looking downstream at the first rock band structure and chute of the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 8. Photo point 2 photographs looking upstream to bridge below first rock band structure and chute of the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 9. Photo point 3 photographs looking upstream across pool 1 at the modified concrete grade control structure and pedestrian bridge in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 4

Balance Hydrologics, Inc.

Figure 10. Photo point 4 photographs taken on right bank from top of the modified concrete grade control structure wall looking downstream across chute 2 along the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 5

Balance Hydrologics, Inc.

Figure 11. Photo point 5 photographs looking upstream across chute 2 to modified concrete grade control structure and bridge in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 6

Balance Hydrologics, Inc.

Figure 12. Photo point 6 photographs looking upstream across pool 2 and chute 2 in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 13. Photo point 7 panoramic photographs looking downstream at rock band structure and chute 3 in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Note forming erosion line on right bank downstream of rock band. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 14. Photo point 8 photographs looking upstream across rock band structure and pool 3 in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

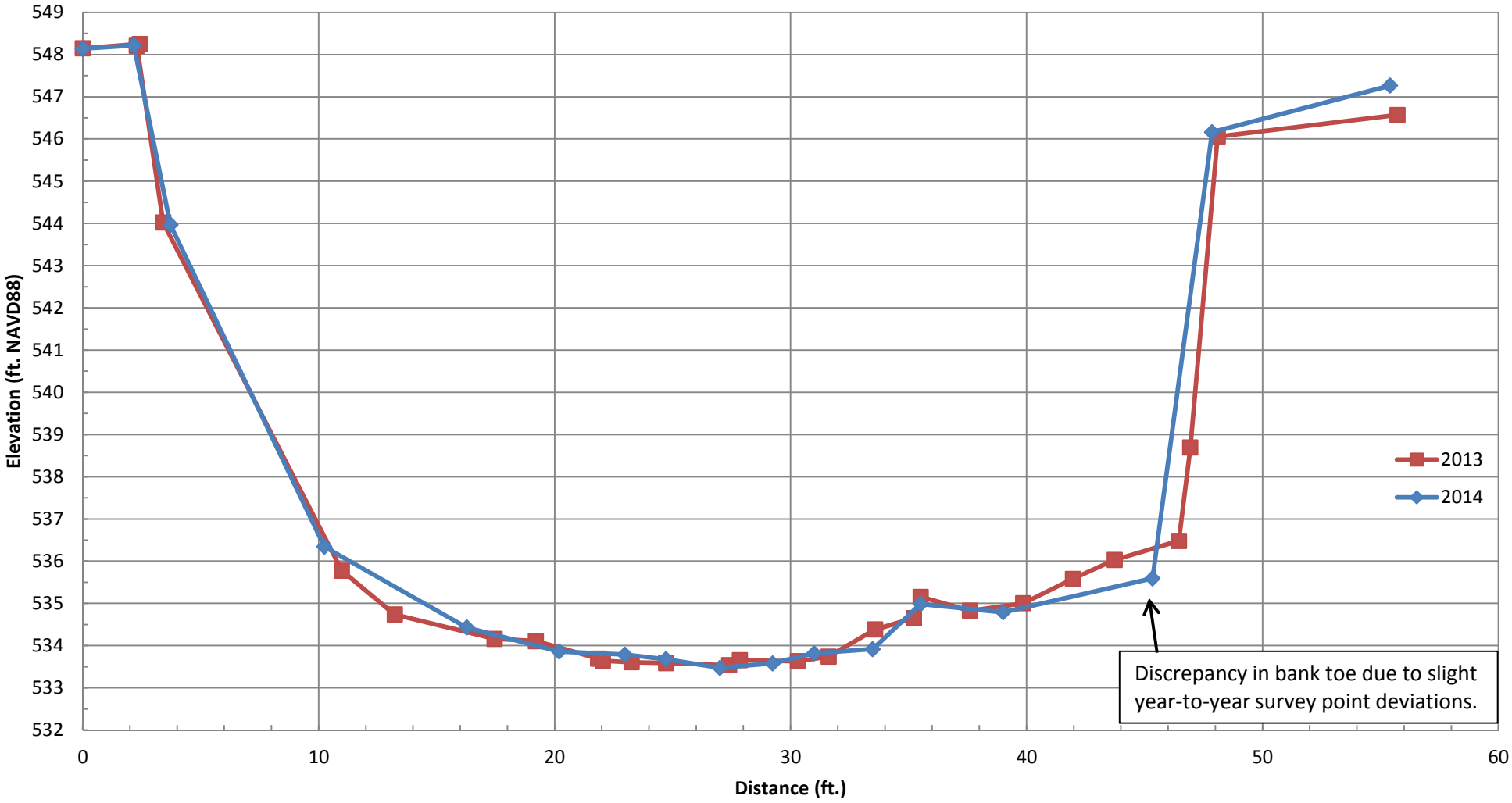
Photo point 9

Balance Hydrologics, Inc.

Figure 15. Photo point 9 photographs looking upstream across rock band structure and pool 4 in the fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 16. Photo point 10 looking upstream from bottom of fish passage project. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 1 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.



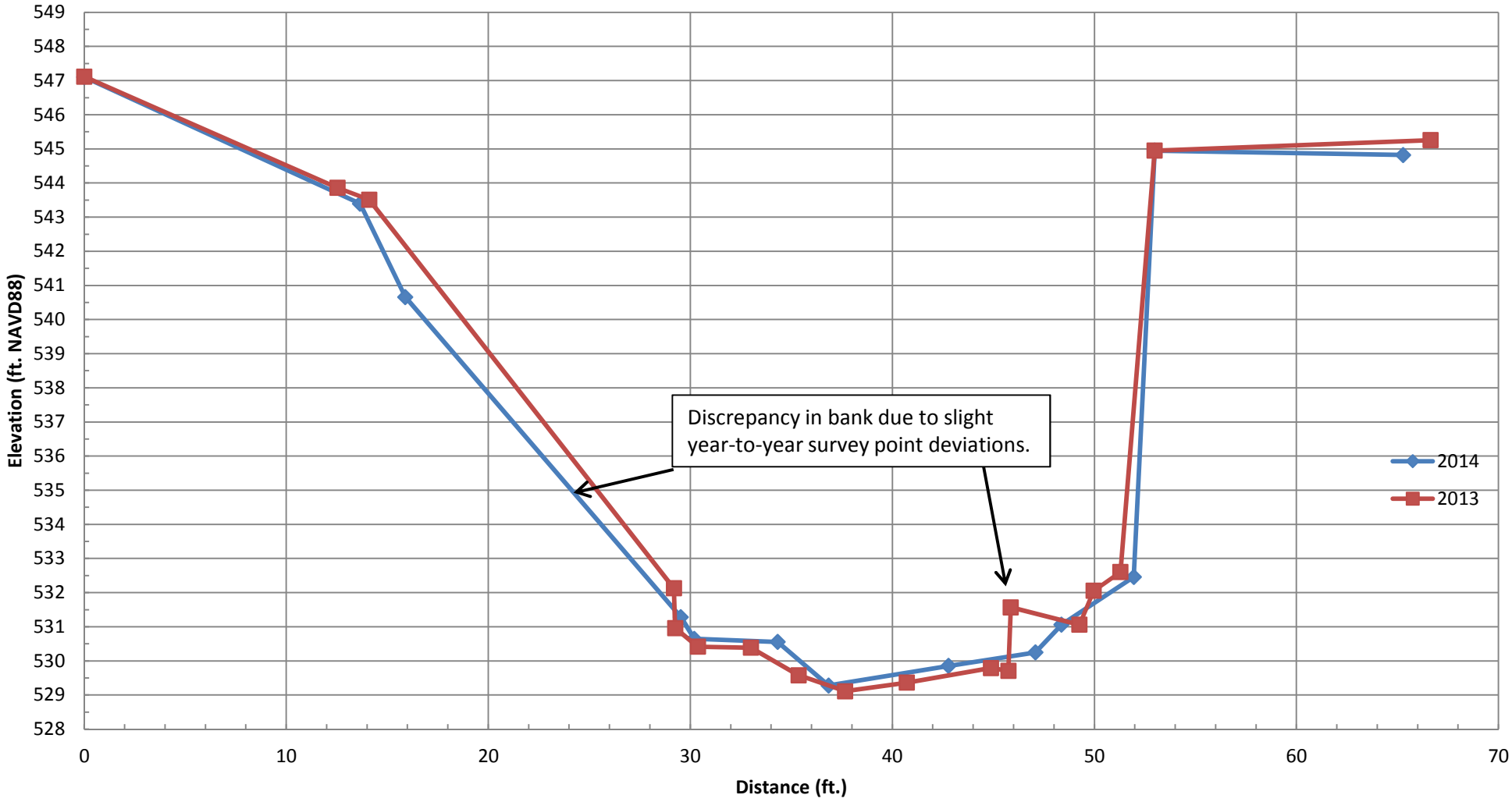
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Figure 17 . Cross section 1, Alum Rock WY14 monitoring, Santa Clara County, California.

Balance Hydrologics, Inc.

214032 Totalstation_Master.xlsx



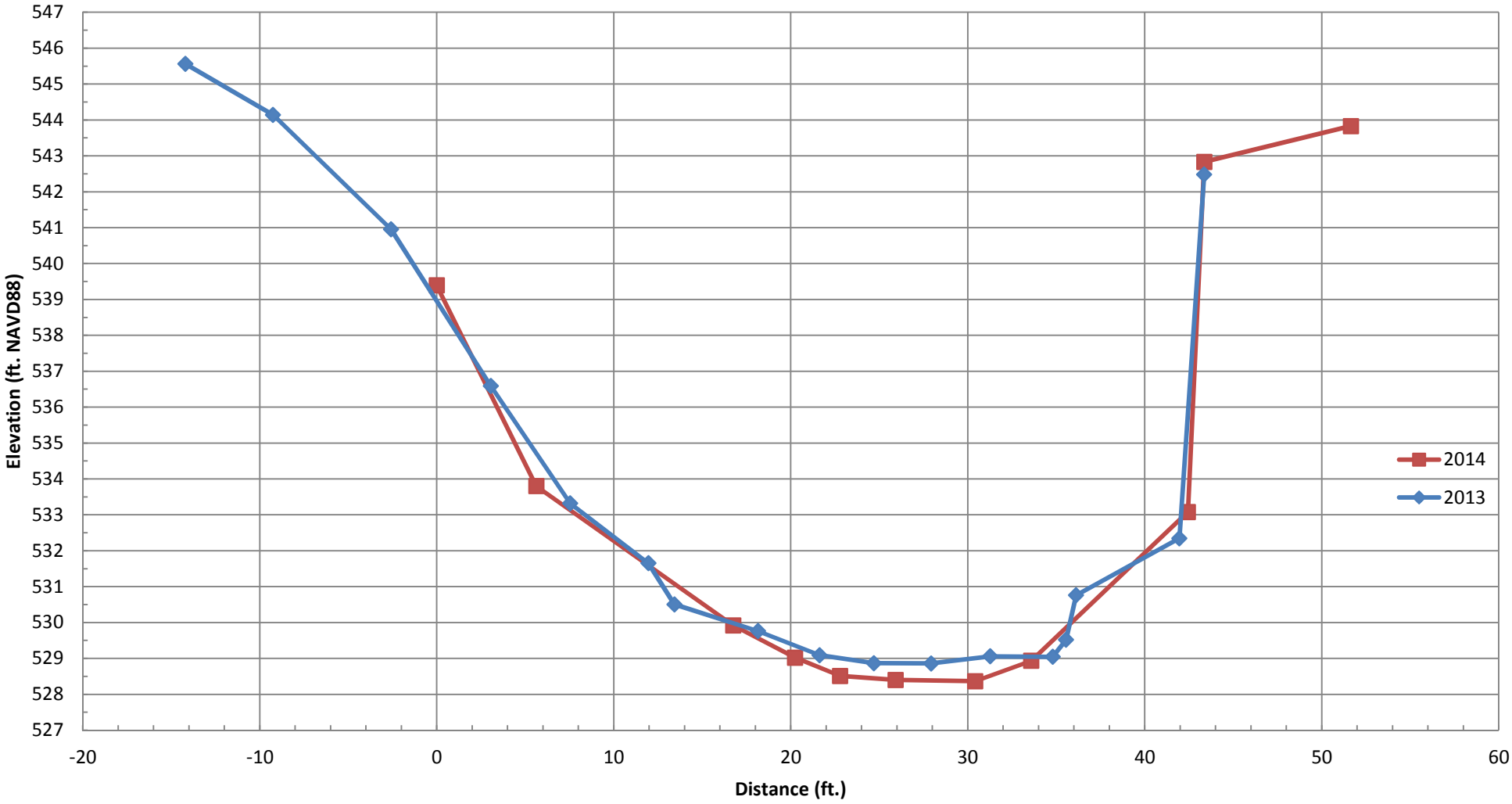
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Figure 18 . Cross section 2, Alum Rock WY14 monitoring, Santa Clara County, California.

