ANNUAL RESTORATION MONITORING REPORT
YEAR 4

SAN FELIPE CREEK RESTORATION PROJECT
SANTA CLARA VALLEY HABITAT AGENCY

Prepared for

SANTA CLARA VALLEY HABITAT AGENCY

535 Alkire Avenue
Morgan Hill, California 95037
Contact: Nathan Hale and Julie King

Prepared by

NOMAD ECOLOGY

(925) 228-1027
822 MAIN STREET
MARTINEZ, CA 94553

JANUARY 2023

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Section 1. RESTORATION PROJECT OVERVIEW

1.1. INTRODUCTION AND SUMMARY

Nomad Ecology (Nomad) prepared this Annual Monitoring Report for the San Felipe Creek Restoration Project (project) on behalf of the Santa Clara Valley Habitat Agency (Habitat Agency). This report summarizes the annual monitoring results for Year 4 (2022) of monitoring. Site performance for Years 1, 2, and 3 can be found in the San Felipe Creek Restoration Project Mitigation Monitoring Annual Report for Year 1 (Dudek 2020a), Year 2 (Dudek 2020b) and Year 3 (Dudek 2021).

The project consists of the restoration, establishment, and enhancement of aquatic resources along San Felipe Creek and its tributaries between the Corral and Cañada de Pala trails in the Joseph D. Grant County Park in unincorporated Santa Clara County, California (Figures 1 and 2). The restoration project generates habitat restoration credits and contributes to recovery per the requirements of the Santa Clara Valley Habitat Plan (ICF International 2012) and Regional General Permit 18 (USACE 2016). Restoration credits are also being sought to satisfy requirements associated with 401 Water Quality Certifications issued by the Regional Water Quality Control Board. Restoration of San Felipe Creek will mitigate impacts from historical land uses and disturbances, enhance aquatic and upland habitats, make San Felipe Creek more resilient to climate change, and provide educational opportunities for the public.

The project restored approximately 1 mile of stream through modification of in-channel habitat and restoration of sustainable natural channel and floodplain functions. Restoration construction was completed in 2018 and included the following activities:

- Improvements to park trails and associated drainage features
- Restoration of San Felipe Creek
- Improvements to an incised agricultural ditch and seasonal wetlands
- Rehabilitation of incised tributaries
- Rehabilitation of Boyds Creek (a tributary to San Felipe Creek) and an associated abandoned channel
- Enhancement of seasonal wetlands and a spring wetland

Per the San Felipe Creek Restoration Project Mitigation and Monitoring Plan (MMP) (Dudek 2019), monitoring began in 2018 following the completion of construction activities and will extend for a 10-year period through October 2028. This report presents the results of the fourth year (2022) of restoration monitoring. This report provides an overview of the restoration project; performance standards; requirements, timing, and methodology of monitoring efforts; monitoring results; and recommendations.

The performance of the project site, is evaluated through comparison of the monitoring data to the performance standards in the MMP. There are separate performance standards for wetland restoration areas and for stream and riparian buffer areas. In addition there are wetland re-establishment success criteria, separate from the performance standards that will not be evaluated until Year 5 or Year 10 and so were not evaluated in 2022 – Year 4.

Based on vegetation monitoring in Year 4, the wetland rehabilitation and enhancement areas met three of the six interim performance standards. They met: maximum cover by weed species, minimum absolute

cover of wetland species (OBL, FACW, or FAC)[1], and target species richness performance standards. They did not meet: minimum container plant cover, minimum seeded area cover, or minimum relative cover of native species performance standards. The hydrology performance standard could not be evaluated in Year 4 because it was a below-average precipitation year. Recommendations are included to keep the site on track to meet performance standards. Recommendations include removing the container plant cover performance standard as this is not a useful measure of seasonal wetland restoration performance, and revising the relative cover performance standard to be measured relative to reference sites. It is expected that seeded area cover will increase in an average rain year and no additional planting or seeding is recommended at this time.

Based on vegetation monitoring in Year 4, the stream and riparian buffer met two of the six interim performance standards. They met: maximum cover by weed species and target species richness performance standards. They did not meet: minimum container plant cover, minimum cuttings cover, minimum seeded area cover, or minimum relative cover of native species performance standards. These performance standards were not met because the majority of surviving plants on site were part of the Phase 1 and 2 replacement planting that occurred in fall 2020 and fall 2021, and the plants are younger and smaller than plants from the initial plantings. Because they are younger and smaller, they do not provide significant cover. Because these sites are densely planted, we do not recommend additional planting. Continued maintenance including irrigation, caging, mulching, and weed control will ensure these plants continue to grow and mature and provide sufficient cover to meet performance standards.

Based on hydrology monitoring in Year 4 conducted by Balance Hydrologics, Inc. (Balance), the stream and riparian buffers are meeting all performance standards. Balance recommends adding a second course of staked debris jams during summer 2023,

1.2. PERMIT HOLDER AND INFORMATION

The following permits were secured for this project and are held by the Santa Clara Valley Habitat Agency. This document was prepared in accordance with the conditions provided in the following regulatory permit documents:

- U.S. Army Corps of Engineers File Number: 2017-00322S, and RGP 18, File Number: SPN-2012-00302S
- San Francisco Bay Regional Water Quality Control Board, Water Quality Certification, CIWQS Place ID 836012
- California Department of Fish and Wildlife Lake or Streambed Alteration Agreement, Notification Number 1600-2017-0309-R3
- Santa Clara Valley Habitat Agency Reporting File Number SCVHA-2-18-01

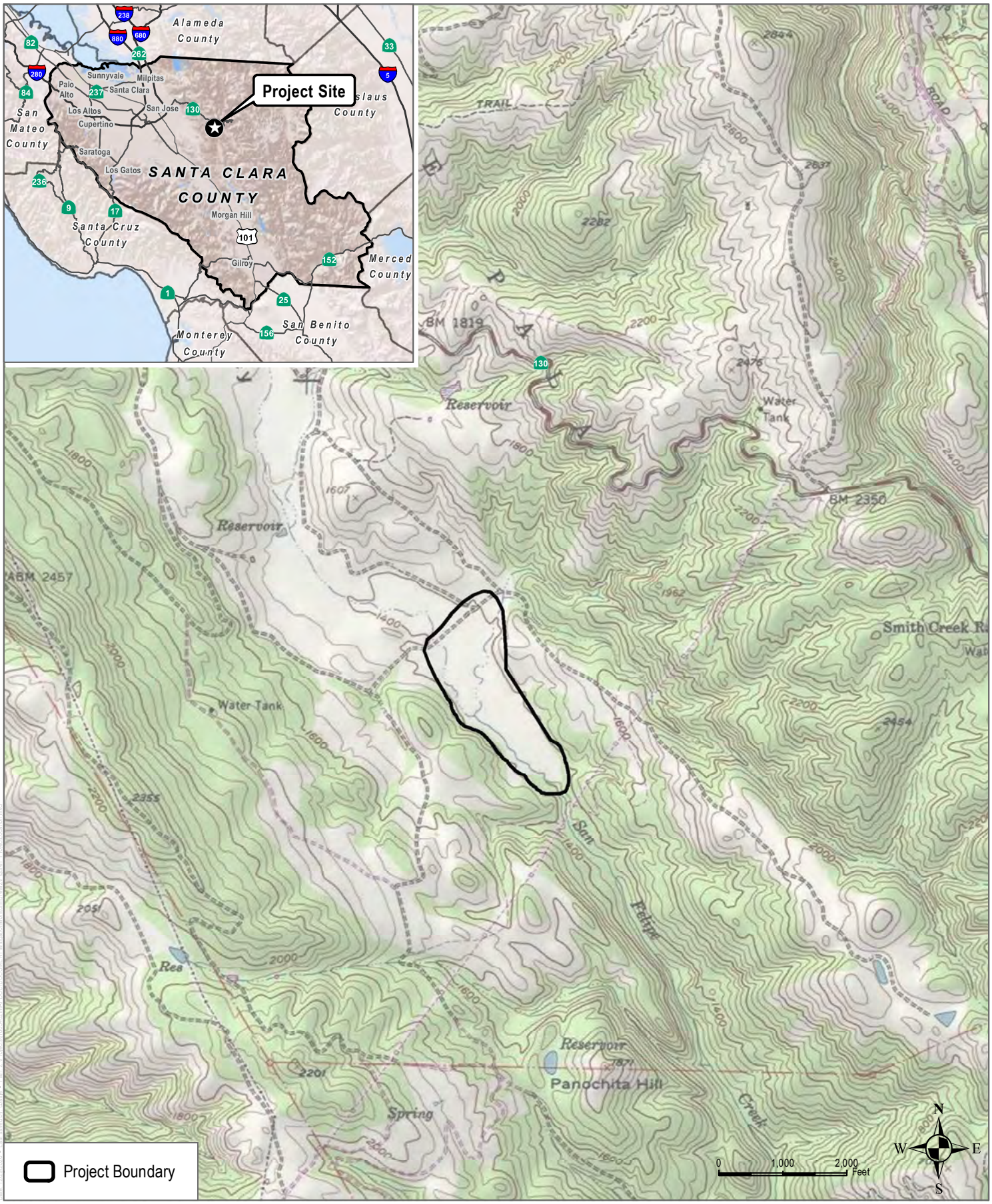
1.3. PROJECT SETTING

The project site is in the Joseph D. Grant County Park in unincorporated Santa Clara County, California (Figure 1). The project site is approximately 7 miles east of the City of San Jose in Section 12, Township 7 South, and Range 2 East of the U.S. Geological Survey Lick Observatory 7.5-minute quadrangle. The

[1] Prior project reports mistakenly defined wetland species as consisting of OBL and FACW species, and they measured and reported wetland species' cover accordingly. This report and all subsequent reports define wetland species by the indicators OBL, FACW, and FAC, in accordance with the U.S. Army Corps of Engineers' wetland delineation methodology.

approximate center of the project site corresponds to GPS coordinates 37.320166, -121.699706. The restoration area is within the San Francisco Bay Area subregion of the California Floristic Province (Baldwin et al. 2012) and within the Coyote Creek Watershed.

The project site is approximately 61 acres and is along approximately 1 mile of San Felipe Creek. The project site consists of undeveloped parkland bordering the San Felipe Creek corridor south of the Corral Trail and associated tributaries and uplands (Figure 2). Topography within the restoration area consists of low-gradient alluvial valley and terrace terrain, surrounded to the north, east, and south by steepening hill slopes.



SOURCE: USGS 7.5-Minute Series Lick Observatory Quadrangle

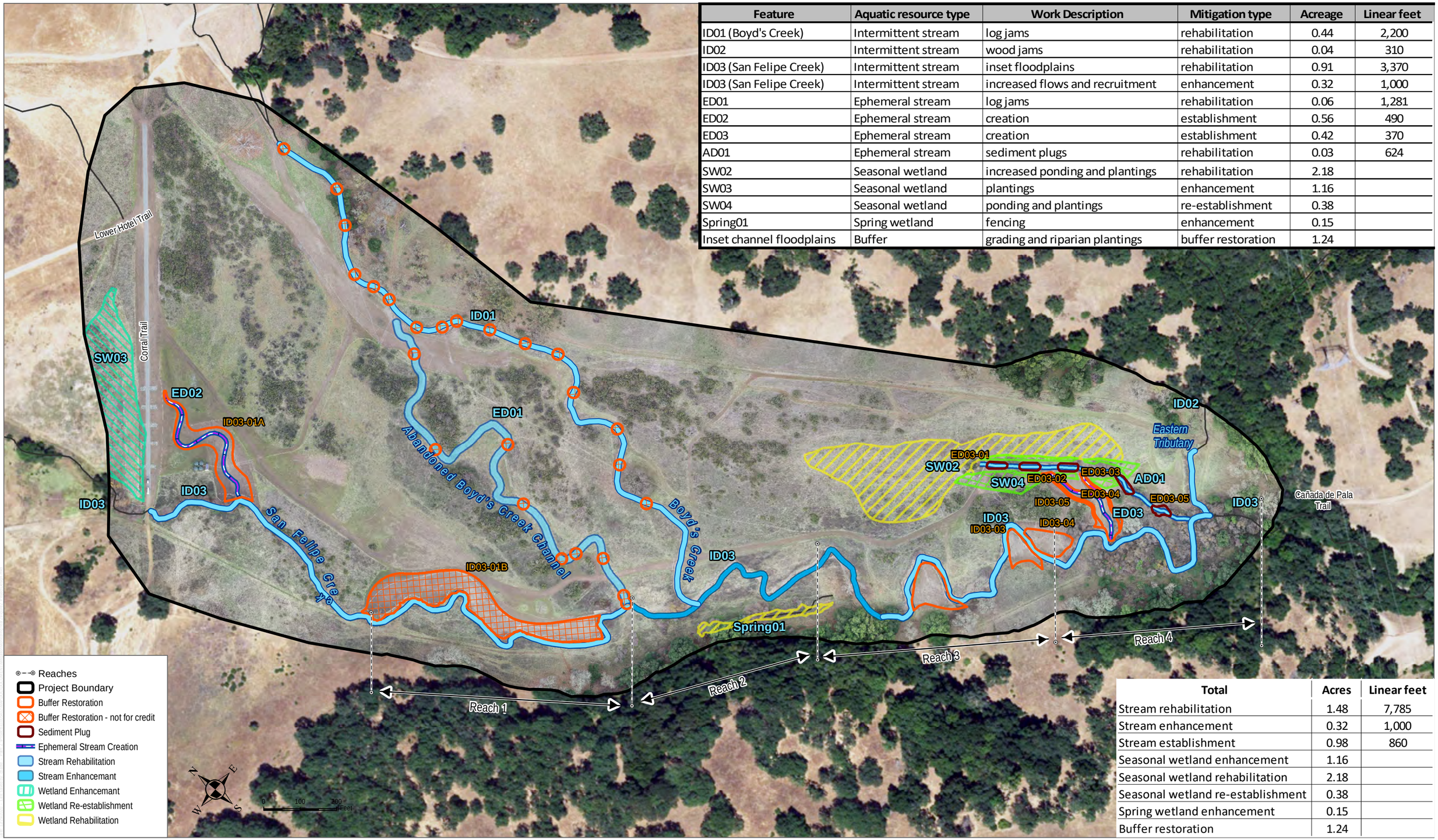
FIGURE 1

Project Location

San Felipe Creek Restoration Project

DUDEK

Feature	Aquatic resource type	Work Description	Mitigation type	Acreage	Linear feet
ID01 (Boyd's Creek)	Intermittent stream	log jams	rehabilitation	0.44	2,200
ID02	Intermittent stream	wood jams	rehabilitation	0.04	310
ID03 (San Felipe Creek)	Intermittent stream	inset floodplains	rehabilitation	0.91	3,370
ID03 (San Felipe Creek)	Intermittent stream	increased flows and recruitment	enhancement	0.32	1,000
ED01	Ephemeral stream	log jams	rehabilitation	0.06	1,281
ED02	Ephemeral stream	creation	establishment	0.56	490
ED03	Ephemeral stream	creation	establishment	0.42	370
AD01	Ephemeral stream	sediment plugs	rehabilitation	0.03	624
SW02	Seasonal wetland	increased ponding and plantings	rehabilitation	2.18	
SW03	Seasonal wetland	plantings	enhancement	1.16	
SW04	Seasonal wetland	ponding and plantings	re-establishment	0.38	
Spring01	Spring wetland	fencing	enhancement	0.15	
Inset channel floodplains	Buffer	grading and riparian plantings	buffer restoration	1.24	



Total	Acres	Linear feet
Stream rehabilitation	1.48	7,785
Stream enhancement	0.32	1,000
Stream establishment	0.98	860
Seasonal wetland enhancement	1.16	
Seasonal wetland rehabilitation	2.18	
Seasonal wetland re-establishment	0.38	
Spring wetland enhancement	0.15	
Buffer restoration	1.24	

SOURCE: Bing Maps 2020

DUDEK

FIGURE 2

Project Design

San Felipe Creek Restoration Project

1.4. RESTORATION PROJECT PURPOSE AND PROJECT ELEMENTS

1.4.1 PROJECT PURPOSE AND GOALS

The purpose of the project is to restore approximately 1 mile of stream by modifying in-channel habitat and restoring sustainable natural channel and floodplain functions within the reach of San Felipe Creek located between the Corral and Cañada de Pala Trails (Figure 2). Conditions prior to restoration were variable within the project reach but were generally categorized as an incised channel with a disconnected historical floodplain, limited groundwater connectivity, and areas that had converted to upland plant species (denuded of riparian vegetation). Legacy agricultural activities had influenced overland flow pathways and channel morphology. Restoration of San Felipe Creek will mitigate impacts from historical land uses and disturbances, enhance aquatic and upland habitats, make San Felipe Creek more resilient to climate change, and provide educational opportunities for the public. The restoration project was proposed to generate habitat restoration credits and contribute to recovery per the requirements of the Santa Clara Valley Habitat Plan (Habitat Plan) (ICF International 2012) and Regional General Permit 18 (USACE 2016). Restoration credits are also being sought to satisfy requirements associated with 401 Water Quality Certifications issued by the Regional Water Quality Control Board. Restoration of San Felipe Creek within the project area supports the biological goals and objectives of the Habitat Plan.

Overall, the project will result in increased aquatic resource functions and services by restoring, establishing, and enhancing wetland and non-wetland waters of the United States, including improving functions within an existing on-site ditch and incised channel, and restoring riparian woodland adjacent to San Felipe Creek. These restoration actions are expected to benefit special-status species such as California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*) by providing upland habitat and refugia. The project will also increase the diversity of native wetland and riparian vegetation, as well as improve the functional capacity of existing on-site streams by increasing the potential for addition of allochthonous material (organic matter and nutrients imported into an ecosystem), and providing flood protection benefits and groundwater recharge.

1.4.2 PROJECT ELEMENTS

The following project elements were implemented with the goal of establishing (i.e., creating), re-establishing, rehabilitating, and enhancing the creek and wetland areas into the desired habitat types. Per Habitat Plan definitions (ICF International 2012), all of these methods are considered under the umbrella term "restoration." Each element is described in further detail below. The anticipated mitigation type and amount for each project element is provided in Table 1. The Restoration As-Builts are included in Appendix A.

Table 1. Aquatic Resource Mitigation Types and Amounts per MMP

FEATURE	AQUATIC RESOURCE TYPE	WORK DESCRIPTION	MITIGATION TYPE[1]	ACREAGE	LINEAR FEET
ID01 (Boyds Creek)	Intermittent stream	Log jams	Rehabilitation	0.44	2,200
ID02 (Incising Tributary)	Intermittent stream	Wood jams	Rehabilitation	0.04	310
ID03 (San Felipe Creek Reaches 1, 3, and 4)	Intermittent stream	Inset floodplains	Rehabilitation	0.91	3,370
ID03 (San Felipe Creek Reach 2)	Intermittent stream	Increased flows and recruitment	Enhanced	0.32	1,000

Feature	Aquatic Resource Type	Work Description	Mitigation Type[1]	Acreage	Linear Feet
ED01 (Boyds Creek Abandoned Channel)	Ephemeral stream	Log jams	Rehabilitation	0.06	1,281
ED02 (Ephemeral Drainage)	Ephemeral stream	Creation	Establishment	0.56	490
ED02 (Ephemeral Drainage)	Ephemeral stream	Creation	Establishment	0.42	370
AD01 (Agricultural Ditch)	Ephemeral stream	Sediment plugs	Rehabilitation	0.03	624
SW02 (Rehabilitated Seasonal Wetland)	Seasonal wetland	Increased ponding and plantings	Rehabilitation	2.18	N/A
SW03 (Enhanced Seasonal Wetland)	Seasonal wetland	Plantings	Enhancement	1.16	N/A
SW04 (Re-established Seasonal Wetland)	Seasonal wetland	Ponding and plantings	Re-establishment	0.38	N/A
Spring01 (Spring Wetlands)	Spring wetland	Fencing	Enhancement	0.15	N/A

Source: San Felipe Creek Restoration Project – Year 3 Annual Report (Dudek 2021)
[1] Per Habitat Plan definitions (ICF International 2012), all of these methods are considered under the umbrella term "restoration."

Improve Corral Trail and Lower Hotel Trail

Prior to restoration efforts, the Corral Trail was lower than the surrounding fields, and it captured runoff that would otherwise flow across and infiltrate into the Boyds Creek alluvial fan, resulting in erosion of the road and excess sediment delivery to San Felipe Creek, and reducing recharge across the alluvial fan. The Corral Trail was modified using filling to allow flows to pass the road to the south onto the alluvial fan. Where runoff flowed across and eroded the Hotel Trail, an Arizona Crossing (i.e., low-flow crossing) was constructed to prevent erosion, reduce fine sediment loading, improve trail access, and reduce trail maintenance.

Along the Corral Trail near the seasonal wetland to the east of San Felipe Creek, there was an existing buried rock drain that was inadequate to carry water across the trail during high-flow periods. The project built up the grade along the Corral Trail to reduce flow and erosion across the trail, in tandem with installation of additional rock drain lenses to carry water from the upstream to downstream side of the road, where it naturally flows into San Felipe Creek. The elevation of the rock lenses was designed to maintain the hydrology of the existing seasonal wetland upstream. To avoid concentration of flows, each drainage lens contains a single 4-inch-diameter high-density polyethylene pipe located at the same elevation. The pipes are redundant and are included to prolong the life of the drainage lenses and avoid erosion of the Corral Trail from overtopping, and maintain existing water surface elevations and hydroperiods in the existing wetland. These pipes are intended to provide a low-flow path that can easily be maintained by parks staff.

The previously listed trail and road modifications did not have any direct impacts on waters of the United States. There are indirect, beneficial effects on downstream water quality and quantity in Boyds Creek and San Felipe Creek. Disturbed areas resulting from the trail improvements were seeded with native upland plant species. The trail itself was not seeded.

Restoration of San Felipe Creek (ID03)

The project approach acknowledges the varying states of incision from reach to reach, and accelerated the channel evolution process by excavating, expanding, and revegetating inset channel floodplains. Advancing the channel evolution process to stable form proactively removes fine sediment before it is introduced to the system by way of bank erosion and failure, while at the same time establishing more frequent floodplain inundation and encouraging more frequent aquifer recharge. The excavated floodplains will likely store fine sediment transported from upstream of the site, further reducing fine-sediment impacts.

Reach 1 (upstream portion of on-site San Felipe Creek [ID03] to confluence with Boyds Creek abandoned channel [ED01])

Inset floodplain creation (ID03-01 and ID03-01A) occurred in Reach 1 of San Felipe Creek (ID03) to advance widening processes and re-sculpt inset flood bench features. The flood bench was excavated between 1 to 3 feet above the channel bed based on storm flow observations; recurrence flow analysis; and relationships between slope, watershed areas, and channel geometry in downstream reference reaches. The restoration approach and plant palettes were tailored to the intermittent flow regime of this area. The above actions should result in creek rehabilitation within Reach 1 of San Felipe Creek. Per Habitat Plan definitions this is considered stream restoration. Additionally, these actions should result in restoration of the willow riparian forest and scrub or mixed riparian forest and woodland land cover type per the Habitat Plan.

Ephemeral Drainage (ED02)

There was a small head cut along San Felipe Creek just downstream of the Corral Trail in the vicinity of ID03-01A. The project re-contoured the feature into a broad ephemeral drainage (ED02) (creek establishment or stream restoration per Habitat Plan definitions) that maintains slow, overland flow as it approaches San Felipe Creek. The downstream portion of the ephemeral drainage creates a backwater channel when San Felipe Creek floods, slowing flow and increasing early-season infiltration.

Reach 2 (confluence with Boyds Creek abandoned channel downstream to eastern edge of spring wetland)

Reach 2 of San Felipe Creek (ID03) was generally in good condition and had good connection with the valley surface and well-developed inset floodplains, so no work occurred within this reach. Reach 2 will be enhanced by way of increased water flows and improved riparian cover over time.

Reaches 3 and 4 (downstream portion)

Additional inset floodplains (ID03-02, ID03-03, and ID03-04) were developed in this reach of San Felipe Creek (ID03). There were existing inset floodplains, but more extensive floodplain inundation and riparian diversity was intended by lowering selected inset floodplains and planting more riparian species. The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas. The additional inset floodplains should result in creek rehabilitation (stream restoration per Habitat Plan definitions) within Reaches 3 and 4. Additionally, these actions should result in restoration of the willow riparian forest and scrub, or mixed riparian forest and woodland land cover type per the Habitat Plan.

Improve Incised Agricultural Ditch (AD01) and Seasonal Wetlands (SW02 and SW04)

Linear plug treatments were implemented within the incised agricultural ditch (AD01) to slow the drainage of water through the ditch. These sediment plugs serve to re-establish the water table adjacent to the ditch to support additional seasonal wetlands (SW04), arrest incision, and encourage spreading of flows across valley bottomlands. In addition to re-established seasonal wetland areas (SW04), the existing seasonal wetlands (SW02) adjacent to the agricultural ditch were rehabilitated by way of improved hydrology and planting native species. The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas.

Additionally, a new ephemeral creek (ED03) and floodplain feature (ID03-05) were established to direct the channel to a new confluence with San Felipe Creek upstream of the ditch's previous confluence, consistent with valley floor topography. This feature was intended to restore the willow riparian forest and scrub, or mixed riparian forest and woodland land cover type defined in the Habitat Plan. Disturbed existing willows in the incised agricultural ditch were used to revegetate banks and plugs. Undisturbed willows were anticipated to self-propagate upslope in the ditch. Additionally, the established creek was planted with native species. The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas.

Rehabilitate Incising Tributary (ID02) Using Staked Wood Jams

Installation of staked wood jams occurred to rehabilitate (restore per Habitat Plan definitions) the incised tributary (ID02) located in the southern portion of the project site. Staked wood jams retain sediment and aggrade the channel, reversing the downcutting trend. The wood jams were installed in a phased approach, which should result in an eventual 6 to 7 feet of increased channel elevation. The wood jams were planted from cuttings using red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*). The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas.

Rehabilitate Boyds Creek (ID01) and Boyds Creek Abandoned Channel (ED01)

The project elements implemented within the Boyds Creek alluvial fan included living log jams planted with container plants to encourage distribution of flows to abandoned swales and channels across the Boyds Creek fan. Areas at the head of the alluvial fan impacted by former agricultural operations and roads were graded and lowered and overbank swales were restored to allow flood-flows to spread across the alluvial fan more frequently.

Constructed living log jams consist of large wood, with and without root wads, paired with native container plants consisting of sycamore (*Platanus racemosa*) and valley oak (*Quercus lobata*). The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas. Sycamore plantings were only used when genetically pure container plants were procured at the time of planting; valley oaks were used as substitutions, as needed.

Enhancement of Seasonal Wetland (SW03) and Spring Wetland (Spring01)

Within the existing seasonal wetland (SW03) at the northern portion of the project site and the spring wetland (Spring01) adjacent to San Felipe Creek, enhancement (restoration per Habitat Plan definitions) occurred in the form of non-native and invasive plant species control and installation of permanent exclusion fencing to improve wetland habitat diversity and function. Non-native and invasive plants that were removed from the wetlands include poison hemlock (*Conium maculatum*∗), Fuller's teasel (*Dipsacus*

***** Denotes a plant species not native to California.

*fullonum**), and curly dock (*Rumex crispus**). were removed from the wetlands include poison hemlock (*Conium maculatum**), Fuller's teasel (*Dipsacus fullonum**), and curly dock (*Rumex crispus**).

The spring wetland had been decimated by feral pigs (*Sus scrofa*), and as a result there was little vegetation within the wetland. Permanent exclusion fencing was installed to protect the project area, including the spring wetland. With the exclusion fence installed, it is anticipated that the wetland area will naturally revegetate over time since enough existing native plants within the spring can provide seed stock, as long as the non-native and invasive plant species and the pigs are controlled.

1.4.3 Initial Planting and Seeding

Initial restoration implementation included planting container plants and willow stakes (Table 2) and seeding with native seed mixes (Tables 3-5). Initial planting efforts included 9,114 container plants installed in the wetland rehabilitation and enhancement areas and the riparian buffer and stream areas and 400 willow cuttings installed along living log jams and in the riparian enhancement areas (Dudek 2020b, 2021).

Table 2. Original Plantings Installed During Initial Restoration Implementation

Scientific Name	Common Name	Type of Planting	Quantity of Planting Installed[1]
Aesculus californica	California buckeye	tree pot4	17
Baccharis salicifolia	mulefat	deepot	110
Carex praegracilis	field sedge	liners	1,882
Frangula californica	California coffeeberry	deepot	65
Juncus effusus	common rush	tree bands	1,741
Juncus patens	spreading rush	tree bands	2,254
Juncus xiphioides	iris-leaved rush	tree bands	1,891
Platanus racemosa	California sycamore	tree pot4	150
Quercus douglasii	blue oak	tree pot4	5
Quercus lobata	valley oak	tree pot4	293
Ribes californicum	California gooseberry	deepot	160
Rosa californica	wild rose	deepot	230
Rubus ursinus	California blackberry	deepot	130
Salix laevigata	red willow	cuttings	200
Salix lasiolepis	arroyo willow	cuttings	200
Sambucus mexicana	elderberry	deepot	86
Symphoricarpos albus	snowberry	deepot	100
		Total	**9,514**

Source: San Felipe Creek Restoration Project As Built Plans in the Year 3 Annual Monitoring Report (Dudek 2021).

Table 3. Seed Mix Type 1 – Wetland Riparian Mix

Scientific Name	Common Name	Application Rate (lbs. pure live seed/ac)
Achillea millefolium	yarrow	0.2
Cyperus eragrostis	umbrella plant	2.0
Elymus glaucus	blue wild rye	10.0
Elymus trachycaulus	slender wheatgrass	6.0
Festuca rubra	native red fescue	8.0
Hordeum brachyantherum subsp. *brachyantherum*	meadow barley	12.0
Lasthenia californica	goldfields	0.5
	Total	**38.7**

Table 4. Seed Mix Type 2 – Riparian Mix

Scientific Name	Common Name	Application Rate (lbs. pure live seed/ac)
Achillea millefolium	yarrow	0.2
Cyperus eragrostis	umbrella plant	2.0
Elymus glaucus	blue wild rye	10.0
Elymus trachycaulus	slender wheatgrass	6.0
Festuca rubra	native red fescue	8.0
Heliotropium curassavicum	heliotrope	1.0
Hordeum brachyantherum subsp. *brachyantherum*	meadow barley	12.0
Sisyrinchium bellum	blue-eyed grass	2.0
	Total	**41.2**

Table 5. Seed Mix Type 3 – Upland Mix

Scientific Name	Common Name	Application Rate (lbs. pure live seed/ac)
Achillea millefolium	yarrow	0.2
Bromus carinatus	California brome	6.0
Clarkia purpurea	purple clarkia	2.0
Elymus glaucus	blue wild rye	15.0
Eriogonum fasciculatum	California buckwheat	1.5
Eriophyllum confertifolium	golden yarrow	0.25
Hordeum brachyantherum subsp. *brachyantherum*	meadow barley	8.0
Phacelia californica	California phacelia	1.0

SCIENTIFIC NAME	COMMON NAME	APPLICATION RATE (LBS. PURE LIVE SEED/AC)
Sisyrinchium bellum	blue-eyed grass	2.0
Stipa pulchra	purple needlegrass	12.0
	Total	**47.95**

1.5. RESTORATION IMPLEMENTATION AND MONITORING SCHEDULE

Project construction began in late summer 2018 and continued through November 2018. Implementation of the restoration project began once grading of the channel areas and installation of the intended improvements were complete, as per the final as-built engineering plans. Seeding occurred on October 23 and 25, 2018. Planting of woody vegetation and plugs occurred on November 7 through November 19, 2018. Habitat Agency staff submitted the as-built engineering plans to regulatory agencies on May 13, 2019; the plans were also included within the Year 1 Annual Report (Dudek 2020a). The implementation schedule for the overall restoration program and status is presented in Table 6.

Table 6. Restoration Implementation Schedule

IMPLEMENTATION TASK	SCHEDULE	YEAR 4 STATUS
Order seed and container plants	Upon approval of the 65% Design Submittal.	Complete
Restoration site clearing and grading	After Notice to Proceed with construction and before channel/slope grading.	Complete
Restoration channel/slope grading	After site clearing and grading.	Complete
Restoration area finish grading	Upon certification of channel grading; based on final construction phasing strategy.	Complete
Initial weed treatment	After site grading.	Complete
Temporary irrigation	To be installed after initial weed treatment. Discontinued by the end of Year 3 and removed/abandoned at the end of Year 5.	Complete and Currently Maintained
Seed mix application	Following weed eradication and before container planting.	Complete
Container planting and cutting installation	Following weed eradication and container planting.	Complete. Additional planting occurred in 2020 and 2021.
Establishment Period: Assessment of installation, seed germination, and plant establishment	Weekly during initial 120-day period following seeding and container plant installation.	Complete
Site maintenance	10 years. Monthly during Year 1; monthly during November through April, and every other month during May through October for Years 2–10; maintenance visits will also be informed by the biological monitoring and biologist's recommendations.	Year 4 Complete; Ongoing

IMPLEMENTATION TASK	SCHEDULE	YEAR 4 STATUS
Restoration monitoring	Qualitative monitoring quarterly during Year 1, beginning with successful completion of initial maintenance period, and bi-annual during Years 2–10. Quantitative monitoring (transects) annually in Years 2–10.	Year 4 Complete; Ongoing
Final sign-off	End of Year 10 (or earlier if agreed to by agencies based on achievement of Year 10 standards).	To be Completed Year 10

Source: San Felipe Creek Restoration Project – Year 3 Annual Report (Dudek 2021)

During the 10-year maintenance and monitoring period, the project will be assessed to document the status of the compensatory mitigation effort, measured against the project performance standards outlined in the MMP (Dudek 2019). Dudek conducted the annual restoration monitoring during the initial 3 years of the 10-year monitoring period. Habitat Restoration Sciences Inc. (HRS) conducted the first 3 years of the 10-year site maintenance. Beginning in Year 4 (2022), Nomad Ecology conducted the biological monitoring, and Confluence Restoration, Inc. (Confluence) conducted site maintenance. Balance Hydrologics, Inc. conducted the geomorphic and hydrologic monitoring for Years 1 through 4.

Annual reports for the 10-year maintenance and monitoring period will be submitted each year for compliance with the permit reporting requirements and will be submitted by December 31 to accommodate California Department of Fish and Wildlife and San Francisco Regional Water Quality Control Board requirements.

1.6. SUMMARY OF REMEDIAL ACTIONS IN PRIOR YEARS

Maintenance and monitoring activities, as well as remedial actions to improve site performance and achievement of performance standards have been ongoing since implementation of the restoration project.

Based on the results of Year 1 and Year 2 monitoring (Dudek 2020a, Dudek 2020b), the plantings were not meeting performance standards for survival. Plant loss and mortality occurred shortly after installation due to high rainfall and heavy flows, with additional loss over time due to feral pig activity, irrigation malfunction, and drought (Dudek 2020b). A Remedial Plan (Dudek 2020c) was developed to correct performance deficiencies of the project, with the intent to bring the project back into conformance with performance standards. Recommendations from the Remedial Plan (Dudek 2020c) included replacement plantings. To mitigate the initial plant mortality, 751 container plants were installed in the riparian buffer and stream habitats in fall 2020, and an additional 100 willow cuttings were installed in January 2021. An additional 1,273 container plants (Table 7) and 40 willow cuttings were installed in fall 2021 (Dudek 2021). The Remedial Plan (Dudek 2020c) was included as an appendix in the Year 3 Annual Monitoring Report (Dudek 2021).

Table 7. Replacement Plantings - 2021

SCIENTIFIC NAME	COMMON NAME	QUANTITY INSTALLED	PLANTING AREA(S)
Aesculus californica	California buckeye	104	ID03-02, ID01, ED01
Artemisia douglasiana	California mugwort	96	ID01, ED01
Baccharis pilularis	coyote brush	94	ID03-02, ID01, ED01
Baccharis salicifolia	mulefat	135	ID01, ED01
Frangula californica	California coffeeberry	95	ID03-02, ID01, ED01
Heteromeles arbutifolia	toyon	143	ID03-02

Scientific Name	Common Name	Quantity Installed	Planting Area(s)
Platanus racemosa	California sycamore	45	ID03-02, ID01, ED01
Populus fremontii	Fremont cottonwood	75	ID03-02
Quercus agrifolia	coast live oak	62	ID03-02
Quercus lobata	valley oak	140	ID03-02, ID01, ED01
Ribes californicum	California gooseberry	25	ID03-02
Rosa californica	California rose	57	ID03-02
Rubus californica	California blackberry	55	ID03-02
Sambucus nigra spp. caerulea	blue elderberry	107	ID01, ED01
Symphoricarpos albus	common snowberry	40	ID03-02
Total Container Plants		**1,273**	

The irrigation system was transitioned from sprinkler to drip irrigation throughout 2020 and 2021 to ensure replacement plants would receive enough water. In 2022, weeds were removed from the immediate vicinity of the plantings. Invasive weeds were controlled during irrigation maintenance visits.

In addition to plantings, two log jam and debris jam structures were built (Appendix D). On November 4, 2020, HRS replaced a log on Boyds Creek that had been dislodged in an attempt to protect plantings on an outside bank, and on August 26, September 20 and September 21, 2021, HRS constructed a debris jam structure to redirect flows into the pre-project channel alignment where a cutoff channel had formed at ID03-02 in 2019 (Balance Hydrologics 2022).

Section 2. SITE MAINTENANCE ACTIVITIES

Site maintenance was performed by Confluence throughout the project site during Year 4. Per the MMP (Dudek 2019), maintenance and monitoring are to continue for 10 years or until the project performance standards have been met. Maintenance activities included fence and gate inspection and repair; irrigation inspection, repair and maintenance; plant inspection and cage repair; weed control; trash and debris removal; mowing; and other related activities. Confluence monitored the site for evidence of feral pig activity as fences and gates are designed to exclude feral pigs. All maintenance dates, activities and site notes to date for Year 4 are summarized in Table 8. A more extensive table of maintenance activities can be found in Appendix B.

Invasive species are defined in the MMP as species that threaten the diversity or abundance of native species through competition for resources, predation, parasitism, interbreeding with native populations, transmitting diseases, or causing physical or chemical changes to the invaded habitat (Dudek 2019). The California Invasive Plant Council (Cal-IPC) identifies, lists, and rates invasive species (Cal-IPC 2022). Per the MMP, species rated "moderate" or "high" by Cal-IPC are considered weeds and are monitored for comparison to the project performance standards (Dudek 2019). In Year 4, weed management activities targeted black mustard (*Brassica nigra**), hoary mustard (*Hirschfeldia incana**), yellow star-thistle (*Centaurea solstitialis**), bull thistle (*Cirsium vulgare**), poison hemlock*, and pepperweed (*Lepidium latifolium**).

Table 8. Summary of Site Management Activities for Year 4

MONTH (DAYS) IN 2022	MANAGEMENT ACTIVITIES CONDUCTED DURING MONTH	SITE NOTES
January 7, 21	• Fence and gate inspection and repair • Irrigation inspection, repair, maintenance • Plant inspection and plant cage repair • Debris and litter removal	Inspected fence line and made repairs as needed; bent section of fence, cleared flap gates with sediment and/or woody debris buildup preventing full closure. Surveyed damage to irrigation and plantings in floodplain; damage due to high flows from recent rain. Replaced plant protection cages. Pig damage observed under large, isolated oak tree. Coyote observed on site. Rainy, cold weather. Water flowing off-site.
February 2, 14, 15, 16, 21, 23, 24, 25	• Fence inspection and repair • Irrigation inspection, repairs, and maintenance • Weed management • Site inspection	Inspected fence line. Repaired one break/loose area in southeast section of fence line. Inspected and upgraded irrigation system. Removed superfluous PVC pipes, repaired one break and drip leaks, replaced and cleared emitters. Pump house is leaking Planting area soil is drying out at surface Hand-pulled mustards in planting area near pump house. Approximately 10% of planting basins need clearing.

Month (Days) in 2022	Management Activities Conducted during Month	Site Notes
March 2, 3, 7, 24, 25	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance	Inspected fence line and made repairs as needed. Tightened areas with loose wire. Note that thicker gauge wire would be stronger. No breaks or entry points observed. Irrigation system and water tanks inspected and repaired as needed. Clogged emitters to be replaced. Repaired PVC breaks, removed unnecessary PVC. Hand-pulled mustards and other weeds from in planting basins, followed weeding with mulch. Applied caging to plantings as necessary. Observed excessive herbivory on an uncaged coffeeberry, applied cage. Noted plantings to be removed from irrigation or outgrown cage. Plants in ID03-05 and ED03-04 plants look good and healthy, but small, and some with yellow/brown leaves especially on Toyon. Willows, deciduous oaks and buckeyes beginning to leaf-out. Observed large boar run out of wetland in Sen Felipe Creek into middle of site. Balance noted pond water levels were low in comparison to previous years.
April 1, 13, 20	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance	Inspected fence line and made repairs as needed. Irrigation system inspected and repaired as needed. Removed unnecessary PVC, and combined irrigation zones. Hand-pulled mustards and other weeds in Boyds Creek drainage (ID01), followed up by applying mulch to basins. Wetland areas lack noticeable plant material. Rain is periodic, but planted basins dry out quickly. By mid-month evidence of rain and soil moisture. Pond water levels remain low. Most plants coming out of winter dormancy, observed several sycamores with new buds. Deer observed in lower floodplain.
May 5, 6, 18, 19, 20, 25, 26	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed control • Plant inspection and maintenance • Mowed roads and access points to minimize fire danger	Inspected fence line, no breaks to note. Irrigation system inspected and repaired as needed. One leak on mainline repaired. Removed unnecessary PVC, and combined irrigation zones. Replaced clogged and low-flow emitters. Hand-pulled weeds from planted basins, followed up by applying approximately 0.5 cubic feet mulch to basins. Plantings health is variable, moderate and good to strong site wide. Toyon appears to be the weakest, most unsuccessful plant. Flagged empty and dead planted basins.

Month (Days) in 2022	Management Activities Conducted during Month	Site Notes
June 1, 2, 8, 9, 20, 22, 29	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance • Mowed roads and access points to minimize fire danger	Irrigation system inspected and made repairs as needed. Set automated timers; observed wires chewed through, and adjusted and repaired timers as needed. Replaced clogged emitters. Replaced sprinklers with drip irrigation. Removed unused valves. Beginning to find rodent chew holes in drip line; repaired holes. Sediment accumulating in irrigation system, clear filters periodically. Removed dead plants from irrigation, many of which were toyon. Willow cuttings not on drip irrigation are looking dry. Hand watered and added to irrigation system. Hand-pulled weeds from planted basins, followed up by applying mulch to basins. Mowed poison hemlock north of the pump house to the fence line and around the spring on 6/9. Applied deer repellent to willows and other browsed plants. Rodent mounds evident in many planting basins, resulting in some new plant deaths. Deer browsing evident throughout, even on mugwort; some cages are bent/pushed around. Cages are inconsistent on plant species and diameter. Observed many native recruits along small channel east of plug and pond zone. Buckeye leaves beginning to brown. Mowed gravel access road north of the pump house to the park gate.
July 13, 15, 18, 19, 21, 22	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance	Irrigation system inspected and repaired as needed; repaired 4 leaks in drip line. Consistent soil moisture without sings of leaks within the irrigation zones. Repaired rodent chew-holes as necessary. Flushed and cleared all filters of sediment. Buried and taped up openings in valve boxes to prevent rodents from entering/chewing timer wires. Replaced clogged emitters. Mid-month, water was shut-off, but quickly restored. Walked irrigation lines, while weeding planted basins. Flagged basins with dead plants. Mustards and yellow star-thistle observed scattered throughout the site. Weeded planted basins and perimeters, and large individuals between planted basins. Clipped and hand removed all pepperweed flower- and seed-heads and bagged and removed from site on 7/15. Eight bags of pepperweed were removed. Hand pulled bull thistle growing along ponds on 7/21. Willows in ponds show healthy growth. Applied deer repellent to prevent browsing. Removed dead plants from irrigation. Plants with questionable health still receive irrigation.

Month (Days) in 2022	Management Activities Conducted during Month	Site Notes
August 1, 2, 8, 9, 10, 12, 15, 16, 17, 23, 26	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance • Debris and litter removal	Inspected fence line and repaired as needed. Cleared dirt and debris buildup along fence line at top of ID02. Materials were moved downstream of the fence into the site as instructed by Balance Hydrologics. Lowered hog wire fence panel to the new ground level. Irrigation system inspected and repaired as needed. Replaced clogged emitters. Consistent soil moisture without signs of leaks. Cleaned filters of sediment buildup at all valves. Repaired rodent chew-holes as necessary. Cleaned solar panels for water pump system. Repaired float on fill tank. Weeded planted areas, primarily of mustards and yellow star-thistle, throughout site. Reshaped basins while weeding. Followed up weeding efforts with mulch. Hand-pulled and bagged pepperweed at north end of the site on 8/8. Pepperweed is resprouting where previously treated, but much more sparse. Applied deer repellent to willows, coffee berry and other browsed plants plants in southern zones. Observed more plant deaths and flagged. Removed dead plants from irrigation. Observed 10-15 new oak tree deaths on 8/15; basin soil is disturbed and tap root chewed off at 45 degree angle just below surface. Repurposed cages from dead plants to protect living plants with browsing, many of which were snowberry. Abundant browsing throughout the site. Plants also receive browsing from tops of cages; wider and taller cages may be more beneficial.
September 6, 12, 13, 19, 26, 27, 28, 30	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance • Completed plant survival count	Irrigation system inspected and repaired as needed. Cleaned filters of sediment buildup at all valves. Repaired rodent chew-holes as necessary. Replaced timer batteries as necessary. Replaced clogged and leaky emitters. Irrigation mainline broken on 9/27 and repaired 9/28. Buried the irrigation mainline (2” PVC) that crosses the access road. Buried the 1.5” lateral that crosses the road next to Boyd valve. Weeded mustard and yellow star-thistle and others in planted areas throughout site. The spring looks clear of hemlock. The pepperweed patches near the northern edge of the site are growing back, small plants; smaller area has regrown to approximately 25% of the original cover, and larger patch has regrown to approximately 50% of the original cover. Discovered 10 basins rooted and dug up from pigs. Plants were heavily impacted and/or killed. By 9/13 pigs have made wallows in a few dead plant basins that still have irrigation, and adjacent to other plantings. Capped the dead ones to avoid future damage. Repurposed cages from dead plants to protect living vulnerable plants. Applied deer repellent to willows, coffee berry and other browsed/vulnerable plants. Observed a few small pigs in the site near the lower floodplain and side channel on 9/12. Counted oaks, buckeyes, sycamores, willows and cottonwoods in the southern section. 220 cages needed for trees in this area. Recommend 3 foot diameter 2x2 welded wire, 4’ tall cage with 3 rebar. Most rebar is skinner and shorter than preferred.

Month (Days) in 2022	Management Activities Conducted during Month	Site Notes
October 3, 6, 7, 20, 21, 28	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance • Weed management • Plant inspection and maintenance • Completed plant survival count • Collected acorns for direct seeding	Irrigation system inspected and repaired as needed. Consistent soil moisture without signs of leaks. Cleaned filters of sediment buildup at all valves. Repaired rodent chew-holes as necessary. Replaced timer batteries as necessary. Replaced clogged and leaky emitters. Reset irrigation timers to run every two weeks. Reset timers for later in the morning due to lack of morning sun. Removed dead plants from irrigation. Plants look good after not receiving irrigation for two weeks. Site is still dry overall. Continued weeding in planted areas throughout site. Applied repellent (liquid fence) on uncaged and browsed plants in all zones; mugwort and coyote brush were not sprayed. Many shrubs and trees are growing out of their cages. Some native recruits establishing in the upper floodplain; rushes, native dock, coyote mint. Dispersed native seed in areas disturbed by pigs within planting areas. Willows and deciduous trees beginning to show first signs of dormancy. Collected acorns for direct seeding.
November 2, 7, 21	• Fence inspection and repairs • Irrigation inspection, repairs, and maintenance. Prepared system for winter. • Weed management • Plant inspection and maintenance • Planted acorns	Irrigation system inspected and repaired as needed. Powered off pump, drained irrigation line. Turned off all timers. Bubble-wrapped two of the tank valves. Weeded dense mustard populations in the ponds. Continued pulling and consolidating pulled mustards. Pepperweed beginning to grow back in northern patch. Planted acorns in pump house zone, Boyd zone, Mother oak, lower floodplain and side channel on 11/7. Marked acorn basins with red flag. Planted acorns in basins with cage, irrigation and mulch. Pump house - basins had good moisture below mulch. Pigs seem to have dug and tilled soil around many of the basins but most plants were spared. 4 different Mugwort clusters had been ripped out with roots munched. Browsing noted on a few other plants. Noticed occasional larger Sambucas that had been damaged by apparent rubbing in lower floodplain. Reconstructed cages that had been lifted or damaged by pigs. Most pig activity noted at pump house and side Channel. Applied deer repellent to all willows and browsed plants. Weeded in mother oak zone.

Section 3. SUCCESS CRITERIA, PERFORMANCE STANDARDS AND MONITORING METHODS

The MMP contains success criteria for Wetland Re-establishment Areas, performance standards for Wetland Rehabilitation and Enhancement Areas, and performance standards for Non-Wetland Waters (Streams) and Riparian Buffer Areas (Dudek 2019). The ecologically based performance standards were established in the MMP to determine if the compensatory mitigation project is achieving its objectives. The MMP requires the site to be monitored and maintained for 10 years (2018 to 2028) or until performance standards have been met. Restoration features are shown in Figures 2 and 3.

3.1. WETLAND RE-ESTABLISHMENT SUCCESS CRITERIA

Per the MMP, the following functional wetlands success criteria must be met for the wetland re-establishment mitigation areas by the end of Year 5 or Year 10 of monitoring.

3.1.1 WETLANDS RE-ESTABLISHMENT AREAS MUST MEET ALL THREE WETLAND PARAMETERS

The wetlands re-establishment areas under the jurisdiction of the USACE must meet the definition of three-parameter USACE-jurisdictional wetlands by the end of the 5-year maintenance and monitoring period. A delineation of the wetland establishment areas will be required prior to resource agency sign-off from the USACE and RWQCB. If it is determined that the wetland establishment areas meet the vegetation and hydrology criteria for a USACE wetland, but are lacking hydric soils, the USACE may waive, at their discretion, the need to obtain hydric soils prior to sign-off if the site is progressing towards hydric soils and will likely become hydric in the near future.

3.1.2 WETLANDS RE-ESTABLISHMENT AREAS MUST BE SELF-SUSTAINING

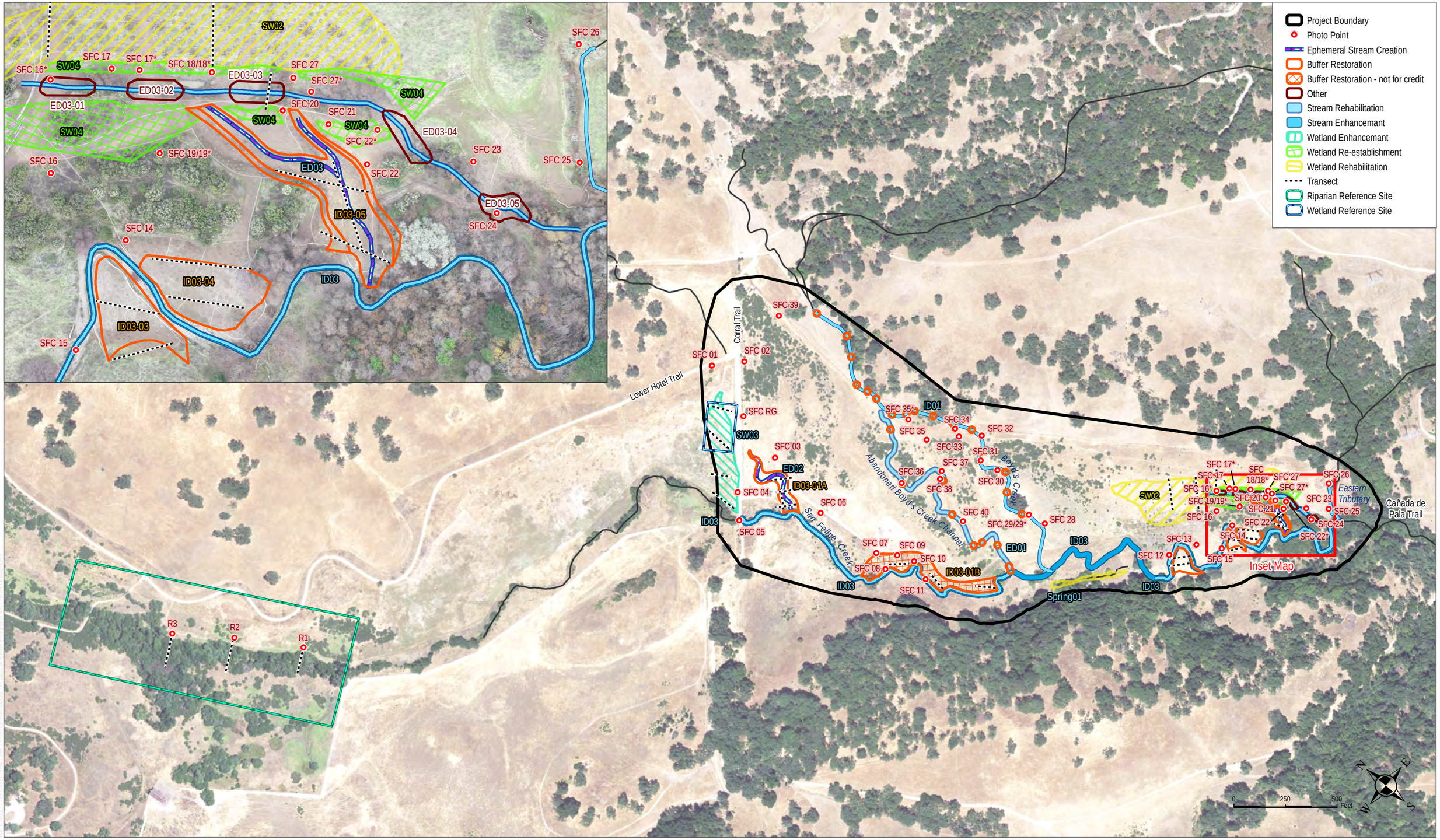
The wetlands re-establishment mitigation areas must be self-sustaining (i.e., able to survive on their own without artificial support) by the end of the 10-year maintenance and monitoring period. Determination of self-sustainability will be the presence of natural growth cycles and healthy wetlands vegetation that has not been irrigated in the preceding 2 years prior to the end of the 10-year maintenance and monitoring period.

3.1.3 WETLANDS RE-ESTABLISHMENT AREAS MUST SHOW EVIDENCE OF NATURAL RECRUITMENT

The wetlands re-establishment mitigation areas must show evidence of natural recruitment of native wetlands and/or riparian species within the mitigation area. This means naturally occurring native species colonize the site in addition to the originally planted container plants or applied seed.

3.2. WETLAND REHABILITATION AND ENHANCEMENT AREAS PERFORMANCE STANDARDS

Per the MMP, the following performance standards will be achieved for all wetlands rehabilitation and enhancement areas at the end of each year of monitoring (Table 9) (Dudek 2019). If revegetation efforts fail to meet performance standards in any one year, the habitat restoration specialist will recommend remedial actions to the Habitat Agency and maintenance contractor that will help enhance the project to a level of conformance. Several of the performance standards require comparison of the restoration site to a reference site which are shown in Figure 3.



SOURCE: Bing Maps 2020

DUDEK

FIGURE 3

Qualitative and Quantitative Monitoring Reference

San Felipe Creek Restoration Project

Table 9. Wetland Rehabilitation and Enhancement Performance Standards

Performance Metric	Year of Monitoring									
	1 (2019)	2 (2020)	3 (2021)	4 (2022)	5 (2023)	6 (2024)	7 (2025)	8 (2026)	9 (2027)	10 (2028)
Container Plants (Minimum Performance)	90% plant survivorship	85% plant survivorship	25% vegetated cover	30% vegetated cover	35% vegetated cover	40% vegetated cover	45% vegetated cover	50% vegetated cover	55% vegetated cover	60% vegetated cover
Cuttings (Minimum Performance)	70% plant survivorship	65% plant survivorship	15% vegetated cover	20% vegetated cover	25% vegetated cover	30% vegetated cover	35% vegetated cover	40% vegetated cover	45% vegetated cover	50% vegetated cover
Seeded Areas (Minimum Cover of Plants)[1]	50% cover	55% cover	60% cover	65% cover	70% cover	70% cover	70% cover	70% cover	70% cover	70% cover
Maximum Cover by Weed Species[2]	15% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover
Absolute Cover of Wetland Species (OBL, FACW, or FAC)[3]	≥50% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species	≥75% reference[3] absolute cover of wetland species
Relative Cover of Native Species	≥50% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species
Target Species Richness	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site	≥75% of reference[4] site
Hydrology	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year	≥14 days of ponding or saturated soils in an average or above-average precipitation year

Source: San Felipe Creek Restoration Project – Mitigation and Monitoring Plan (Dudek 2019)
Year 4 is shaded gray as these are the applicable performance standards for this annual report.
[1] Although the MMP says "Minimum Cover of Native Plants", this performance standard has been interpreted to be Minimum Cover of all Plants starting in Year 1 (Dudek 2020a).
[2] Weeds shall be non-native plant species rated moderate to high according to the California Invasive Plant Council excluding common non-native grass species that have naturalized throughout Californa (Cal-IPC).
[3] Prior project reports mistakenly defined wetland species as consisting of OBL and FACW species. This report and all subsequent reports define wetland species by the indicators OBL, FACW, and FAC, in accordance with the U.S. Army Corps of Engineers' wetland delineation methodology.

[4] The seasonal wetland reference site is in the northeastern portion of SW03 and is shown in Figure 3.

3.3. NON-WETLAND WATERS (STREAMS) AND RIPARIAN BUFFER AREAS PERFORMANCE STANDARDS

Per the MMP, the following performance standards will be achieved for Non-Wetland Waters (Streams) and Riparian Buffer Areas at the end of each year of monitoring (Table 10) (Dudek 2019). If revegetation efforts fail to meet performance standards in any one year, the habitat restoration specialist will recommend remedial actions to the Habitat Agency and maintenance contractor that will help enhance the project to a level of conformance. Several of the performance standards require comparison of the restoration site to a reference site which are shown in Figure 3.

Table 10. Non-Wetland Waters (Streams) and Riparian Buffer Areas Performance Standards

PERFORMANCE METRIC	YEAR									
	1 (2019)	2 (2020)	3 (2021)	4 (2022)	5 (2023)	6 (2024)	7 (2025)	8 (2026)	9 (2027)	10 (2028)
Container Plants (Minimum Performance)	90% plant survivorship	85% plant survivorship	25% vegetated cover	30% vegetated cover	35% vegetated cover	40% vegetated cover	45% vegetated cover	50% vegetated cover	55% vegetated cover	60% vegetated cover
Cuttings (Minimum performance)	70% plant survivorship	65% plant survivorship	15% vegetated cover	20% vegetated cover	25% vegetated cover	30% vegetated cover	35% vegetated cover	40% vegetated cover	45% vegetated cover	50% vegetated cover
Seeded Areas (Minimum cover of all plants)[1]	50% cover	55% cover	60% cover	65% cover	70% cover	70% cover	70% cover	70% cover	70% cover	70% cover
Maximum Cover by Weed Species[2]	20% cover	15% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover	10% cover
Relative Cover of Native Species	≥50% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species	≥75% relative cover of native species
Target Species Richness	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]	≥75% of reference site[3]
Hydrology – Inset Floodplains on San Felipe Creek	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event	Inset Floodplain inundation if peak flows exceed a 2-year event
Hydrology – Boyds Creek	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels	Flow in 2 or more channels

Alluvial Fan – Living Log Jams	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season	during the winter season
Channel Form	< 1 foot of channel bed elevation loss	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	<1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	<1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint	<1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint
Corral Trail Drainage Lenses	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged.	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	During- and post- storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged
Lower Hotel Trail Arizona Crossing	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed	Articulated mat is stable and no significant knickpoints have formed
Staked Wood Jams	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.

Source: San Felipe Creek Restoration Project – Mitigation and Monitoring Plan (Dudek 2019)
Year 4 is shaded gray as these are the applicable performance standards for this annual report.

[1] Although the MMP says "Minimum Cover of Native Plants", this performance standard has been interpreted to be Minimum Cover of all Plants starting in Year 1 (Dudek 2020a).
[2] Weeds shall be non-native plant species rated moderate to high according to the California Invasive Plant Council excluding common naturalized grass species (Cal-IPC).
[3] Reference sites include established willow riparian habitat upstream and within the same reach of the project site and were identified in Year 1 of monitoring and are shown on Figure 3.

3.4. MONITORING SCHEDULE AND SITE VISITS

3.4.1 ANNUAL MONITORING SCHEDULE

Monitoring methods consist of a combination of quantitative and qualitative data collection to assess restoration progress in relation to the performance standards described in the MMP (Dudek 2019). Quantitative monitoring (transects and plots) occurs in the late spring/early summer during Years 2 through 10. Qualitative monitoring occurs quarterly during Year 1, beginning with successful completion of the initial 120-day maintenance period, and bi-annually during Years 2 through 10. Monitoring methods and timing, as well as associated performance metrics are summarized in Table 11.

Table 11. Mitigation Monitoring Methods and Timing

MONITORING TASK	MONITORING YEAR		PERFORMANCE METRIC
	YEARS 1 AND 2	YEARS 3 THROUGH 10	
WETLANDS RE-ESTABLISHMENT, REHABILITATION, AND ENHANCEMENT MONITORING			
Quantitative Monitoring: Vegetation – Belt Transects	April-June, beginning in Year 2	Annually, April-June	Container Plants Survivorship or Vegetated Cover Cuttings Survivorship or Vegetated Cover Seeded Areas Cover of Native Plants Maximum Cover by Weed Species Absolute Cover of Wetland Species Relative Cover of Native Species Target Species Richness
Hydrologic Monitoring	October 1- September 30	October 1 – September 30	Hydrology including Hydroperiod and Groundwater Levels
Qualitative Monitoring	Quarterly, beginning with successful completion of 120-day maintenance period; bi-annually Year 2	Bi-annually	Invasive Weeds Wildlife Observations Plant Health and Vigor Maintenance Needs
STREAM AND RIPARIAN BUFFER MONITORING			
Quantitative Monitoring: Vegetation – Point Intersect Transects	April – June, beginning in Year 2	Annually, April – June	Container Plants Survivorship or Vegetated Cover Cuttings Survivorship or Vegetated Cover Seeded Areas Cover of Native Plants Maximum Cover by Weed Species Relative Cover of Native Species Target Species Richness
Qualitative Monitoring	Quarterly, beginning with successful completion of 120-day maintenance period; bi-annually Year 2	Bi-annually	Plant survival and vigor Wildlife usage Maintenance Needs
Hydrologic Monitoring	N/A	N/A	Hydrology Channel Form Drainage Lenses Arizona Crossing Staked Wood Jams

3.4.2 MONITORING SITE VISITS IN 2022

The site was monitored on nine dates during the Year 4 monitoring year (Table 12). Balance Hydrologics[2] completed hydrologic monitoring on December 10, 2021, and January 25, March 25, and September 23, 2022. Nomad Ecology principal vegetation ecologist Erin McDermott and botanist Leanne Feely conducted monitoring visits on May 3, May 5, June 6, and June 30, 2022. Habitat Agency staff made regular site visits throughout the year which are not included in Table 12. A site visit was conducted by the project team including Habitat Agency staff, Balance Hydrologics, Nomad Ecology, and Confluence on September 26, 2022. All monitoring visits required by the MMP for Year 4 were conducted.

Table 12. 2022 Monitoring Site Visits

MONITORING ELEMENT	DEC 10, 2021	JAN 25, 2022	MARCH 25, 2022	MAY 3, 2022	MAY 5, 2022	JUNE 6, 2022	JUNE 30, 2022	SEPT. 23, 2022	SEPT. 26, 2022
Quantitative Monitoring: Wetland Vegetation – Belt Transects	-	-	-	X	-	-	-	-	-
Quantitative Monitoring: Stream and Riparian Buffer Vegetation – Point Intersect Transects	-	-	-	X	X	-	-	-	-
Hydrologic Monitoring	X	X	X	-	-	-	-	X	-
Qualitative Monitoring	-	-	-	X	X	X	X	-	-
Invasive Plant Assessment	-	-	-	-	X	-	X	-	-
Photo Point Photo Monitoring	-	-	-	-	-	X	-	-	-
Overall Site Assessment	-	-	-	X	X	X	X	-	X

3.5. MONITORING METHODS

3.5.1 QUANTITATIVE MONITORING

Wetland Vegetation – Belt Transects

Vegetation sampling was conducted on May 3 and 5, 2022 by Nomad Ecology principal vegetation ecologist Erin McDermott and botanist Leanne Feely. For wetland habitat rehabilitation, enhancement, and creation areas, the belt transect method of vegetation sampling was used to determine compliance and achievement of the revegetation performance standards. Permanent belt transects measuring 30 to 50 meters long were established in the wetland revegetation areas at representative locations during Year 2 by Dudek at the time of the first sampling event (Dudek 2020b). During 2022 monitoring, belt transects were placed in the same locations, however some belt transects were shortened so that the entire belt transect stayed inside the feature being sampled. At each transect, 1-meter by 1-meter quadrats were placed at 10-meter intervals. Data collected at each plot along the belt transects included absolute cover of each plant species present as well as the cover of all vegetation, bare soil, and water using the California

[2] Balance staff visited the site on additional dates to calibrate, repair, and download water level recorders.

Native Plant Society (CNPS) method for estimating cover values. This method uses a "bird's eye view" looking from above, and only living plants are included in the vegetation cover estimate (CNPS 2019). Monitoring transects locations are shown in Figure 3.

The vegetation data was analyzed to determine vegetative cover of container plants, vegetative cover of cuttings, cover of seeded areas, cover of weed species, absolute cover of wetland species, relative cover of native species, and target species richness.

Total cover contributed by invasive weed species was calculated for each created seasonal wetland. Invasive weeds were defined as California Invasive Plant Council (Cal-IPC) ranked Moderate or High (Cal-IPC 2019). Several non-native annual grasses that have a Moderate Cal-IPC rank were not included as invasive weeds, as these species are ubiquitous throughout annual grasslands in San Felipe and contribute substantial cover in the grassland communities on site. These species include foxtail fescue (*Festuca myuros**), hare barley (*Hordeum murinum* subsp. *leporinum**), Italian ryegrass (*Festuca perennis**), Mediterranean barley (*Hordeum marinum* subsp. *gussoneanum**), ripgut brome (*Bromus diandrus**), red brome (*Bromus rubens**), slender oats (*Avena barbata**), and wild oats (*Avena fatua**).

The Arid West 2016 Regional Wetland Plant List was used to determine wetland indicator status for each species (Lichvar et. al. 2016). The predicted frequency of occurrence in wetlands represented by each wetland indicator status category is presented in Table 13. Per the MMP, wetland species include those with a FACW or OBL indicator.

Table 13. Categories of Wetland Plant Indicators

Indicator Categories	Codes	Comments
Obligate	OBL	Almost always is a hydrophyte, rarely in uplands
Facultative Wetland	FACW	Usually is a hydrophyte but occasionally found in uplands
Facultative	FAC	Commonly occurs as either a hydrophyte or non-hydrophyte
Facultative Upland	FACU	Occasionally is a hydrophyte but usually occurs in uplands
Upland	UPL	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified.
Not Listed	NL	Plant species does not have a listed wetland indicator status.

Source: Environmental Laboratory 1987

Stream and Riparian Buffer Vegetation – Point Intersect Transects

Vegetation sampling was conducted in on May 3 and 5, 2022 by Nomad Ecology principal vegetation ecologist Erin McDermott and botanist Leanne Feely. Data for stream and riparian restoration areas were collected using the line intercept transect method of vegetation sampling to document achievement of the performance standards on the project site. In Year 2, permanent vegetation transect sampling stations were established by Dudek within the project site to measure year-to-year changes in plant cover and species composition (Dudek 2020b). In Year 4, transects were adjusted to center on restoration features and to be a consistent length of 20 meters. Data collection points were distributed evenly along the transect (every 25 cm) so the number of points along each transect were sufficient to provide adequate resolution of cover values. Monitoring transects and points are shown in Figure 3. At each sampling point, the species was recorded, and if no vegetation was present then bare ground was recorded. Cover values were calculated by dividing the number of hits by the total number of sampling points and multiplying by 100.

The vegetation data was analyzed to determine vegetative cover of container plants, vegetative cover of cuttings, cover of seeded areas, cover of weed species, relative cover of native species, and target species richness. Species included for determining total cover contributed by invasive weed species was calculated using the methods described above.

Stream and Riparian Buffer Vegetation – Plant Survival Counts

While the MMP does not require plant survival counts for Year 4, this effort was completed to inform site maintenance activities and whether any replanting was required. Confluence completed plant survival counts of all planted woody and shrub species on September 27 and 28, 2022.

3.5.2 HYDROLOGIC MONITORING

A network of gauges to monitor stream, wetland, and groundwater-level was established in December 2018 by Balance. Balance installed stage and streamflow monitoring stations on both Boyds Creek and San Felipe Creek at the upstream and downstream ends of the site, per requirements in the MMP. Piezometers are located near constructed floodplain and wetland features. Surface ponding gauges were also placed in or near wetland features and the expanded wetlands at ED03. Peak stage gauges were placed in distributary channels associated with the Boyds Creek alluvial fan as well as in the channel that drains the ponded areas at ED03. Further details of this effort are available in the Geomorphic and Hydrologic Monitoring Report (Balance Hydrologics 2022; Appendix C).

The following hydrologic features were monitored in 2022, which included maintaining and downloading data from the network.

Stage and Streamflow

Balance monitored water levels and estimated streamflow in San Felipe and Boyds Creek using continuous-recording water level sensors, which collect and record 15-minute stage measurements within the designed wetland features and nearby channels and wetlands. Balance staff visited the site multiple times during the rainy season and during the dry season to calibrate, repair, and download water level recorders.

Groundwater

Balance monitored groundwater levels were monitored near constructed floodplain features, channels, and wetlands using continuous-recording water level sensors in piezometers. Water level data were calibrated against periodic manual depth-to-water readings to develop 1-hour depth-to-groundwater (below the ground surface) records. The ground surface and top of each piezometer were also surveyed and used to convert the depth-to-water records to groundwater elevation records.

Surface Ponding in Wetlands

Inundation duration within the wetland areas were monitored by Balance using continuous-recording water level sensors in stilling wells along with staff plates. Water level data were calibrated to periodic manual stage readings to develop hourly wetland stage records.

Peak Stage near Floodplains

Balance monitored peak stage and documented whether floodplains were inundated using six additional level recorders at select locations across the project site. Data from these supplemental stations are archived along with manual stage and high-water mark readings.

3.5.3 QUALITATIVE MONITORING

Nomad principal vegetation ecologist Erin McDermott and botanist Leanne Feely visited the project site on May 3 and 5, June 6 and 30, and September 26, 2022 to qualitatively assess conditions throughout the site. Per the MMP, qualitative monitoring includes overall assessment of container plant and seedling establishment and survival (vigor); assessment of wildlife usage of the restoration site through incidental observation of presence, nests, scat, and other sign; assessment of container plant health, including reviewing for pests and disease; assessment of weeds and exotic non-native species and recommendations for control; and an assessment of soil moisture and plant stress.

Balance qualitatively assessed geomorphic conditions on site during site visits in the wet and dry season to observe streamflow conditions and areas of surface ponding, document evidence of runoff patterns, and inspect the stability of constructed features (Balance 2022; Appendix C). When practical and safe, a small unmanned aerial vehicle was used to collect oblique aerial photos and repeat vertical aerial photographs (Balance 2022; Appendix C).

3.5.4 PHOTO POINT MONITORING

All photo points were visited and photos taken on June 6, 2022 by Nomad Ecology botanist Leanne Feely. Forty permanent photo-documentation stations were established by Dudek during Year 1 monitoring to record the progress of the revegetation program and the status of plant establishment over the 10-year period, and eight additional photo points were established in Year 3. GPS coordinates and the direction of view were recorded for each photo point location. Photo documentation methods included replicating the permanent photos of the restoration features for each photo documentation site visit. Photos taken during the photo point monitoring are included in Appendix E.

Section 4. MONITORING RESULTS

This section provides the results of the Year 4 monitoring in relation to the performance standards outlined in the MMP (Dudek 2019).

4.1. ANNUAL RAINFALL

Overall, conditions on site during Year 4 were characterized as drought conditions, with rainfall totals well below average. In Geomorphic and Hydrologic Monitoring Report (Balance Hydrologics 2022 in Appendix C), Balance presented rainfall data from the University of California Berkeley Blue Oak Ranch Reserve (UCBO) rain gage, located 4.5 miles northwest of the site at approximately 1800 feet mean sea level elevation. Average annual rainfall at the UCBO station is approximately the same as at the project site (Schaaf and Wheeler 2007 in Balance 2022). Annual precipitation at the UCBO station was 16.6 inches during Water Year (WY) 2022, which is less than the long-term average of 24 inches, as reported in the Santa Clara County drainage manual (Schaaf and Wheeler 2007). The UCBO station has been operating since 2011, and the average annual rainfall at UCBO over the 11-year period of record is 22.4 inches.

Annual precipitation during WY2022 was characterized by an unusually large early-season atmospheric river event in late October 2021 as well as several high intensity storms in December 2021, followed by a very dry period that spanned what are typically the wettest months of the water year (January 2022 through April 2022). The largest WY2022 events were multi-day storms that occurred in October 2021 and December 2021. On October 24 and 25, 2021, 4.2 inches of rain was recorded.

Between December 21 and 27, 2021, 4.4 inches of rain was recorded. Peak 24-hour rainfall was 4.0 inches, recorded between 10:00 AM on October 24 and 10AM PM on October 25, 2021. Because the storm was very early in the season and soils were very dry, very little flow response occurred.

4.2. WETLAND RE-ESTABLISHMENT SUCCESS CRITERIA

The wetland re-establishment success criteria must be met in Year 5 or Year 10. The wetland re-establishment areas will be monitored in Year 5 to determine if they are meeting success criteria or are on track to meet it by Year 10. These monitoring activities will include conducting a wetland delineation to determine if restored wetlands meet the definition of three-parameter USACE-jurisdictional wetlands, determining if they are self-sustaining during qualitative monitoring, and monitoring for evidence of natural recruitment of native wetland and/or riparian species.

4.3. WETLAND REHABILITATION AND ENHANCEMENT AREA PERFORMANCE

Based on vegetation monitoring in Year 4, the wetland rehabilitation and enhancement areas met half of the interim performance standards. They met: maximum cover by weed species, absolute cover of wetland species (OBL or FACW), and target species richness performance standards. They did not meet: container plant cover, seeded area cover, or relative cover of native species performance standards. The hydrology performance standard could not be evaluated in Year 4 because it was a below-average precipitation year. The performance standards and monitoring results for vegetation and hydrology in the wetland rehabilitation and enhancement areas are outlined in Table 14 and discussed further below.

Table 14. Wetland Rehabilitation and Enhancement Area Performance – Year 4

Performance Metric	Year 4 (2022) Target	Wetland Feature Monitoring Results		Overall Site Performance (Average)
		SW02	SW03	
Container Plants (Minimum Performance)	30% vegetated cover	<1% Not Met	4% Not Met	2% Not Met
Cuttings (Minimum performance)[1]	20% vegetated cover	N/A	N/A	N/A
Seeded Areas (Minimum % of Plants)	65% cover	50% Not Met	71% **Met**	61% Not Met
Maximum Cover by Weed Species	10% cover	9% **Met**	9% **Met**	9% **Met**
Absolute Cover of Wetland Species (OBL, FACW, or FAC)[2]	≥75% reference absolute cover of wetland species Reference site had 18% wetland species cover; restoration areas require a minimum of 14% wetland species cover (which is 75% of 18%).	11% Not Met	58% **Met**	35% **Met**
Relative Cover of Native Species	≥75% relative cover of native species	5% Not Met	59% Not Met	32% Not Met For comparison, reference wetland had only 19% relative native
Target Species Richness	≥75% of reference site Reference site has 10 native species present; restoration areas require a minimum of 8 native species to meet the minimum performance standard.	12 species **Met**	4 species Not Met	15 species **Met**
Hydrology[3]	≥14 days of ponding or saturated soils in an average or above-average precipitation year	N/A	N/A	N/A

Source: San Felipe Creek Restoration Year 3 Monitoring Report (Dudek 2021).
[1] No cuttings were installed within wetland rehabilitation and enhancement areas (SW02 and SW03).
[2] Prior project reports mistakenly defined wetland species as consisting of OBL and FACW species, and they measured and reported wetland species' cover accordingly. This report and all subsequent reports define wetland species by the indicators OBL, FACW, and FAC, in accordance with the U.S. Army Corps of Engineers' wetland delineation methodology. The performance standard in Year 4 would also be met if only OBL and FACW species were considered wetland species as reference sites had 2% cover of OBL and FACW species and the restoration sites each had 2% cover of OBL and FACW species.
[3] Water Year 2022 was a below-average rainfall year.

4.3.1 Container Plants (Minimum Performance)

Percent cover was recorded for all species along the belt transects, and for any species that was planted, the cover was assumed to be from a planted individual. Initial planting included field sedge (*Carex praegracilis*) and a variety of rushes including Baltic rush (*Juncus balticus* ssp. *ater*), common rush (*Juncus effusus*), spreading rush (*Juncus patens*) and iris-leaved rush (*Juncus xiphioides*). Planted container plants had a cover of less than 1% in SW02 and 4% in SW03, which is less than the 30% Year 4 target. Individuals of field sedge and common rush were observed in SW02 and SW03. While the performance standard is not met, the overall goal of the wetland restoration is to develop native and wetland species cover, and the wetland is on track to meet these goals as detailed below. We recommend discarding this performance metric in future years as it is not a useful indicator of seasonal wetland

performance. The other performance standards including relative native species cover, absolute cover of wetland species, and target species richness are sufficient to assess the performance of restored seasonal wetlands.

4.3.2 CUTTINGS (MINIMUM PERFORMANCE)

No cuttings were installed in the wetland rehabilitation or enhancement areas. This performance standard is not applicable.

4.3.3 SEEDED AREAS (MINIMUM COVER OF PLANTS)

SW02 had an average absolute vegetation cover of 50%. SW03 had an average absolute vegetative cover of 71%. Overall site vegetative cover was 61%, which does not meet the Year 4 performance target of 65% cover of plants.

Native species that were regularly encountered in SW02 and SW03 include American bird's foot trefoil (*Acmispon americanus* var. *americanus*), winter cress (*Barbarea orthoceras*), spreading rush, mugwort (*Artemisia douglasiana*), blue wildrye (*Elymus glaucus* subsp. *glaucus*), creeping wildrye (*Elymus triticoides*), dense sedge (*Carex densa*), and common madia (*Madia elegans*). All native species observed along sampling transects are listed in the discussion of species richness in Section 4.3.7 under species richness.

Non-native species present include slender oat*, black mustard*, ripgut brome*, soft chess* (*Bromus hordeaceous*), Fuller's teasel*, medusahead grass (*Elymus caput-medusae**), long-beaked filaree (*Erodium botrys**), brome fescue*, Italian ryegrass*, hoary mustard*, and Mediterranean barley*.

SW02 had open areas with low cover of vegetation and high cover of bare soil with mammal burrows present. Soils appeared to be dry and loamy and likely did not pond or saturate in WY2022. It is expected that during an average water year, bare soils would saturate and vegetate with annual wetland species. If vegetation cover does not increase significantly in Year 5, then additional planting or seeding may be recommended. SW03 had high vegetation cover due to dense stands of creeping wildrye.

4.3.4 MAXIMUM COVER BY INVASIVE WEED SPECIES

Invasive weed species had absolute cover of 9% in SW02 and 9% in SW03 with an average of 9% cover, which meets the performance standard of 10% or less. Invasive weed species observed in the wetland rehabilitation and enhancement areas include black mustard*, Italian thistle*, yellow star-thistle*, poison hemlock*, Fuller's teasel*, medusahead grass*, hoary mustard* and pennyroyal (*Mentha pulegium**). In order to keep invasive weed cover below the 10% threshold and continue to meet performance standards, we recommend continued weed control. Further details about invasive weeds found on site are in Section 4.6 Qualitative Monitoring.

4.3.5 ABSOLUTE COVER OF WETLAND SPECIES (OBL, FACW OR FAC)

The performance standard for absolute cover of wetland species (OBL, FACW, or FAC) is based on comparison to the reference site, and restored wetlands must have 75% or more compared to the reference site. Based on quantitative data collected in Year 4, the reference site had 18% wetland species cover, therefore the restoration areas require a minimum of 14% wetland species cover (75% of 18% cover) to meet the minimum performance standard.

The absolute cover of wetland species was 11% in SW02, which does not meet the performance standard, and 58% in SW3, which meets the performance standard. The average is 35% which meets the performance standard. Wetland species observed in the wetland rehabilitation and enhancement areas include winter cress (FACW), dense sedge (OBL), spreading rush (FACW), willow dock (*Rumex salicifolius*, FACW), arroyo willow (FACW), blue-eyed grass (*Sisyrinchium bellum*, FACW), poison

hemlock* (FACW), pennyroyal*(OBL), creeping wildrye (FAC), mugwort (FAC), common verbena (*Verbena lasiostachys* var. *lasiostachys*; FAC), Italian rye grass*(*FAC*), and Mediterranean barley* (FAC).

In order for a site to qualify as a wetland, it must be dominated by wetland species (OBL, FACW and FAC species) using the USACE Dominance Test.

4.3.6 Relative Cover of Native Species

SW02 had 5% relative cover of native species and SW03 had 59% relative cover of native species, for an average of 32% relative cover which does not meet the performance standard of greater or equal to 75% relative cover of native species. This data show that SW02 is dominated by non-native species, SW03 is dominated by native species (primarily creeping wildrye), and that on average a third of the restored seasonal wetland cover is composed of native plants.

For comparison purposes, the reference site had 19% relative native species cover, which is higher than SW02 and lower than SW03. Native species observed in the restored seasonal wetlands and reference site during quantitative monitoring are shown in Table 15.

A relative cover of 75% native species is very high for seasonal wetlands in the region and will likely not be attained. We recommend revising this performance standard to be relative to the reference site.

4.3.7 Target Species Richness

Based on quantitative data gathered in Year 4, the reference site has 10 native species present, therefore the restoration areas require a minimum of 8 native species to meet the minimum performance standard. SW02 had 12 native species captured in sampling quadrats and SW03 had 4 species captured in sampling quadrats, for a total of 15 species among the 2 sites. The restoration areas had 15 native species present, which surpasses the performance standard. Native species recorded in both the reference site and restoration areas during vegetation monitoring are listed in Table 15.

Starting in Year 5, we recommend measuring species richness by completing a timed survey of each restoration seasonal wetland and the reference site to record as many unique species as possible. This will result in a more robust list, since transect sampling is likely to capture only a portion of the species present.

Table 15. Native Species Recorded in Wetland Reference and Restoration Sites During Year 4 Vegetation Monitoring

Scientific Name[1]	Common Name	Present in Restoration Site	Present in Reference Site
Acmispon americanus var. *americanus*	American bird's foot trefoil	X	X
Artemisia douglasiana[2]	mugwort	X	-
Barbarea orthoceras	winter cress	X	-
Cardamine oligosperma	bitter cress	X	-
Carex densa	dense sedge	X	-
Carex praegracilis[2]	field sedge	X	-
Dipterostemon capitatus subsp. *capitatus*	blue dicks	X	-
Elymus glaucus subsp. *glaucus*[2]	blue wildrye	X	X
Elymus triticoides	creeping wildrye	X	X

SCIENTIFIC NAME[1]	COMMON NAME	PRESENT IN RESTORATION SITE	PRESENT IN REFERENCE SITE
Hemizonia congesta subsp. *luzulifolia*	hayfield tarweed	X	X
Hordeum brachyantherum subsp. *brachyantherum*[2]	meadow barley		X
Juncus patens[2]	common rush	X	X
Limnanthes douglasii subsp. *nivea*	snow white meadowfoam		X
Lupinus bicolor	lupine	X	-
Madia elegans	common madia	X	X
Madia exigua	little tarweed	-	X
Rumex salicifolius	willow dock	X	-
Salix lasiolepis	arroyo willow	X	-
Sisyrinchium bellum[2]	blue eyed grass	X	-
Verbena lasiostachys var. *lasiostachys*	common verbena	X	-

[1] These species were recorded during monitoring site visits and annual vegetation monitoring. Comprehensive botanical surveys were not conducted. Other native species may be present in the restoration area.
[2] Species that were included in the container planting or seed mixes.

4.3.8 HYDROLOGY

The standard states that hydrology will consist of a minimum of 14 days of ponding or saturated soils in an average or above-average precipitation year. WY2022 was well below the long-term average precipitation year; therefore, the 14-day ponding criterion was not applicable. The site is on track to meeting this performance standard in an average or above- average precipitation year. A more detailed discussion of the site's hydrology performance can be found in the Geomorphic and Hydrologic Monitoring Report (Balance 2022; Appendix C).

4.4. NON-WETLAND WATERS (STREAM) AND RIPARIAN BUFFER PERFORMANCE - VEGETATION

The results of vegetation monitoring of the stream and riparian buffer, and how they compare to the performance standards, are discussed in the following sections. Performance standards for streams based on hydrology are discussed in Section 4.5.

Based on vegetation monitoring in Year 4, the stream and riparian buffer met two of the six interim performance standards. They met: maximum cover by weed species and target species richness performance standards. They did not meet: container plant cover, cuttings cover, seeded area cover, or relative cover of native species performance standards.

A summary of riparian buffer performance during Year 4 is presented in the Table 16. Performance standards are discussed in detail below.

Table 16. Non-Wetland Waters (Stream) and Riparian Buffer Performance – Year 4 Vegetation

Performance Metric	Year 4 (2022) Target	Stream and Riparian Buffer Feature[1]						Overall Site Performance
		ID03-01A	ID03-01B	ID03-02	ID03-03	ID03-04†	ID03-05	
Container Plants (Minimum Performance)	30% vegetated cover	3% Not Met	N/A No planting occurred	<1% Not Met	6% Not Met	6% Not Met	2% Not Met	3% Not Met
Cuttings (Minimum performance)	20% vegetated cover	1% Not Met	0% Not Met	0% Not Met	0% Not Met	N/A[2]	6% Not Met	1% Not Met
Seeded Areas (Minimum % cover of plants)	65% cover	60% Not Met	60% Not Met	53% Not Met	46% Not Met	59% Not Met	69% **Met**	59% Not Met
Maximum Cover by Weed Species	10% cover	4% **Met**	5% **Met**	4% **Met**	4% **Met**	10% **Met**	5% **Met**	6% **Met**
Relative Cover of Native Species	≥75% relative cover of native species	42% Not Met	23% Not Met	5% Not Met	25% Not Met	24% Not Met	69% Not Met	31% Not Met
Target Species Richness	≥75% of reference site Reference site had 8 native species present; restoration areas require a minimum of 6	15 species **Met**	7 species **Met**	4 species Not Met	11 species **Met**	14 species **Met**	15 species **Met**	**Met** 31 species among all the restoration areas

Source: San Felipe Creek Restoration Year 3 Monitoring Report (Dudek 2021).
[1] ED01 did not have sampling transects established in it when transects were set up by Dudek. The transect in ED03-03 was not sampled in 2022 because the ephemeral drainage is very narrow and the transect extends into adjacent habitats and does not represent the stream channel. Suitable transects can be established in Year 5 2023 to capture these areas.
[2] No cuttings were installed at ID03-04.

4.4.1 Container Plants (Minimum Performance)

Container plant performance in the riparian buffer was assessed during vegetation monitoring data collection along transects and estimated visually. Container plant cover in the riparian buffer areas ranged from <1%-6% and averaged 3% based on transect data. Cover was visually estimated to be 6-10%. Container plants did not meet the performance standard of 30% vegetated cover. The majority of the container plants on site are replacement plants that were planted in 2020 and 2021 as a remedial action to address low plant survival. Therefore the planted containers on site are still fairly young and small and are not providing sufficient cover to meet performance standards. The site is densely planted and container plantings are expected to grow and increase in cover with continued maintenance. Additional container plantings are not recommended due to the density of plantings in the planted areas. The riparian buffer and stream habitat is on track toward meeting the final goal of this performance standard.

In future years, the MMP performance standards could be modified to combine container plant cover and cuttings cover since willow cuttings were planted intermixed with container plantings. This holistic approach would better assess performance of the riparian buffer areas.

Table 17. Summary of Woody/Shrub Plant Survivorship at Each Restoration Feature

Restoration Feature	Year 0 – Total Plants Installed[1]	Year 4 – Total Plants Present Sept. 2022[2]	Overall Plant Survivorship[3]
ED03-01	230	53	23%
ED03-02			
ED03-03			
ED03-04			
ED03-05			
ID02	108	16	15%
ID03-01A	354	355	100%
ID03-02	170	255	150%
ID03-03	199	265	133%
ID03-04			
ID03-05	385	430	112%
Log Jams (ID01 and ED01)	300	245	82%
Willow Cuttings (ID02, ID03-03, ID03-04, ED03-01, ED03-02, ED03-03)	400	Willows are included in the counts above but approximately 100 are present.	Willows are included in the counts above.
Total	**2,146**	**1,619**	**75%**

[1] Source: San Felipe Creek Restoration Year 3 Monitoring Report (Dudek 2021). The numbers in this column include only the original plantings to establish baseline planting numbers to calculate percent survival. They do not include the replacement plantings in 2020 and 2021.
[2] As counted by Confluence in September 2022 during a maintenance site visit.
[3] These percent survival percentages are approximate because willows were not counted separately during the September 2022 count. Plant survival for monitoring purposes compares plantings present in the current year (Year 4) to the original plantings at initial project implementation. Replacement plantings were not added to the initial plant total for these calculations, which, coupled with natural recruitment, is why some values exceed 100%

4.4.2 Cuttings (Minimum Performance)

Performance of willow cuttings in the riparian buffer was assessed during vegetation monitoring and site visits. Willow cutting cover in the riparian buffer areas ranged from 0%-6% and averaged 1% based on transect data. Willow cover was visually estimated to be 2%. Willow cover does not meet the performance standard. As discussed above, the majority of the willows on site are replacement plants that were planted in 2020 and 2021 as a remedial action to address low survival. Therefore the willow stakes on site are still fairly young and small and are not providing sufficient cover to meet performance standards. The site is densely planted and willow plantings are expected to grow and increase in cover. Additional willow plantings are not recommended due to the density of plantings in the planted areas.

4.4.3 Seeded Areas (Minimum Cover of Plants)

Vegetative cover in riparian buffer enhancement and restoration areas ranged from 46% to 69%, with an average vegetative cover of 59%. ID03-05 met the minimum cover, however the other features did not.

Native species that were regularly encountered along riparian transects include yarrow (*Achillea millefolium*), American bird's foot trefoil, creeping wildrye, blue wildrye (*Elymus glaucus* subsp. *glaucus*), lupine (*Lupinus bicolor*), common madia, California brome (*Bromus sitchensis* var. *carinatus*), and blue-eyed grass. Non-native species include ripgut brome*, soft chess*, long-beaked filaree*, and Italian ryegrass*.

Although the minimum cover standard was not reached, total cover was 59% which is fairly close to the 65% performance standard. We anticipate vegetation cover on site will continue to grow and increase in cover toward the performance goal.

4.4.4 Maximum Cover by Weed Species

Invasive weed species were present in the stream and riparian buffer restoration areas with an overall average cover of 5%, ranging between 4% and 10% cover, which meets the performance standard of less than 10% cover. Non-native invasive weed species observed in the stream and riparian buffer restoration areas include yellow star-thistle*, medusahead grass*, hoary mustard* and harding grass (*Phalaris aquatica**). Although cover of weed species was below the performance standard, these species will continue to be monitored and managed to ensure the site stays on track to continue to meet performance standards. Further details about invasive weeds found on site are in Section 4.6 Qualitative Monitoring.

4.4.5 Relative Cover of Native Species

Relative cover of native species within the stream and riparian buffer rehabilitation and enhancement areas ranged from 5% to 69%, with an average of 31%, which does not meet this performance standard of at least 75%. An average of 31% shows that a third of the total vegetation cover on site is composed of native species.

The low relative cover of native species can be attributed primarily to the small size of the native plantings since they were planted in 2020 and 2021 as remedial actions. With time the cover of these species should increase, however 75% relative cover is considered an infeasible target. Native species observed during vegetation monitoring are listed in Table 18.

4.4.6 Target Species Richness

Based on quantitative data gathered in Year 4, the reference site had 8 native species present; therefore, the restoration areas require a minimum of 6 native species present to meet the performance standard. There were 31 native species among all the restoration areas, which meets the performance standard. Of note, the riparian reference site consists of mature riparian cover with a shaded understory and limited species richness. Native species recorded in both the reference site and restoration areas during vegetation monitoring are listed in Table 18.

Table 18. Native Species Recorded in Riparian Buffer Reference and Restoration Sites During Year 4 Vegetation Monitoring

Scientific Name[1]	Common Name[1]	Restoration Site	Reference Site
Achillea millefolium	yarrow	X	-
Acmispon americanus var. *americuanus*	American bird's foot trefoil	X	-
Acmispon wrangelianus	Chilean trefoil	X	-
Aesculus californica[2]	California buckeye	X	-
Amsinckia menziesii	small flowered fiddleneck	X	-

SCIENTIFIC NAME[1]	COMMON NAME[1]	RESTORATION SITE	REFERENCE SITE
Artemisia douglasii[2]	mugwort	X	-
Baccharis pilularis subsp. *consanguinea*[2]	coyote brush	X	-
Baccharis salicifolia[2]	mule fat	X	-
Bromus sitchensis var. *carinatus*[2]	California brome[2]	X	-
Castilleja exserta subsp. *exserta*	owl's clover	X	-
Cyperus eragrostis	umbrella sedge[2]	X	-
Elymus glaucus subsp. *glaucus*[2]	blue wildrye[2]	X	-
Elymus triticoides	creeping wildrye	X	X
Eplobium brachycarpum	willow herb	X	-
Eschscholzia californica	California poppy	X	-
Equisetum arvense	common horsetail	-	X
Galium aparine	common bedstraw	-	X
Hordeum brachyantherum subsp. *brachyantherum*[2]	meadow barley[2]	X	-
Juncus bufonius var. *bufonius*	common toad rush	X	-
Juncus patens[2]	common rush	X	-
Lupinus bicolor	lupine	X	-
Lupinus microcarpus var. *microcarpus*	chick lupine	X	-
Madia elegans	common madia	X	-
Plagiobothrys nothofulvus	rusty haired popcorn flower	X	-
Phyla nodiflora	common lippia	X	-
Quercus agrifolia[2] var *agrifolia*	coast live oak	-	X
Ribes californicum[2] var. *californicum*	California gooseberry	X	-
Rubus ursinus[2]	California blackberry	X	-
Rumex salicifolius	willow dock	X	-
Salix laevigata[2]	red willow	X	X
Salix lasiolepis[2]	arroyo willow	X	X
Sambucus nigra subsp. *caerulea*[2]	blue elderberry	X	-
Sisyrinchium bellum[2]	blue eyed grass[2]	X	-
Stipa pulchra[2]	purple needle grass[2]	X	-
Toxicodendron diversilobium	poison oak	-	X
Umbellularia californica	California bay	X	X
Verbena lasiostachys var. *lasiostachys*	common verbena	X	-

[1]These species were recorded during monitoring site visits and annual vegetation monitoring. Comprehensive botanical surveys were not conducted. Other native species may be present in the restoration area.
[2]Species that were included in the container planting or seed mixes.

4.5. NON-WETLAND WATERS (STREAM) AND RIPARIAN BUFFER PERFORMANCE - HYDROLOGY

Based on hydrology monitoring in Year 4 conducted by Balance, the stream and riparian buffers are meeting all performance standards. A summary of stream performance for each hydrology metric during Year 4 is presented in Table 19. WY 2022 was the third consecutive year of drought at the project site. Detailed hydrologic data can be found in the Geomorphic and Hydrologic Monitoring Report (Balance 2022 in Appendix C) and information below is taken from this report.

Table 19. Stream Feature Performance – Year 4

Performance Metric	Year 4 (2022) Target	Stream Feature								Overall Site Performance
		ID01	ID02	ID03 (reaches 1,3 and 4)	ID03 (reach 2)	ED01	ED02	ED03	AD01	
Hydrology – Inset Floodplains on San Felipe Creek	Inset Floodplain inundation if peak flows exceed a 2-year event.[1]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrology – Boyds Creek Alluvial Fan – Living Log Jams	Flow in 2 or more channels during the winter season	**Met**	N/A	N/A	N/A	**Met**	N/A	N/A	N/A	**Met**
Channel Form	There will be less than 1 foot of channel bed elevation loss averaged over reach and absent of a significant knickpoint.	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**
Corral Trail Drainage Lenses	During and post-storm, if the Corral Trail was overtopped, positive flow off road will be maintained with no significant erosion of road or fill prism. Pipes will not be plugged in the dry season.	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**
Lower Hotel Trail Arizona Crossing	Articulated mat is stable and no significant knickpoints	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**
Staked Wood Jams	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**	**Met**

[1] There was no 2-year event in Water Year 2022 so this performance metric was not applicable.

4.5.1 HYDROLOGY – INSET FLOODPLAINS ON SAN FELIPE CREEK

A 2-year streamflow event did not occur during WY2022; therefore, this performance standard is not applicable. Nonetheless, Balance observed that inset floodplains were inundated during WY2022. Based on monitoring data, it appears that water levels inundated the ID03-01floodplain briefly on December 25 and 27, 2021, suggesting that the ID03-01 floodplain may have been partially or completely inundated during those storm events. Similarly, ID03-02 floodplain was inundated briefly on December 25 and 27,

2021, suggesting that the ID03-02 floodplain may have been partially or completely inundated during those storm events. Similarly ID03-03 and ID03-04 were inundated, at least partially for approximately a month starting on December 25, 2021.

4.5.2 Hydrology – Boyds Creek Alluvial Fan – Living Log Jams

The performance standard states that flows from Boyds Creek should occupy at least two of the existing or created channels (located at area ED01-01) across the Boyds Creek alluvial fan during the monitoring year. WY2022 was the third consecutive year of drought; however, enough rain fell during the early part of the water year to trigger flow in 3 of the 5 distributary channels during the wet period in late December 2021. This performance standard was met in Year 4.

4.5.3 Channel Form

Balance did not collect topographic data in WY2022 to detect topographic change and evaluate this performance standard due to the absence of 2-year flows. Also, field observations indicated limited or no substantial change. Observations made during site visits did not indicate any new areas of problematic erosion during WY2022. This performance standard was met. Detailed observations for each stream feature are included in the Geomorphic and Hydrologic Monitoring Report (Appendix C).

4.5.4 Corral Trail Drainage Lenses

As discussed in the Geomorphic and Hydrologic Monitoring Report (Appendix C), no deleterious erosion or deposition was observed in or around the drainage lenses and Corral Trail. The PVC pipes in the drainage were not clogged. There was no evidence (e.g., high-water marks) that the Corral Trail overtopped during WY2022. This performance standard is being met.

4.5.5 Lower Hotel Trail Arizona Crossing

As discussed in the Geomorphic and Hydrologic Monitoring Report (Appendix C), the articulated mat Arizona Crossing constructed on the Lower Hotel Trail is performing as designed, and no deleterious erosion or deposition was noted. This performance standard has been achieved.

4.5.6 Staked Wood Jams

Staked debris jams were installed in the Incised Tributary (ID02-01), including four standard staked debris jams and two hand-built staked debris jams utilizing slash and cobbles. During Years 1 through 3, the staked debris jams appeared to both retain and release sediment. This process is to be expected, and it appears all the staked debris jams are functioning as intended, serving to capture episodic sediment delivered during high flows and meter sediment out during intermediate flows.

At this time, Balance recommends adding a second course of staked debris jams, as outlined in the MMP, during summer 2023. At this point as all jams are considered to be “full”, trapped sediment and debris has had the opportunity to consolidate, and additional aggradation could take place with additional structures, and would benefit the system with continued progress toward a long-term goal of reversing incision in this channel.

4.6. Qualitative Monitoring

On May 3 and 5, June 6 and 30, and September 26, 2022, Nomad principal vegetation ecologist Erin McDermott and botanist Leanne Feely visited the project site to qualitatively assess site-wide conditions. Qualitative monitoring included surveys for invasive weeds, wildlife observations, and visual assessment of vegetation during each site. Habitat Agency staff also made wildlife observations.

4.6.1 INVASIVE WEEDS

Per the MMP (Dudek 2019), plants were considered non-native invasive weeds if they are Cal-IPC ranked as Moderate to High threat level, or if they were included on the CDFA list of invasive species. Naturalized non-native annual grasses with the Cal-IPC rank of Moderate (such as wild oats*, ripgut brome*, Italian ryegrass*, and hare barley*) were not mapped or controlled since they are ubiquitous throughout the site and not subject to the criterion.

Ten invasive weed species were observed in the Restoration Area (Table 20), including black mustard*, Italian thistle*, yellow star-thistle*, bull thistle*, poison hemlock*, teasel*, medusahead grass*, hoary mustard*, perennial pepperweed*, pennyroyal*, and harding grass*. These weed species varied in distribution from widespread to limited to just a few or more populations. Confluence conducted weed management and control during maintenance visit including hand removal, which are described in detail in Section 2.

Table 20. Invasive Weed Species Recorded in the Restoration Area

COMMON NAME *SPECIES NAME*	CAL-IPC RATING[1]	DISTRIBUTION IN RESTORATION AREA	TREATMENT IN 2022	RECOMMENDED TREATMENT FOR 2022
black mustard *Brassica nigra*	Moderate	Scattered throughout the site.	Hand pulled in planted areas.	Hand pull around plantings. Herbicide treatment in select areas as feasible. Goat grazing.
Italian thistle *Carduus pycnocephalus* subsp. *pycnocephalus*	Moderate	Isolated patches throughout the site.	Hand pulled in planted areas.	Hand pull around plantings. Mow large stands. Herbicide treatment in select areas as feasible. Goat grazing.
Yellow star-thistle *Centaurea solstitialis*	High	Scattered throughout the site.	Hand pulled in planted areas.	Hand pull around plantings. Mow large stands. Herbicide treatment in select areas as feasible. Goat grazing.
Bull thistle *Cirsium vulgare*	Moderate	Isolated patches throughout the site.	Hand pulled in isolated patches adjacent to ponds.	Hand pull around plantings. Herbicide treatment in select areas as feasible. Goat grazing.
Poison hemlock *Conium maculatum*	Moderate	Dense stand in the Spring 01.	Mowed entire stand.	Hand pull as feasible. Mowing is generally ineffective.

COMMON NAME *SPECIES NAME*	CAL-IPC RATING[1]	DISTRIBUTION IN RESTORATION AREA	TREATMENT IN 2022	RECOMMENDED TREATMENT FOR 2022
Teasel *Dipsacus sativus*	Moderate	Scattered within SW03	None.	Hand pull around plantings. Herbicide treatment in select areas as feasible. Goat grazing.
Medusahead grass *Elymus caput-medusae*	High	Scattered throughout the site.	None	Hand pull around plantings. Targeted goat grazing outside of planted areas.
Hoary mustard *Hirschfeldia incana*	Moderate	Scattered throughout the site.	Hand pulled in planted areas.	Hand pull around plantings. Herbicide treatment in select areas as feasible. Goat grazing.
perennial pepperweed *Lepidium latifolium*	High	Isolated patches within SW03.	Hand pulled	Hand pull around plantings and in SW02. Herbicide treatment in select areas as feasible. Goat grazing.
pennyroyal *Mentha pulegium*	Moderate	Isolated patches within SW03.	None	Hand pull around plantings. Herbicide treatment in select areas as feasible.
Harding grass *Phalaris aquatica*	Moderate	Scattered patches with few individuals. throughout the site.	None	Hand pull or mow. Herbicide treatment in select areas as feasible.

[1]California Invasive Plant Council rating as listed in the California Invasive Plant Inventory Database (Cal-IPC 2022).
[2]California Department of Food and Agriculture noxious weeds are included on the CDFA California Noxious Weeds List (CDFA 2022).

4.6.2 WILDLIFE OBSERVATIONS

Trail cameras were deployed throughout the site during Year 4 to detect feral pigs that may gain access to the site through breeches in the perimeter fence or through vehicle gates unintentionally left open by other Park user groups. Native mammals documented regularly accessing the restoration area included bobcat (*Lynx rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), mule deer (*Odocoileus hemionus*), striped skunk (*Mephitis mephitis*), black-tailed jack rabbit (*Lepus californicus*), and brush rabbit (*Sylvilagus bachmani*). Trail cameras also documented an adult American badger (*Taxidea taxus*) digging numerous burrows and preying upon Botta's pocket gophers and California ground squirrels from March 11 through April 8, 2022, and again on July 29, 2022. Observations of the badger were submitted to the California Natural Diversity Database. A mountain lion was also detected at ID02 on February 17, 2022.

All five ponds were checked monthly for the presence of western pond turtle and California red-legged frog, but none were observed. The ponds held very little water or were dry by April so did not provide breeding habitat or summer refugia to either species.

4.6.3 FERAL PIG CONTROL

Wildlife Detections LLC continued Phase 2 remedial actions identified in the Year 3 report by securing an additional 3,635 linear feet of barbed wire atop the woven wire mesh perimeter fence and added a minimum of three 12-guage vertical wire ties between every t-post along those sections to further hold up the wire mesh to resist feral pig ability to climb over the fence. Additional welded wire livestock panels and/or strings of barbed wire were fixed to the three entry gates to prevent pigs from climbing through the slats. Wildlife Detections staff also baited the 1-way pig gate area allowing for non-lethal removal of pigs from the restoration site and access back into the Park.

Multiple feral pigs were documented within the restoration area during Year 4. These included:

- Large young adult boar: January 1 – March 22, 2022 (first gained access September 2021). Released from the restoration area via the 1-way pig gate.
- Large old boar (>300 lbs): June 3-21, July 18, and Nov 14- Dec 19, 2022. He has continued to routinely smash his way over the perimeter fence since 2019 and is the only pig documented going over the fence.
- Five juvenile pigs: (~June 30 -September 4, 2022). First observed within the restored seasonal wetland (SW02), by Nomad biologist Leanne Feely. All 5 were released via the 1-way pig gate on September 4, 2022, but 3 of 5 were back inside the enclosure by that night. Two of three juvenile pigs that had reentered the restoration area on September 4th were released through the 1-way pig gate on September 15, 2022. The single remaining juvenile pig was last documented on September 30, 2022, and is presumed to have escaped the enclosure.
- Seven young piglets (less than 2 months old): August 27, 2022, at the Spring. They were all small enough to have squeezed through the 6-inch mesh squares of the perimeter fence. It is presumed that they squeezed back out and rejoined their mother outside of the fence.

4.6.4 PLANT HEALTH AND VIGOR

Plant health was regularly monitored in Year 4 by Confluence during their regular maintenance visits. Nomad Ecology staff surveyed the plantings during site visits. Overall the plantings appeared vigorous and healthy. Cages were well maintained. Irrigation was running consistently, with Confluence regularly checking the irrigation system and addressing any issues.

4.7. PHOTO POINT MONITORING

Photos were taken at each of the 40 permanent photo point locations on June 6, 2022, and are included in Appendix E.

Section 5. SUMMARY AND RECOMMENDATIONS

5.1. SUMMARY

Per the MMP, if revegetation efforts fail to meet performance standards in any year, remedial actions shall be recommended to bring the project to a level of conformance (Dudek 2019). The results of monitoring and recommendations are summarized in Table 21. Details of the recommendations are discussed below.

Table 21. Summary of Year 4 Results and Recommendations

Performance Standard	Wetland Rehabilitation and Enhancement			Stream and Riparian Buffer Enhancement		
	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations
Container Plants (minimum performance)	30% vegetated cover	2% Vegetative Cover Did not meet Performance Standard	Recommend discarding this performance standard in future years as it is not a useful indicator of seasonal wetland performance.	30% vegetated cover	2% Vegetative Cover Did not meet Performance Standard	Continue to maintain container plantings to facilitate growth and increase cover. Because willows are intermixed with container plantings along transects, we recommend combining the container and willow cover requirements.
Cuttings (minimum performance)	20% vegetated cover	N/A	N/A	20% vegetated cover	1% Vegetative Cover Did not meet Performance Standard	Continue to maintain willows to facilitate growth and increase cover. Because willows are intermixed with container plantings along transects, we recommend combining the container and willow cover requirements.
Seeded Areas (minimum percent of cover of plants)	65% cover	61% cover Did not meet Performance Standard	In average water year, vegetation is expected to increase. If vegetation does not increase in Year 5 then additional planting or seeding may be recommended.	65% cover	59% Vegetative Cover Did not meet Performance Standard	Vegetation on site is expected to increase.
Maximum Cover by Weed Species	10% cover	10% cover **Met Performance Standard**	Continue to control weeds on site.	10% cover	6% cover **Met Performance Standard**	Continue to control weeds on site.

Performance Standard	Wetland Rehabilitation and Enhancement			Stream and Riparian Buffer Enhancement		
	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations
Absolute Cover of Wetland Species (OBL, FACW and FAC)[1]	≥75% reference absolute cover of wetland species Minimum 14% required to reach 75% of reference wetland cover.	35% cover **Met Performance Standard**	None	N/A	N/A	N/A
Relative Cover of Native Species	≥75% relative cover of native species	32% cover Did not meet Performance Standard	A relative cover of 75% native species is very high for seasonal wetlands in the region and will likely not be attained. We recommend revising this performance standard to be relative to the reference site.	≥75% relative cover of native species	31% cover Did not meet Performance Standard	Continue to maintain container plantings to facilitate growth and increase cover.
Target Species Richness	≥75% of reference site Reference site has 10 native species present; restoration areas require a minimum of 8 native species to meet the minimum performance standard.	15 species **Met Performance Standard**	Starting in Year 5, we recommend measuring species richness by completing a timed survey of each restoration seasonal wetland and the reference site to record as many unique species as possible. This will result in a more robust list, since transect sampling is likely to capture only a portion of the species present.	≥75% of reference site	31 species **Met Performance Standard** (Minimum 6 species required to reach 75% of reference target species)	Starting in Year 5, we recommend measuring species richness by completing a timed survey of each restoration seasonal wetland and the reference site to record as many unique species as possible. This will result in a more robust list, since transect sampling is likely to capture only a portion of the species present.
Hydrology †	≥14 days of ponding or saturated soils in an average or above-average precipitation year	N/A because there was no 2-year event in Water Year 2022.	None-	N/A	N/A	N/A
Hydrology – Inset Floodplains on San Felipe Creek	N/A	N/A	N/A	Inset Floodplain inundation if peak flows exceed a 2-year event*	N/A because Water Year 2022 was a below-average rainfall year.	None

Performance Standard	Wetland Rehabilitation and Enhancement			Stream and Riparian Buffer Enhancement		
	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations	Year 4 Performance Standard	Year 4 Monitoring results	Recommendations
Hydrology – Boyds Creek Alluvial Fan – Living Log Jams	N/A	N/A	N/A	Flow in 2 or more channels during the winter season	**Met Performance Standard**	None
Channel Form	N/A	N/A	N/A	There will be less than 1 foot of channel bed elevation loss averaged over reach and absent of a significant knickpoint.	**Met Performance Standard**	None
Corral Trail Drainage Lenses	N/A	N/A	N/A	During and post-storm, if the Corral Trail was overtopped, positive flow off road will be maintained with no significant erosion of road or fill prism. Pipes will not be plugged in the dry season	**Met Performance Standard**	None
Lower Hotel Trail Arizona Crossing	N/A	N/A	N/A	Articulated mat is stable and no significant knickpoints have formed	**Met Performance Standard**	None
Staked Wood Jams	N/A	N/A	N/A	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	**Met Performance Standard**	Place additional staked debris jams in summer 2023.

[1] Prior project reports mistakenly defined wetland species as consisting of OBL and FACW species, and they measured and reported wetland species' cover accordingly. This report and all subsequent reports define wetland species by the indicators OBL, FACW, and FAC, in accordance with the U.S. Army Corps of Engineers' wetland delineation methodology. The performance standard in Year 4 would also be met if only OBL and FACW species were considered wetland species as reference sites had 2% cover of OBL and FACW species and the restoration sites each had 2% cover of OBL and FACW species.

5.2. RECOMMENDATIONS

5.2.1 CONTINUE TO MAINTAIN PLANTINGS IN STREAM AND RIPARIAN BUFFER AREAS

Stream and riparian buffer areas did not meet performance standards related to minimum vegetative cover, cover of plantings, or relative cover of native species. This is because the majority of surviving plants on site were part of the Phase 1 and 2 replacement planting that occurred in fall 2020 and fall 2021, and the plants are younger and smaller than plants from the initial plantings. Because they are younger and smaller, they do not provide significant cover. Because the sites are densely planted, we do not recommend additional planting. Continued maintenance including irrigation, caging, mulching, and weed control will ensure these plants continue to grow and mature and provide sufficient cover to meet performance standards.

5.2.2 POSSIBLE SEEDING OR PLANTING IN SEASONAL WETLAND RESTORATION AREAS

The seasonal wetland area SW03 did not meet minimum vegetation cover requirements but it was close. WY2022 was a below average year for precipitation, and it is expected that in an average precipitation year, vegetation cover in seasonal wetlands will be higher and likely meet performance standards. From Year 5 to Year 10, the minimum cover target is 70% cover. If vegetation cover does not increase in Year 5, then additional seeding or planting of plugs may be recommended. Plugs of creeping wildrye could be harvested on site from SW02 and planted in SW03, or plugs could be purchased and planted.

5.2.3 INVASIVE WEED CONTROL

Invasive weeds should continue to be controlled on site. This will keep the site on track to meet the goals of the project as well as help maintain and increase native cover and decrease invasive cover to meet these performance standards. Control recommendations are included in Table 20. Highest priority for control of invasive weeds are around plantings and in planting areas, and in SW02, SW03, and Spring01. Species that are limited in distribution on site are also high priority for control since they can be controlled before they become well established. These species include Harding grass*, perennial pepperweed*, pennyroyal*, Italian thistle* and bull thistle*. The following species are widespread on site and should be treated as feasible, particularly in planted areas: hoary mustard*, black mustard*, teasel*, yellow star-thistle* and medusahead grass*. Information about effective control of each species is included below. All herbicide application should be under the direction of a Certified Pest Control Advisor. All herbicide labels and regulations should be followed. All weed control activities will avoid impacts to plantings.

In addition to Cal-IPC Moderate and High threat species, milk thistle (Silybum marianum)* is an invasive plant species that appears to pose challenges to establishing plantings and habitat development within the site. While not required by the HMMP, due to its Limited status rank by Cal-IPC, this species is recommended for control as needed. Control would be consistent with measures for Italian thistle and bull thistle.

Italian Thistle and Bull Thistle

Mechanical methods can be utilized when individuals are small. To control by cutting, use a sharpened shovel at the top of the root crown and grubbing hoes to cut the plants 2 to 4 inches below ground level to prevent resprouting (DiTomaso et al. 2013). Mowing the plant during flowering can greatly reduce seed production, though a single mowing is seldom sufficient due to the wide differences in the maturity of plants in a natural population. Wait to mow until plants bolt and are about to flower (flowering generally occurs May to July). This may require repeated visits at weekly intervals over the 4-7 week blooming period since not all plants bloom simultaneously. Plants will regrow if mowed before they are fully

bolted. Plants cut four days after the first flowers open can still produce viable seed (DiTomaso et al. 2013).

These species can be sprayed with a selective herbicide (aminopyralid or clopyralid) when they are in the rosette stage or hand pulled up to the flowering stage. Surveys should be conducted every 6-8 weeks throughout the growing season to detect target species early and control them prior to them setting seed.

Yellow Star-thistle

Mowing is most effective when plants are cut below the height of the lowest branches and 2-5% of the total population of seed heads are in bloom. Mowing too early can result in higher seed production (DiTomaso and Healy 2007). Hand pulling, hoeing, string line trimming of plants every 2-4 weeks during the growing season can be effective. If the plants have flowered, they should be placed in bags to prevent seeds from dispersing (DiTomaso et al. 2013). High-intensity short duration grazing should be implemented during the period when plants have bolted to just before they produce spiny heads (DiTomaso et al 2013). Sheep and goats are more effective than cattle at controlling yellow star thistle (Wilson et al. 2006). A number of herbicides are very effective at killing yellow star-thistle if applied before senescence. Triclopyr is broadleaf selective and best used in seedling to rosette stage.

Teasel

Annual control treatments are usually needed for 4 to 6 years until viable seeds in the soil become sparse. Manually removing plants a few inches below the crown can effectively control small populations. (DiTomaso and Healy 2007). Mowing larger populations during bolting phase before flowers develop can prevent seed production (DiTomaso and Healy 2007) but will not kill plants because the root crown will resprout and flower after being cut. Livestock may graze rosettes but teasel has low palatability at most growth stages. Aminopyralid is effective when applied to rosette to young bolting stage. Glyphosate is also effective if applied to rapidly growing plants from the rosette to early bolting stage (DiTomaso et al. 2013).

Poison Hemlock

Hand removal is recommended for small infestations. When pulling the plants, dig down and remove the entire taproot. Wear gloves and wash hands after working with poison hemlock. Manual control efforts can be successful but can cause soil disturbance and encourage further germination of seeds. Solid carpets of hemlock seedlings are not uncommon following soil disturbance. Cutting is ineffective; the plants send up new seed stalk in the same season the cutting occurs (DiTomaso et al. 2013). Due to the plant's toxicity, grazing is not recommended for control. Herbicide use is limited for this plant on site as it occurs in Spring01. Triclopyr is best applied during postemergence in seedling to rosette stage since it is most effective on smaller plants. Glyphosate is best when applied to postemergence to rapidly growing plants before bolting.

Medusahead Grass

Medusahead grass should be targeted via precision grazing efforts outside of the planted areas (to prevent grazing on planted species), but in adjacent locations. Because of its high silica content, livestock avoid grazing medusa head as it approaches maturity (DiTomaso et al 2013). Livestock will eat it in the vegetative stage and significant reductions in plant populations are possible with two years of heavy grazing at high stock density. Grazing early in the season prevents seed productions and reduces medusa head mulch (Davison et al. 2006). The optimal timing for grazing is in late spring, typically between late April to early May, after medusahead stems begin to elongate and before the seed milk stage, which is just prior to exposure of the inflorescense (DiTomaso et al. 2008). The most effective results occur when grazing is high density for a short duration (DiTomaso et al. 2008).

Hoary Mustard and Black Mustard

Manual removal or cultivation before seeds develop, particularly during the seedling stage, can control populations. Control methods implemented over a period of years will eventually exhaust the seedbank (DiTomaso et al. 2013). Glyphosate is a non-selective herbicide and will suppress post-emergent small plants.

Perennial Pepperweed

Seedlings can be controlled by hand-pulling or tilling, but seedlings are often not encountered. Established plants cannot be controlled by these methods because shoots quickly resprout from small root segments. Root segments as small as 1 inch are capable of producing new shoots. Mowing helps by removing thatch and allowing favorable species to grow, though mowing does stimulate new growth in perennial pepperweed (DiTomaso et al. 2013).

Grazing should occur prior to seed set since germination of viable seeds is improved by the rumination process (Davison et. al. 2006). Perennial pepperweed is readily grazed by sheep, goats, and cattle when it is in the seedling to early flowering stage. Repeated, intense grazing can significantly reduce biomass and density in the year the grazing occurs but grazing must be continued indefinitely (DiTomaso et al. 2013).

Mowing at the flower bud stage and treating the regrowth at the bolting to flowering stage with systemic herbicide can significantly reduce populations (DiTomaso and Healy 2007). Glyphosate is effective postemergence from seedling to bloom stage but is most effective at flower bud or flowering stage (DiTomaso et al. 2013).

Pennyroyal

Manual removal of individual plants before flowering, including all rhizomes and stolons, followed by immediate removal of observed seedlings can effectively control small populations (DiTomaso and Healy 2007). Below-ground reproductive tissues should be cut about three inches below the soil surface when the plants are beginning to bolt. Mowing in late spring or early summer over several years may weaken plants but cutting will result in crown resprouting (DiTomaso et al. 2013). Control by grazing is unlikely because pennyroyal is unpalatable as forage (DiTomaso et al. 2013). Herbicide options are limited because it tends to inhabit wetland environments.

Harding Grass

Regular manual removal of these species before seeds mature can help control unwanted populations. Close mowing late in the season when plants are still green can reduce plants vigor. Grazing by livestock can be used to reduce biomass. Glyphosate is a non-selective herbicide that can be used young plants just after germination as a spot treatment, or if used as a follow up to mowing or grazing (DiTomaso et al. 2013).

5.2.4 FERAL PIG CONTROL

Fence improvements and retrofits were completed by HRS and Southwest Fence and Supply Company, in fall and winter 2020. Wildlife Detections LLC continued Phase 2 remedial actions identified in the Year 3 report by securing 3,635 linear feet of barbed wire atop the woven wire mesh and added a minimum of three 12-guage vertical wire ties between every t-post along those sections to further hold up the wire mesh to resist feral pig ability to climb over the fence. Additional welded wire livestock panels and/or strings of barbed wire were fixed to the three entry gates to prevent pigs from climbing through the slats. Confluence and the Habitat Agency conducted monthly fence inspections, and completed repairs as necessary. Continued fence monitoring and maintenance will occur to maintain pig exclusion.

5.2.5 Revised Performance Standards

The seasonal wetland areas have a performance standard for container plantings of a minimum of 30% vegetated cover. We recommend discarding this performance standard and instead using the other performance standards to capture cover of wetland vegetation, cover of native vegetation and species richness. This recommendation is based on the position that container planting cover is not an ecologically useful measure of the seasonal wetland restoration performance. Many of the container plantings did not survive likely because conditions were not right for those species, for example iris-leaved rush requires wetter conditions than are present in seasonal wetlands on site. However the seasonal wetlands on site have been colonized by more appropriate native wetland species including creeping wildrye and winter cress. .

The stream and riparian buffer areas have separate minimum cover performance standards for container plantings and cuttings. In many areas on site container plantings and willow cuttings are mixed in together and willow cover is low because container cover is high, or vice versa. These areas are densely planted and planting additional containers or willows does not make ecological sense. We recommend discarding the cuttings minimum cover performance standard and counting the willows in with the container plantings to have one cover value target for planted woody vegetation (trees and shrubs) in the stream and riparian buffer areas.

5.2.6 Revised Sampling Methodology

Starting in Year 5, we recommend measuring species richness by completing a timed survey of each restoration seasonal wetland and the reference site to record as many unique species as possible. This will result in a more robust list, since transect sampling is likely to capture only a portion of the species present.

5.2.7 Corrected Definition for Wetland Species

Prior project reports mistakenly defined wetland species as consisting of OBL and FACW species, and they measured and reported wetland species' cover accordingly. This report and all subsequent reports define wetland species by the indicators OBL, FACW, and FAC, in accordance with the U.S. Army Corps of Engineers' wetland delineation methodology. The performance standard is met in Year 4 using OBL, FACW, and FAC species, and would also be met if only OBL and FACW species were considered wetland species as reference sites had 2% cover of OBL and FACW species and the restoration sites each had 2% cover of OBL and FACW species.

5.2.8 Geomorphic and Hydrologic Maintenance – Add Staked Debris Jams

The installed staked debris jams at the Incised Tributary (ID02-01) are functioning as intended, serving to capture episodic sediment delivered during high flows and meter sediment out during intermediate flows. Balance recommends adding a second course of staked debris jams during summer 2023, as all jams appear to be stabilizing with aggraded sediment. Continued aggradation will benefit the channel by reversing the incision that has taken place in this tributary.

Section 6. REFERENCES

Balance Hydrologics. 2022. *Geomorphic and Hydrologic Monitoring Report*. Balance Hydrologics, Inc. Project Assigment: 222108

California Invasive Plant Council (Cal-IPC). 2022. *California Invasive Plant Inventory*, online. https://www.cal-ipc.org/plants/inventory/

California Native Plant Society (CNPS). 2019. *Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling Field Form*. February. https://www.cnps.org/wp-content/uploads/2019/03/veg-releve-field-protocol.pdf

DiTomaso J.M., G.B. Kyser, George MR, Doran MP, Laca EA. 2008. Control of medusahead (*Taeniatherum caput-medusae*) using timely sheep grazing. Invasive Plant Sci Manage 1:241-247.

DiTomaso, J.M., G.B. Kyser, S.R. Oneto, R.G. Wilson, S.B. Orloff, L.W. Anderson, S.D. Wright, J.A. Roncoroni, T.L. Miller, T.S. Prather, C. Ransom, K.G. Beck, C. Duncan, K.A. Wilson, J.J. Mann. 2013. *Weed Control in Natural Areas in the Western United Sates.* Weed Research and Information Center, University of California.

Dudek. 2019. San Felipe Creek Restoration Project Mitigation and Monitoring Plan. Prepared for Santa Clara Valley Habitat Agency. August 2019.

Dudek. 2020a. San Felipe Creek Restoration Project Mitigation Monitoring Annual Report, Year 1 – 2019. Prepared for Santa Clara Valley Habitat Agency. April 2020.

_____. 2020b. San Felipe Creek Restoration Project Mitigation Monitoring Annual Report, Year 2 – 2020. Prepared for Santa Clara Valley Habitat Agency. December 2020.

_____. 2020c. San Felipe Creek Restoration Project Remedial Plan – REVISED FINAL. Prepared for Santa Clara Valley Habitat Agency. December 2020.

_____. 2021. San Felipe Creek Restoration Project Mitigation Monitoring Annual Report, Year 3 – 2021. Prepared for Santa Clara Valley Habitat Agency. December 2021.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. January. 100 pp. plus appendices.

ICF International. 2012. Santa Clara Valley Habitat Plan. Final. Prepared for City of Gilroy, City of Morgan Hill, City of San José, County of Santa Clara, Santa Clara Transportation Authority, and Santa Clara Valley Water District. August 2012.

Kyser G.B., J.M. DiTomaso, K.W. Davies, J.S. Davy, B.S. Smith. 2014. Medusahead Management Guide for the Western States. University of California, Weed Research and Information Center, Davis. 68 pp. Available at: wric.ucdavis.edu.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. Arid West 2016 Regional Wetland Plant List. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016.

Schaaf and Wheeler, 2007. *Santa Clara County Drainage Manual*. Prepared for Santa Clara County, 66 p. + appendices.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. ed. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-06-16. MS: U.S. Army Engineer Research and Development Center.

_____. 2016. Regional General Permit 18 Santa Clara Valley Habitat Plan Regional General Permit. January 2016.

APPENDIX A AS BUILT DRAWINGS

SEED MIXES:

NOTES:

1. ALL SEED AND PROPAGULE MATERIALS SHALL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM THE GENERAL SANTA CLARA COUNTY REGION, UNLESS OTHERWISE APPROVED BY THE ENGINEER'S REPRESENTATIVE.
2. USE SEED MIX TYPE 3 FOR DISTURBED AREAS NOT OTHERWISE INDICATED TO RECEIVE A SPECIFIC SEED MIX.

SEED MIX TYPE 1 – WETLAND RIPARIAN MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	CYPERUS ERAGROSTIS	UMBRELLA PLANT	2
	ELYMUS GLAUCUS	BLUE WILD RYE	10
	ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	6
	FESTUCA RUBRA	NATIVE RED FESCUE	8
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	12
	LASTHENIA CALIFORNICA	GOLDFIELDS	0.5
		TOTAL MIX TYPE 1	**38.7**

SEED MIX TYPE 2 – RIPARIAN MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	CYPERUS ERAGROSTIS	UMBRELLA PLANT	2
	ELYMUS GLAUCUS	BLUE WILD RYE	10
	ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	6
	FESTUCA RUBRA	NATIVE RED FESCUE	8
	HELIOTROPIUM CURASSAVICUM	HELIOTROPE	1
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	12
	SISYRINCHIUM BELLUM	BLUE EYED GRASS	2
		TOTAL MIX TYPE 2	**41.2**

SEED MIX TYPE 3 – UPLAND MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	BROMUS CARINATUS	CALIFORNIA BROME	6
	CLARKIA PURPUREA	PURPLE CLARKIA	2
	ELYMUS GLAUCUS	BLUE WILD RYE	15
	ERIOGONUM FASCICULATUM	CALIFORNIA BUCKWHEAT	1.5
	ERIOPHYLLUM CONFERTIFLORUM	GOLDEN YARROW	0.25
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	8
	PHACELIA CALIFORNICA	CALIFORNIA PHACELIA	1
	SISYRINCHIUM BELLUM	BLUE EYED GRASS	2
	STIPA PULCHRA	PURPLE NEEDLE GRASS	12
		TOTAL MIX TYPE 3	**47.95**

PLANT LISTS:

NOTES:

1. PLANTING AREA CALCULATIONS WERE PROVIDED BY BALANCE HYDROLOGICS ON APRIL 20, 2017.
2. ALL PLANT MATERIAL SHALL ORIGINATE FROM PLANT PROPAGATION MATERIALS GATHERED DIRECTLY FROM THE SITE, OR BE NATIVE STOCK FROM THE REGION PURCHASED FROM A REPUTABLE NATIVE PLANT NURSERY.
3. AT ALL TIMES SPECIAL CARE SHALL BE TAKEN WITH THE PROPAGATION OF CALIFORNIA SYCAMORE TO ELIMINATE HYBRIDIZING WITH THE NON-NATIVE LONDON PLANE TREE (*PLATANUS HISPANICA* (*X ACERIFOLIA*)).
4. INSTALL ALL CONTAINER PLANTS AND CUTTINGS IN A RANDOM DISTRIBUTION TO MIMIC A NATURAL PLANT LAYOUT.
5. BMP'S FOR EXCLUDING PHYTOPHTHORA RAMORUM SHALL BE CONDUCTED AS PRESCRIBED ON SHEET 2.0.

AS-BUILT DRAWINGS

PLANT LISTS (CONTINUED):

PLANT LIST 1. NEW SWALE LOCATION – SHEET 5.1

APPROXIMATELY 15,635 SQUARE FEET

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
LOWER SLOPE (APPROXIMATELY 6,580 SQUARE FEET)					
JUNCUS EFFUSUS	COMMON RUSH	TREEBANDS	75	2'-0"	PLANT ALONG TOE OF SLOPE AND IN LOW FLOW CHANNEL WITHIN 60 FEET OF THE CREEK, IN GROUPS OF 3-7 PLANTS
JUNCUS PATENS	SPREADING RUSH	TREEBANDS	75	2'-0"	PLANT ALONG TOE OF SLOPE AND IN LOW FLOW CHANNEL WITHIN 60 FEET OF THE CREEK, IN GROUPS OF 3-7 PLANTS
ROSA CALIFORNICA	WILD ROSE	DEEPOT	100	6' 0"	INSTALL IN GROUPS OF 3 7 PLANTS
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	60	2'-0"	4 FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; 1 ROW AT TOE OF SLOPE WITHIN 60 FEET OF THE CREEK
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	60	2'-0"	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; 1 ROW AT TOE OF SLOPE WITHIN 60 FEET OF THE CREEK
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	30	12' 0"	INSTALL GROUPS OF 3 5 PLANTS
UPPER SLOPE (APPROXIMATELY 9,055 SQUARE FEET)					
~~*AMELANCHIER UTAHENSIS*~~	SERVICEBERRY	DEEPOT	70	6' 0"	SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	34	12'-0"	
SYMPHORICARPOS ALBUS	SNOWBERRY	DEEPOT	70	6' 0"	INSTALL IN GROUPS OF 3 5 PLANTS SEE AS-BUILT DRAWING NOTE 4 BELOW, THIS SHEET

- FOR *ROSA CALIFORNICA*, *SAMBUCUS MEXICANA*, AND ALL UPPER SLOPE SPECIES; CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- ALL SLOPE LAY BACK AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 2. LIVING LOG-JAM BIO-TECHNICAL ENHANCEMENT FEATURES AT TRIBUTARIES TO SAN FELIPE CREEK – SHEETS 5.2 AND 5.3

27 TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	TREEPOT4	150	PER DETAIL 1 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS; SEE NOTE BELOW
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	150	PER DETAIL 1 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS

- ALTERNATE SPECIES AT LOCATIONS SHOWN ON THE DETAILS.
- PLANT SYCAMORE SPECIFIES AS PURE GENETIC PLANTS ARE AVAILABLE; IF PLANTS ARE NOT AVAILABLE, SUBSTITUTE THE NEEDED QUANTITY WITH *QUERCUS LOBATA* (VALLEY OAK) IN TREEPOT4 CONTAINERS.
- LIVING LOG-JAM BIO-TECHNICAL ENHANCEMENT FEATURES SHALL NOT RECEIVE ANY SEEDING.

PLANT LIST 3. INSET FLOODPLAIN DEVELOPMENT AND RELATED SLOPE AT SAN FELIPE CREEK – SHEET 5.3

APPROXIMATELY 41,400 SQUARE FEET

- INSET FLOODPLAIN DEVELOPMENT AND RELATED SLOPE AREA SHALL BE SEEDED WITH SEED MIX TYPE 2 ONLY; NO CONTAINER PLANTS OR CUTTINGS SHALL BE INSTALLED.

PLANT LIST 4. INSET FLOODPLAIN AT SAN FELIPE CREEK, NORTHERN AREA – SHEET 5.5

APPROXIMATELY 9,030 SQUARE FEET

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
FRANGULA CALIFORNICA	COFFEE BERRY	DEEPOT	30	6' 0"	INSTALL ON UPPER ELEVATIONS TO THE WEST
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	60	6'-0"	INSTALL IN GROUPS OF 3 5 PLANTS
~~*RIBES MALVACEUM*~~	~~CHAPARRAL CURRANT~~	~~DEEPOT~~	~~30~~	~~6'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET
ROSA CALIFORNICA	WILD ROSE	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	30	6' 0"	INSTALL IN GROUPS OF 3 7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	20	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
~~*UMBELLULARIA CALIFORNICA*~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~20~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 5 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5,5 FOR PLANTING AS-BUILT DRAWINGS.
2. *AMELANCHIER UTAHENSIS* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
3. *RIBES CALIFORNICUM* WAS SUBSTITUTED FOR *RIBES MALVACEUM*.
4. *SYMPHORICARPOS ALBUS* WAS SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
5. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, California 94710
tel (510) 704-1000 fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

SEED MIXES & PLANT LISTS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0A

P:\300.ENVIRONMENTAL\100564 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PLANT LISTS (CONTINUED):

PLANT LIST 5. INSET FLOODPLAIN AT SAN FELIPE CREEK, SOUTHERN AREA – SHEET 5.5

APPROXIMATELY 10,970 SQUARE FEET (INCLUDES BOTH SIDES OF THE CREEK)

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
FRANGULA CALIFORNICA	COFFEE BERRY	DEEPOT	35	6'-0	INSTALL ON UPPER ELEVATIONS TO THE WEST
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	70	6'-0	INSTALL IN GROUPS OF 3-5 PLANTS
~~RIBES MALVACEUM~~	~~CHAPARRAL CURRANT~~	~~DEEPOT~~	~~35~~	~~6'-0~~	SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
ROSA CALIFORNICA	WILD ROSE	DEEPOT	35	6'-0	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	35	6'-0	INSTALL IN GROUPS OF 3-7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	24	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
~~UMBELLULARIA CALIFORNICA~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~24~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 6. CHANNEL PLUGS AND BANKS AT INCISED AGRICULTURAL DITCH – SHEET 5.5

5 TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	50	6'-0	INSTALL PER DETAIL 2, SHEET 4.1
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	60	PER DETAIL 2 SHEET 4.1	INSTALL AT TOP OF BANK
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	60	2'-0	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL IN DITCH ON UPSTREAM SIDE OF PLUG - INSTALL PER DETAIL 2, SHEET 4.1
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	60	2'-0	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL IN DITCH ON UPSTREAM SIDE OF PLUG - INSTALL PER DETAIL 2, SHEET 4.1

- INSTALL SPECIES AT LOCATIONS SHOWN ON THE DETAILS 2, SHEET 4.1.
- CHANNEL PLUG AREAS IN DITCH SHALL NOT RECEIVE ANY SEEDING.
- BANK AREAS DISTURBED BY PLUG INSTALLATION SHALL BE SEEDED WITH SEED MIX TYPE 3.

PLANT LIST 7. LOG STEP POOL STRUCTURES WEST OF THE INCISED AGRICULTURAL DITCH – SHEET 5.5

4 TOTAL: PER DETAILS ON SHEET 4.1

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	24	4'-0" TO 6'-0"	INSTALL PER DETAIL 3, SHEET 4.1
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	32	4'-0	INSTALL AT TOP OF BANK
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	44	PER DETAIL 3 SHEET 4.1	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL AT BOULDERS - REFER TO DETAIL 3, SHEET 4.1 FOR INSTALLATION
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	44	PER DETAIL 3 SHEET 4.1	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL AT BOULDERS - REFER TO DETAIL 3, SHEET 4.1 FOR INSTALLATION

- INSTALL SPECIES AT LOCATIONS SHOWN ON THE DETAIL 3, SHEET 4.1.
- LOG STEP POOL STRUCTURES SHALL NOT RECEIVE ANY SEEDING.

PLANTING PREPARATION NOTES:

1. PLANTING PREPARATION WILL CONSIST OF NON-NATIVE, WEEDY PLANT CONTROL TREATMENT AND AMENDING SOIL AS NEEDED TO PREPARE THE REVEGETATION TREATMENT AREAS FOR PLANTING. REFER TO SHEET 5.0E FOR THE PERFORMANCE RECOMMENDATIONS FOR THE MAXIMUM PERCENT COVER BY WEED SPECIES.

2. UPON THE DIRECTION OF THE AGENCY, THE CONTRACTOR MAY BE RESPONSIBLE FOR WEED TREATMENT OVER THE ENTIRE PROJECT AREA.

3. FOLLOWING GRADING OPERATIONS THE SOIL WILL BE TESTED BY THE CONTRACTOR FOR SOIL FERTILITY AND NATIVE PLANT GROWTH SUITABILITY. REPRESENTATIVE SOIL SAMPLES WILL BE TAKEN WITHIN THE REVEGETATION TREATMENT AREAS BY THE CONTRACTOR. SOIL TESTING WILL BE PERFORMED BY A QUALIFIED LABORATORY AND, PENDING THE TEST RESULTS, SOIL AMENDING WILL BE PERFORMED ACCORDING TO THE SOIL LABORATORY'S RECOMMENDATIONS BEFORE PLANTING AND SEEDING. AMENDMENTS WILL BE THOROUGHLY INCORPORATED AND BLENDED IN THE SOIL TO A DEPTH OF 8-10 INCHES. FOR PRELIMINARY SOIL TEST RESULTS, SEE SHEET 5.0F.

4. NON-NATIVE, WEEDY PLANT SPECIES, OBSERVED AT THE PROJECT SITE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

BOTANICAL NAME	COMMON NAME	CALIFORNIA INVASIVE PLANT COUNCIL (CAL-IPC) RATING
AVENA BARBATA	SLENDER OAT	MODERATE
AVENA FATUA	WILD OATS	MODERATE
BRASSICA NIGRA	BLACK MUSTARD	MODERATE
BROMUS SPP.	BROMES	MODERATE - HIGH
CARDUUS PYCNOCEPHALUS	ITALIAN THISTLE	MODERATE
CENTAUREA SOLSTITIALIS	YELLOW STAR THISTLE	HIGH
CONIUM MACULATUM	POISON HEMLOCK	MODERATE
ELYMUS CAPUT-MEDUSAE	MEDUSA HEAD GRASS	HIGH

5. THE CONTRACTOR'S LICENSED PEST CONTROL ADVISOR (PCA) SHALL PREPARE, SUBMIT FOR APPROVAL, AND IMPLEMENT A NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN. THE CONTRACTOR'S PCA SHALL PREPARE A MONTHLY SCHEDULE (IN A TABLE FORMAT) FOR AND A MAP OF THE SPECIFIC TREATMENTS NEEDED AS PART OF THE NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN. THE PLAN SHALL ADDRESS NON-NATIVE, WEEDY PLANT SPECIES CONTROL IN COORDINATION WITH TIMING OF SOIL TESTING, AMENDMENT APPLICATION AND PLANTING AND SEEDING.

6. AS A GUIDE, THE FOLLOWING RECOMMENDATIONS SHOULD BE CONSIDERED FOR THE NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN:
   - BEFORE EARTHWORK OPERATIONS, CONDUCT MOWING (INCLUDING MASTICATING) TO BEGIN SITE PREPARATION FOR ALL REVEGETATION AREAS.
   - CONCURRENT WITH THE MOWING, USE EXISTING LOGS AVAILABLE IN THE PARK AND REDUCE THE LOGS TO CREATE TUB GRINDINGS (A COARSE MULCH BYPRODUCT), IF SOURCE MATERIALS ARE AVAILABLE.
   - IMMEDIATELY AFTER MOWING, CONDUCT EARTHWORK OPERATIONS WHERE PRESCRIBED.
   - AFTER EARTHWORK OPERATIONS, AND IN OTHER REVEGETATION AREAS NOT RECEIVING ANY GRADING, SPREAD THE TUB GRINDINGS AS AN ORGANIC MULCH THROUGHOUT THE AREAS TO RECEIVE REVEGETATION TO A 6- TO 8-INCH DEPTH; THIS WILL INCREASE ORGANIC MATTER IN THE PLANTING AREAS, WHILE SUPPRESSING THE NON-NATIVE, WEEDY PLANT SPECIES. NOTE, THE ORGANIC MULCH SHOULD HELP AMEND THE SOIL; HOWEVER, OTHER AMENDMENTS SUCH AS FERTILIZER WILL NOT BE USED.
   - QUARTERLY, AND BEFORE ANY REVEGETATION PLANTINGS, CONDUCT HAND-PULLING AND MECHANICAL (E.G., STRING TRIMMER) REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING THROUGH THE TUB GRINDING MULCH LAYER.
   - CONDUCT SEEDING.
   - CONDUCT REVEGETATION CONTAINER PLANTING, THROUGH THE TUB GRINDING MULCH LAYER.
   - AFTER CONTAINER PLANTING, AND QUARTERLY, CONDUCT HAND-PULLING AND MECHANICAL (E.G., STRING TRIMMER) REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING THROUGH THE TUB GRINDING MULCH LAYER.
   - AFTER SEEDING, MAINTAIN A 20-FOOT BUFFER AROUND ALL REVEGETATION AREAS USING MECHANICAL METHODS (E.G., STRING TRIMMER); IN ADDITION, CONDUCT HAND-PULLING REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING WITHIN THE REVEGETATION AREAS.
   - AFTER PLANTING AND SEEDING, AND DURING THE PLANT ESTABLISHMENT MAINTENANCE PERIOD, CONSIDER THE USE OF SPOT TREATMENTS OF SELECT HERBICIDES AS RECOMMENDED BY SANTA CLARA COUNTY PARK DISTRICT'S INTEGRATED PEST MANAGEMENT PLAN, AND APPROVED BY THE COUNTY'S INTEGRATED PEST MANAGER, FOR HIGHLY INVASIVE SPECIES (E.G. YELLOW STAR THISTLE, MEDUSA HEAD GRASS).

7. THE USE OF HERBICIDE IS TO BE MINIMIZED; HOWEVER, DUE TO THE PREVALENCE OF STAR THISTLE, IT IS STRONGLY RECOMMENDED THAT HERBICIDES BE USED TO REDUCE STAR THISTLE AND OTHER NON-NATIVE, WEEDY PLANT SPECIES IN THE PROJECT AREA (BEFORE AND AFTER REVEGETATION).

8. WHERE HERBICIDE IS USED FOR NON-NATIVE INVASIVE SPECIES, ONLY HERBICIDE APPROVED BY THE COUNTY-INTEGRATED PEST MANAGER (COUNTY-IPM), THAT IS ALSO STATE AND COUNTY APPROVED FOR USE IN AQUATIC ENVIRONMENTS SHALL BE USED. THE HERBICIDE WILL BE NON-SELECTIVE, BROAD-SPECTRUM, POST-EMERGENT, TRANS-LOCATING HERBICIDE WITH LOW TOXICITY TO WILDLIFE APPROVED FOR USE IN AND AROUND AQUATIC HABITATS BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA). HERBICIDE WILL BE OF HIGH GRADE QUALITY AND IN PERFECT CONDITION AT TIME OF INSTALLATION. SELECT HERBICIDES AS APPROPRIATE FOR THE DESIRED EFFECT (I.E., BROADLEAF HERBICIDE TO AVOID HARM TO NATIVE GRASSES). HERBICIDE WILL BE APPLIED IN COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS AND ACCORDING TO MANUFACTURER'S SPECIFICATIONS. AT ALL TIMES, HERBICIDE WILL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES (BMPS) PRESCRIBED BY THE CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION. HERBICIDE WILL BE APPLIED SO THAT IT WILL NOT DRIFT, OR SHOW SIGNS OF DRIFT, OUTSIDE THE DESIGNATED PLANTING AREA. AT ALL TIMES, PROTECT EXISTING PLANTS TO REMAIN FROM HERBICIDE DRIFT. AVOID SPRAYING DURING WINDY CONDITIONS; IF WINDY CONDITIONS PERSIST, USE A LARGE DROPLET SIZE WITH LOW TANK PRESSURE; A MOVABLE IMPERMEABLE BARRIER WILL BE USED WHILE SPRAYING TO PROTECT AGAINST DRIFT. HERBICIDE WILL BE APPLIED ONLY DURING PERIODS WHEN BENEFICIAL RESULTS CAN BE OBTAINED. THE CONTRACTOR WILL APPLY HERBICIDE AS NECESSARY BEFORE THE RAINY SEASON. HOWEVER, AN EXCEPTION MAY BE MADE FOR HERBICIDE APPLICATION TO COOL SEASON NON-NATIVE INVASIVE SPECIES, SUBJECT TO APPROVED WEATHER CONDITIONS. ALL SAFETY MEASURES RECOMMENDED BY THE MANUFACTURER WILL BE STRICTLY ADHERED TO. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO LANDS, VEGETATION, AND WATER RESULTING FROM IMPROPER USE OF CHEMICALS.

9. AT ALL TIMES OPERATIONS SHALL IMPLEMENT PHYTOPHTHORA BMP'S AS PRESCRIBED ON SHEET 2.0.

10. TO APPLY FOR PESTICIDE APPLICATION, THE CONTRACTOR SHALL SUBMIT A WRITTEN APPLICATION TO AND FOR APPROVAL BY THE COUNTY IPM. NOTE, THE COUNTY IS LIMITED TO HERBICIDE MATERIALS THAT CAN BE APPLIED; FOR MORE INFORMATION, CONSULT THE SANTA CLARA COUNTY'S IPM ADMINISTRATIVE GUIDELINES AND PROCEDURES (https://www.sccgov.org/sites/ipm/Resources/Santa%20Clara%20County's%20IPM%20Administrative%20Guidelines%20-%20Procedures/Pages/Santa-Clara-County's-IPM-Administrative-Guidelines---Procedures.aspx), AND SANTA CLARA COUNTY'S IPM AND PESTICIDE USE ORDINANCE (https://www.sccgov.org/sites/ipm/Resources/Santa%20Clara%20County's%20IPM%20Administrative%20Guidelines%20-%20Procedures/SCC%20IPM%20-%20Pesticide%20Use%20Ordinance/Pages/SCC-IPM---Pesticide-Use-Ordinance.aspx).

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5,5 FOR PLANTING AS-BUILT DRAWINGS.
2. *RIBES CALIFORNICUM* WAS SUBSTITUTED FOR *RIBES MALVACEUM*.
3. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

AS-BUILT DRAWINGS

P:\300 ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.

DUDEK

HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK

DRAWN BY P KULCHAWIK

CHECKED BY J ZANZI

IN CHARGE J ZANZI

DATE 11-14-2017

PLANT LISTS & PLANTING NOTES 1

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA

SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE --

SHEET 5.0B

PLANT LISTS (CONTINUED):

PLANT LIST 8. PROPOSED DRAINAGE CHANNEL WEST OF THE INCISED AGRICULTURAL DITCH – SHEET 5.5

APPROXIMATELY 12,200 SQUARE FEET (INCLUDES BOTH SIDES OF THE STREAM)

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
INSET FLOODPLAIN (APPROXIMATELY 8,595 SQUARE FEET)					
AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	TREEPOT4	12	12'-0"	
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	12	12'-0"	
ROSA CALIFORNICA	WILD ROSE	DEEPOT	65	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	65	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	12	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
SLOPE (INCLUDES BOTH SIDES OF THE STREAM) (APPROXIMATELY 3,605 SQUARE FEET)					
AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	TREEPOT4	5	12'-0"	
QUERCUS DOUGLASII	BLUE OAK	TREEPOT4	5	12'-0"	INSTALL AT UPPER ELEVATIONS
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	5	12'-0"	
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
SYMPHORICARPOS ALBUS	SNOWBERRY	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-5 PLANTS SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
~~*UMBELLULARIA CALIFORNICA*~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~5~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 1.
- ALL SLOPE AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 9. STAKED WOOD JAMS AT INTERMITTENT STREAM (SOUTH END OF STUDY AREA) – SHEET 5.5

6 TOTAL; PER DETAILS ON SHEET 4.2

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	36	4'-0" TO 6'-0"	INSTALL PER DETAIL 3, SHEET 4.2
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	36	PER DETAIL 3 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	36	PER DETAIL 3 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS

- ALTERNATE SPECIES AT LOCATIONS SHOWN ON THE DETAILS.
- STAKED WOOD JAMS SHALL NOT RECEIVE ANY SEEDING.

PLANT LIST 10. SEASONAL WETLAND ENHANCEMENT AREAS – SHEETS 5.1, 5.4, AND 5.5

2 SEASONAL WETLAND AREAS (SW03 AND SW02), APPROXIMATELY 145,926 SQUARE FEET TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
CAREX PRAEGRACILIS	FIELD SEDGE	LINERS	1,882	2' 0"	PLANT IN GROUPS OF 3 7 PLANTS
JUNCUS EFFUSUS	COMMON RUSH	TREEBANDS	1,666	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS
JUNCUS PATENS	SPREADING RUSH	TREEBANDS	2,179	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS
JUNCUS XIPHIOIDES	IRIS LEAVED RUSH	TREEBANDS	1,891	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS

- PLANTING SHALL OCCUR WITHIN EXISTING WETLANDS TO SUPPLEMENT EXISTING NATIVE PLANT SPECIES.
- PLANTING IN THE NORTHERN WETLAND AREA (SW03) SHALL BE LIMITED TO THE SOUTHERN HALF OF THAT WETLAND, CLOSEST TO CORRAL TRAIL; ASSUMES SUPPLEMENTAL PLANTING OVER 25% OF SAID WETLAND AREA.
- ASSUMES SUPPLEMENTAL PLANTING OVER 25% OF THE EXISTING WETLAND AREA (SW02).
- EXISTING SEASONAL WETLANDS SHALL NOT RECEIVE ANY SEEDING.
- REFER TO DETAIL 1, SHEET 5.0F.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5,5 FOR PLANTING AS-BUILT DRAWINGS.
2. *SYMPHORICARPOS ALBUS* WAS SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS.*
3. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

FINISH GRADING NOTES:

1. VERIFY SITE CONDITIONS AND EXISTING GRADE CONDITIONS, LOCATIONS OF EXISTING INFRASTRUCTURE, AND ALL EXISTING VEGETATION. CONDUCT FIELD ADJUSTMENTS NECESSARY TO ACCOMMODATE OR TO MINIMIZE IMPACTS ON THESE CONDITIONS.
2. AVOID DAMAGE TO EXISTING CONDITIONS, INCLUDING BENCH MARKS, UTILITIES, VEGETATION TO REMAIN, AND OTHER FEATURES TO BE PRESERVED.
3. FINISH GRADING OPERATIONS WILL CONFORM TO EXISTING SITE AND ADJACENT CONDITIONS AND GRADES WHEREVER POSSIBLE.
4. SITE CLEANUP WILL OCCUR ON A DAILY BASIS AND AS EACH PHASE OF THE FINISH GRADING OPERATIONS CONCLUDES. ALL DEBRIS, EXCESS DIRT, AND EXTRANEOUS EQUIPMENT WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.
5. ELIMINATE UNEVEN AREAS RESULTING FROM ROUGH-GRADING OPERATIONS AND REMOVE ANY DEBRIS, ROOTS, BRANCHES, OR OTHER MATERIALS LARGER THAN 6-INCHES.
6. SUBSOIL WILL BE GRADED TO PROVIDE POSITIVE DRAINAGE. ALL GRADE CHANGES WILL BE GRADUAL, WITH SLOPES BLENDING INTO LEVEL AREAS.
7. SUBSOIL WILL BE COMPACTED NO MORE THAN 85% MAXIMUM ATTAINABLE DENSITY UNLESS OTHERWISE NOTED.
8. PLANTING AREAS THAT BECOME COMPACTED IN EXCESS OF 85% RELATIVE COMPACTION DUE TO CONSTRUCTION ACTIVITIES, WILL BE THOROUGHLY CROSS-RIPPED TO A MINIMUM DEPTH OF 12 INCHES TO ALLEVIATE THE OVER-COMPACTED CONDITION. TAKE CARE TO AVOID ANY EXISTING SUBSURFACE UTILITY LINES.
9. ENSURE THAT THE TOP 2-INCHES OF SOIL IS FREE OF STONES, DEBRIS, BRANCHES, ROOTS, STUMPS, WIRE, OR OTHER DELETERIOUS MATTER 1-INCH IN DIAMETER AND LARGER. DISPOSE OF DEBRIS OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.
10. BEFORE BEGINNING PLANTING OPERATIONS, FINISH GRADE ALL PLANTING AREAS, FILL AS NEEDED AND REMOVE SURPLUS SOIL AND FLOAT AREAS TO A SMOOTH, UNIFORM GRADE TO ELEVATIONS AS INDICATED ON THE DRAWINGS.
11. ESTABLISH FINISH GRADES TO ELIMINATE UNEVEN AREAS RESULTING FROM ROUGH-GRADING OPERATIONS. BLEND FINISH GRADES WITH EXISTING GRADES. FINISH GRADING OPERATIONS WILL PROVIDE FOR SMOOTH TRANSITIONS TO EXISTING GRADES AND FOR ANY CONNECTIONS TO EXISTING TRAILS.
12. UNLESS OTHERWISE INDICATED, CROSS SLOPES WILL BE 2%, MAXIMUM.
13. AT NO TIME WILL THE FINISH GRADE SURFACES HAVE A GLAZED APPEARANCE. ALL FINISH GRADE SURFACES WILL BE ROUGHENED CAT-TRACKS (I.E., THE IMPRINT ON EARTHEN MATERIAL RESULTING FROM TRACTOR TREADS). FINISH GRADING WILL INCLUDE PREPARING ALL SEEDING AREAS, AT LOCATIONS SHOWN ON THE DRAWINGS, BY COMPLETING ONE PASS OF A TRACTOR DRIVEN PERPENDICULAR TO THE FINAL GRADE CONTOURS LEAVING CAT-TRACKS PERPENDICULAR TO THE FINAL SITE CONTOURS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\13004 SAN FELIPE CREEK RESTORATION\13-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS AND RECREATION DEPARTMENT HABITAT AGENCY

Balance Hydrologics, Inc. 800 Bancroft Way • Suite 101 Berkeley, CA 94710-2251 tel (510) 704-1000 • fax (510) 704-1001 www.balancehydro.com

DUDEK HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK | DRAWN BY P KULCHAWIK 07-24-17 | CHECKED BY J ZANZI 11-14-17 | IN CHARGE J ZANZI 03-08-19 | DATE 11-14-2017

PLANT LISTS & PLANTING NOTES 2

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE --

SHEET 5.0C

EXCLUSION FENCING NOTES:

1. EXCLUSION FENCING IS SHOWN ON THE DRAWINGS AS AN APPROXIMATE LOCATION ONLY. FIELD VERIFY SITE CONDITIONS AND FENCING LOCATIONS BEFORE ACTUAL CONSTRUCTION. CONSTRUCT FENCING AS DETAILED ON THE DRAWINGS, AND ADAPT TO SITE CONDITIONS. CONNECT TO EXISTING FENCES WHENEVER POSSIBLE.

2. FENCING WILL BE INSTALLED UPON COMPLETION OF THE PLANTING PREPARATION OPERATIONS AND EARTHWORK, AND BEFORE THE START OF THE CONTAINER PLANT INSTALLATION.

3. THE AREAS TO RECEIVE FENCING WILL BE FREE OF WASTE AND/OR DEBRIS AND THE FENCE LINES WILL BE GRADED TO A SMOOTH, CONTINUOUS SURFACE WITH NO ABRUPT DIPS OR HUMPS THAT WOULD INTERFERE WITH FENCE INSTALLATION OR LEAVE GAPS UNDER THE FENCE.

4. FENCING WILL BE SET PLUMB, LEVEL, AND TRUE TO LINE AND WILL PRESENT A NEAT AND FINISHED APPEARANCE. INCLUDE SETTING FENCING IN ITS CORRECT PLACE, FASTENING IT, CONNECTING IT, OR INCORPORATING IT INTO OTHER PORTIONS OF THE WORK, AS EACH ITEM MAY REQUIRE. FURNISH ANCHORS AND ADHESIVES AS REQUIRED FOR INSTALLATION.

5. PROVIDE AND FIELD LOCATE GATES AT LOCATIONS SHOWN ON THE DRAWINGS. EACH GATE WILL CONSIST OF A 12-FOOT WIDE VEHICLE GATE WITH A 3-FOOT PEDESTRIAN LEVER GATE AS DETAILED ON THE DRAWINGS. THE GATES WILL ALSO INCORPORATE 'SNOUT WIRE' TO MATCH THE BELOW GRADE PORTION OF THE FENCING. GATES WILL BE INSTALLED ADJACENT TO CORNER POSTS. CONFORM TO CALTRANS STANDARD SPECIFICATION 80-10, GATES. FIELD LOCATE AND FIELD FABRICATE ALL GATES.

6. FENCING WILL BE INSTALLED IN STRAIGHT LINES WHEREVER POSSIBLE TO MINIMIZE ANGLES AND OVERALL LENGTH OF FENCE.

7. FENCING WILL BE FIELD-FIT TO MUD LEVEL WHEREVER POSSIBLE.

8. FENCING WILL MINIMIZE CREEK CROSSINGS WHEREVER POSSIBLE. WHERE CREEK CROSSING ARE NEEDED, FIELD FABRICATE AND ADAPT FENCING TO FOLLOW THE CREEK CHANNEL CROSS-SECTION; REFER TO DETAIL ON THE DRAWINGS.

9. SITE CLEAN-UP WILL OCCUR AT THE COMPLETION OF THE FENCING CONSTRUCTION. ALL UNUSED WIRE AND MATERIALS, DEBRIS, AND EXTRANEOUS EQUIPMENT WILL BE REMOVED OFFSITE BY THE CONTRACTOR ACCORDING TO STATE AND LOCAL REGULATIONS.

10. THROUGHOUT THE MAINTENANCE PERIOD, MAINTAIN AND TAKE CORRECTIVE ACTIONS TO ENSURE THAT THE FENCING IS UPRIGHT, VERTICAL, AND TAUT AS INSTALLED AT LOCATIONS SHOWN ON THE DRAWINGS.

11. AS AN ADAPTIVE MANAGEMENT ACTION, MONITOR AND POSSIBLY REMOVE FENCING WITHIN CREEK BEFORE WINTER OR BEFORE ANTICIPATED HIGH CREEK FLOW EVENTS.

12. AFTER THE 10-YEAR PLANT ESTABLISHMENT MAINTENANCE PERIOD IS COMPLETE, AND IF DIRECTED BY THE SANTA CLARA VALLEY HABITAT AGENCY AND THE COUNTY, THE CONTRACTOR SHALL REMOVE THE EXCLUSION FENCE IN ITS ENTIRETY AFTER APPROVAL AND REGULATORY AGENCY SIGN-OFF OF THE PROJECT; IF REMOVED, ALL EXCLUSION FENCE MATERIAL WILL BE RECYCLED OFF SITE ACCORDING TO STATE AND LOCAL REGULATIONS.

IRRIGATION SYSTEM NOTES

1. THE IRRIGATION SYSTEM WILL BE A TEMPORARY SYSTEM. THE CONTRACTOR WILL FIELD-DESIGN THE IRRIGATION SYSTEM TO PROVIDE ADEQUATE WATER TO FACILITATE THE ESTABLISHMENT OF PERSISTENT PLANTS, TO BE PLANTED ACCORDING TO THE DRAWINGS.

2. THE IRRIGATION SYSTEM IS EXPECTED TO BE CONNECTED TO THE WATER TANK LOCATED ON SAN FELIPE ROAD (APPROX 5,000 LF NORTHWEST OF THE PROJECT AREA) AS SHOWN ON THE DRAWINGS. THERE IS ROOM FOR TWO TANKS AS NEEDED. AT THE CONTRACTOR'S DISCRETION, THE EXISTING WATER TANK (ESTIMATED TO BE 5,000 GALLONS) MANY BE USED FOR THE IRRIGATION SYSTEM PROVIDED THE IRRIGATION SYSTEM IS NOT OPERATED ON SATURDAYS AND SUNDAYS. AT ALL TIMES, USE OF THE EXISTING WATER TANK MUST BE CONDUCTED IN DIRECT COORDINATION WITH AND AS APPROVED BY COUNTY PARKS STAFF.

3. THE MAJOR PORTIONS OF THE IRRIGATION SYSTEM WILL BE INSTALLED BEFORE THE INSTALLATION OF ANY PLANTS OR SEEDED AREAS.

4. IRRIGATION OF ALL PLANTS AND SEEDED AREAS WILL BEGIN THE SAME DAY AS PLANT INSTALLATION AND SEEDING.

SEEDING NOTES:

MATERIALS

1. ALL SEED AND PROPAGULE MATERIALS SHALL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM THE GENERAL SANTA CLARA COUNTY REGION.

2. USE SEED MIX TYPE 3 FOR DISTURBED AREAS NOT OTHERWISE INDICATED TO RECEIVE A SPECIFIC SEED MIX.

3. SEED MIXES WILL CONSIST OF THE MIXES SHOWN ON THE DRAWINGS; THE SEED MIXES WILL CONFORM TO THE PRESCRIBED REQUIREMENTS FOR PURE LIVE SEED RATE PER SPECIES. SEED MIXES WILL NOT BE PRE-MIXED. WEED SEED WILL NOT EXCEED 0.25% OF THE PURE LIVE SEED SPECIFIED. AT NO TIME WILL THE MIXES CONTAIN SEEDS OF NON-NATIVE INVASIVE PLANTS. CROP SEED WILL NOT EXCEED 0.50% OF THE PURE LIVE SEED SPECIFIED. ALL SEED MUST BE TESTED WITHIN 1 YEAR BEFORE THE APPLICATION DATE.

4. HYDROMULCH WILL BE AN AN ORGANIC, PLANT-DERIVED SUBSTANCE CONTAINING CORN STARCH, PSYLLIUM OR GUAR GUM, OR A COMBINATION THEREOF SUCH AS ECOLOGY M-BINDER, OR EQUAL. THE HYDROMULCH WILL FORM A TRANSPARENT THREE-DIMENSIONAL FILM-LIKE CRUST PERMEABLE TO WATER AND AIR AND CONTAINING NO AGENTS TOXIC TO SEED GERMINATION. THE HYDROMULCH WILL BE PACKED IN CLEARLY MARKED BAGS STATING THE CONTENTS OF EACH PACKAGE. THE HYDROMULCH WILL REQUIRE NO CURING TIME, WILL REMAIN SOFT AND REWETTABLE, AND WILL NOT INHIBIT SEED GERMINATION. ALL INGREDIENTS WILL BE BIODEGRADABLE.

5. BROADCAST SEEDING - EQUIPMENT: SEEDING EQUIPMENT FOR BROADCAST SEEDING WILL BE HAND SPREADERS.

EXECUTION

6. THE AREAS TO BE SEEDED WILL HAVE A FIRM SEED BED WHICH HAS PREVIOUSLY BEEN ROUGHENED BY SCARIFYING, DISKING, HARROWING, CHISELING, OR OTHERWISE WORKED TO A DEPTH OF AT LEAST 4 INCHES ON SOIL OR 2 INCHES ON INTACT ROCK SURFACES. THE SEED BED MAY BE PREPARED AT THE TIME OF COMPLETION OF EXCAVATION OR EARTHWORK. CONSTRUCTION DEBRIS AND EXTRANEOUS PILES OF SOIL WILL BE REMOVED BEFORE SEEDING.

7. SEED MIX APPLICATION RATES WILL BE AS SHOWN ON THE DRAWINGS.

8. ALL SEEDING OPERATIONS WILL BE CONDUCTED BEFORE PLANT INSTALLATION, EXCEPT FOR CUTTINGS. SEEDING WILL OCCUR BETWEEN SEPTEMBER 15 AND OCTOBER 15. SEED WILL BE APPLIED BEFORE ANY RAIN AND/OR GROUND FREEZE.