Balance Hydrologics, Inc.

214032 Totalstation_Master.xlsx



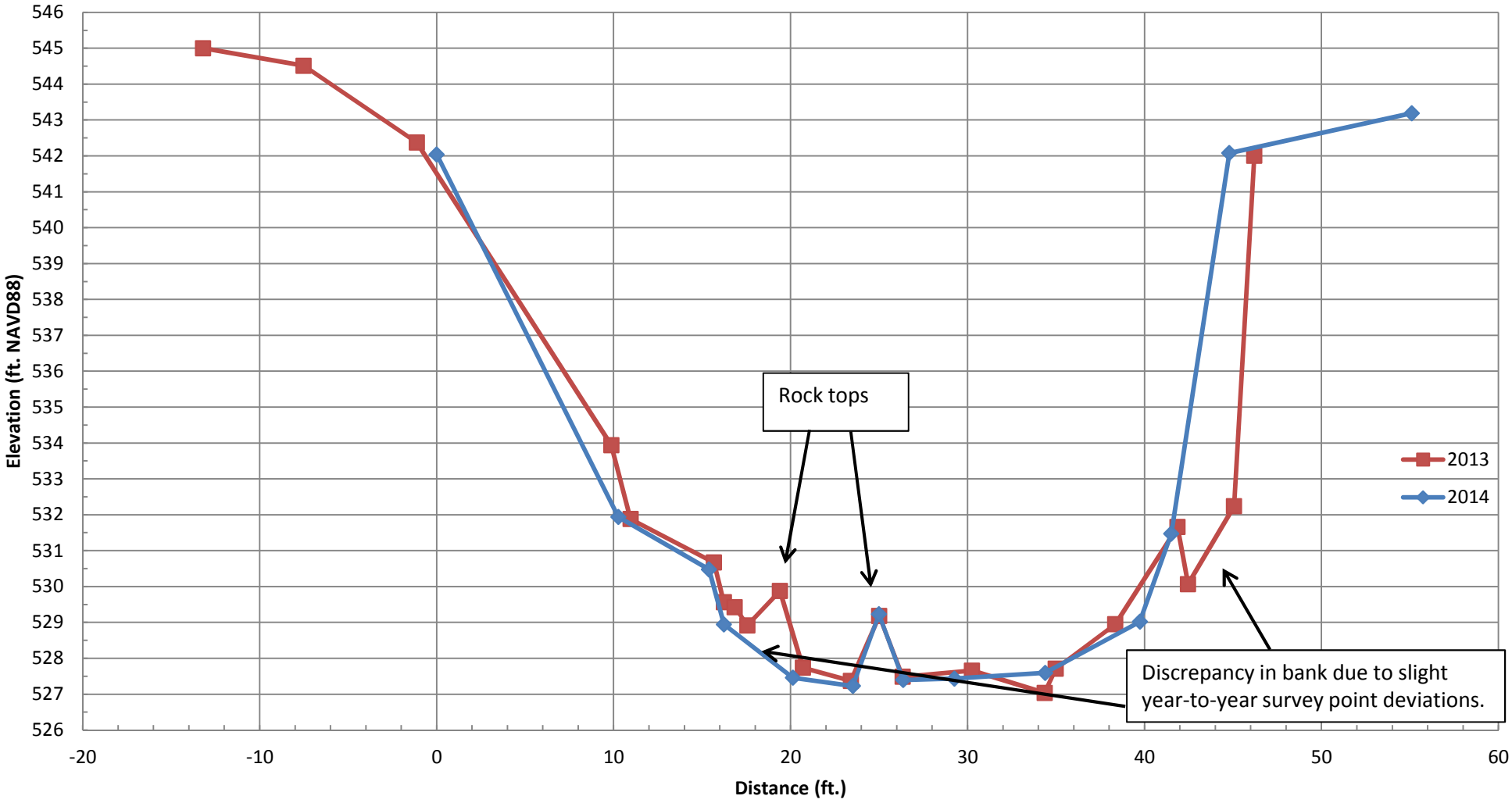
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 19 . Cross section 3, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx



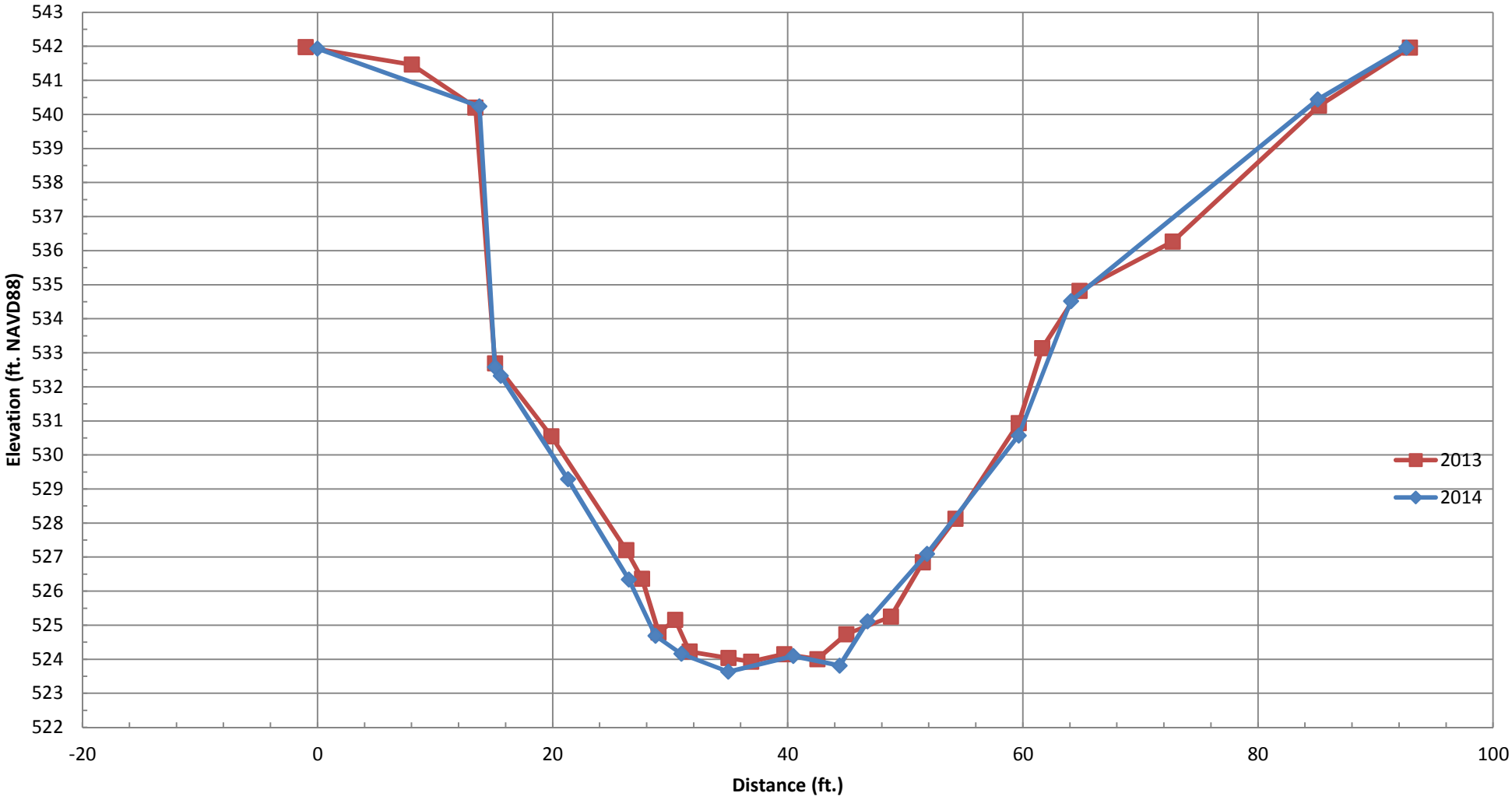
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 20 . Cross section 4, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx



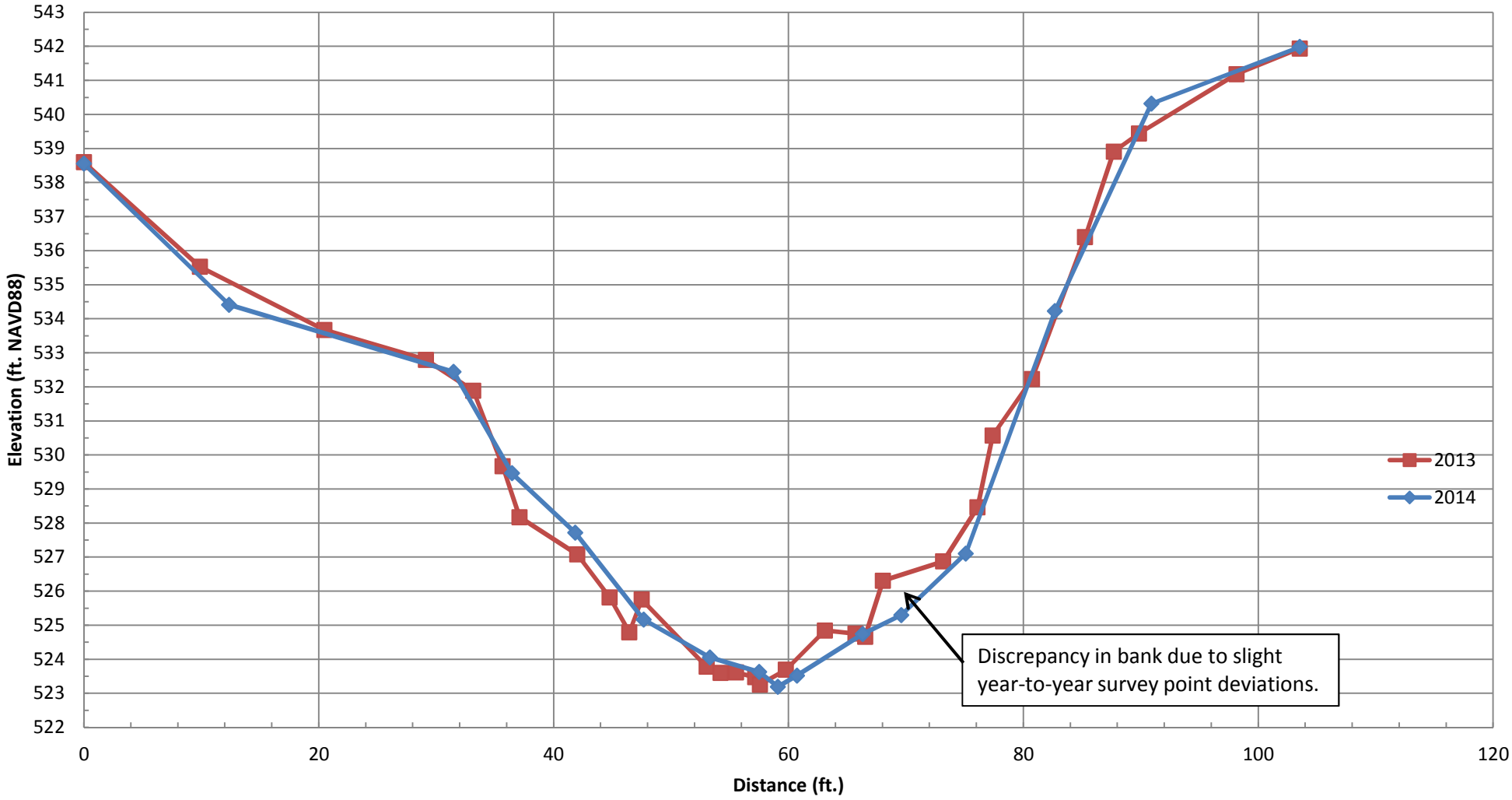
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 21 . Cross section 5, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx



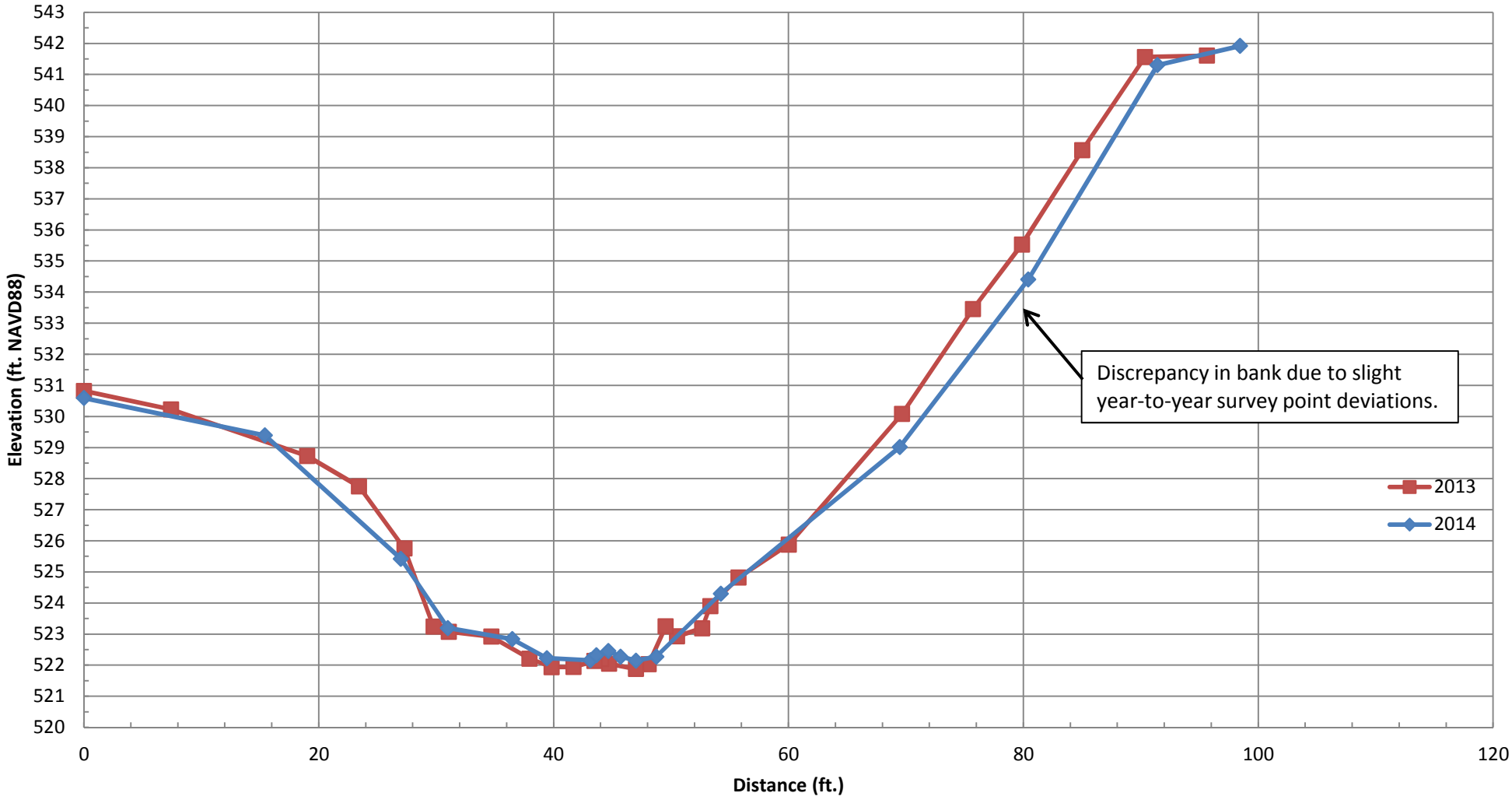
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Figure 22 . Cross section 6, Alum Rock WY14 monitoring, Santa Clara County, California.

Balance Hydrologics, Inc.

213017 Alum_14_survey master.xlsx



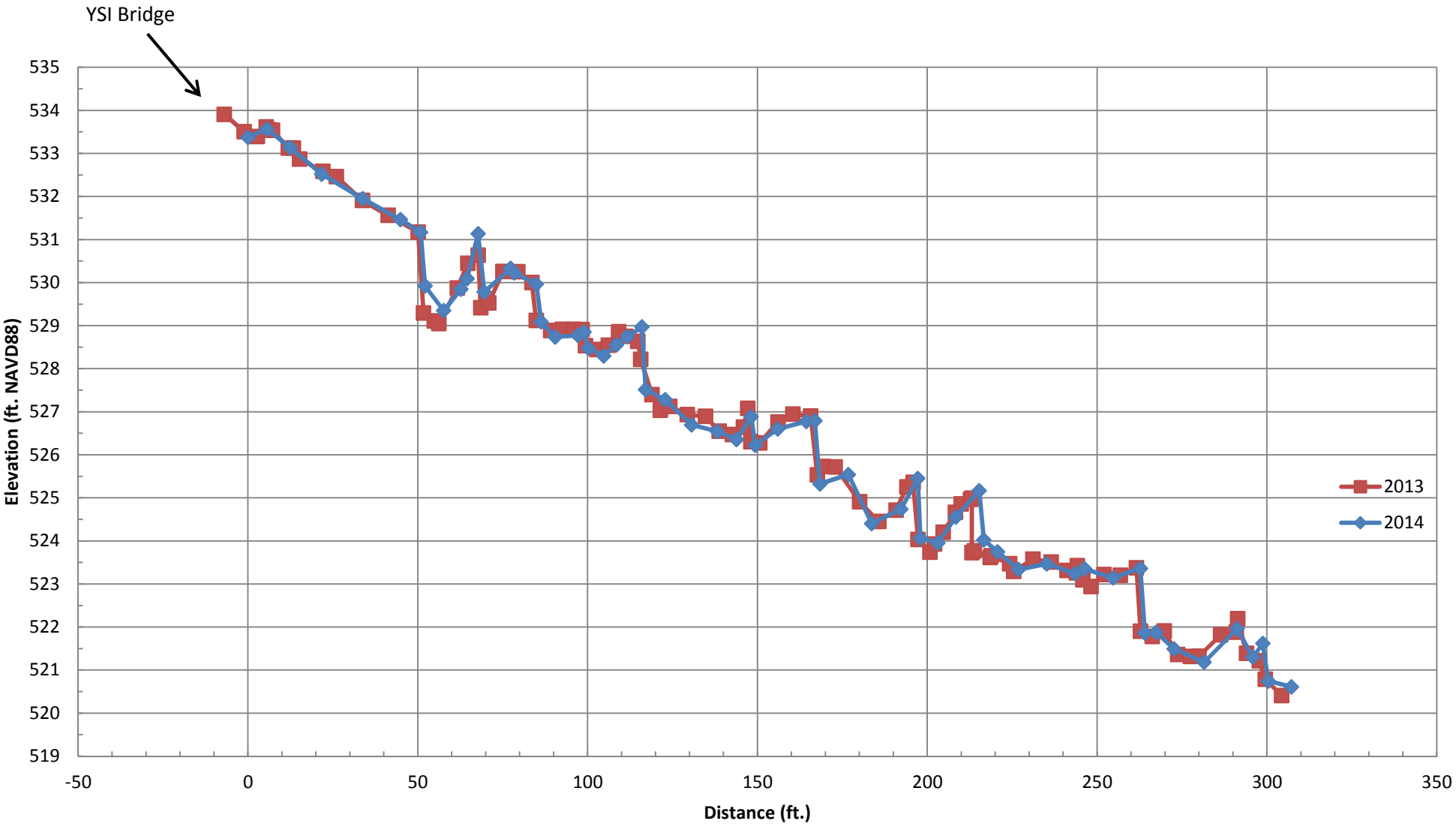
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Figure 23 . Cross section 7, Alum Rock WY14 monitoring, Santa Clara County, California.

Balance Hydrologics, Inc.

213017 Alum_14_survey master.xlsx



Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 24 . Thalweg longitudinal profile, fish passage, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx

Balance Hydrologics, Inc.

Figure 25. Photo point 11 looking upstream at Site 10 floodplain toward foot bridge. WY13 photo taken October 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 12

Balance Hydrologics, Inc.

Figure 26. Photo point 12 looking upslope at the downstream edge of the Site 10 floodplain. WY13 photo taken October 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Balance Hydrologics, Inc.