9. SEEDING WILL NOT OCCUR WHEN WIND SPEEDS EXCEED 5 MILES PER HOUR.

10. SEED ONLY THOSE AREAS THAT CAN BE WATERED ON THE SAME DAY AS INSTALLATION.

11. HAND-BROADCAST SEEDING METHODS WILL BE USED TO APPLY SEED TO SAID AREAS. FERTILIZER WILL NOT BE APPLIED TO SEEDING AREAS. MYCHORRIZAL INOCULANT WILL BE MIXED WITH THE SEED AND APPLIED DURING THE SEEDING OPERATIONS. SEED WILL BE UNIFORMLY BROADCAST WITH HAND-HELD SEEDERS AND LIGHTLY RAKED TO INCORPORATE TO A DEPTH OF 0.25- TO 0.5-INCHES. SEED WILL NOT BE LEFT UNCOVERED FOR MORE THAN 24 HOURS. ALL BROADCAST SEEDING AREAS WILL BE HAND-RAKED TO COVER THE SEEDS.

12. AREAS TO BE SEEDED NEAR AND WITHIN DRIPLINES OF EXISTING VEGETATION TO REMAIN, OR RECENTLY PLANTED SHRUBS OR TREES, WILL BE SEEDED BY HAND AND THESE AREAS WILL BE HAND-RAKED TO COVER THE SEEDS.

13. THE HYDROMULCH APPLICATIONS WILL BE COMPLETED ACCORDING TO MANUFACTURER'S SPECIFICATIONS IN THAT AREA ON THE SAME WORKING DAY. HYDROMULCH WILL BE APPLIED BY SPRAYING OVER THE SURFACE OF ALL SEEDED AREAS.

PLANTING NOTES:

MATERIALS

1. ALL PLANT MATERIAL WILL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM PLANT PROPAGATION MATERIALS GATHERED DIRECTLY FROM THE SITE, OR WILL BE NATIVE STOCK FROM THE REGION PURCHASED FROM A REPUTABLE NATIVE PLANT NURSERY.

2. AT ALL TIMES SPECIAL CARE WILL BE TAKEN WITH THE PROPAGATION OF CALIFORNIA SYCAMORE TO ELIMINATE HYBRIDIZING WITH THE NON-NATIVE LONDON PLANE TREE (PLATANUS HISPANICA (X ACERIFOLIA)). CALIFORNIA SYCAMORE SPECIES WILL BE PLANTED AS PURE GENETIC PLANT QUANTITIES ARE AVAILABLE; IF PLANTS ARE NOT AVAILABLE, THE NEEDED QUANTITIES WILL BE SUBSTITUTED WITH QUERCUS LOBATA (VALLEY OAK) TREES.

3. CONTAINER GROWN PLANTS WILL BE IN A VIGOROUS AND HEALTHY CONDITION AND NOT ROOT BOUND OR WITH THE ROOT SYSTEM HARDENED OFF. CONTAINER SIZES FOR SPECIFIC PLANT SPECIES WILL BE AS INDICATED ON THE DRAWINGS. PLANT CONTAINER DIMENSIONS WILL BE AS FOLLOWS:
   3.1. TREEPOT4 = 4-INCH SQUARE BY 14-INCH LONG
   3.2. DEEPOT = 2½-INCH DIAMETER BY 10-INCH LONG
   3.3. TREEBAND = 4-INCH SQUARE BY 10-INCH LONG

4. CUTTINGS WILL BE HARVESTED FROM WITHIN OR IMMEDIATELY ADJACENT TO THE PROJECT SITE. CUTTINGS WILL BE COLLECTED TO MINIMIZE DISTURBANCE TO THE COLLECTION SITE. THE SOURCE PLANT COLLECTION AREA WILL BE LEFT ABLE TO PHYSICALLY AND VISUALLY RECOVER TO UNDISTURBED CONDITIONS WITHIN ONE YEAR. AT NO TIME WILL MATERIAL SOURCES BE DENUDED OR STRIPPED IN EXCESS OF 25% OF TOTAL BRANCHES.

5. CUTTINGS WILL BE HARVESTED AT A LENGTH OF 4½-FEET (TO ACCOUNT FOR POTENTIAL HAMMERING DAMAGE) WITH A CALIPER RANGING FROM ½- TO 1½-INCHES. LEAVES, BRANCHES, AND TWIGS WILL BE REMOVED ON EACH CUTTING IMMEDIATELY AFTER HARVESTING THE CUTTING FROM THE SOURCE PLANT. THE LEAVES, BRANCHES, AND TWIGS WILL BE REMOVED FROM THE ENTIRE CUTTING, STARTING FROM THE BASE AND MOVING TOWARD THE TOP. AT ALL TIMES, VEGETATION WILL BE REMOVED CAREFULLY TO AVOID DAMAGE TO BARK OR ANY BUDS EXISTING ON THE CUTTING. THE CUTTINGS WILL BE CUT AT A RIGHT ANGLE AT THE WIDE END OF THE CUTTING. CUTTING MATERIALS WILL BE HARVESTED WHEN THE CUTTINGS ARE DORMANT. ALL CUTTINGS WILL BE HARDENED-OFF GREEN WOOD THAT IS A MAXIMUM OF 1-YEAR-OLD GROWTH.

6. TO ENSURE CUTTINGS ARE ADEQUATELY DORMANT, CUTTINGS SHOULD NOT BE COLLECTED UNTIL AFTER OCTOBER 15 AND BEFORE DECEMBER 31. CUTTINGS WILL NOT BE COLLECTED WHEN THE AIR TEMPERATURE IS GREATER THAN 21°C (70°F). CUTTINGS WILL BE INSTALLED WITHIN 7 DAYS OF COLLECTION.

7. IMMEDIATELY AFTER REMOVING THE CUTTINGS FROM A SOURCE PLANT AND BUNDLING, THE CUTTINGS WILL BE KEPT COOL, AT A TEMPERATURE LESS THAN 60°F, AND SATURATED IN WATER IMMEDIATELY AFTER COLLECTION AND UNTIL JUST BEFORE INSTALLATION. CUTTINGS WILL BE STORED IN LARGE CONTAINERS THAT HOLD WATER.

8. WOOD MULCH WILL BE WALK-ON TYPE (1½-INCH DIAMETER) FIR BARK OR SHREDDED CEDAR MULCH. WOOD MULCH WILL BE FREE OF DIRT, STICKS, ROCKS, OR OTHER DEBRIS. AT NO TIME WILL REDWOOD BARK BE USED.

EXECUTION

9. INSTALL CONTAINER PLANTS AND CUTTINGS IN A RANDOM DISTRIBUTION TO MIMIC A NATURAL PLANT LAYOUT, UNLESS OTHERWISE NOTED IN THE PLANT LISTS OR THE DETAILS. THE CONTRACTOR SHALL FIELD-LOCATE EACH PLANT FOR APPROVAL BEFORE ACTUAL INSTALLATION.

10. CONTAINER PLANT INSTALLATION. CONTAINER PLANTS WILL BE INSTALLED BETWEEN OCTOBER 1 AND OCTOBER 31 UNLESS OTHERWISE DIRECTED BY THE ENGINEER'S REPRESENTATIVE. WHATEVER SPECIES ARE NOT AVAILABLE FOR FALL PLANTING, WILL BE INSTALLED THE FOLLOWING SPRING BETWEEN APRIL 1 AND APRIL 15.

11. REFER TO DETAILS ON SHEET 5.0E.

12. PLANT CONTAINERS WILL BE OPENED AND REMOVED IN SUCH A MANNER THAT THE SOIL SURROUNDING THE ROOTBALL WILL NOT BE BROKEN. DO NOT INJURE THE ROOTBALL WHILE REMOVING THE CONTAINER OR BOX. AFTER REMOVING PLANT, SUPERFICIALLY CUT EDGE ROOTS WITH A KNIFE ON 3 SIDES. APPLY PLANTING SOIL TO THE PLANTING PIT UP TO 1/2 THE HEIGHT OF THE ROOTBALL. ADD WATER TO THE TOP OF THE REMAINING PLANTING PIT AND LET SOAK IN BEFORE COMPLETING THE REMAINDER OF BACKFILLING. FINISH BACKFILLING WITH PLANTING SOIL OF THE PLANTING PIT BY TAMPING THE SOIL FIRMLY AROUND THE ROOTBALL AND WATERING THOROUGHLY.

13. IN UPLAND PLANTING AREAS ONLY, AND AFTER FINAL BACKFILLING, CONSTRUCT A WATER RETENTION BASIN AROUND THE BASE OF EACH TREE AND SHRUB PLANTING AS DETAILED ON THE DRAWINGS. SPREAD A 2-INCH DEEP LAYER OF WOOD MULCH IN ALL TREE AND SHRUB PLANTING BASINS.

14. CUTTING INSTALLATION. TO ENSURE CUTTINGS ARE ADEQUATELY DORMANT, CUTTINGS SHOULD NOT BE PLANTED UNTIL AFTER OCTOBER 15 AND BEFORE DECEMBER 31. CUTTING LAYOUT WILL BE AT THE DENSITY SHOWN ON THE DRAWINGS, AND WILL BE LOCATED SOMEWHAT IRREGULARLY TO AVOID EXISTING SHRUBS AND TO MIMIC A NATURAL LAYOUT. AT NO TIME DURING CUTTING PLACEMENT WILL BARK BE SCRAPED, ROUGHED, OR GRINDED; OR BUDS BE STRIPPED. PLANTING HOLES FOR CUTTINGS WILL BE EXCAVATED AS DETAILED ON THE DRAWINGS. CUTTINGS WILL BE INSTALLED VERTICALLY SO THAT THE NARROW END IS EXPOSED ABOVE GRADE AND BUDS ARE FACING UPWARD. ALL CUTTINGS WILL BE INSTALLED WITH ⅔ OF THEIR LENGTH BELOW GRADE. AT NO TIME WILL FERTILIZER BE APPLIED TO CUTTINGS. WHETHER THE CUTTINGS ARE HAMMERED IN PLACE OR NOT, THE TOP 6-INCHES OF EACH CUTTING WILL BE CUT OFF TO PROVIDE A FRESH CUT TOP. BACKFILL MATERIALS WILL BE TAMPED IN PLACE TO COMPLETELY ENCIRCLE THE CUTTING AND LEAVE NO AIR POCKETS.

15. ALL CONTAINER PLANTS AND CUTTINGS WILL BE WATERED IMMEDIATELY AFTER INSTALLATION. AFTER THE FIRST WATERING, WATER WILL BE APPLIED TO ALL PLANTS TO ACHIEVE CONTINUALLY MOIST CONDITIONS AS REQUIRED TO KEEP THE VEGETATION IN A HEALTHY AND VIGOROUS GROWING CONDITION.

16. INSTALL PLANT PROTECTION CAGES AS DETAILED FOR ALL WOODY CONTAINER PLANTS; CAGES ARE NOT REQUIRED FOR CUTTINGS OR HERBACEOUS PLANTS.

AS-BUILT DRAWINGS

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710-2213
ar/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

PLANTING & FENCING NOTES

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0D

PLANT ESTABLISHMENT NOTES:

1. THE PLANT ESTABLISHMENT PERIOD WILL BEGIN IMMEDIATELY AFTER COMPLETION OF THE SEEDING, PLANTING, AND IRRIGATION SYSTEM INSTALLATION AND IS EXPECTED TO CONTINUE FOR A MINIMUM OF 10 YEARS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER'S REPRESENTATIVE.

2. PLANT ESTABLISHMENT WILL INCLUDE WATERING, IRRIGATION SYSTEM OPERATIONS AND MAINTENANCE, NON-NATIVE INVASIVE/EXOTIC SPECIES CONTROL, DEBRIS REMOVAL, AND REPLACEMENT PLANTING AND RESEEDING IF NEEDED. ALL PLANTED AND SEEDED NATIVE VEGETATION WILL BE MAINTAINED REGULARLY TO PROMOTE HEALTH AND ESTABLISHMENT.

PERFORMANCE RECOMMENDATIONS

3. THE TARGET SURVIVAL RATE FOR ALL REVEGETATION TREATMENTS WILL BE EVALUATED BY EACH TREATMENT AREA AT THE END OF EACH YEAR. FOR CONTAINER PLANTS AND CUTTINGS, IT IS EXPECTED THAT INDIVIDUAL PLANT COUNTS WILL BE CONDUCTED TO EVALUATE PERCENT SURVIVORSHIP OF THE PLANTS FOR YEARS 1 AND 2; AFTER THAT, MINIMUM PERCENT COVER OF THE NATIVE PLANTINGS WILL BE EVALUATED FOR YEARS 3 THROUGH 10. IN ADDITION, SEEDED AREAS FOR APPLICABLE REVEGETATION TREATMENT AREAS WILL HAVE THE MINIMUM PERCENT COVER OF NATIVE VEGETATION AND FREE OF NON-NATIVE INVASIVE SPECIES.

YEAR	CONTAINER PLANTS MINIMUM PERFORMANCE	CUTTINGS MINIMUM PERFORMANCE	SEEDED AREAS MINIMUM % OF NATIVE PLANTS	MINIMUM COVER BY SEEDED SPECIES
1	80% PLANTS SURVIVING	70% PLANTS SURVIVING	80% COVER	40% COVER
2	80% PLANTS SURVIVING	65% PLANTS SURVIVING	85% COVER	75% COVER
3	85% ESTIMATED COVER	75% ESTIMATED COVER	90% COVER	70% COVER
4	90% ESTIMATED COVER	80% ESTIMATED COVER	95% COVER	70% COVER
5	95% ESTIMATED COVER	85% ESTIMATED COVER	70% COVER	70% COVER
6	95% ESTIMATED COVER	90% ESTIMATED COVER	70% COVER	70% COVER
7	95% ESTIMATED COVER	95% ESTIMATED COVER	70% COVER	70% COVER
8	95% ESTIMATED COVER	95% ESTIMATED COVER	70% COVER	70% COVER
9	95% ESTIMATED COVER	95% ESTIMATED COVER	70% COVER	70% COVER
10	95% ESTIMATED COVER	95% ESTIMATED COVER	70% COVER	70% COVER
PLANTS SURVIVING WILL BE BASED ON THE QUANTITIES OF PLANTS ORIGINALLY INSTALLED				

4. PLANTS SHOULD BE REGULARLY OBSERVED FOR SYMPTOMS OF DAMAGED FOLIAGE, DISEASE, SIZE, COLOR, WILTING, DEFOLIATION, AND VANDALISM. AT NO TIME WILL ANY PLANTS SHOW SYMPTOMS OF DISEASE, INSECT DAMAGE, GIRDLING, STRUCTURAL DEFORMITIES, DIEBACK, DRY ROOTBALL, OR SUNBURN; AS WELL AS SYMPTOMS OF WATER STRESS (CAUSED BY OVERWATERING OR UNDERWATERING), STUNTED GROWTH, WILTING, PREMATURE LOSS OF LEAVES (FOR DECIDUOUS SPECIES), AND PREMATURE YELLOWING OF LEAVES (FOR DECIDUOUS SPECIES).

EXECUTION

5. ESTABLISH AND MAINTAIN ALL PLANTS AND SEEDED VEGETATION IN A HEALTHY CONDITION THROUGHOUT THE PLANT ESTABLISHMENT PERIOD. CHECK THE CONDITION OF EACH PLANT AND SEEDED VEGETATION FOR SYMPTOMS OF DISEASE, SIZE, COLOR, WILTING, DEFOLIATION, NEW GROWTH, BROWSING BY WILDLIFE, INSECT DAMAGE, GIRDLING, STRUCTURAL DEFORMITIES, DIEBACK, SUNBURN AND VANDALISM; CONDUCT CORRECTIVE ACTIONS AS REQUIRED.

6. GENERAL PLANT ESTABLISHMENT OPERATIONS WILL INCLUDE, BUT WILL NOT BE LIMITED TO:
   - MAINTAINING PLANTING AND SEEDING AREAS AND IRRIGATION SYSTEMS FOR A MINIMUM OF 3 YEARS AFTER PLANTING.
   - PROVIDING TRASH REMOVAL IN ALL PLANTING AND SEEDING AREAS.
   - MAINTAIN ADEQUATE PROTECTION OF PLANTING AND SEEDING AREAS. REPAIRING DAMAGED AREAS.
   - REPLACING ALL DEAD AND SEVERELY STRESSED PLANTS AND OTHER MATERIALS.
   - MAINTAINING AND REMOVING ALL NON-NATIVE INVASIVE SPECIES FROM ALL PLANTING AREAS.
   - OPERATING THE IRRIGATION SYSTEM ON A REGULAR BASIS

7. THE IRRIGATION SYSTEM WILL BE REGULARLY MAINTAINED TO ASSURE ADEQUATE OPERATION AND TO MEET THE NEEDS OF THE PLANT MATERIALS. IRRIGATION MAINTENANCE IS EXPECTED TO INCLUDE EXAMINING THE IRRIGATION SYSTEMS AS NEEDED, INCLUDING CLEANING AND ADJUSTING EQUIPMENT; REPAIRING DAMAGED EQUIPMENT; TESTING EACH SYSTEM TO ENSURE THAT THE IRRIGATION SYSTEMS ARE OPERATIONAL; AND CHECKING PIPES FOR LEAKS OR BLOCKED LINES.

8. INSPECT THE IRRIGATION SYSTEM PER THE CONTRACTOR'S SCHEDULE DURING THE DRY SEASON FOR AS LONG AS IRRIGATION IS DEEMED NECESSARY FOR PLANT SURVIVAL; PLANTS WILL BE EXAMINED AT THE SAME TIME FOR SIGNS OF STRESS (E.G., WILTING, LEAF DROP, EXCESSIVE INSECT DAMAGE, ETC.). IRRIGATION OPERATIONS WILL BE ADJUSTED TO CORRECT ALL OBSERVED PROBLEMS.

9. CONDUCT AS-NEEDED SITE EVALUATIONS OF WATER APPLICATION DURING THE PLANT ESTABLISHMENT PERIOD. WATERING WILL CONSIST OF THE APPLICATION OF WATER IN A MANNER THAT IS SUFFICIENT TO WET THE SOIL AND SATURATE THE ROOT ZONE AND AS FREQUENT AS NECESSARY TO MAINTAIN HEALTHY GROWTH, WITHOUT DAMAGING THE PLANTS, THE SURROUNDING GRADE OR THE ANY WATERING BASINS.

10. THE IRRIGATION SYSTEM WILL BE USED AS NECESSARY DURING THE FIRST THREE YEARS OF THE LONG-TERM MAINTENANCE AND MONITORING PERIOD, AND WILL BE TERMINATED AT THE END OF THIRD YEAR TO ENSURE THAT THE SITE IS SELF-SUSTAINING FOR AT LEAST TWO YEARS (I.E. TWO SUMMERS) BEFORE FINAL SIGN-OFF FROM THE RESOURCE AGENCIES. ALL ABOVE GROUND COMPONENTS WILL BE REMOVED COMPLETELY FROM THE RESTORATION SITE BY THE END OF THE FIFTH YEAR, AND RECYCLED OFF SITE ACCORDING TO STATE AND LOCAL REGULATIONS.

11. NON-NATIVE INVASIVE SPECIES CONTROL ASSESSMENTS AND ADDITIONAL TREATMENT RECOMMENDATIONS SHOULD OCCUR UPON COMPLETION OF THE RESTORATION AND AFTER EACH YEAR OF GROWTH. NON-NATIVE, INVASIVE PLANTS AND NOXIOUS WEEDS SHOULD BE REMOVED BY HAND, OR IF NEEDED, SPOT APPLICATIONS OF HERBICIDE AS DIRECTED BY THE CONTRACTOR'S PCA.

12. PEST CONTROL ADAPTIVE MANAGEMENT WILL BE CONDUCTED AS NECESSARY TO ADDRESS SITE PROBLEMS. IF SIGNIFICANT PLANT MORTALITY AND COVER REDUCTION OCCURS AS INDICATED BY QUALITATIVE OR QUANTITATIVE MONITORING OF THE SITE, REMEDIAL MEASURES MAY BE RECOMMENDED, INCLUDING REPLACEMENT PLANTING AND RESEEDING.

13. NATIVE PLANT MATERIAL THAT HAS NO EASILY OBSERVABLE VIABLE ABOVE-GROUND LIVING MATTER OR IS OF CONSISTENTLY POOR VIGOR AND FORM WILL BE CONSIDERED DEAD. REPLACE DEAD PLANTS ACCORDING TO THE DRAWINGS AT A RATE OF REPLACEMENT THAT WILL MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD PLANTS WILL BE REMOVED BEFORE INSTALLATION OF REPLACEMENT PLANTS. ALL DEAD PLANTS WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

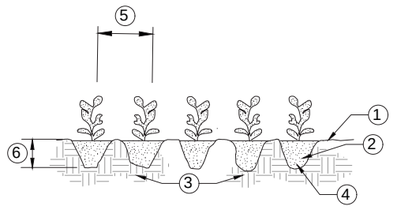
14. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD VEGETATION WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

15. SITE CLEANUP WILL OCCUR DURING THE PLANT ESTABLISHMENT MAINTENANCE VISITS. REMOVE ALL TRASH AND EXCESS DIRT CAUSED FROM THE WORK ACCORDING TO STATE AND LOCAL REGULATIONS.

16. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD VEGETATION WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

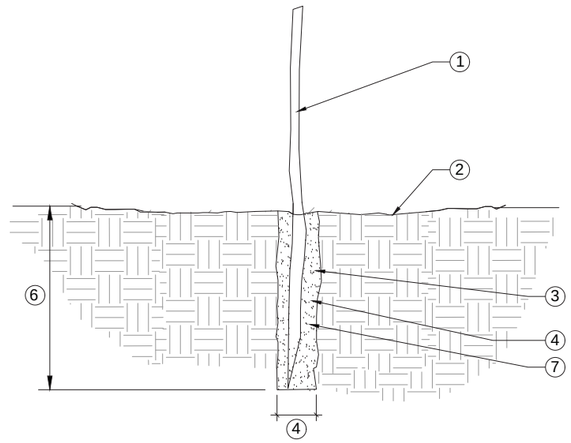
17. IN ADDITION, PLANT PROTECTION CAGES AND EXCLUSION FENCING WILL BE INSPECTED BY THE CONTRACTOR DURING PLANT ESTABLISHMENT SITE VISITS AND MAINTAINED AS INSTALLED IN AN UPRIGHT AND IN EFFECTIVE CONDITION.

18. REFER TO THE PROJECT MITIGATION AND MONITORING PLAN FOR ADDITIONAL INFORMATION AND REQUIREMENTS.



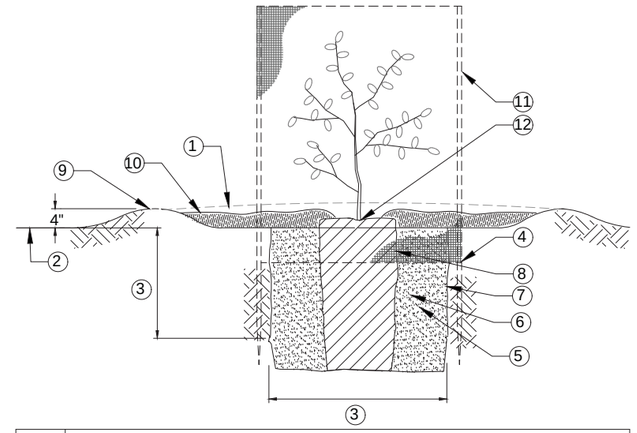
ITEM	DESCRIPTION
1	FINISH GRADE
2	ROOT BALL
3	AMENDED SOIL (PER NOTES)
4	WATER AND TAMP BACKFILL MIX WELL
5	SEE PLANT LISTS FOR SPECIES AND SPACING
6	DEPTH OF ROOT BALL

1 HERBACEOUS PLANTING (TREEBAND CONTAINER PLANTING)
SCALE: NTS



ITEM	DESCRIPTION
1	54" POLE CUTTING (SEE PLANT LIST FOR SPECIES)
2	FINISH GRADE
3	AMENDED SOIL (PER NOTES)
4	2" DIAMETER AUGERED PIT (LIGHTLY TAMP SURFACE AFTER PLANTING)
5	TREAT BELOW-GRADE PORTION OF CUTTING WITH ROOTING HORMONE
6	32" DEPTH
7	FILL AUGERED HOLE COMPLETELY WITH WATER AND ALLOW TO DRAIN BEFORE PLANTING

2 POLE CUTTING
SCALE: NTS



ITEM	DESCRIPTION
1	EXISTING GRADE
2	FINISH GRADE
3	DIG PLANTING HOLE DEPTH OF ROOT BALL & 2X WIDTH
4	SET BOTTOM OF PLANT SHELTER 4" BELOW SOIL SURFACE
5	WATER AND TAMP BACKFILL MIX WELL. TO BE FREE OF ROCKS AND CLODS OVER 1" DIA.
6	AMENDED SOIL (PER SPECIFICATIONS)
7	SCARIFY SIDES OF PLANTING PIT
8	ROOT BALL
9	WATERING BASIN 4" ABOVE FINISH GRADE
10	2" THICK BARK MULCH LAYER 18" RADIUS, HOLD BACK 3" FROM ROOT CROWN
11	WIRE MESH TREE SHELTER, (24" TALL X 12" DIA.) STAKE IN PLACE WITH AND ATTACH TO TWO 24" LONG #3 REBAR STAKES
12	ROOT CROWN OF PLANT 1" ABOVE FINISH GRADE

3 CONTAINER PLANTING WITH CAGE
SCALE: NTS

PREPARED FOR:
SANTA CLARA COUNTY PARKS
HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way - Suite 101
Berkeley, CA 94710-2251
tel (510) 704-1000 / fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

PLANTING NOTES & DETAILS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
--

SHEET
5.0E

AS-BUILT DRAWINGS

PRELIMINARY SOIL TEST RESULTS:

IN JANUARY 2017, 4 SOIL SAMPLES WERE TAKEN, ALL AT A 6-12-INCH DEPTH:

#1 NORTHERN END OF CREEK STUDY AREA,
#2 MIDDLE OF CREEK STUDY AREA
#3 EASTERN SIDE OF STUDY AREA
#4 SOUTHERN END OF CREEK STUDY AREA

THE SAMPLES WERE TESTED BY WALLACE LABORATORIES FOR FERTILITY FOR PLANTING, AND THE RESULTS OF THE TESTS ARE SUMMARIZED BELOW.

THESE SAMPLES ARE ACIDIC. THE PH VALUES RANGE FROM 6.30 FOR SAMPLE 2 TO 6.69 FOR SAMPLE 1. THESE ARE DESIRABLE PH VALUES FOR MANY SPECIES - SLIGHTLY ACIDIC. SLIGHT ACIDITY INCREASES THE AVAILABILITY OF MANY NUTRIENTS. HIGH ACIDITY MAKES SOME NUTRIENTS TOO AVAILABLE SUCH AS IRON AND MANGANESE. IN ADDITION, HIGH ACIDITY MAKES SOME NON-ESSENTIAL MINERALS TOO AVAILABLE AND POTENTIALLY TOXIC SUCH AS ALUMINUM AND VANADIUM.

SOME SPECIES ARE ADAPTED TO ACIDIC SOILS WHILE OTHERS ARE BETTER ADAPTED TO ALKALINE SOILS. LUPINE AND OTHER LEGUMINOUS PLANTS ARE BETTER ADAPTED TO ALKALINE SOILS.

SALINITY IS LOW. IT RANGES FROM 0.12 TO 0.17 MILLIMHO/CM. BETTER GROWTH OCCURS WITH MODEST SALINITY WHERE THE CONCENTRATIONS OF SOLUBLE MINERALS ARE HIGHER. NUTRIENTS ARE ABSORBED IN THE SOLUBLE FORM. SOLUBLE CALCIUM, MAGNESIUM, POTASSIUM, SULFUR, AND BORON ARE LOW. THE SOIL PHYSICAL PROPERTIES ARE BETTER WITH HIGHER SALINITY. THE SALINITY CAN BE INCREASED WITH THE ADDITION OF GYPSUM.

NITROGEN, SULFUR, AND BORON ARE LOW. PHOSPHORUS IS MODEST. MANGANESE IS LOW FOR SAMPLE 3. ZINC IS LOW FOR SAMPLES 2, 3 AND 4. IRON IS VERY HIGH FOR SAMPLE 3. SAMPLE 3 HAS HIGH SOIL MOISTURE AT ABOUT 93% OF FIELD CAPACITY. ANAEROBIOSIS GREATLY INCREASES THE AVAILABILITY OF IRON. IN EXCESS, MANGANESE IS INHIBITED. SPECIES WHICH ARE INTOLERANT OF HIGH LEVELS OF IRON MANY HAVE BRONZING. IN SEVERE CASES, LEAVES CAN TURN BLACK.

A MODEST AMOUNT OF BARIUM IS PRESENT. BARIUM INTERFERES WITH THE METABOLISM OF SULFUR. GYPSUM CAN BE APPLIED TO REDUCE THE EFFECTS OF BARIUM.

BETTER GROWTH IS EXPECTED WITH HIGHER LEVELS OF NITROGEN, ZINC, MANGANESE, SULFUR AND BORON. ORGANIC MATTER SUPPLIES MACRONUTRIENTS AND MICRONUTRIENTS, ESPECIALLY AS IT MINERALIZES. MICRONUTRIENTS ARE BEST APPLIED WITH THE ADDITION OF ORGANIC MATTER.

THE LOWEST OIL MOISTURE IS ABOUT 79% OF FIELD CAPACITY FOR SAMPLE 4. THE HIGHEST IS SAMPLE 3.

RECOMMENDATIONS

WALLACE LABORATORIES HAS PROVIDED THE FOLLOWING RECOMMENDATIONS FOR SOIL PREPARATION AND POTENTIAL AMENDMENTS.

GENERAL SOIL PREPARATION ON A SQUARE FOOT BASIS. BROADCAST THE FOLLOWING MATERIALS UNIFORMLY. THE RATES ARE PER 1,000 SQUARE FEET. INCORPORATE THEM HOMOGENEOUSLY 6 INCHES DEEP:

CALCIUM NITRATE (15.5-0-0) - 6 POUNDS
AGRICULTURAL GYPSUM - 10 POUNDS
GOOD QUALITY SOIL AMENDMENT - ABOUT 2 CUBIC YARDS, SUFFICIENT FOR 2% TO 3% SOIL ORGANIC MATTER ON A DRY WEIGHT BASIS

FOR SOIL PREPARATION ON A VOLUME BASIS, INCORPORATE HOMOGENEOUSLY THE FOLLOWING MATERIALS INTO CLEAN SOIL. RATES ARE EXPRESSED ON A CUBIC YARD BASIS:

CALCIUM NITRATE (15.5-0-0) - 1/4 POUND
AGRICULTURAL GYPSUM - 1/2 POUND
GOOD QUALITY SOIL AMENDMENT - ABOUT 10% BY VOLUME, SUFFICIENT FOR 2% TO 3% SOIL ORGANIC MATTER ON A DRY WEIGHT BASIS

1. HUMUS MATERIAL SHALL HAVE AN ACID-SOLUBLE ASH CONTENT OF NO LESS THAN 6% AND NO MORE THAN 20%. THE ORGANIC MATTER CONTENT SHALL BE 50% OR MORE ON A DRY WEIGHT BASIS.
2. THE PH OF THE MATERIAL SHALL BE BETWEEN 6 AND 7.5.
3. THE SALT CONTENT SHALL BE LESS THAN 10 MILLIMHO/CM @ 25° C. IN A SATURATED PASTE EXTRACT.
4. BORON CONTENT OF THE SATURATED EXTRACT SHALL BE LESS THAN 1.0 PARTS PER MILLION.
5. SILICON CONTENT (ACID-INSOLUBLE ASH) SHALL BE LESS THAN 50%.
6. CALCIUM CARBONATE SHALL NOT BE PRESENT IF TO BE APPLIED ON ALKALINE SOILS.
7. TYPES OF ACCEPTABLE PRODUCTS ARE COMPOSTS, MANURES, MUSHROOM COMPOSTS, STRAW, ALFALFA, PEAT MOSSES ETC. LOW IN SALTS, LOW IN HEAVY METALS, FREE FROM WEED SEEDS, FREE OF PATHOGENS AND OTHER DELETERIOUS MATERIALS.
8. COMPOSTED WOOD PRODUCTS ARE CONDITIONALLY ACCEPTABLE [STABLE HUMUS MUST BE PRESENT]. WOOD BASED PRODUCTS ARE NOT ACCEPTABLE WHICH ARE BASED ON RED WOOD OR CEDAR.
9. SLUDGE-BASED MATERIALS ARE NOT ACCEPTABLE.
10. CARBON:NITROGEN RATIO IS LESS THAN 25:1.
11. THE COMPOST SHALL BE AEROBIC WITHOUT MALODOROUS PRESENCE OF DECOMPOSITION PRODUCTS.
12. THE MAXIMUM PARTICLE SIZE SHALL BE 0.5 INCH, 80% OR MORE SHALL PASS A NO. 4 SCREEN FOR SOIL AMENDING.

MAXIMUM TOTAL PERMISSIBLE POLLUTANT CONCENTRATIONS IN AMENDMENT IN PARTS PER MILLION ON A DRY WEIGHT BASIS:

ARSENIC	20	COPPER	100	SELENIUM	50
CADMIUM	15	LEAD	200	SILVER	10
CHROMIUM	300	MERCURY	10	VANADIUM	500
COBALT	50	MOLYBDENUM	20	ZINC	200
		NICKEL	100		

THE SOIL AMENDMENT IS EXPECTED TO PROVIDE MICRONUTRIENTS.

FOR SITE MAINTENANCE, APPLY CALCIUM NITRATE (15.5-0-0) AT 5 POUNDS PER 1,000 SQUARE FEET ABOUT ONCE PER QUARTER OR AS NEEDED TO SUPPORT PLANT GROWTH. CALCIUM NITRATE (15.5-0-0) HELPS TO SLIGHTLY INCREASE THE PH TO INCREASE SOIL AERATION.

MONITOR THE SITE WITH PERIODIC SOIL TESTING. ADJUST THE MAINTENANCE PROGRAM AS NEEDED.

SOD NOTES:

MATERIALS

A. SOD SHALL BE EXISTING WETLAND MEADOW GRASS AND/OR FORB PLANT SPECIES WITH ROOTS AND SOIL INTACT FROM AND SALVAGED WITHIN THE PROJECT'S WATERSHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SALVAGING THE SOD IN 2-FOOT WIDE BY 3-FOOT LONG STRIPS, EXCAVATING A MINIMUM OF 6-INCHES OF SOIL TO CONTAIN AS MANY OF THE PLANT ROOTS AS POSSIBLE. AT ALL TIMES, SOD SALVAGE SHALL BE FREE OF NOXIOUS WEEDS.

B. DELIVERY, HANDLING, AND STORAGE

1. DO NOT DELIVER MORE SOD THAN CAN BE INSTALLED AT THE SITE IN 1 DAY. DO NOT PILE SOD STRIPS ON ONE ANOTHER. PROTECT ROOT SYSTEM FROM EXPOSURE TO THE WEATHER. PROTECT SOD AGAINST DEHYDRATION, CONTAMINATION AND HEATING DURING TRANSPORTATION AND DELIVERY. AT ALL TIMES MAINTAIN STORED SOD MOIST AND UNDER SHADE.
2. SOD SHALL NOT BE STORED AT THE PROJECT SITE FOR LONGER THAN 8-HOURS; UNLESS THE CONTACTOR HAS IDENTIFIED A SAFE LOCATION AND WATER SOURCE THAT IS APPROVED BY THE ENGINEER BEFORE STORAGE OPERATIONS. SOD SHALL BE PROTECTED FROM EXPOSURE TO WIND, SHADED FROM THE SUN, AND KEPT IN MOIST CONDITIONS UNTIL READY FOR INSTALLATION. PROTECT ROOT SYSTEM FROM EXPOSURE TO THE WEATHER. PROTECT SOD AGAINST DEHYDRATION, CONTAMINATION AND HEATING DURING TRANSPORTATION AND DELIVERY.

EXECUTION

A. THE CONTRACTOR SHALL INSTALL AND MAINTAIN SOD AT LOCATIONS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL FLAG OR OTHERWISE FIELD-MARK ALL SOD LOCATIONS FOR APPROVAL BEFORE THE START OF SOD INSTALLATION.

B. THE SOIL SURFACE IN THE SOD INSTALLATION AREAS SHALL BE PREPARED ACCORDING TO THE SOIL REHABILITATION PRESCRIPTIONS CONTAINED IN THIS SECTION. THE CONTRACTOR SHALL ENSURE THAT SOD INSTALLATION AREAS ARE NOT COMPACTED DUE TO ANY CONSTRUCTION OPERATIONS BEFORE SOD INSTALLATION. CONTRACTOR SHALL CAREFULLY SMOOTH OUT ALL SURFACE IRREGULARITIES THAT WILL BE RECEIVING SOD, ROLL THE AREA TO EXPOSE SOIL DEPRESSIONS, AND REGRADE AS NECESSARY. WATER SOIL TO A DEPTH OF 4-INCHES, 48 HOURS BEFORE PLACING SOD. VERIFY THAT SOIL REHABILITATION AND RELATED PREPARATORY WORK HAVE BEEN COMPLETED BEFORE PLACING SOD. DO NOT BEGIN WORK UNTIL CONDITIONS HAVE BEEN APPROVED BY THE ENGINEER.

C. SOD SALVAGE, INSTALLATION, AND ESTABLISHMENT OPERATIONS SHALL BE CONDUCTED AS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE ENGINEER. SOD SALVAGE AND INSTALLATION OPERATIONS SHALL BE CONDUCTED IN COORDINATION WITH OTHER WORK ON THE PROJECT SITE.

D. THE ENGINEER WILL FIELD LOCATE THE SOD TO BE SALVAGED BEFORE THE START OF SALVAGE OPERATIONS; THE CONTRACTOR SHALL PROVIDE 48 HOURS, MINIMUM ADVANCED NOTICE WHEN REQUESTING FIELD IDENTIFICATION OF SALVAGE AREAS. THE CONTRACTOR SHALL FLAG OR OTHERWISE FIELD-MARK ALL SOD INSTALLATION LOCATIONS FOR APPROVAL BEFORE THE START OF INSTALLATION.

E. UPON EXCAVATION, SOD SALVAGE SHALL BE MAINTAINED MOIST AND READIED FOR INSTALLATION AT THEIR ULTIMATE LOCATIONS AS PRESCRIBED ON THE DRAWINGS AND HEREIN. WHENEVER POSSIBLE, SOD INSTALLATION SHALL OCCUR IMMEDIATELY AFTER SALVAGE. IF POSSIBLE, THE SOD SALVAGE AND INSTALLATION OPERATIONS SHALL OCCUR IN THE LATTER PART OF SEPTEMBER; THE EXACT DATES FOR SALVAGE AND INSTALLATION OPERATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

F. BEFORE INSTALLATION, THE CONTRACTOR SHALL EXCAVATE AN AREA TO ACCOMMODATE THE WIDTH AND DEPTH OF THE SOD MATERIAL WITHOUT ANY RESULTING SETTLEMENT. CONTRACTOR SHALL CAREFULLY SMOOTH OUT ALL SURFACE IRREGULARITIES THAT WILL BE RECEIVING SOD, ROLL THE AREA TO EXPOSE SOIL DEPRESSIONS, AND REGRADE AS NECESSARY. WATER SOIL TO A DEPTH OF 4-INCHES, 48 HOURS BEFORE SOD PLACEMENT. VERIFY THAT SOIL REHABILITATION AND RELATED PREPARATORY WORK HAVE BEEN COMPLETED BEFORE PLACING SOD. DO NOT BEGIN WORK UNTIL CONDITIONS HAVE BEEN APPROVED BY THE ENGINEER.

G. BEGIN SOD PLACEMENT AT THE BOTTOM OF SLOPES. MATS SHALL BE UNROLLED AND PLACED PARALLEL TO CREEK FLOW. LAY THE FIRST SOD AS STRIPS ALONG A STRAIGHT BASELINE, PARALLEL TO THE CREEK. BUTT JOINTS TIGHTLY BUT DO NOT OVERLAP THE JOINTS. ON THE SECOND STRIP, STAGGER SOD IN A RUNNING BOND PATTERN. ENDS SHALL BE KEYED IN PLACE. USE A SHARP KNIFE TO CUT THE SOD TO FIT IRREGULAR CURVED AREAS AND ANY STRUCTURES. DO NOT TEAR, STRETCH OR DROP SOD DURING PLACEMENT.

H. SOD SHALL BE ANCHORED AS DETAILED ON THE DRAWINGS.

I. DO NOT LAY THE ENTIRE AMOUNT OF SOD BEFORE START OF WATERING. WATER IN LIGHTLY, WHERE A RELATIVELY LARGE AREA OF SOD HAS BEEN PLACED. SOD SHALL BE IMMEDIATELY WATERED AFTER INSTALLATION AND SHALL BE MAINTAINED MOIST THROUGHOUT THE CONTRACT PERIOD. KEEP SOD MOIST DURING THE FIRST WEEK AFTER INSTALLATION. AFTER THE FIRST WEEK, SUPPLEMENT RAINFALL TO PRODUCE A TOTAL OF 2-INCHES PER DAY. REPEAT WATERING AT REGULAR INTERVALS UNTIL THE SOD ESTABLISHES ITSELF. ONCE THE SOD HAS BECOME ESTABLISHED, DECREASE THE WATERING FREQUENCY AND INCREASE THE AMOUNT OF WATER PER APPLICATION.

J. SOD SHALL BE WATERED IMMEDIATELY FOLLOWING INSTALLATION.

1. WATER INSTALLED SOD IMMEDIATELY AFTER INSTALLATION AND CONTINUOUSLY AT A FREQUENCY OF ONCE A WEEK DURING THE PERIOD MAY 1 THROUGH OCTOBER 1, UNTIL AN "INSTALLATION ACCEPTANCE" IS GIVEN IN WRITING BY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE THAT THE SOD IS PROPERLY WATERED BEFORE AND AFTER INSTALLATION AND BEFORE THE START OF THE PLANT ESTABLISHMENT PERIOD. SOD SHALL BE THOROUGHLY HAND WATERED IMMEDIATELY AFTER INSTALLATION. THE CONTRACTOR SHALL CONTINUE TO IRRIGATE THE SOD AS NECESSARY TO MAINTAIN THE SOD IN A HEALTHY CONDITION THROUGHOUT THE DURATION OF THE CONTRACT PERIOD. THE FREQUENCY AND DURATION OF THE WATERING CYCLE SHALL DEPEND ON CURRENT WEATHER PATTERNS AND SITE-SPECIFIC SOIL MOISTURE CONDITIONS.
3. THE CONTRACTOR BEARS FULL RESPONSIBILITY FOR WATERING SOD IN A MANNER THAT SHALL MAINTAIN PLANT HEALTH AND VIGOR AND PROMOTE PLANT ESTABLISHMENT AND GROWTH.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\1100\54 SAN FELIPE CREEK RESTORATION\1.1-AS-BUILTS_REVEG\1.CAD\REVEG AS-BUILTS_05-01REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS AND OPEN SPACE AUTHORITY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710-2251
ar/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK HRS

DESIGNED BY	DATE	BY	SUBMITTALS / REVISIONS
DUDEK			
DRAWN BY	03-27-17	TG	CONCEPT PLANS
P KULCHAWIK	07-24-17	PK	DRAFT 65% DESIGN
CHECKED BY	11-14-17	PK	FINAL 65% DESIGN
J ZANZI	03-08-19	JZ	AS-BUILT DRAWINGS
IN CHARGE			
J ZANZI			
DATE			
11-14-2017			

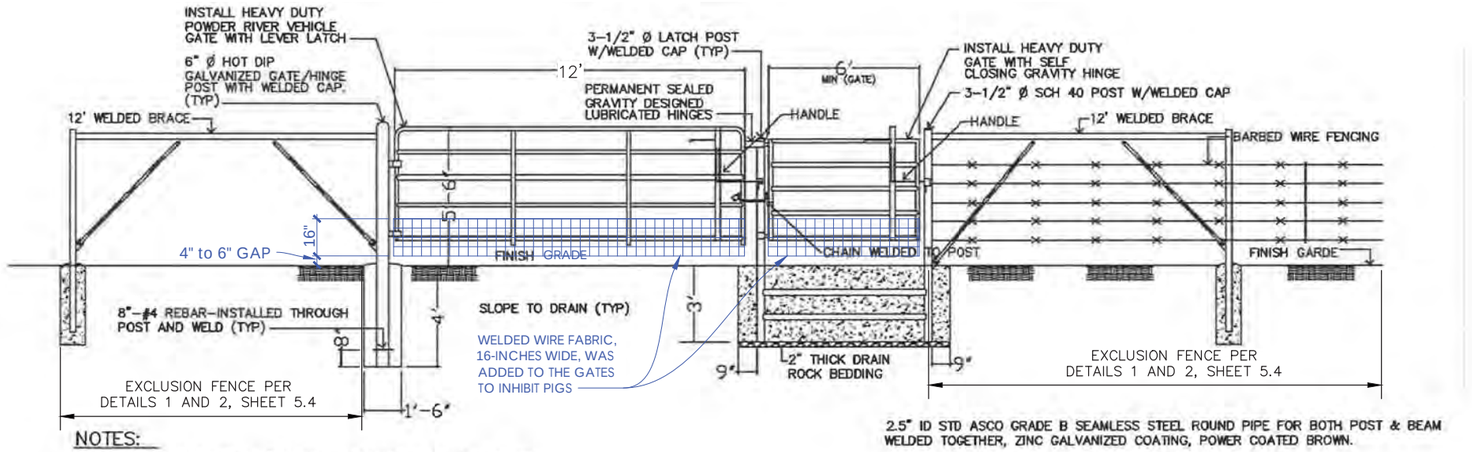
PRELIMINARY SOIL TEST RESULTS AND SOD NOTES

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
--

SHEET
5.0F



NOTES:

1. EQUESTRIAN GATE TO BE "SOUTHWEST RANGER GATE", AS MFG. BY SOUTHWEST FENCE AND SUPPLY CO.

2.5" ID STD ASCO GRADE B SEAMLESS STEEL ROUND PIPE FOR BOTH POST & BEAM WELDED TOGETHER, ZINC GALVANIZED COATING, POWER COATED BROWN.

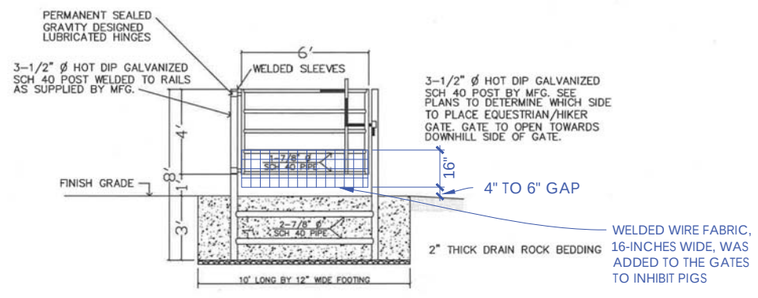
2. VEHICLE GATE TO BE HEAVY DUTY TUBE GATE, AS MFG. BY POWDER RIVER CO., OR EQUAL. GATE SHALL BE IN WIDTH INDICATED IN SPECIFICATIONS GREEN IN COLOR BY MFG. AS AVAILABLE AT:

   POWDER RIVER
   (800) 453-5318
   www.powderriver.com

3. CUSTOM MADE EQUIVALENT GATE MUST BE CONSTRUCTED OF ROUND STOCK IRON METAL WITH A MINIMUM DIAMETER OF 1-1/2".

4. WELDS ON POSTS SHALL BE PAINTED WITH ZRC GALVANIZING COMPOUND OR EQUAL, TO MATCH BROWN COAT COLOR.

1 VEHICULAR GATE WITH EQUESTRIAN HIKER GATE
SCALE: NTS



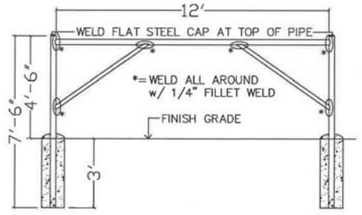
NOTES:

1. EQUESTRIAN GATE TO BE "SOUTHWEST RANGER GATE", AS MFG. BY SOUTHWEST FENCE AND SUPPLY CO.

   SOUTHWEST FENCE & SUPPLY CO.
   P.O. BOX 1523
   PATTERSON, CA 95363.
   (800) 843-9623

2. CONCRETE: 5,000 PSI
3. GATE POSTS AND GATE DO NOT REQUIRE PAINTING UNLESS NOT SUPPLIED BY MFG. IN GREEN
4. GATE HINGES MUST BE WELDED ONTO THE HINGE POST AT AN ANGLE SO THAT WHEN THE GATE IS OPENED IT WILL AUTOMATICALLY SWING SHUT.
5. WELD ON POSTS SHOULD SHOULD BE PAINTED W/ZRD GALVANIZING COMPOUND OR EQUAL.

2 METAL EQUESTRIAN/HIKER GATE
SCALE: NTS



BRACE MATERIAL:

ALL PIPE MATERIALS: USE 2.5" Ø STD. A500 GRADE B.

GRIND ALL WELD PRIOR TO PAINTING.

PRIMED AND PAINT W/2 COATS BLACK RUST PREVENTION PAINT.

ADJUST BRACE AS NECESSARY TO ACCOMODARE SLOPE IN THE FIELD.

3 WELDED STEEL SINGLE BRACE
SCALE: NTS

NOTE: THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL GATES FOR APPROVAL BEFORE ORDERING MATERIALS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\100654 SAN FELIPE CREEK RESTORATION\13-AS-BUILTS_REVEG\1 CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS; HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way - Suite 101
Berkeley, CA 94710-2251
ar1 (510) 704-1000 * fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

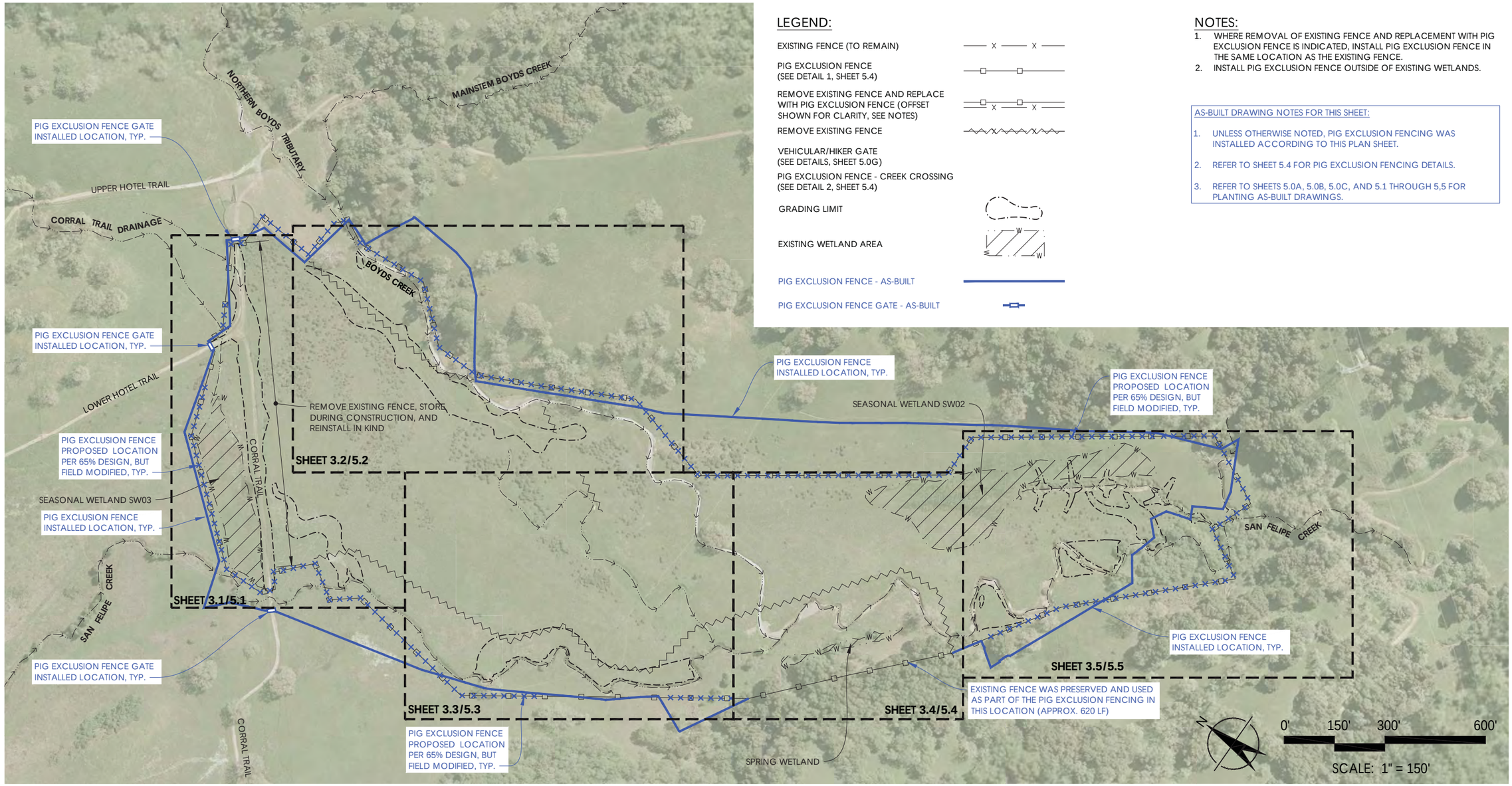
SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

FENCE GATE DETAILS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0G



LEGEND:

- EXISTING FENCE (TO REMAIN)
- PIG EXCLUSION FENCE (SEE DETAIL 1, SHEET 5.4)
- REMOVE EXISTING FENCE AND REPLACE WITH PIG EXCLUSION FENCE (OFFSET SHOWN FOR CLARITY, SEE NOTES)
- REMOVE EXISTING FENCE
- VEHICULAR/HIKER GATE (SEE DETAILS, SHEET 5.0G)
- PIG EXCLUSION FENCE - CREEK CROSSING (SEE DETAIL 2, SHEET 5.4)
- GRADING LIMIT
- EXISTING WETLAND AREA
- PIG EXCLUSION FENCE - AS-BUILT
- PIG EXCLUSION FENCE GATE - AS-BUILT

NOTES:

1. WHERE REMOVAL OF EXISTING FENCE AND REPLACEMENT WITH PIG EXCLUSION FENCE IS INDICATED, INSTALL PIG EXCLUSION FENCE IN THE SAME LOCATION AS THE EXISTING FENCE.
2. INSTALL PIG EXCLUSION FENCE OUTSIDE OF EXISTING WETLANDS.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PIG EXCLUSION FENCING WAS INSTALLED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.4 FOR PIG EXCLUSION FENCING DETAILS.
3. REFER TO SHEETS 5.0A, 5.0B, 5.0C, AND 5.1 THROUGH 5,5 FOR PLANTING AS-BUILT DRAWINGS.

AS-BUILT DRAWINGS

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710
ph (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK 07-24-17
CHECKED BY	D SHAW 11-14-17
IN CHARGE	E BALLMAN
DATE	11-14-2017

FENCING PLAN OVERVIEW

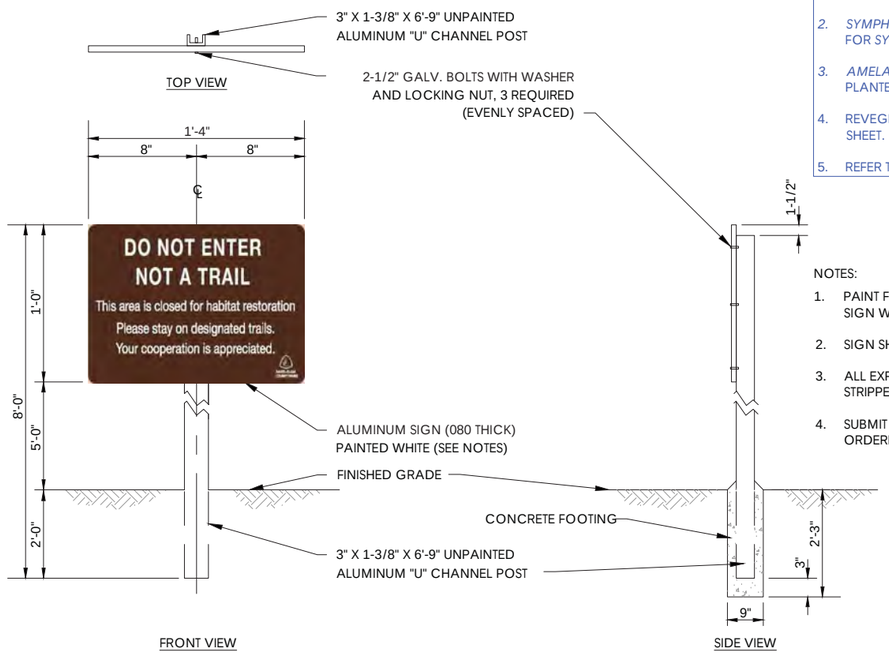
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 150'

SHEET 5.0H

P:\300.ENVIRONMENTAL\130054 SAN FELIPE CREEK RESTORATION\11-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 FENCING.DWG



1 RESTORATION SIGN
SCALE: NTS

NOTES:

1. PAINT FRONT OF SIGN PER COUNTY STANDARDS. PAINT BACK OF SIGN WITH ONE COAT PRIMER & TWO COATS BLACK ENAMEL.
2. SIGN SHALL BE COATED WITH 3m VINYL AND BE LAMINATED.
3. ALL EXPOSED BOLT THREADS EXTENDING BEYOND NUT SHALL BE STRIPPED AFTER INSTALLATION.
4. SUBMIT SHOP DRAWING OF SIGN FOR APPROVAL BEFORE ORDERING.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. *SYMPHORICARPOS ALBUS* PLANTS WERE SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS.*
3. *AMELANCHIER UTAHENSIS* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
4. REVEGETATION SIGNS WERE INSTALLED ACCORDING TO THIS PLAN SHEET.
5. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.

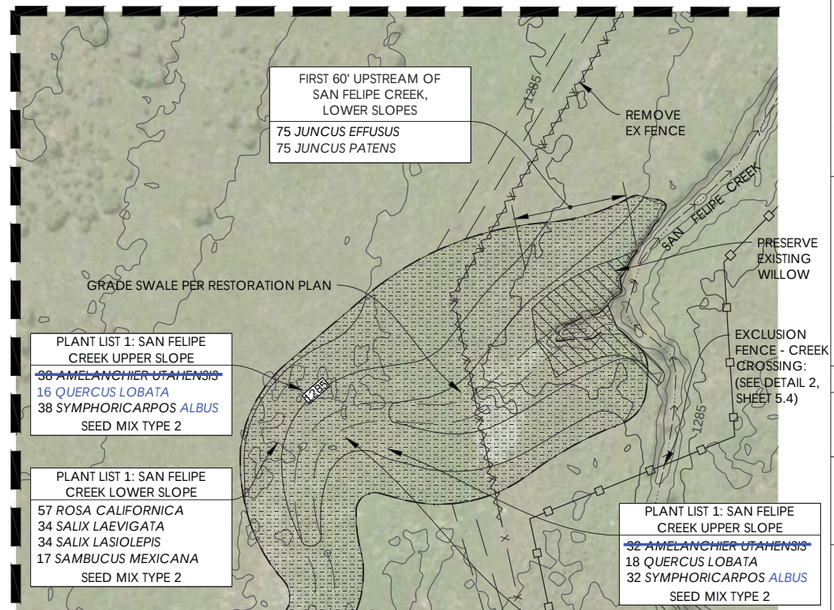
LEGEND:

- SEED MIX TYPE 1 - WETLAND RIPARIAN MIX
- SEED MIX TYPE 2 - RIPARIAN MIX
- SEED MIX TYPE 3 - UPLAND MIX
- RESTORATION SIGN (SEE DETAIL 1, THIS SHEET) (4 TOTAL; ALL THIS SHEET)

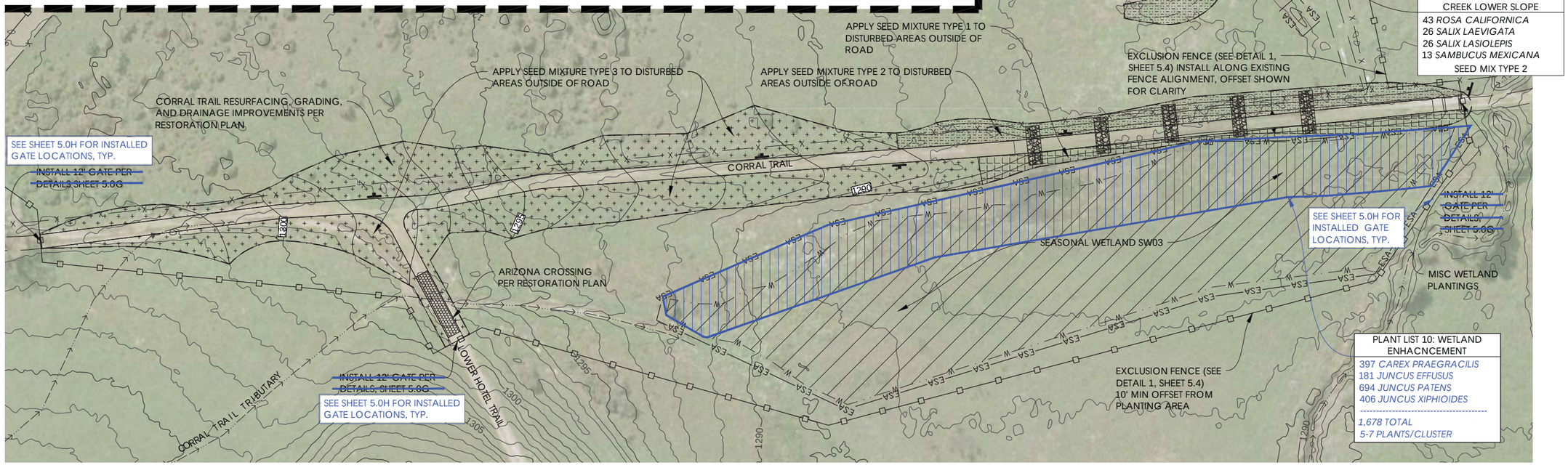
0' 40' 80' 160'

SCALE: 1" = 40'

MATCH SHEET 5.3



MATCH SHEET 5.2



NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

AS-BUILT DRAWINGS

P:\300 ENVIRONMENTAL\ 300154 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\ CAD\REVEG AS-BUILTS_09-17\05-40SCALE.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

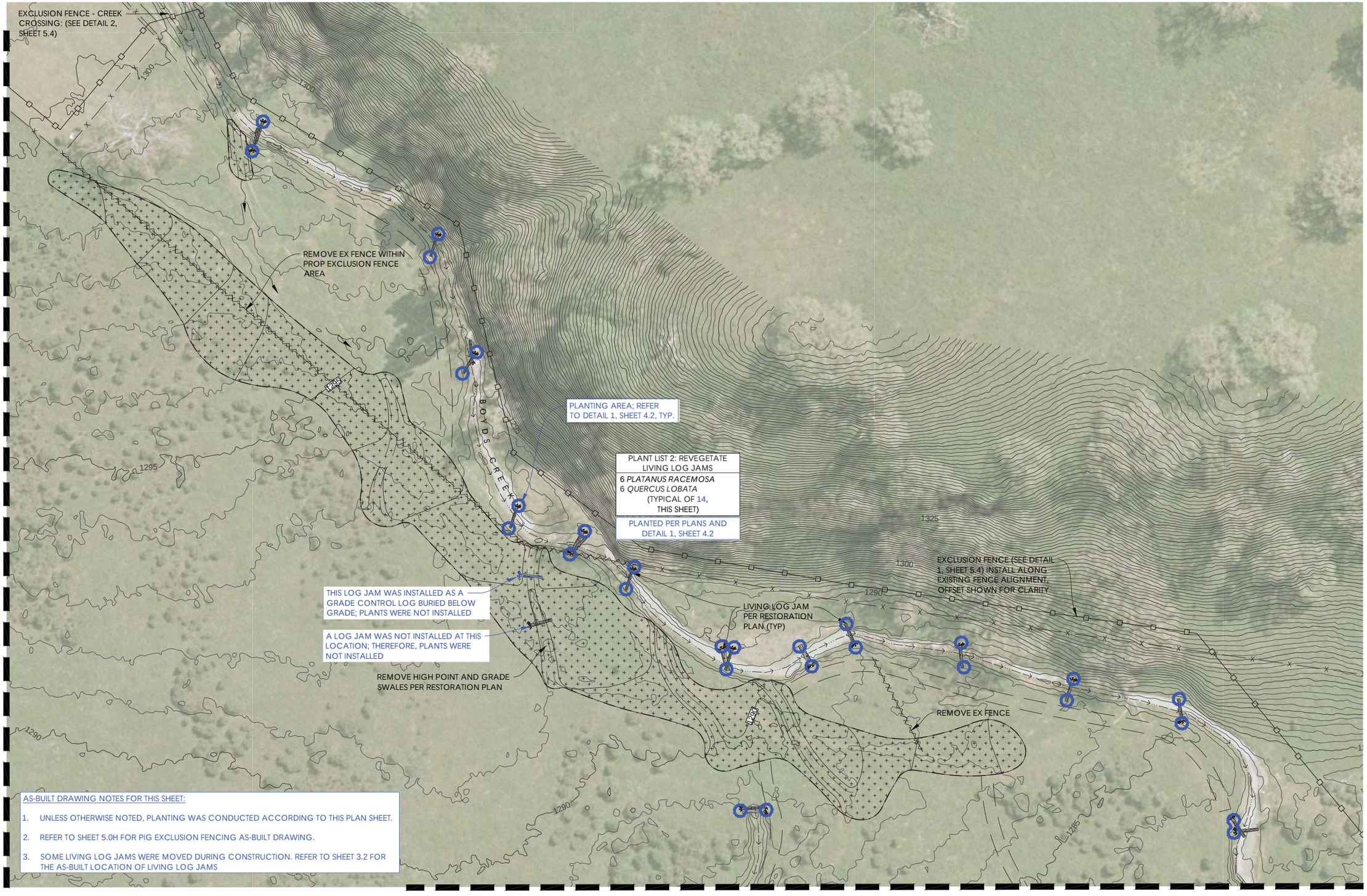
CORRAL TRAIL PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 40'

SHEET 5.1



MATCH SHEET 5.1

MATCH SHEET 5.3

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.
3. SOME LIVING LOG JAMS WERE MOVED DURING CONSTRUCTION. REFER TO SHEET 3.2 FOR THE AS-BUILT LOCATION OF LIVING LOG JAMS

LEGEND:

SEED MIX TYPE 3 - UPLAND MIX

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

0' 40' 80' 160'

SCALE: 1" = 40'

AS-BUILT DRAWINGS

P:\1300.ENVIRONMENTAL\120054 SAN FELIPE CREEK RESTORATION\11-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11OS-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

UPPER BOYDS CREEK PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

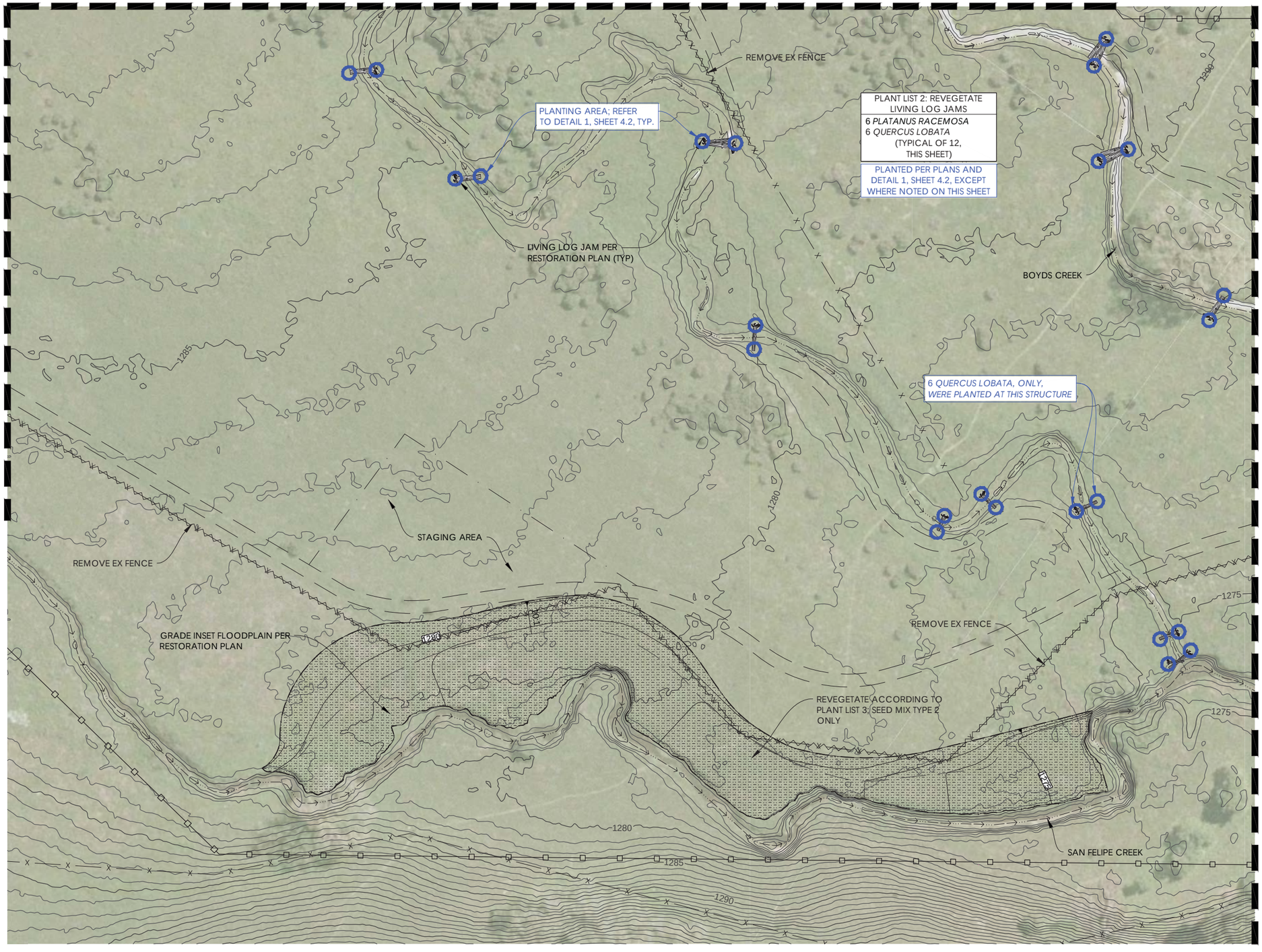
SCALE
1" = 40'

SHEET
5.2

MATCH SHEET 5.2

MATCH SHEET 5.1

MATCH SHEET 5.4



LEGEND:

SEED MIX TYPE 2 - RIPARIAN MIX

AS-BUILT DRAWINGS

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.
3. SOME LIVING LOG JAMS WERE MOVED DURING CONSTRUCTION. REFER TO SHEET 3.3 FOR THE AS-BUILT LOCATION OF LIVING LOG JAMS.

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

0' 40' 80' 160'

SCALE: 1" = 40'

P: \300.ENVIRONMENTAL \ 300154 SAN FELIPE CREEK RESTORATION \1-AS-BUILTS_REVEG \ CAD \ REVEG AS-BUILTS_05-1TO5-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 / fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

SAN FELIPE REACH 1 & LOWER BOYDS CREEK PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

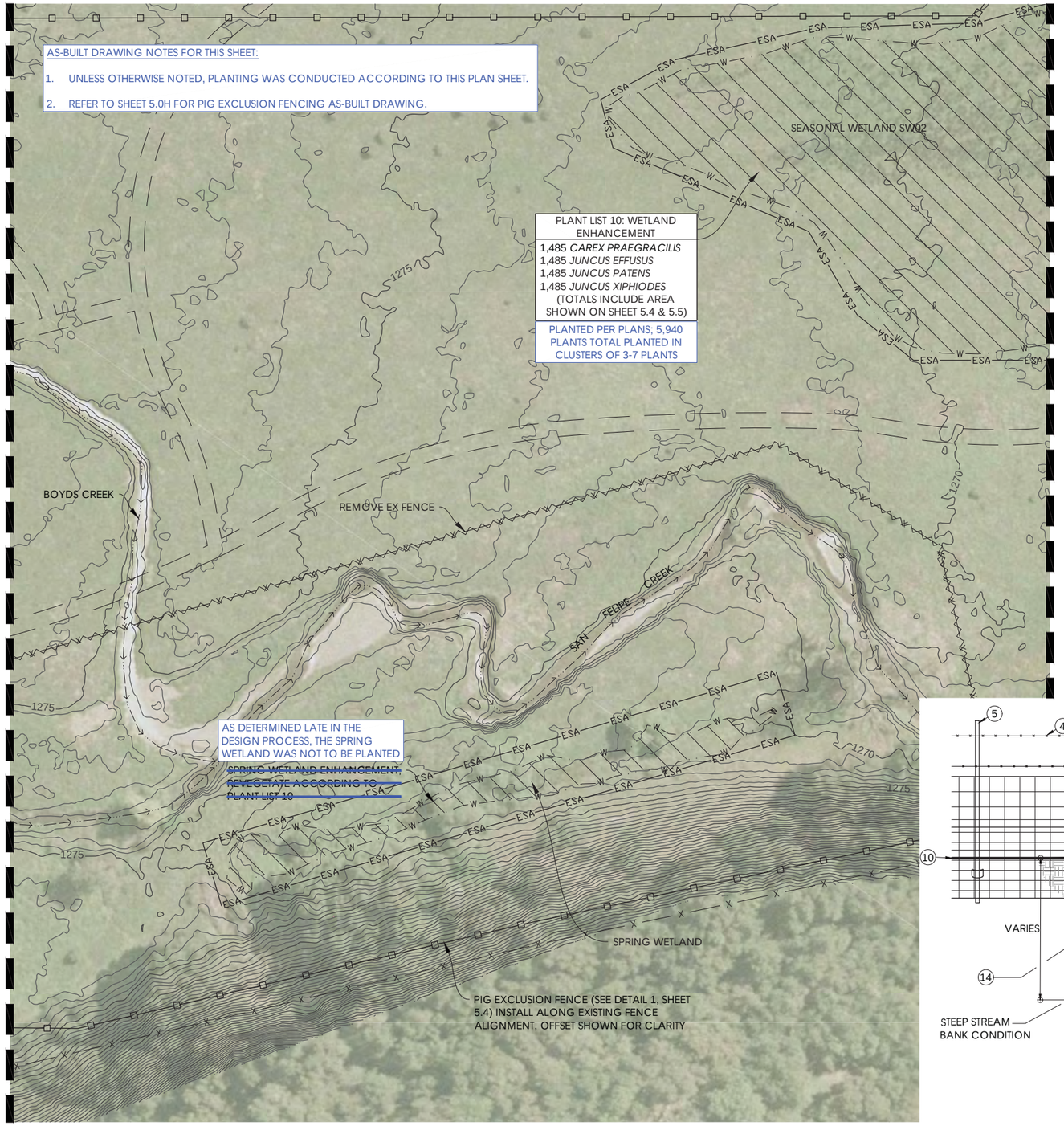
PROJECT NUMBER
215108

SCALE
1" = 40'

SHEET
5.3

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.



PLANT LIST 10: WETLAND ENHANCEMENT

1,485	*CAREX PRAEGRACILIS*
1,485	*JUNCUS EFFUSUS*
1,485	*JUNCUS PATENS*
1,485	*JUNCUS XIPHIODES*

(TOTALS INCLUDE AREA SHOWN ON SHEET 5.4 & 5.5)

PLANTED PER PLANS; 5,940 PLANTS TOTAL PLANTED IN CLUSTERS OF 3-7 PLANTS

MATCH SHEET 5.3

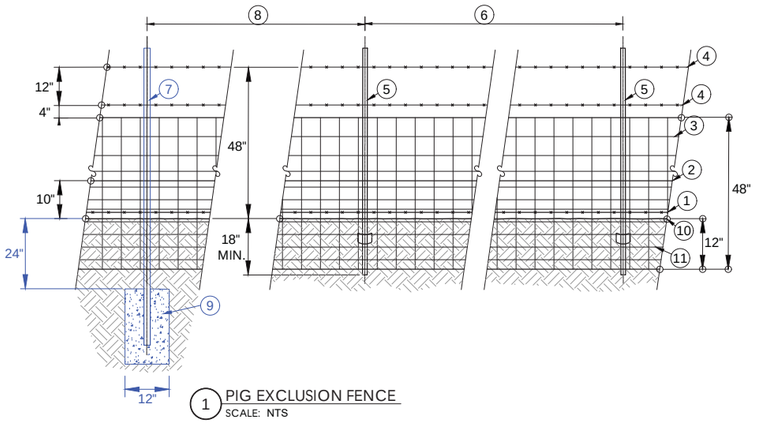
MATCH SHEET 5.5

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

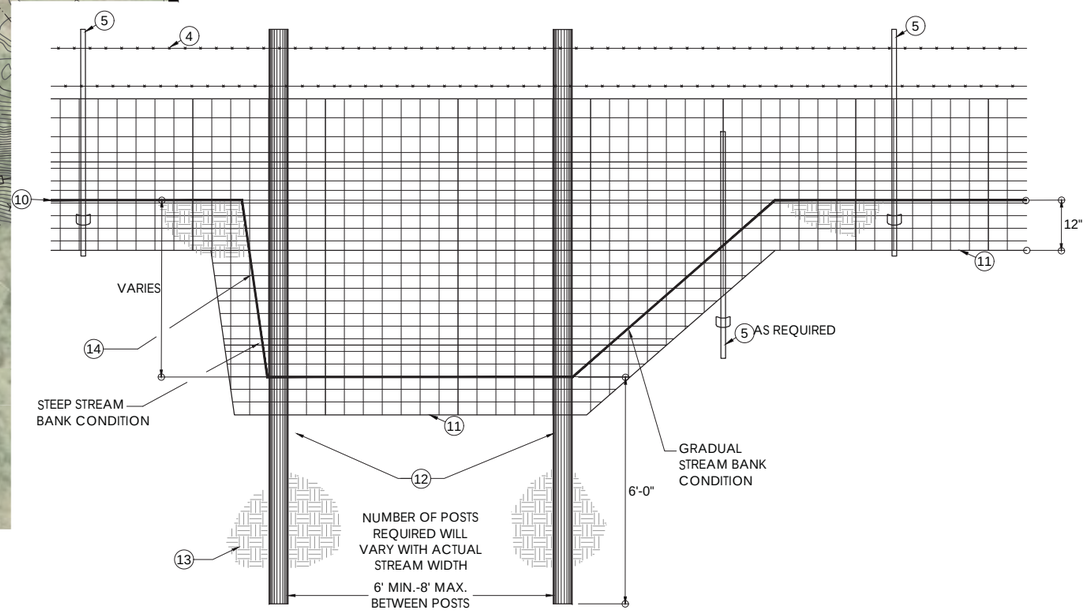
0' 40' 80' 160'

SCALE: 1" = 40'

ITEM	DESCRIPTION
1	12 1/2 GAUGE HIGH-TENSILE BARBED WIRE W/ 4 POINT BARBS (5" SPACING)
	INSTALLED 2" ABOVE FINISH GRADE. WIRED TO FENCE AT EVERY 4'
2	10 GAUGE HIGH-TENSILE SMOOTH WIRE INSTALLED 10" ABOVE EXISTING GRADE
3	12 1/2 GAUGE FIELD FENCE (CLASS 1 GALVANIZED) 48" HEIGHT - HEAVIER GAUGE ON TOP AND BOTTOM WIRES. VERTICAL WIRE SPACED 6" MAX. WITH HORIZONTAL WIRE SPACED 6" MAX. AND GRADUALLY SMALLER TOWARD BOTTOM W/ MAX. 3/2" SPACING BETWEEN BOTTOM THREE WIRES; BURIED 12" BELOW GRADE
4	15 1/2 GAUGE HIGH-TENSILE BARBED WIRE W/ 4 POINT BARBS (5" SPACING)
5	72" PREMIUM STEEL T-POST - ATTACH FENCE TO T-POSTS W/ WIRE
6	PLACE T-POSTS @ 10' O/C.
7	3" GALVANIZED 2" DIA. TUBULAR STEEL POST - ATTACH FENCE TO POST WITH WIRE
8	INSTALL GALVANIZED POLE @ EVERY 100' O/C. AND AT ALL CHANGES OF DIRECTION
9	ANCHOR GALVANIZED POLE IN 12" X 24" CONCRETE FOOTING
10	EXISTING GRADE
11	TRENCH AND BURY FIELD FENCE BELOW GRADE TO A 12" DEPTH
12	6" DIAMETER, PRESSURE TREATED, ROUND WOOD POSTS (WITHIN CHANNEL ONLY)
13	COMPACT SUBGRADE AROUND POSTS, TYP.
14	PROVIDE EXTRA WIRES AS REQUIRED



1 PIG EXCLUSION FENCE
SCALE: NTS



2 PIG EXCLUSION FENCE - CREEK CROSSING
SCALE: NTS

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\11-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11T05-40SCALE.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS AND RECREATION HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2251
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

DATE	BY	SUBMITTALS / REVISIONS
03-27-17	TG	CONCEPT PLANS
07-24-17	PK	DRAFT 65% DESIGN
11-14-17	PK	FINAL 65% DESIGN
03-08-19	JZ	AS-BUILT DRAWINGS

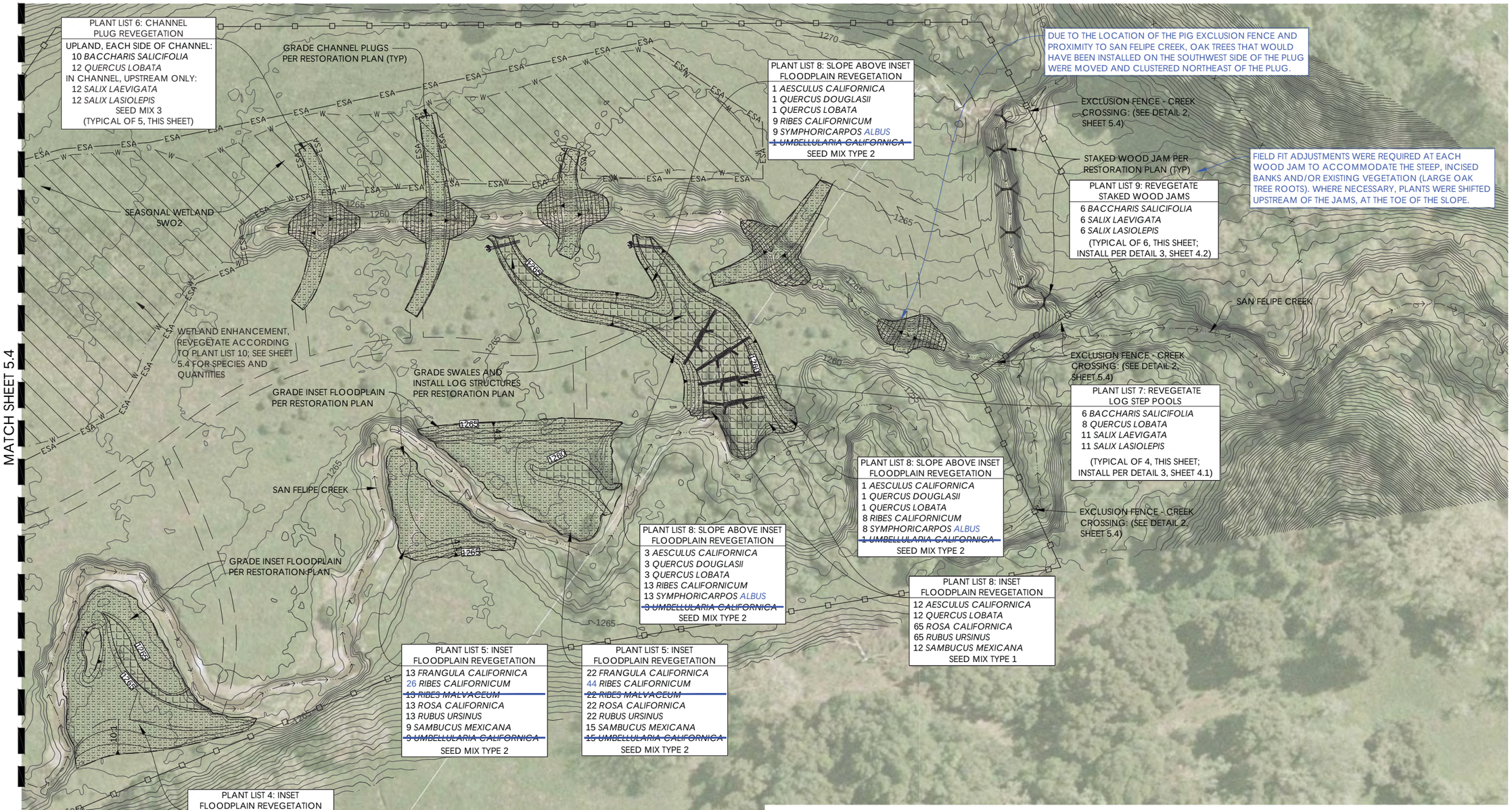
SAN FELIPE CREEK REACH 2 PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 40'

SHEET 5.4



NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. *RIBES CALIFORNICUM* PLANTS WERE SUBSTITUTED FOR *RIBES MALVACEUM*.
3. *SYMPHORICARPOS ALBUS* PLANTS WERE SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
4. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
5. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.

LEGEND:

SEED MIX TYPE 1 - WETLAND RIPARIAN MIX

SEED MIX TYPE 2 - RIPARIAN MIX

0' 40' 80' 160'

SCALE: 1" = 40'

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\110054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\1-CAD\REVEG AS-BUILTS_05-11\05-40SCALED.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710
ar/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

SAN FELIPE CREEK REACHES 3 & 4 PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
1" = 40'

SHEET
5.5

APPENDIX B CONFLUENCE MAINTENANCE LOG

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
12/20/21	Ryan/Doug	4.5(3ea)		Handoff meeting with HRS. Walked to upper tank that feeds the site tanks. Located buried shut off valve. Sal went over pump and pressure tank procedure most importantly not to run pump without water. Cloud cover prevented full pressurization of the system. Yellow light on controller indicated low power. Procedure is written o. Wall. Pressure gauge at the press tank broken due to freeze, sal used manual pressure gauge on valve on top of tank. Walked irrigation system from valve 1-27.. mainline is 95% UV pipe called Yellomine, no glue joint					
1/7		6(2)	Rain	Rented trailer and delivered kubota to job site. Used it once on site and it worked well. Noticed only county lock code worked on last two gates. Did not see HRS on any locks. Walked fence line for the first time. Stopped in floodplain planting areas to inspect damage. Noticed several broken pipes and dislodged drip tubing lines, mostly on the downstream planting area. Removed debris from planting basins and cages that had accumulated. Drip lines will need to be repaired when drier after last winter flows ideally. Found one recently bend section on fence, at the highest point of the fencing near decaying oak. All three flap gates had sediment and or woody debris preventing full closure. The downstream flap gate had a large amount of cobbles deposited in the cross section. Water was still flowing here, but obstructions were removed as best as feasible at all gates. Noted one Coyote in the site. Weather was rainy and cold. Tanks were full of water.	Na	Na	Yes	Multiple breaks in floodplain planting areas.	100%
1/21/22	RY	6.5(1.5)	High wind/sun	Walked up Boyd's creek (ID-01) inspected all planting areas and creek crossings. Found and replaced two deer cages. Reconfigured drip tubing at crossing to original position or close to it. Noted very light stapling of the tubing, more staples along drip tubing will help keep it from moving in the future. Plan to install union connections on tubing at each crossing for winterizing system. Upper flap gate clear. Walked down ED-01; no damage to drip system along this drainage. Found valve that controlls this area and extends to the Great Oak planting on Baldwin. Took photo of sun damaged pvc lateral on id-01 that will need to be replaced before it breaks (about 40' of 3/4" pipe). Inspected floodplain planting areas damaged by recent highflows (ID03-2,3,&4). Repaired drip tubing displaced by flooding in all areas. Followed drip tubing and uncovered buried plants at emitter locations. Found about 6-10 emitter locations without associated plants (most in active channel bottom or edge). At id03-2, buried 1.5" lateral line just upstream of the brushlayering repair, creating higher channel berm. Used adjacentsediment deposits to bury. Reformed basin affected by high flows and continued to remove debris from cages. Per julie'srequest, spent some time digging out irrigation trench inlet to site still more work to do here. Walked fence line. One repair made on forced entry point above id03-1b under large isolated oak heavily routed underneath.	4-6 noted in id04,5	Mustard	Yes	ID-01, Ed-01, ID03-2,3,&4. New lateral break at 12 valve cluster. Pump house-leak on 1.5" union threaded both ends will need two short nipples when replacing	100%
2/2/22	RY	5 onsite (3 hrs)	Sun wind cool	Second gate had pile of locks on ground master lock was open. Last gate not latched but chained. Tanks are full. Pump house leak seems slightly larger. Pump house planting area soil drying out at the surface, but moist just under. Did mustard weeding pass in planting area here. Started basin weeding at highest plants working down still more basins near and below pump house inspected plug ponds for RLF and pond turtles, non observed. About 10% of planting basins need clearing in southern planting area walked fenline and repaired one apparent breakin in south Eastsection. Could have been just loose fencing and barbed wire here but repaired regardless. Picked up 3 25 foot waddles from container for use atUvas south. Transported to confluence yard for use tomorrow.		Mustard	Yes		100%
2/14/22	RY,DS, KL	(3hrs travel ea.) KL-5, DS-6,RY-6	Sunny warm	Inspected all zone and mainline to irrigation. Verified all tanks are full. Activated pump and began irrigation inspection with pump house planting areas. Started removing superfluous pvc pipes, repaired one break. Both zone irrigated 20-30 minutes. Unable to get highest emitters to flow when both on, but mainline was still filling. Wasp nest in timer at 12valve cluster removed. Irrigation lines emptied through ball valve at 12 valve cluster and at first valve by pump house. No breaks in fence this inspection		Na	Yes		100%
2/15/2022	KL	2		Material shopping and irrigation repair prep					

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
2/16/2022	KL	6.5 (3)	Sunny warm	Fired up system and flushed air from mainline, through the valves, starting at downstream end. Turned timers to off position so none would turn on during manual watering in other areas. Pump house zone: ran both zones simultaneously. Fixed one broken barb and two broken emitters blasting water, noticed some clogged emitters. Watered for 1 hour. Spaghetti is vinyl which could blow off in heat. *ID-01: Fixed broken compression to pvc fitting on Baldwin on upstream end and break on 3/4" pvc on downstream end. Fixed approximately 10 drip leaks mainly missing emitters and popped off barbed connectors; most likely from mainline movement during creek flow. Ran middle/mother, ED-01, oak zone at the same time so pump provides impressive flow. Ran these zones for 1.5 hours each. *Lots of drip detailing and stapling to do, would like to get ride of spaghetti but would involve a lot of work. Many clogged emitters near end caps; brown water coming out of the few ends caps a checked, NO filters after valves. Turned of pump house ball valves inflow and outflow, switched off solar and pump power then drained the mainline which holds a lot of water. Ran valves throughout during mainline draining to get some of the mainline water to plants. Walked wetland irrigation zones. No cages and hard to see what was originally planted. Old ford can easily drive throughout site				North end to middle of site	
2/21/2022	KL	1.5 (stopped in on way to Isabel; zero travel)	Sunny cool	Site inspection to check tanks and plumbing. Found lowest tank, closest to pump house, overflowing. Float shut off in first tank did not turn off. Barely touched float arm and I heard the flow shut off. Let some water out of cam coupler ball valve and low tank stopped spilling. Confirmed float valve in first tank was still off. Pump house plumbing had already leaked out of union, no drip. Opened 2" ball valve at pump house valves to drain any remaining water. Removing pressure gauge in pump house for a couple minutes helped gurgle the remaining water out of system. First ball valve upstream of pump house, blue top, and black gate valve inside of pump house are off. Cold weather expected this week					100%
2/23/2022	KL	1		Sourced and ordered 12•1" disc filters					
2/24/2021	KL	2		Picked up 6 yards of fibar from Santa Cruz and prepped for the next day at central. More fibar available 3/9					
2/25/2022	KL 6.5(3) GS, MB, KN (6.5 + 1.5 each)	26 (7.5)	Cold morning, warm afternoon	Fence inspection: everything looks good with no repairs needed and all flap gates are fully closed. Site walk with team, all planting areas were visited and we also inspected the tanks and pump house. Found many broken pvc lines in the floodplain zones but, unable to repair today since ice was still found inside of pipes at 930am. *Weeded 3/5ths of the basins (12 hours; around 150 basins) in the pump house zones and staged mulch and wheelbarrows next to pump house zone. Some new moisture present on the soil surface from recent light rain. Tanks are full with no breaks, temperature was 27 degrees upon arrival. Filled kubota with 5 gallons diesel, kubota fuel tank now full		Mustard, burr clover, annual grasses, thistle	Yes		100%
3/2/2022	KL 6.5 (2.5) GS, MB, (6.5 + 1.5 each)	19.5 (5.5)	Warm	Continued hand weeding basins (8 hours) at the pump house and started mulching the weeded basins (8 hours, mulched 130 basins). Used 3 shovel fulls of mulch on each basin, .5 cuft. Found one dug up and halfway eaten coffee berry that was uncaged. Repurposed 2 cages from Coyote brush and caged 2 other uncaged coffee berries. Purple flagged Coyote brush to remove from irrigation and one basin with broken emitter; purple flag = irrigation work. *Perimeter fence walk. Tightened 6 areas of slightly loose fence with tie wire, thicker gauge wire would be stronger; no major breaks/entry points found. Saw large boar run out of wetland in San Felipe creek into middle of site.		Mustard, burr clover, annual grasses, thistle	Yes		100%
3/3/22	GS, MB (6.5 + 1.5 each)	13 (3)	Cloudy	Continued weeding basins (4 hours) and mulching (6 hours). Mulched approximately 160 basins. Noticed a few sambuucas that could use larger cages. Began drizzling as we were leaving.					
3/7/22	GS, MB (6.5 + 1.5 each)	13 (3)	Cool, sunny	Inspected water tanks and surrounding plumbing for leaks. Confirmed they are full and in tact. Continued weeding basins (5 hours) and mulching (5 hours). Did approximately 115 basins and used up mulch pile. About 45 basins left to weed and mulch.					100%
3/24/2022	KL	7.5 (3)	Sunny, cool morning	Fired up system and flushed lines of air. *Watered pump house zone (ID03-01A), Boyd (ID01) and mother oak (ED01) for 1.5 hours, soil was dry before watering. These plants got 4-6 gallons each. Marked drip to pvc connections with lime green flag, end caps are orange flags and irrigation removal or repair are purple flags. *Reconfigured upstream floodplain planting, zone 1 (ID03-02), to run off 1 valve not 2, around 100 plants total here. Finding clogged emitters on the upper bench right side looking downstream, potentially from flooding pushing sediment into emitters. Ran this zone for 45 minutes, slightly more soil moisture here than the rest of the site. Started looking into reconfiguring downstream floodplain zone 2 (ID03-03 & 04) About 120 plants here and has 3 valves; will make this zone one valve. *Fixed al least one new pvc break in each zone run today, appears from leftover water freezing in pipe. Majority are breaks in the 1/2" pvc at the ends of the zone, where the pipe has splintered and fractured 1-8 foot lengths. Fixed 10 clogged emitters and one broken drip compression coupling. *Fence walk, found no new openings or sags. *Willows, deciduous oaks and buckeyes just starting to open up. Other zones ready for water, will return tomorrow. Water was one foot below the float in the first tank, and filling, when I was leaving.			Yes		

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
3/25/2022	KL	7 (3)	Sunny, warm	Watered ID03-05 and ED03-04 for 1 hour each. Feeder pipe, lateral, from upstream valve was cracked about 100' before zone; repaired pipe where the 2" transitioned to 1.5" This area is supplied by two valves from two different valve areas; will consider combining these into one zone. Removed a lot of extra pvc here, some cracked and leaking. This Pvc was connected to the drip but unnecessary for watering. Plants looking good here overall just small, some yellow/brown leaves especially on Toyon. *Began reconfiguration of floodplain 2, ID03-03 & 04. Lots of broken pvc pipe here and more plants than noted yesterday, closer 350. Repaired 2/3rds of the irrigation and ran drip for 1 hour. This area still needs a fair amount of irrigation work to connect all plants and minimize amount of pipe in the creek bed. All plants throughout entire site have two 2gph emitters so far, delivering 4 gallons per hour per plant. *Turned system off and flushed water from lines through all valve clusters and large ball valves at the pump house and 12 valve cluster. Was able to use a fair amount of the drain water to continue watering plants. Float in first tank was almost to its stopping point but still filling upon departure. Balance was out today and showed me how low the ponds are already this year compared to previous years					100%
4/1/2022	KL	5 (3)	Sunny, warm	Fixed breaks and watered the 3rd zone in the lower floodplain planting area for 1.5 hours. This zone is getting closer to being run by just one valve. Removed a whole bunch of pvc that was unnecessary and piled it for off haul. Fixed breaks on sprinklers in the drainage at the far end of site and ran for 1 hour. This zone also waters willows in a couple of the ponds. Sprinklers will be switched to drip in the future. Ran the two wetland zones for 1 hour each after repairing pvc breaks and removing unnecessary pipe. These are small zones with not much noticeable plant material. *All valves onsite are high flow sprinkler valves, 1.5" Hunter PGV. Valves will need to be switched to lower flow valves were zones cannot be connected. Recorded pressure as high as 60 psi at 12 valve manifold, zones will need pressure reducers. Left staples and filters in shed. *Hard to tell how much it rained out here. Basins watered last week have dried up faster than expected but, all zones should be good for at least a week. Photos taken of a few of the ponds, water level is the same as before. System is off and drained mainline into planting zones					100%
4/13/2022	KL: 5 (3) GS, MB, KN, PP, ML: 6.5 (1.5) each	37.5 (10.5)	Cloudy, cool	Picked up 6 yards of fibar and brought to site. Weeded basins in the Boyd creek drainage, ID01, and added mulch using 3-4 yards of mulch. Counted 220 basins in this zone; will need a different valve. Left the remainder of the mulch by the pump house. Basins have held moisture well since the last visit, finally some evidence of rain from the last storm. Most plants now coming out of winter dormancy, found quite a few sycamores with new buds. Started flagging empty basins with white flags. Left 1000 feet of drip tubing, 100 emitters and some more pvc fittings in the shed. Couldn't get the RTV to start this morning	7-10 empty basins in ID01				
4/20/2022	KL	5 (3)	Mild	Fence walk and checked moisture in all zones. Fence is all good, found a deer in lower floodplain and a cow just outside of fence in the southwest corner. *Moisture is medium on average throughout site with the sandiest and in mulched areas showing medium to low basin moisture. Site has dried up a bit since our visit last week. Water next week in northern areas if no significant rain tomorrow. *Counted 455 basins in the pump house area, might be able to water this area off one valve. Flagged and counted sub zones as well. *Removed unused pvc from the pump house area and consolidated for removal. A little bit more mulching and basin weeding to be done here. Pump house has lots of small plants with brown leaves, dirt mounds from gophers already covering mulch in some places too. Count dead plants/empty basins next time			Yes		100%
5/5/2022	KL	6.5 (1.5)	Hazy, warm	Powered up system and flushed water from the lines. *Watered pump house, Boyd and mother oak zones, north end of site, with 6 gallons going to each plant. Watered the southern most drainage, id02, for one hour; this is still on sprinklers. Basins were dry before irrigation and there is a range of plant health, moderate overall. *Organized shed and separated a large bag of threaded fittings that we won't use. Separated all slip fittings by size. *Fixed a broken 3/4" pvc pipe in Boyd and blown off compression fitting in the mother oak zone, high pressure. Flagged end caps with orange flags and drip to pvc connections with lime green flags in the mother oak zone. *Turned system off but did not drain the lines; returning soon to finish a full watering event. Still a lot of irrigation fine tuning to be done	852				100%

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
5/6/2022	KL	6.5 (1.5)	Warm	System pressurized in 20 minutes. Watered ID03-02 thru ID03-05 and ED03-01 thru ED03-05, basically the whole southern section, with 6 gallons per plant. *Upper floodplain (ID03-02) : flushed end caps, a few had black water flush out. Replaced 10 clogged emitters, some of the spaghetti was clogged with sludge too but it blew out while emitter was off. Counted 290 basins here. Plant health is good to strong. Continued removing unnecessary PVC. *Lower floodplain (ID03-03 & ID03-04): Replaced 35 glogged emitters, all located in the lower portions of the floodplain. Spaghetti tubing was also clogged on a few of them. Unburied emitters covered in sediment and connected the drip from the two old zones to make one irrigation zone. Plant health is moderate to good here. *ID03-05: replaced 25 clogged emitters and removed portions of clogged spaghetti; all in the lowest part of the channel. Lots of natives here. Plant health is good to strong. *Fixed one chewed spaghetti in each of the two floodplain zones. Still getting 35-50 psi at the drip end caps while system is running around 20-25 gpm. Recommend all new valves; probably 8 total; since the existing high flow sprinkler valves are not turning off with the timer every time/not designed for drip. Also recommend pressure reducers in addition to the filters already purchased. Toyon seems to be the weakest plant/most unsuccessful plants					
5/18/2022	KL 7.5 MB, PP, ML 6.5 each (1.5) each	27.5 (6)	Hot	Mowed all roads and access points as discussed with Julie to minimize fire danger from vehicle traffic (20 hours on site) Purchased new valves, pressure reducers and associated fittings. Joined subzones into one zone in the pump house area and plumbed in a new valve, disc filter and pressure reducers. Watered pump house, Boyd and mother oak zones (northern portion of site) with 8 gallons going to each plant. Still finding some clogged and low flowing emitters, these basins most likely received less water. Basins were dry before irrigation event					100%
5/19/2022	KL	6	Hot	Found a leak at a 2" elbow in the mainline, not yellowmine pipe, at the 12 valve cluster; fine for now but will need attention soon. Inspected pump house drip after rezoning, running good, some clogged emitters near end caps. *Added new valve, filter and pressure reducer to upper floodplain. Same story, running good but still some clogged emitters and spaghetti tubing. Tan this zone for two hours. *Combined zones to one valve and added new valve, filter and pressure reducers to lower floodplain. Watered the remaining areas in the southern section of site. Will return tomorrow to water lower floodplain with new assembly built today. *Still need to add valves, filters and reducers to four more zones. Northern two zones are pretty straight forward, southern two zones still need a lot of reconfiguring					
5/20/2022	KL	5 (3)	Warm	ID03-03 & ID03-04 (lower floodplain): Ran drip for 2 hours, 8 gallons per plant. Weeded basins of large invasives and continued replacing clogged emitters in lower elevations. A couple clogged emitters were brand new. High concentration of dead/weak toyon on western slope, approximately 10 plants, these toyons seem to be very young. *Entire site is well watered at this time. Started reconfiguring the southern channel which will include ID02, ID03-05, ED03-01 thru ED03-05. *Fence walk; no sags or breaks found			Yes	Ongoing	100%
5/25/2022	KL, GS, KN, PP, ML 6.5 each (1.5 each)	32.5 (7.5)	Hot	Weeded and mulched plants in ED01, flagged about 40 empty basins with white flags. Used 1.5 yards of mulch. Started weeding upper floodplain ID-03-02. Pump would not pressurize even though it was getting plenty of water. Plumbed in new pump, working good now. Watered willows in the plug and pond area that we not on drip and starting running mainline to them. Changed valves and added disc filters plus pressure reducers in ED01 and ID01	~40 in ED01				100%
5/26/2022	KL, GS, KN, PP, ML 6.5 each (1.5 each)	32.5 (7.5)	Warm, overcast	Weeded basins in the southern portion of the site including the plug and pond area and nearby channel, plus the floodplain planting areas. Leak in the mainline is much worse today, fitting is cracked. Drained mainline and fixed leak bypassing and removing the entire 12 valve cluster. Continued reconfiguring the southern most valves and added new valves with filters and pressure reducers to these 2 valve locations, at the southern end of the 3" mainline	~25 in upper floodplain				
6/1/2022	KL	6.5 (1.5)	Hot	*Repressurized irrigation after mainline fix last week and purged air from the system. *Watered ID01, Boyd, and ED01, mother oak, simultaneously for 2 hours. *Started capping obviously dead plants, a lot are baby toyons, in ID03-01A (pump house). Changed flag from white to blue once plant is confirmed dead and irrigation is capped. Ran this zone for two hours. Flow is maxed out but, will improve after empty basin emitters are all capped. *Set timers to run floodplain plantings this afternoon automatically. ID03-02 is the upper floodplain and ID03-03 plus ID03-04 is the lower floodplain; one valve each. *Willow pole cuttings not on drip are starting to look a little dry in upper floodplain and in the plug and ponds. Continued hand watering them and adding them to the irrigation lines.					
6/2/2022	KL	6 (2)	Hot	Both floodplains watered yesterday afternoon automatically. Watered the lowest portion of the site, 2 valves, for 2 hours each zone. Added all new willows in the plug and ponds to drip prior to irrigation event. Continued weeding basins and replacing clogged emitters here. *Watered new willow pole cuttings in the upper floodplain section. Will get these on drip also. A lot of brand new plants in this zone. ID02 needs drip also, still on sprinklers. *Talked with Julie and Cassie onsite. Julie requested mowing hemlock around the spring, mowing the main road behind pump house, and addressing the large pepperweed on the north fence bounded just west of the pig trap					

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
6/8/2022	KL 5 (3) MB, PP, ML 6.5 (1.5) each	24.5 (7.5)	Warm breezy	Checked on Posion hemlock mowing and pepper weed patch. Pepper weed can definitely be hand weeded and is just starting to bud, no flowers yet. *Hand weeded basins in the southern portion of site and located small plantings, mostly mule fat in the steep ID02 channel on the southern boundary of the site. Removed sprinklers from ID02 and ran drip irrigation to the smallest plants. Also ran drip to the willows in the upper floodplain. *Irrigated pump house, mother oak and Boyd for 2 hours each. Set both floodplains to water automatically this afternoon for two hours each				All zones	
6/9/2022	KL 4.5 (1.5) PP, ML 6.5 (1.5) each	17.5 (4.5)	Overcast/hot	Mowed Posion hemlock north of the pump house to the fence line and mowed hemlock around the spring. Mowed gravel access road north of the pump house to the park gate (12 hours) Mowed and hand weeded invasives in the two floodplain zones. *Watered the plug and pond zone, mostly new willow cuttings with some oaks, and watered the small channel just east of the plug and pond, lots of plants here and many native recruits. These two zones were watered for 2 hours each. Continued replacing clogged emitters and weeding basins here. *Timers are off and solar power and pump power are off. Water ball valve and gate valves are on. System getting very close to being automated	White and blue flagged basins	Posion hemlock mowing		All zones	100%
6/20/2022	KL	5.5 (2.5)	Hot	Rodent mounds appearing in a lot of basins. Evidence of new deer browse throughout even on mugwort and some cages are bent/pushed around. Cages are really inconsistent; some less deer resistant plants have cages and some of those same plants do not, and they are really small diameter... Rewired timers where necessary, removing unused valves. Had to splice one wire on two of the timers, the wires were almost chewed all the through, a shallow bury of valve boxes will help this issue. Buckeyes leaves starting to turn brown, some buckeye leaves came and went really fast. Watered northern zones and set timers to run on Mondays and Tuesdays weekly. Irrigation schedules are entered on next page/sheet in this log. Starting to find a few rodent chew holes in drip line				Northern zones	
6/22/2022	KL	3 (3)	55 degrees at 7am	Turned on the pump house planting zone just before 7am to test early morning irrigation. Pump runs but has low power and won't pressurize this area; our biggest zone. Pump took a long time to pressurize after turning the pump house zone off. Reset all timers to start an hour later. Pump pressurizes within minutes a little later in the day. *Sprayed repellent on newly dripped willows and some coffee and blackberries that had obvious browsing. *Checked 3 of the new disc filters, beginning, middle and end of site. All had the mystery sediment already accumulating in the filter; cleaned these 3. *Fixed 3 small chew holes, in the drip line, in pump house zone and one in the lower floodplain				Southern zones	100%
6/29/2022	KL	3 (3)	Warm	All zones have moisture present from irrigation events over the last two days. North end of the site gets watered on Mondays and south end gets watered on Tuesdays. Cleaned all 6 filters. A good accumulation of sediment was found in all filters except for at the last valve location, furthest from pump, which had minimal build up. Sediment is heavy and gritty and also accumulates in the filter body; filters are installed vertically. Flushed filter bodies also to clear sediment. Lower floodplain flow seemed stronger after filter cleaning. Sprayed all irrigated willows with repellent. Noticing more animal/rodent burrowing in basins resulting in some new plant deaths					
7/13/2022	GS, ML 6.5 (1.5) each, KL (2)	15 (3)	Warm	Applied WD-40 to pedestrian gate latch. Pump House - Consistent soil moisture throughout zone without signs of leaks. Mustard and yst on fringes and scattered throughout zone. Walked the irrigation lines weeding basins and sky flagging dead plants with blue and white flags (ran out of whites). Hand pulled large yst between plants. BOYD - Continued to walk along irrigation line occasionally checking basin moisture, especially near end caps. Weeded basins and basin perimeters. Good soil moisture throughout zone. Lower Floodplain -overall soil moisture is good. No puddles or signs of leaks. Weeded most basins. Quite a bit of yst throughout entire site. Lower - Basin moisture consistent with other zones. Willows in ponds show healthy growth. Did not get to weeding lower floodplain. Did not have white flags to continue skyflagging dead basins past pump house. Kevin ~ Irrigation supply run the day before and irrigation zone layout and mapping with guys before their departure					
7/15/2022	KL 7.5 (1.5) GS, MB, ML 6.5 (1.5) each	27 (6)	Hot	Tanks are only 1/4 full and no water entering tanks from feeder pipe supplied by parks. Pump still pressurized and works fine. Water level is just above pump float cut off. Contacted Julie and Parks has had water off recently but thought it was restored; they are working on it. *Mowed pump house and capped irrigation to all dead plant basins, blue flags. White flags are plants with questionable health, still receiving irrigation. *Clipped and hand removed all pepper weed seed heads/flowers and bagged and removed for the one large patch northeast of the pump house. 8 bags of pepper weed removed, 5 hours. Capped irrigation to dead plants and weeded in the upper floodplain, ID03-02. Parks has been very helpful in resolving water supply issue, still no water flowing into tank upon departure so turned off all timers. Noticed same sediment found clogging emitters in the bottom of the tanks		Pepperweed			25% not filling

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
7/18/2022	KL, GS 6.5 (1.5) each	13 (3)	Hot	Water is now flowing to the site and tanks are full. Turned valves back on to water automatically, Mondays and Tuesdays. Fixed a rodent chew hole in drip mainline and in a spaghetti tubing in the plug and pond side channel, ID03-05. These were larger openings that were leaking significant water. *Flushed and cleaned all 7 filters; most had a good amount of build up in them already. *Buried and taped off openings in the valve boxes on active valves in the southern section to prevent mice from chewing on timer wires. *Found some broken top wires on the fence near 1D02 on the west side where the two fences come together, did not repair. *Ran drip in the lower section watering all 3 zones and replaced 50 clogged emitters in lower floodplain, ID03-03&04 and 50 in the side channel, ID03-05. More emitters needed in side channel. *Sprayed repellent on irrigated willows in the southern section and upper floodplain, ID03-02				Southern section	100% (water back on)
7/19/2022	KL (1), GS, KN (6.5 +1.5 each)	14 (3)	Hot	The pump was running when we arrived as expected, as well as Boyd and Mother oak zones. Walked along the irrigation lines checking every plant's emitters for proper function. Replaced clogged and poorly functioning emitters. Repaired 4 leaks in drip line at Boyd. Continued irrigation and emitter check throughout the mother oak zone, pump house, and upper flood plain. Walked lines while zones were scheduled to run. Replaced a total of 70 emitters. Buried valve/timer boxes.				Northern section	
7/21/2022	GS, KN, MB, ML, HE (6.5 + 1.5 each)	32.5 (7.5)	Hot	Weeded basins in lower floodplain and southern zone in preparation for mulch. Marked dead basins with white flags. Capped dead basins in upper floodplain and began weeding between plants, consolidating weeds in refuse piles. Marked capped basins with blue flags. Pulled all the bull thistle growing along ponds. Plants in the southern zones still had good soil moisture. Fibar mulch still not in stock, may be delivered friday.					
7/22/2022	GS, KN, ML, HE, MB, PP (6.5 +1.5)	39 (9)	Hot	Hand weeded the pump house, Boyd and most of the mother oak zone. Consolidated weeds into refuse piles when posible. Basins still showing moisture from irrigation event.					
8/1/2022	GS, ML, HE (6.5 + 1.5 each)	19.5 (4.5)	Cloudy	Pump PSI was at 0 when we arrived. Weather was cloudy/overcast which might have affected solar panels. It resumed running about 40 minutes in to the lower floodplains run schedule. Weeded area while irrigation ran, no leaks noted. Walked through the plug and ponds while irrigation was running and replaced clogged emitters. Did the same in the side channel. Replaced about 65 emitters total. Water pressure was a bit weak in one of the drip lines. Applied deer repellent to willows and coffee berries in the southern zones.					
8/2/2022	GS, ML, HE (6.6 + 1.5 each)	19.5 (4.5)	Sunny	Performed irrigation checks in Boyd, mother oak, pump house and the upper flood plain at the times they were scheduled to run. Repaired a total of 7 breaks or leaky emitters. More casualties noted while walking through. Replaced a few clogged emitters. Hand weeded the lower floodplain and part of the upper floodplain					
8/8/2022	KL, PP, HE (6.5 + 1.5)	19.5 (4.5)	Sunny	Cleared dirt and clastic debris that was built up against the fence at the top of ID02. Material was moved downstream of the fence into the site as instructed by Balance Hydrology. We lowered hog wire fence panel to the new ground level (6 hours). *Lots of browsing noted throughout. Plants are also getting nibbled from the tops of cages, wider and taller cages would be much more beneficial. *Cleaned filters in all 7 valves. Sediment build up was moderate to heavy. Bagged and removed pepper weed north end of site, 5 bags removed. Pepper weed is coming back where previously removed but, much more sparse. Weeded in plug and pond area, plenty more weeding could be done. Repaired one heavily chewed spaghetti tubing in plug and pond side channel		Mustard, YST, pepper weed		Southern section	100%
8/9/2022	KL (1) PP (8) HE (8) ML(8)	20.5(4.5)	Sunny	Reshaped basins, mechanically removed weeds from basins, and mulch 75% of upper floor plain					
8/10/2022	PP, ML, HE (8 each)	19.5 (4.5)	Sunny	Upper flood plain fully mulched, began mulching on the lower flood plain, used up all the mulch, more mulching to be done					
8/12/2022	KL	2		Dump and mulch pick up					
8/15/2022	KL	2		Mulch pick up and prep					
8/16/2022	KL, GS, KN, HE (6.5 + 1.5 each)	26 (6)	Hot	Fixed 8 chew holes and 3 leaky fittings plus a pvc glue joint halfway blown off in Boyd and mother oak. Plugged a few more previously flagged dead plant basins and removed a section of drip crossing the creek that was not needed. *Fixed one chewed spaghetti tube in the upper floodplain. Found a few caged plants heavily browsed; looks like animal dug under cage. Some cages have been collapsed from the top and top of plant browsed. Lots of plants growing out of/through the small cages. Easily found 10-15 new oak tree deaths; basin soli is disturbed and tap root chewed off at a 45 degree angle just below the surface. *Continued mulching southern most zones. Almost finished, left some mulch on site for the remaining basins				Northern section	100%

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortaility	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
8/17/2022	KL 4 (1.5) PP, KN 6.5 (1.5) each	17.5 (4.5)	Cloudy warm	Cleaned solar panels and weeded the pump house consolidating weeds into three distinct piles. *Float on fill tank was slightly stuck open. Jiggled float and pulled up on it to get it to fully close. *Fence walk: no noticeable entry points and no new damage found. Finished mulching in the southern section and continued weeding this area	10 new gopher deaths on trees	Primarily yellow star thistle and mustard	Yes, all good		100%
8/23/2022	GS, PP (8 each) MB (7) KL (1)	19.5 (4.5)	Hot	Water pump was running at 40 psi when we arrived. Performed irrigation check in Boyd and mother oak, replacing 2 leaky emitters and repairing one break. Repaired one other chew hole in the pump house zone. Reassigned cages from dead plants to living plants that were being browsed at pump house, many were snow berry. A few plants left to cage. General weed pass on pump house zone, and upper flood plain, started a second refuse pile under big bay tree in upper flood plain. Applied deer repellent to willows, coffee berries and other browsed plants in both floodplains, side channel and plug in ponds					
8/26/2022	GS, MB, ML, HE (6.5 +1.5 each) KL (1)	27 (6)	Hot sunny	Reassigned cages from dead basins to browsed plants. Marked some dead basins that still had irrigation with lime green flags, to be plugged next visit. Reassigned more cages in the lower iod zone before fence. Pulled weeds in the side channel. Applied deer repellent to browsed uncaged plants in all northern zones. Met mechanic at front gate to repair RTV. Fairly easy fix, he also cleaned out the air filter, removed crusted battery acid and checked the oil. Next service should be done at 1925. Air filter should be cleaned every once in a while by blowing air (compressor or leaf blower) inside the filter. Radiator can also be cleaned by pulling screen out and hitting with a leaf blower. Battery in pump house zone timer is low					
9/6/2022	KL	5 (3)	Very hot	Irrigation check in northern zones: all good. Fixed chewed spaghetti and broken emitter in Boyd and broken barb connector in pump house. Capped an old flush valve and unused emitters in the P&P side channel. Irrigation Zones that ran yesterday have moisture present in basins and no evidence of major leaks/large wet spots. *Cleaned filters; less sediment in the pump house and mother oak filters compared to the rest which had significant/major build up. Found 10 basins dug up from the pigs in pump house; plants were heavily impacted/killed. Replaced pump house timer battery. Restocked fittings for repairs in shed	10 due to pigs 10 new gopher deaths on trees			Northern zones	100
9/12/2022	GS, MB, ML (6.5 + 1.5 each) KL (1)	20.5 + 4.5	Gloomy then hot	Performed irrigation checks in the southern zones. Repaired 2 breaks in the plug and pond side channel. Full weeding pass of the lower floodplain, reassigned about 12 cages and applied deer repellent to vulnerable plants. The side channel had proper flow throughout the zone. Hand weeded, reassigned about 8 cages and applied deer repellent to browsed plants. RTV started up right away and was running well. Filled up flat tire. Loaded up pvc that was in storage container and hauled off site. Spotted a few small pigs in the site near the lower floodplain and side channel				Southern zones	
9/13/2022	GS, MB, Ml (6.5 + 1.5 each)	19.5 + 4.5	Breezy	Checked irrigation in the northern zones while they were running. Repaired multiple punctures and chew holes in Boyd and a few leaky emitters in the mother oak zone. Pump house - Pigs have made burrows in a few dead basins that still have irrigation, and next to a few of the other plants. Plugged the dead ones to avoid future damage. The filter at the valve box was leaking pretty bad. That sandy build up was all in the threads so it couldn't tighten all the way down. Flushed and cleaned the filter, which was pretty dirty. Weeded yst and some mustard in the upper floodplain and reassigned cages. Applied deer repellent to browsed plants In all northern zones.					
9/19/2022	KL 4.5 (2.5) ML, HE 6.5 (1.5) each	17.5 (5.5)	Rain last night/cloudy	Ground was wet from rain last night and this morning. Pump was still providing enough power to water lower floodplain even though it was cloudy in the morning. *Buried the mainline, 2" pvc, that crosses access road near 12 valve cluster. Buried the 1.5" lateral that crosses the road next to Boyd valve. *Continued weeding the southern zone focusing on the area the connects the northern ponds to the wetland on the east. Some scattered oaks here on drip as well. *The spring looks clear of hemlock and the pepper weed patches near the northern edge of the site are growing back. Smaller pepper weed patch has regrown only 25% of original cover and the larger patch is about 50% filled back in. Pepper weed individuals are small and very green. Very approachable with another hand weeding event but, not expecting that method to be 100% effective. Counted Oaks, buckeyes, sycamores, willows and cottonwoods in the southern section. Need 220 cages for all of the trees in this area, will count trees in northern section soon. Recommend 3 foot diameter 2x2 welded wire, 4' tall, cage with 3 rebar. Most rebar on site is skinnier and shorter than preferred		Mustard, yellow star thistle, tobacco		Southern zone	100%
9/26/22	RY 3.5 (2.5), KL 3.5 (2.5)	7 (5)	Sunny	Quarterly site walk with Parks, Balance, Nomad, and HA. Kevin to provide preliminary plant count to Nomad.					
9/27/2022	KL, MB, ML 6.5 (1.5) each	19.5 (4.5)	Sunny	Began site clean up of all unused pvc pipe and associated irrigation materials. Started in the southern area and worked north getting about halfway through it. 2" pvc mainline was accidentally broken, system is off at the pump house, will fix tomorrow. *Found multiple large chew holes in drip lines surrounding the mother oak, still needs repair but, the zone did receive adequate irrigation today. *Finished the tree caging count for new cages; 2x2 welded wire, 4' tall, 2.5'-3' diameter. *Started survivorship/living plant count in the individual irrigation zones				Northern zones	100%

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
9/28/2022	KL 7.5 MB, ML 6.5 (1.5) each	20.5 (4.5)	Sunny	Fixed mainline break, flushed air from system and watered upper floodplain for 2 hours, upper floodplain missed scheduled irrigation yesterday due to irrigation break. Restocked shed with pvc and drip fittings. *Finished counting plants, complied numbers and emailed. *Finished loading trailer and off hauled material. Most of the time was spent disassembling the 12 valve clusters and the laterals that used to feed sprinkler system in the southern wetland. *Filters are in need of cleaning again					
9/30/2022	KL (1.5), GS, MB, PP, ML (6.5 + 1.5 each)	27.5 (6)	Sunny	Dump run on 9/29 of unused old pvc pipe/sprinkler lines. Collected old pvc from 12 valve zone and pump house and hauled off site. Left 4 of each size pipe in both areas. Hunted for acorns at oaks in different parts of the site but had no luck. Feels slightly early. Hand weeded mostly mustard in side channel and consolidated in a pile. *turned off timer to plug and pond zones and closed ball valve. Mistakingly cut the active line that feeds the scattered oaks on the other sides of the ponds. Did not have glue to cap the end, bring next visit. Plug and ponds will not run on Monday*	1050				
10/3/2022	KL	2		Second dump run of old PVC. Truck and trailer clean					
10/6/2022	KL, GS 6.5 + 1.5 each	13 (3)	Sunny	Cleaned all filters; upper floodplain was extremely clogged with sediment; others filters had medium build up. *Capped accidentally cut lateral in pond zone and fixed chewed irrigation around the mother oak. *Ran irrigation in northern zones: mother oak, Boyd, pump house and upper floodplain and fixed a few more leaks. Plants look good after not being irrigated for ten days so set timers to run every two weeks. Weeded southern portion of mother oak zone and weeded in the upper floodplain. *Capped emitters to dead plants in the side channel (next to ponds in southern zone)	Few more gopher and pig related deaths in each zone	Mustard		Northern zones	100%
10/7/2022	KL	6 (2)	Warm	Southern zone: lower floodplain, ponds/ID02 and side channel irrigation ran today. Made some minor adjustments but, working good with clean filters. Set these zones to run Fridays every two weeks. *Sprayed repellent, liquid fence, on uncaged and browsed plants in all zones; mugwort and coyote brush were not sprayed. Many shrubs and trees are growing out of their cages. Collected acorns for direct seeding. These basins will be flagged with red flags. *1" sch 80 male adapter starting to drip in pump house. Would be a bit of a redo to fix because it is really close to other fittings. *Wasps were in pump house shed, seemed to exit after leaving door open for awhile				Southern zones	
10/20/2022	KL, MB, ML 6.5 (1.5) each	19.5 (4.5)	Hot afternoon, temp in low 40's upon arrival	Irrigation not producing enough flow at 8am; no water at top of Boyd during irrigation event. Low power was determined to be from lack of sun since, pump finally started to get enough flow around 9am. Switched all start times on all timers one hour later, all set for 14 day interval. Fixed two significant chew holes at pump house. Weeded a little more than half of Boyd starting on the southern edge ending a little past the valves. Performed a full weeding pass on the upper floodplain. Plants looking good after not getting irrigated for two weeks. Site is still very dry overall. Sediment accumulating in filters again, clean next week. Some native recruits showing in the upper floodplain; juncus,native dock, coyote mint. Spread native seed in areas disturbed by pigs;within planting areas		Mustard, YST, wild tobacco		Northern zones	100%
10/21/2022	KL, PP 5.5 (2.5) each	11 (5)	Warm, little cool breeze in the afternoon	Irrigation check in southern zones, all good. Fixed some basins and moved emitters from pig rutting. Leak in pump house is not too bad for now; barely even drips while system is on and anticipating the last irrigation event to be in two weeks. Continued weeding Boyd creek, still some more to be done on the north end. Weeded all of the lower floodplain. Willows and deciduous trees starting to show first signs of dormancy	Less gopher and pig damage	Mustard, YST		Southern zones	
10/28/2022	GS, PP (6.5 + 2.5 each)	13 (3)	Hazy	Collected pvc and other irrigation components from the storage container, pump house, upper floodplain and the 12 valve cluster. Break found in the upper floodplain, after valve where pvc crosses creek and is supported by T-stakes. The break is at the reducer bushing from 2" to 1.5". Left a 2" coupler and 2"-1.5" reducer bushing in the valve box. Missing a 1.5" coupler, bring fittings next visits turned ball valve and timer off at upper floodplain. Flushed and cleaned all water filters. Applied deer repellent to willows and browsed plants in all zones.					
11/2/2022	GS, PP (6.5 + 1.5 each)	13 (3)	Cloudy with occasional showers	Ran pond zones manually for 2 hours then turned timer off. Repaired break at upper floodplain and ran for 2 hours then switched timer off. Weeded dense mustard populations in the ponds and continued pulling and consolidating dry mustard in upper Boyd. Bubbles wrapped 2 of the tank valves. Will need more bubble wrap the do the rest. Pepper weed beginning to grow back in patch north of the pump house.					
11/7/2022	KL (1) GS, MB (6.5 + 1.5 each)	14 (3)	Cloudy, occasional sun	Powered off pump at both switches and closed ball valve from tanks at pump house. Ran irrigation in pump house, lower floodplain and pond zones for an hour to drain line. Opened hose valves at Boyd and 12 valve and 2" ball valve and cap at the pump house. Turned off all times. Weeded mustard in side channel. Planted acorns in pump house, Boyd, mother oak and a few in the lower floodplain and side Chanel. Marked acorn basins with red flag. Installed in basins with cage, irrigation and mulch. Drove RTV for a while but flat tire is still an issue and did not have air compressor. A tire patch kit could be ideal for the next visit **RTV NOTE: Was told by previous owner that they kept a spare wheel with tire on hand for flats as most cost effective eway to repair flats. Inquire with Kubota.**					

San Felipe Creek Maintenance Log WY 2022

Date	Staff	Hours on-site (travel)	Field Conditions	Task Descriptions and Location	Plant Mortality	Weeds controlled	Fenceline Patrol	Irrigation Inspection	Water Tank Level
11/21/2022	GS, HE (6.5 + 1.5 each)	13 (3)	Hazy, sunny	Retrieved RTV and inflated leaky tire. Tire was visibly flatter but held up until the end of the day. Fuel gauge at 3/4. Pump house - basins had good moisture below mulch. Pigs seem to have dug and tillled up soil around many of the basins but most plants were spared. 4 different mugwort clusters had been ripped out with roots munched. Browsing noted on a few other plants. Noticed occasional larger sambuucas that had been damaged by apparent rubbing in lower floodplain. Re established cages that had been lifted or damaged by pigs. Most pig activity noted at pump house and side Channel. Applied deer repellent to all willows and browsed plants. Weeded in mother oak zone					

APPENDIX C YEAR 4 GEOMORPHIC AND HYDROLOGIC MONITORING REPORT

YEAR 4 GEOMORPHIC AND HYDROLOGIC MONITORING, SAN FELIPE CREEK RESTORATION PROJECT, JOSEPH D. GRANT PARK, SANTA CLARA COUNTY, CALIFORNIA

Report prepared for:

Erin McDermott, Nomad Ecology

Prepared by:

John Hardy, M.S., CERPIT
Eric Donaldson, P.G.
Dave Shaw, P.G.

Balance Hydrologics, Inc.

December 2022

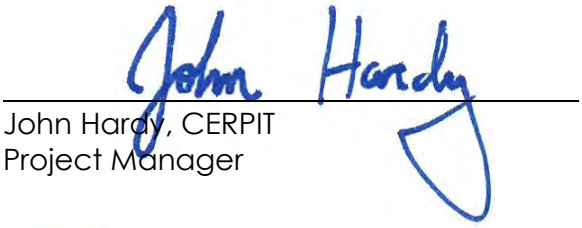
A report prepared for:

Erin McDermott
Nomad Ecology, LLC
822 Main Street
Martinez, California 94553
emcdermott@nomadecology.com

Year 4 Geomorphic and Hydrologic Monitoring, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California

 Project Assignment: 222108

by



John Hardy, CERPIT
Project Manager

Eric Donaldson, P.G.

Reviewed by: David Shaw, P.G., Principal-in-charge

Balance Hydrologics

800 Bancroft Way, Suite 101
Berkeley, California 94710
(510) 704-1000
office@balancehydro.com

December 2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

EXECUTIVE SUMMARY

This report summarizes the annual geomorphic and hydrologic monitoring results for Year 4 monitoring (Water Year[1] 2022, WY2022) of the San Felipe Creek Restoration Project (project), located along San Felipe and Boyds Creeks in Joseph D. Grant Park, Santa Clara County. The project provides advanced mitigation credit for the Santa Clara Valley Habitat Agency (SCVHA) as part of the Santa Clara Valley Habitat Conservation Plan (HCP) in-lieu fee program.

The project was completed in November 2018. Geomorphic and hydrologic monitoring began in October 2018, shortly after earthwork and structures were completed, and will extend for a 10-year period through October 2028 (WY2028). This work is being conducted by Balance Hydrologics, Inc. (Balance) staff geomorphologists and hydrologists. This report presents a brief description of the project, the success criteria set forth in the project Mitigation and Monitoring Plan (MMP, Monarres and others 2018), monitoring methods, monitoring results, and recommendations.

WY2022 was a dry year, with below-average annual precipitation. Due to the low frequency and intensity of storm events, the valley-fill aquifer at the project area experienced limited recharge. Shallow groundwater data suggest that the valley-fill aquifer became saturated. Streamflow in San Felipe Creek and Boyds Creek were also limited and occurred during late December for over a week. Peak flows did not exceed a 2-year event during WY2022, so a topographic survey was not required.

On September 23, 2020, the design and monitoring Team (Team) conducted a collaborative end of year review of the project area and agreed upon strategic adaptive management actions for select areas. These actions were completed by SCVHA and HRS in coordination with the Balance and Dudek project design and monitoring team. Balance was primarily involved in two adaptive management actions: 1) on November 4, 2020, HRS replaced a log on Boyds Creek that had been dislodged in an attempt to protect plantings on an outside bank, and 2) on August 26, September 20 and September 21, 2021, HRS constructed a debris jam structure to redirect flows into the pre-project channel alignment where a cutoff channel had

[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, WY2022 occurred from October 1, 2021, through September 30, 2022.

formed at ID03-02 in 2019. These two areas of adaptive management appear to be performing within the acceptable range of conditions.

During the Year 4 end of year site visit on September 23, 2022, no new areas of problematic erosion or aggradation were observed.

We recommend adding a second course of staked debris jams during summer 2023, as outlined in the MMP as part of the ongoing stewardship of the Project site, as all the jams appear to be stabilizing with aggraded sediment.

At the time of this report, the project is performing as intended. Adaptive management actions for hydrology and geomorphic conditions are not recommended at this time. The monitoring team will continue to monitor the site and evaluate conditions in the context of the success criteria laid out in the MMP.

1. SITE DESCRIPTION AND MONITORING CRITERIA

The San Felipe Creek Restoration project (Project) site is located along San Felipe Creek in Halls Valley at an elevation of approximately 1300 feet (NAVD88), within Joseph D. Grant Park County Park (**Figure 1**) in the headwaters of Coyote Creek. San Felipe Creek drains Halls Valley and has a watershed area of approximately 3.1 square miles at the upstream project boundary. Boyds Creek is tributary to San Felipe, flows into Halls Valley within the Project site from the flanks of Mount Hamilton to the east, and has a watershed area of approximately 2.6 square miles. The purpose of the Project was to restore approximately 1 mile of stream channel by restoring hydrologic function, modifying in-channel habitat and restoring dynamic channel and floodplain functions along San Felipe and Boyds Creeks between the Corral Trail and Cañada de Pala Trail.

Legacy agricultural activities influenced overland flow pathways and channel morphology. The site conditions, impairments and restoration actions are described in the project conceptual design and feasibility study report (Donaldson and others, 2017). The impairment map assembled for that report is attached as **Appendix A**. The Project was intended to mitigate impacts from historical land uses and disturbances, enhance aquatic and upland habitats, and make San Felipe Creek and Boyds Creek more resilient to climate change. Restoration activities consisted of the following:

- re-establishment of dispersed flow paths across eroded portions the Corral Trail and across the Boyds Creek alluvial fan,
- re-connection of distributary channels on the Boyds Creek alluvial fan and placement of instream wood to disperse flows and establish dynamic flow paths,
- excavation of inset floodplains on San Felipe Creek,
- partial filling of an eroded Agricultural Ditch to create ponded areas and slow subsurface drainage of adjacent desiccated wetland areas, and
- placement of wood debris structures to reverse incision on an unnamed tributary to San Felipe Creek, the "Incised Eastern Tributary".

The San Felipe Creek Restoration Project MMP (Monarres and others, 2018) establishes hydrologic and geomorphic success criteria and monitoring requirements for the project. Relevant hydrologic and geomorphic success criteria and associated monitoring approaches are catalogued in **Table 1**. Monitoring station locations are shown in **Figure 2**.

2. MONITORING METHODS

The MMP requires at least 10 years of hydrologic and geomorphic monitoring to establish project success and establish the restoration and enhancement credits. Creek stage (water level) and flow, wetland inundation duration, and qualitative geomorphic monitoring will occur every year. Repeat topographic surveys are planned for years in which a 2-year flow or greater has occurred. No fewer than three topographic surveys are required over the course of the 10-year monitoring period, and one topographic survey will be conducted during Year-10 monitoring.

2.1 Hydrologic Monitoring

2.1.1 Rainfall

To provide context for the hydrologic and geomorphic data collected at the project site, we present rainfall data from the University of California Berkeley Blue Oak Ranch Reserve (UCBO) rain gage[2], located 4.5 miles northwest of the site at approximately 1800 feet MSL elevation. Average annual rainfall at the UCBO station is approximately the same as at the Project site (Santa Clara County Drainage Manual, Schaaf and Wheeler, 2007).

2.1.2 Water Levels and Streamflow Monitoring

We established a stream, wetland, and groundwater-level monitoring network following completion of restoration work and prior to significant winter rainfall in December 2018. The following list describes the gaging methods for each type of gage:

Stage and streamflow: To monitor water levels and estimate streamflow in San Felipe and Boyds Creek, we installed continuous-recording water level sensors which collect and record 15-minute stage measurements within the designed wetland features and nearby channels and wetlands. Balance staff visited the site multiple times during the rainy season and during the dry season to calibrate, repair, and download water level recorders. Water level data were used to create 15-minute stage hydrographs at stream stage and streamflow stations.

[2] Long-term data are available through the Western Regional Climate Center (https://wrcc.dri.edu/weather/ucbo.html), and 10-minute interval preliminary data are used here with permission from University of California at Berkeley (http://sensor.berkeley.edu/index_ucnrs.html).

We established three streamflow gages, two on San Felipe Creek (SFUS and SFDS) and one on Boyds Creek (BCUS)[3]. Periodic staff plate readings are used to calibrate the 15-minute depth data recorded by the logger and convert the raw water level record to a stage record, according to the local datum. To develop an estimated record of streamflow, periodic streamflow measurements were taken during Year 1 monitoring in accordance with practices outlined in the U.S. Geological Survey Techniques of Water Resources Investigations[4]. The manual flow measurements were used to establish Manning's roughness coefficients at streamflow gage sites. A rating curve was then developed to convert stage to streamflow using the Manning's calculator in United States Corps of Engineers Hydraulic Engineering Center River Analysis System (HEC-RAS) 5.0. The stage-discharge rating was then calibrated using additional manual flow measurements. For the purposes of evaluating the success criteria outlined above and in **Table 1**, the estimated streamflow record is considered to be sufficient. Additional measurements are required to develop a more accurate streamflow record, and will be taken opportunistically, but due to the limited surface flows at the site during Year 4 and the methods outlined above, no staff were on-site during the brief periods of surface flow and no streamflow measurements were taken.

Groundwater monitoring: To monitor groundwater levels near constructed floodplain features, channels and wetlands, we installed continuous-recording water level sensors in 4 of the 5 piezometers which were used during the pre-project evaluation. Water level data were calibrated against periodic manual depth-to-water readings to develop 1-hour depth-to-groundwater (below the ground surface) records. The ground surface and top of each piezometer were also surveyed and used to convert the depth-to-water records to groundwater elevation records.

Surface ponding in wetlands: To monitor inundation duration within wetland areas, we installed continuous-recording water level sensors in stilling wells along with staff plates. Water level data were calibrated to periodic manual stage readings to develop hourly wetland stage records.

[3] Note that Boyds Creek Downstream (BCDS) is a stage-only gage.

[4] https://pubs.usgs.gov/twri/index090905.html

Peak stage near floodplains: To record peak stage and document whether floodplains were inundated, we installed six additional water level recorders at select locations across the project site (BCA1, BCA2, BCA3, BCA4, BCDS, SFDF). Data from these supplemental stations are archived along with manual stage and high-water mark readings.

2.1.3 Monitoring Locations

A complete list of hydrologic monitoring stations and location descriptions are included in **Table 2** and station locations are shown in **Figure 2**. We present relevant site observations in station observer logs. The station observer log for surface water stations is presented in **Appendix D** and the station observer log for groundwater stations is presented in **Appendix E**.

For the purposes of this monitoring program, 3 types of features are considered:

- Excavated or constructed restoration elements on ephemeral drainages (ED) and intermittent drainages (ID). Excavated features are named according to their identifying symbols in the project plans and the project MMP: ID03-01, ID03-01A, ID03-02, etc. In some cases, informal nomenclature is also used for ease of communication. At the restored Agricultural Ditch (ED03), a series of five ponds separated by sediment plugs were excavated.
- Names for pre-existing enhanced and restored seasonal wetlands that are within or near the project area are the same as those initially given to them in the MMP, prior to project construction: SW02, SW03, and SW04.
- The Corral Trail and drainage lenses.

We installed stage and streamflow monitoring stations on both Boyds Creek and San Felipe Creek at the upstream and downstream ends of the site, per requirements in the MMP. Piezometers are located near constructed floodplain and wetland features. Surface ponding gages were also placed in or near wetland features and the expanded wetlands at ED03. Peak stage gages are placed in distributary channels associated with the Boyds Creek alluvial fan as well as in the channel that drains the ponded areas at ED03.

On December 10, 2021, we relocated ADDC from within the Agricultural Ditch drainage channel to San Felipe Creek in the vicinity of the created floodplain areas ID03-03 and

ID03-04 and labeled the new station San Felipe Downstream Floodplain (SFDF). During the same visit, we also relocated SFDS approximately 500 feet downstream to the northeastern apex of the channel bend adjacent to ID03-02.

2.2 Geomorphic Monitoring

2.2.1 Qualitative Observations

Balance staff visited the site during the wet and dry season to observe streamflow conditions and areas of surface ponding, document evidence of runoff patterns, and inspect the stability of constructed features. Hydrologic observations were catalogued in field observer logs. When practical and safe, a small unmanned aerial vehicle (UAV, or drone) was used to collect oblique aerial photos and repeat vertical aerial photographs.

2.2.2 Topographic Surveys

Flow recurrence estimates are presented here to lend context to year-by-year observations of the site and establish whether 2-year recurrence flows occurred at the project site during the monitoring year, a trigger for topographic data collection, per the MMP. We use estimated peak streamflow at SFUS and compare this to calculated peak flow recurrence estimates according to regional regression relationships developed by Gotvald and others (2012), as summarized in **Table 3**. As stated above, during years when peak flows at SFUS exceed the 2-year threshold, topographic survey data will be collected. Topographic data was not collected during WY2022 monitoring.

3. MONITORING RESULTS

3.1 Overview of Annual Conditions

3.1.1 Rainfall

Annual precipitation in the vicinity of the Project site was 16.6 inches during WY2022, as recorded at the UCBO station (**Figure 3**), less than the long-term average of 24 inches, as reported in the Santa Clara County drainage manual. The UCBO station has been operating since 2011, and the average annual rainfall at UCBO over the 11-year period of record is 22.4 inches.

Annual precipitation during WY2022 was characterized by an unusually large early-season atmospheric river event in late October 2021 as well as several high intensity storms in December 2021, followed by a very dry period that spanned what are typically the wettest months of the water year (January 2022 through April 2022). The largest WY2022 events were multi-day storms that occurred in October 2021 and December 2021. On October 24 and 25, 2021, 4.2 inches of rain was recorded. Between December 21 and 27, 2021, 4.4 inches of rain was recorded. Peak 24-hour rainfall was 4.0 inches, recorded between 10:00 AM on October 24 and 10:00 AM on October 25, 2021. Because the storm was very early in the season and soils were very dry, very little flow response occurred.

3.1.2 Site Hydrologic Response

3.1.2.1 Streamflow Gaging

Stage and estimated streamflow records for the Boyds Creek upstream station (BCUS) and the San Felipe upstream (SFUS) and downstream (SFDS) stations are presented in **Figure 4** through **Figure 6**.

Streamflow at the Boyds Creek upstream station (BCUS) occurred in response to rainfall between December 14 and 17, 2021, after about 8.5 inches of cumulative seasonal rainfall at the Blue Oak Preserve. Streamflow at BCUS again responded for a longer period of time between December 23, 2021, and January 3, 2022.

Streamflow commenced along San Felipe Creek after about 11 inches of seasonal rainfall. Streamflow at the San Felipe Creek upstream station (SFUS) occurred in response to rainfall December 24, 2021, and January 8, 2022.

At the San Felipe Creek downstream station (SFDS) streamflow occurred in response to rainfall between December 24, 2021, and January 16, 2022.

The annual peak flow at SFUS was recorded on December 27, 2021. The annual peak flow on Boyds Creek and at SFDS were recorded on December 25, 2021. Peak flows at BCUS and SFUS are estimated to be 21.5 and 27.4 cfs, respectively (**Figure 4** and **Figure 5**). Calibration data at SFDS are not sufficient to generate flow estimates from the record of stage. When sufficient data are collected, we will add a record of streamflow to **Figure 6**.

During WY2022 we relocated the ADDC gage that was formerly located in ID03-05 to San Felipe Creek between ID03-03 and ID03-04 and renamed SFDF (See **Figure 2**), to evaluate frequency and timing of floodplain inundation at ID03-03 and ID03-04. **Figure 7** presents water levels at SFDF.

The estimated annual peak flows are below the 2-year flows established from regional regression equations (Gotvald and others, 2012).

3.1.2.2 Groundwater and Surface Water Interactions

Groundwater and surface water levels were measured in the central portion of the project site in the vicinity of San Felipe Creek (**Figures 8a** and **8b**) and Boyds Creek (**Figure 9a and 9b**). Water level data from Piezometer 16-2 suggest that groundwater levels in the alluvial aquifer underlying the site began rising[5] in response to rainfall on December 24, 2021, after approximately 10 inches of cumulative seasonal rainfall. The water level in Piezometer 19-1 also began rising on December 24, 2021, approximately 9 hours after a response was detected in Piezometer 16-2.

Water level in Piezometer 16-5 began rising on December 25, 2021, shortly after flow was detected in Boyds Creek and BCUS and BCDS. Review of the water level data in the Boyds Creek distributary channels BCA1, BCA2, BCA3 and BCA4 suggests BCA3 and BCA4 received flow during WY2022 (**Figure 10**)**.** Inundation was detected in the BCA3 distributary channel during the high flow event on December 24, 2021, suggesting that this channel became activated in response to high flow. Inundation was detected in the BCA4 secondary distributary channel between December 27, 2021, and January 9,

[5] Piezometers range from 6 to 7 feet depth below ground surface, thus water level changes which occur deeper than 6 to 7 feet are not detected.

2021, suggesting that the response at BCA4 was due to groundwater rising high enough in the Boyds Creek alluvial fan to inundate the BCA4 channel.

Similar to previous years, groundwater and surface water gages (SFUS, Piezometer 16-2 and 19-1) in the vicinity of San Felipe Creek upstream of the confluence with Boyds Creek tends to demonstrate "losing stream" characteristics initially with the onset of rainfall and streamflow, and then appears to be a partially "gaining stream" during baseflow periods, with inputs dominated by slightly higher groundwater on the west (right) side of the channel. The early season 'losing stream' relationship is indicated by hydraulic gradients between the San Felipe Creek channel (SFUS) and Piezometers 19-1 and 16-2, where water surface elevations in the stream and right (west) bank are slightly higher than that in the valley on the left side of the stream. Water levels at SDUS and in Piezometer 19-1 are very similar beginning after the steady rains of late December 2021, when the stream appeared to be largely equilibrated with a nearly saturated valley-fill aquifer. Finally, after the first week of January 2022, gradient toward San Felipe Creek appears to only be coming from the valley slope on the left bank (west), and even then, only slightly, possibly suggesting that San Felipe Creek continued to lose water to the alluvial aquifer. Water levels at SFUS remain nearly steady between December 31, 2021, and January 8, 2022. Prior to water levels falling starting on about January 8, 2022, flow was present, but after that date, flow ceased in San Felipe Creek and the pool where the gage is located slowly drained as water levels in the underlying aquifer fell.

Groundwater and surface water gages (Piezometer 16-3 and ADWW, respectively) in the vicinity of the restored Agricultural Ditch (ED03) are presented in **Figure 11**. Unlike WY2021[6] (but similar to prior years), groundwater conditions adjacent to the restored Agricultural Ditch appeared to respond only after substantial seasonal rainfall (approximately 13 inches) and several days after the heavy rains that began on December 31, 2021. Based on the water level data collected at ADWW, it appears that the restored Agricultural Ditch did not fill completely and spill into the ID03-05 drainage channel. However, ponding occurred from December 23, 2021, through May 28, 2022 (**Figure 11**). At Piezometer 16-3, which measures groundwater levels in the vicinity of seasonal wetland SW-02, the groundwater response is delayed relative to ADWW; we see a response in water levels in Piezometer 16-3 on December 31, 2021, 8 days after ADWW. The delayed response in Piezometer 16-3, and comparatively lower water levels in the agricultural ditch wetland, suggest that upgradient contributions from adjacent

[6] During the previous monitoring year, WY2021, Piezometer 16-3 appeared to respond earlier in the wet season. It is likely that the rapid response to initial wet season rainfall during WY2021 was a result of more intense site irrigation prior to the onset of winter rains.

hillslopes, and possibly the Boyds Creek alluvial fan are key to filling the underlying aquifer in the area of SW02. In WY2022, groundwater levels in Piezometer 16-3 crested at about 3.5 feet below the wetland surface.

Most wetland areas appear to have met the hydrologic criteria for seasonal wetlands during WY2022. It is unclear whether the wetland areas SW02 and SW04 met the hydrologic criteria for seasonal wetlands during WY2022, but since WY2022 was a below-average rainfall year, the site is meeting this hydrologic success criteria.

3.1.3 Geomorphic Monitoring Results

Balance staff visited the project site on December 10, 2021, January 25, 2022, March 25, 2022, and September 23, 2022, to make visual observations of the constructed project elements. Aerial photographs were taken on September 23, 2022 and were stitched together to create an orthorectified mosaic aerial photograph of the entire site (**Appendix B**). Aerial orthomosaic photos for Years 1 through 3 can be seen in the Year 3 monitoring report (Donaldson and others, 2021a). For comparison, as-built drawings are included in **Appendix C**[7].

3.2 Success Criteria

3.2.1 Success Criterion 1: More Than 14 Days of Inundation/Saturation at Seasonal Wetlands in an Average or Above-average Precipitation Year

The MMP defines wetland success as 14 days of inundation/saturation in normal to wet years. WY2022 rainfall was approximately 74 percent of average, following two drier-than-normal water years. Despite the lack of abundant rainfall and multi-year lower-than-normal-rainfall conditions, enough rain fell to support a portion of on-site wetlands.

Water levels in ED03-02 within the agricultural ditch, persisted for at least 5 months (**Figure 11**). All of the agricultural ditch wetlands held water for more than 14 days. Photos provided by SCVHA staff suggest that all of the agricultural ditch wetlands were filled from approximately late December through at least April 8, 2022[8]. Though no direct ponding or soil saturation measurements were taken within season wetlands SW02 and SW04, water levels presented in **Figure 11** suggest that groundwater-levels in

[7] Please note that coordinates and elevations presented in the as-built drawings were updated during Year-1 monitoring. Due to improvements in technology, topographic data and water level stations are referenced to NAVD88 in this report.

[8] The ADWW gage is approximately 0.5 feet above the deepest part of ED03-02.

those areas did not rise to the wetland surface, suggesting that wetland criteria for SW02 and SW04 were not met during WY2022.

Surface ponding in the seasonal wetland at the Corral Trail Seasonal Wetland station (CTSW) was detected between December 25, 2021, and January 6, 2022 (**Figure 12**), after approximately 12 inches or seasonal rainfall, suggesting that longer duration ponding in the wetland likely occurs only after substantial seasonal rainfall has recharged the underlying alluvial aquifer. Surface ponding in this wetland lasted for approximately 13 days, though moist soil conditions likely continued for days after this period.

Seasonal wetlands SW02 and SW04 did not likely meet the hydrologic wetland criteria, however, because a less-than-average amount of rain fell during WY2022, the site is meeting the Success Criterion 1 for wetland hydrology.

3.2.2 Success Criterion 2: Inset Floodplains Inundated By 2-Year Event

A 2-year streamflow event did not occur during WY2022; therefore, this success criterion is not applicable. Nonetheless, we observed that inset floodplains were inundated during WY2022. In **Figure 5** it appears that water levels at SFUS inundated the ID03-01floodplain briefly on December 25 and 27, 2021, suggesting that the ID03-01 floodplain may have been partially or completely inundated during those storm events. Similarly, **Figure 6** shows water levels at SFDS inundated the ID03-02 floodplain briefly on December 25 and 27, 2021, suggesting that the ID03-02 floodplain may have been partially or completely inundated during those storm events. **Figures 7 and 13** suggest that ID03-03 and ID03-04 were inundated, at least partially for approximately a month starting on December 25, 2021.

3.2.3 Success Criterion 3: Flow in Two or More Boyds Creek Channels During Winter Season

Success Criteria 3 (**Table 1**) states that flows from Boyds Creek should occupy at least two of the existing or created channels (located at area ED01-01) across the Boyds Creek alluvial fan during the monitoring year. WY2022 was the third consecutive year of drought, however enough rain fell during the early part of the water year to trigger flow in 3 of the 5 distributary channels (BCDS, BCA3 and BCA4, see **Figures 9 and 10**) during the wet period in late December 2021. Success Criterion 3 was met during WY2022.

One log that was a long member in Living Log Jam A on the Boyds Creek alluvial fan become dislodged during WY2022 (See map of log jams in **Appendix D**). The log was dislodged from the upper-most two log jam on the mainstem of Boyds Creek, just downstream of the flow split to the BCA1 channel. The logs largely serve to raise the channel thalweg in the mainstem of Boyds Creek to encourage flows to enter the distributary channels and satisfy Success Criterion 3. Since Success Criterion 3 is being met, even in drier-than-normal years, we do not recommend the replacing the log at this time.

3.2.4 Success Criterion 4: Less Than One Foot of Elevation Loss in Stream Channels, Averaged Overreach[9] and Absence of a Significant Knick Point

Due to the lack of 2-year flows, and field observations which indicated limited or no substantial change, we did not collect topographic data to detect topographic change and evaluate Success Criterion 4 during WY2022.Observations made during site visits did not indicate any new areas of problematic erosion during WY2022.

3.2.4.1 ED01-01 – Boyds Creek Alluvial Fan

In WY2022, two logs from two separate living log jams moved downstream. Logs placed as part of the living log jams were intentionally not anchored so that active channel dynamics and migration could occur. Therefore, movement of logs was anticipated. In many cases, we observed localized scour and deposition within 1 to 10 feet of the placed logs, with bed aggradation upstream, and scouring of pools downstream of logs. All of the living log jams installed on the abandoned branch of Boyds Creek (BCA4), are stable and remain largely buried. Though localized scour and deposition greater than one foot occurred locally, no net degradation or lowering of the streambed was observed across the reach. This is consistent with the expected response described in the MMP; the living log jams are functioning as intended.

Based on a collaborative review at the end of WY2020, the Project Team decided to replace one log in an effort to protect three oak plantings (**Figure 14**). This adaptive management measure was executed on November 4, 2020 and is presented in the adaptive management as-built memorandum (Donaldson and others, 2021b). The log has not moved since being installed, and planted oaks continue to grow.

[9] For the purposes of measuring elevation loss with respect to the success criterion, we interpret reach over which average elevation loss is detected to be defined by the reaches laid out in the project impairment map (**Appendix A**). For Boyds Creek, we take reach to be defined as the length of Boyds Creek within the project boundary.

We will continue to monitor placed logs and make adaptive management recommendations if floodplain inundation or bed elevation success criteria are not met, or if vegetative survivorship success criteria are threatened.

3.2.4.2 Graded Swale (ID03-01a)

This swale allows overland stormflows from the Corral Trail drainage lenses and the Boyds Creek alluvial fan to return to San Felipe Creek without causing excess erosion. It is unclear whether hydrologic conditions were sufficiently wet to generate runoff through the ID01-01a swale; no erosion was noted at the graded swale, and the feature appears to be functioning as intended.

3.2.4.3 San Felipe Creek Graded Floodplain ID03-01

No notable erosion or deposition was noted during WY2022 end-of-year site inspections. We noted that grasses are becoming well-established on the floodplain, and we anticipate those will continue to provide soil strength. The channel and floodplain morphology are within the expected range of outcomes and the channel through this reach is meeting Success Criterion 4.

3.2.4.4 San Felipe Creek Graded Floodplains ID03-02, ID03-03, and ID03-04

At these locations, the designed floodplain was reconfigured by high flows during WY2019, which inundated and flowed across the created floodplain features with enough velocity to form new channels. At these locations, however, much of the former channel experienced deposition, thereby balancing the sediment production from this area, with minimal net change in channel bed elevation. Other portions of the abandoned channel features formed backwater pools/channels at low flows.

Year 1 topographic data (Donaldson and others, 2020) indicated that some areas of the ID03-02 floodplain along San Felipe Creek, experienced over 1 foot of incision where the new cutoff channel formed through the created floodplain during the first year after construction. However, it should be noted that the new channel thalweg elevation is very close (i.e., less than 1-foot vertical difference) when compared to the former channel elevation. Follow-up observations suggest the cutoff channel changed little during WY2020 (**Figure 15**). Thus, we interpreted that Success Criterion 4 is being met at this location.

Based on a collaborative review at the end of WY2020, the Team sought to offset the risk of a new channel evolving to become a dominant and/or incising single thread channel at ID03-02. Adaptive management activities were initiated during WY2021 and consisted of installing a bioengineered debris jam during WY2021 in the inlet of the new channel to direct flows to the historic channel alignment and continue to encourage flows to spread across the created floodplain area. This work was completed on August 26, 2021and is presented in **Figure 15** and the adaptive management as-built memorandum (Donaldson and others, 2021b). Very little change occurred at ID03-02 during WY2022, despite flows inundating the floodplain in the vicinity of the bio-engineered debris jam, and Success Criterion 4 continues to be met at ID03-02.

Similar to ID03-02, the constructed floodplains at ID03-03 and ID03-04 were inundated and modified by WY2019 high flows, but channel avulsion did not occur at these locations. Rather, a set of shallow channels and backwater features become developed. The observed dynamism of the channel is within the expected outcomes for the design and the site is functioning as expected, with less than 1 foot of vertical elevation change and active channel dynamics within the inset and widened floodplain corridors. Success Criterion 4 is being met at ID03-03 and ID03-04.

3.2.4.5 Created Channel ID03-05

During WY2019, we observed 1 to 3 feet of erosion at the confluence of ID03-05 and San Felipe Creek, which appears to have resulted from the focusing of scour on the left bank of San Felipe Creek during high flows at the outside of the bend, exacerbated by the downstream site boundary exclusion fence which crosses San Felipe Creek at this location (See **Appendix C** for boundary fence alignment). The fence has been improved, and we expect less flow restriction during high flows in the future. With the exception of the dramatic increase in vegetative cover, the bank erosion appears to not have changed subsequent to WY2019, including WY2022, and is contained to a small area and does not appear to affect the function of stability of ID03-05 or San Felipe Creek. Thus, the channel morphology is within the expected range of outcomes and is meeting Success Criterion 4.

3.2.5 Success Criteria 5 and 6: Corral Trail and Lower Hotel Arizona Crossing Stability (R-01)

During end-of-year site visit observations, no deleterious erosion or deposition was observed in or around the drainage lenses and Corral Trail (**Figure 16**). The PVC pipes in the drainage were not clogged. There was no evidence (e.g., high-water marks) that the Corral Trail overtopped during WY202. The articulated mat Arizona Crossing

constructed on the Lower Hotel Trail is performing as designed and no deleterious erosion or deposition was noted (**Figure 16**). Success Criteria 5 and 6 are being met.

3.2.6 Success Criterion 7: Staked Debris Jams at ID02-01 Intact and Capturing Sediment

Staked debris jams were installed in the Incised Tributary (ID02-01), including four standard staked debris jams and two hand-built staked debris jams utilizing slash and cobbles. During Years 1 through 3, the staked debris jams appeared to both retain and release sediment. This process is to be expected, and it appears all the staked debris jams are functioning as intended, serving to capture episodic sediment delivered during high flows and meter sediment out during intermediate flows (**Figure 17**).
At this time, we recommend adding a second course of staked debris jams, as outlined in the MMP, during summer 2023. At this point as all jams are considered to be "full", trapped sediment and debris has had the opportunity to consolidate, and additional aggradation could take place with additional structures, and would benefit the system with continued progress toward a long-term goal of reversing incision in this channel.

4. CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

From a hydrologic and geomorphic perspective, the San Felipe Creek Restoration Project is performing as intended. In WY2022 the Project is meeting all the hydrologic and geomorphic success criteria described in the MMP.

Based on Year 1 through Year 4 observations, we note the following:

- Flows from Boyds Creek and San Felipe Creek appear to have been the primary sources of groundwater recharge to the alluvial aquifer at the confluence of the Boyds Creek alluvial fan and San Felipe Creek. Shallow groundwater entering the alluvial aquifer from the west side of the valley also appear to contribute to recharge, but to a lesser degree.

- Year 1 through 4 monitoring data suggested the restoration project increases the rate of groundwater recharge and the volume of storage. Pre-project data collected during WY2017 suggests about 15 inches of rainfall was required for aquifer saturation. As with observations made during the first three years of post-project monitoring, the aquifer appears to be nearly full after less cumulative seasonal rainfall; for example, during WY2022 in the vicinity of Piezometer 16-2 saturation appears to have occurred after approximately 10 inches of rainfall.

- Estimated annual peak flows did not exceed a 2-year recurrence flow. Nevertheless, we observed that nearly all hydrologic success criteria for normal or greater-than-normal hydrologic years were likely met.

- The Corral Trail and Lower Hotel Trail Arizona crossing are performing as intended, dispersing flows across the alluvial fan, with no road erosion or flow capture.

- As outlined in the MMP as part of the ongoing stewardship of the Project site, installation of a second course of staked debris jams was planned, once the first course had stabilized with aggraded with sediment. We recommend adding a second course of staked debris jams during summer 2023, as all the jams appear to be stabilizing with aggraded sediment. Continued aggradation will benefit the channel by reversing the incision that has taken place in this tributary.

- Adaptive management actions for hydrology and geomorphic conditions are not recommended at this time.

This monitoring program is scheduled to continue through Year 5, and monitoring will continue with respect to the success criteria, with additional attention on the processes affecting the above areas of interest.

5. LIMITIATIONS

Data and conclusions presented in this report are based on available observations and measurements. If other additional data should become available, or if we find that observations, measurements, or calculations were in error, we reserve the right to correct and update the data based on new information. Many sources of uncertainty can influence the data, such as transient physical changes to the monitoring location. Balance Hydrologics has prepared this report for the client's exclusive use on this project. Use of these data by others and for other purposes without the written consent of Balance Hydrologics, Inc. is not permitted and could lead to significant error and/or environmental damage.

6. REFERENCES

Donaldson, E., Hardy, J., Shaw D., 2021a. Year 3 Geomorphic and Hydrologic Monitoring, San Felipe Restoration Project, Joseph D. Grant Park, Santa Clara County, California. 19 p. + tables, figures, and appendices.

Donaldson, E., Shaw D., Hardy, J., 2021b. San Felipe Restoration Project 2020-2021 adaptive management as-built memo: Balance Hydrologics consulting report prepared for Dudek, 2 p. + attachments.

Donaldson, E., Shaw, D., and Senter, A., 2017. Conceptual Design and Feasibility Study, San Felipe Creek, Santa Clara County, California. Prepared by Balance Hydrologics, Inc., Dudek, Inc., and Habitat Restoration Sciences, Inc for the Santa Clara Valley Habitat Agency. 72 p. + plates and appendices.

England, J.F., Jr., Cohn, T.A., Faber, B.A., Stedinger, J.R., Thomas, W.O., Jr., Veilleux, A.G., Kiang, J.E., and Mason, R.R., Jr., 2018. Guidelines for determining flood flow frequency--Bulletin 17C: U.S. Geological Survey Techniques and Methods, book 4, chap. B5, 148. https://doi.org/10.3133/tm4B5.

Gotvald, A.J., Barth, N.A., Veilleuz, A.G., and Parrett, C., 2012, Methods for determining magnitude and frequency of floods in California, based on data through water year 2006, U.S., Geological Survey Scientific Investigations Report 2012-5113, 38 p.

Monarres, L., Burris, L., Zanzi, J., and Wickens, D., 2018, San Felipe Creek Restoration Project Mitigation and Monitoring Plan. Prepared for the Santa Clara Valley Habitat Agency. June 2018 version. 94 p. + figures and appendices.

Schaaf and Wheeler, 2007. Santa Clara County Drainage Manual. Prepared for Santa Clara County, 66 p. + appendices.