Figure 27. Photo point 13 looking downstream from foot bridge at Site 10 floodplain. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 14

Balance Hydrologics, Inc.

Figure 28. Photo point 14 looking from upslope across XS 101 at Site 10 floodplain. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

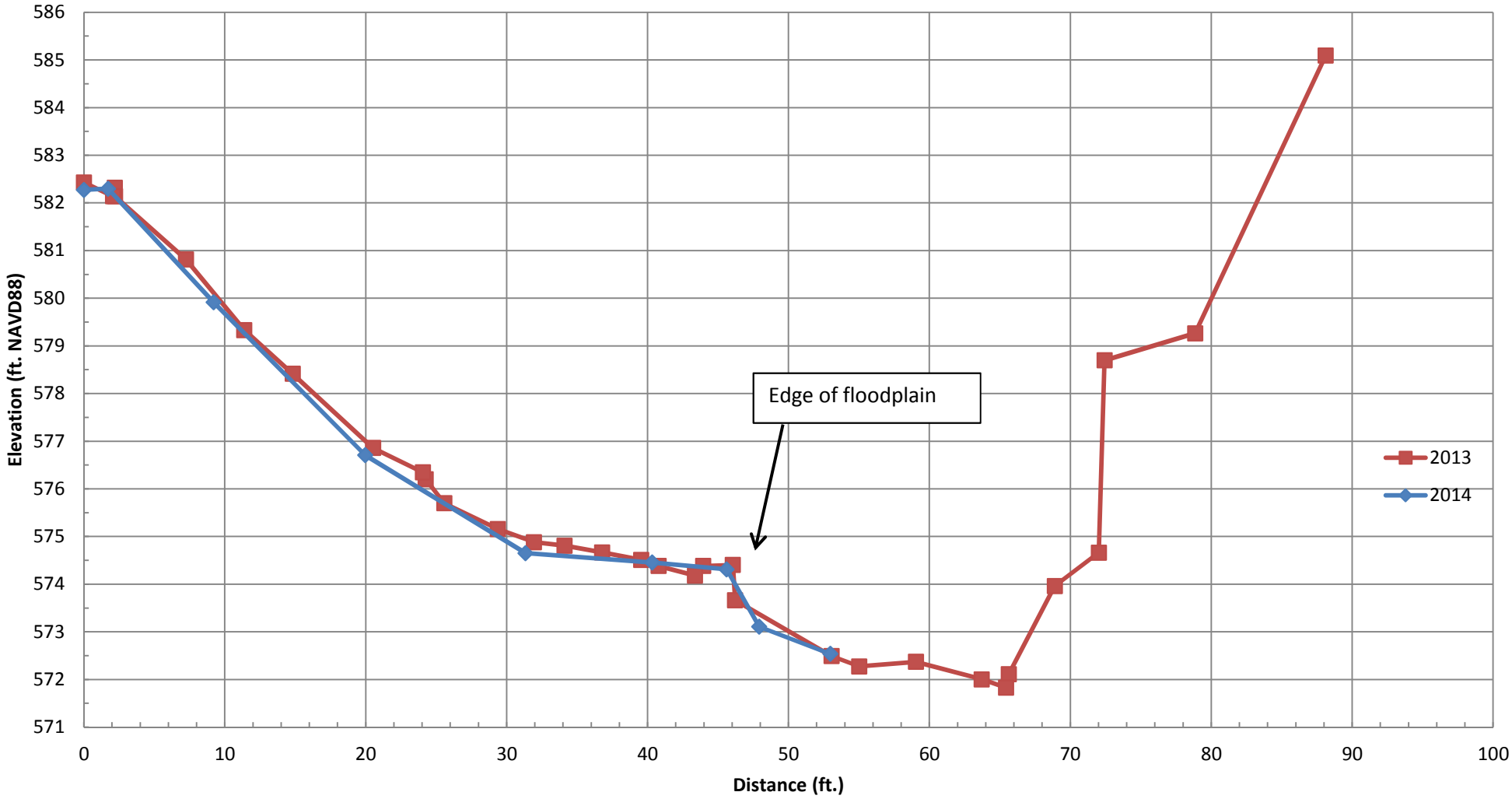
Balance Hydrologics, Inc.

Figure 29. Photo point 15 looking from upslope across XS 102 at Site 10 floodplain. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.

Photo point 16

Balance Hydrologics, Inc.

Figure 30. Photo point 16 looking from upslope to the footbridge at Site 10 floodplain. WY13 photo taken November 2013. WY14 photo taken September 2014. Refer to Figure 2 of this report for photo point locations. Upper Penitencia Creek, Alum Rock Park, Santa Clara County, California.



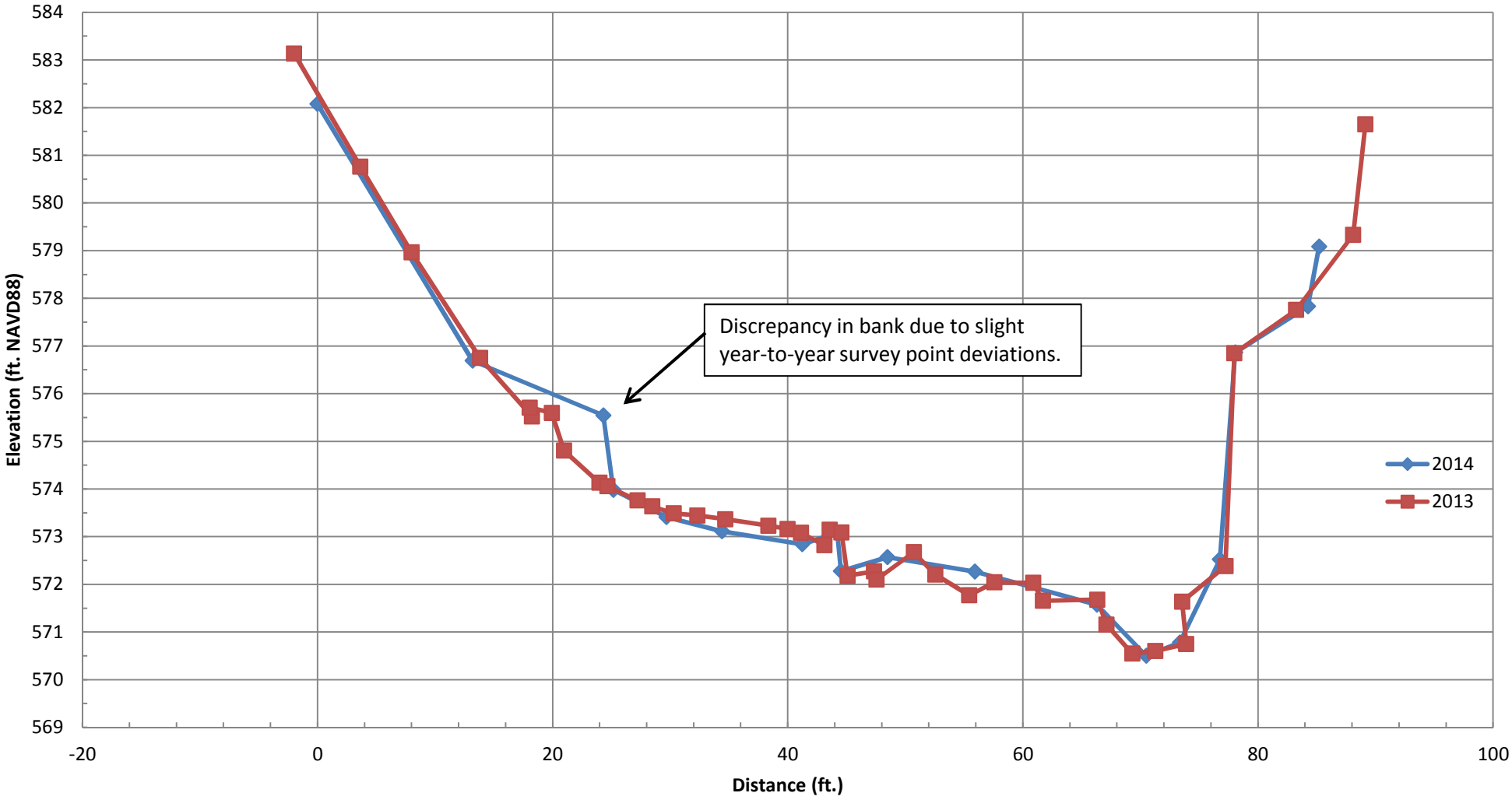
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Figure 31 . Cross section 101, Alum Rock WY14 monitoring, Santa Clara County, California.

Balance Hydrologics, Inc.

213017 Alum_14_survey master.xlsx



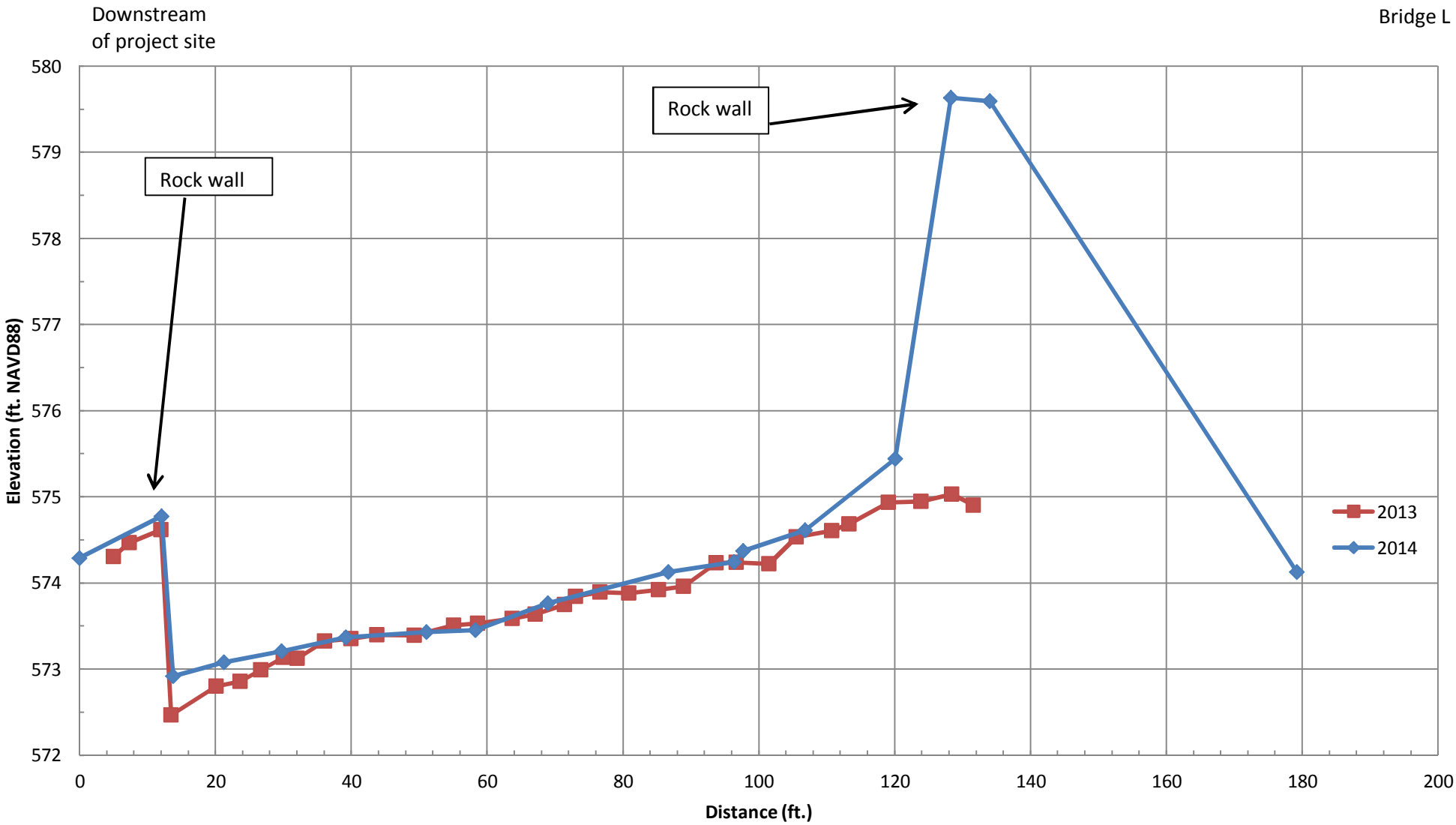
Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 32 . Cross section 102, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx



Horizontal and vertical scales do not match.

Source: Balance Hydrologics survey

Balance Hydrologics, Inc.

Figure 33. Floodplain elevational profile, Alum Rock WY14 monitoring, Santa Clara County, California.

213017 Alum_14_survey master.xlsx

Appendix E

Fisheries Monitoring Report and Monitoring Plan

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Alum Rock Park Fish Passage Improvement Project—Project Site 13

Year 2 Fisheries Monitoring Report

Prepared for:

Santa Clara Valley Transportation Authority
3331 N. First Street, Bldg. B
San Jose, CA 95134
p (408) 321-5976
f (408) 321-5787
Attn: Ann Calnan, Sr. Environmental Planner

Prepared by:

H. T. Harvey & Associates

February 2015 Project No. 3518-02

Executive Summary

The Alum Rock Fish Passage Improvement Project (Project) was implemented by the Santa Clara Valley Transportation Authority (VTA) to improve fish passage in Upper Penitencia Creek, a tributary to Coyote Creek in Santa Clara County, San Jose, California. Upper Penitencia Creek contains a small run of Central California Coast steelhead (*Oncorhynchus mykiss*), a species listed as threatened under the Federal Endangered Species Act. Upper Penitencia Creek is also listed as critical habitat for this species. In 2012, fish passage was improved by modifying an existing concrete weir and by constructing a roughened channel. On behalf of VTA, H. T. Harvey & Associates (HTH) developed and applied a Fisheries Monitoring Plan (Plan) to meet the requirements of the Project's Biological Opinion prepared by the National Marine Fisheries Service for the Project. Plan goals were to: 1) document the fish species occupying the Project reach, and 2) document habitat associations in the Project and Upstream reaches (HTH 2013a). Year 1 monitoring was completed in 2013 (HTH 2014); Year 2 monitoring was completed in fall 2014. Monitoring will continue, as described in the Plan, through Year 5.

Special attention was given to determine the occurrence of steelhead due to their listing status. HTH fish ecologists habitat typed and surveyed (electrofished) habitat units in the Project reach and Upstream reach. The Upstream reach was surveyed to determine 1) if fish are able to migrate upstream through the Project reach and 2) as a reference for comparison of fish-habitat associations within the Project reach. The fish community documented during Year 2 surveys was composed of four native species: California roach (*Lavinia symetricus*), riffle sculpin (*Cottus gulosus*), Sacramento sucker (*Catostomus occidentalis*), and steelhead. Spring samples included four steelhead in the Project reach and four steelhead in the Upstream reach; fall samples included two steelhead in the Project reach and three steelhead in the Upstream reach. The results of the 2014 Year 2 surveys indicate that the Project goals have been met; native fish, including steelhead, inhabit the Project and Upstream reaches.

Table of Contents

Tables

Figures

Appendices

Section 1.0 Introduction

1.1 Project Purpose

The Alum Rock Park Fish Passage Improvement Project – Project Site 13 (Project) was implemented by the Santa Clara Valley Transportation Authority to improve fish passage in Upper Penitencia Creek, a tributary to Coyote Creek. Upper Penitencia Creek provides some of the most important spawning and rearing habitat for the federally threatened Central California Coast steelhead (CCC steelhead) (*Oncorhynchus mykiss*) distinct population segment (DPS) in the Coyote Creek watershed (Leidy et al. 2005). The purpose of the Project is to improve fish passage for native resident and anadromous fish in the creek, which is designated as critical habitat for the CCC steelhead (70 FR 52488). The CCC steelhead were originally listed as a federally threatened DPS in 1997 (62 FR 43937); the 1997 listing includes both anadromous (i.e., steelhead) and non-anadromous (i.e., rainbow trout) forms. The listing was updated in 2006 (71 FR 834) to include anadromous steelhead only. The fish passage improvements were completed in 2012. The purpose of this report is to present fish survey results from Year 2 post construction monitoring surveys. This document is the second of five reports that are required as part of the Project's long-term, post-Project monitoring.

1.2 Background

Fish passage in the Project reach was improved by modifying a 4.5-ft high concrete weir (crest of weir to normal pool surface) to allow passage by steelhead (Figure 1, Figure 2) and constructing a 225-ft long roughened channel. Project monitoring is required to "assess the biological performance of the fish passage improvement Project and evaluate the ability of the site to pass steelhead" (National Marine Fisheries Service [NMFS] 2012). To meet this goal, a 5-year Fisheries Monitoring Plan (Plan) was developed by H. T. Harvey & Associates (HTH), approved by NMFS, and implemented beginning in September 2013 (HTH 2013a; 2014). The Plan includes habitat typing and electrofishing surveys to document: 1) the fish species occupying the Project reach, and 2) the habitat associations in reaches within and upstream of the Project reach. During Year 2 monitoring, HTH fish ecologists documented all fish species that were encountered with special focus on CCC steelhead. Both CCC steelhead and resident rainbow trout have been documented in Upper Penitencia Creek and upstream of the Project area (Leidy et al. 2005; Leicester 2011; Leicester and Smith 2012; HTH 2013b). Because CCC steelhead likely exhibit variable life history strategies, rainbow trout observed in the Project reach were assumed to be steelhead and are referred to as such in this report. Other monitoring components performed by others and not summarized herein include vegetation monitoring and streambed hydrological monitoring, all of which when combined, will improve understanding of the evolving habitat conditions and species use in the restored channel.

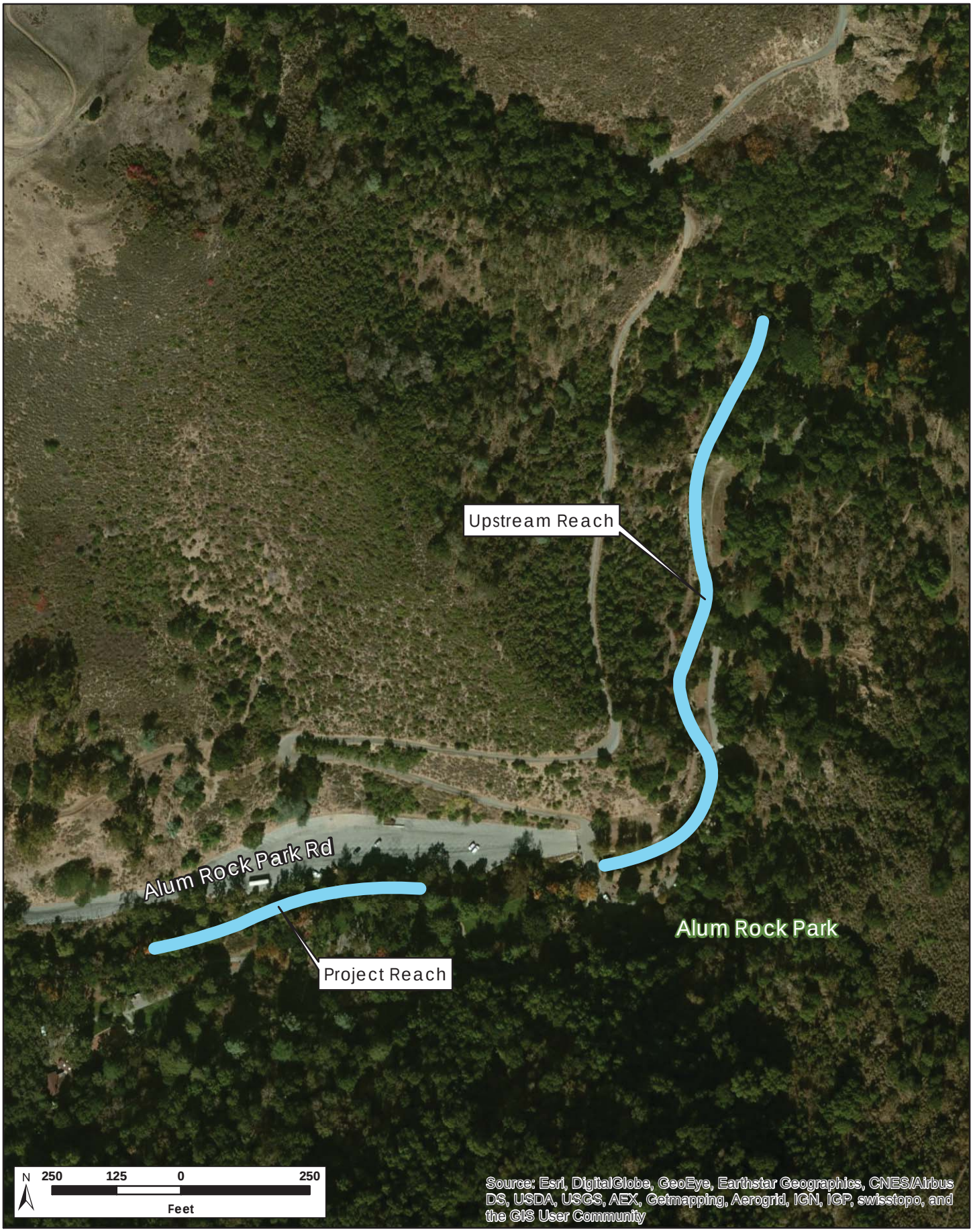
Figure 1. Concrete Weir Prior to Modification, 8 August 2012 (Looking Upstream)

Figure 2. Modified Concrete Weir, 5 November 2014 (Looking Downstream)

Section 2.0 Methods

2.1 Survey Reaches

HTH fish ecologists identified survey reaches in coordination with California Department of Fish and Wildlife (CDFW) regional biologists to avoid duplicating reaches electrofished during annual CDFW surveys. Survey reaches contain individual habitat units that are concentrated in two areas: 1) the Project reach, and 2) the Upstream reach. The Project reach is approximately 400 feet (ft) long and contains all habitat units in the installed roughened channel and additional contiguous habitat units upstream (Figure 3). All habitat units in the Project reach were electrofished. The Upstream reach is approximately 1,200 ft long. Within the Upstream reach, 10 habitat units spread throughout the reach were electrofished. The combined length of the 10 habitat units electrofished in the Upstream reach was approximately 300 ft. During each survey event, HTH fish ecologists categorized individual habitat units within each survey reach into distinct types: riffles, flatwater, and pools using Level IV habitat type descriptions from the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 1998). Changes in the number and type of habitat units surveyed in different years is primarily due to natural fluvial processes; the same trained ecologist is tasked with describing the habitat units in both reaches to minimize variability. Each unit was electrofished, once in the spring and once in the fall, to document fish–habitat associations. Spring electrofishing surveys were conducted on 1 May 2014; HTH fish ecologists surveyed 18 contiguous habitat units in the Project reach and 10 non-contiguous habitat units in the Upstream reach. Fall electrofishing surveys were conducted on 4 and 5 November 2014; HTH fish ecologists surveyed 19 contiguous habitat units in the Project reach and 10 non-contiguous habitat units in the Upstream reach. The surveyed units in the Upstream reach were located between the Alum Rock Falls Road (Rd) bridge, upstream of the Youth Science Institute (YSI) walking bridge, and the Sycamore Grove picnic area in Alum Rock Park (Figure 3).