TABLES

Table 1. San Felipe Creek Restoration Project Success Criteria and Associated Monitoring Approaches, Santa Clara County, California

Crit. #	MMP Section	Area	Success Criteria	Monitoring Approach
			Hydrologic Success Criteria	
1	12.2 (Table 15)	Wetland rehabilitation and enhancement areas	14 days of ponding or saturated soils in an average or above-average rainfall year	Surface water and shallow groundwater gaging in and adjacent to wetland features
2	12.3 (Table 16)	Inset floodplains on San Felipe Creek	Inset floodplain inundation if peak flows exceed a 2-year event	Surface water gaging and post-storm observations of high-water marks
3	12.3 (Table 16)	Boyds Creek alluvial fan	Flow in 2 or more channels during each winter season	Water level and estimated flow gages in break-out channels, and post-storm observations of high-water marks
			Geomorphic Success Criteria	
4	12.3 (Table 16)	Boyds and San Felipe Creeks	Less than 1 foot of channel bed elevation loss	End-of-water year topographic surveys following years when the 2-year flow is exceeded. No fewer than 3 topographic surveys will occur over the 10-year monitoring surveys.
5	12.3 (Table 16)	Corral Trail drainage lenses	During- and post-storm: If Corral Trail is/was overtopped, positive flow off of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged	Visual inspection during and after wet-season
6	12.3 (Table 16)	Lower Hotel Trail Arizona crossing	Articulated mat is stable and no significant knickpoints have formed	Visual inspection during and after wet-season
7	12.3 (Table 16)	Staked debris jams	Staked material is intact and in such a condition to capture sediment and organic material transported by creek	Visual inspection during and after wet-season

Table 2. Hydrologic Monitoring Stations and Descriptions, San Felipe Creek Restoration Project, Santa Clara County, California

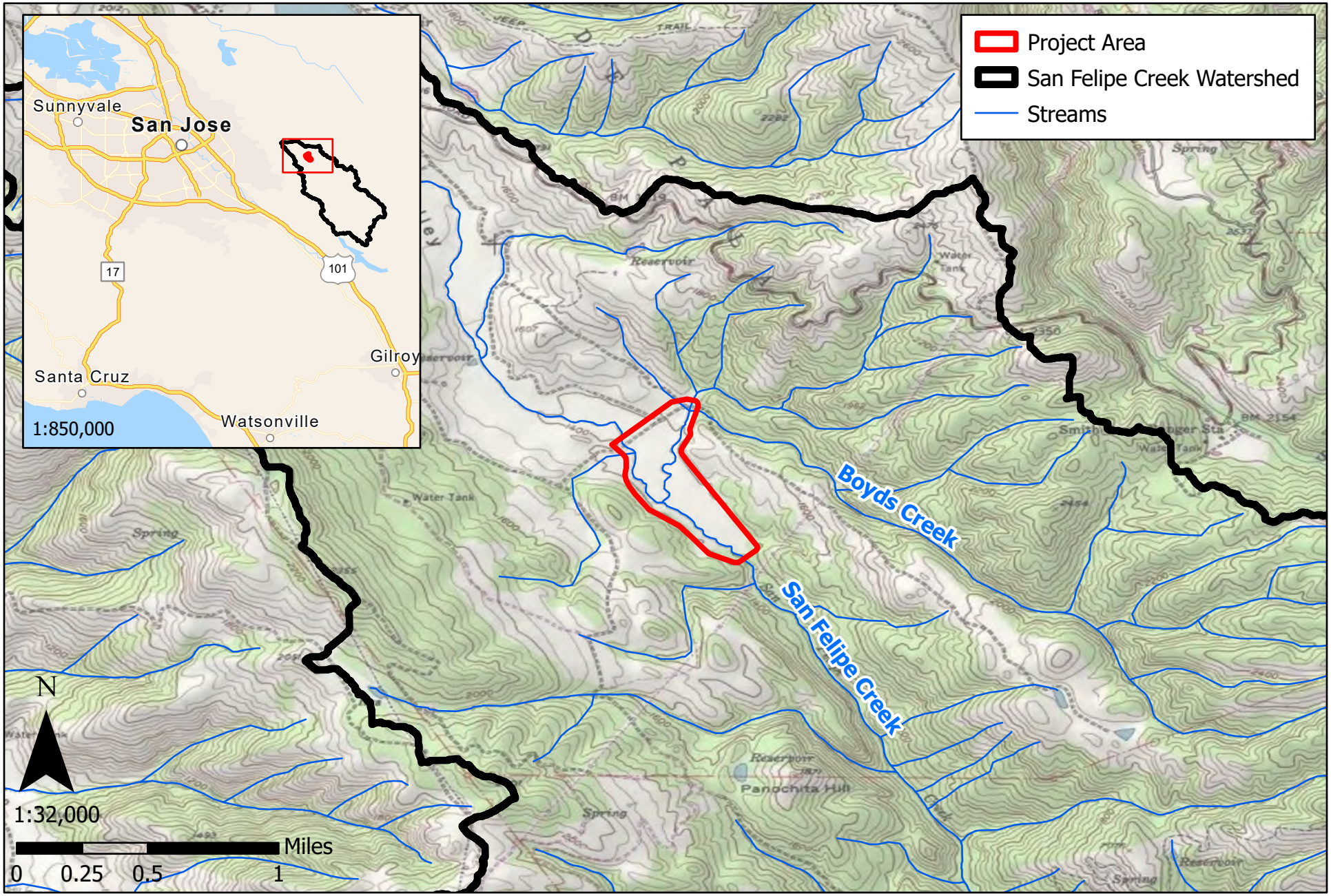
Station Name	Gage type	Station Description
Seasonal wetland water level gages and piezometers		
Piezometer 16-2	Piezometer	Formerly Piezometer A, west of San Felipe Creek near station SFUS (adjacent to project area ID03-01)
Piezometer 19-1	Piezometer	East of San Felipe Creek near station SFUS (adjacent to project area ID03-01)
Piezometer 16-5	Piezometer	Formerly Piezometer C, north of Boyds Creek near station BCDS
Piezometer 16-3	Piezometer	Formerly Piezometer E, east side of SW04 (Agricultural Ditch Wetland) (adjacent to project area ED03)
ADWW	Seasonal wetland water level	In ED03-02 (relocated during WY2021)
CTSW	Seasonal wetland water level	Southeast side of SW03, Corral Trail seasonal wetland (north of Corral Trail)
Stream water level and flow gages		
BCUS	Water level and estimated flow	Boyds Creek upstream of project site
SFUS	Water level and estimated flow	San Felipe near upstream end of site (adjacent to project area ID03-01)
SFDS	Water level and estimated flow	San Felipe Creek upstream of project area ID03-02, SFDS was moved upstream on 3/18/19 after the original location was cutoff from flow
BCDS	Water level	Boyds Creek near the confluence with San Felipe Creek
BCA1	Water level	Boyds Creek distributary channels (in project area ED01-01)
BCA2	Water level	Boyds Creek distributary channels (in project area ED01-01)
BCA3	Water level	Boyds Creek distributary channels (in project area ED01-01)
BCA4	Water level	Boyds Creek distributary channels (in project area ED01-01)
SFDF	Water level	San Felipe Creek near project areas ID03-03 and ID03-04
Rainfall		
U.C. Berkeley Blue Oak Rainfall gage (Data courtesy of U.C. Berkeley)		

Table 3. Estimated Peak Flow Recurrence on San Felipe and Boyds Creek,
San Felipe Creek Restoration Project, Santa Clara County, California

USGS Regional Regression Equations, Discharge Estimates

USGS Regional Regression equations for Central Coast (Region 4) and North Coast (Region 1) of California (Gotvald et al., 2012)	(SFUS) *San Felipe upstream of Boyds Creek*	(BCUS) *Boyds Creek*	(ED03) *Incising Agricultural Channel*	(ID02-01) *Incising Southern Tributary*	*San Felipe-Boyds to downstream Project boundary*
A = Drainage Area (mi^2)	3.1	2.6	0.07	0.08	5.8
P = Mean Annual Precipitation (in/yr)	24	24	24	24	24
	cfs	*cfs*	*cfs*	*cfs*	*cfs*
Central Coast (Region 4)					
$Q_2 = 0.00459A^{0.856}P^{2.58}$	44	37	2	2	75
$Q_5 = 0.0984A^{0.852}P^{1.97}$	135	114	5	6	231
$Q_{10} = 0.460A^{0.846}P^{1.66}$	234	199	9	11	398
$Q_{25} = 2.13A^{0.842}P^{1.34}$	391	332	16	18	662
$Q_{50} = 5.32A^{0.840}P^{1.15}$	532	452	21	25	901
$Q_{100} = 11.0A^{0.84}P^{0.994}$	670	569	27	31	1,135
North Coast (Region 1)					
$Q_2 = 1.82A^{0.904}P^{0.983}$	115	97	4	4	203
$Q_5 = 8.11A^{0.887}P^{0.772}$	257	217	9	10	449
$Q_{10} = 14.8A^{0.88}P^{0.696}$	366	308	13	15	636
$Q_{25} = 26.0A^{0.874}P^{0.628}$	512	432	18	21	884
$Q_{50} = 36.3A^{0.870}P^{0.589}$	632	533	23	26	1,090
$Q_{100} = 48.5A^{0.866}P^{0.556}$	756	639	27	32	1,302
Q_2 average	**80**	**67**	**3**	**3**	**139**

FIGURES

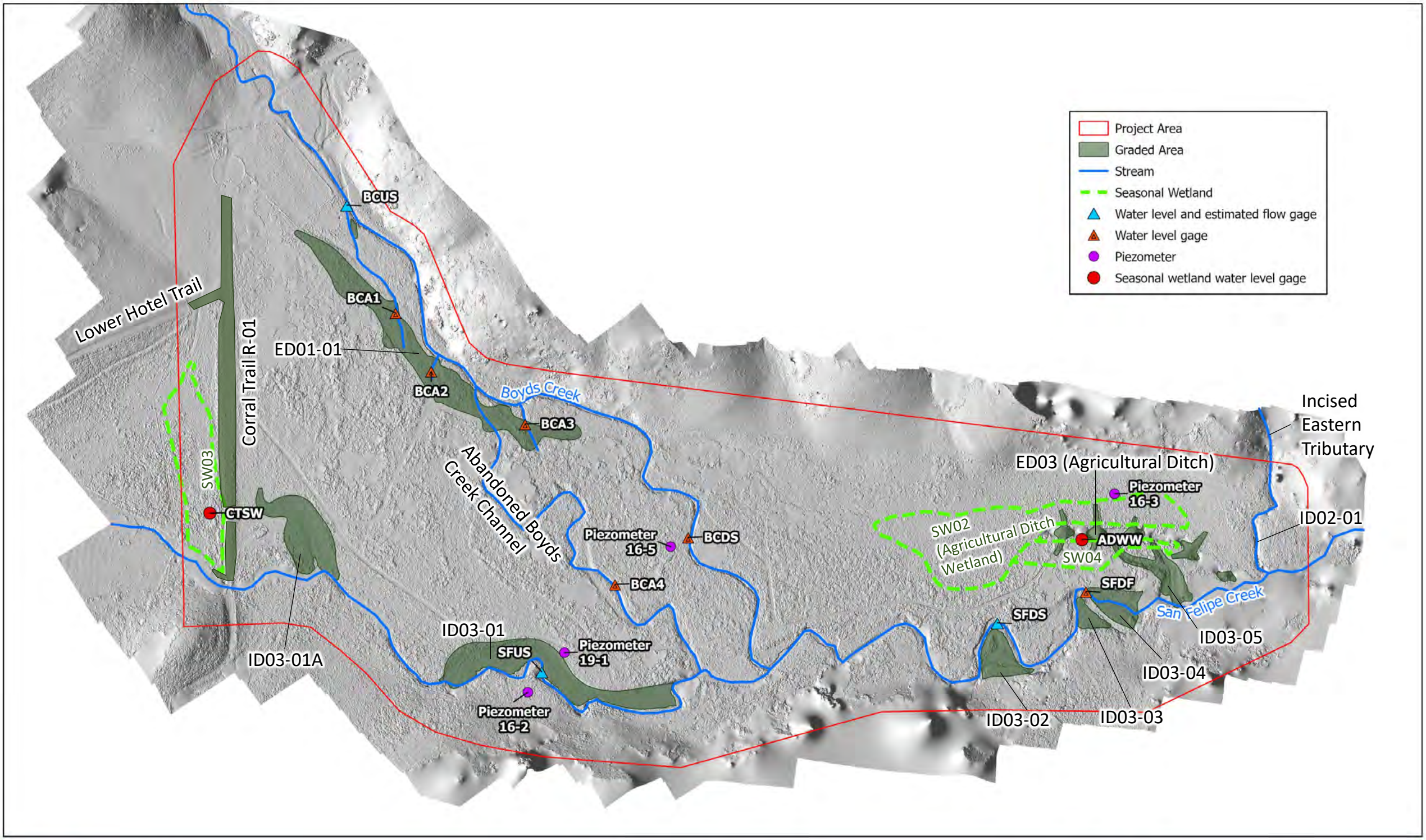


Balance Hydrologics

Figure 1. Location Map, San Felipe Creek Restoration Project, Joseph D. Grant County Park, Santa Clara County, California

W:\Projects\215108.aprx

Source: ESRI 2021, Balance Hydrologics 2021



Balance Hydrologics™

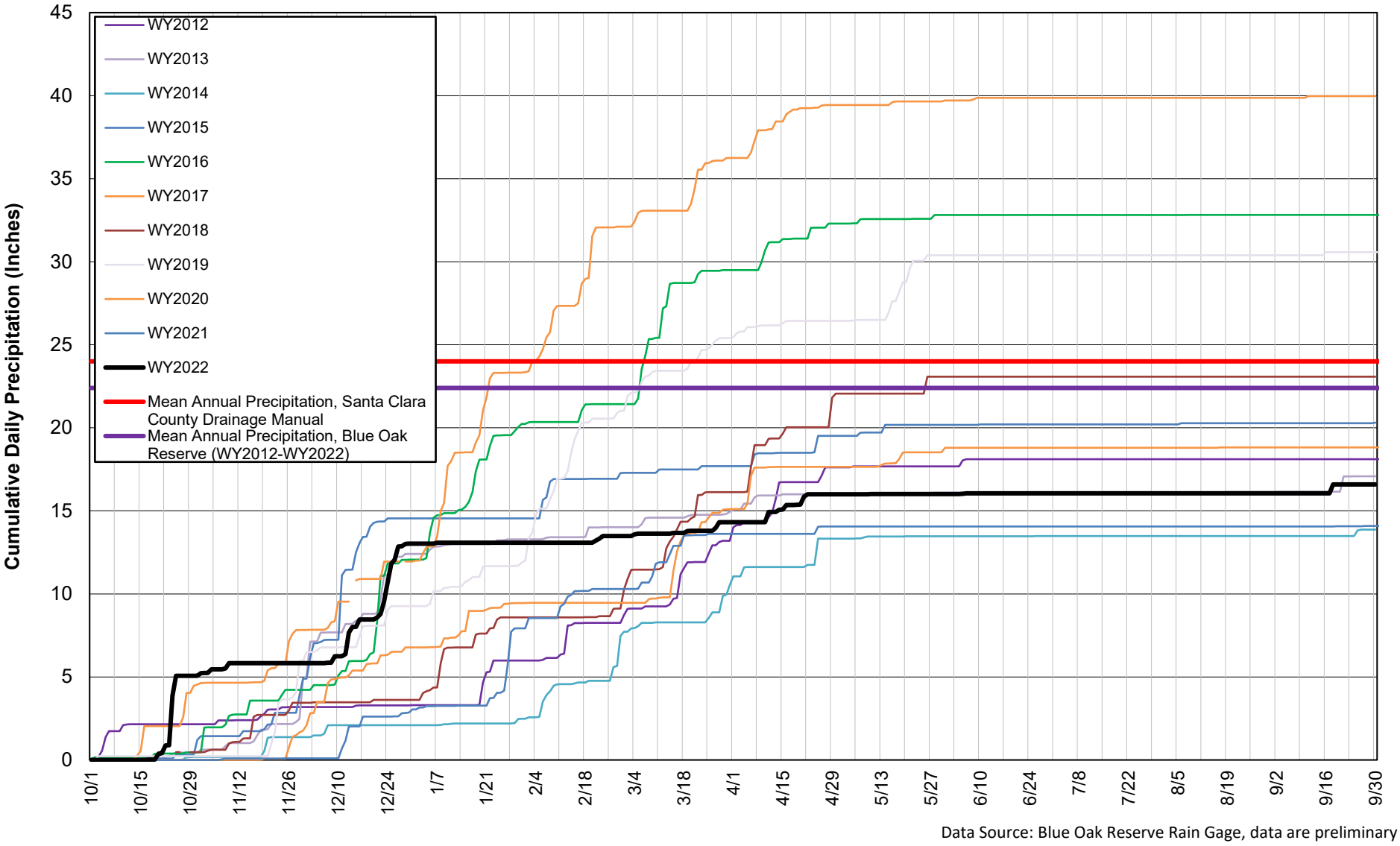
W:\Projects\215108 San Felipe Creek\monitoring locations.aprx

Figure 2. Monitoring station locations, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

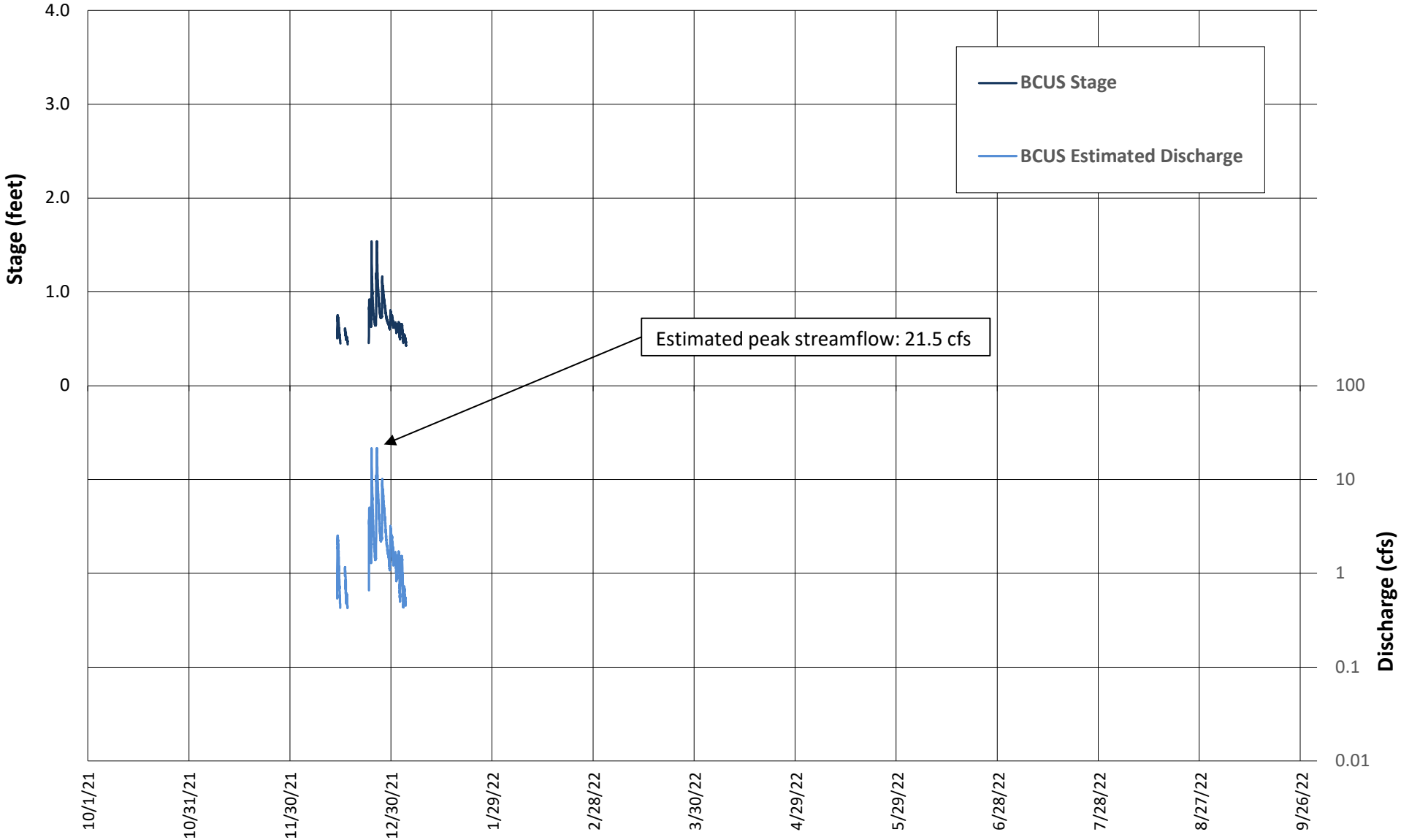
N



Data Source: Blue Oak Reserve Rain Gage, data are preliminary

Balance Hydrologics™

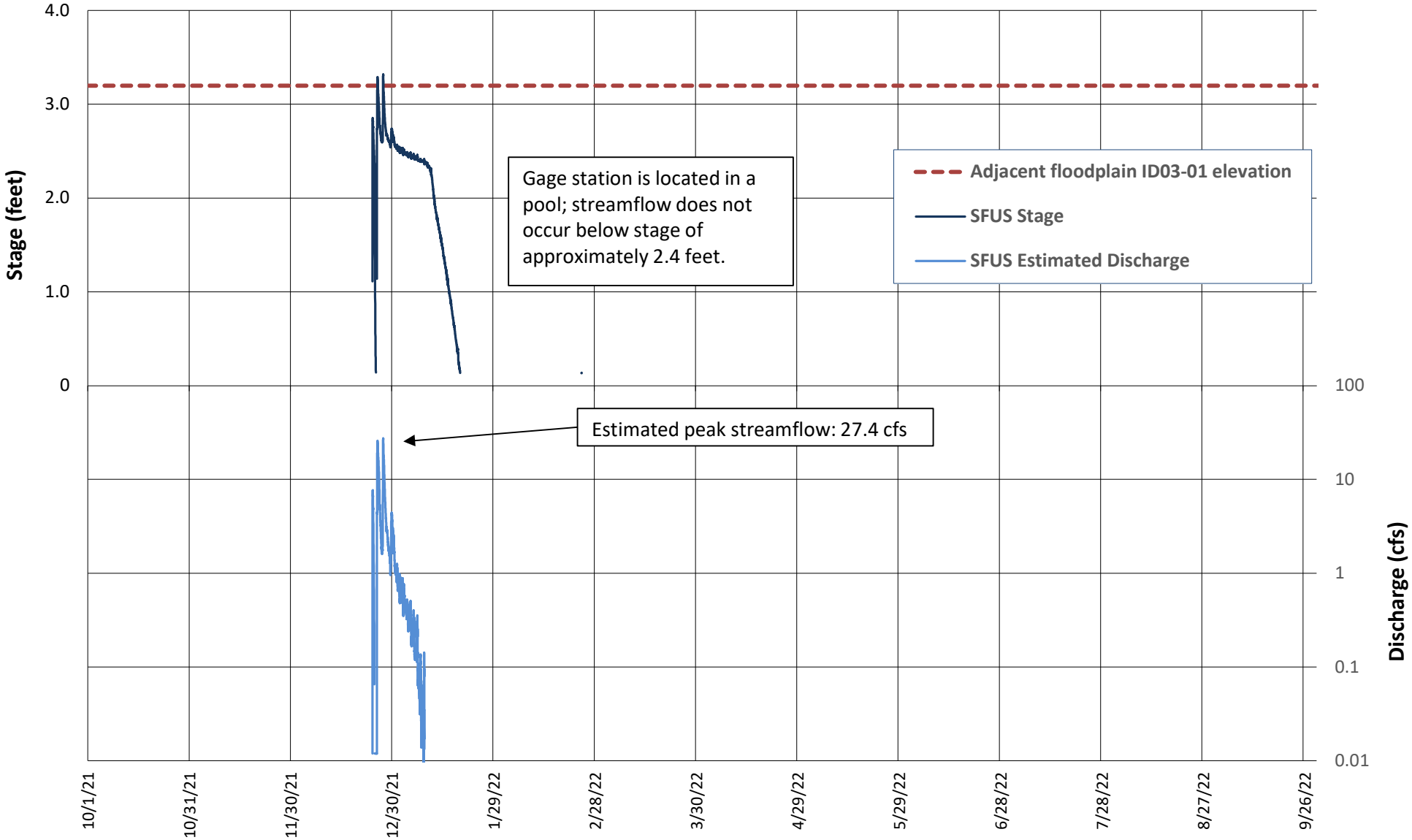
Figure 3. Cumulative daily precipitation, Blue Oak Reserve, San Jose, California, water years 2012 - 2022. Total annual rainfall in WY2022 was well below the long-term mean annual precipitation (approximately 24 inches per Santa Clara County Drainage Manual), and the 10-year average at the Blue Oak Reserve (22.4 inches). Since construction (WY2019-WY2022), mean annual preciptation has been 20.0 inches, less than the long-term mean annual precipation.



Balance Hydrologics

222108 stream gages.xlsx

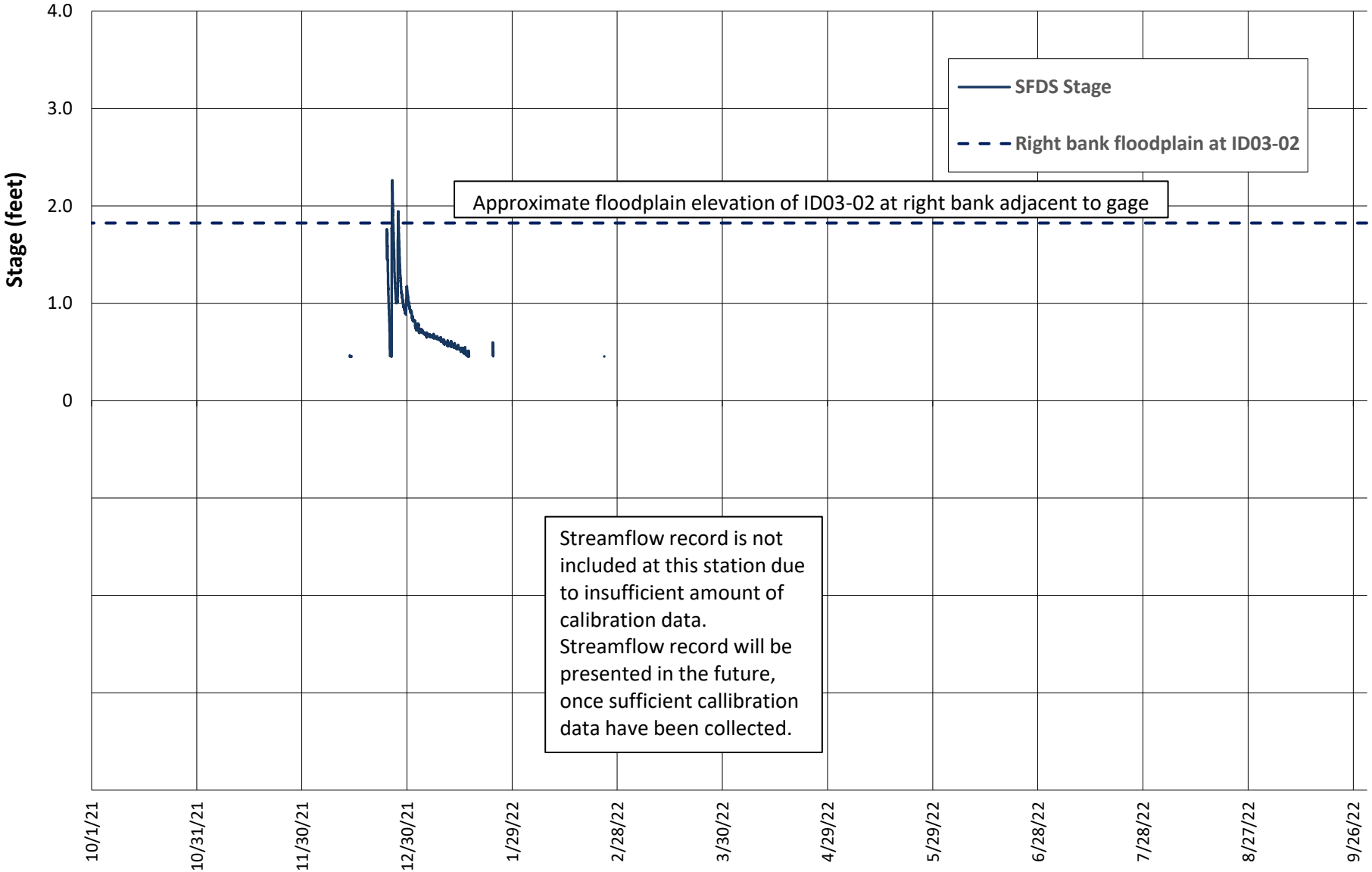
Figure 4. Stage and estimated discharge at the Boyds Creek upstream station (BCUS), water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California. Record of flow is an estimate based on limited calibration measurements.



Balance Hydrologics

222108 stream gages.xlsx

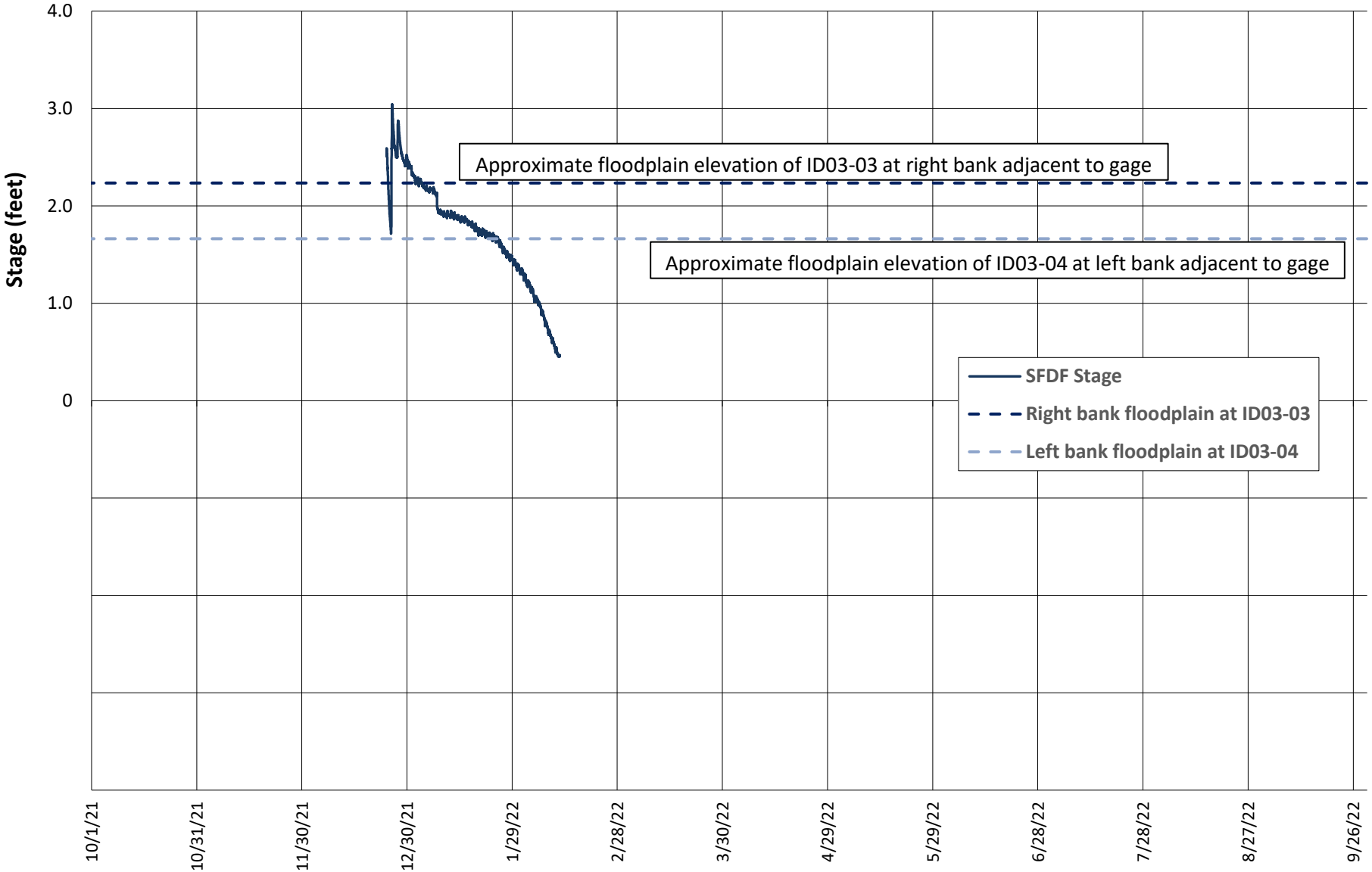
Figure 5. Stage and estimated discharge at the San Felipe Creek upstream station (SFUS), adjacent to floodplain area ID03-01, water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California



Balance Hydrologics

222108 stream gages.xlsx

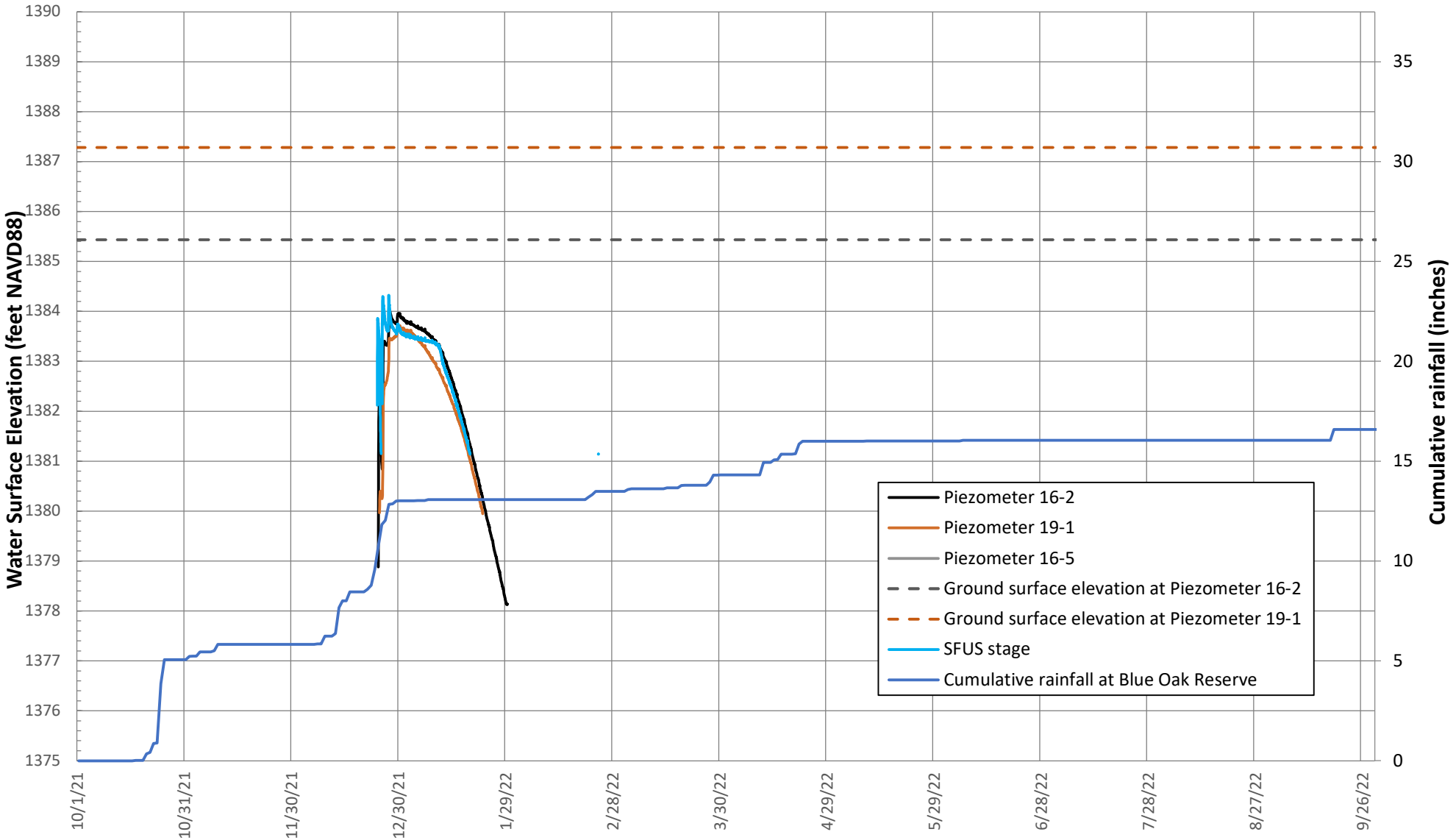
Figure 6. Stage and estimated discharge at the San Felipe Creek downstream station (SFDS), water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California. On December 10, 2021, SFDS was relocated to the northeast apex of the channel bend at ID03-02.



Balance Hydrologics

222108 stream gages.xlsx

Figure 7. Stage at the San Felipe Creek downstream floodplains station (SFDF), water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California. On December 10, 2021, SFDF was installed between ID03-03 and ID03-04 to evaluate timing and duration of floodplain inundation at ID03-03 and ID03-04.



Balance Hydrologics

Figure 8a. **Shallow groundwater levels at Piezometers 16-2 and 19-1, and surface water level in San Felipe Creek (SFUS) for WY2022. San Felipe Creek Restoration Project, Santa Clara County, California.**

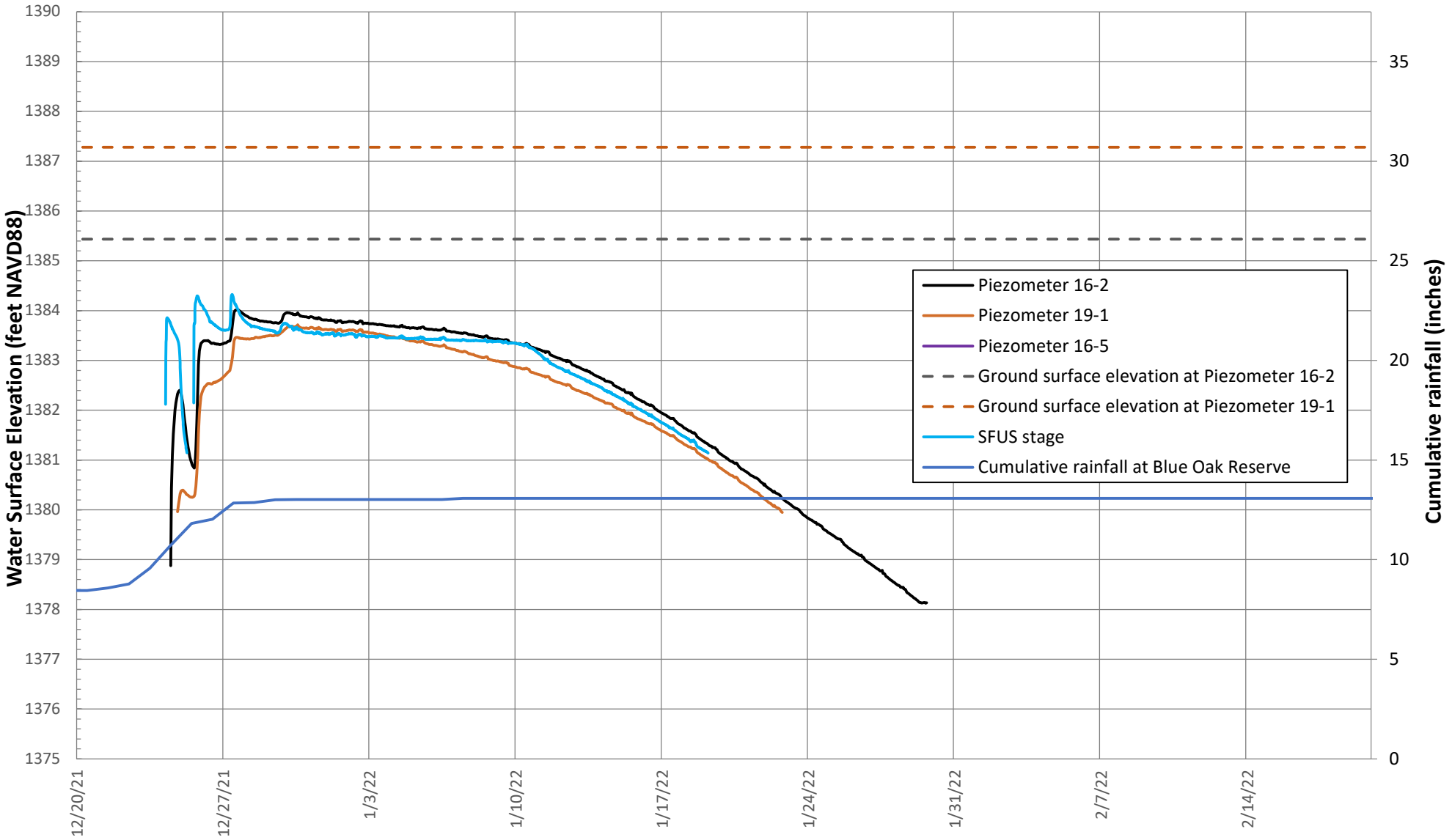
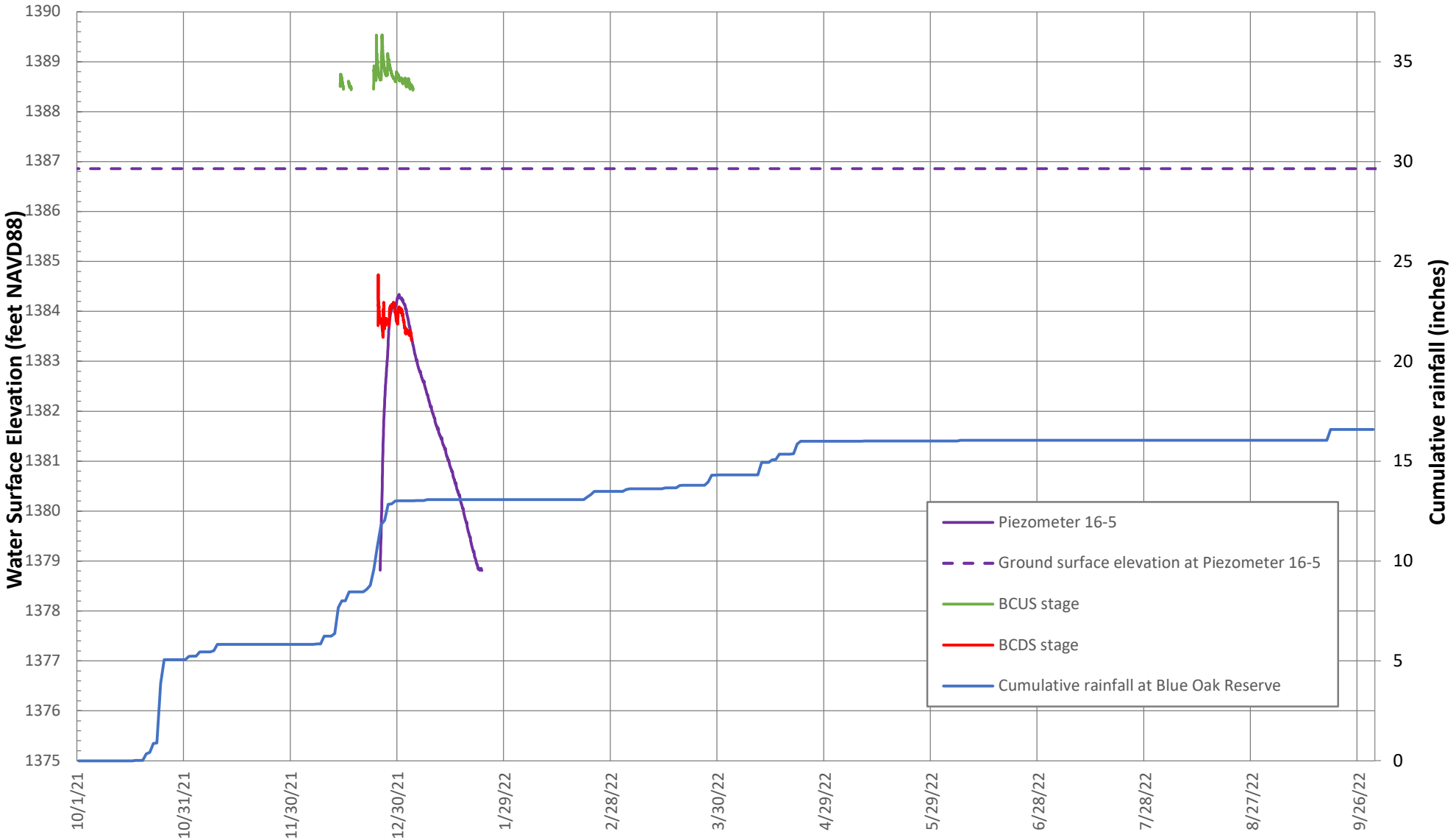


Figure 8b. DETAIL - Shallow groundwater levels at Piezometers 16-2 and 19-1, and surface water level in San Felipe Creek (SFUS) for WY2022. San Felipe Creek Restoration Project, Santa Clara County, California.

Balance Hydrologics



Balance Hydrologics

Figure 9a. Shallow groundwater levels at Piezometer 16-5 and surface water stage in Boyds Creek upstream station (BCUS) and Boyds Creek downstream (BCDS), WY2022. San Felipe Creek Restoration Project, Santa Clara County, California. Note that water levels at BCUS have been shifted down approximately 20 feet to improve plotting for comparison with BCDS.

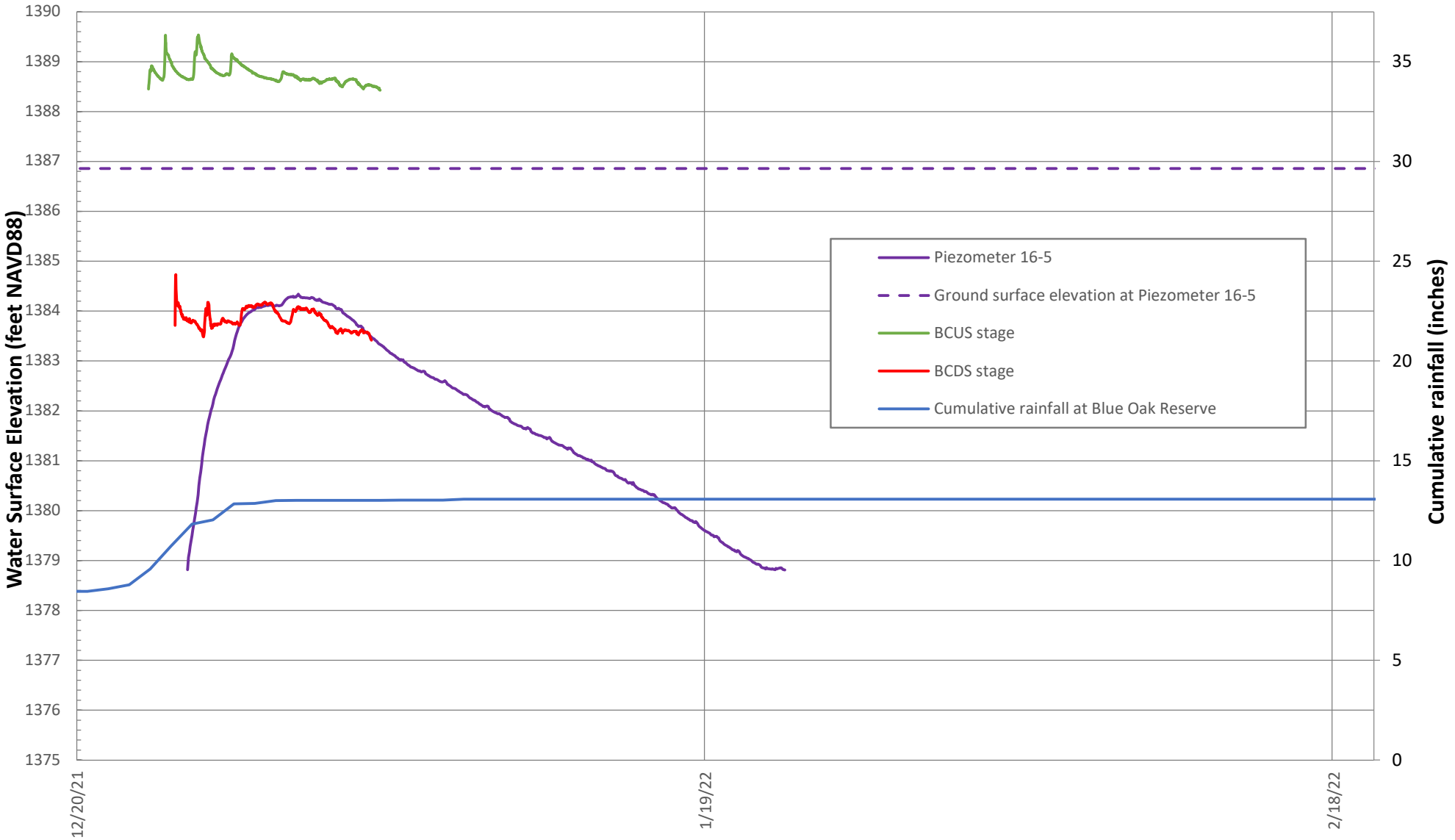
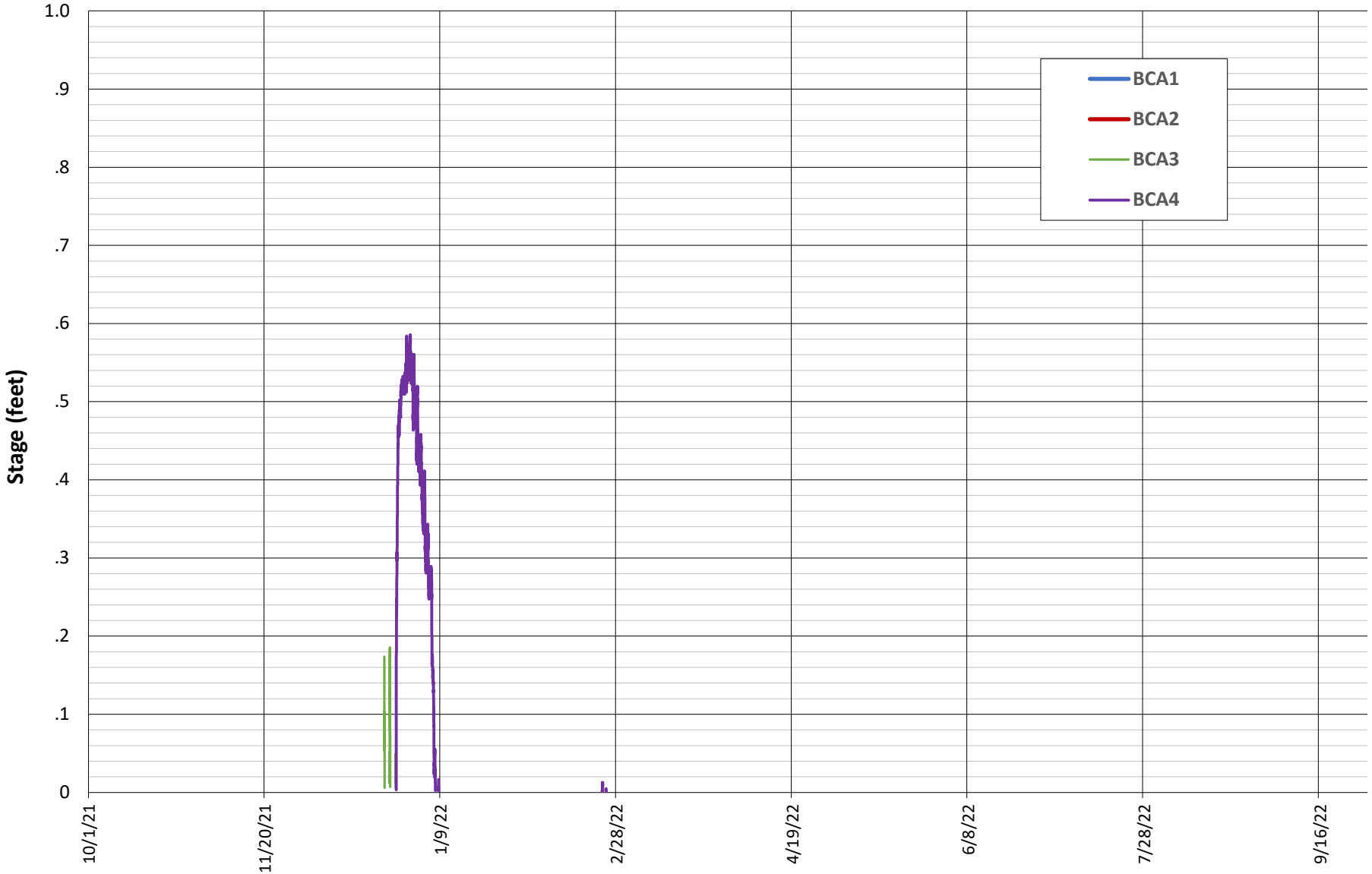


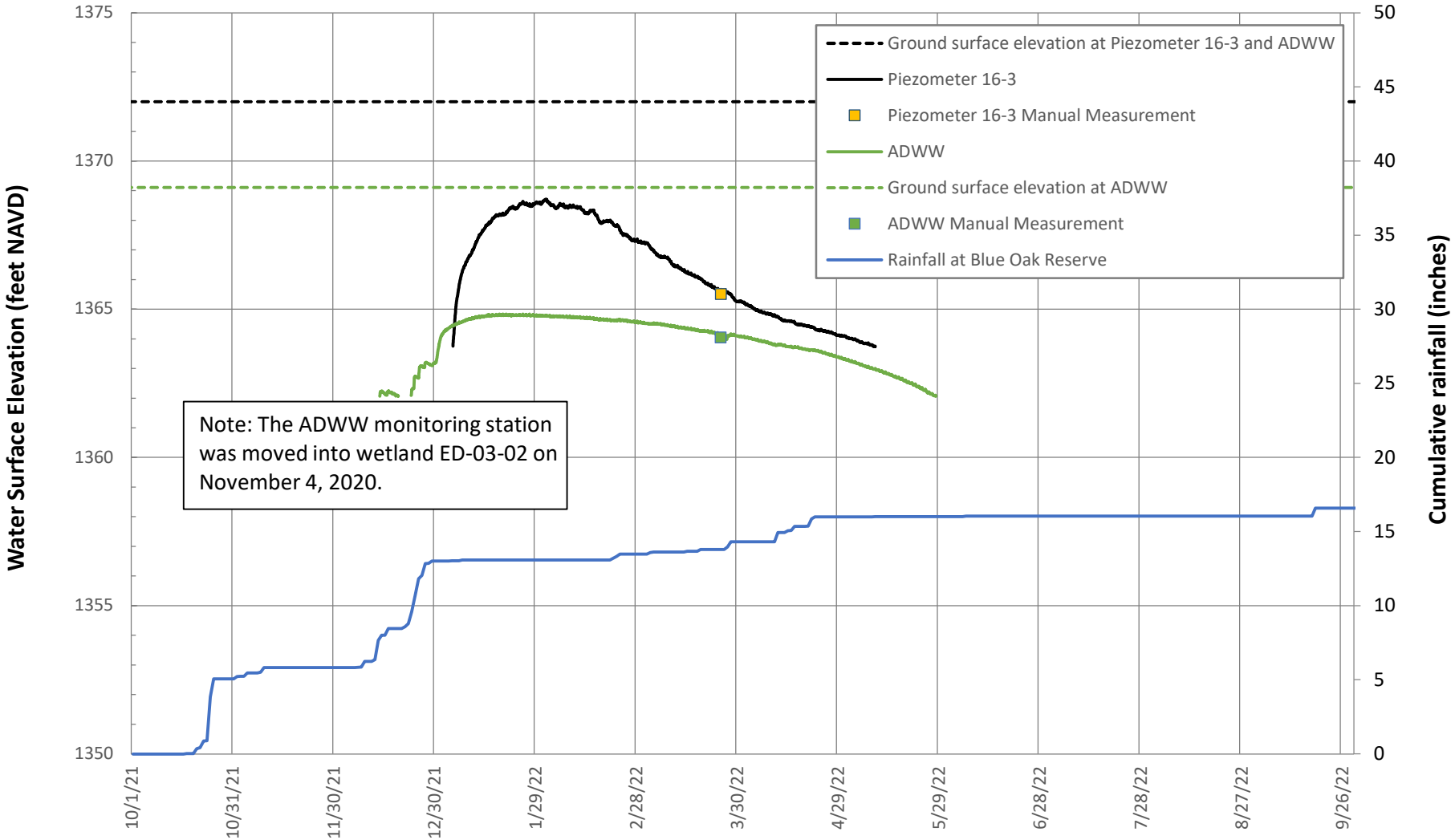
Figure 9b. DETAIL - Shallow groundwater levels at Piezometer 16-5 and surface water stage in Boyds Creek upstream station (BCUS) and Boyds Creek downstream (BCDS), WY2022. San Felipe Creek Restoration Project, Santa Clara County, California. Note that water levels at BCUS have been shifted down approximately 20 feet to improve plotting for comparison with BCDS.



Balance Hydrologics

222108 stream gages.xlsx

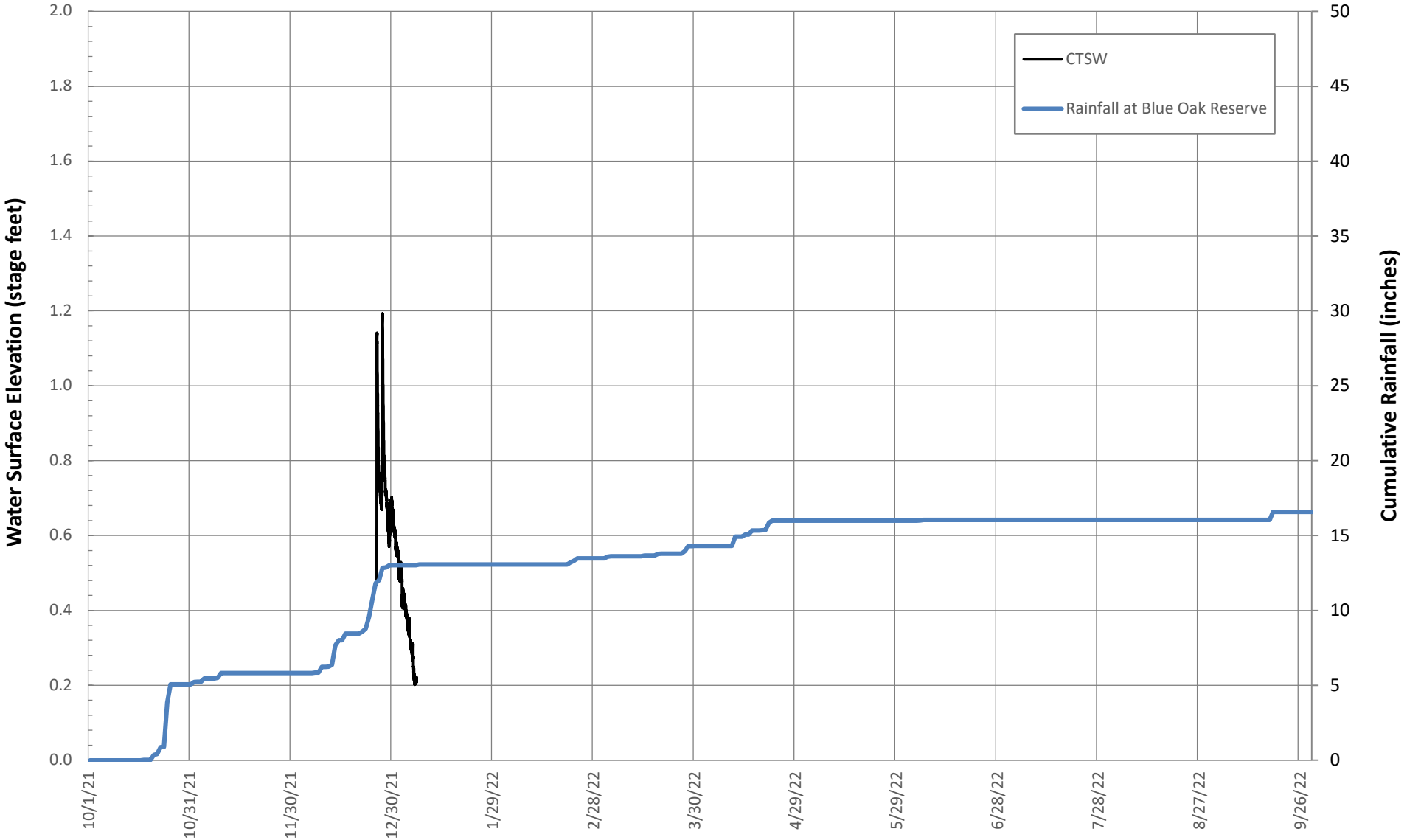
Figure 10. Stage at the Boyds Creek avulsion channel stations, water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California



Balance Hydrologics

222108 ADWW and ADWE Figure

Figure 11. Water levels in the agricultural ditch (ADWW) and Piezometer 16-3 near Seasonal Wetlands SW02 and SW04, water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California.



Balance Hydrologics

Figure 12. Corral Trail seasonal wetland CTSW water levels, water year 2022, San Felipe Creek Restoration Project, Santa Clara County, California. Wetland ground surface varies, but is located at a stage of approximately 0.2 feet.

222108 CTSW.xlsx

ID03-02: 1/25/2022
Debris on the floodplain surface of ID03-02 suggests flood flows engaged the floodplain during WY2022.

ID03-03/04: 1/6/2022
Flows spreading across the floodplain at ID03-03 and ID03-04 (background). Flood flows engaged the floodplains during WY2022. San Felipe Creek enters from the right of frame.

Balance Hydrologics

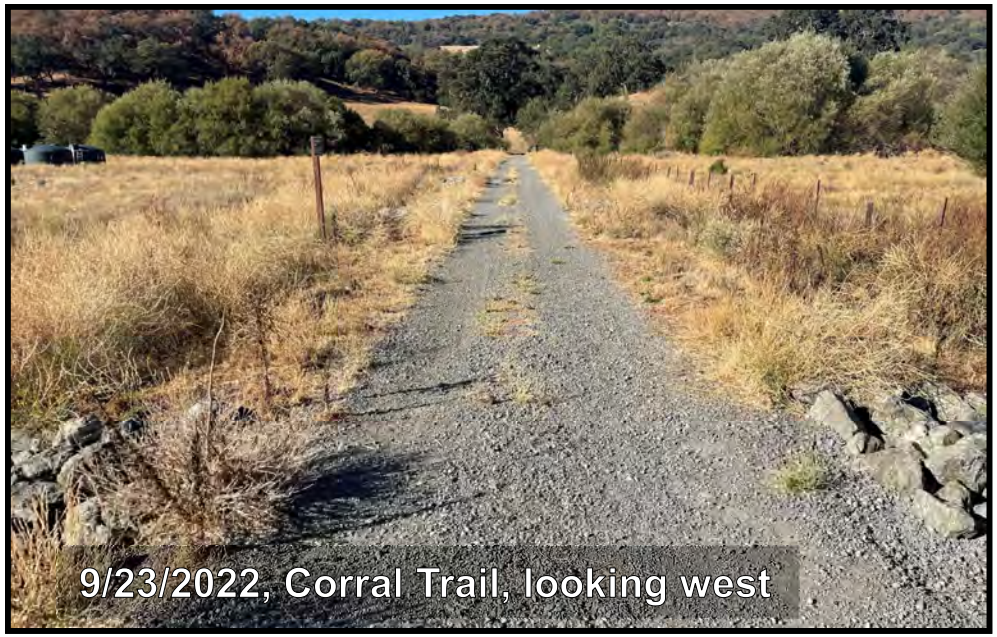
Figure 13. San Felipe Creek at created floodplain ID03-02 (Top), ID03-03 and ID03-04 (Bottom) WY2022. San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California. The created floodplain areas pictured here were inundated during WY2022 even though the site did not experience a 2-year flow event.

Balance Hydrologics

Figure 14. Plantings at living log jams, September 23, 2020 (left) and April 28, 2021. Year 4 San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California. See replaced log in red oval in 2021 and 2022 photos.

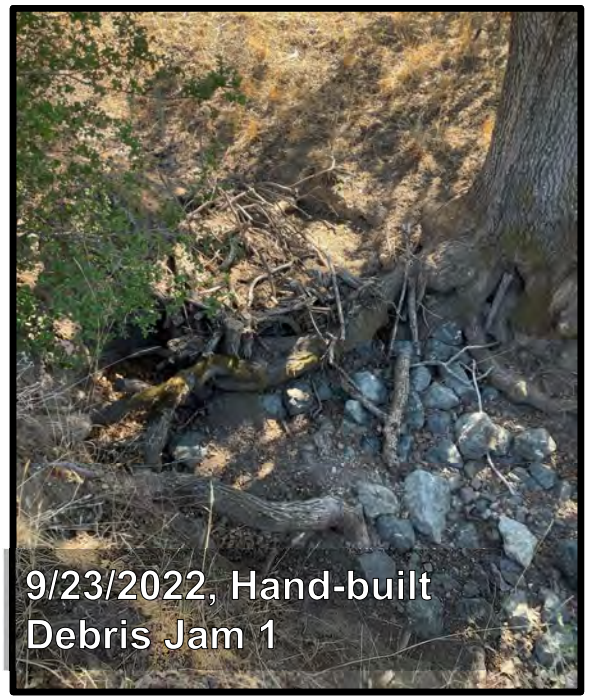
Balance Hydrologics

Figure 15. Comparison of San Felipe Creek at created floodplain ID03-02 between Year 1,Year 2 and post-adaptive management repair in Year 3 and Year 4. looking downstream. San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California. The ID03-02 Floodplain was en



Balance Hydrologics

Figure 16. Corral Trail and drainage lens and Lower Hotel Trail Arizona crossing, September 23, 2022. San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.



Note: Staked debris jams are numbered in downstream order, upper left to lower right.

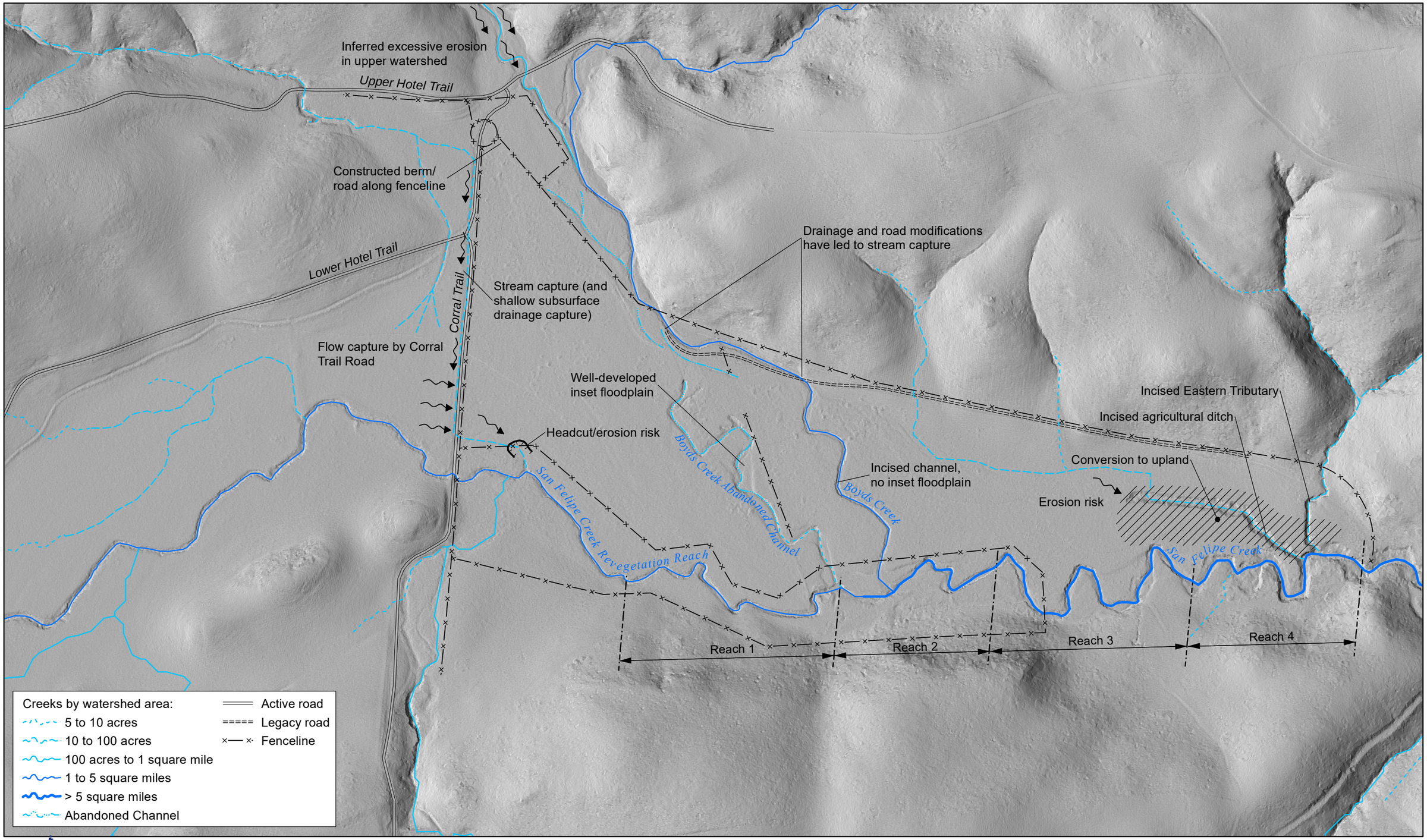
Balance Hydrologics

Figure 17. Staked debris jams at ID02-01, September 23, 2022, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.

APPENDICES

APPENDIX A

Impairment Map



Balance Hydrologics, Inc.

Y:\GIS\Projects\215108 San Felipe Creek\FIGURES\215108 impairment map.mxd

Plate 2. San Felipe Creek Impairment Map, Santa Clara County, California

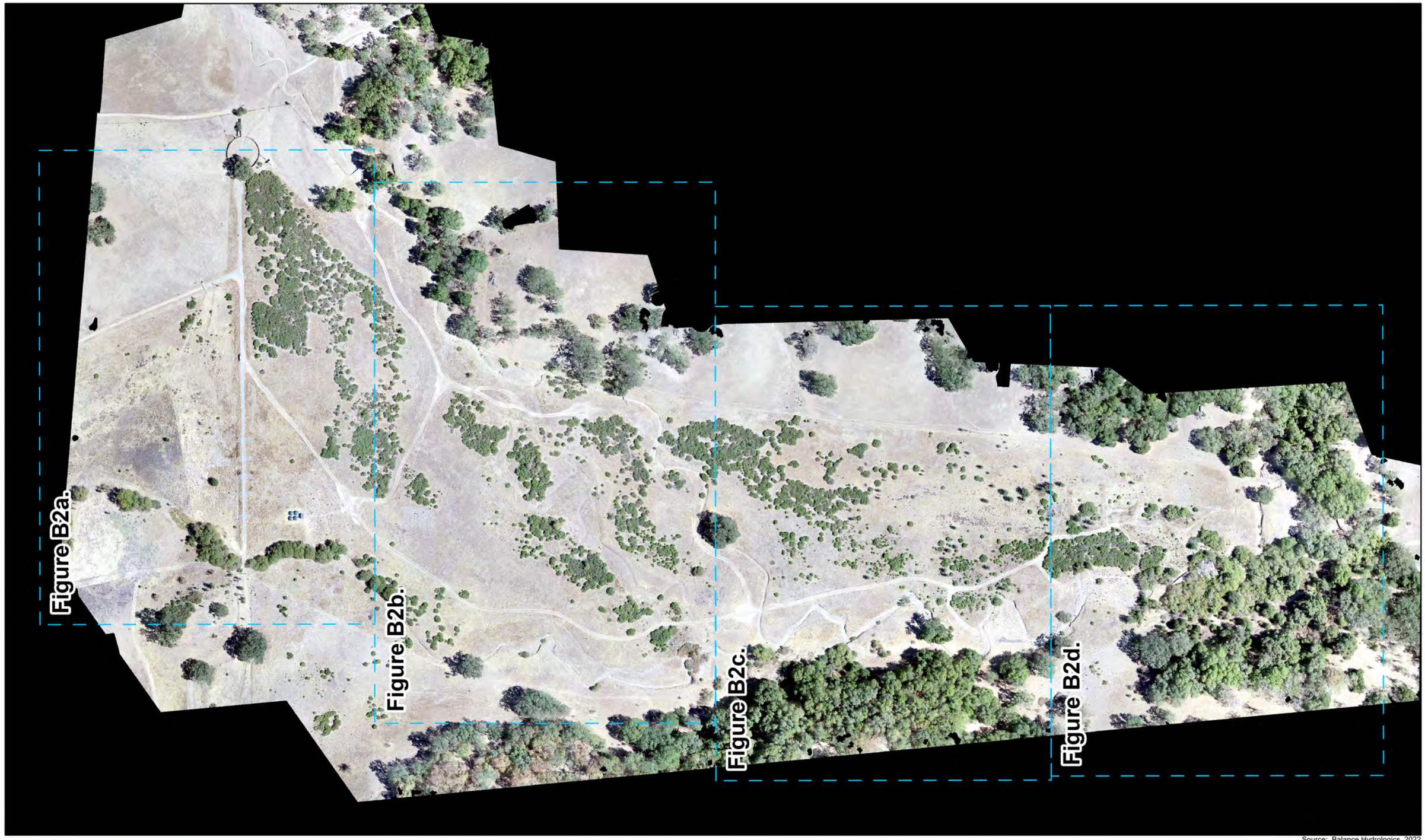
Note: impairment map was created pre-restoration.

Basemap source: EarthScope LiDAR mapping (2007)

0 150 300 600 Feet

APPENDIX B

September 23, 2022, Ortho-Aerial Photograph



Source: Balance Hydrologics, 2022

Balance Hydrologics™

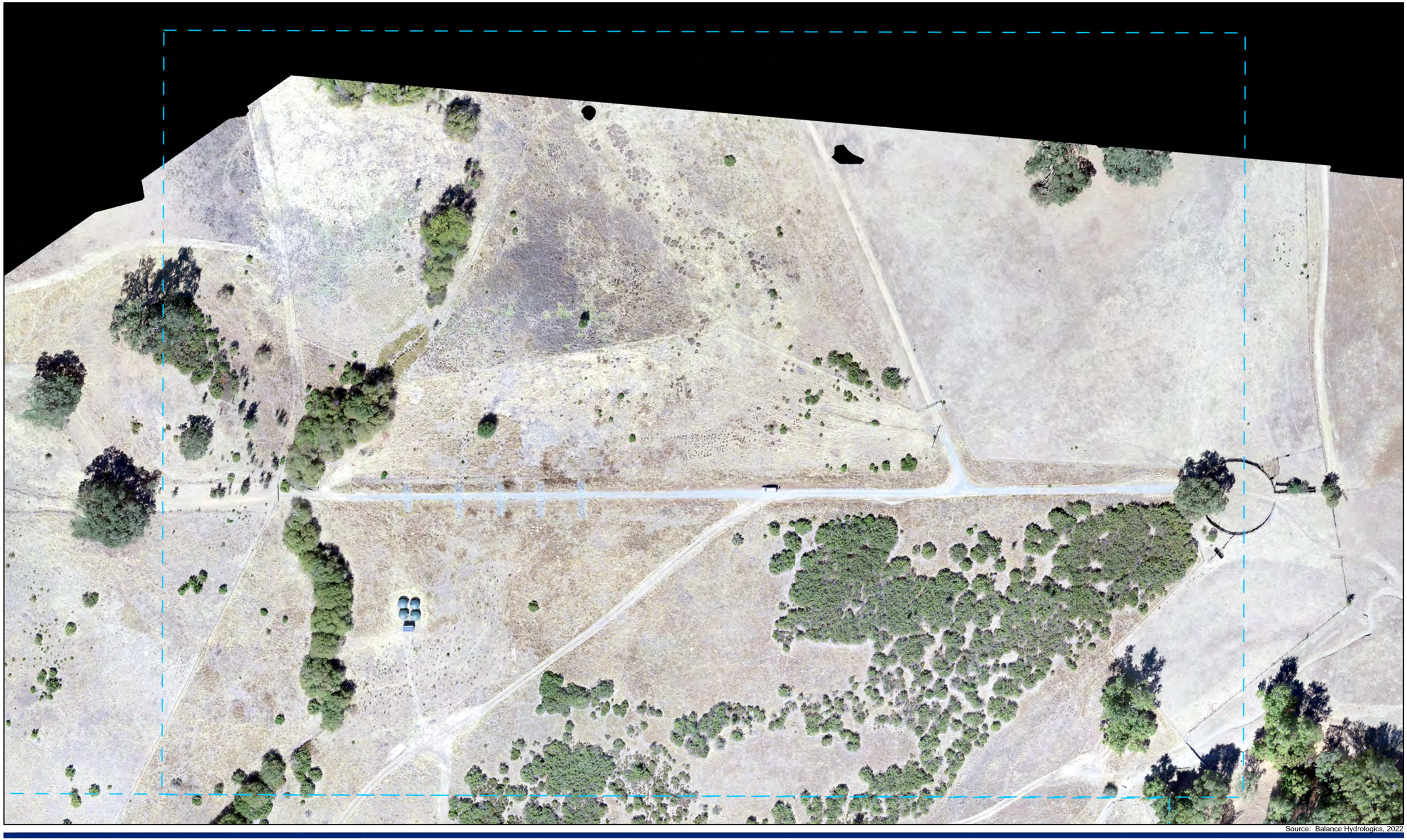
W:\Projects\215108 San Felipe Creek\Map\215108.aprx

Figure B1. September 2022 orthomosaic image, September 23, 2022, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

N



Source: Balance Hydrologics, 2022

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\215108.aprx

Figure B2 a. September 2022 orthomosaic image, September 23, 2022, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

Source: Balance Hydrologics, 2022

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\215108.aprx

Figure B2 b. September 2022 orthomosaic image, September 23, 2022, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

Source: Balance Hydrologics, 2022

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\215108.aprx

Figure B2 c. September 2022 orthomosaic image, September 23, 2022, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

Source: Balance Hydrologics, 2022

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\215108.aprx

Figure B2 d. September 2022 orthomosaic image, September 23, 2022, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

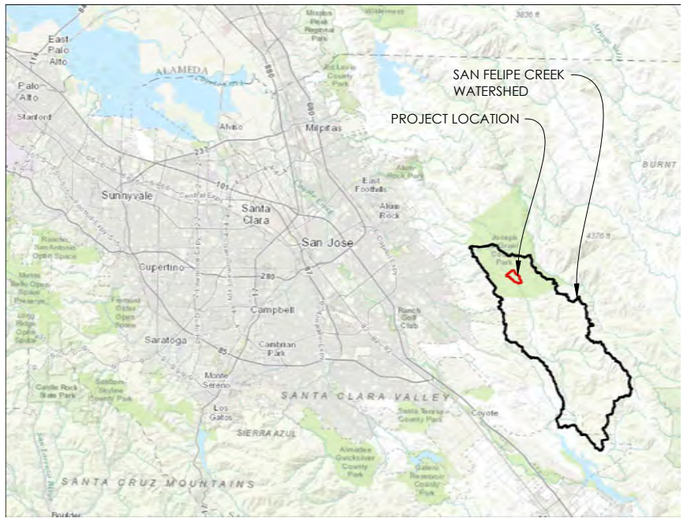
APPENDIX C
Project as-built drawings

SAN FELIPE CREEK RESTORATION

JOSEPH D GRANT COUNTY PARK

SANTA CLARA COUNTY, CALIFORNIA

VICINITY MAP



LOCATION MAP

SHEET INDEX

PROJECT TEAM

CLIENT
SANTA CLARA VALLEY HABITAT AGENCY
TERAH DONOVAN, PRINCIPAL PROGRAM MANAGER
535 ALKIRE AVENUE, SUITE 100
MORGAN HILL, CALIFORNIA 95037
TEL (408) 779-7261

LANDOWNER
SANTA CLARA COUNTY PARKS
JEREMY FARR, NATURAL RESOURCES PLANNER
298 GARDEN HILL DRIVE
LOS GATOS, CALIFORNIA 95032
TEL (408) 355-2200

DESIGN-BUILD TEAM

CONTRACTOR
HABITAT RESTORATION SCIENCES, INC.
MARK GIRARD, PRESIDENT
1217 DISTRIBUTION WAY
VISTA, CALIFORNIA 92081
TEL (760) 479-4210

SITE CIVIL ENGINEER / GEOMORPHOLOGIST
BALANCE HYDROLOGICS
EDWARD D. BALLMAN, P.E.
ERIC DONALDSON, P.G.
800 BANCROFT WAY, SUITE 101
BERKELEY, CALIFORNIA 94710
TEL (510) 704-1000

LANDSCAPE ARCHITECT/ BIOLOGIST/ REVEGETATION/PERMITTING
DUDEK
JOHN ZANZI, R.L.A.
CALIFORNIA LICENSE NO. 2933
1102 R STREET
SACRAMENTO, CALIFORNIA 95811
TEL (916) 443-8335

LAURIE MONARRES
REGULATORY SPECIALIST
1630 SAN PABLO AVENUE, SUITE 300
OAKLAND, CALIFORNIA 94612
TEL (510) 601-2515

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-01-TITLE - STANDARD\215108-01-TITLE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS
HABITAT RESTORATION SCIENCES, INC.

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY DONALDSON
DRAWN BY P KUICHAWIK
CHECKED BY D.SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

COVER SHEET

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE NTS
SHEET 1.0

LEGEND:

EXISTING MAJOR CONTOUR - 5 FT — 1235

EXISTING MINOR CONTOUR -1 FT

EXISTING CHANNEL/FLOWPATH

EXISTING FENCE — X — X — X — X

EXISTING WETLAND LIMIT — W — W — W

PROPOSED MAJOR CONTOUR — 1235

PROPOSED MINOR CONTOUR

PROPOSED EXCLUSION FENCE (PER DETAIL 1, SHEET 5.4)

ESA FENCING — ESA ESA ESA ESA ESA

GRADE BREAK

GRADING LIMIT

CONSTRUCTION ACCESS ROUTE

CONSTRUCTION STAGING AREA

PROPOSED FINISHED GRADE ELEVATION — 1250.0

PROPOSED FINISHED GRADE SLOPE — 2%

PROPOSED SURFACE FLOW DIRECTION

PROPOSED EMBANKMENT SLOPE

EXISTING WETLAND AREA — W W W W

ABBREVIATIONS:

'	FEET	SY	SQUARE YARDS
"	INCH	TYP	TYPICAL
#	NUMBER	V	VERTICAL
APPROX	APPROXIMATE	W/I	WITHIN
BMP	BEST MANAGEMENT PRACTICE	WSE	WATER SURFACE ELEVATION
CMP	CORRUGATED METAL PIPE		
CY	CUBIC YARDS		
DBH	DIAMETER AT BREAST HEIGHT (4' FROM GROUND)		
DIA, Ø	DIAMETER		
EA	EACH		
EG	EXISTING GRADE		
ELEV	ELEVATION		
EOP	EDGE OF PAVEMENT		
ESA	ECOLOGICALLY SENSITIVE AREA		
EX	EXISTING		
FG	FINISH GRADE		
FT	FEET		
GALV	GALVANIZED		
H	HORIZONTAL		
HDPE	HIGH DENSITY POLYETHYLENE		
IE	INVERT ELEVATION		
IMP	IMPERVIOUS		
IN	INCH		
INV	INVERT		
LT	LEFT		
MAX	MAXIMUM		
MIN	MINIMUM		
NTS	NOT TO SCALE		
OC	ON CENTER		
PC	POLE CUTTING		
PROP	PROPOSED		
RC	RELATIVE COMPACTION		
SCCP	SANTA CLARA COUNTY PARKS		
SF	SQUARE FEET		
STA	STATION		
SWPPP	STORM WATER POLLUTION PREVENTION PLAN		

AS-BUILT DRAWINGS

GENERAL NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR VISITING THE PROJECT SITE TO VERIFY SITE CONDITIONS AND FOR COMPLETELY CARRYING OUT THE SCOPE OF WORK SHOWN ON THESE DRAWINGS.
2. ALL PARTS OF THIS PROJECT - INCLUDING SOIL PREPARATION, EARTHWORK, AND PLANTING - ARE SUBJECT TO FIELD DESIGN BY THE DESIGN-BUILD TEAM.
3. UTILITY LOCATIONS DEPICTED HEREIN ARE APPROXIMATE. THE CONTRACTOR WILL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES BEFORE THE START OF ANY CONSTRUCTION OPERATIONS, INCLUDING AND NOT LIMITED TO EXCAVATION OR TRENCHING. THE CONTRACTOR WILL CALL UNDERGROUND SERVICE ALERT (USA) AT 811/1-800-227-2600. THE CONTRACTOR WILL PROVIDE A MINIMUM OF 48 HOURS ADVANCE NOTICE FOR LOCATING UTILITIES.
4. ALL FIELD ADJUSTMENTS MUST BE APPROVED BY THE ENGINEER'S REPRESENTATIVE BEFORE CONSTRUCTION OF SAID ADJUSTMENTS; FAILURE TO DO SO SHALL RESULT IN THE CONTRACTOR ASSUMING FULL RESPONSIBILITY FOR ANY REQUIRED REVISIONS OR FIELD MODIFICATIONS, AS DIRECTED BY THE ENGINEER'S REPRESENTATIVE, AT NO ADDITIONAL COST.
5. CONFORM TO EXISTING GRADES AND CONDITIONS WHENEVER POSSIBLE. ANY ADJACENT OR OFFSET AREAS DISTURBED MUST BE RESTORED TO THE PRE-DISTURBANCE CONDITIONS TO THE SATISFACTION OF THE ENGINEER'S REPRESENTATIVE.
6. ALL LUBRICATION, REFUELING, OR MAINTENANCE OF CONSTRUCTION VEHICLES SHALL BE CONDUCTED WITHIN APPROVED CONSTRUCTION STAGING AREAS AND BE A MINIMUM OF 100 FEET AWAY FROM EXISTING CHANNELS
7. STAGING AREAS MUST BE CONTAINED TO CONFINE THE AREA AND PREVENT CONTAMINANTS FROM ENTERING NEARBY CHANNELS AND WATER BODIES.
8. THE TOPOGRAPHIC BASEMAP WAS DERIVED FROM 2008 NSF FUNDED EARTHSCOPE LiDAR DATA. ELEVATIONS ARE RELATIVE TO THE NAVD88 DATUM. LiDAR DATA ARE PRONE TO INACCURACIES FROM VEGETATION AND WATER INFERENCE. THE ENGINEER'S REPRESENTATIVE WILL FIELD ADJUST THE DESIGN IF CONFLICTS EXIST BETWEEN THE TOPOGRAPHIC BASEMAP AND FIELD CONDITIONS.
9. PRESERVE TREES AND VEGETATION OUTSIDE OF THE GRADING LIMIT. ANY TREES OR VEGETATION DISTURBED OUTSIDE OF THE GRADING LIMIT WILL BE REPLACED.
10. REFER TO PROJECT IMPLEMENTATION DOCUMENTS, WHICH WILL INCLUDE THE PROJECT SWPPP, IPM, FIRE PREVENTION PLAN, PHYTOPHTHORA BMPs, DEWATERING AND DIVERSION PLAN, ESA FENCING, HABITAT PLAN, AND COUNTY PARKS PERMIT CONDITIONS.
11. REFER TO THE PROJECT PERMITS AND MITIGATION AND MONITORING PLAN FOR ADDITIONAL INFORMATION AND REQUIREMENTS FOR CONSTRUCTION AND POST-CONSTRUCTION MAINTENANCE.
12. AT ALL TIMES, THE CONTRACTOR WILL IMPLEMENT BMPs TO PREVENT THE SPREAD OF INVASIVE PLANT SPECIES. THE BMP ACTIONS SHALL ADDRESS PROJECT MATERIALS; TRAVEL; TOOL EQUIPMENT AND VEHICLE CLEANING; CLOTHING, BOOTS, AND GEAR CLEANING; WASTE DISPOSAL; AND SOIL DISTURBANCE. BMPs TO PREVENT THE SPREAD OF INVASIVE PLANT SPECIES SHALL BE CONDUCTED AS PRESCRIBED IN THE CALIFORNIA INVASIVE PLANT COUNCIL'S BEST MANAGEMENT PRACTICES, PREVENTING THE SPREAD OF INVASIVE PLANT SPECIES, 3RD EDITION; A COPY IS PROVIDED IN THE PROJECT MMP.
13. SCALES SHOWN ON THE DRAWINGS ARE FOR FULL SIZE 22" X 34" (ANSI D) PLOTS.

BMPS FOR EXCLUDING PHYTOPHTHORA RAMORUM FROM NONINFESTED AREAS:

1. AT ALL TIMES THE CONTRACTOR'S OPERATIONS SHALL IMPLEMENT THE FOLLOWING BEST MANAGEMENT PRACTICES (BMP'S) DURING THE PROJECT'S INSTALLATION AND 10-YEAR MAINTENANCE PERIOD.
2. WHENEVER POSSIBLE, WORK ON P. RAMORUM-INFECTED AND -SUSCEPTIBLE SPECIES DURING THE DRY SEASON. WHEN WORKING IN WET CONDITIONS, KEEP EQUIPMENT ON PAVED OR DRY SURFACES AND AVOID MUD.
3. EXCLUSION IS THE PREFERRED MANAGEMENT TACTIC IN SUSCEPTIBLE FOREST TYPES WHERE SUDDEN OAK DEATH (SOD) HAS NOT BEEN DETECTED.
4. SANITATION AND EXCLUSION PRACTICES SHALL BE USED TO AVOID TRANSPORTING THE P. RAMORUM PATHOGEN THROUGHOUT THE SITE, OR FROM AN INFESTED LOCATION TO OTHER NONINFESTED LOCATIONS.
5. CONFORM TO ALL FEDERAL AND STATE REGULATIONS AND INSPECTIONS TO PREVENT THE MOVEMENT OF P. RAMORUM-INFESTED NURSERY STOCK.
6. DO NOT COLLECT SOIL OR PLANT MATERIAL (WOOD, BRUSH, LEAVES, LITTER, ETC.) FROM HOST TREES IN THE QUARANTINED 14-COUNTY AREA WITHOUT FIRST CONTACTING THE LOCAL AGRICULTURAL COMMISSIONER FOR APPROVAL.
7. P. RAMORUM CAN BE TRANSPORTED BY MOVING INFECTED LEAVES FROM CALIFORNIA BAY TREES (UMBELLULARIA CALIFORNICA). INFECTED LEAVES CAN FALL INTO VEHICLES (TRUCK BEDS, THE AREA BELOW THE WINDSHIELD) AND BE MOVED TO NEW LOCATIONS. INFECTED CALIFORNIA BAY LEAVES DROPPED ON THE GROUND MAY PRODUCE P. RAMORUM SPORES THAT COULD BE SPLASHED TO LOW LEAVES OF SUSCEPTIBLE SPECIES AND INITIATE A NEW INFESTATION. TAKE ALL NEEDED STEPS TO AVOID MOVING INFECTED LEAVES OR SPORES BY CHECKING AND CLEANING VEHICLES AT STAGING AREAS, BEFORE LEAVING STAGING AREAS. COLLECT AND SAFELY DISPOSE OF ANY "HITCHHIKING" LEAVES DISCOVERED IN A VEHICLE.
8. DISPOSE OF POTENTIALLY CONTAMINATED LEAVES BY BURNING OR BY PLACING THE LEAVES IN A SEALED BAG AND SEND TO A LANDFILL. DO NOT ADD THEM TO A GREEN WASTE RECYCLING CONTAINER.
9. CHIPPERS AND TRUCKS USED IN PRUNING OPERATIONS INVOLVING SOD HOSTS, ESPECIALLY CALIFORNIA BAY, SHOULD NOT BE MOVED BETWEEN INFESTED AND NONINFESTED AREAS WITHOUT BEING THOROUGHLY CLEANED. CLEAN TRUCKS, CHIPPERS, CHAIN SAWS, AND ANY TOOLS THAT MAY CONTAIN INFESTED PLANT FRAGMENTS BEFORE LEAVING THE JOB SITE SO INFESTED MATERIAL IS NOT MOVED OFF SITE.
10. MOIST SOIL ON HIKING BOOTS AND BICYCLE TIRES HAS BEEN SHOWN TO SPREAD SOD. VEHICLES DRIVEN ON DIRT ROADS THAT PASS THROUGH LANDS INFESTED WITH P. RAMORUM MAY ALSO SPREAD CONTAMINATED SOIL, ESPECIALLY WHEN CONDITIONS ARE MUDDY. FOOTWEAR AND VEHICLES SHOULD BE CLEANED BEFORE LEAVING INFESTED AREAS AND BEFORE ENTERING NEW AREAS. DRY SOIL POSES A LOW RISK FOR SPREADING SOD BECAUSE DRY SOIL IS LESS APT TO STICK TO SURFACES AND THE AMOUNT OF VIABLE P. RAMORUM INOCULUM ON THE SURFACE OF DRY SOIL IS VERY LOW.
11. SANITIZE SHOES, PRUNING GEAR, AND OTHER EQUIPMENT BEFORE WORKING IN AN AREA WITH SUSCEPTIBLE PLANTS. BEFORE LEAVING A P. RAMORUM-INFESTED SITE, USE ALL REASONABLE METHODS TO SANITIZE GEAR AND EQUIPMENT. SCRAPE, BRUSH, AND/OR HOSE OFF ACCUMULATED SOIL AND MUD FROM CLOTHING, GLOVES, BOOTS, AND SHOES. REMOVE MUD AND PLANT DEBRIS BY BLOWING OUT OR POWER WASHING TRUCKS AND OTHER VEHICLES.
    a. IF COMPLETE ON-SITE SANITATION IS NOT POSSIBLE, FINISH DECONTAMINATING AT A LOCAL POWER WASH FACILITY OR AN ISOLATED AREA IN YOUR EQUIPMENT YARD. CLEAN, ORDERLY VEHICLES AND EQUIPMENT ARE GOOD BUSINESS, AND PREVENT PATHOGEN AND INSECT SPREAD.
12. CLEANING CONTAMINATED TOOLS AND EQUIPMENT.
    a. IF POSSIBLE, CLEAN TOOLS, EQUIPMENT, SHOES, VEHICLES, AND OTHER ITEMS THAT MAY HAVE BECOME CONTAMINATED WITH P. RAMORUM INOCULUM IN SOIL OR DEBRIS BEFORE LEAVING THE INFESTED LOCATION.
    b. IF CLEANING IS CONDUCTED AT A SITE THAT IS ALREADY INFESTED, INOCULUM CAN BE BRUSHED OR WASHED FROM THE CONTAMINATED SURFACES; THE CONTAMINATED MATERIAL DOES NOT NEED TO BE COLLECTED AND DESTROYED. CLEANING SHOULD BE CONDUCTED ON A SURFACE THAT IS UNLIKELY TO ALLOW CLEANED MATERIALS TO BECOME RECONTAMINATED, SUCH AS PAVEMENT, A PLASTIC TARP, OR A CONTINUOUS LAYER OF GRAVEL.
    c. SIMPLY SPRAYING DISINFECTANTS ON CONTAMINATED SURFACES IS NOT EFFECTIVE FOR KILLING P. RAMORUM INOCULUM THAT IS PRESENT IN LARGE PIECES OF PLANT TISSUE OR THICK LAYERS OF SOIL. THOROUGH CLEANING OF DEBRIS AND SOIL FROM EQUIPMENT, TIRES, AND SHOES IS NECESSARY TO REMOVE P. RAMORUM PROPAGULES (SPORES OR MYCELIUM).
    d. COMPRESSED AIR CAN BE USED TO HELP BLOW DEBRIS AND SOIL OUT OF TOOLS AND EQUIPMENT SUCH AS CHAIN SAWS AND CHIPPERS.
    e. DEBRIS AND SOIL CAN ALSO BE BRUSHED OR SWEPT FROM SURFACES.
    f. SURFACES WITH CLINGING MUD OR DAMP DEBRIS MAY NEED TO BE WASHED OFF. USE A BRUSH AND CLEAN, UNCONTAMINATED WATER TO THOROUGHLY REMOVE SOIL FROM SURFACES. AN APPROPRIATE CLEANING AGENT CAN BE USED AFTER REMOVING LARGE PARTICLES OF DEBRIS AND SOIL TO PROVIDE A HIGHER LEVEL OF PROTECTION. DETERGENT SOLUTIONS, DILUTED BLEACH, AND ETHYL OR ISOPROPYL ALCOHOL (70 PERCENT OR HIGHER) CAN FACILITATE CLEANING OF CONTAMINATED SURFACES AND MAY DIRECTLY KILL EXPOSED SPORES. SOME FORMULATED PRODUCTS, SUCH AS LYSOL® DISINFECTANT SPRAY (79 PERCENT ETHYL ALCOHOL), CAN BE USED FOR THIS PURPOSE. ALLOW WET SURFACES TO DRY THOROUGHLY TO FURTHER REDUCE THE CHANCE THAT ANY P. RAMORUM PROPAGULES WILL SURVIVE.
    g. BECAUSE WASH WATER FROM VEHICLES MAY CONTAIN HEAVY METALS, HYDROCARBONS, AND OTHER MATERIALS, VEHICLE WASH STATIONS SHOULD BE CONFIGURED TO PREVENT THESE RESIDUES FROM CONTAMINATING SURFACE OR GROUND WATER. CONTAMINATED WASH WATER SHOULD BE CONTAINED SO IT CAN BE TREATED OR DISPOSED OF IN COMPLIANCE WITH LOCAL AND STATE REGULATIONS.
    h. IF IT IS NOT POSSIBLE TO COMPLETELY CLEAN ITEMS SUCH AS SHOES OR HAND TOOLS AT THE INFESTED AREA, THESE ITEMS MAY BE PLACED IN PLASTIC BAGS FOR LATER CLEANING AT AN INDOOR SITE SUCH AS A UTILITY SINK. IT IS IMPORTANT TO MAKE SURE THAT ALL POTENTIALLY CONTAMINATED MATERIAL IS WASHED DOWN INTO THE SANITARY SEWER SYSTEM (NOT INTO STORMWATER DRAINS) OR IS SEALED IN BAGS THAT WILL BE SENT TO A LANDFILL.
    i. DISINFECTING WITH DILUTED BLEACH. STANDARD COMMERCIAL BLEACH (5.25 PERCENT SODIUM HYPOCHLORITE) DILUTED TO 10 PERCENT STRENGTH (ONE PART BLEACH, NINE PARTS WATER) MAY BE USED AS A DISINFECTANT FOR HARD SURFACES. FOR CONCENTRATED ("ULTRA") BLEACH (6.15 PERCENT SODIUM HYPOCHLORITE, EPA REG. NO. 67619-8), THE CORRESPONDING DILUTION RATIO IS ABOUT 1 PART BLEACH TO 10.5 PARTS WATER.
        - PREPARE AND USE SANITATION KITS CONSISTING OF: CHLORINE BLEACH AND WATER (10:90 MIXTURE OF BLEACH:WATER), CLOROX CLEANUP®, OR LYSOL®; A SCRUB BRUSH, METAL SCRAPER, OR BOOT BRUSH; AND PLASTIC GLOVES.
    j. EQUIPMENT TO BE DISINFECTED NEEDS TO BE MAINTAINED IN CONTACT WITH THE BLEACH SOLUTION FOR AT LEAST A MINUTE TO KILL P. RAMORUM PROPAGULES. LONGER CONTACT TIMES AND MORE THOROUGH SOAKING WILL BE NEEDED IF LARGE PIECES OF DEBRIS ARE PRESENT. USE FRESHLY MADE BLEACH SOLUTIONS AND CHANGE THEM ONCE THEY BECOME CONTAMINATED. BLEACH SOLUTIONS LOSE POTENCY OVER TIME AND ARE DEACTIVATED WITH USE.
        - CONCENTRATED BLEACH AND HYPOCHLORITE SOLUTIONS ARE CORROSIVE AND NEED TO BE HANDLED WITH CARE, USING BOTH EYE AND SKIN PROTECTION. BLEACH SOLUTIONS CAN ALSO REACT WITH VARIOUS CHEMICALS TO RELEASE TOXIC CHLORINE GAS AND OTHER HAZARDOUS CHLORINATED GASES. BLEACH SOLUTIONS CAN CORRODE STEEL, AND ARE NOT ADVISABLE FOR EQUIPMENT SUCH AS CHAIN SAWS. BECAUSE THESE PRODUCTS ARE CORROSIVE TO METAL AND FABRIC, RINSE GEAR AND EQUIPMENT WITH WATER AFTER SANITATION TO REMOVE CORROSIVES. IF EQUIPMENT SUCH AS CHAIN SAWS CANNOT BE TREATED WITH DISINFECTANTS, CONSIDER RUNNING THEM THROUGH A NON-HOST PLANT BEFORE LEAVING THE INFESTED SITE TO BREAK FREE ANY LODGED MATERIAL.
13. P. RAMORUM CAN SURVIVE, AND APPEARS TO REPRODUCE, IN STREAMS AND RIVERS. WATERCOURSES THAT DRAIN SOD-AFFECTED WATERSHEDS CAN CONTAIN SPORES OF P. RAMORUM. MORE SPORES ARE TYPICALLY PRESENT IN WATERCOURSES DURING THE WET SEASON, BUT SPORES MAY BE PRESENT IN SOME STREAMS YEAR ROUND. UNTREATED WATER FROM POTENTIALLY INFESTED STREAMS SHOULD NOT BE USED FOR IRRIGATION, DUST CONTROL ON ROADS, OR SIMILAR PURPOSES. WATER CAN BE TREATED WITH ULTRAFILTRATION, CHEMICALS (CHLORINE, OZONE), OR UV RADIATION TO ELIMINATE PHYTOPHTHORA SPORES.

AS-BUILT NOTES:

1. PHYTOPHTHORA RAMORUM WAS NOT ENCOUNTERED DURING CONSTRUCTION.

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK; HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-05-19	EB

DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

SYMBOLS, GENERAL NOTES, AND PHYTOPHTHORA BMPs

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 2.0

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-02-0NOTES - STANDARD\215108-02-0-NOTES.DWG

SCHEDULE OF MATERIALS:

ITEM	UNIT	QUANTITY
Clearing and Grubbing	SY	25,400
Earthwork - (total cut and fill, see Earthwork Summary this sheet)	CY	8,300
Fencing and 3 gates	LF	8,370
Staked Wood Jam	EA	6
Living Log Jam: 1-Log	EA	17
Living Log Jam: 2-Log	EA	10
Log Grade Control	EA	2
Log Step Structures	EA	4
Arizona Crossing (P-02)	EA	1
Surface Aggregate (Corral Trail and Lower Hotel Trail)	SF	11,000
Planting and Seeding Preparation	SF	330,000
Planting: Treepot 4	EA	520
Planting: Deepot	EA	951
Planting: Treebands	EA	7,678
Planting: Cuttings	EA	400
Seeding: Seed Mix 1 - Wetland Riparian Mix	AC	0.28
Seeding: Seed Mix 2 - Riparian Mix	AC	2.71
Seeding: Seed Mix 3 - Upland Mix	AC	2.04
Seeding: Seed Mix 3 - Upland Mix for access route/staging area rehabilitation	AC	2.43

SUMMARY OF EARTHWORK QUANTITIES:

ID	AREA (SF)	CUT (CY)	FILL (CY)	BORROW / SPOIL (+/- CY)
ED01-01	59,820	770	0	-770
ED01-02	900	30	30	0
ED02-01	22,930	690	0	-690
ED03-01	2,740	0	250	250
ED03-02	3,140	0	220	220
ED03-03	2,180	0	230	230
ED03-04	3,070	0	300	300
ED03-05	1,110	0	140	140
ID01-01	1,600	50	50	0
ID02-01	380	0	40	40
ID03-01	44,840	1,820	0	-1,820
ID03-02	11,090	630	0	-630
ID03-03	4,300	170	0	-170
ID03-04	9,060	530	0	-530
ID03-05	12,650	1,190	0	-1,180
R-01	47,620	0	1,230	-1,230
R-02	2,190	10	10	0
TOTAL	226,850	5,500	2,500	-3,500

SUMMARY OF LOG QUANTITIES:

Structure Type	Structure Quantity	Logs per Structure by Log Type			
		Log with Rootwad: 20' long x 24" dia	Foundation/Crest Log: 15' long x 24" dia	Floodplain Log: 18' long x 18" dia	Wing Log: 5' to 10' long x 18" dia
Living Log-Jam: 1-Log	17	1	0	0	0
Living Log-Jam: 2-Log	10	2	0	0	0
Log Grade Control	2	1	0	0	0
Log Step Structures	4	0	3	2	2
TOTAL		39	12	8	8

LEGEND:

GRADING LIMIT WITH AREA ID — ID03-02

BENCHMARK TABLE

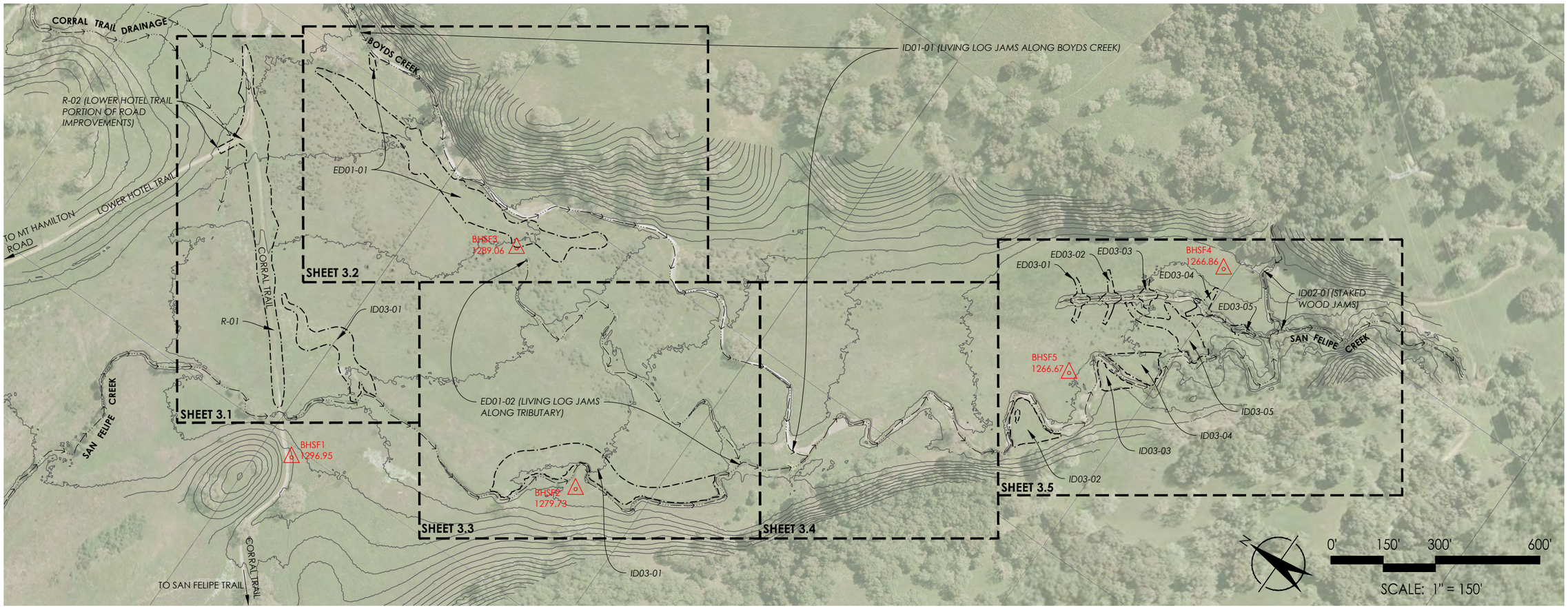
POINT	NORTHING	EASTING	ELEVATION
BMSF1	1,941,910.53	6,211,969.67	1,296.95
BMSF2	1,941,190.66	6,212,364.01	1,279.73
BMSF3	1,941,726.80	6,212,832.54	1,289.06
BMSF4	1,940,030.84	6,213,951.27	1,266.86
BMSF5	1,940,222.47	6,213,451.79	1,266.67

NOTES:

1. EARTHWORK QUANTITIES ARE BASED ON THE BEST AVAILABLE FIELD INFORMATION, AND DO NOT ACCOUNT FOR SHRINK OR SWELL OF SOILS. ACTUAL QUANTITIES MAY VARY.
2. ALL LOG DIMENSIONS ARE MINIMUM ACCEPTABLE VALUES; MEASURED ANYWHERE ON THE LOG >4' ABOVE THE ROOT BOLE.
3. LENGTHS FOR LOGS WITH ROOTWADS ARE MEASURED FROM THE CUT END TO THE BOLE.
4. IF THE TOTAL NUMBER OF LOGS WITH ROOTWADS CANNOT BE PROCURED, LOGS WITH TWO CUT ENDS MAY BE SUBSTITUTED WITH APPROVAL FROM THE ENGINEER'S REPRESENTATIVE.

DATUM NOTES:

1. VERTICAL DATUM IS APPROXIMATELY BASED ON THE HEIGHT ABOVE THE ELIPSOID (WGS 84), NOT ORTHOMETRIC HEIGHT. HORIZONTAL DATUM IS APPROXIMATELY BASED ON NAD83 STATE PLANE ZONE III SURVEY FEET (± 3 FEET) ALL BENCHMARK COORDINATES AND ELEVATIONS ARE PRESENTED IN AN INTERNALLY CONSISTENT SURVEY GRADE DATUM.



AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-02-1 QUANTITIES - STANDARD\215108-02-1 QUANTITIES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS, SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
DUDEK
HRS HABITAT RESTORATION SCIENCES, INC.

SUBMITALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK
CHECKED BY	D SHAW
IN CHARGE	E BALLMAN
DATE	02-11-2019

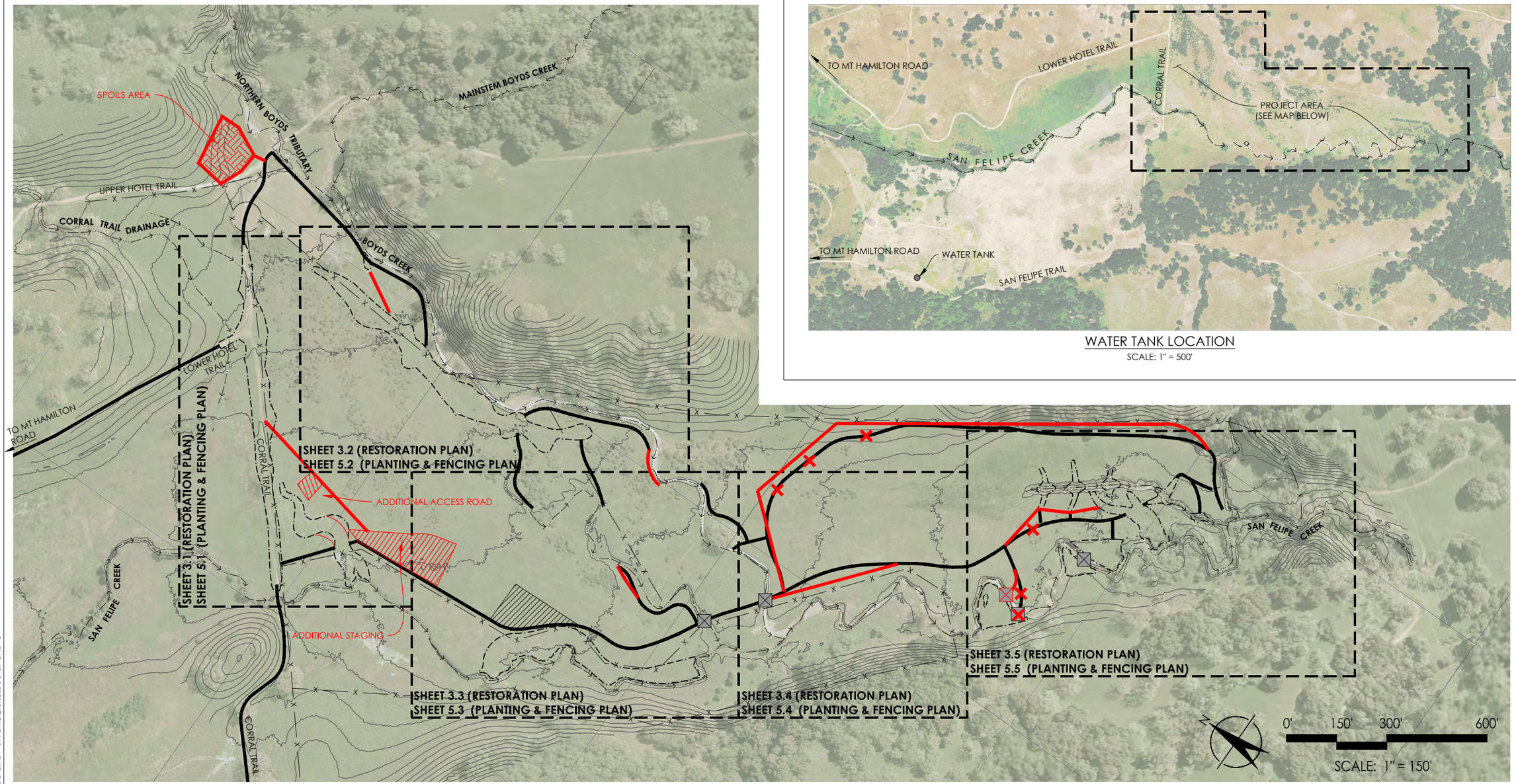
SUMMARY OF MATERIALS QUANTITIES

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 150'

SHEET 2.1



WATER TANK LOCATION

SCALE: 1" = 500'

TO SAN FELIPE TRAIL AND WATER TANK (EXPECTED POINT OF CONNECTION FOR TEMPORARY IRRIGATION SYSTEM); SEE INSET MAP ABOVE

LEGEND:

- CONSTRUCTION ACCESS ROUTE (OUTSIDE OF GRADING LIMIT)
- STAGING AND STOCKPILE AREA
- GRADING LIMIT
- TEMPORARY CHANNEL CROSSING (SEE DETAIL 1, THIS SHEET)
- RE-ALIGNED OR ADDITIONAL ACCESS ROUTE

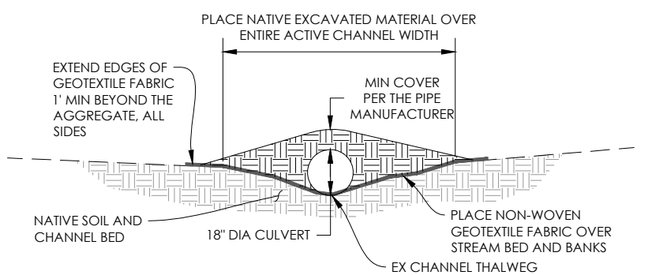
AS-BUILT DRAWINGS

NOTES:

1. REFER TO NOTES ON SHEETS 5.0B AND 5.0C FOR PLANTING PREPARATION NOTES.
2. THE WATER TANK OFF OF SAN FELIPE TRAIL IS THE EXPECTED WATER SERVICE POINT FOR THE IRRIGATION SYSTEM. SEE NOTES ON SHEET 5.0D.
3. CONSTRUCTION ACCESS ROUTES SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN FIELD.
4. THE STAGING AREA SHOWN ON THIS SHEET IS THE PRIMARY STAGING AREA. ADDITIONAL, SMALLER STAGING AREAS WILL BE LOCATED WITHIN GRADING AREAS.
5. EXISTING FENCE REMOVAL TO BE LIMITED TO AREAS IN CONFLICT WITH CONSTRUCTION ACTIVITIES AND MARKED IN THE FIELD AS SHOWN ON SHEET 5.6. ALL OTHER EXISTING FENCING WILL BE PROTECTED IN PLACE.
6. UPON COMPLETION OF CONSTRUCTION, ALL STAGING AND CONSTRUCTION ACCESS AREAS WILL BE DECOMMISSIONED BY RIPPING AND TILLING TO A 12-INCH DEPTH AND APPLYING SEED MIX TYPE 3.
7. UPON COMPLETION OF THE 10-YEAR MAINTENANCE PERIOD, ALL MAINTENANCE ACCESS ROADS WILL BE DECOMMISSIONED BY RIPPING AND TILLING TO A 12-INCH DEPTH AND APPLYING SEED MIX TYPE 3.

AS-BUILT NOTE

IRRIGATION IS TEMPORARY, CONTRACTOR OWNED INFASTRUCTURE, AND THUS IS NOT SHOWN.



1 TEMPORARY CHANNEL CROSSING

SCALE: NTS

TEMPORARY CHANNEL CROSSING NOTES:

1. GEOTEXTILE SHALL COVER THE ENTIRE FOOTPRINT OF THE AGGREGATE AND PIPE.
2. REMOVE THE CROSSING UPON COMPLETION OF CONSTRUCTION AND BEFORE WINTER RAINS AND RESTORE THE CHANNEL AND BANKS TO THEIR PRE-DISTURBANCE CONDITION.

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK; HRS HABITAT RESTORATION SCIENCES, INC.

SUBMITALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK
CHECKED BY	D SHAW
IN CHARGE	E BALLMAN
DATE	02-11-2019

OVERVIEW MAP AND SITE PREPARATION PLAN

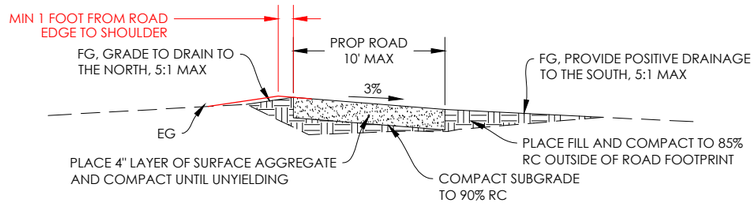
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

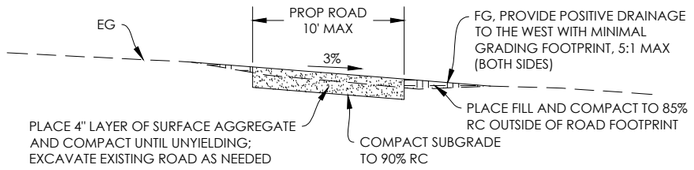
SCALE 1" = 150'

SHEET 3.0

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-0-OVERVIEW - STANDARD\215108-03-0-OVERVIEW.DWG



1 CORRAL TRAIL TYPICAL SECTION
SCALE: NTS



2 LOWER HOTEL TRAIL TYPICAL SECTION
SCALE: NTS

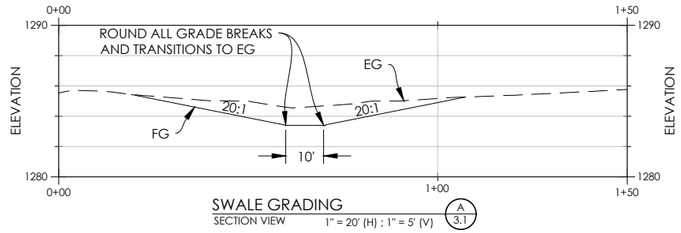
LEGEND:

- INSTALL ARIZONA CROSSING PER DETAIL 1, SHEET 4.0
- REBUILD CORRAL TRAIL PER DETAIL 1, THIS SHEET
- PLACE FILL (EXCAVATED MATERIAL FROM ON SITE)
- ROAD GRADING MONUMENT (SEE NOTES, THIS SHEET)

NOTES:

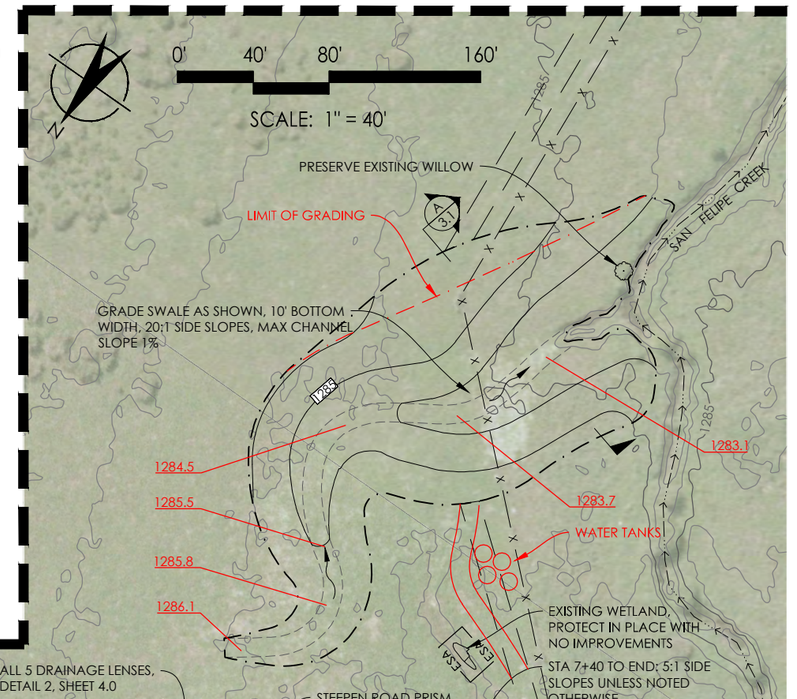
1. SEE SHEET 5.1 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. ROAD GRADING MONUMENTS SHALL BE FLEXIBLE ROAD MARKERS 56" TALL BY 4" WIDE, AND SHALL BE MOUNTED ON A 12" GALVANIZED U-CHANNEL MOUNTING STAKE. THE MONUMENTS SHALL BE TRIMMED PER THE DIRECTION OF SCCP PARKS MAINTENANCE STAFF, AND MARKED TO INDICATE AS-BUILT FINISH GRADE.
4. SURFACE AGGREGATE SHALL BE 3/4" MINUS WELL-GRADED MATERIAL. PROVIDE PRODUCT SHEET TO ENGINEER'S REPRESENTATIVE FOR APPROVAL.

AS-BUILT NOTE
REFER TO SHET 3.0 FOR CHANGES TO ACCESS ROUTES

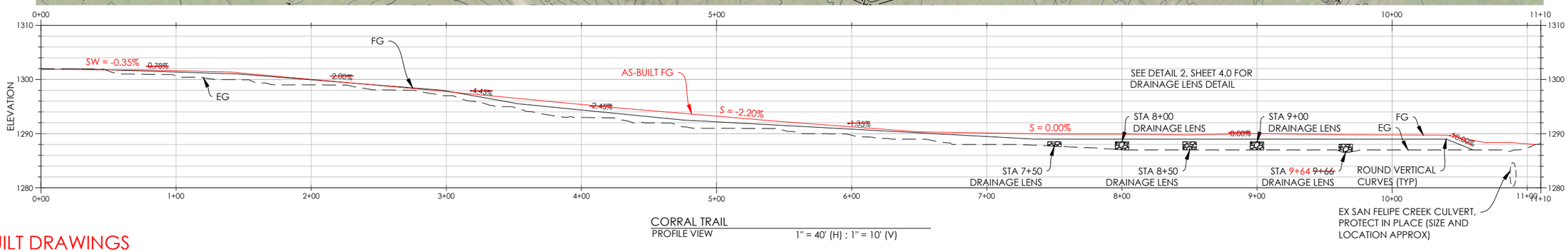


SWALE GRADING
SECTION VIEW 1" = 20' (H) ; 1" = 5' (V) (A 3.1)

MATCH SHEET 3.3



MATCH SHEET 3.2



CORRAL TRAIL
PROFILE VIEW 1" = 40' (H) ; 1" = 10' (V)

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-TOS-40SCALE - STANDARD\215108-03-TOS-40SCALE.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
http://www.balancehydro.com/

DUDEK HRS HABITAT RESTORATION SOLUTIONS, INC.

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK
CHECKED BY	D SHAW
IN CHARGE	E BALLMAN
DATE	02-11-2019

DATE	BY	SUBMITTALS / REVISIONS
03-27-17	TG	CONCEPT PLANS
07-24-17	PK	DRAFT 65% DESIGN
11-14-17	PK	FINAL 65% DESIGN
03-05-19	EB	AS-BUILT DRAWINGS

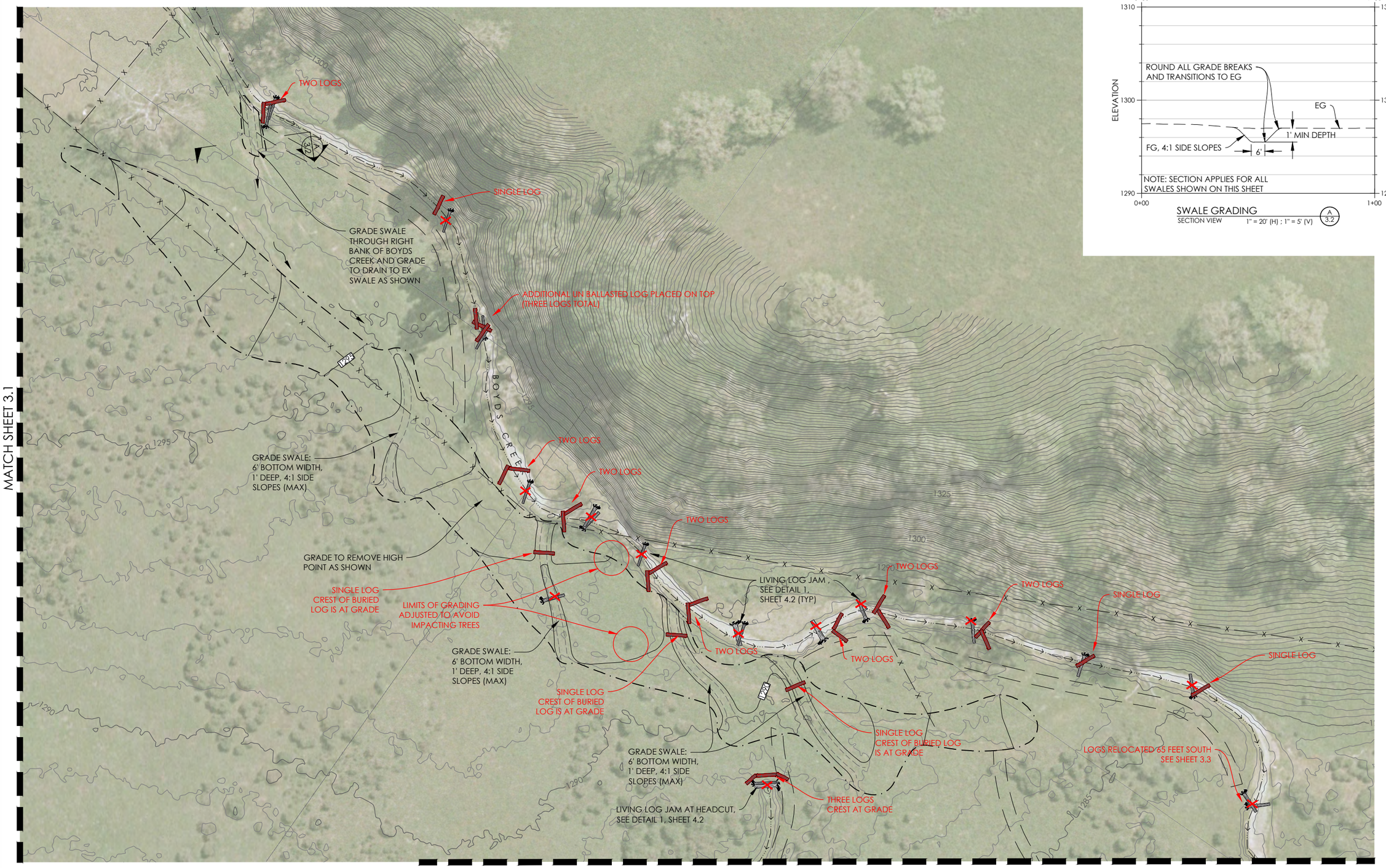
CORRAL TRAIL RESTORATION PLAN

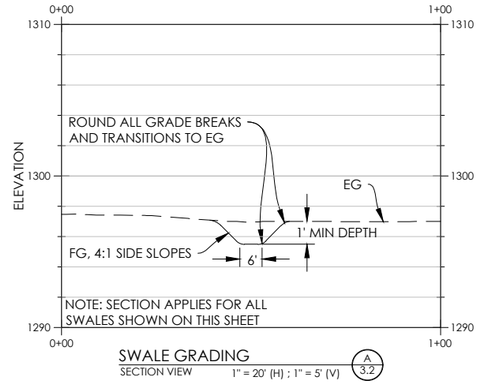
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 40'

SHEET 3.1





NOTES:
1. SEE SHEET 5.2 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. LIVING LOG JAM LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.

AS-BUILT DRAWINGS

AS-BUILT NOTES
1. NO LOGS WITH ROOTWADS WERE AVAILABLE. AVAILABLE WOOD WAS GENERALLY SHORTER THAN SPECIFIED, SO TWO- AND THREE-LOG STRUCTURES WERE USED IN MANY LOCATIONS. SEE TYPICALS ON SHEET 4.2.
2. REFER TO SHEET 3.0 FOR CHANGES TO ACCESS ROUTES

0' 40' 80' 160'
SCALE: 1" = 40'

PREPARED FOR:
SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS
HABITAT RESTORATION SCIENCES, INC.

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

UPPER BOYDS CREEK RESTORATION PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE 1" = 40'
SHEET 3.2

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-1TO5-40SCALE - STANDARD\215108-03-1TO5-40SCALE.DWG

MATCH SHEET 3.2

MATCH SHEET 3.1

MATCH SHEET 3.4

SINGLE LOG

SINGLE LOG

SINGLE LOG

SINGLE LOG

LIVING LOG JAM, SEE DETAIL 1, SHEET 4.2 (TYP)

TWO LOGS

TWO LOGS

TWO LOGS

CHANNEL GAGE 3 (PROTECT IN PLACE)

PIEZOMETER C (PROTECT IN PLACE)

BOYDS CREEK

CREST GAGE 2 (PROTECT IN PLACE)

PROTECT TREE

THREE LOGS

TWO LOGS

TWO LOGS

INSTALL TEMPORARY STREAM CROSSING, SEE DETAIL 1, SHEET 3.0

TWO LOGS

SINGLE LOG

TWO LOGS

STAGING AREA

GRADE INSET FLOODPLAIN

GRADUALLY VARY SLOPE TO BLEND WITH EXISTING

REMOVE AND REPLACE PIEZOMETER B

INSTALL NEW PIEZOMETER B

GRADUALLY VARY SLOPE STEEPNESS TO BLEND WITH EXISTING

CHANNEL GAGE 1 (PROTECT IN PLACE)

PIEZOMETER A (PROTECT IN PLACE)

EG 1276.7 THALWEG

EG1275.5 THALWEG

EG 1273.2 THALWEG

SAN FELIPE CREEK

1278.7 1278.6 1278.3 1278.1 1279.4 1279.6 1277.9 1278.3 1277.8 1277.3 1276.9 1276.0 1278.9 1278.6 1279.4 1279.1 1278.7 1277.1 1276.2 1276.5 1274.9 1276.0 1274.5 1275.2 1274.0 1273.8 1273.9 1274.0

1290 1285 1280 1275 1270

0' 40' 80' 160'

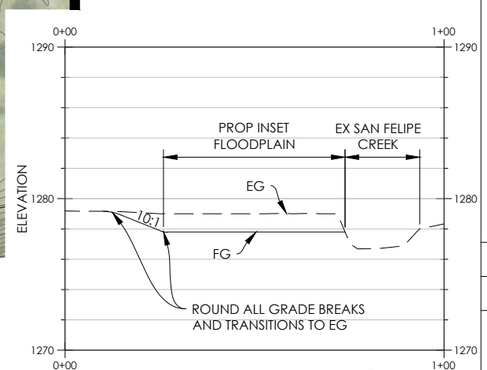
SCALE: 1" = 40'

NOTES:

1. SEE SHEET 5.3 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. ALL LOG STRUCTURES SHOWN ON THIS SHEET ARE LIVING LOG JAMS. SEE DETAIL 1, SHEET 4.1.
4. LIVING LOG JAM LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.

AS-BUILT NOTE

REFER TO SHET 3.0 FOR CHANGES TO ACCESS ROUTES



INSERT FLOODPLAIN GRADING (A 3.3)

SECTION VIEW 1" = 20' (H) ; 1" = 5' (V)

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-TIO5-40SCALE - STANDARD\215108-03-TIO5-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS HABITAT RESTORATION SCIENCES, INC.

DESIGNED BY	DATE	BY	SUBMITALS / REVISIONS
DONALDSON	03-27-17	TG	CONCEPT PLANS
DRAWN BY	07-24-17	PK	DRAFT 65% DESIGN
P KUICHAWIK	11-14-17	PK	FINAL 65% DESIGN
CHECKED BY	03-05-19	EB	AS-BUILT DRAWINGS
D SHAW			
IN CHARGE			
E BALLMAN			
DATE			
02-11-2019			

SAN FELIPE CREEK REACH 1 & LOWER BOYDS CREEK RESTORATION PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
1" = 40'

SHEET
3.3

AS-BUILT DRAWINGS

NOTES:

1. SEE SHEET 5.4 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. NO RESTORATION FEATURES THIS SHEET; CONSTRUCTION ACCESS ONLY.
3. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.

AS-BUILT NOTE

REFER TO SHET 3.0 FOR CHANGES TO ACCESS ROUTES

PREPARED FOR:

SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS
HABITAT RESTORATION SCIENCES, INC.

SUBMITALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK
CHECKED BY	D SHAW
IN CHARGE	E BALLIMAN
DATE	02-11-2019

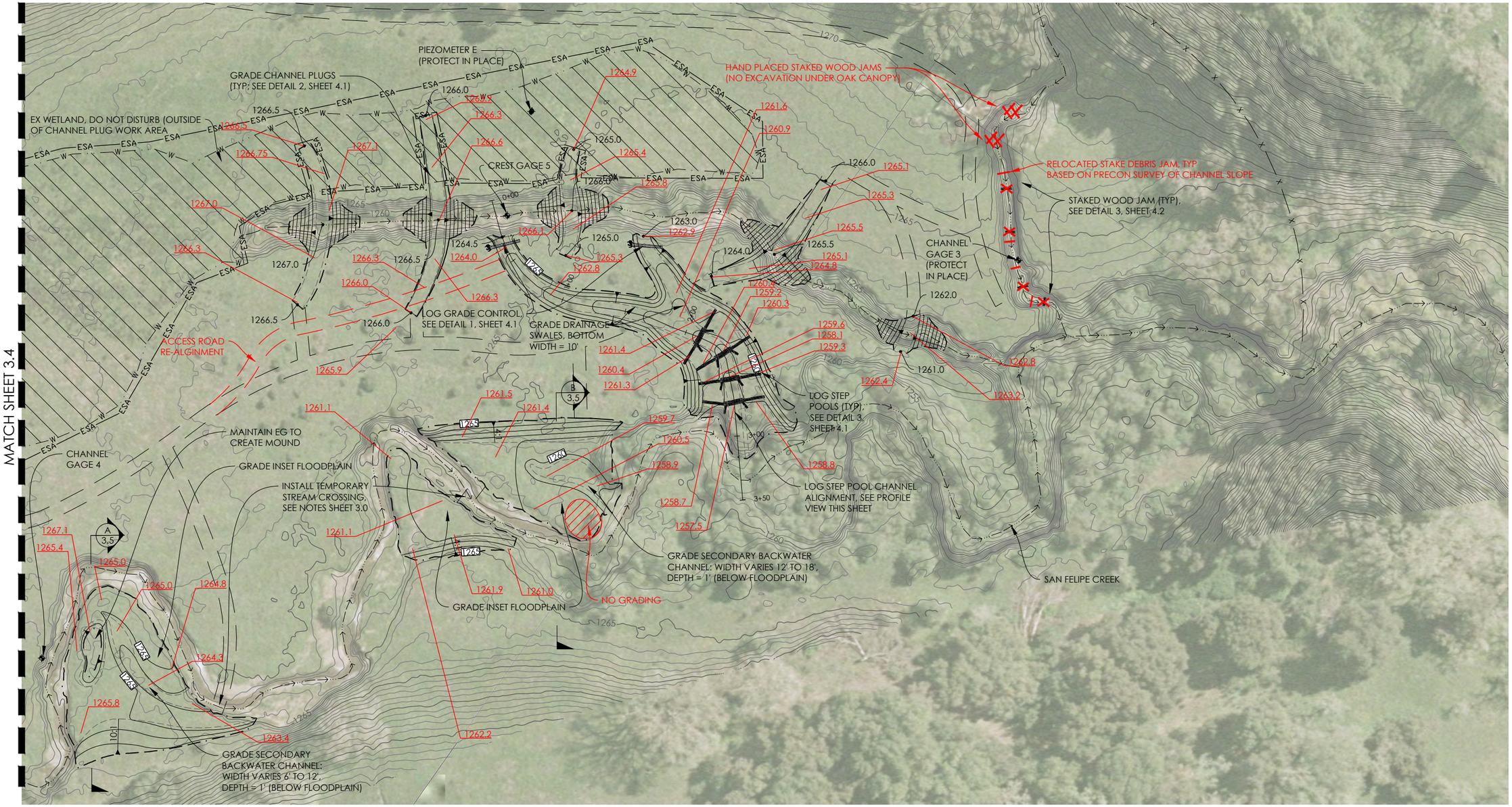
SAN FELIPE CREEK REACH 2 RESTORATION PLAN

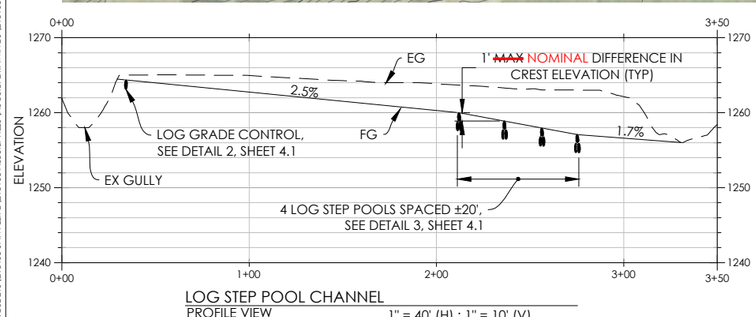
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

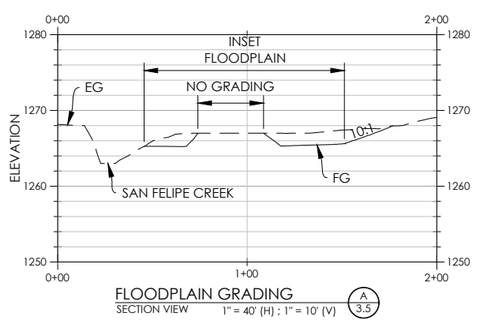
SCALE
1" = 40'

SHEET
3.4

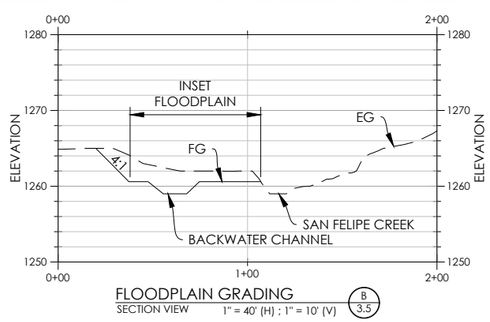




LOG STEP POOL CHANNEL
PROFILE VIEW 1" = 40' (H) ; 1" = 10' (V)



FLOODPLAIN GRADING (A 3.5)
SECTION VIEW 1" = 40' (H) ; 1" = 10' (V)



FLOODPLAIN GRADING (B 3.5)
SECTION VIEW 1" = 40' (H) ; 1" = 10' (V)

NOTES:
1. SEE SHEET 5.5 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.

AS-BUILT NOTE
REFER TO SHET 3.0 FOR CHANGES TO ACCESS ROUTES

0' 40' 80' 160'
SCALE: 1" = 40'

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-TIOS-40SCALE STANDARD\215108-03-TIOS-40SCALE.DWG

PREPARED FOR:
SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
DUDEK
HRS

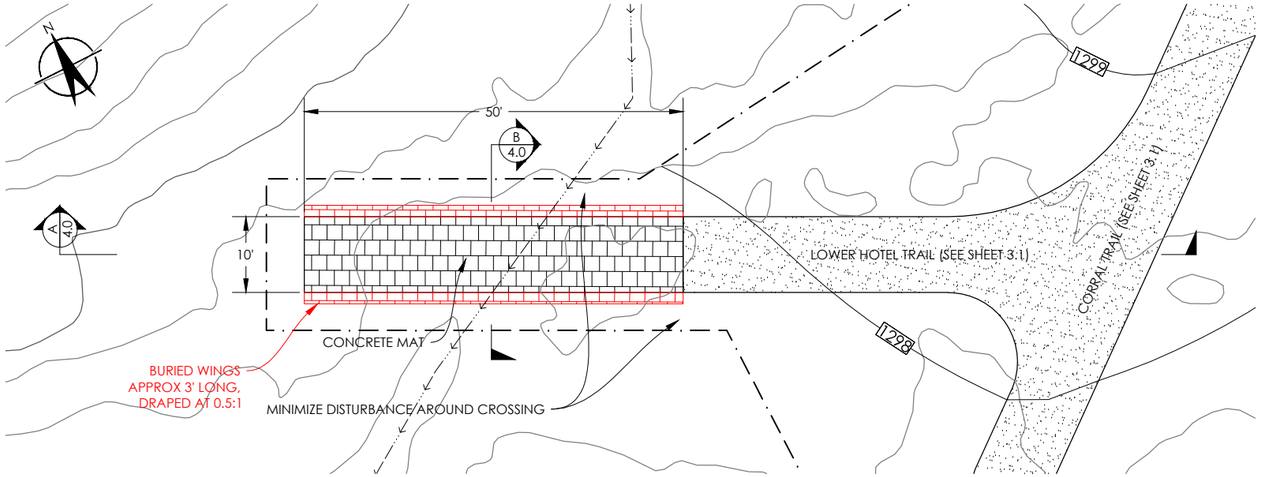
SUBMITALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

SAN FELIPE CREEK REACHES 3 & 4 RESTORATION PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

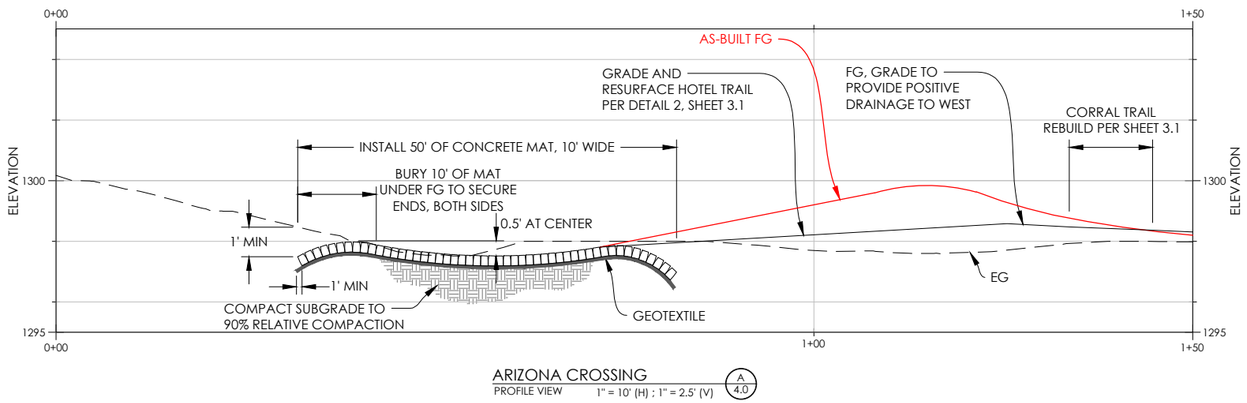
PROJECT NUMBER 215108
SCALE 1" = 40'
SHEET 3.5



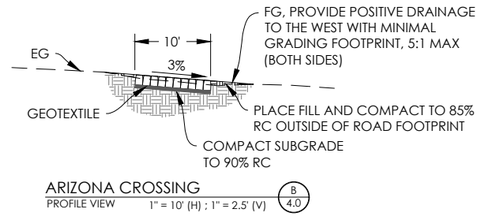
1 ARIZONA CROSSING
SCALE: 1" = 10'

NOTES:
1. THE ARIZONA CROSSING SHALL BE SURFACED WITH A CABLED CONCRETE MAT PRODUCT. BLOCKS SHALL BE OPEN-CELL. SUBMIT PHOTO OF PRODUCT SAMPLE TO THE ENGINEER'S REPRESENTATIVE PRIOR TO INSTALLATION. BLOCKS SHALL MEET TESTING REQUIREMENTS IN ACCORDANCE WITH ASTM D 6684-01.
2. GEOTEXTILE SHALL MEET THE MANUFACTURER'S GUIDELINES FOR USE WITH THE CONCRETE MAT.
3. INSTALL CONCRETE MAT PER THE MANUFACTURER'S SPECIFICATIONS.

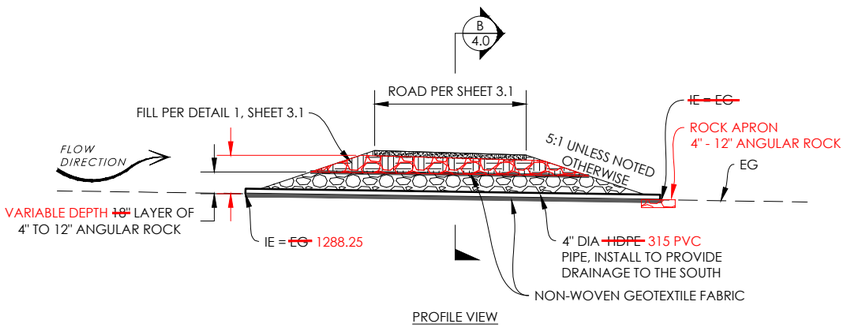
AS-BUILT NOTES:
1. THE BURIED WINGS ON THE ARIZONA CROSSING DETAIL ARE PER MANUFACTURERS RECOMMENDATION.
2. THE GRADES ON LOWER HOTEL TRAIL, BETWEEN THE ARIZONA CROSSING AND CORRAL TRAIL, WERE CHANGED TO IMPROVE FLOW SPLITTING AT THE TRAIL JUNCTION.



ARIZONA CROSSING
PROFILE VIEW 1" = 10' (H) ; 1" = 2.5' (V) A 4.0

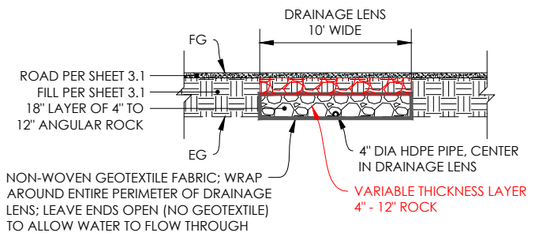


ARIZONA CROSSING
PROFILE VIEW 1" = 10' (H) ; 1" = 2.5' (V) B 4.0



PROFILE VIEW

2 DRAINAGE LENS
SCALE: 1" = 5'



DRAINAGE LENS
SECTION VIEW 1" = 5' B 4.0

AS-BUILT DRAWINGS

PREPARED FOR:
SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS
HABITAT RESTORATION SCIENCES, INC.

SUBMITALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-05-19	EB

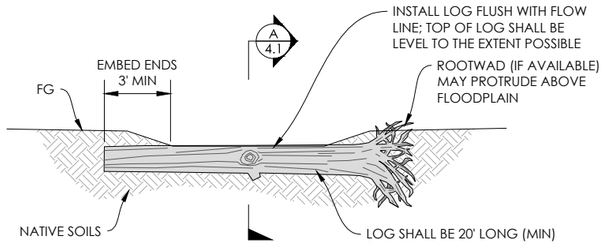
DESIGNED BY DONALDSON
DRAWN BY P KUCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

TRAIL DRAINAGE DETAILS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

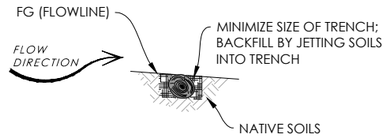
PROJECT NUMBER
215108
SCALE
AS SHOWN
SHEET
4.0

W:\CAD\PROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-04 DETAILS - STANDARD\215108-04 DETAILS.DWG

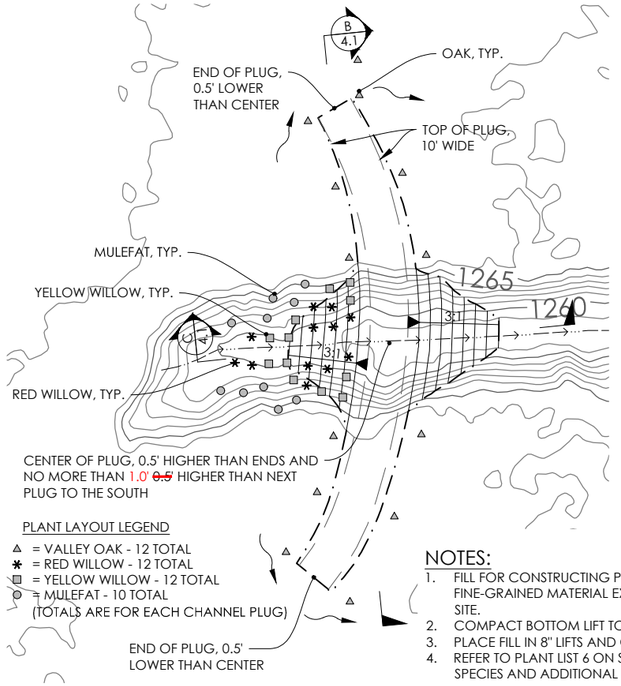


SECTION VIEW

1 LOG GRADE CONTROL
SCALE: 1" = 5'

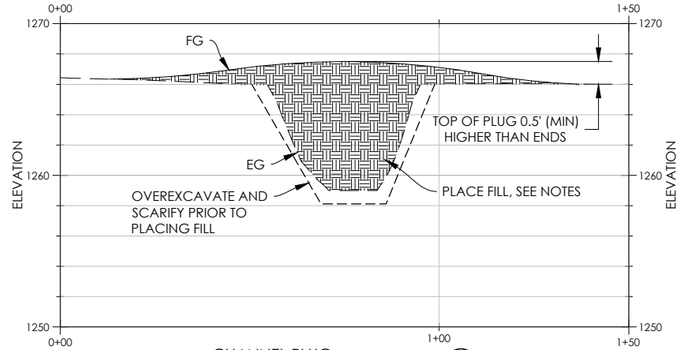


LOG GRADE CONTROL
SECTION VIEW 1" = 5' (A 4.1)

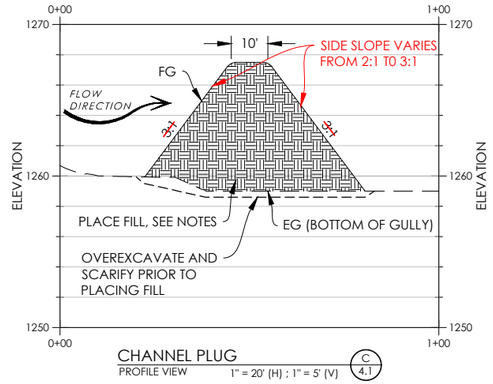


NOTES:
1. FILL FOR CONSTRUCTING PLUGS WILL BE FINE-GRAINED MATERIAL EXCAVATED FROM ON SITE.
2. COMPACT BOTTOM LIFT TO 90% RC.
3. PLACE FILL IN 8" LIFTS AND COMPACT TO 85% RC.
4. REFER TO PLANT LIST 6 ON SHEET 5.0B FOR PLANT SPECIES AND ADDITIONAL INFORMATION

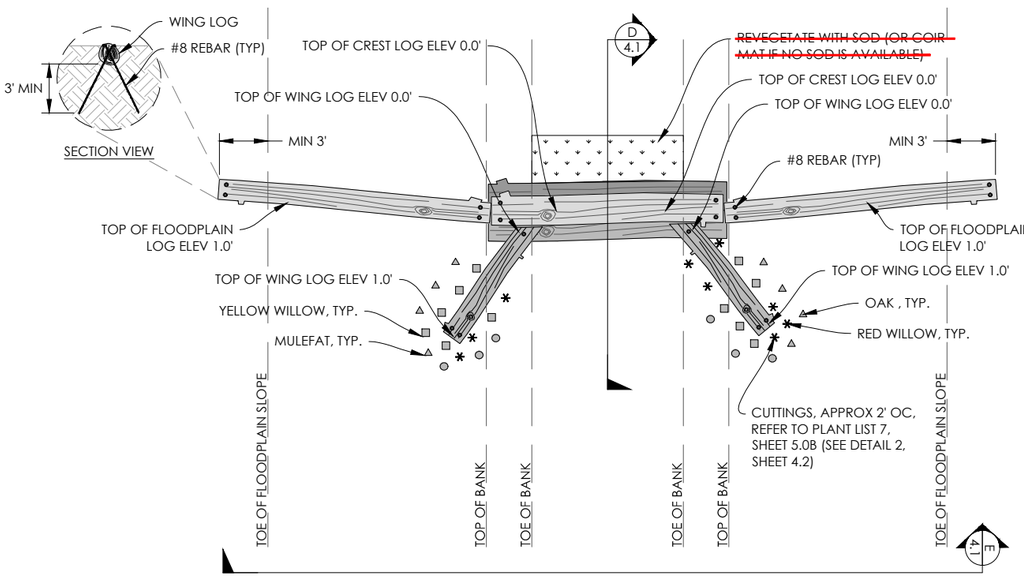
2 CHANNEL PLUG
SCALE: 1" = 20'



CHANNEL PLUG
SECTION VIEW 1" = 20' (H) ; 1" = 5' (V) (B 4.1)

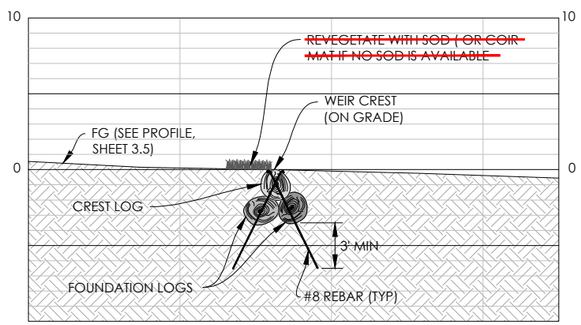


CHANNEL PLUG
PROFILE VIEW 1" = 20' (H) ; 1" = 5' (V) (C 4.1)

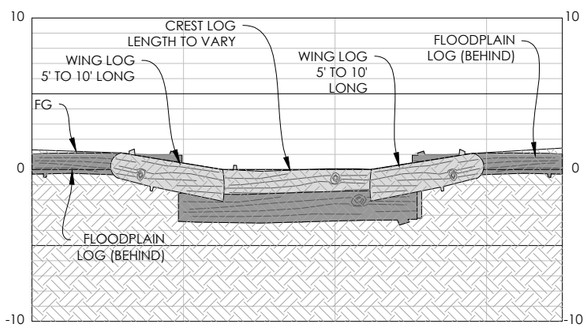


PLANT LAYOUT LEGEND
△ = VALLEY OAK - 8 TOTAL
✱ = RED WILLOW - 11 TOTAL
□ = YELLOW WILLOW - 11 TOTAL
○ = MULEFAT - 6 TOTAL
(TOTALS ARE FOR EACH LOG STEP POOL STRUCTURE)

3 LOG STEP POOL
SCALE: 1" = 5'



LOG STEP POOL
SECTION VIEW 1" = 5' (D 4.1)



LOG STEP POOL
ELEVATION VIEW 1" = 5' (E 4.1)

NOTES:
1. CREST LOGS AND FOUNDATION LOGS SHALL BE 15' LONG (MIN) AND 2' DIA ~~(MIN)~~ (NOMINAL).
2. WING LOGS SHALL BE 5' TO 10' LONG (TRIMMED ACCORDING TO FIELD CONDITIONS) AND 18" DIA (MIN).
3. FLOODPLAIN LOGS SHALL BE 18' LONG ~~(MIN)~~ (NOMINAL) AND 18" DIA ~~(MIN)~~ (NOMINAL) .
4. SOD SHALL BE EXISTING NATIVE MEADOW GRASS AND/OR FORBS. SEE SHEET 5.0F FOR ADDITIONAL NOTES ON SOD.
5. REFER TO PLANT LIST 7 ON SHEET 5.0B FOR PLANT SPECIES AND ADDITIONAL INFORMATION
6. CONCEAL TOP OF REBAR PIECES BY NOTCHING LOGS WITH CHAINSAW AND BENDING TOPS OVER INTO NOTCHES.
7. ~~COIR MAT SHALL BE A BIODEGRADABLE PRODUCT WITH 65% OPEN AREA OF WEAVE.~~
7. FOR POLE CUTTING INSTALLATION ADJACENT TO LOGS, SEE DETAIL 2, SHEET 4.2.

AS-BUILT DRAWINGS

W:\CAD\PROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-04-DETAILS - STANDARD\215108-04-DETAILS.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS HABITAT RESTORATION SCIENCES, INC.

	BY	DATE
SUBMITTALS / REVISIONS		
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

CHANNEL STABILIZATION DETAILS 1

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

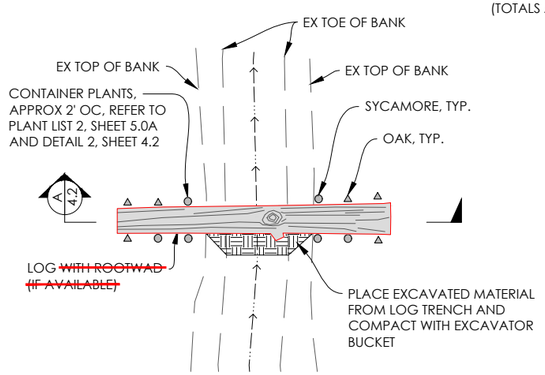
PROJECT NUMBER 215108
SCALE AS SHOWN
SHEET 4.1

CONTAINER PLANT LAYOUT LEGEND

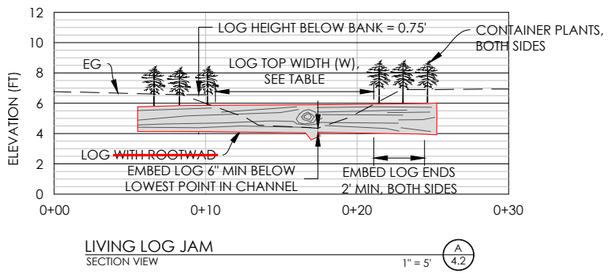
△ = VALLEY OAK - 6 TOTAL

⊙ = CALIFORNIA SYCAMORE - 6 TOTAL

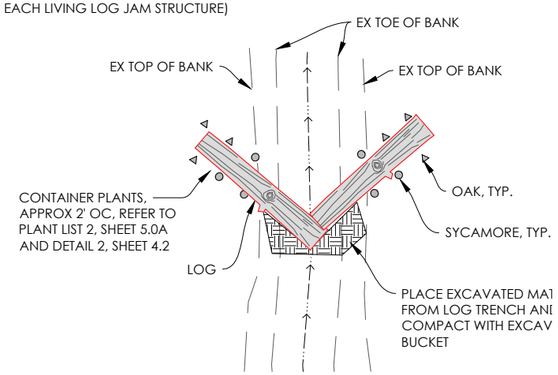
(TOTALS ARE FOR EACH LIVING LOG JAM STRUCTURE)



1 LIVING LOG JAM (SINGLE LOG)
SCALE: 1" = 5'

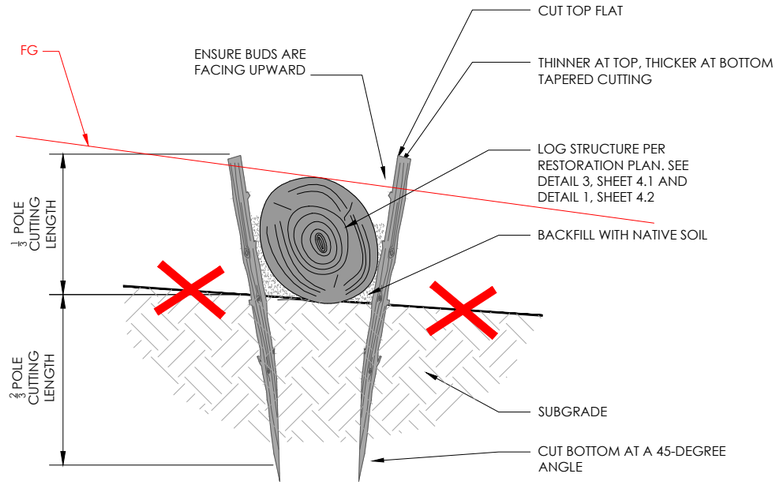


LIVING LOG JAM
SECTION VIEW
1" = 5'
A 4.2



4 LIVING LOG JAM (TWO LOGS)
SCALE: 1" = 5'

NOTES:
1. LIVING LOG JAMS SHALL BE CONSTRUCTED WITH LOGS WITH ROODWADS 20' LONG (MIN) MEASURED FROM CUT END TO BOLE AND 24" DIAMETER (MIN). IF LOGS WITH ROOTWADS ARE NOT AVAILABLE, LOGS WITH TWO CUT ENDS MAY BE SUBSTITUTED WITH APPROVAL FROM THE ENGINEER'S REPRESENTATIVE.
2. MAKE TOP OF LOG AS LEVEL AS POSSIBLE TO AVOID FLOW CONCENTRATION AND SCOUR. ORIENT LOG PERPENDICULAR TO FLOW DIRECTION.
3. INSTALL LIVING LOG JAMS WITH TWO LOGS WHERE SHOWN ON THE RESTORATION PLAN AND PER THE DIRECTION OF THE ENGINEER'S REPRESENTATIVE.



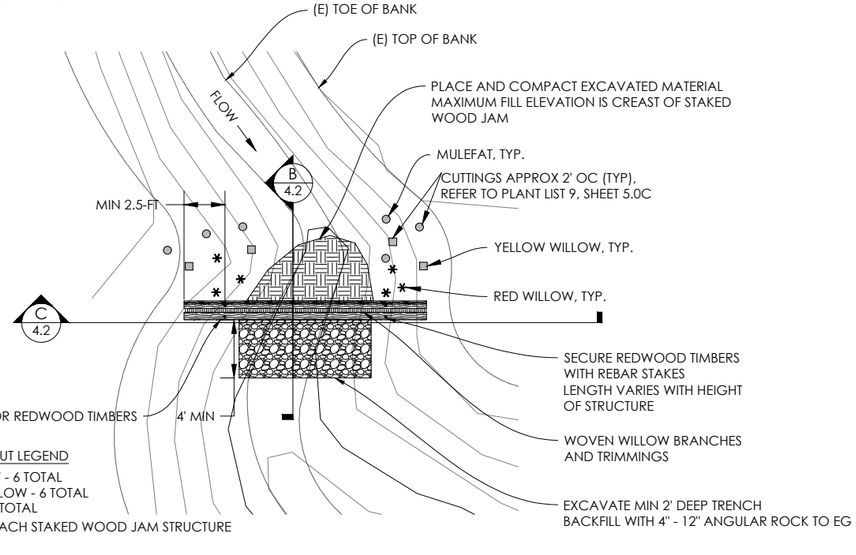
NOTES:
1. REFER TO PLANT LIST FOR PLANT SPECIES AND SIZE.
2. PLACE CUTTING CONCURRENT WITH ~~LOG WORK~~ PLANTING.

2 POLE CUTTING INSTALLATION ADJACENT TO LOGS
SCALE: NTS

AS-BUILT NOTES:
1. STAKED DEBRIS JAM WING WALLS WERE REMOVED BECAUSE THE REQUIRED EXCAVATION WOULD HAVE CAUSED EXCESSIVE IMPACTS.
2. STAKED DEBRIS JAMS MOVED IN ORDER TO MEET SPECIFICAITONS IN DETAIL 3 AND DISTRIBUTE VERTICAL DIFFERENCE EQUALLY BETWEEN STRUCTURES.
3. 1.THE TWO UPPER MOST STAKED DEBRIS JAMS UNDER DRIP LINE OF MATURE OAK WERE CONSTRUCTED BY HAND WEAVING WILLOW SLASH INTO ROOTS AND HAND PLACING 4" - 12" ANGULAR ROCK.

5 UPPER MOST STAKED DEBRIS JAM (HANDWORK ONLY)
SCALE: NTS

6 STAKED DEBRIS JAM (HANDWORK ONLY)
SCALE: NTS



CUTTING LAYOUT LEGEND

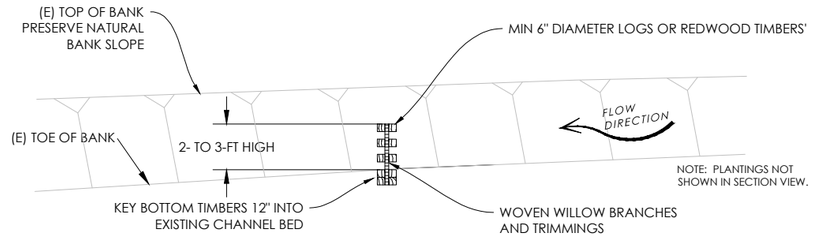
✱ = RED WILLOW - 6 TOTAL

▪ = YELLOW WILLOW - 6 TOTAL

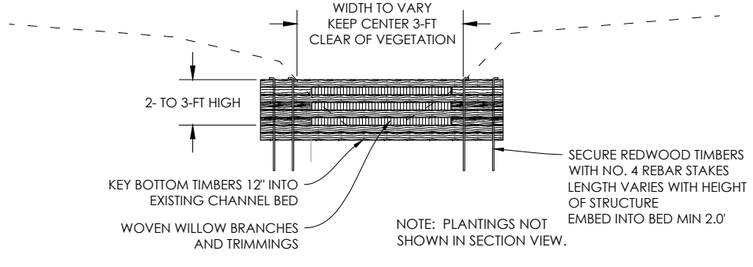
⊙ = MULEFAT - 6 TOTAL

(TOTALS FOR EACH STAKED WOOD JAM STRUCTURE

3 STAKED WOOD JAM
SCALE: NTS



B STAKED WOOD JAM SECTION
SCALE: NTS



C STAKED WOOD JAM SECTION
SCALE: NTS

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-04 DETAILS - STANDARD\215108-04 DETAILS.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK HRS HABITAT RESTORATION SCIENCES, INC.

DESIGNED BY	DONALDSON
DRAWN BY	P KULCHAWIK
CHECKED BY	D SHAW
IN CHARGE	E BALLMAN
DATE	02-11-2019

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-05-19	EB

CHANNEL STABILIZATION DETAILS 2

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE AS SHOWN

SHEET 4.2

SEED MIXES:

NOTES:

1. ALL SEED AND PROPAGULE MATERIALS SHALL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM THE GENERAL SANTA CLARA COUNTY REGION, UNLESS OTHERWISE APPROVED BY THE ENGINEER'S REPRESENTATIVE.
2. USE SEED MIX TYPE 3 FOR DISTURBED AREAS NOT OTHERWISE INDICATED TO RECEIVE A SPECIFIC SEED MIX.