N:\Projects3500\3518-01\02\Reports\Fig 3 Survey Reach Map_Revision.mxd

H.T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 3: Survey Reach Map

Alum Rock Park Fish Passage Improvement Project - Site 13 (3518-02)

February 2015

2.2 Electrofishing

Electrofishing surveys were conducted by HTH fish ecologists using a Smith-Root LR24 backpack electrofishing unit following NMFS (2000) guidelines. Ambient conductivity and temperature were measured to generate power correction factors to serve as starting points for determining safe and effective electrofishing settings. HTH fish ecologists also followed CDFW techniques (Leicester pers. comm. 2012) developed specifically for electrofishing in the high conductivity waters found in portions of Upper Penitencia Creek. Final electrofishing unit settings (Table 1) were determined by observing the threshold response behavior of target species.

Table 1. Water Quality and Electrofishing Settings

Date	Time	Temperature (ºC)	Ambient Conductivity (µS)	Waveform	Frequency (Hz)	Voltage	Duty Cycle (%)
1 May 2014	0645	15.1	915	PDC*	30	150	12
4 Nov 2014	0800	10.9	2733	PDC	30	150	12
5 Nov 2014	0900	14.5	3215	PDC	30	150	12
5 Nov 2014	1200	17.3	327.8	PDC	30	200	12

*Pulsed direct current

Before electrofishing, HTH fish ecologists isolated target units from other units by using block seines or natural features such as falls or dams or by using a combination of both. Fish captured during electrofishing were placed in a plastic bucket containing cool, clean, shaded, aerated stream water. Surveys were performed early in the morning when water temperatures were cool, and were discontinued when water temperatures approached 18°C as mandated by the NMFS guidelines for electrofishing in waters containing federally listed salmonids (NMFS 2000). Temperatures did not reach 18°C during spring or fall surveys. The first 20 fish of each species were identified, weighed and measured (total length) and returned to the unit from which they were captured. The remaining fish were tallied and released to the unit from which they were captured. All steelhead captured were examined for features associated with smoltification (e.g., silver color, faded parr marks) that would indicate that the fish were preparing to emigrate, further indicating that they were anadromous steelhead rather than resident rainbow trout.

Section 3.0 Results

3.1 Electrofishing Survey Results

The fish community documented during Year 2 surveys was composed of four native species: California roach (*Lavinia symetricus*), riffle sculpin (*Cottus gulosus*), Sacramento sucker (*Catostomus occidentalis*), and steelhead. In total, 421 fish were captured during the spring and 780 fish were captured during fall (Table 2). California roach were the most abundant followed by riffle sculpin; both were found in nearly all of the habitat units surveyed (Table 2). Sacramento suckers were present in the Project reach but were absent from the Upstream habitat units surveyed (Table 2).

Steelhead were captured both in the Project reach and the Upstream reach in both spring and fall. In the spring, three steelhead were captured in pocket water units, one steelhead was captured in a run unit, and four steelhead were captured in pool units. In the fall, five steelhead were captured in pool habitat units (Table 2).

Table 2. Species Distribution in the Project Reach and the Upstream Reach—Spring and Fall 2014

	Habitat Type (Level IV)		California Roach		Riffle Sculpin		Sacramento Sucker		Steelhead		Subtotal	
Unit	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring Subtotal**	**Fall Subtotal**
Project Reach												
Y2-PR Unit 1	Glide	Bedrock Formed Pool	8	19	3	6					11	25
Y2-PR Unit 2	Mid Channel Pool	Glide	26	62		17	1				27	79
Y2-PR Unit 3	Low Gradient Riffle	Low Gradient Riffle	4	1	1	1					5	2
Y2-PR Unit 4	Mid Channel Pool	Boulder Formed Pool	4	29	3	17					7	46
Y2-PR Unit 5	Plunge Pool	Plunge Pool	4	16	1						5	16
Y2-PR Unit 6	Glide	Low Gradient Riffle	7	4		1					7	5
Y2-PR Unit 7	Boulder Formed Pool	Pocket Water	12	20	5						17	20
Y2-PR Unit 8	Mid Channel Pool	Plunge Pool	1	55	2	16				1	3	72
Y2-PR Unit 9	Plunge Pool	Boulder Formed Pool	47	59		8		2			47	69
Y2-PR Unit 10	Boulder Formed Pool	Plunge Pool	14	8					1		15	8
Y2-PR Unit 11	Step Run	Plunge Pool	14	12		6		1			14	19
Y2-PR Unit 12	Run	Pocket Water	24	37	3	9	1				28	46
Y2-PR Unit 13	Run	Mid Channel Pool	14	33		7		4	1		15	44
Y2-PR Unit 14	Pocket Water	Boulder Formed Pool		16	5	4			1		6	20
Y2-PR Unit 15	Mid Channel Pool	Plunge Pool	28	18		11	1				29	29
Y2-PR Unit 16	Pocket Water	Plunge Pool	7	33	2	8		3	1	1	10	45
Y2-PR Unit 17	Plunge Pool	Low Gradient Riffle	29	19	4	7					33	26
Y2-PR Unit 18	Low Gradient Riffle	Glide	20	9	8	10					28	19
Y2-PR Unit 19		Low Gradient Riffle		3		5						8
		Project Reach Subtotal	263	453	37	133	3	10	4	2	307	598

	Habitat Type (Level IV)		California Roach		Riffle Sculpin		Sacramento Sucker		Steelhead		Subtotal	
Unit	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**	**Fall**	**Spring Subtotal**	**Fall Subtotal**
Upstream Reach												
Y2-UR Unit 1	Boulder Formed Pool	Boulder Formed Pool	2	23	4						6	23
Y2-UR Unit 2	Glide	Bedrock Formed Pool	2	59	5	2					7	61
Y2-UR Unit 3	Bedrock Formed Pool	Step Run	29	15	8	2			1		38	17
Y2-UR Unit 4	Plunge Pool	Run	6	11	4	1					10	12
Y2-UR Unit 5	Pocket Water	Plunge Pool	5	29	23	4					28	33
Y2-UR Unit 6	Glide	Mid Channel Pool		2	4	3					4	5
Y2-UR Unit 7	Pocket Water	Mid Channel Pool	1	9	4	7			1		6	16
Y2-UR Unit 8	Boulder Formed Pool	Boulder Formed Pool		9	1	1			2	1	3	11
Y2-UR Unit 9	Step Run	Pocket Water			12	1					12	1
Y2-UR Unit 10	Boulder Formed Pool	Bedrock Formed Pool				1				2	0	3
		Upstream Reach Subtotal	45	157	65	22	0	0	4	3	114	182
		Total	308	610	102	155	3	10	8	5	421	780

In spring, there were 0.9 steelhead per 100 linear ft in the Project reach and 1.25 steelhead per 100 linear ft in the Upstream reach, whereas in fall there were 0.5 steelhead per 100 linear ft in the Project reach and 1.0 steelhead per 100 linear ft in the Upstream reach (Table 3). The number of fish per 100 linear feet has been reported from past surveys (Leicester 2011; Leicester and Smith 2012) and is included in Table 3 for reference. Steelhead observed in the Project and in the Upstream reaches in both seasons were between 85 millimeters (mm) and 230 mm (Table 4); all steelhead displayed the distinct parr marks typical of resident rainbow trout and juvenile steelhead; none displayed features associated with smolting steelhead (e.g., silver coloration, faded parr marks).

Table 3. Density of Steelhead in Upper Penitencia Creek

Location	Survey Year	Survey Date	Length of Survey Reach (ft)	Steelhead Density (#fish/100 linear ft)	Surveyor
Alum Rock Park Restoration Project—Project Reach	2014	4 Nov	440	0.5	HTH
Alum Rock Park Restoration Project—Upstream Reach	2014	5 Nov	310	1.0	HTH
Alum Rock Park Restoration Project—Project Reach	2014	1 May	450	0.9	HTH
Alum Rock Park Restoration Project—Upstream Reach	2014	1 May	320	1.25	HTH
Alum Rock Park Restoration Project—Project Reach	2013	16 Sept	384	1.6	HTH
Alum Rock Park Restoration Project—Upstream Reach	2013	17 Sept	185	0.5	HTH
Upper Penitencia Creek Floodplain Restoration Project	2013	18 Sept	484	1.0	HTH
Upstream of YSI bridge—Alum Rock Park	2010	31 Aug	288	0.7	CDFW
Eagle Rock Picnic Area—Alum Rock Park	2010	19 Oct	215	7.1	CDFW
Near 1st Bridge in Alum Rock Park	2010	31 Aug	437	4.1	CDFW
Upstream of Percolation Ponds at Dorel Rd	2010	30 Aug	120	0	CDFW
Downstream of percolation pond outflow	2010	31 Aug	314	4.1	CDFW
Downstream of Percolation Pond Outflow	2010	19 Oct	354	1.4	CDFW
Piedmont Rd	2010	19 Oct	315	0.3	CDFW
Upstream of Capitol Avenue; Downstream of Wildlife Center	2010	30 Aug	338	0	CDFW
Downstream of Hwy 680	2010	30 Aug	298	0	CDFW

Location	Survey Year	Survey Date	Length of Survey Reach (ft)	Steelhead Density (#fish/100 linear ft)	Surveyor
Trail Halfway from Upper Vehicle Bridge to the Arroyo Aguague Confluence	2011	31 Dec	278	13.0	CDFW
Upstream of YSI Weir—Alum Rock Park	2011	14 Aug	258	0.4	CDFW
Visitor Center—Alum Rock Park	2011	22 Oct	308	2.3	CDFW
Eagle Rock Picnic Area—Alum Rock Park	2011	22 Oct	208	3.4	CDFW
1st Bridge in Alum Rock Park	2011	14 Aug	210	2.9	CDFW
Dorel Drive	2011	19 Sept	235	0.8	CDFW
Downstream of Percolation Pond Outfall	2011	14 Aug	358	0	CDFW
Downstream of Wildlife Center	2011	19 Sept	457	0	CDFW
Downstream of Hwy 680	2011	14 Aug	309	0	CDFW