SEED MIX TYPE 1 – WETLAND RIPARIAN MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	CYPERUS ERAGROSTIS	UMBRELLA PLANT	2
	ELYMUS GLAUCUS	BLUE WILD RYE	10
	ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	6
	FESTUCA RUBRA	NATIVE RED FESCUE	8
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	12
	LASTHENIA CALIFORNICA	GOLDFIELDS	0.5
		TOTAL MIX TYPE 1	**38.7**

SEED MIX TYPE 2 – RIPARIAN MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	CYPERUS ERAGROSTIS	UMBRELLA PLANT	2
	ELYMUS GLAUCUS	BLUE WILD RYE	10
	ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	6
	FESTUCA RUBRA	NATIVE RED FESCUE	8
	HELIOTROPIUM CURASSAVICUM	HELIOTROPE	1
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	12
	SISYRINCHIUM BELLUM	BLUE EYED GRASS	2
		TOTAL MIX TYPE 2	**41.2**

SEED MIX TYPE 3 – UPLAND MIX

SYMBOL	SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
	ACHILLEA MILLEFOLIUM	YARROW	0.2
	BROMUS CARINATUS	CALIFORNIA BROME	6
	CLARKIA PURPUREA	PURPLE C.ARKIA	2
	ELYMUS GLAUCUS	BLUE WILD RYE	15
	ERIOGONUM FASCICULATUM	CALIFORNIA BUCKWHEAT	1.5
	ERIOPHYLLUM CONFERTIFLORUM	GOLDEN YARROW	0.25
	HORDEUM BRACHYANTHERUM SSP. BRACHYANTHERUM	MEADOW BARLEY	8
	PHACELIA CALIFORNICA	CALIFORNIA PHACELIA	1
	SISYRINCHIUM BELLUM	BLUE EYED GRASS	2
	STIPA PULCHRA	PURPLE NEEDLE GRASS	12
		TOTAL MIX TYPE 3	**47.95**

PLANT LISTS:

NOTES:

1. PLANTING AREA CALCULATIONS WERE PROVIDED BY BALANCE HYDROLOGICS ON APRIL 20, 2017.
2. ALL PLANT MATERIAL SHALL ORIGINATE FROM PLANT PROPAGATION MATERIALS GATHERED DIRECTLY FROM THE SITE, OR BE NATIVE STOCK FROM THE REGION PURCHASED FROM A REPUTABLE NATIVE PLANT NURSERY.
3. AT ALL TIMES SPECIAL CARE SHALL BE TAKEN WITH THE PROPAGATION OF CALIFORNIA SYCAMORE TO ELIMINATE HYBRIDIZING WITH THE NON-NATIVE LONDON PLANE TREE (*PLATANUS HISPANICA* (*X ACERIFOLIA*)).
4. INSTALL ALL CONTAINER PLANTS AND CUTTINGS IN A RANDOM DISTRIBUTION TO MIMIC A NATURAL PLANT LAYOUT.
5. BMP'S FOR EXCLUDING PHYTOPHTHORA RAMORUM SHALL BE CONDUCTED AS PRESCRIBED ON SHEET 2.0.

AS-BUILT DRAWINGS

PLANT LISTS (CONTINUED):

PLANT LIST 1. NEW SWALE LOCATION – SHEET 5.1

APPROXIMATELY 15,635 SQUARE FEET

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
LOWER SLOPE (APPROXIMATELY 6,580 SQUARE FEET)					
JUNCUS EFFUSUS	COMMON RUSH	TREEBANDS	75	2'-0"	PLANT ALONG TOE OF SLOPE AND IN LOW FLOW CHANNEL WITHIN 60 FEET OF THE CREEK, IN GROUPS OF 3-7 PLANTS
JUNCUS PATENS	SPREADING RUSH	TREEBANDS	75	2'-0"	PLANT ALONG TOE OF SLOPE AND IN LOW FLOW CHANNEL WITHIN 60 FEET OF THE CREEK, IN GROUPS OF 3-7 PLANTS
ROSA CALIFORNICA	WILD ROSE	DEEPOT	100	6' 0"	INSTALL IN GROUPS OF 3 7 PLANTS
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	60	2'-0"	4 FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; 1 ROW AT TOE OF SLOPE WITHIN 60 FEET OF THE CREEK
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	60	2'-0"	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; 1 ROW AT TOE OF SLOPE WITHIN 60 FEET OF THE CREEK
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	30	12' 0"	INSTALL GROUPS OF 3 5 PLANTS
UPPER SLOPE (APPROXIMATELY 9,055 SQUARE FEET)					
~~*AMELANCHIER UTAHENSIS*~~	SERVICEBERRY	DEEPOT	70	6' 0"	SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	34	12'-0"	
SYMPHORICARPOS ALBUS	SNOWBERRY	DEEPOT	70	6' 0"	INSTALL IN GROUPS OF 3 5 PLANTS SEE AS-BUILT DRAWING NOTE 4 BELOW, THIS SHEET

- FOR *ROSA CALIFORNICA*, *SAMBUCUS MEXICANA*, AND ALL UPPER SLOPE SPECIES; CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- ALL SLOPE LAY BACK AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 2. LIVING LOG-JAM BIO-TECHNICAL ENHANCEMENT FEATURES AT TRIBUTARIES TO SAN FELIPE CREEK – SHEETS 5.2 AND 5.3

27 TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	TREEPOT4	150	PER DETAIL 1 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS; SEE NOTE BELOW
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	150	PER DETAIL 1 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS

- ALTERNATE SPECIES AT LOCATIONS SHOWN ON THE DETAILS.
- PLANT SYCAMORE SPECIFIES AS PURE GENETIC PLANTS ARE AVAILABLE; IF PLANTS ARE NOT AVAILABLE, SUBSTITUTE THE NEEDED QUANTITY WITH *QUERCUS LOBATA* (VALLEY OAK) IN TREEPOT4 CONTAINERS.
- LIVING LOG-JAM BIO-TECHNICAL ENHANCEMENT FEATURES SHALL NOT RECEIVE ANY SEEDING.

PLANT LIST 3. INSET FLOODPLAIN DEVELOPMENT AND RELATED SLOPE AT SAN FELIPE CREEK – SHEET 5.3

APPROXIMATELY 41,600 SQUARE FEET

- INSET FLOODPLAIN DEVELOPMENT AND RELATED SLOPE AREA SHALL BE SEEDED WITH SEED MIX TYPE 2 ONLY; NO CONTAINER PLANTS OR CUTTINGS SHALL BE INSTALLED.

PLANT LIST 4. INSET FLOODPLAIN AT SAN FELIPE CREEK, NORTHERN AREA – SHEET 5.5

APPROXIMATELY 9,030 SQUARE FEET

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
FRANGULA CALIFORNICA	COFFEE BERRY	DEEPOT	30	6' 0"	INSTALL ON UPPER ELEVATIONS TO THE WEST
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	60	6'-0"	INSTALL IN GROUPS OF 3 5 PLANTS
~~*RIBES MALVACEUM*~~	~~CHAPARRAL CURRANT~~	~~DEEPOT~~	~~30~~	~~6'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET
ROSA CALIFORNICA	WILD ROSE	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	30	6' 0"	INSTALL IN GROUPS OF 3 7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	20	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
~~*UMBELLULARIA CALIFORNICA*~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~20~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 5 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5.5 FOR PLANTING AS-BUILT DRAWINGS.
2. *AMELANCHIER UTAHENSIS* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
3. *RIBES CALIFORNICUM* WAS SUBSTITUTED FOR *RIBES MALVACEUM*.
4. *SYMPHORICARPOS ALBUS* WAS SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
5. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, California 94710
ph (510) 704-1000 / fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

SEED MIXES & PLANT LISTS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0A

P:\300.ENVIRONMENTAL\100654 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PLANT LISTS (CONTINUED):

PLANT LIST 5. INSET FLOODPLAIN AT SAN FELIPE CREEK, SOUTHERN AREA – SHEET 5.5

APPROXIMATELY 10,970 SQUARE FEET (INCLUDES BOTH SIDES OF THE CREEK)

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
FRANGULA CALIFORNICA	COFFEE BERRY	DEEPOT	35	6'-0	INSTALL ON UPPER ELEVATIONS TO THE WEST
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	70	6'-0	INSTALL IN GROUPS OF 3-5 PLANTS
~~RIBES MALVACEUM~~	~~CHAPARRAL CURRANT~~	~~DEEPOT~~	~~35~~	~~6'-0~~	SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
ROSA CALIFORNICA	WILD ROSE	DEEPOT	35	6'-0	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	35	6'-0	INSTALL IN GROUPS OF 3-7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	24	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
~~UMBELLULARIA CALIFORNICA~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~24~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 6. CHANNEL PLUGS AND BANKS AT INCISED AGRICULTURAL DITCH – SHEET 5.5

5 TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	50	6'-0	INSTALL PER DETAIL 2, SHEET 4.1
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	60	PER DETAIL 2 SHEET 4.1	INSTALL AT TOP OF BANK
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	60	2'-0	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL IN DITCH ON UPSTREAM SIDE OF PLUG - INSTALL PER DETAIL 2, SHEET 4.1
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	60	2'-0	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL IN DITCH ON UPSTREAM SIDE OF PLUG - INSTALL PER DETAIL 2, SHEET 4.1

- INSTALL SPECIES AT LOCATIONS SHOWN ON THE DETAILS 2, SHEET 4.1.
- CHANNEL PLUG AREAS IN DITCH SHALL NOT RECEIVE ANY SEEDING.
- BANK AREAS DISTURBED BY PLUG INSTALLATION SHALL BE SEEDED WITH SEED MIX TYPE 3.

PLANT LIST 7. LOG STEP POOL STRUCTURES WEST OF THE INCISED AGRICULTURAL DITCH – SHEET 5.5

4 TOTAL; PER DETAILS ON SHEET 4.1

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	24	4'-0" TO 6'-0"	INSTALL PER DETAIL 3, SHEET 4.1
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	32	4'-0	INSTALL AT TOP OF BANK
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	44	PER DETAIL 3 SHEET 4.1	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL AT BOULDERS - REFER TO DETAIL 3, SHEET 4.1 FOR INSTALLATION
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	44	PER DETAIL 3 SHEET 4.1	4-FEET LONG, SALVAGE ON SITE AT COUNTY PARK'S DIRECTION; INSTALL AT BOULDERS - REFER TO DETAIL 3, SHEET 4.1 FOR INSTALLATION

- INSTALL SPECIES AT LOCATIONS SHOWN ON THE DETAIL 3, SHEET 4.1.
- LOG STEP POOL STRUCTURES SHALL NOT RECEIVE ANY SEEDING.

PLANTING PREPARATION NOTES:

1. PLANTING PREPARATION WILL CONSIST OF NON-NATIVE, WEEDY PLANT CONTROL TREATMENT AND AMENDING SOIL AS NEEDED TO PREPARE THE REVEGETATION TREATMENT AREAS FOR PLANTING. REFER TO SHEET 5.0E FOR THE PERFORMANCE RECOMMENDATIONS FOR THE MAXIMUM PERCENT COVER BY WEED SPECIES.

2. UPON THE DIRECTION OF THE AGENCY, THE CONTRACTOR MAY BE RESPONSIBLE FOR WEED TREATMENT OVER THE ENTIRE PROJECT AREA.

3. FOLLOWING GRADING OPERATIONS THE SOIL WILL BE TESTED BY THE CONTRACTOR FOR SOIL FERTILITY AND NATIVE PLANT GROWTH SUITABILITY. REPRESENTATIVE SOIL SAMPLES WILL BE TAKEN WITHIN THE REVEGETATION TREATMENT AREAS BY THE CONTRACTOR. SOIL TESTING WILL BE PERFORMED BY A QUALIFIED LABORATORY AND, PENDING THE TEST RESULTS, SOIL AMENDING WILL BE PERFORMED ACCORDING TO THE SOIL LABORATORY'S RECOMMENDATIONS BEFORE PLANTING AND SEEDING. AMENDMENTS WILL BE THOROUGHLY INCORPORATED AND BLENDED IN THE SOIL TO A DEPTH OF 8-10 INCHES. FOR PRELIMINARY SOIL TEST RESULTS, SEE SHEET 5.0F.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5.5 FOR PLANTING AS-BUILT DRAWINGS.
2. *RIBES CALIFORNICUM* WAS SUBSTITUTED FOR *RIBES MALVACEUM*.
3. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

4. NON-NATIVE, WEEDY PLANT SPECIES, OBSERVED AT THE PROJECT SITE INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

BOTANICAL NAME	COMMON NAME	CALIFORNIA INVASIVE PLANT COUNCIL (CAL-IPC) RATING
AVENA BARBATA	SLENDER OAT	MODERATE
AVENA FATUA	WILD OATS	MODERATE
BRASSICA NIGRA	BLACK MUSTARD	MODERATE
BROMUS SPP.	BROMES	MODERATE - HIGH
CARDUUS PYCNOCEPHALUS	ITALIAN THISTLE	MODERATE
CENTAUREA SOLSTITIALIS	YELLOW STAR THISTLE	HIGH
CONIUM MACULATUM	POISON HEMLOCK	MODERATE
ELYMUS CAPUT-MEDUSAE	MEDUSA HEAD GRASS	HIGH

5. THE CONTRACTOR'S LICENSED PEST CONTROL ADVISOR (PCA) SHALL PREPARE, SUBMIT FOR APPROVAL, AND IMPLEMENT A NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN. THE CONTRACTOR'S PCA SHALL PREPARE A MONTHLY SCHEDULE (IN A TABLE FORMAT) FOR AND A MAP OF THE SPECIFIC TREATMENTS NEEDED AS PART OF THE NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN. THE PLAN SHALL ADDRESS NON-NATIVE, WEEDY PLANT SPECIES CONTROL IN COORDINATION WITH TIMING OF SOIL TESTING, AMENDMENT APPLICATION AND PLANTING AND SEEDING.

6. AS A GUIDE, THE FOLLOWING RECOMMENDATIONS SHOULD BE CONSIDERED FOR THE NON-NATIVE, WEEDY PLANT SPECIES CONTROL TREATMENT PLAN:
   - BEFORE EARTHWORK OPERATIONS, CONDUCT MOWING (INCLUDING MASTICATING) TO BEGIN SITE PREPARATION FOR ALL REVEGETATION AREAS.
   - CONCURRENT WITH THE MOWING, USE EXISTING LOGS AVAILABLE IN THE PARK AND REDUCE THE LOGS TO CREATE TUB GRINDINGS (A COARSE MULCH BYPRODUCT), IF SOURCE MATERIALS ARE AVAILABLE.
   - IMMEDIATELY AFTER MOWING, CONDUCT EARTHWORK OPERATIONS WHERE PRESCRIBED.
   - AFTER EARTHWORK OPERATIONS, AND IN OTHER REVEGETATION AREAS NOT RECEIVING ANY GRADING, SPREAD THE TUB GRINDINGS AS AN ORGANIC MULCH THROUGHOUT THE AREAS TO RECEIVE REVEGETATION TO A 6- TO 8-INCH DEPTH; THIS WILL INCREASE ORGANIC MATTER IN THE PLANTING AREAS, WHILE SUPPRESSING THE NON-NATIVE, WEEDY PLANT SPECIES. NOTE, THE ORGANIC MULCH SHOULD HELP AMEND THE SOIL; HOWEVER, OTHER AMENDMENTS SUCH AS FERTILIZER WILL NOT BE USED.
   - QUARTERLY, AND BEFORE ANY REVEGETATION PLANTINGS, CONDUCT HAND-PULLING AND MECHANICAL (E.G., STRING TRIMMER) REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING THROUGH THE TUB GRINDING MULCH LAYER.
   - CONDUCT SEEDING.
   - CONDUCT REVEGETATION CONTAINER PLANTING, THROUGH THE TUB GRINDING MULCH LAYER.
   - AFTER CONTAINER PLANTING, AND QUARTERLY, CONDUCT HAND-PULLING AND MECHANICAL (E.G., STRING TRIMMER) REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING THROUGH THE TUB GRINDING MULCH LAYER.
   - AFTER SEEDING, MAINTAIN A 20-FOOT BUFFER AROUND ALL REVEGETATION AREAS USING MECHANICAL METHODS (E.G., STRING TRIMMER); IN ADDITION, CONDUCT HAND-PULLING REMOVAL OF ANY NON-NATIVE, WEEDY PLANT SPECIES EMERGING WITHIN THE REVEGETATION AREAS.
   - AFTER PLANTING AND SEEDING, AND DURING THE PLANT ESTABLISHMENT MAINTENANCE PERIOD, CONSIDER THE USE OF SPOT TREATMENTS OF SELECT HERBICIDES AS RECOMMENDED BY SANTA CLARA COUNTY PARK DISTRICT'S INTEGRATED PEST MANAGEMENT PLAN, AND APPROVED BY THE COUNTY'S INTEGRATED PEST MANAGER, FOR HIGHLY INVASIVE SPECIES (E.G. YELLOW STAR THISTLE, MEDUSA HEAD GRASS).

7. THE USE OF HERBICIDE IS TO BE MINIMIZED; HOWEVER, DUE TO THE PREVALENCE OF STAR THISTLE, IT IS STRONGLY RECOMMENDED THAT HERBICIDES BE USED TO REDUCE STAR THISTLE AND OTHER NON-NATIVE, WEEDY PLANT SPECIES IN THE PROJECT AREA (BEFORE AND AFTER REVEGETATION).

8. WHERE HERBICIDE IS USED FOR NON-NATIVE INVASIVE SPECIES, ONLY HERBICIDE APPROVED BY THE COUNTY-INTEGRATED PEST MANAGER (COUNTY-IPM), THAT IS ALSO STATE AND COUNTY APPROVED FOR USE IN AQUATIC ENVIRONMENTS SHALL BE USED. THE HERBICIDE WILL BE NON-SELECTIVE, BROAD-SPECTRUM, POST-EMERGENT, TRANS-LOCATING HERBICIDE WITH LOW TOXICITY TO WILDLIFE APPROVED FOR USE IN AND AROUND AQUATIC HABITATS BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA). HERBICIDE WILL BE OF HIGH GRADE QUALITY AND IN PERFECT CONDITION AT TIME OF INSTALLATION. SELECT HERBICIDES AS APPROPRIATE FOR THE DESIRED EFFECT (I.E., BROADLEAF HERBICIDE TO AVOID HARM TO NATIVE GRASSES). HERBICIDE WILL BE APPLIED IN COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS AND ACCORDING TO MANUFACTURER'S SPECIFICATIONS. AT ALL TIMES, HERBICIDE WILL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES (BMPS) PRESCRIBED BY THE CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION. HERBICIDE WILL BE APPLIED SO THAT IT WILL NOT DRIFT, OR SHOW SIGNS OF DRIFT, OUTSIDE THE DESIGNATED PLANTING AREA. AT ALL TIMES, PROTECT EXISTING PLANTS TO REMAIN FROM HERBICIDE DRIFT. AVOID SPRAYING DURING WINDY CONDITIONS; IF WINDY CONDITIONS PERSIST, USE A LARGE DROPLET SIZE WITH LOW TANK PRESSURE; A MOVABLE IMPERMEABLE BARRIER WILL BE USED WHILE SPRAYING TO PROTECT AGAINST DRIFT. HERBICIDE WILL BE APPLIED ONLY DURING PERIODS WHEN BENEFICIAL RESULTS CAN BE OBTAINED. THE CONTRACTOR WILL APPLY HERBICIDE AS NECESSARY BEFORE THE RAINY SEASON. HOWEVER, AN EXCEPTION MAY BE MADE FOR HERBICIDE APPLICATION TO COOL SEASON NON-NATIVE INVASIVE SPECIES, SUBJECT TO APPROVED WEATHER CONDITIONS. ALL SAFETY MEASURES RECOMMENDED BY THE MANUFACTURER WILL BE STRICTLY ADHERED TO. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO LANDS, VEGETATION, AND WATER RESULTING FROM IMPROPER USE OF CHEMICALS.

9. AT ALL TIMES OPERATIONS SHALL IMPLEMENT PHYTOPHTHORA BMP'S AS PRESCRIBED ON SHEET 2.0.

10. TO APPLY FOR PESTICIDE APPLICATION, THE CONTRACTOR SHALL SUBMIT A WRITTEN APPLICATION TO AND FOR APPROVAL BY THE COUNTY IPM. NOTE, THE COUNTY IS LIMITED TO HERBICIDE MATERIALS THAT CAN BE APPLIED; FOR MORE INFORMATION, CONSULT THE SANTA CLARA COUNTY'S IPM ADMINISTRATIVE GUIDELINES AND PROCEDURES (https://www.sccgov.org/sites/ipm/Resources/Santa%20Clara%20County's%20IPM%20Administrative%20Guidelines%20-%20Procedures/Pages/Santa-Clara-County's-IPM-Administrative-Guidelines---Procedures.aspx), AND SANTA CLARA COUNTY'S IPM AND PESTICIDE USE ORDINANCE (https://www.sccgov.org/sites/ipm/Resources/Santa%20Clara%20County's%20IPM%20Administrative%20Guidelines%20-%20Procedures/SCC%20IPM%20-%20Pesticide%20Use%20Ordinance/Pages/SCC-IPM---Pesticide-Use-Ordinance.aspx).

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way · Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 · fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS HABITAT RESTORATION SCIENCES, INC.

DATE	BY	SUBMITTALS / REVISIONS
03-27-17	TG	CONCEPT PLANS
07-24-17	PK	DRAFT 65% DESIGN
11-14-17	PK	FINAL 65% DESIGN
03-08-19	JZ	AS-BUILT DRAWINGS

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

PLANT LISTS & PLANTING NOTES 1

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0B

PLANT LISTS (CONTINUED):

PLANT LIST 8. PROPOSED DRAINAGE CHANNEL WEST OF THE INCISED AGRICULTURAL DITCH – SHEET 5.5

APPROXIMATELY 12,200 SQUARE FEET (INCLUDES BOTH SIDES OF THE STREAM)

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
INSET FLOODPLAIN (APPROXIMATELY 8,595 SQUARE FEET)					
AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	TREEPOT4	12	12'-0"	
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	12	12'-0"	
ROSA CALIFORNICA	WILD ROSE	DEEPOT	65	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
RUBUS URSINUS	CALIFORNIA BLACKBERRY	DEEPOT	65	6'-0"	INSTALL IN GROUPS OF 3-7 PLANTS
SAMBUCUS MEXICANA	ELDERBERRY	DEEPOT	12	12'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
SLOPE (INCLUDES BOTH SIDES OF THE STREAM) (APPROXIMATELY 3,605 SQUARE FEET)					
AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	TREEPOT4	5	12'-0"	
QUERCUS DOUGLASII	BLUE OAK	TREEPOT4	5	12'-0"	INSTALL AT UPPER ELEVATIONS
QUERCUS LOBATA	VALLEY OAK	TREEPOT4	5	12'-0"	
RIBES CALIFORNICUM	CALIFORNIA GOOSEBERRY	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-5 PLANTS
SYMPHORICARPOS ALBUS	SNOWBERRY	DEEPOT	30	6'-0"	INSTALL IN GROUPS OF 3-5 PLANTS SEE AS-BUILT DRAWING NOTE 2 BELOW, THIS SHEET
~~*UMBELLULARIA CALIFORNICA*~~	~~CALIFORNIA BAY~~	~~TREEPOT4~~	~~5~~	~~12'-0"~~	SEE AS-BUILT DRAWING NOTE 3 BELOW, THIS SHEET

- CONTAINER PLANTS WILL BE GENERALLY PLANTED IN CLUSTERS OVER APPROXIMATELY 60% OF THE PLANTING AREA, ALLOWING FOR GAPS IN BETWEEN SAID CLUSTERS.
- INSET FLOODPLAIN AREAS SHALL BE SEEDED WITH SEED MIX TYPE 1.
- ALL SLOPE AREAS SHALL BE SEEDED WITH SEED MIX TYPE 2.

PLANT LIST 9. STAKED WOOD JAMS AT INTERMITTENT STREAM (SOUTH END OF STUDY AREA) – SHEET 5.5

6 TOTAL; PER DETAILS ON SHEET 4.2

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
BACCHARIS SALICIFOLIA	MULEFAT	DEEPOT	36	4'-0" TO 6'-0"	INSTALL PER DETAIL 3, SHEET 4.2
SALIX LAEVIGATA	RED WILLOW	CUTTINGS	36	PER DETAIL 3 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS
SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	36	PER DETAIL 3 SHEET 4.2	ENSURE PLANT ESTABLISHMENT WATERING FOR A MINIMUM OF 3 YEARS

- ALTERNATE SPECIES AT LOCATIONS SHOWN ON THE DETAILS.
- STAKED WOOD JAMS SHALL NOT RECEIVE ANY SEEDING.

PLANT LIST 10. SEASONAL WETLAND ENHANCEMENT AREAS – SHEETS 5.1, 5.4, AND 5.5

2 SEASONAL WETLAND AREAS (SW03 AND SW02), APPROXIMATELY 145,926 SQUARE FEET TOTAL

BOTANICAL NAME	COMMON NAME	SIZE / TYPE	QUANTITY	SPACING	COMMENTS
CAREX PRAEGRACILIS	FIELD SEDGE	LINERS	1,882	2' 0"	PLANT IN GROUPS OF 3 7 PLANTS
JUNCUS EFFUSUS	COMMON RUSH	TREEBANDS	1,666	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS
JUNCUS PATENS	SPREADING RUSH	TREEBANDS	2,179	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS
JUNCUS XIPHIOIDES	IRIS LEAVED RUSH	TREEBANDS	1,891	2'-0"	PLANT IN GROUPS OF 3-7 PLANTS

- PLANTING SHALL OCCUR WITHIN EXISTING WETLANDS TO SUPPLEMENT EXISTING NATIVE PLANT SPECIES.
- PLANTING IN THE NORTHERN WETLAND AREA (SW03) SHALL BE LIMITED TO THE SOUTHERN HALF OF THAT WETLAND, CLOSEST TO CORRAL TRAIL; ASSUMES SUPPLEMENTAL PLANTING OVER 25% OF SAID WETLAND AREA.
- ASSUMES SUPPLEMENTAL PLANTING OVER 25% OF THE EXISTING WETLAND AREA (SW02).
- EXISTING SEASONAL WETLANDS SHALL NOT RECEIVE ANY SEEDING.
- REFER TO DETAIL 1, SHEET 5.0F.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THE PLANS; REFER TO SHEETS 5.1 THROUGH 5,5 FOR PLANTING AS-BUILT DRAWINGS.
2. *SYMPHORICARPOS ALBUS* WAS SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
3. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.

FINISH GRADING NOTES:

1. VERIFY SITE CONDITIONS AND EXISTING GRADE CONDITIONS, LOCATIONS OF EXISTING INFRASTRUCTURE, AND ALL EXISTING VEGETATION. CONDUCT FIELD ADJUSTMENTS NECESSARY TO ACCOMMODATE OR TO MINIMIZE IMPACTS ON THESE CONDITIONS.
2. AVOID DAMAGE TO EXISTING CONDITIONS, INCLUDING BENCH MARKS, UTILITIES, VEGETATION TO REMAIN, AND OTHER FEATURES TO BE PRESERVED.
3. FINISH GRADING OPERATIONS WILL CONFORM TO EXISTING SITE AND ADJACENT CONDITIONS AND GRADES WHEREVER POSSIBLE.
4. SITE CLEANUP WILL OCCUR ON A DAILY BASIS AND AS EACH PHASE OF THE FINISH GRADING OPERATIONS CONCLUDES. ALL DEBRIS, EXCESS DIRT, AND EXTRANEOUS EQUIPMENT WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.
5. ELIMINATE UNEVEN AREAS RESULTING FROM ROUGH-GRADING OPERATIONS AND REMOVE ANY DEBRIS, ROOTS, BRANCHES, OR OTHER MATERIALS LARGER THAN 6-INCHES.
6. SUBSOIL WILL BE GRADED TO PROVIDE POSITIVE DRAINAGE. ALL GRADE CHANGES WILL BE GRADUAL, WITH SLOPES BLENDING INTO LEVEL AREAS.
7. SUBSOIL WILL BE COMPACTED NO MORE THAN 85% MAXIMUM ATTAINABLE DENSITY UNLESS OTHERWISE NOTED.
8. PLANTING AREAS THAT BECOME COMPACTED IN EXCESS OF 85% RELATIVE COMPACTION DUE TO CONSTRUCTION ACTIVITIES, WILL BE THOROUGHLY CROSS-RIPPED TO A MINIMUM DEPTH OF 12 INCHES TO ALLEVIATE THE OVER-COMPACTED CONDITION. TAKE CARE TO AVOID ANY EXISTING SUBSURFACE UTILITY LINES.
9. ENSURE THAT THE TOP 2-INCHES OF SOIL IS FREE OF STONES, DEBRIS, BRANCHES, ROOTS, STUMPS, WIRE, OR OTHER DELETERIOUS MATTER 1-INCH IN DIAMETER AND LARGER. DISPOSE OF DEBRIS OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.
10. BEFORE BEGINNING PLANTING OPERATIONS, FINISH GRADE ALL PLANTING AREAS, FILL AS NEEDED AND REMOVE SURPLUS SOIL AND FLOAT AREAS TO A SMOOTH, UNIFORM GRADE TO ELEVATIONS AS INDICATED ON THE DRAWINGS.
11. ESTABLISH FINISH GRADES TO ELIMINATE UNEVEN AREAS RESULTING FROM ROUGH-GRADING OPERATIONS. BLEND FINISH GRADES WITH EXISTING GRADES. FINISH GRADING OPERATIONS WILL PROVIDE FOR SMOOTH TRANSITIONS TO EXISTING GRADES AND FOR ANY CONNECTIONS TO EXISTING TRAILS.
12. UNLESS OTHERWISE INDICATED, CROSS SLOPES WILL BE 2%, MAXIMUM.
13. AT NO TIME WILL THE FINISH GRADE SURFACES HAVE A GLAZED APPEARANCE. ALL FINISH GRADE SURFACES WILL BE ROUGHENED CAT-TRACKS (I.E., THE IMPRINT ON EARTHEN MATERIAL RESULTING FROM TRACTOR TREADS). FINISH GRADING WILL INCLUDE PREPARING ALL SEEDING AREAS, AT LOCATIONS SHOWN ON THE DRAWINGS, BY COMPLETING ONE PASS OF A TRACTOR DRIVEN PERPENDICULAR TO THE FINAL GRADE CONTOURS LEAVING CAT-TRACKS PERPENDICULAR TO THE FINAL SITE CONTOURS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS AND RECREATION DEPARTMENT HABITAT AGENCY

Balance Hydrologics, Inc. 800 Bancroft Way • Suite 101 Berkeley, CA 94710-2251 ar/(510) 704-1000 • fax (510) 704-1001 www.balancehydro.com

DUDEK

HRS

BY	DATE	SUBMITTALS / REVISIONS
TG	03-27-17	CONCEPT PLANS
PK	07-24-17	DRAFT 65% DESIGN
PK	11-14-17	FINAL 65% DESIGN
JZ	03-08-19	AS-BUILT DRAWINGS

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK 07-24-17
CHECKED BY J ZANZI 03-08-19
IN CHARGE J ZANZI
DATE 11-14-2017

PLANT LISTS & PLANTING NOTES 2

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE --

SHEET 5.0C

EXCLUSION FENCING NOTES:

1. EXCLUSION FENCING IS SHOWN ON THE DRAWINGS AS AN APPROXIMATE LOCATION ONLY. FIELD VERIFY SITE CONDITIONS AND FENCING LOCATIONS BEFORE ACTUAL CONSTRUCTION. CONSTRUCT FENCING AS DETAILED ON THE DRAWINGS, AND ADAPT TO SITE CONDITIONS. CONNECT TO EXISTING FENCES WHENEVER POSSIBLE.

2. FENCING WILL BE INSTALLED UPON COMPLETION OF THE PLANTING PREPARATION OPERATIONS AND EARTHWORK, AND BEFORE THE START OF THE CONTAINER PLANT INSTALLATION.

3. THE AREAS TO RECEIVE FENCING WILL BE FREE OF WASTE AND/OR DEBRIS AND THE FENCE LINES WILL BE GRADED TO A SMOOTH, CONTINUOUS SURFACE WITH NO ABRUPT DIPS OR HUMPS THAT WOULD INTERFERE WITH FENCE INSTALLATION OR LEAVE GAPS UNDER THE FENCE.

4. FENCING WILL BE SET PLUMB, LEVEL, AND TRUE TO LINE AND WILL PRESENT A NEAT AND FINISHED APPEARANCE. INCLUDE SETTING FENCING IN ITS CORRECT PLACE, FASTENING IT, CONNECTING IT, OR INCORPORATING IT INTO OTHER PORTIONS OF THE WORK, AS EACH ITEM MAY REQUIRE. FURNISH ANCHORS AND ADHESIVES AS REQUIRED FOR INSTALLATION.

5. PROVIDE AND FIELD LOCATE GATES AT LOCATIONS SHOWN ON THE DRAWINGS. EACH GATE WILL CONSIST OF A 12-FOOT WIDE VEHICLE GATE WITH A 3-FOOT PEDESTRIAN LEVER GATE AS DETAILED ON THE DRAWINGS. THE GATES WILL ALSO INCORPORATE 'SNOUT WIRE' TO MATCH THE BELOW GRADE PORTION OF THE FENCING. GATES WILL BE INSTALLED ADJACENT TO CORNER POSTS. CONFORM TO CALTRANS STANDARD SPECIFICATION 80-10, GATES. FIELD LOCATE AND FIELD FABRICATE ALL GATES.

6. FENCING WILL BE INSTALLED IN STRAIGHT LINES WHEREVER POSSIBLE TO MINIMIZE ANGLES AND OVERALL LENGTH OF FENCE.

7. FENCING WILL BE FIELD-FIT TO MUD LEVEL WHEREVER POSSIBLE.

8. FENCING WILL MINIMIZE CREEK CROSSINGS WHEREVER POSSIBLE. WHERE CREEK CROSSING ARE NEEDED, FIELD FABRICATE AND ADAPT FENCING TO FOLLOW THE CREEK CHANNEL CROSS-SECTION; REFER TO DETAIL ON THE DRAWINGS.

9. SITE CLEAN-UP WILL OCCUR AT THE COMPLETION OF THE FENCING CONSTRUCTION. ALL UNUSED WIRE AND MATERIALS, DEBRIS, AND EXTRANEOUS EQUIPMENT WILL BE REMOVED OFFSITE BY THE CONTRACTOR ACCORDING TO STATE AND LOCAL REGULATIONS.

10. THROUGHOUT THE MAINTENANCE PERIOD, MAINTAIN AND TAKE CORRECTIVE ACTIONS TO ENSURE THAT THE FENCING IS UPRIGHT, VERTICAL, AND TAUT AS INSTALLED AT LOCATIONS SHOWN ON THE DRAWINGS.

11. AS AN ADAPTIVE MANAGEMENT ACTION, MONITOR AND POSSIBLY REMOVE FENCING WITHIN CREEK BEFORE WINTER OR BEFORE ANTICIPATED HIGH CREEK FLOW EVENTS.

12. AFTER THE 10-YEAR PLANT ESTABLISHMENT MAINTENANCE PERIOD IS COMPLETE, AND IF DIRECTED BY THE SANTA CLARA VALLEY HABITAT AGENCY AND THE COUNTY, THE CONTRACTOR SHALL REMOVE THE EXCLUSION FENCE IN ITS ENTIRETY AFTER APPROVAL AND REGULATORY AGENCY SIGN-OFF OF THE PROJECT; IF REMOVED, ALL EXCLUSION FENCE MATERIAL WILL BE RECYCLED OFF SITE ACCORDING TO STATE AND LOCAL REGULATIONS.

IRRIGATION SYSTEM NOTES

1. THE IRRIGATION SYSTEM WILL BE A TEMPORARY SYSTEM. THE CONTRACTOR WILL FIELD-DESIGN THE IRRIGATION SYSTEM TO PROVIDE ADEQUATE WATER TO FACILITATE THE ESTABLISHMENT OF PERSISTENT PLANTS, TO BE PLANTED ACCORDING TO THE DRAWINGS.

2. THE IRRIGATION SYSTEM IS EXPECTED TO BE CONNECTED TO THE WATER TANK LOCATED ON SAN FELIPE ROAD (APPROX 5,000 LF NORTHWEST OF THE PROJECT AREA) AS SHOWN ON THE DRAWINGS. THERE IS ROOM FOR TWO TANKS AS NEEDED. AT THE CONTRACTOR'S DISCRETION, THE EXISTING WATER TANK (ESTIMATED TO BE 5,000 GALLONS) MANY BE USED FOR THE IRRIGATION SYSTEM PROVIDED THE IRRIGATION SYSTEM IS NOT OPERATED ON SATURDAYS AND SUNDAYS. AT ALL TIMES, USE OF THE EXISTING WATER TANK MUST BE CONDUCTED IN DIRECT COORDINATION WITH AND AS APPROVED BY COUNTY PARKS STAFF.

3. THE MAJOR PORTIONS OF THE IRRIGATION SYSTEM WILL BE INSTALLED BEFORE THE INSTALLATION OF ANY PLANTS OR SEEDED AREAS.

4. IRRIGATION OF ALL PLANTS AND SEEDED AREAS WILL BEGIN THE SAME DAY AS PLANT INSTALLATION AND SEEDING.

SEEDING NOTES:

MATERIALS

1. ALL SEED AND PROPAGULE MATERIALS SHALL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM THE GENERAL SANTA CLARA COUNTY REGION.

2. USE SEED MIX TYPE 3 FOR DISTURBED AREAS NOT OTHERWISE INDICATED TO RECEIVE A SPECIFIC SEED MIX.

3. SEED MIXES WILL CONSIST OF THE MIXES SHOWN ON THE DRAWINGS; THE SEED MIXES WILL CONFORM TO THE PRESCRIBED REQUIREMENTS FOR PURE LIVE SEED RATE PER SPECIES. SEED MIXES WILL NOT BE PRE-MIXED. WEED SEED WILL NOT EXCEED 0.25% OF THE PURE LIVE SEED SPECIFIED. AT NO TIME WILL THE MIXES CONTAIN SEEDS OF NON-NATIVE INVASIVE PLANTS. CROP SEED WILL NOT EXCEED 0.50% OF THE PURE LIVE SEED SPECIFIED. ALL SEED MUST BE TESTED WITHIN 1 YEAR BEFORE THE APPLICATION DATE.

4. HYDROMULCH WILL BE AN AN ORGANIC, PLANT-DERIVED SUBSTANCE CONTAINING CORN STARCH, PSYLLIUM OR GUAR GUM, OR A COMBINATION THEREOF SUCH AS ECOLOGY M-BINDER, OR EQUAL. THE HYDROMULCH WILL FORM A TRANSPARENT THREE-DIMENSIONAL FILM-LIKE CRUST PERMEABLE TO WATER AND AIR AND CONTAINING NO AGENTS TOXIC TO SEED GERMINATION. THE HYDROMULCH WILL BE PACKED IN CLEARLY MARKED BAGS STATING THE CONTENTS OF EACH PACKAGE. THE HYDROMULCH WILL REQUIRE NO CURING TIME, WILL REMAIN SOFT AND REWETTABLE, AND WILL NOT INHIBIT SEED GERMINATION. ALL INGREDIENTS WILL BE BIODEGRADABLE.

5. BROADCAST SEEDING - EQUIPMENT: SEEDING EQUIPMENT FOR BROADCAST SEEDING WILL BE HAND SPREADERS.

EXECUTION

6. THE AREAS TO BE SEEDED WILL HAVE A FIRM SEED BED WHICH HAS PREVIOUSLY BEEN ROUGHENED BY SCARIFYING, DISKING, HARROWING, CHISELING, OR OTHERWISE WORKED TO A DEPTH OF AT LEAST 4 INCHES ON SOIL OR 2 INCHES ON INTACT ROCK SURFACES. THE SEED BED MAY BE PREPARED AT THE TIME OF COMPLETION OF EXCAVATION OR EARTHWORK. CONSTRUCTION DEBRIS AND EXTRANEOUS PILES OF SOIL WILL BE REMOVED BEFORE SEEDING.

7. SEED MIX APPLICATION RATES WILL BE AS SHOWN ON THE DRAWINGS.

8. ALL SEEDING OPERATIONS WILL BE CONDUCTED BEFORE PLANT INSTALLATION, EXCEPT FOR CUTTINGS. SEEDING WILL OCCUR BETWEEN SEPTEMBER 15 AND OCTOBER 15. SEED WILL BE APPLIED BEFORE ANY RAIN AND/OR GROUND FREEZE.

9. SEEDING WILL NOT OCCUR WHEN WIND SPEEDS EXCEED 5 MILES PER HOUR.

10. SEED ONLY THOSE AREAS THAT CAN BE WATERED ON THE SAME DAY AS INSTALLATION.

11. HAND-BROADCAST SEEDING METHODS WILL BE USED TO APPLY SEED TO SAID AREAS. FERTILIZER WILL NOT BE APPLIED TO SEEDING AREAS. MYCHORRIZAL INOCULANT WILL BE MIXED WITH THE SEED AND APPLIED DURING THE SEEDING OPERATIONS. SEED WILL BE UNIFORMLY BROADCAST WITH HAND-HELD SEEDERS AND LIGHTLY RAKED TO INCORPORATE TO A DEPTH OF 0.25- TO 0.5-INCHES. SEED WILL NOT BE LEFT UNCOVERED FOR MORE THAN 24 HOURS. ALL BROADCAST SEEDING AREAS WILL BE HAND-RAKED TO COVER THE SEEDS.

12. AREAS TO BE SEEDED NEAR AND WITHIN DRIPLINES OF EXISTING VEGETATION TO REMAIN, OR RECENTLY PLANTED SHRUBS OR TREES, WILL BE SEEDED BY HAND AND THESE AREAS WILL BE HAND-RAKED TO COVER THE SEEDS.

13. THE HYDROMULCH APPLICATIONS WILL BE COMPLETED ACCORDING TO MANUFACTURER'S SPECIFICATIONS IN THAT AREA ON THE SAME WORKING DAY. HYDROMULCH WILL BE APPLIED BY SPRAYING OVER THE SURFACE OF ALL SEEDED AREAS.

PLANTING NOTES:

MATERIALS

1. ALL PLANT MATERIAL WILL BE FROM LOCAL GENETIC STOCK ORIGINATING FROM PLANT PROPAGATION MATERIALS GATHERED DIRECTLY FROM THE SITE, OR WILL BE NATIVE STOCK FROM THE REGION PURCHASED FROM A REPUTABLE NATIVE PLANT NURSERY.

2. AT ALL TIMES SPECIAL CARE WILL BE TAKEN WITH THE PROPAGATION OF CALIFORNIA SYCAMORE TO ELIMINATE HYBRIDIZING WITH THE NON-NATIVE LONDON PLANE TREE (PLATANUS HISPANICA (X ACERIFOLIA)). CALIFORNIA SYCAMORE SPECIES WILL BE PLANTED AS PURE GENETIC PLANT QUANTITIES ARE AVAILABLE; IF PLANTS ARE NOT AVAILABLE, THE NEEDED QUANTITIES WILL BE SUBSTITUTED WITH QUERCUS LOBATA (VALLEY OAK) TREES.

3. CONTAINER GROWN PLANTS WILL BE IN A VIGOROUS AND HEALTHY CONDITION AND NOT ROOT BOUND OR WITH THE ROOT SYSTEM HARDENED OFF. CONTAINER SIZES FOR SPECIFIC PLANT SPECIES WILL BE AS INDICATED ON THE DRAWINGS. PLANT CONTAINER DIMENSIONS WILL BE AS FOLLOWS:
   3.1. TREEPOT4 = 4-INCH SQUARE BY 14-INCH LONG
   3.2. DEEPOT = 2½-INCH DIAMETER BY 10-INCH LONG
   3.3. TREEBAND = 4-INCH SQUARE BY 10-INCH LONG

4. CUTTINGS WILL BE HARVESTED FROM WITHIN OR IMMEDIATELY ADJACENT TO THE PROJECT SITE. CUTTINGS WILL BE COLLECTED TO MINIMIZE DISTURBANCE TO THE COLLECTION SITE. THE SOURCE PLANT COLLECTION AREA WILL BE LEFT ABLE TO PHYSICALLY AND VISUALLY RECOVER TO UNDISTURBED CONDITIONS WITHIN ONE YEAR. AT NO TIME WILL MATERIAL SOURCES BE DENUDED OR STRIPPED IN EXCESS OF 25% OF TOTAL BRANCHES.

5. CUTTINGS WILL BE HARVESTED AT A LENGTH OF 4½-FEET (TO ACCOUNT FOR POTENTIAL HAMMERING DAMAGE) WITH A CALIPER RANGING FROM ½- TO 1½-INCHES. LEAVES, BRANCHES, AND TWIGS WILL BE REMOVED ON EACH CUTTING IMMEDIATELY AFTER HARVESTING THE CUTTING FROM THE SOURCE PLANT. THE LEAVES, BRANCHES, AND TWIGS WILL BE REMOVED FROM THE ENTIRE CUTTING, STARTING FROM THE BASE AND MOVING TOWARD THE TOP. AT ALL TIMES, VEGETATION WILL BE REMOVED CAREFULLY TO AVOID DAMAGE TO BARK OR ANY BUDS EXISTING ON THE CUTTING. THE CUTTINGS WILL BE CUT AT A RIGHT ANGLE AT THE WIDE END OF THE CUTTING. CUTTING MATERIALS WILL BE HARVESTED WHEN THE CUTTINGS ARE DORMANT. ALL CUTTINGS WILL BE HARDENED-OFF GREEN WOOD THAT IS A MAXIMUM OF 1-YEAR-OLD GROWTH.

6. TO ENSURE CUTTINGS ARE ADEQUATELY DORMANT, CUTTINGS SHOULD NOT BE COLLECTED UNTIL AFTER OCTOBER 15 AND BEFORE DECEMBER 31. CUTTINGS WILL NOT BE COLLECTED WHEN THE AIR TEMPERATURE IS GREATER THAN 21°C (70°F). CUTTINGS WILL BE INSTALLED WITHIN 7 DAYS OF COLLECTION.

7. IMMEDIATELY AFTER REMOVING THE CUTTINGS FROM A SOURCE PLANT AND BUNDLING, THE CUTTINGS WILL BE KEPT COOL, AT A TEMPERATURE LESS THAN 60°F, AND SATURATED IN WATER IMMEDIATELY AFTER COLLECTION AND UNTIL JUST BEFORE INSTALLATION. CUTTINGS WILL BE STORED IN LARGE CONTAINERS THAT HOLD WATER.

8. WOOD MULCH WILL BE WALK-ON TYPE (1½-INCH DIAMETER) FIR BARK OR SHREDDED CEDAR MULCH. WOOD MULCH WILL BE FREE OF DIRT, STICKS, ROCKS, OR OTHER DEBRIS. AT NO TIME WILL REDWOOD BARK BE USED.

EXECUTION

9. INSTALL CONTAINER PLANTS AND CUTTINGS IN A RANDOM DISTRIBUTION TO MIMIC A NATURAL PLANT LAYOUT, UNLESS OTHERWISE NOTED IN THE PLANT LISTS OR THE DETAILS. THE CONTRACTOR SHALL FIELD-LOCATE EACH PLANT FOR APPROVAL BEFORE ACTUAL INSTALLATION.

10. CONTAINER PLANT INSTALLATION. CONTAINER PLANTS WILL BE INSTALLED BETWEEN OCTOBER 1 AND OCTOBER 31 UNLESS OTHERWISE DIRECTED BY THE ENGINEER'S REPRESENTATIVE. WHATEVER SPECIES ARE NOT AVAILABLE FOR FALL PLANTING, WILL BE INSTALLED THE FOLLOWING SPRING BETWEEN APRIL 1 AND APRIL 15.

11. REFER TO DETAILS ON SHEET 5.0E.

12. PLANT CONTAINERS WILL BE OPENED AND REMOVED IN SUCH A MANNER THAT THE SOIL SURROUNDING THE ROOTBALL WILL NOT BE BROKEN. DO NOT INJURE THE ROOTBALL WHILE REMOVING THE CONTAINER OR BOX. AFTER REMOVING PLANT, SUPERFICIALLY CUT EDGE ROOTS WITH A KNIFE ON 3 SIDES. APPLY PLANTING SOIL TO THE PLANTING PIT UP TO 1/2 THE HEIGHT OF THE ROOTBALL. ADD WATER TO THE TOP OF THE REMAINING PLANTING PIT AND LET SOAK IN BEFORE COMPLETING THE REMAINDER OF BACKFILLING. FINISH BACKFILLING WITH PLANTING SOIL OF THE PLANTING PIT BY TAMPING THE SOIL FIRMLY AROUND THE ROOTBALL AND WATERING THOROUGHLY.

13. IN UPLAND PLANTING AREAS ONLY, AND AFTER FINAL BACKFILLING, CONSTRUCT A WATER RETENTION BASIN AROUND THE BASE OF EACH TREE AND SHRUB PLANTING AS DETAILED ON THE DRAWINGS. SPREAD A 2-INCH DEEP LAYER OF WOOD MULCH IN ALL TREE AND SHRUB PLANTING BASINS.

14. CUTTING INSTALLATION. TO ENSURE CUTTINGS ARE ADEQUATELY DORMANT, CUTTINGS SHOULD NOT BE PLANTED UNTIL AFTER OCTOBER 15 AND BEFORE DECEMBER 31. CUTTING LAYOUT WILL BE AT THE DENSITY SHOWN ON THE DRAWINGS, AND WILL BE LOCATED SOMEWHAT IRREGULARLY TO AVOID EXISTING SHRUBS AND TO MIMIC A NATURAL LAYOUT. AT NO TIME DURING CUTTING PLACEMENT WILL BARK BE SCRAPED, ROUGHED, OR GRINDED; OR BUDS BE STRIPPED. PLANTING HOLES FOR CUTTINGS WILL BE EXCAVATED AS DETAILED ON THE DRAWINGS. CUTTINGS WILL BE INSTALLED VERTICALLY SO THAT THE NARROW END IS EXPOSED ABOVE GRADE AND BUDS ARE FACING UPWARD. ALL CUTTINGS WILL BE INSTALLED WITH ¾ OF THEIR LENGTH BELOW GRADE. AT NO TIME WILL FERTILIZER BE APPLIED TO CUTTINGS. WHETHER THE CUTTINGS ARE HAMMERED IN PLACE OR NOT, THE TOP 6-INCHES OF EACH CUTTING WILL BE CUT OFF TO PROVIDE A FRESH CUT TOP. BACKFILL MATERIALS WILL BE TAMPED IN PLACE TO COMPLETELY ENCIRCLE THE CUTTING AND LEAVE NO AIR POCKETS.

15. ALL CONTAINER PLANTS AND CUTTINGS WILL BE WATERED IMMEDIATELY AFTER INSTALLATION. AFTER THE FIRST WATERING, WATER WILL BE APPLIED TO ALL PLANTS TO ACHIEVE CONTINUALLY MOIST CONDITIONS AS REQUIRED TO KEEP THE VEGETATION IN A HEALTHY AND VIGOROUS GROWING CONDITION.

16. INSTALL PLANT PROTECTION CAGES AS DETAILED FOR ALL WOODY CONTAINER PLANTS; CAGES ARE NOT REQUIRED FOR CUTTINGS OR HERBACEOUS PLANTS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\100154 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\5-CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710-2251
ph/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

DESIGNED BY	DATE	BY	SUBMITTALS / REVISIONS
DUDEK	03-27-17	TG	CONCEPT PLANS
DRAWN BY	07-24-17	PK	DRAFT 65% DESIGN
P. KULCHAWIK	11-14-17	PK	FINAL 65% DESIGN
CHECKED BY	03-08-19	JZ	AS-BUILT DRAWINGS
J ZANZI			
IN CHARGE			
J ZANZI			
DATE			
11-14-2017			

PLANTING & FENCING NOTES

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
--

SHEET
5.0D

PLANT ESTABLISHMENT NOTES:

1. THE PLANT ESTABLISHMENT PERIOD WILL BEGIN IMMEDIATELY AFTER COMPLETION OF THE SEEDING, PLANTING, AND IRRIGATION SYSTEM INSTALLATION AND IS EXPECTED TO CONTINUE FOR A MINIMUM OF 10 YEARS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER'S REPRESENTATIVE.

2. PLANT ESTABLISHMENT WILL INCLUDE WATERING, IRRIGATION SYSTEM OPERATIONS AND MAINTENANCE, NON-NATIVE INVASIVE/EXOTIC SPECIES CONTROL, DEBRIS REMOVAL, AND REPLACEMENT PLANTING AND RESEEDING IF NEEDED. ALL PLANTED AND SEEDED NATIVE VEGETATION WILL BE MAINTAINED REGULARLY TO PROMOTE HEALTH AND ESTABLISHMENT.

PERFORMANCE RECOMMENDATIONS

3. THE TARGET SURVIVAL RATE FOR ALL REVEGETATION TREATMENTS WILL BE EVALUATED BY EACH TREATMENT AREA AT THE END OF EACH YEAR. FOR CONTAINER PLANTS AND CUTTINGS, IT IS EXPECTED THAT INDIVIDUAL PLANT COUNTS WILL BE CONDUCTED TO EVALUATE PERCENT SURVIVORSHIP OF THE PLANTS FOR YEARS 1 AND 2; AFTER THAT, MINIMUM PERCENT COVER OF THE NATIVE PLANTINGS WILL BE EVALUATED FOR YEARS 3 THROUGH 10. IN ADDITION, SEEDED AREAS FOR APPLICABLE REVEGETATION TREATMENT AREAS WILL HAVE THE MINIMUM PERCENT COVER OF NATIVE VEGETATION AND FREE OF NON-NATIVE INVASIVE SPECIES.

YEAR	CONTAINER PLANTS MINIMUM PERFORMANCE	CUTTINGS MINIMUM PERFORMANCE	SEEDED AREAS MINIMUM % OF CONTAINER PLANTS	MINIMUM COVER BY SEEDED SPECIES
1	80% PLANTS SURVIVING	70% PLANTS SURVIVING	50% COVER	40% COVER
2	80% PLANTS SURVIVING	65% PLANTS SURVIVING	75% COVER	75% COVER
3	75% ESTIMATED COVER	70% ESTIMATED COVER	90% COVER	70% COVER
4	80% ESTIMATED COVER	80% ESTIMATED COVER	95% COVER	70% COVER
5	85% ESTIMATED COVER	85% ESTIMATED COVER	70% COVER	70% COVER
6	90% ESTIMATED COVER	90% ESTIMATED COVER	70% COVER	70% COVER
7	95% ESTIMATED COVER	95% ESTIMATED COVER	70% COVER	70% COVER
8	80% ESTIMATED COVER	80% ESTIMATED COVER	70% COVER	70% COVER
9	85% ESTIMATED COVER	85% ESTIMATED COVER	70% COVER	70% COVER
10	80% ESTIMATED COVER	80% ESTIMATED COVER	70% COVER	70% COVER
PLANTS SURVIVING WILL BE BASED ON THE QUANTITIES OF PLANTS ORIGINALLY INSTALLED				

4. PLANTS SHOULD BE REGULARLY OBSERVED FOR SYMPTOMS OF DAMAGED FOLIAGE, DISEASE, SIZE, COLOR, WILTING, DEFOLIATION, AND VANDALISM. AT NO TIME WILL ANY PLANTS SHOW SYMPTOMS OF DISEASE, INSECT DAMAGE, GIRDLING, STRUCTURAL DEFORMITIES, DIEBACK, DRY ROOTBALL, OR SUNBURN; AS WELL AS SYMPTOMS OF WATER STRESS (CAUSED BY OVERWATERING OR UNDERWATERING), STUNTED GROWTH, WILTING, PREMATURE LOSS OF LEAVES (FOR DECIDUOUS SPECIES), AND PREMATURE YELLOWING OF LEAVES (FOR DECIDUOUS SPECIES).

EXECUTION

5. ESTABLISH AND MAINTAIN ALL PLANTS AND SEEDED VEGETATION IN A HEALTHY CONDITION THROUGHOUT THE PLANT ESTABLISHMENT PERIOD. CHECK THE CONDITION OF EACH PLANT AND SEEDED VEGETATION FOR SYMPTOMS OF DISEASE, SIZE, COLOR, WILTING, DEFOLIATION, NEW GROWTH, BROWSING BY WILDLIFE, INSECT DAMAGE, GIRDLING, STRUCTURAL DEFORMITIES, DIEBACK, SUNBURN AND VANDALISM; CONDUCT CORRECTIVE ACTIONS AS REQUIRED.

6. GENERAL PLANT ESTABLISHMENT OPERATIONS WILL INCLUDE, BUT WILL NOT BE LIMITED TO:
   - MAINTAINING PLANTING AND SEEDING AREAS AND IRRIGATION SYSTEMS FOR A MINIMUM OF 3 YEARS AFTER PLANTING.
   - PROVIDING TRASH REMOVAL IN ALL PLANTING AND SEEDING AREAS.
   - MAINTAIN ADEQUATE PROTECTION OF PLANTING AND SEEDING AREAS. REPAIRING DAMAGED AREAS.
   - REPLACING ALL DEAD AND SEVERELY STRESSED PLANTS AND OTHER MATERIALS.
   - MAINTAINING AND REMOVING ALL NON-NATIVE INVASIVE SPECIES FROM ALL PLANTING AREAS.
   - OPERATING THE IRRIGATION SYSTEM ON A REGULAR BASIS

7. THE IRRIGATION SYSTEM WILL BE REGULARLY MAINTAINED TO ASSURE ADEQUATE OPERATION AND TO MEET THE NEEDS OF THE PLANT MATERIALS. IRRIGATION MAINTENANCE IS EXPECTED TO INCLUDE EXAMINING THE IRRIGATION SYSTEMS AS NEEDED, INCLUDING CLEANING AND ADJUSTING EQUIPMENT; REPAIRING DAMAGED EQUIPMENT; TESTING EACH SYSTEM TO ENSURE THAT THE IRRIGATION SYSTEMS ARE OPERATIONAL; AND CHECKING PIPES FOR LEAKS OR BLOCKED LINES.

8. INSPECT THE IRRIGATION SYSTEM PER THE CONTRACTOR'S SCHEDULE DURING THE DRY SEASON FOR AS LONG AS IRRIGATION IS DEEMED NECESSARY FOR PLANT SURVIVAL; PLANTS WILL BE EXAMINED AT THE SAME TIME FOR SIGNS OF STRESS (E.G., WILTING, LEAF DROP, EXCESSIVE INSECT DAMAGE, ETC.). IRRIGATION OPERATIONS WILL BE ADJUSTED TO CORRECT ALL OBSERVED PROBLEMS.

9. CONDUCT AS-NEEDED SITE EVALUATIONS OF WATER APPLICATION DURING THE PLANT ESTABLISHMENT PERIOD. WATERING WILL CONSIST OF THE APPLICATION OF WATER IN A MANNER THAT IS SUFFICIENT TO WET THE SOIL AND SATURATE THE ROOT ZONE AND AS FREQUENT AS NECESSARY TO MAINTAIN HEALTHY GROWTH, WITHOUT DAMAGING THE PLANTS, THE SURROUNDING GRADE OR THE ANY WATERING BASINS.

10. THE IRRIGATION SYSTEM WILL BE USED AS NECESSARY DURING THE FIRST THREE YEARS OF THE LONG-TERM MAINTENANCE AND MONITORING PERIOD, AND WILL BE TERMINATED AT THE END OF THIRD YEAR TO ENSURE THAT THE SITE IS SELF-SUSTAINING FOR AT LEAST TWO YEARS (I.E. TWO SUMMERS) BEFORE FINAL SIGN-OFF FROM THE RESOURCE AGENCIES. ALL ABOVE GROUND COMPONENTS WILL BE REMOVED COMPLETELY FROM THE RESTORATION SITE BY THE END OF THE FIFTH YEAR, AND RECYCLED OFF SITE ACCORDING TO STATE AND LOCAL REGULATIONS.

11. NON-NATIVE INVASIVE SPECIES CONTROL ASSESSMENTS AND ADDITIONAL TREATMENT RECOMMENDATIONS SHOULD OCCUR UPON COMPLETION OF THE RESTORATION AND AFTER EACH YEAR OF GROWTH. NON-NATIVE, INVASIVE PLANTS AND NOXIOUS WEEDS SHOULD BE REMOVED BY HAND, OR IF NEEDED, SPOT APPLICATIONS OF HERBICIDE AS DIRECTED BY THE CONTRACTOR'S PCA.

12. PEST CONTROL ADAPTIVE MANAGEMENT WILL BE CONDUCTED AS NECESSARY TO ADDRESS SITE PROBLEMS. IF SIGNIFICANT PLANT MORTALITY AND COVER REDUCTION OCCURS AS INDICATED BY QUALITATIVE OR QUANTITATIVE MONITORING OF THE SITE, REMEDIAL MEASURES MAY BE RECOMMENDED, INCLUDING REPLACEMENT PLANTING AND RESEEDING.

13. NATIVE PLANT MATERIAL THAT HAS NO EASILY OBSERVABLE VIABLE ABOVE-GROUND LIVING MATTER OR IS OF CONSISTENTLY POOR VIGOR AND FORM WILL BE CONSIDERED DEAD. REPLACE DEAD PLANTS ACCORDING TO THE DRAWINGS AT A RATE OF REPLACEMENT THAT WILL MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD PLANTS WILL BE REMOVED BEFORE INSTALLATION OF REPLACEMENT PLANTS. ALL DEAD PLANTS WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

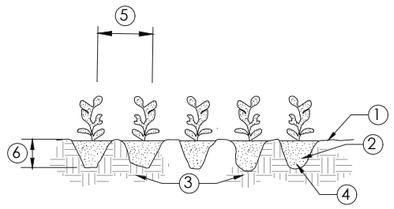
14. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD VEGETATION WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

15. SITE CLEANUP WILL OCCUR DURING THE PLANT ESTABLISHMENT MAINTENANCE VISITS. REMOVE ALL TRASH AND EXCESS DIRT CAUSED FROM THE WORK ACCORDING TO STATE AND LOCAL REGULATIONS.

16. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD VEGETATION WILL BE REMOVED OFFSITE ACCORDING TO STATE AND LOCAL REGULATIONS.

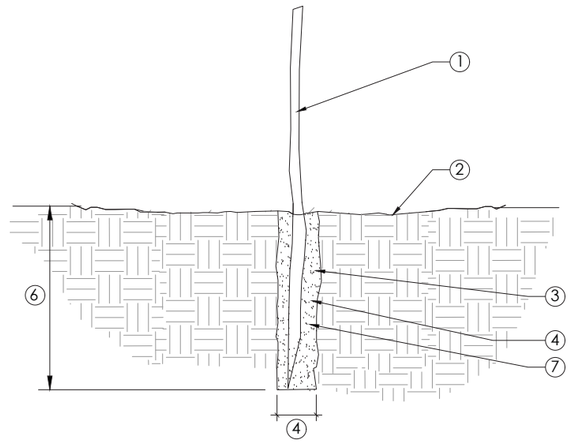
17. IN ADDITION, PLANT PROTECTION CAGES AND EXCLUSION FENCING WILL BE INSPECTED BY THE CONTRACTOR DURING PLANT ESTABLISHMENT SITE VISITS AND MAINTAINED AS INSTALLED IN AN UPRIGHT AND IN EFFECTIVE CONDITION.

18. REFER TO THE PROJECT MITIGATION AND MONITORING PLAN FOR ADDITIONAL INFORMATION AND REQUIREMENTS.



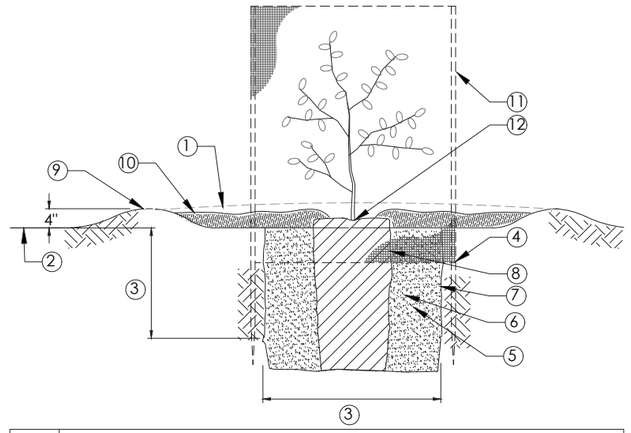
ITEM	DESCRIPTION
1	FINISH GRADE
2	ROOT BALL
3	AMENDED SOIL (PER NOTES)
4	WATER AND TAMP BACKFILL MIX WELL
5	SEE PLANT LISTS FOR SPECIES AND SPACING
6	DEPTH OF ROOT BALL

1 HERBACEOUS PLANTING (TREEBAND CONTAINER PLANTING)
SCALE: NTS



ITEM	DESCRIPTION
1	54" POLE CUTTING (SEE PLANT LIST FOR SPECIES)
2	FINISH GRADE
3	AMENDED SOIL (PER NOTES)
4	2" DIAMETER AUGERED PIT (LIGHTLY TAMP SURFACE AFTER PLANTING)
5	TREAT BELOW-GRADE PORTION OF CUTTING WITH ROOTING HORMONE
6	32" DEPTH
7	FILL AUGERED HOLE COMPLETELY WITH WATER AND ALLOW TO DRAIN BEFORE PLANTING

2 POLE CUTTING
SCALE: NTS



ITEM	DESCRIPTION
1	EXISTING GRADE
2	FINISH GRADE
3	DIG PLANTING HOLE DEPTH OF ROOT BALL & 2X WIDTH
4	SET BOTTOM OF PLANT SHELTER 4" BELOW SOIL SURFACE
5	WATER AND TAMP BACKFILL MIX WELL. TO BE FREE OF ROCKS AND CLODS OVER 1" DIA.
6	AMENDED SOIL (PER SPECIFICATIONS)
7	SCARIFY SIDES OF PLANTING PIT
8	ROOT BALL
9	WATERING BASIN 4" ABOVE FINISH GRADE
10	2" THICK BARK MULCH LAYER 18" RADIUS, HOLD BACK 3" FROM ROOT CROWN
11	WIRE MESH TREE SHELTER, (24" TALL X 12" DIA.) STAKE IN PLACE WITH AND ATTACH TO TWO 24" LONG #3 REBAR STAKES
12	ROOT CROWN OF PLANT 1" ABOVE FINISH GRADE

3 CONTAINER PLANTING WITH CAGE
SCALE: NTS

PREPARED FOR:
SANTA CLARA COUNTY PARKS
HABITAT AGENCY
Balance Hydrologics, Inc.
800 Bancroft Way - Suite 101
Berkeley, CA 94710-2251
ar/(510) 704-1000 / fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

DESIGNED BY	DATE	BY	SUBMITTALS / REVISIONS
DUDEK	03-27-17	TG	CONCEPT PLANS
DRAWN BY	07-24-17	PK	DRAFT 65% DESIGN
P KULCHAWIK	11-14-17	PK	FINAL 65% DESIGN
CHECKED BY	03-08-19	JZ	AS-BUILT DRAWINGS
J ZANZI			
IN CHARGE			
J ZANZI			
DATE			
11-14-2017			

PLANTING NOTES & DETAILS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

SCALE
--

SHEET
5.0E

AS-BUILT DRAWINGS

PRELIMINARY SOIL TEST RESULTS:

IN JANUARY 2017, 4 SOIL SAMPLES WERE TAKEN, ALL AT A 6-12-INCH DEPTH:

#1 NORTHERN END OF CREEK STUDY AREA,
#2 MIDDLE OF CREEK STUDY AREA
#3 EASTERN SIDE OF STUDY AREA
#4 SOUTHERN END OF CREEK STUDY AREA

THE SAMPLES WERE TESTED BY WALLACE LABORATORIES FOR FERTILITY FOR PLANTING, AND THE RESULTS OF THE TESTS ARE SUMMARIZED BELOW.

THESE SAMPLES ARE ACIDIC. THE PH VALUES RANGE FROM 6.30 FOR SAMPLE 2 TO 6.69 FOR SAMPLE 1. THESE ARE DESIRABLE PH VALUES FOR MANY SPECIES - SLIGHTLY ACIDIC. SLIGHT ACIDITY INCREASES THE AVAILABILITY OF MANY NUTRIENTS. HIGH ACIDITY MAKES SOME NUTRIENTS TOO AVAILABLE SUCH AS IRON AND MANGANESE. IN ADDITION, HIGH ACIDITY MAKES SOME NON-ESSENTIAL MINERALS TOO AVAILABLE AND POTENTIALLY TOXIC SUCH AS ALUMINUM AND VANADIUM.

SOME SPECIES ARE ADAPTED TO ACIDIC SOILS WHILE OTHERS ARE BETTER ADAPTED TO ALKALINE SOILS. LUPINE AND OTHER LEGUMINOUS PLANTS ARE BETTER ADAPTED TO ALKALINE SOILS.

SALINITY IS LOW. IT RANGES FROM 0.12 TO 0.17 MILLIMHO/CM. BETTER GROWTH OCCURS WITH MODEST SALINITY WHERE THE CONCENTRATIONS OF SOLUBLE MINERALS ARE HIGHER. NUTRIENTS ARE ABSORBED IN THE SOLUBLE FORM. SOLUBLE CALCIUM, MAGNESIUM, POTASSIUM, SULFUR, AND BORON ARE LOW. THE SOIL PHYSICAL PROPERTIES ARE BETTER WITH HIGHER SALINITY. THE SALINITY CAN BE INCREASED WITH THE ADDITION OF GYPSUM.

NITROGEN, SULFUR, AND BORON ARE LOW. PHOSPHORUS IS MODEST. MANGANESE IS LOW FOR SAMPLE 3. ZINC IS LOW FOR SAMPLES 2, 3 AND 4. IRON IS VERY HIGH FOR SAMPLE 3. SAMPLE 3 HAS HIGH SOIL MOISTURE AT ABOUT 93% OF FIELD CAPACITY. ANAEROBIOSIS GREATLY INCREASES THE AVAILABILITY OF IRON. IN EXCESS, MANGANESE IS INHIBITED. SPECIES WHICH ARE INTOLERANT OF HIGH LEVELS OF IRON MANY HAVE BRONZING. IN SEVERE CASES, LEAVES CAN TURN BLACK.

A MODEST AMOUNT OF BARIUM IS PRESENT. BARIUM INTERFERES WITH THE METABOLISM OF SULFUR. GYPSUM CAN BE APPLIED TO REDUCE THE EFFECTS OF BARIUM.

BETTER GROWTH IS EXPECTED WITH HIGHER LEVELS OF NITROGEN, ZINC, MANGANESE, SULFUR AND BORON. ORGANIC MATTER SUPPLIES MACRONUTRIENTS AND MICRONUTRIENTS, ESPECIALLY AS IT MINERALIZES. MICRONUTRIENTS ARE BEST APPLIED WITH THE ADDITION OF ORGANIC MATTER.

THE LOWEST OIL MOISTURE IS ABOUT 79% OF FIELD CAPACITY FOR SAMPLE 4. THE HIGHEST IS SAMPLE 3.

RECOMMENDATIONS

WALLACE LABORATORIES HAS PROVIDED THE FOLLOWING RECOMMENDATIONS FOR SOIL PREPARATION AND POTENTIAL AMENDMENTS.

GENERAL SOIL PREPARATION ON A SQUARE FOOT BASIS. BROADCAST THE FOLLOWING MATERIALS UNIFORMLY. THE RATES ARE PER 1,000 SQUARE FEET. INCORPORATE THEM HOMOGENEOUSLY 6 INCHES DEEP:

CALCIUM NITRATE (15.5-0-0) - 6 POUNDS
AGRICULTURAL GYPSUM - 10 POUNDS
GOOD QUALITY SOIL AMENDMENT - ABOUT 2 CUBIC YARDS, SUFFICIENT FOR 2% TO 3% SOIL ORGANIC MATTER ON A DRY WEIGHT BASIS

FOR SOIL PREPARATION ON A VOLUME BASIS, INCORPORATE HOMOGENEOUSLY THE FOLLOWING MATERIALS INTO CLEAN SOIL. RATES ARE EXPRESSED ON A CUBIC YARD BASIS:

CALCIUM NITRATE (15.5-0-0) - 1/4 POUND
AGRICULTURAL GYPSUM - 1/2 POUND
GOOD QUALITY SOIL AMENDMENT - ABOUT 10% BY VOLUME, SUFFICIENT FOR 2% TO 3% SOIL ORGANIC MATTER ON A DRY WEIGHT BASIS

1. HUMUS MATERIAL SHALL HAVE AN ACID-SOLUBLE ASH CONTENT OF NO LESS THAN 6% AND NO MORE THAN 20%. THE ORGANIC MATTER CONTENT SHALL BE 50% OR MORE ON A DRY WEIGHT BASIS.
2. THE PH OF THE MATERIAL SHALL BE BETWEEN 6 AND 7.5.
3. THE SALT CONTENT SHALL BE LESS THAN 10 MILLIMHO/CM @ 25° C. IN A SATURATED PASTE EXTRACT.
4. BORON CONTENT OF THE SATURATED EXTRACT SHALL BE LESS THAN 1.0 PARTS PER MILLION.
5. SILICON CONTENT (ACID-INSOLUBLE ASH) SHALL BE LESS THAN 50%.
6. CALCIUM CARBONATE SHALL NOT BE PRESENT IF TO BE APPLIED ON ALKALINE SOILS.
7. TYPES OF ACCEPTABLE PRODUCTS ARE COMPOSTS, MANURES, MUSHROOM COMPOSTS, STRAW, ALFALFA, PEAT MOSSES ETC. LOW IN SALTS, LOW IN HEAVY METALS, FREE FROM WEED SEEDS, FREE OF PATHOGENS AND OTHER DELETERIOUS MATERIALS.
8. COMPOSTED WOOD PRODUCTS ARE CONDITIONALLY ACCEPTABLE [STABLE HUMUS MUST BE PRESENT]. WOOD BASED PRODUCTS ARE NOT ACCEPTABLE WHICH ARE BASED ON RED WOOD OR CEDAR.
9. SLUDGE-BASED MATERIALS ARE NOT ACCEPTABLE.
10. CARBON:NITROGEN RATIO IS LESS THAN 25:1.
11. THE COMPOST SHALL BE AEROBIC WITHOUT MALODOROUS PRESENCE OF DECOMPOSITION PRODUCTS.
12. THE MAXIMUM PARTICLE SIZE SHALL BE 0.5 INCH, 80% OR MORE SHALL PASS A NO. 4 SCREEN FOR SOIL AMENDING.

MAXIMUM TOTAL PERMISSIBLE POLLUTANT CONCENTRATIONS IN AMENDMENT IN PARTS PER MILLION ON A DRY WEIGHT BASIS:

ARSENIC	20	COPPER	100	SELENIUM	50
CADMIUM	15	LEAD	200	SILVER	10
CHROMIUM	300	MERCURY	10	VANADIUM	500
COBALT	50	MOLYBDENUM	20	ZINC	200
		NICKEL	100		

THE SOIL AMENDMENT IS EXPECTED TO PROVIDE MICRONUTRIENTS.

FOR SITE MAINTENANCE, APPLY CALCIUM NITRATE (15.5-0-0) AT 5 POUNDS PER 1,000 SQUARE FEET ABOUT ONCE PER QUARTER OR AS NEEDED TO SUPPORT PLANT GROWTH. CALCIUM NITRATE (15.5-0-0) HELPS TO SLIGHTLY INCREASE THE PH TO INCREASE SOIL AERATION.

MONITOR THE SITE WITH PERIODIC SOIL TESTING. ADJUST THE MAINTENANCE PROGRAM AS NEEDED.

SOD NOTES:

MATERIALS

A. SOD SHALL BE EXISTING WETLAND MEADOW GRASS AND/OR FORB PLANT SPECIES WITH ROOTS AND SOIL INTACT FROM AND SALVAGED WITHIN THE PROJECT'S WATERSHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SALVAGING THE SOD IN 2-FOOT WIDE BY 3-FOOT LONG STRIPS, EXCAVATING A MINIMUM OF 6-INCHES OF SOIL TO CONTAIN AS MANY OF THE PLANT ROOTS AS POSSIBLE. AT ALL TIMES, SOD SALVAGE SHALL BE FREE OF NOXIOUS WEEDS.

B. DELIVERY, HANDLING, AND STORAGE

1. DO NOT DELIVER MORE SOD THAN CAN BE INSTALLED AT THE SITE IN 1 DAY. DO NOT PILE SOD STRIPS ON ONE ANOTHER. PROTECT ROOT SYSTEM FROM EXPOSURE TO THE WEATHER. PROTECT SOD AGAINST DEHYDRATION, CONTAMINATION AND HEATING DURING TRANSPORTATION AND DELIVERY. AT ALL TIMES MAINTAIN STORED SOD MOIST AND UNDER SHADE.
2. SOD SHALL NOT BE STORED AT THE PROJECT SITE FOR LONGER THAN 8-HOURS; UNLESS THE CONTACTOR HAS IDENTIFIED A SAFE LOCATION AND WATER SOURCE THAT IS APPROVED BY THE ENGINEER BEFORE STORAGE OPERATIONS. SOD SHALL BE PROTECTED FROM EXPOSURE TO WIND, SHADED FROM THE SUN, AND KEPT IN MOIST CONDITIONS UNTIL READY FOR INSTALLATION. PROTECT ROOT SYSTEM FROM EXPOSURE TO THE WEATHER. PROTECT SOD AGAINST DEHYDRATION, CONTAMINATION AND HEATING DURING TRANSPORTATION AND DELIVERY.

EXECUTION

A. THE CONTRACTOR SHALL INSTALL AND MAINTAIN SOD AT LOCATIONS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL FLAG OR OTHERWISE FIELD-MARK ALL SOD LOCATIONS FOR APPROVAL BEFORE THE START OF SOD INSTALLATION.

B. THE SOIL SURFACE IN THE SOD INSTALLATION AREAS SHALL BE PREPARED ACCORDING TO THE SOIL REHABILITATION PRESCRIPTIONS CONTAINED IN THIS SECTION. THE CONTRACTOR SHALL ENSURE THAT SOD INSTALLATION AREAS ARE NOT COMPACTED DUE TO ANY CONSTRUCTION OPERATIONS BEFORE SOD INSTALLATION. CONTRACTOR SHALL CAREFULLY SMOOTH OUT ALL SURFACE IRREGULARITIES THAT WILL BE RECEIVING SOD, ROLL THE AREA TO EXPOSE SOIL DEPRESSIONS, AND REGRADE AS NECESSARY. WATER SOIL TO A DEPTH OF 4-INCHES, 48 HOURS BEFORE PLACING SOD. VERIFY THAT SOIL REHABILITATION AND RELATED PREPARATORY WORK HAVE BEEN COMPLETED BEFORE PLACING SOD. DO NOT BEGIN WORK UNTIL CONDITIONS HAVE BEEN APPROVED BY THE ENGINEER.

C. SOD SALVAGE, INSTALLATION, AND ESTABLISHMENT OPERATIONS SHALL BE CONDUCTED AS INDICATED ON THE DRAWINGS AND AS DIRECTED BY THE ENGINEER. SOD SALVAGE AND INSTALLATION OPERATIONS SHALL BE CONDUCTED IN COORDINATION WITH OTHER WORK ON THE PROJECT SITE.

D. THE ENGINEER WILL FIELD LOCATE THE SOD TO BE SALVAGED BEFORE THE START OF SALVAGE OPERATIONS; THE CONTRACTOR SHALL PROVIDE 48 HOURS, MINIMUM ADVANCED NOTICE WHEN REQUESTING FIELD IDENTIFICATION OF SALVAGE AREAS. THE CONTRACTOR SHALL FLAG OR OTHERWISE FIELD-MARK ALL SOD INSTALLATION LOCATIONS FOR APPROVAL BEFORE THE START OF INSTALLATION.

E. UPON EXCAVATION, SOD SALVAGE SHALL BE MAINTAINED MOIST AND READIED FOR INSTALLATION AT THEIR ULTIMATE LOCATIONS AS PRESCRIBED ON THE DRAWINGS AND HEREIN. WHENEVER POSSIBLE, SOD INSTALLATION SHALL OCCUR IMMEDIATELY AFTER SALVAGE. IF POSSIBLE, THE SOD SALVAGE AND INSTALLATION OPERATIONS SHALL OCCUR IN THE LATTER PART OF SEPTEMBER; THE EXACT DATES FOR SALVAGE AND INSTALLATION OPERATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

F. BEFORE INSTALLATION, THE CONTRACTOR SHALL EXCAVATE AN AREA TO ACCOMMODATE THE WIDTH AND DEPTH OF THE SOD MATERIAL WITHOUT ANY RESULTING SETTLEMENT. CONTRACTOR SHALL CAREFULLY SMOOTH OUT ALL SURFACE IRREGULARITIES THAT WILL BE RECEIVING SOD, ROLL THE AREA TO EXPOSE SOIL DEPRESSIONS, AND REGRADE AS NECESSARY. WATER SOIL TO A DEPTH OF 4-INCHES, 48 HOURS BEFORE SOD PLACEMENT. VERIFY THAT SOIL REHABILITATION AND RELATED PREPARATORY WORK HAVE BEEN COMPLETED BEFORE PLACING SOD. DO NOT BEGIN WORK UNTIL CONDITIONS HAVE BEEN APPROVED BY THE ENGINEER.

G. BEGIN SOD PLACEMENT AT THE BOTTOM OF SLOPES. MATS SHALL BE UNROLLED AND PLACED PARALLEL TO CREEK FLOW. LAY THE FIRST SOD AS STRIPS ALONG A STRAIGHT BASELINE, PARALLEL TO THE CREEK. BUTT JOINTS TIGHTLY BUT DO NOT OVERLAP THE JOINTS. ON THE SECOND STRIP, STAGGER SOD IN A RUNNING BOND PATTERN. ENDS SHALL BE KEYED IN PLACE. USE A SHARP KNIFE TO CUT THE SOD TO FIT IRREGULAR CURVED AREAS AND ANY STRUCTURES. DO NOT TEAR, STRETCH OR DROP SOD DURING PLACEMENT.

H. SOD SHALL BE ANCHORED AS DETAILED ON THE DRAWINGS.

I. DO NOT LAY THE ENTIRE AMOUNT OF SOD BEFORE START OF WATERING. WATER IN LIGHTLY, WHERE A RELATIVELY LARGE AREA OF SOD HAS BEEN PLACED. SOD SHALL BE IMMEDIATELY WATERED AFTER INSTALLATION AND SHALL BE MAINTAINED MOIST THROUGHOUT THE CONTRACT PERIOD. KEEP SOD MOIST DURING THE FIRST WEEK AFTER INSTALLATION. AFTER THE FIRST WEEK, SUPPLEMENT RAINFALL TO PRODUCE A TOTAL OF 2-INCHES PER DAY. REPEAT WATERING AT REGULAR INTERVALS UNTIL THE SOD ESTABLISHES ITSELF. ONCE THE SOD HAS BECOME ESTABLISHED, DECREASE THE WATERING FREQUENCY AND INCREASE THE AMOUNT OF WATER PER APPLICATION.