Table 4. Number, Length and Weight of Steelhead Captured—Spring and Fall 2014

	Habitat Type		Length (mm)		Weight (g)	
Unit	Spring	Fall	Spring	Fall	Spring	Fall
Y2 PR Unit 8		Plunge pool		138		23.1
Y2 PR Unit 10	Boulder formed pool		180		2.45	
Y2 PR Unit 13	Run		185		Escape	
Y2 PR Unit 14	Pocket water		151		1.27	
Y2 PR Unit 16	Pocket water	Plunge pool	141	175	1.78	43.4
Y2 UR Unit 3	Bedrock formed pool		146		1.65	
Y2 UR Unit 7	Pocket water		230		4.1	
Y2 UR Unit 8	Boulder formed pool	Boulder formed pool	130; 156	158	0.93; 1.33	34.0
Y2 UR Unit 10		Bedrock formed pool		93; 85		8.5; 5.8

In the Project reach, most riffle sculpin were between 61 mm and 100 mm in spring and between 31 mm and 60 mm in fall (Figure 4), and in the Upstream reach most were between 61 mm and 90 mm in the spring and 31 mm and 80 mm in the fall (Figure 5). In the Project reach, most California roach were between 41 mm and 70 mm in the spring and between 31 mm and 70 mm in the fall (Figure 6), and in the Upstream reach, most were between 41 mm and 60 mm in the spring and between 41mm and 80mm in the fall (Figure 7). The three Sacramento sucker captured in Project reach in the spring were 65 mm, 88 mm, and 159 mm; there were no Sacramento suckers captured in the Upstream reach in the spring. In the fall, there were 10

Sacramento suckers captured in the Project reach which were between 65 mm and 199 mm in length. There were no Sacramento suckers captured in the Upstream reach in the fall.

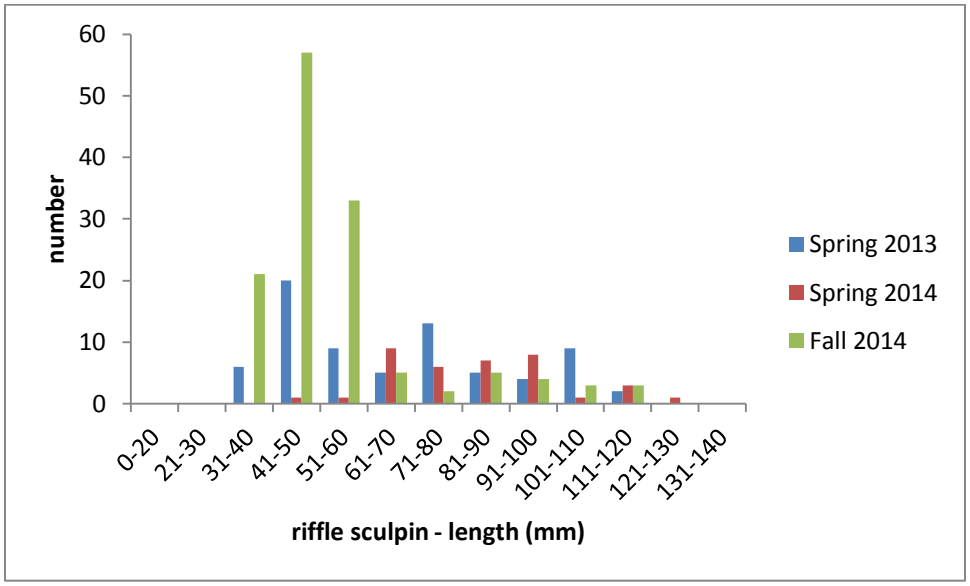


Figure 4. Length Frequency—Riffle Sculpin in the Project Reach

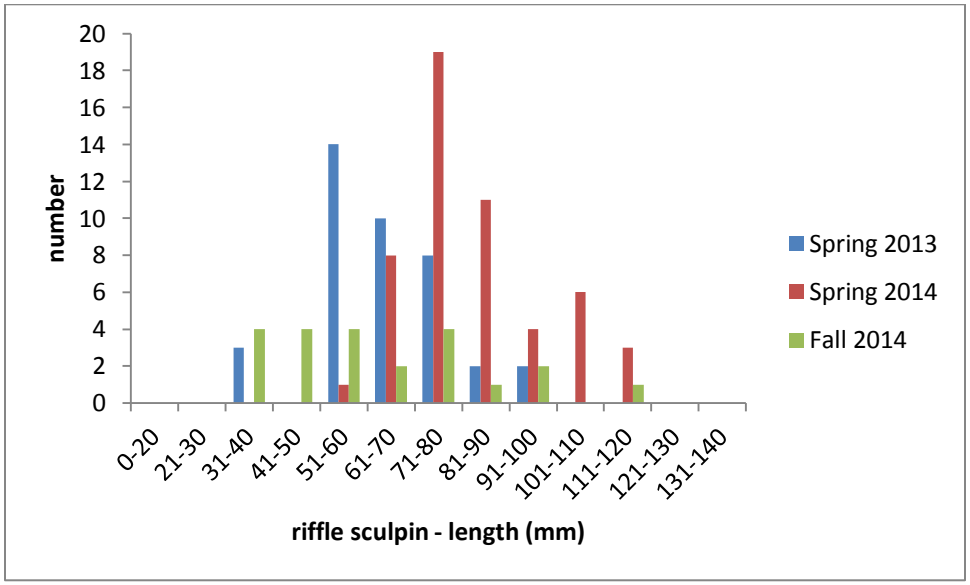


Figure 5. Length Frequency—Riffle Sculpin in the Upstream Reach

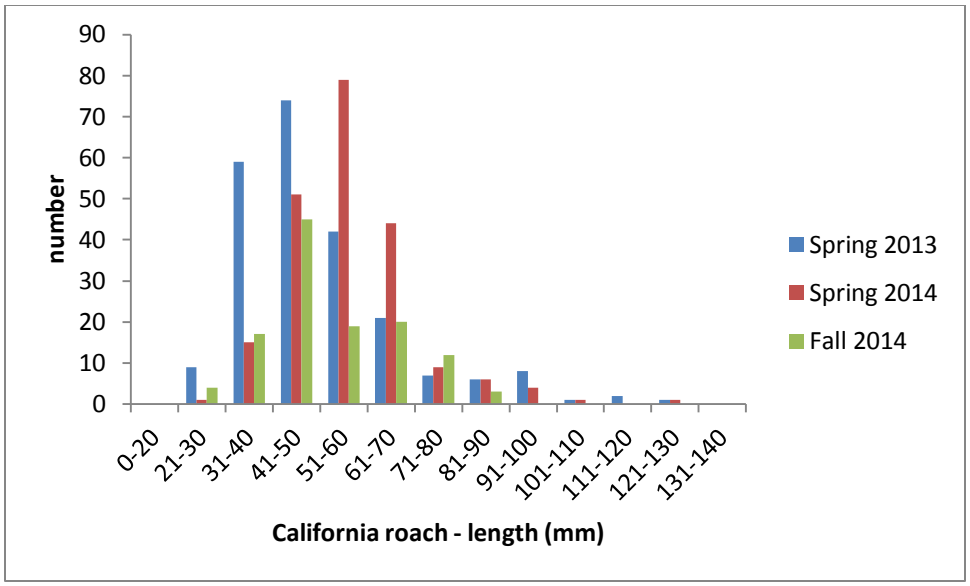


Figure 6. Length Frequency—California Roach in the Project Reach

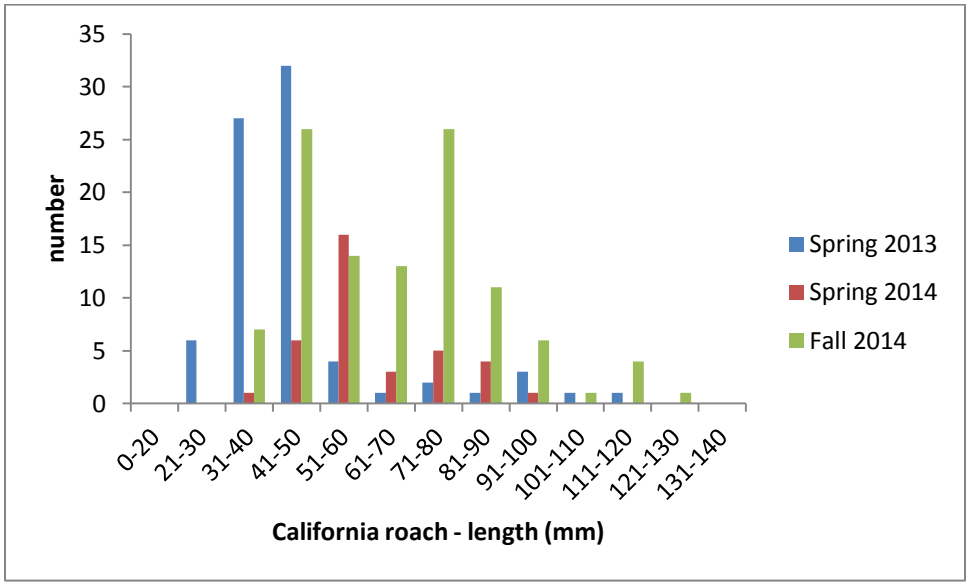


Figure 7. Length Frequency—California Roach in the Upstream Reach

Section 4.0 Discussion

The fish species documented in surveyed reaches were consistent with surveys from other reaches in Upper Penitencia Creek (Leicester 2011; Leicester and Smith 2012). In the past, eight native fish species have been documented in different reaches of the Upper Penitencia Creek watershed including: steelhead and rainbow trout, Pacific lamprey (*Entosphenus tridentatus*), California roach, hitch (*Lavinia exilicauda*), Sacramento blackfish (*Orthodon microlepidotus*), Sacramento sucker, prickly sculpin (*Cottus asper*), and riffle sculpin (Buchan et al. 1999, as cited in Stillwater Sciences 2006; Santa Clara Valley Water District [SCVWD] 2008). However, these species occupy different habitats within the watershed and are not found in all reaches of Upper Penitencia Creek. Pacific lamprey, hitch, prickly sculpin and California blackfish were not observed in the surveyed sites during 2014 monitoring.

4.1 Native Species Detected

4.1.1 California Central Coast Steelhead

The density (i.e., number of fish/100 ft) of steelhead in the survey reaches during spring and fall 2014 surveys was similar to densities documented in nearby reaches in recent years (Table 3). However, the resident population of rainbow trout, rather than a population of anadromous steelhead, may be supporting current densities of juvenile *O. mykiss*. With successive years of dry conditions (i.e., low and intermittent flow) and the resulting inaccessible spawning and summer rearing habitat, steelhead may have been unable to access spawning habitat in the upper reaches of Upper Penitencia Creek in recent years. Leicester (2011) documented poor steelhead reproductive success in Upper Penitencia Creek between 2009 and 2011. The lengths of steelhead captured during Year 2 monitoring ranged from 130 mm to 230 mm; based on recent size at age estimates from CDFW (Leicester 2011), the fish captured during this monitoring year were likely 1 year old and 2 year old fish, although it is possible that larger individuals may have been 3 years old. Signs of steelhead smoltification have been observed in fish >150 mm length in the Coyote Creek watershed (SCVWD 2008), so finding larger fish during our surveys that did not have signs of smoltification supports that the fish could be resident. Past surveys conducted prior to the restoration of the Project reach also documented the occurrence of *O. mykiss* upstream of the Project reach (Leicester 2011; Leicester and Smith 2012). If steelhead smolts are observed upstream of the Project reach, it could indicate successful spawning migrations through the reach; however, resident *O. mykiss* may adopt an anadromous life history strategy thereby making it difficult to determine the origin of smolts (Courter et al. 2013).

4.1.2 Riffle Sculpin

Riffle sculpin and prickly sculpin occupy similar habitats and these two sculpin species are notoriously difficult to differentiate due to overlapping physical characteristics. Riffle sculpin may also hybridize with prickly sculpin, further complicating positive identification especially in small individuals (Moyle 2002). CDFW reports that riffle sculpin occur in Alum Rock Park (i.e. Project reach and Upstream reach) and

prickly sculpin occur in low elevation reaches downstream of the park (Leicester pers. comm. 2014). We were unable to differentiate between the two species of sculpin captured during Year 2 surveys and assumed that all sculpin captured were riffle sculpin based on CDFW reports. The presence of riffle sculpin in survey reaches may indicate healthy habitat conditions for salmonids because riffle sculpin require cold, highly oxygenated water (Moyle 2002).

4.1.3 Sacramento Sucker

Prior to the weir modification, there were abundant Sacramento suckers in pools and glides below the unmodified grade control weir (HTH 2013b). Leicester and Smith (2012) reported that no Sacramento suckers have ever been captured above the concrete weir in Upper Penitencia Creek. Although the modification of the concrete weir structure and restoration of the Project reach is expected to allow Sacramento suckers to migrate into upstream reaches, none were captured in the Upstream reach during our surveys. However, Sacramento suckers may have been present in some of the very large pool habitats where electrofishing was not possible.

4.1.4 California Roach

California roach were captured in nearly every habitat unit surveyed during 2014 monitoring. The abundance and distribution of a wide size range of California roach during surveys was probably due to the ability of California roach to tolerate a variety of water quality conditions and to the low numbers of predatory fishes in the Project and Upstream reaches.

4.2 Absent species

4.2.1 Pacific Lamprey

As discussed above, past surveys (Leicester 2011; Leicester and Smith 2012) have documented lamprey in the low elevation reaches of Upper Penitencia Creek. As of 2012, there are no reports of adult or juvenile lamprey above the percolation ponds in 35 years (Leicester and Smith 2012). We did not capture lamprey during the Year 1 and Year 2 surveys. Intermittent flow and barriers in lower reaches of Upper Penitencia Creek may be preventing lamprey access to upstream reaches including the Project reach.

4.2.2 Hitch

Although no hitch were captured during Year 2 surveys, hitch are native to Coyote Creek where they may hybridize with California roach (Moyle 2002). Hitch are typically found in low gradient, low elevation streams in quiet water (Moyle 2002) which may explain their absence from the relatively high gradient reaches present in Alum Rock Park.

4.2.3 Sacramento Blackfish

There were no Sacramento blackfish captured during Year 1 or Year 2 surveys. The occurrence of Sacramento blackfish in Upper Penitencia Creek in the past may have been the result of a temporary introduction from the South Bay Aqueduct (Abel pers. comm., as cited in Stillwater 2006).

Section 5.0 Conclusions

The results of the 2014 Year 2 surveys indicate that the Project goals continue to be met; native fish including CCC steelhead inhabit the Project reach and the Upstream reach. The presence of steelhead in the Project reach indicates that restoration features are providing habitat for a small population. However, successive years of low steelhead production in Upper Penitencia Creek likely due to drought conditions have the potential to affect future steelhead populations. Although fish passage issues still exist in reaches upstream and downstream of the Project reach, with the ease of access gained through the modification of the concrete weir, steelhead of all life stages can now migrate more easily through the Project reach to upstream habitat when flow conditions allow passage.

Section 6.0 Literature Cited

Courter, I.I., D.B. Child, J.A. Hobbs, T.M. Garrison, J.J.G. Glessner, and S. Duery. 2013. Resident rainbow trout produce anadromous offspring in a large interior watershed. Canadian Journal of Fisheries and Aquatic Sciences 70:701–710.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual. Fourth edition. California Department of Fish and Game, Wildlife and Fisheries Division.

[HTH] H. T. Harvey & Associates. 2013a. Alum Rock Park Bank Repair and Stream Restoration Project—Post Construction Fisheries Monitoring Plan. Santa Clara Valley Transportation Authority, San Jose, CA.

[HTH] H. T. Harvey & Associates. 2013b. Alum Rock Park Bank Repair and Stream Restoration Project—Fish Relocation Summary Report. Santa Clara Valley Transportation Authority, San Jose, CA.

[HTH] H. T. Harvey & Associates. 2014. Alum Rock Park Fish Passage Improvement Project—Project Site 13, Year-1 Fisheries Monitoring. Santa Clara Valley Transportation Authority, San Jose, CA.

Leicester, M. 2011. Upper Penitencia Creek Fish Resources in 2010. California Department of Fish and Game.

Leicester, M. and J. Smith. 2012. Upper Penitencia Creek Fish Resources in 2011.

Leidy, R.A., G.S. Becker, and B.N. Harvey. 2005. Historical Distribution and Current Status of Steelhead/Rainbow Trout (*Oncorhynchus mykiss*) in Streams of the San Francisco Estuary, California. Prepared for Center for Ecosystem Management and Restoration, Oakland, CA.

Moyle, P.B. 2002. Inland Fishes of California. University of California Press, Berkeley and Los Angeles, CA.

[NMFS] National Marine Fisheries Service. 2000. Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act. Accessed 11 December 2013. http://www.westcoast.fisheries.noaa.gov/publications/reference_documents/esa_refs/section4d/electro2000.pdf.

[NMFS] National Marine Fisheries Service. 2012. Biological Opinion. Instream and Floodplain Enhancement Project on Upper Penitencia Creek, Adjacent to Berryessa Road in San Jose, California. Issued: 11 May 2012. Tracking Number 2011/05478.

[SCVWD] Santa Clara Valley Water District. 2008. Mid-Coyote Flood Protection Project, Baseline Fisheries Monitoring Report Year 2. Santa Clara Valley Water District.

Stillwater Sciences. 2006. Upper Penitencia Creek Limiting Factors Analysis—Final Technical Report. Santa Clara Valley Urban Runoff Pollution Prevention Program, Oakland, CA.

Personal Communications

Leicester, M. California Department of Fish and Wildlife. Email to N. Kalson, H. T. Harvey & Associates. 12 November 2012.

Leicester, M. California Department of Fish and Wildlife. Email to N. Kalson, H. T. Harvey & Associates. 6 November 2014.

Appendix A. Habitat Unit Descriptions

	Habitat Type (Level IV)		Max Depth (ft)		Length (ft)		Max Width (ft)		Area (sq ft)	
Unit	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Y2-PR Unit 1	Glide	Bedrock Formed Pool	1	0.5	37	12.5	14	2.5	518	31.25
Y2-PR Unit 2	Mid Channel Pool	Glide	1.5	0.7	27.5	38	13	6.5	357.5	247
Y2-PR Unit 3	Low Gradient Riffle	Low Gradient Riffle	0.3	0.2	13	13	6	8	78	104
Y2-PR Unit 4	Mid Channel Pool	Boulder Formed Pool	1.25	0.5	16	16.5	7	6.5	112	107.25
Y2-PR Unit 5	Plunge Pool	Plunge Pool	1.25	0.5	5	6	7	11	35	66
Y2-PR Unit 6	Glide	Low Gradient Riffle	0.75	0.3	30	28.5	10	7	300	199.5
Y2-PR Unit 7	Boulder Formed Pool	Pocket Water	1.5	0.5	5	18.5	4	9.5	20	175.75
Y2-PR Unit 8	Mid Channel Pool	Plunge Pool	1	1.25	10	17	9	18.5	90	314.5
Y2-PR Unit 9	Plunge Pool	Boulder Formed Pool	2.5	1	20	24	18	10	360	240
Y2-PR Unit 10	Boulder Formed Pool	Plunge Pool	1	0.5	15	6	12	12.5	180	75
Y2-PR Unit 11	Step Run	Plunge Pool	0.75	0.75	15	19	13	12.5	195	237.5
Y2-PR Unit 12	Run	Pocket Water	1.5	0.5	27	33	18	8.5	486	280.5
Y2-PR Unit 13	Run	Mid Channel Pool	1	0.75	15	17.5	16	11	240	192.5
Y2-PR Unit 14	Pocket Water	Boulder Formed Pool	0.75	0.5	8	12	18	11	144	132
Y2-PR Unit 15	Mid Channel Pool	Plunge Pool	1.25	1	16	19	13	16	208	304
Y2-PR Unit 16	Pocket Water	Plunge Pool	2	1.5	32	17	20	20	640	340
Y2-PR Unit 17	Plunge Pool	Low Gradient Riffle	3	0.1	17	75	19	8	323	600
Y2-PR Unit 18	Low Gradient Riffle	Glide	0.5	0.5	144	33	10	8	1440	264
Y2-PR Unit 19		Low Gradient Riffle		0.5		31		13		403
Y2-UR Unit 1	Boulder Formed Pool	Boulder Formed Pool	1	1	19	14	12	9	228	126
Y2-UR Unit 2	Glide	Bedrock Formed Pool	1	2	28	40	12	5	336	200
Y2-UR Unit 3	Bedrock Formed Pool	Step Run	2.25	1	45	59	8	6.5	360	383.5
Y2-UR Unit 4	Plunge Pool	Run	1.5	0.5	13.5	50	4	7	54	350

	Habitat Type (Level IV)		Max Depth (ft)		Length (ft)		Max Width (ft)		Area (sq ft)	
Unit	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Y2-UR Unit 5	Pocket Water	Plunge Pool	1	2.5	43	10.5	13	11	559	115.5
Y2-UR Unit 6	Glide	Mid Channel Pool	0.75	0.5	44	12.5	15	7.5	660	93.75
Y2-UR Unit 7	Pocket Water	Mid Channel Pool	0.5	0.5	28	32.9	7	9	196	296.1
Y2-UR Unit 8	Boulder Formed Pool	Boulder Formed Pool	1.25	1	29	27	10	10	290	270
Y2-UR Unit 9	Step Run	Pocket Water	0.75	0.5	30	30	15	5	450	150
Y2-UR Unit 10	Boulder Formed Pool	Bedrock Formed Pool	0.75	0.5	30	32	12	4.5	360	144