J. SOD SHALL BE WATERED IMMEDIATELY FOLLOWING INSTALLATION.

1. WATER INSTALLED SOD IMMEDIATELY AFTER INSTALLATION AND CONTINUOUSLY AT A FREQUENCY OF ONCE A WEEK DURING THE PERIOD MAY 1 THROUGH OCTOBER 1, UNTIL AN "INSTALLATION ACCEPTANCE" IS GIVEN IN WRITING BY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE THAT THE SOD IS PROPERLY WATERED BEFORE AND AFTER INSTALLATION AND BEFORE THE START OF THE PLANT ESTABLISHMENT PERIOD. SOD SHALL BE THOROUGHLY HAND WATERED IMMEDIATELY AFTER INSTALLATION. THE CONTRACTOR SHALL CONTINUE TO IRRIGATE THE SOD AS NECESSARY TO MAINTAIN THE SOD IN A HEALTHY CONDITION THROUGHOUT THE DURATION OF THE CONTRACT PERIOD. THE FREQUENCY AND DURATION OF THE WATERING CYCLE SHALL DEPEND ON CURRENT WEATHER PATTERNS AND SITE-SPECIFIC SOIL MOISTURE CONDITIONS.
3. THE CONTRACTOR BEARS FULL RESPONSIBILITY FOR WATERING SOD IN A MANNER THAT SHALL MAINTAIN PLANT HEALTH AND VIGOR AND PROMOTE PLANT ESTABLISHMENT AND GROWTH.

AS-BUILT DRAWINGS

P:\3000 ENVIRONMENTAL\100154 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-01 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS / SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way - Suite 101
Berkeley, California 94710
ph/(510) 704-1000 / fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

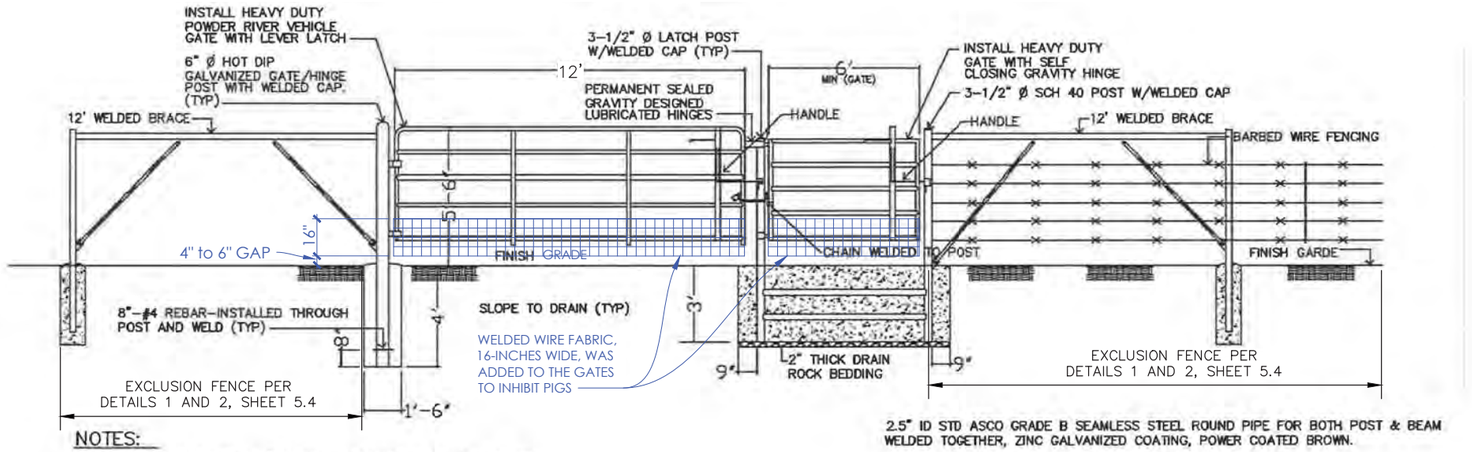
SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

PRELIMINARY SOIL TEST RESULTS AND SOD NOTES

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0F



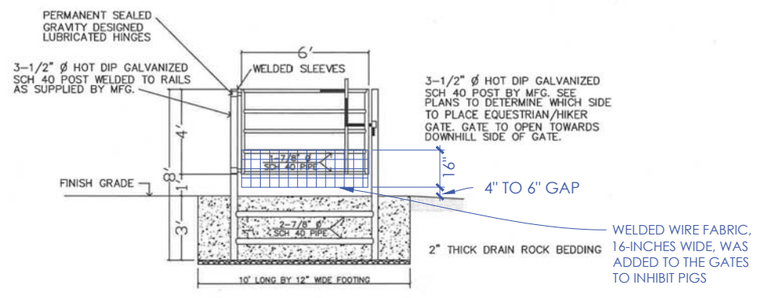
NOTES:

1. EQUESTRIAN GATE TO BE "SOUTHWEST RANGER GATE", AS MFG. BY SOUTHWEST FENCE AND SUPPLY CO.
2. 2.5" ID STD ASCO GRADE B SEAMLESS STEEL ROUND PIPE FOR BOTH POST & BEAM WELDED TOGETHER, ZINC GALVANIZED COATING, POWER COATED BROWN.
2. VEHICLE GATE TO BE HEAVY DUTY TUBE GATE, AS MFG. BY POWDER RIVER CO., OR EQUAL. GATE SHALL BE IN WIDTH INDICATED IN SPECIFICATIONS GREEN IN COLOR BY MFG. AS AVAILABLE AT:

   POWDER RIVER
   (800) 453-5318
   www.powderriver.com

3. CUSTOM MADE EQUIVALENT GATE MUST BE CONSTRUCTED OF ROUND STOCK IRON METAL WITH A MINIMUM DIAMETER OF 1-1/2".
4. WELDS ON POSTS SHALL BE PAINTED WITH ZRC GALVANIZING COMPOUND OR EQUAL, TO MATCH BROWN COAT COLOR.

1 VEHICULAR GATE WITH EQUESTRIAN HIKER GATE
SCALE: NTS



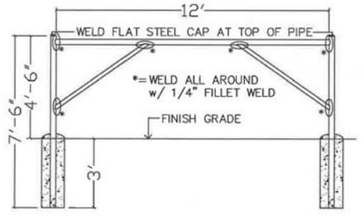
NOTES:

1. EQUESTRIAN GATE TO BE "SOUTHWEST RANGER GATE", AS MFG. BY SOUTHWEST FENCE AND SUPPLY CO.

SOUTHWEST FENCE & SUPPLY CO.
P.O. BOX 1523
PATTERSON, CA 95363.
(800) 843-9623

2. CONCRETE: 5,000 PSI
3. GATE POSTS AND GATE DO NOT REQUIRE PAINTING UNLESS NOT SUPPLIED BY MFG. IN GREEN
4. GATE HINGES MUST BE WELDED ONTO THE HINGE POST AT AN ANGLE SO THAT WHEN THE GATE IS OPENED IT WILL AUTOMATICALLY SWING SHUT.
5. WELD ON POSTS SHOULD SHOULD BE PAINTED W/ZRD GALVANIZING COMPOUND OR EQUAL.

2 METAL EQUESTRIAN/HIKER GATE
SCALE: NTS



BRACE MATERIAL:

ALL PIPE MATERIALS: USE 2.5" Ø STD. A500 GRADE B.

GRIND ALL WELD PRIOR TO PAINTING.

PRIMED AND PAINT W/2 COATS BLACK RUST PREVENTION PAINT.

ADJUST BRACE AS NECESSARY TO ACCOMODARE SLOPE IN THE FIELD.

3 WELDED STEEL SINGLE BRACE
SCALE: NTS

NOTE: THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL GATES FOR APPROVAL BEFORE ORDERING MATERIALS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\100654 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS — HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way - Suite 101
Berkeley, CA 94710-2213
ar/(510) 704-1000 / fax (510) 704-1001
www.balancehydro.com

DUDEK — HRS

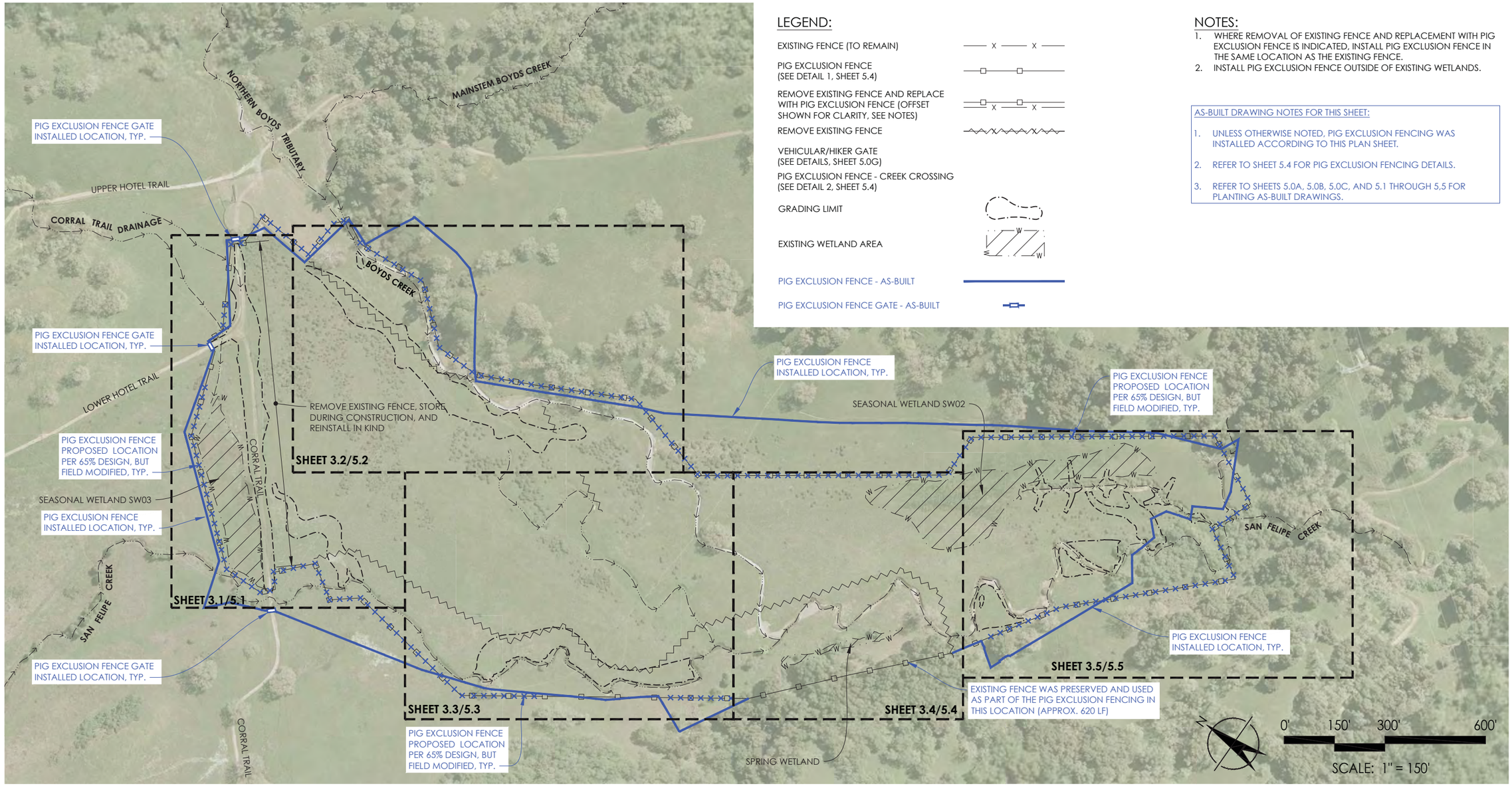
SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

FENCE GATE DETAILS

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET 5.0G



LEGEND:

- EXISTING FENCE (TO REMAIN)
- PIG EXCLUSION FENCE (SEE DETAIL 1, SHEET 5.4)
- REMOVE EXISTING FENCE AND REPLACE WITH PIG EXCLUSION FENCE (OFFSET SHOWN FOR CLARITY, SEE NOTES)
- REMOVE EXISTING FENCE
- VEHICULAR/HIKER GATE (SEE DETAILS, SHEET 5.0G)
- PIG EXCLUSION FENCE - CREEK CROSSING (SEE DETAIL 2, SHEET 5.4)
- GRADING LIMIT
- EXISTING WETLAND AREA
- PIG EXCLUSION FENCE - AS-BUILT
- PIG EXCLUSION FENCE GATE - AS-BUILT

NOTES:

1. WHERE REMOVAL OF EXISTING FENCE AND REPLACEMENT WITH PIG EXCLUSION FENCE IS INDICATED, INSTALL PIG EXCLUSION FENCE IN THE SAME LOCATION AS THE EXISTING FENCE.
2. INSTALL PIG EXCLUSION FENCE OUTSIDE OF EXISTING WETLANDS.

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PIG EXCLUSION FENCING WAS INSTALLED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.4 FOR PIG EXCLUSION FENCING DETAILS.
3. REFER TO SHEETS 5.0A, 5.0B, 5.0C, AND 5.1 THROUGH 5.5 FOR PLANTING AS-BUILT DRAWINGS.

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-6 FENCING.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2213
ph (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

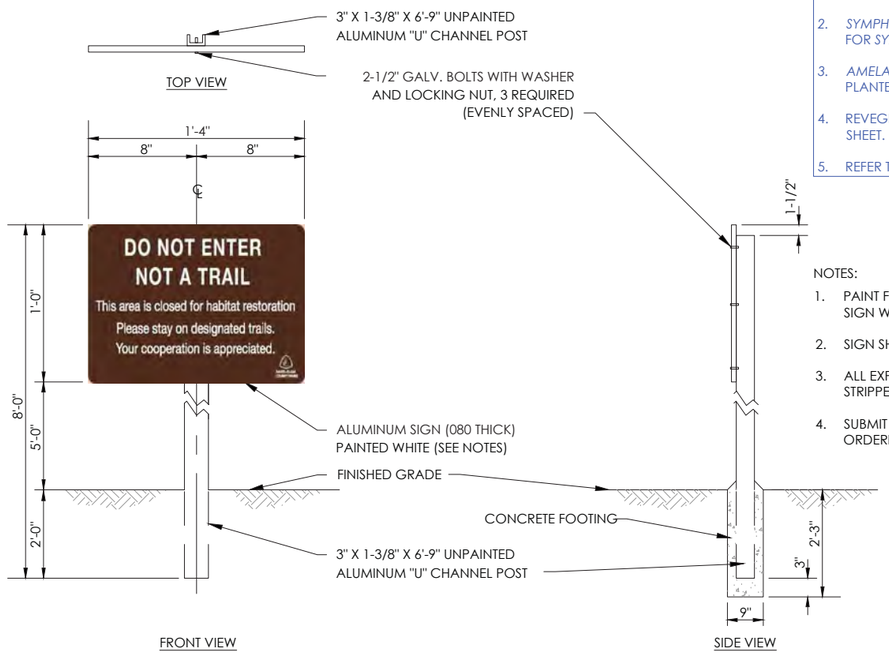
SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK 07-24-17
CHECKED BY D SHAW 11-14-17
IN CHARGE E BALLMAN
DATE 11-14-2017

FENCING PLAN OVERVIEW

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE 1" = 150'
SHEET 5.0H



1 RESTORATION SIGN
SCALE: NTS

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. *SYMPHORICARPOS ALBUS* PLANTS WERE SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
3. *AMELANCHIER UTAHENSIS* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
4. REVEGETATION SIGNS WERE INSTALLED ACCORDING TO THIS PLAN SHEET.
5. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.

NOTES:

1. PAINT FRONT OF SIGN PER COUNTY STANDARDS. PAINT BACK OF SIGN WITH ONE COAT PRIMER & TWO COATS BLACK ENAMEL.
2. SIGN SHALL BE COATED WITH 3m VINYL AND BE LAMINATED.
3. ALL EXPOSED BOLT THREADS EXTENDING BEYOND NUT SHALL BE STRIPPED AFTER INSTALLATION.
4. SUBMIT SHOP DRAWING OF SIGN FOR APPROVAL BEFORE ORDERING.

LEGEND:

- SEED MIX TYPE 1 - WETLAND RIPARIAN MIX
- SEED MIX TYPE 2 - RIPARIAN MIX
- SEED MIX TYPE 3 - UPLAND MIX
- RESTORATION SIGN (SEE DETAIL 1, THIS SHEET) (4 TOTAL; ALL THIS SHEET)

0' 40' 80' 160'

SCALE: 1" = 40'

MATCH SHEET 5.3

FIRST 60' UPSTREAM OF SAN FELIPE CREEK, LOWER SLOPES
75 *JUNCUS EFFUSUS*
75 *JUNCUS PATENS*

REMOVE EX FENCE

SAN FELIPE CREEK

PRESERVE EXISTING WILLOW

GRADE SWALE PER RESTORATION PLAN

PLANT LIST 1: SAN FELIPE CREEK UPPER SLOPE
~~38 *AMELANCHIER UTAHENSIS*~~
16 *QUERCUS LOBATA*
38 *SYMPHORICARPOS ALBUS*
SEED MIX TYPE 2

EXCLUSION FENCE - CREEK CROSSING: (SEE DETAIL 2, SHEET 5.4)

PLANT LIST 1: SAN FELIPE CREEK LOWER SLOPE
57 *ROSA CALIFORNICA*
34 *SALIX LAEVIGATA*
34 *SALIX LASIOLEPIS*
17 *SAMBUCUS MEXICANA*
SEED MIX TYPE 2

PLANT LIST 1: SAN FELIPE CREEK UPPER SLOPE
~~32 *AMELANCHIER UTAHENSIS*~~
18 *QUERCUS LOBATA*
32 *SYMPHORICARPOS ALBUS*
SEED MIX TYPE 2

PLANT LIST 1: SAN FELIPE CREEK LOWER SLOPE
43 *ROSA CALIFORNICA*
26 *SALIX LAEVIGATA*
26 *SALIX LASIOLEPIS*
13 *SAMBUCUS MEXICANA*
SEED MIX TYPE 2

MATCH SHEET 5.2

APPLY SEED MIXTURE TYPE 1 TO DISTURBED AREAS OUTSIDE OF ROAD

APPLY SEED MIXTURE TYPE 3 TO DISTURBED AREAS OUTSIDE OF ROAD

APPLY SEED MIXTURE TYPE 2 TO DISTURBED AREAS OUTSIDE OF ROAD

EXCLUSION FENCE (SEE DETAIL 1, SHEET 5.4) INSTALL ALONG EXISTING FENCE ALIGNMENT, OFFSET SHOWN FOR CLARITY

CORRAL TRAIL RESURFACING, GRADING, AND DRAINAGE IMPROVEMENTS PER RESTORATION PLAN

SEE SHEET 5.0H FOR INSTALLED GATE LOCATIONS, TYP.

~~INSTALL 12' GATE PER DETAIL3 SHEET 5.0G~~

CORRAL TRAIL

SEASONAL WETLAND SW03

SEE SHEET 5.0H FOR INSTALLED GATE LOCATIONS, TYP.

~~INSTALL 12' GATE PER DETAIL5 SHEET 5.0G~~

MISC WETLAND PLANTINGS

ARIZONA CROSSING PER RESTORATION PLAN

~~INSTALL 12' GATE PER DETAIL5, SHEET 5.0G~~

SEE SHEET 5.0H FOR INSTALLED GATE LOCATIONS, TYP.

LOWER HOTEL TRAIL

CORRAL TRAIL TRIBUTARY

EXCLUSION FENCE (SEE DETAIL 1, SHEET 5.4) 10' MIN OFFSET FROM PLANTING AREA

PLANT LIST 10: WETLAND ENHACNCEMENT
397 *CAREX PRAEGRACILIS*
181 *JUNCUS EFFUSUS*
694 *JUNCUS PATENS*
406 *JUNCUS XIPHIOIDES*

1,678 TOTAL
5-7 PLANTS/CLUSTER

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

PREPARED FOR:
SANTA CLARA COUNTY PARKS
HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 / fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

BY	DATE	SUBMITTALS / REVISIONS
TG	03-27-17	CONCEPT PLANS
PK	07-24-17	DRAFT 65% DESIGN
PK	11-14-17	FINAL 65% DESIGN
JZ	03-08-19	AS-BUILT DRAWINGS

CORRAL TRAIL PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

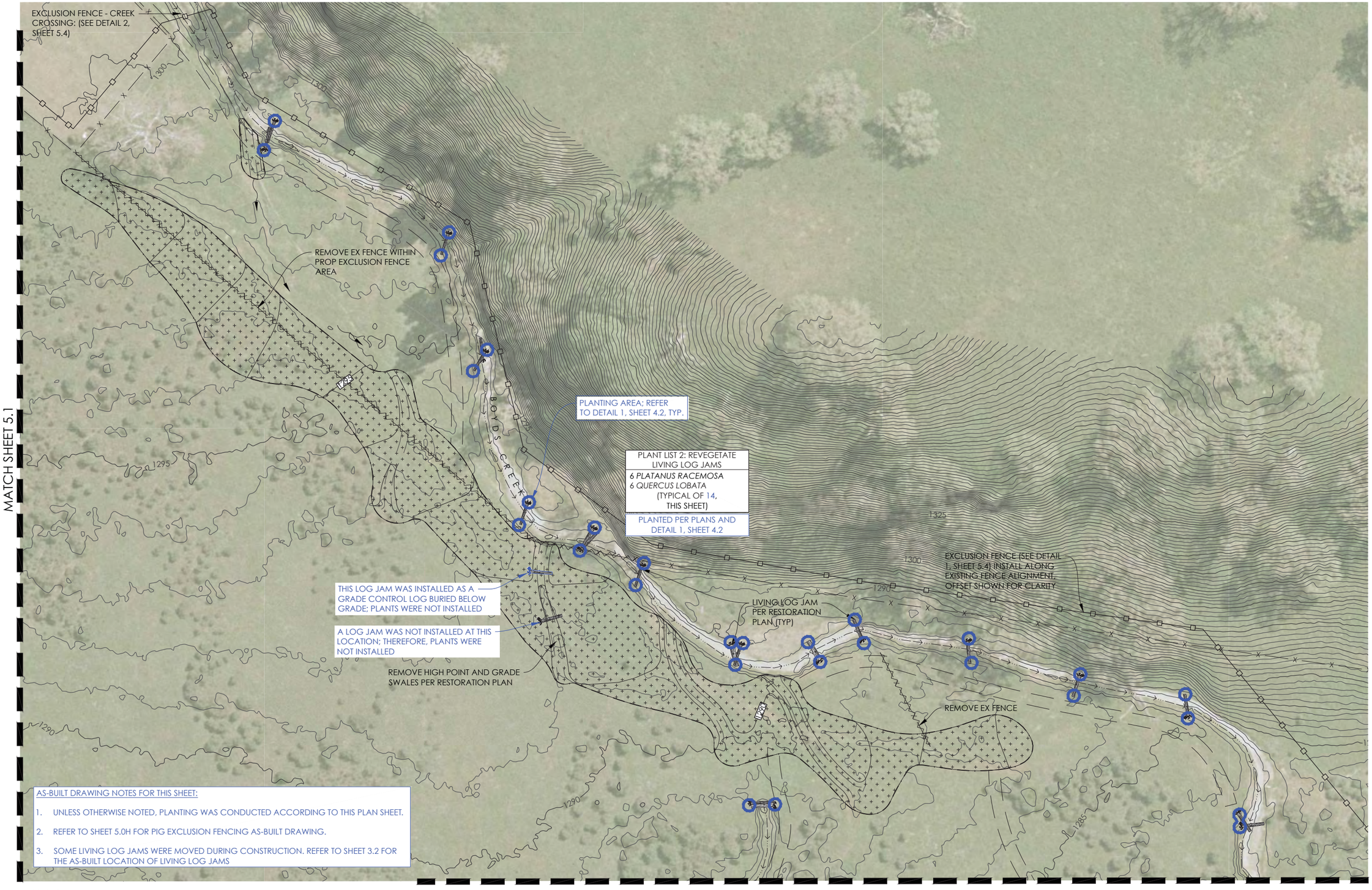
PROJECT NUMBER
215108

SCALE
1" = 40'

SHEET
5.1

AS-BUILT DRAWINGS

P:\300 ENVIRONMENTAL\ 10054 SAN FELIPE CREEK RESTORATION\ 1 AS-BUILTS_REVED\CAD\REVED AS-BUILTS_09-17 S-40SCALE.DWG



AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.
3. SOME LIVING LOG JAMS WERE MOVED DURING CONSTRUCTION. REFER TO SHEET 3.2 FOR THE AS-BUILT LOCATION OF LIVING LOG JAMS

LEGEND:

SEED MIX TYPE 3 - UPLAND MIX

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

0' 40' 80' 160'

SCALE: 1" = 40'

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11TO5-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710
tel (510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK

HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DUDEK
DRAWN BY	P KULCHAWIK
CHECKED BY	J ZANZI
IN CHARGE	J ZANZI
DATE	11-14-2017

UPPER BOYDS CREEK PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER
215108

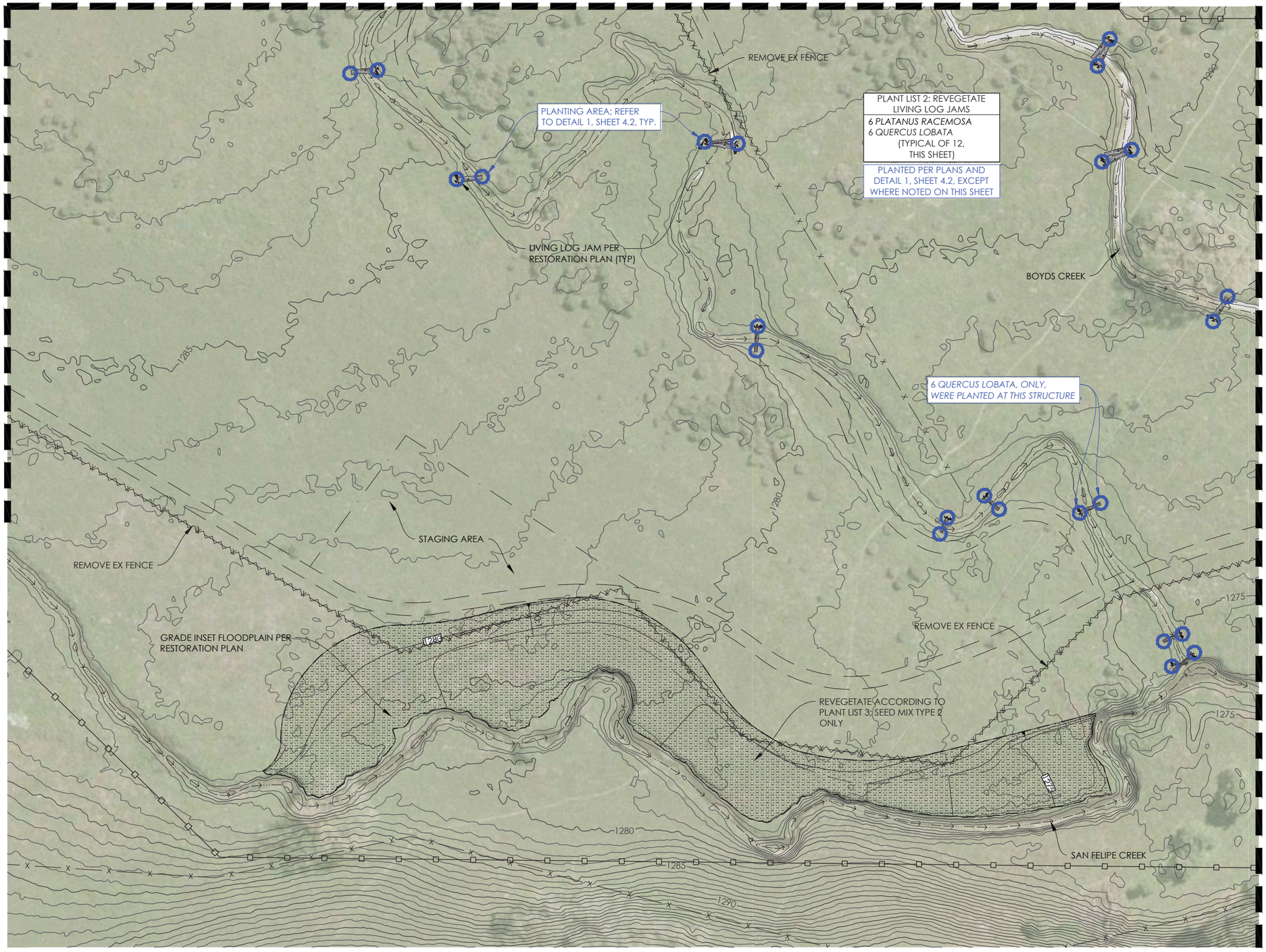
SCALE
1" = 40'

SHEET
5.2

MATCH SHEET 5.2

MATCH SHEET 5.1

MATCH SHEET 5.4



LEGEND:

SEED MIX TYPE 2 - RIPARIAN MIX

AS-BUILT DRAWINGS

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.
3. SOME LIVING LOG JAMS WERE MOVED DURING CONSTRUCTION. REFER TO SHEET 3.3 FOR THE AS-BUILT LOCATION OF LIVING LOG JAMS.

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

0' 40' 80' 160'

SCALE: 1" = 40'

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11OS-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS
HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way, Suite 101
Berkeley, CA 94710-2227
tel (510) 704-1000 / fax (510) 704-1001
www.balancehydro.com

DUDEK
HRS

SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

SAN FELIPE REACH 1 & LOWER BOYDS CREEK PLANTING & FENCING PLAN

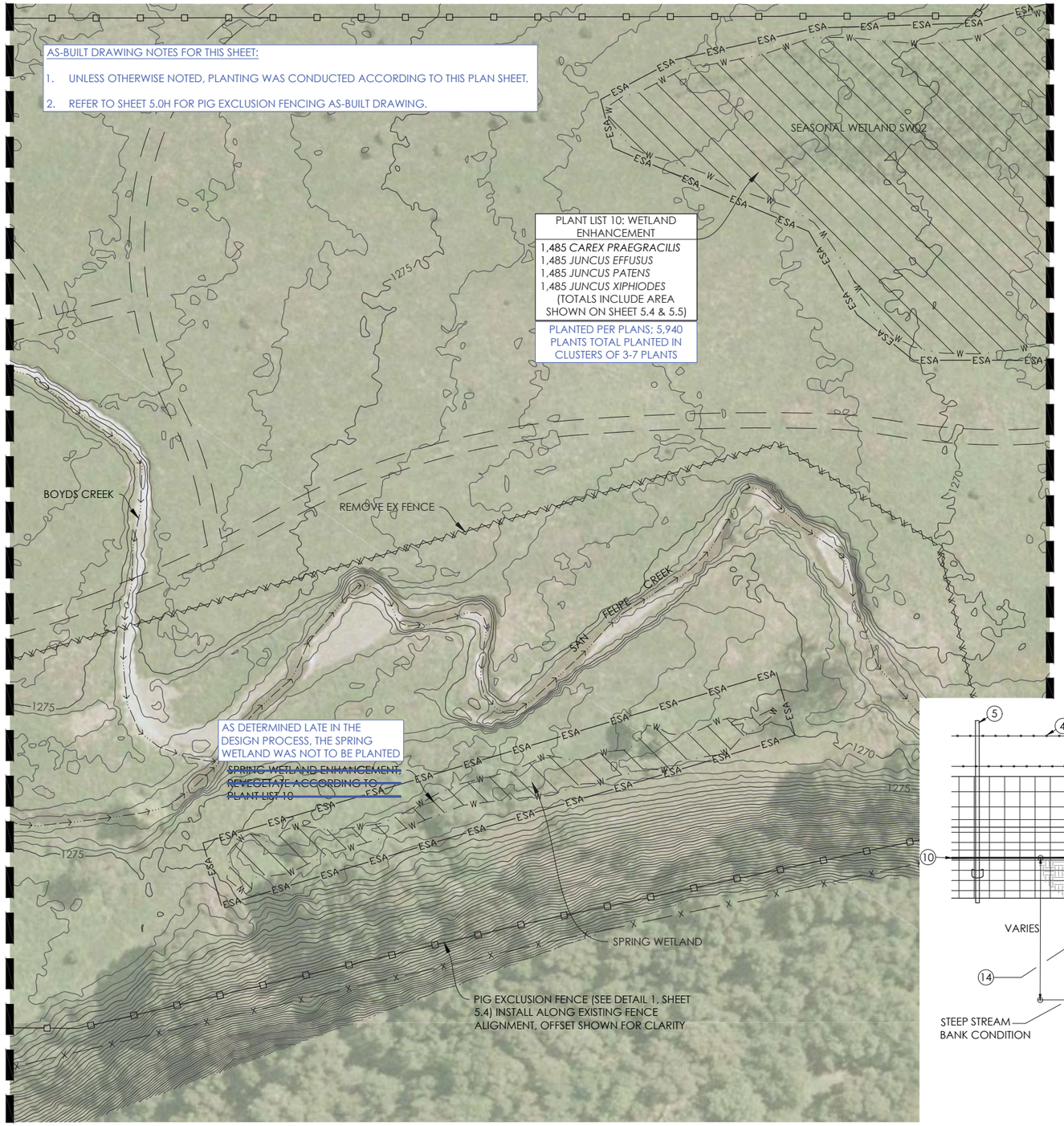
SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

SCALE 1" = 40'

SHEET 5.3



MATCH SHEET 5.3

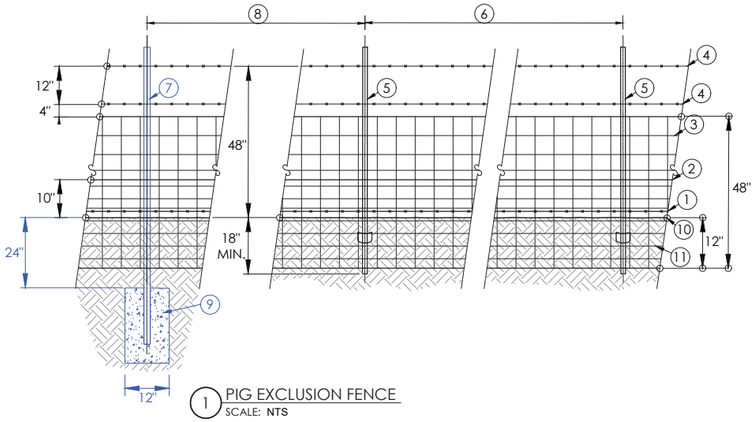
MATCH SHEET 5.5

NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

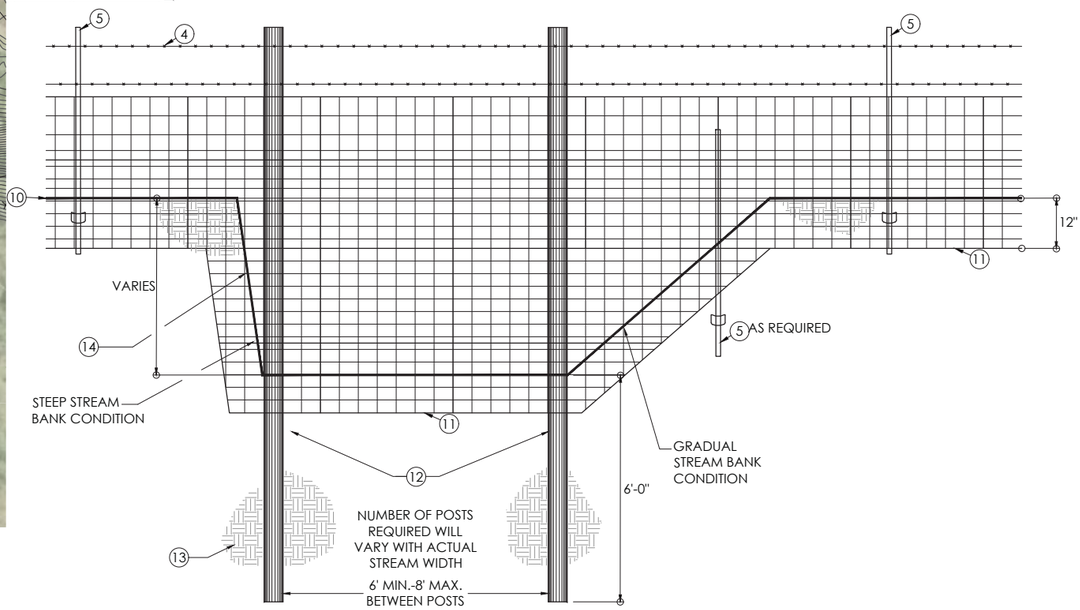
0' 40' 80' 160'

SCALE: 1" = 40'

ITEM	DESCRIPTION
1	12 1/2 GAUGE HIGH-TENSILE BARBED WIRE W/ 4 POINT BARBS (5" SPACING)
	INSTALLED 2" ABOVE FINISH GRADE. WIRED TO FENCE AT EVERY 4'
2	10 GAUGE HIGH-TENSILE SMOOTH WIRE INSTALLED 10" ABOVE EXISTING GRADE
3	12 1/2 GAUGE FIELD FENCE (CLASS 1 GALVANIZED) 48" HEIGHT - HEAVIER GAUGE ON TOP AND BOTTOM WIRES. VERTICAL WIRE SPACED 6" MAX. WITH HORIZONTAL WIRE SPACED 6" MAX. AND GRADUALLY SMALLER TOWARD BOTTOM W/ MAX. 3/2" SPACING BETWEEN BOTTOM THREE WIRES; BURIED 12" BELOW GRADE
4	15 1/2 GAUGE HIGH-TENSILE BARBED WIRE W/ 4 POINT BARBS (5" SPACING)
5	72" PREMIUM STEEL T-POST - ATTACH FENCE TO T-POSTS W/ WIRE
6	PLACE T-POSTS @ 10' O/C.
7	8' GALVANIZED 2" DIA. TUBULAR STEEL POST - ATTACH FENCE TO POST WITH WIRE
8	INSTALL GALVANIZED POLE @ EVERY 100' O/C. AND AT ALL CHANGES OF DIRECTION
9	ANCHOR GALVANIZED POLE IN 12" X 24" CONCRETE FOOTING
10	EXISTING GRADE
11	TRENCH AND BURY FIELD FENCE BELOW GRADE TO A 12" DEPTH
12	6" DIAMETER, PRESSURE TREATED, ROUND WOOD POSTS (WITHIN CHANNEL ONLY)
13	COMPACT SUBGRADE AROUND POSTS, TYP.
14	PROVIDE EXTRA WIRES AS REQUIRED



1 PIG EXCLUSION FENCE
SCALE: NTS



2 PIG EXCLUSION FENCE - CREEK CROSSING
SCALE: NTS

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054.SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11TO5-40SCALE.DWG

PREPARED FOR:
SANTA CLARA COUNTY PARKS
SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, CA 94710-2251
ar/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

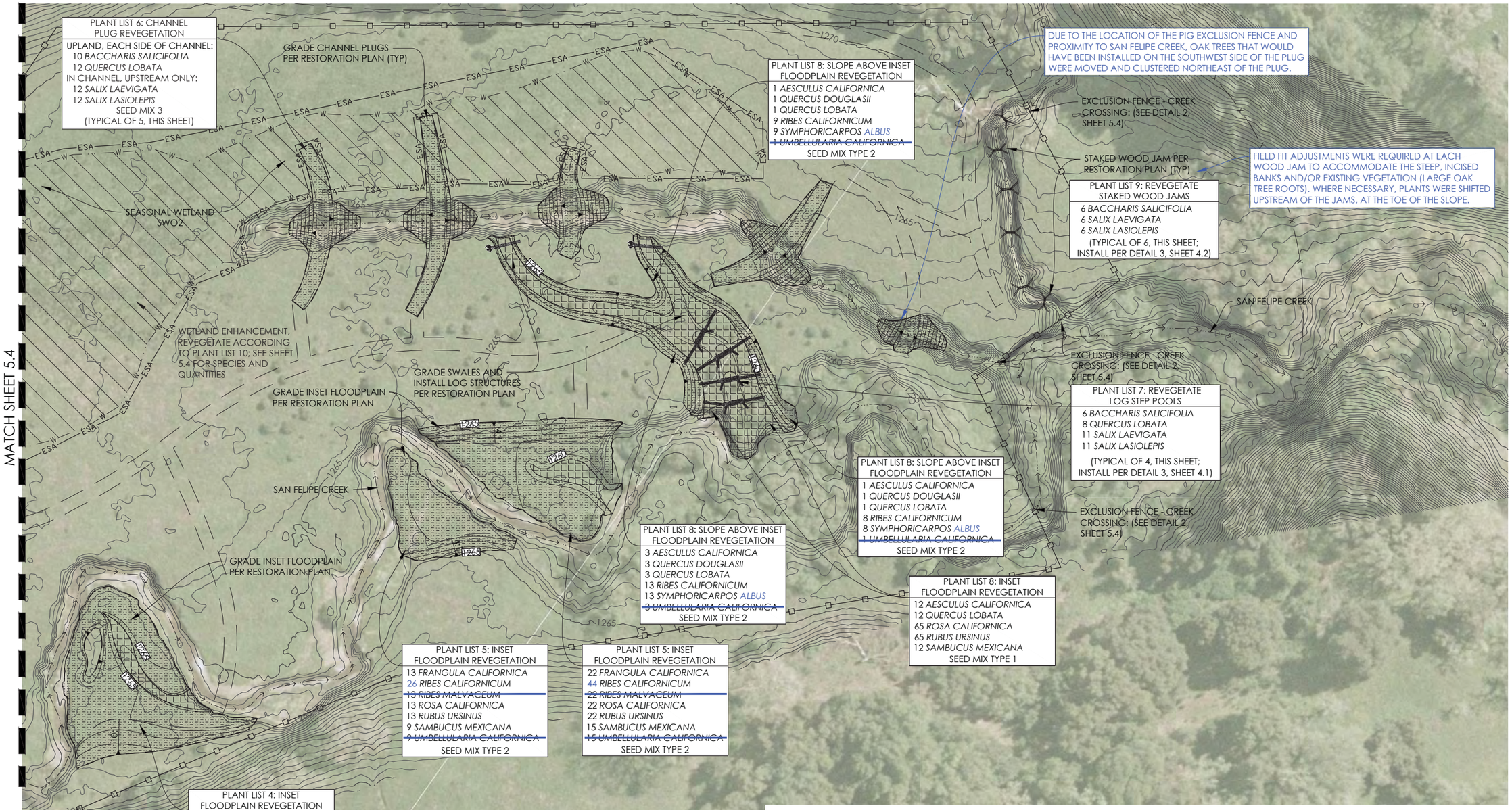
SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

SAN FELIPE CREEK REACH 2 PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE 1" = 40'
SHEET 5.4



NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

AS-BUILT DRAWING NOTES FOR THIS SHEET:

1. UNLESS OTHERWISE NOTED, PLANTING WAS CONDUCTED ACCORDING TO THIS PLAN SHEET.
2. *RIBES CALIFORNICUM* PLANTS WERE SUBSTITUTED FOR *RIBES MALVACEUM*.
3. *SYMPHORICARPOS ALBUS* PLANTS WERE SUBSTITUTED FOR *SYMPHORICARPOS MOLLIS*.
4. *UMBELLULARIA CALIFORNICA* PLANTS WERE NOT AVAILABLE AND WILL BE PLANTED AS PART OF THE PLANT ESTABLISHMENT MAINTENANCE PERIOD.
5. REFER TO SHEET 5.0H FOR PIG EXCLUSION FENCING AS-BUILT DRAWING.

LEGEND:

SEED MIX TYPE 1 - WETLAND RIPARIAN MIX

SEED MIX TYPE 2 - RIPARIAN MIX

0' 40' 80' 160'

SCALE: 1" = 40'

AS-BUILT DRAWINGS

P:\300.ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11DS-40SCALED.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
800 Bancroft Way • Suite 101
Berkeley, California 94710
ph/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com
DUDEK
HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

DESIGNED BY DUDEK
DRAWN BY P KULCHAWIK
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

SAN FELIPE CREEK REACHES 3 & 4 PLANTING & FENCING PLAN

SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

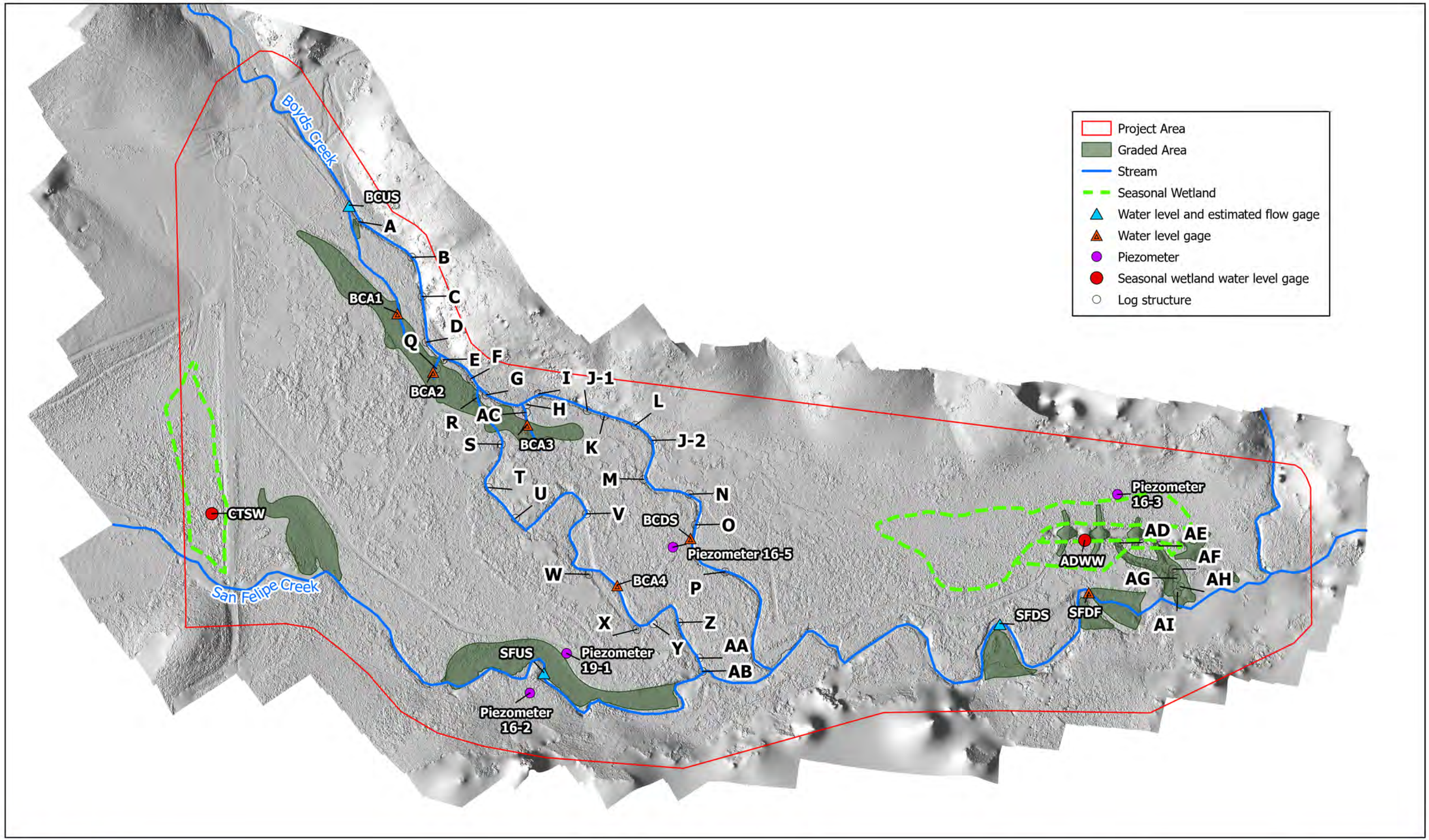
PROJECT NUMBER 215108

SCALE 1" = 40'

SHEET 5.5

APPENDIX D

Log structure locations



Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\monitoring locations.aprx

**Appendix D. Log structure locations,
San Felipe Creek Restoration Project,
Joseph D. Grant Park,
Santa Clara County, California**

APPENDIX E

Surface water station observer log, WY2022

Appendix E. Surface water station observer log: San Felipe Creek Restoration Project, WY2022 (Year-4)

Site Conditions				Streamflow		Water Quality			High-Water	Remarks
Date/Time (mm/dd/yr)	Observer(s)	Stage (feet)	Hydrograph (r/f/s/b)	Discharge (cfs)	Method	Water Temperature (°C)	Specific Conductance at field temp. (µs)	Specific Conductance at 25°C (µs)	Estimated stage at staff plate (feet)	
SFUS										
12/10/2021 ~9:00 am	jh	dry								
1/25/2022 ~10:00 am	ed/ds	dry								No water in gage pool.
3/25/2022 10:08	jh/ed	dry							0.8	Logger downloaded.
9/23/2022 10:01	jh	dry								Logger downloaded, HWM 10 ft upstream is about 2-3 feet above thalweg
SFDS										
12/10/2021 ~9:00 am	jh	dry								Moved gage to ID03-02 near apex of right bend
1/25/2022 ~10:00 am	ed/ds	dry								Evidence of flow across ID03-02
3/25/2022 11:02	jh/ed	dry							1.6	Logger downloaded. HWM presumed to be from Dec 2021. Localized scour at gage.
9/23/2022 13:05	jh	dry							2.0	Channel has scoured approx 0.3 feet at gage. HWMs approximately 0.0 ft above floodplain ground surface near gage.
SFDF										
12/10/2021 ~9:00 am	jh	dry								Installed (moved from ADDC) today. Ground moist at gage, possibly due to sprinklers.
1/25/2022 ~10:00 am	ed/ds	dry								Evidence of flow, standing pools up and downstream of gage in vicinity of ID03-03
3/25/2022 11:29	jh/ed	dry							2.7	Logger downloaded. HWM presumed to be from Dec 2021. Hydraulic control is at roughly 2.5 on staff.
9/23/2022 13:19	jh	dry								Lots of debris (sticks, etc. spread on floodplain from flow from previous winter.
BCUS										
12/10/2021 ~9:00 am	jh	dry								
1/25/2022 ~10:00 am	ed/ds	dry								
3/25/2022 9:53	jh/ed	dry								Logger downloaded.
9/23/2022 11:25	jh	dry							1.0	Logger downloaded.
BCA1										
12/10/2021	jh	dry								
1/25/2022	ed/ds	dry								
3/25/2022 10:07	jh/ed	dry								Logger downloaded.
9/23/2022 11:15	jh	dry								Logger downloaded. No evidence of flow.
BCA2										
12/10/2021	jh	dry								
1/25/2022	ed/ds	dry								
3/25/2022 10:19	jh/ed	dry								Logger downloaded.
9/23/2022 11:06	jh	dry								Logger downloaded. No evidence of flow.
BCA3										
12/10/2021	jh	dry								
1/25/2022	ed/ds	dry								
3/25/2022 10:40	jh/ed	dry								Logger downloaded.
9/23/2022 10:57	jh	dry								Logger downloaded. Appears that flow occurred previous winter.

Appendix E. Surface water station observer log: San Felipe Creek Restoration Project, WY2022 (Year-4)

Site Conditions				Streamflow		Water Quality			High-Water	Remarks
Date/Time (mm/dd/yr)	Observer(s)	Stage (feet)	Hydrograph (r/f/s/b)	Discharge (cfs)	Method	Water Temperature (°C)	Specific Conductance at field temp. (µs)	Specific Conductance at 25°C (µs)	Estimated stage at staff plate (feet)	
BCA4										
12/10/2021	jh	dry								
1/25/2022	ed/ds	dry								
3/25/2022 10:40	jh/ed	dry								Logger downloaded.
9/23/2022 10:23	jh	dry								Logger downloaded.
BCDS										
12/10/2021	jh	dry								
1/25/2022 0:00	ed/ds	dry								
3/25/2022 10:58	jh/ed	dry								Logger downloaded.
9/23/2022 10:40	jh	dry								Possible HWM 1.0 ft on staff. Logger downloaded.
ADWW										
12/10/2021	jh	dry								
1/25/2022 0:00	ed/ds	dry								
3/25/2022 12:07	jh/ed	1.54				14.3	253	336		Logger downloaded.
9/23/2022 12:45	jh	dry								Logger Downloaded. Pond is completely dry.
CTSW										
12/10/2021	jh	dry								
3/25/2022 9:25	jh/ed	dry								Logger downloaded.
9/23/2022 9:26	jh	dry								Logger downloaded.

Observer Key: ds = Dave Shaw, ed = Eric Donaldson, jh=John Hardy
Stage: Water level observed at outside staff plate
Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), baseflow (B), or uncertain (U).
Instrument: If measured, typically made using a standard (AA); pygmy (PY) bucket-wheel ("Price-type") current meter; or portable flume (flume). If estimated, from rating curve (R), visual (V), or float test (F).
Estimated measurement accuracy: Excellent (E) = +/- 2%; Good (G) = +/- 5%; Fair (F) = +/- 9%; Poor (P) estimated percent accuracy given
High-water mark (HWM): Measured or estimated at location of the staff plate
Specific conductance: Measured in microSiemens (micromhos/cm) in field; and adjusted to 25°C using the internal meter conversion
Additional Sampling: Qbed = bedload; Qss = suspended sediment; DO = dissolved oxygen; Nutr = nutrients

APPENDIX E

Ground water station observer log, WY2022

Appendix F. Groundwater station observer log: San Felipe Creek Restoration Project, WY2022 (Year-4)

Site Conditions				Remarks
Date/Time (mm/dd/yr:hhmm)	Observer(s)	Depth to water (feet)	Specific Conductance at 25°C (µs)	
Piezometer 16-2				
12/10/21 14:01	jh	dry		
3/25/2022 9:58	jh/ed	dry		Levelogger downloaded
9/23/2022 9:50	jh	dry		Levelogger downloaded
Piezometer 19-1				
12/10/21 13:54	jh	dry		
3/25/2022 10:24	jh/ed	dry		Levelogger downloaded
9/23/2022 10:08	jh	dry		Levelogger downloaded
Piezometer 16-5				
12/10/21 13:50	jh	dry		
3/25/2022 11:13	jh/ed	dry		Levelogger downloaded
9/23/2022 10:32	jh	dry		Levelogger downloaded
Piezometer 16-3				
12/10/21 13:38	jh	dry		
3/25/2022 11:59	jh/ed	8.11	320	Levelogger downloaded
9/23/2022 12:36	jh	dry		Levelogger downloaded

Observer Key: ds = Dave Shaw, ed = Eric Donaldson, jh = John Hardy
Specific conductance: Measured in microSiemens (micromhos/cm) in field; and adjusted to 25°C using the internal meter conversion

APPENDIX D BALANCE ADAPTIVE MANAGEMENT AS-BUILT MEMORANDUM

MEMO

To: John Zanzi and Mike Sweesy, Dudek

From: Eric Donaldson, John Hardy and Dave Shaw

Date: October 22, 2021

Subject: San Felipe Restoration Project 2020 and 2020 adaptive management as-built summary

This memo presents the as-built condition following adaptive management at the San Felipe Restoration Project site during 2020 and 2021. The first location is on Boyds Creek and is highlighted in Attachment A, an annotated version of as-built Sheet 3.3, where the eastern-most log in the living log jam at this location dislodged during the winter/spring of 2019. The second location is site ID03-02, which can be seen in Attachment B.

1. Boyds Creek living log jam repair

On November 4, 2020, HRS worked under Balance's field direction and in accordance with the adaptive management plan to replace the dislodged log. The log placement was reconfigured with the aim of protecting oak seedlings that had established on the left bank. Figure 1 shows the living log jam after the repair.

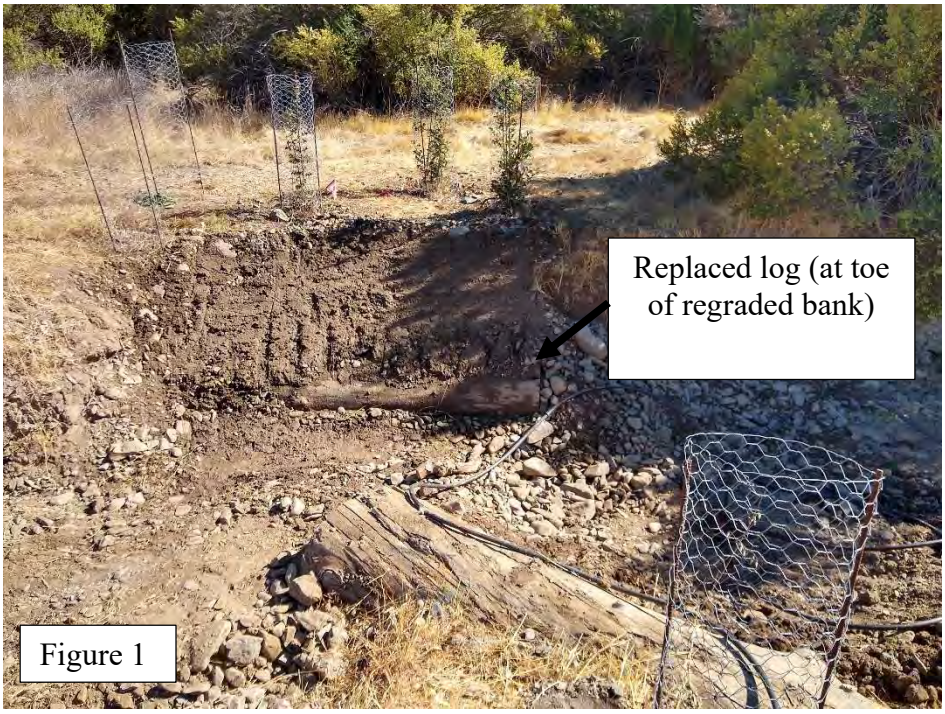


Figure 1

2. ID03-02 BDA installation, ballast placement and slash placement

The as-built condition is presented in Attachment C.

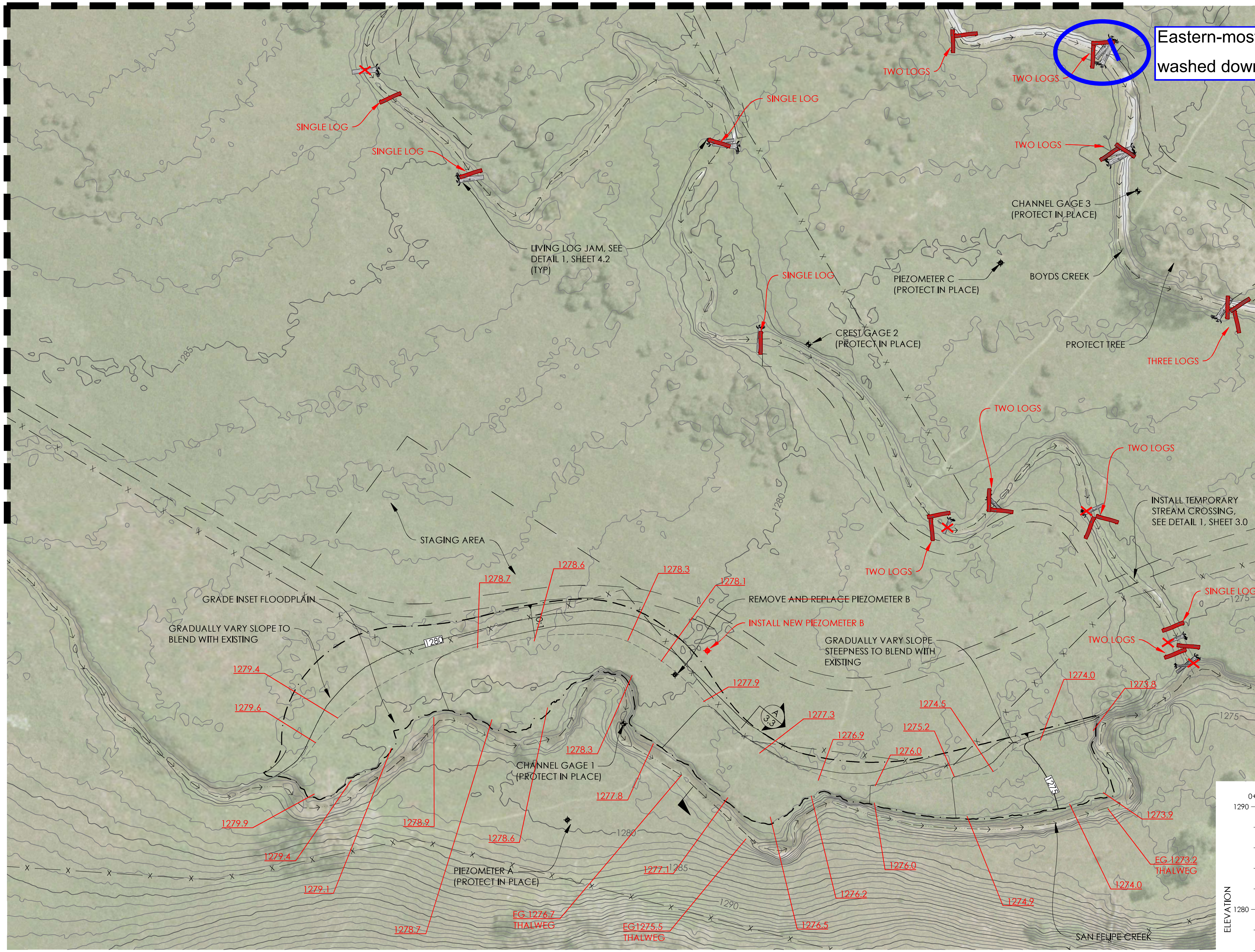
On August 26, 2021 HRS worked with Balance to install a beaver dam analogue (BDA) in the cutoff channel at ID03-02. The BDA was constructed with non-treated cedar split rail fence beams cut and sharpened. Each stake was sharpened and driven to a depth of at least 18 inches below grade. Material excavated from 2019 high flow deposits in the historical channel was used as ballast upstream and downstream of the BDA and to recontour the stream bank upstream of the BDA. The goal of this work was to return low flows to the historic channel alignment, while allowing high flows (with an approximately 2-year recurrence) to spill over the BDA, and floodplain. Accordingly, the historical low flow channel was excavated to approximately 0.5 feet below the elevation of placed ballast within the cutoff channel and adjacent floodplain.

On September 20 and 21, 2021, slash was placed within the cutoff channel between the BDA and the downstream end of the cutoff channel to depth of at least 2 feet. Slash was secured with twine strung between approximately 6 non-treated cedar split rail fence stakes driven through the slash and into the channel bed.

Enclosures: Attachment A: Annotated as-built sheet 3.3
Attachment B: Monitoring map of site
Attachment C: ID03-02 as-built figure

MATCH SHEET 3.2

MATCH SHEET 3.1



MATCH SHEET 3.4

Legend

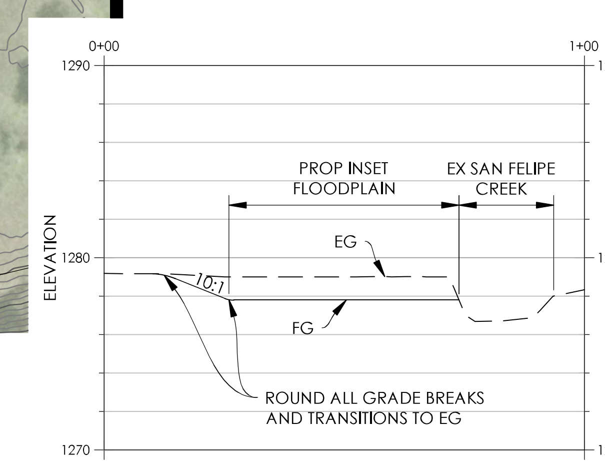
Approximate location of replacement log placed November 4, 2020

0' 40' 80' 160'

SCALE: 1" = 40'

NOTES:

1. SEE SHEET 5.3 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. ALL LOG STRUCTURES SHOWN ON THIS SHEET ARE LIVING LOG JAMS. SEE DETAIL 1, SHEET 4.1.
4. LIVING LOG JAM LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.



INSERT FLOODPLAIN GRADING (A / 3.3)
SECTION VIEW 1" = 20' (H) ; 1" = 5' (V)

AS-BUILT NOTE
REFER TO SHEET 3.0 FOR CHANGES TO ACCESS ROUTES

AS-BUILT DRAWINGS

W:\CADPROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-11O5-40SCALE - STANDARD\215108-03-11O5-40SCALE.DWG

PREPARED FOR: SANTA CLARA COUNTY PARKS; SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.
DUDEK
HRS

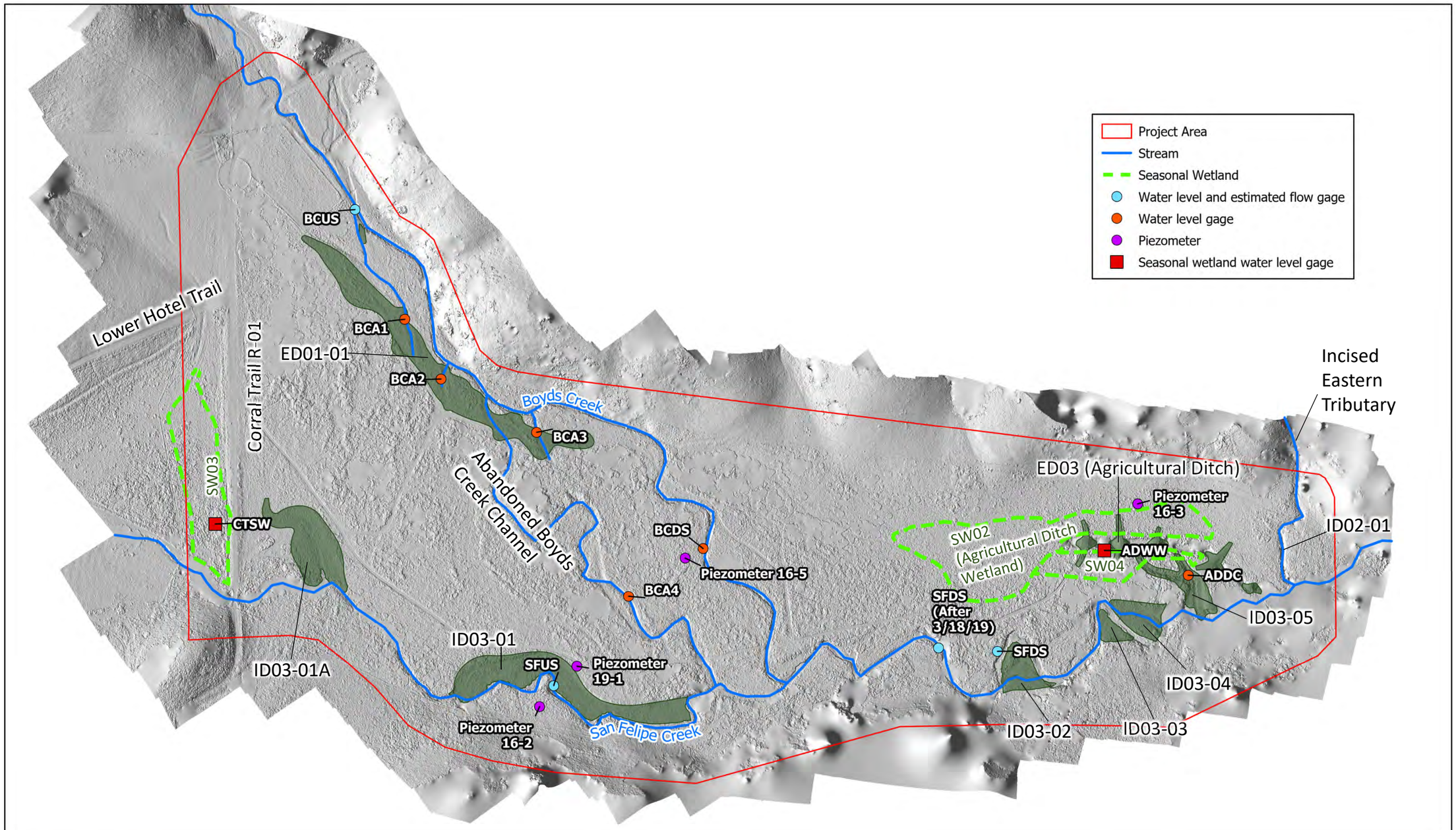
SUBMITTALS / REVISIONS	BY	DATE
CONCEPT PLANS	TG	03-27-17
DRAFT 65% DESIGN	PK	07-24-17
FINAL 65% DESIGN	PK	11-14-17
AS-BUILT DRAWINGS	EB	03-05-19

DESIGNED BY: DONALDSON
DRAWN BY: P KULCHAWIK
CHECKED BY: D SHAW
IN CHARGE: E BALLMAN
DATE: 02-11-2019

SAN FELIPE CREEK REACH 1 & LOWER BOYDS CREEK RESTORATION PLAN

SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE 1" = 40'
SHEET 3.3



Balance Hydrologics™

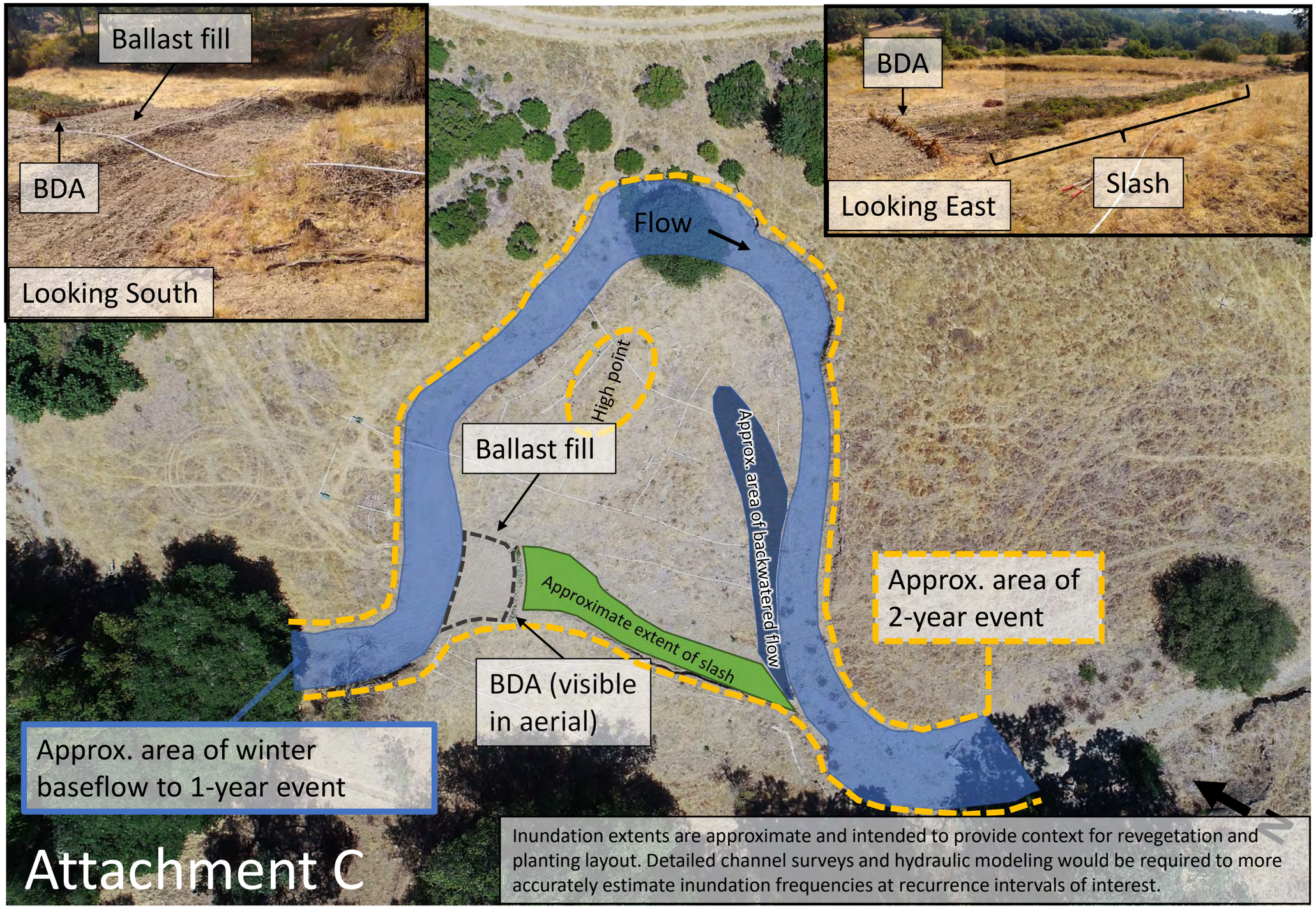
W:\Projects\215108 San Felipe Creek\Map\WY19.mxd

Figure 2. Monitoring Station Locations, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

N


Ballast fill
BDA
Looking South
BDA
Looking East
Slash
Flow
High point
Ballast fill
Approx. area of backwatered flow
Approximate extent of slash
BDA (visible in aerial)
Approx. area of 2-year event
Approx. area of winter baseflow to 1-year event
Inundation extents are approximate and intended to provide context for revegetation and planting layout. Detailed channel surveys and hydraulic modeling would be required to more accurately estimate inundation frequencies at recurrence intervals of interest.
Attachment C

APPENDIX E PHOTO POINT PHOTOS

Photo 1a: West - SW03 - 9/30/2019

Photo 1b: West- SW03 - 10/28/2020

Photo 1c: South West - SW03 - 6/21/2021

Photo 1d: South West – SW03 – 6/6/2022

Photo 2a: West - SW03 - 9/30/2019

Photo 2b: West- SW03 - 10/28/2020

Photo 2c: North West - SW03 - 6/21/2021

Photo 2d: North West - SW03 - 6/6/2022

Photo 3a: South West - ED02 - 6/19/2019

Photo 3b: South West - ED02 - 10/28/2020

Photo 3c: South West - ED02 - 6/21/2021

Photo 3d: South West - ED02 - 6/6/2022

Photo 4a: North East - SW03 -6/18/2019

Photo 4b: North East - SW03 - 10/28/2020

Photo 4c: North East - SW03 - 6/21/2021

Photo 4d: North East - SW03 - 6/6/2022

Photo 5a: South- ID03 - 9/30/2019

Photo 5b: South - ID03 - 10/28/2020

Photo 5c: South- ID03 - 6/21/2021

Photo 5d: South- ID03 - 6/6/2022

Photo 6a: North - ID03 - 9/30/2019

Photo 6b: North - ID03 - 10/28/2020

Photo 6c: North- ID03 - 6/21/2021

Photo 6d: North- ID03 - 6/6/2022

Photo 7a: South West- ID03 - 6/19/2019

Photo 7b: South West - ID03 - 10/28/2020

Photo 7c: South West- ID03 - 6/21/2021

Photo 7d: South West- ID03 - 6/6/2022

Photo 8a: South - ID03 - 6/19/2019

Photo 8b: South - ID03 - 10/28/2020

Photo 8c: South- ID03 - 6/21/2021

Photo 8d: South- ID03 - 6/6/2022

Photo 9a: West - ID03 - 6/19/2019

Photo 9b: West - ID03 - 10/28/2020

Photo 9c: West- ID03 - 6/21/2021

Photo 9d: West- ID03 - 6/6/2022

Photo 10a: South West - ID03 - 6/19/2019

Photo 10b: South West - ID03 - 10/28/2020

Photo 10c: South West - ID03 - 6/21/2021

Photo 10d: South West - ID03 - 6/6/2022

Photo 11a: West- ID03 - 6/19/2019

Photo 11b: West - ID03 - 10/28/2020

Photo 11c: West- ID03 - 6/21/2021

Photo 11d: West- ID03 - 6/6/2022

Photo 12a: South - ID03 - 9/30/2019

Photo 12b: South - ID03 - 10/28/2020

Photo 12c: South- ID03 - 6/21/2021

Photo 12d: South- ID03 - 6/6/2022

Photo 13a: North - ID03 - 9/30/2019

Photo 13b: North - ID03 - 10/28/2020

Photo 13c: North - ID03 - 6/21/2021

Photo 13d: North - ID03 - 6/6/2022

Photo 14a: West - ID03 - 6/19/019

Photo 14b: West - ID03 - 10/28/2020

Photo 14c: West - ID03 - 6/21/2021

Photo 14d: West - ID03 - 6/6/2022

Photo 15a: West - ID03 - 6/19/2019

Photo 15b: West - ID03 - 10/28/2020

Photo 15c: West - ID03 - 6/21/2021

Photo 15d: West - ID03 - 6/6/2022

Photo 16a: East- ED03-01/SW04 - 6/19/2019

Photo 16b: East - ED03-01/SW04 - 10/28/2020

Photo 16c: East - ED03-01/SW04 - 6/21/2021

Photo 16d: East - ED03-01/SW04 - 6/6/2022

Photo 16(2)c: North West - ED03-01- 6/21/2021

Photo 16(2)d: North West - ED03-01- 6/6/2022

Photo 17a: East - ED03-01/SW02 - 9/30/2019

Photo 17b: East - ED03-01/SW02 - 10/28/2020

Photo 17c: East - ED03-01/SW02 - 6/21/2021

Photo 17d: East - ED03-01/SW02 - 6/6/2022

Photo 17(2)c: West - ED03-02 - 6/21/2021

Photo 17(2)d: West - ED03-02 - 6/6/2022

Photo 18a: East - ED03-02/SW02 - 9/30/2019

Photo 18b: East - ED03-02/SW02 - 10/28/2020

Photo 18c: East - ED03-02/SW02 - 6/21/2021

Photo 18d: East - ED03-02/SW02 - 6/6/2022

	
Photo 18(2)c: South West - ED03-03 - 6/21/2021	Photo 18(2)d: South West - ED03-03 - 6/6/2022

Photo 19a: South - ED03-02/SW04 - 06/19/2019

Photo 19b: South - ED03-02/SW04 - 10/28/2020

Photo 19c: South - ED03-02/SW04 - 06/21/2021

Photo 19d: South - ED03-02/SW04 - 6/6/2022

	
Photo 19(2)c: West - ED03-02 - 06/21/2021	Photo 19(2)d: West - ED03-02 - 6/6/2022

Photo 20a: North East - ED03-03/SW04 - 6/19/2019

Photo 20b: North East - ED03-03/SW04- 10/28/2020

Photo 20c: North East - ED03-03/SW04 - 6/21/2021

Photo 20d: North East - ED03-03/SW04 - 6/6/2022

Photo 21a: East- ED03-03/AD01 - 9/30/2019

Photo 21b: East - ED03-03/AD01 - 10/28/2020

Photo 21c: East- ED03-03/AD01 - 6/21/2021

Photo 21d: East- ED03-03/AD01 - 6/6/2022

Photo 22a: North - ED03-04/AD01 - 6/19/2019

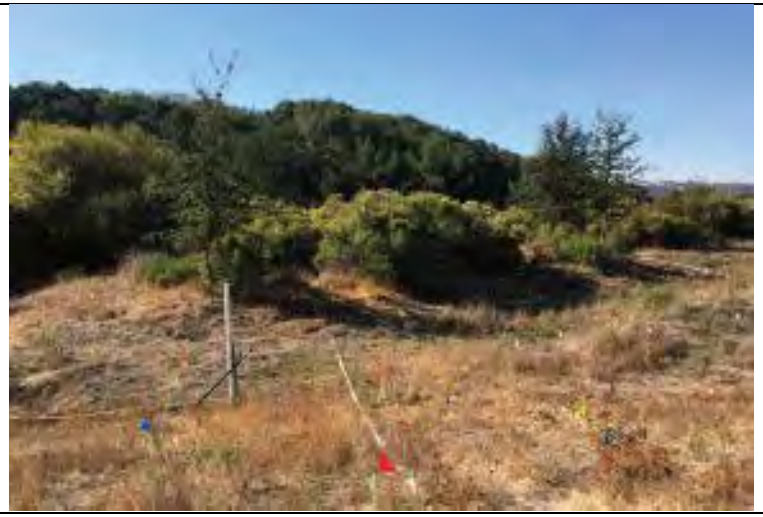


Photo 22b: North- ED03-04/AD01- 10/28/2020

Photo 22c: North - ED03-04/AD01- 6/21/2021

Photo 22d: North - ED03-04/AD01- 6/6/2022

	
Photo 22(2)c: East- ED03-04 - 6/21/2021	Photo 22(2)d: East- ED03-04 - 6/6/2022

Photo 23a: East - ED03-04/AD01 - 9/30/2019

Photo 23b: East - ED03-04/AD01 - 10/28/2020

Photo 23c: East - ED03-04/AD01 - 6/21/2021

Photo 23d: East - ED03-04/AD01 - 6/6/2022

Photo 24a: North- ED03-05/AD01 - 9/30/2019

Photo 24b: North - ED03-05/AD01 - 10/28/2020

Photo 24c: North- ED03-05/AD01 - 6/21/2021

Photo 24d: North- ED03-05/AD01 - 6/6/2022

Photo 25a: South - ID02 - 9/30/2019

Photo 25b: South - ID02- 10/28/2020

Photo 25c: South - ID02 - 7/7/2021

Photo 25d: South - ID02 – 6/6/2022

Photo 26a: West - ID02 - 6/19/2019

Photo 26b: West - ID02 - 10/28/2020

Photo 26c: West- ID02 - 6/21/2021

Photo 26d: West- ID02 - 6/6/2022

Photo 27a: East - ED03-03/SW02 - 9/30/2019

Photo 27b: East - ED03-03/SW02 - 10/28/2020

Photo 27c: East - ED03-03/SW02 - 6/21/2021

Photo 27d: East - ED03-03/SW02 - 6/6/2022

	
Photo 27(2)c: West - ED03-03 - 6/21/2021	Photo 27(2)d: West - ED03-03 – 6/6/2022

Photo 28a: West - ID01 – 9/30/2019

Photo 28b: West - ID01 - 10/28/2020

Photo 28c: West - ID01 - 6/21/2021

Photo 28d: West - ID01 - 6/6/2022

Photo 29a: North - ID01 – 9/30/2019

Photo 29b: North - ID01- 10/28/2020

Photo 29c: North - ID01 - 6/21/2021

Photo 29d: North - ID01 - 6/6/2022

Photo 29a(2): South West - ID02 - 9/30/2019

Photo 29b(2): South West -ID01 - 08/06/2020

Photo 29c(2): South West- ID01 – 6/21/2021

Photo 29d(2): South West- ID01 – 6/6/2022

Photo 30a: South - ID01 - 9/30/2019

Photo 30b: South - ID01- 10/28/2020

Photo 30c: South - ID01 - 6/21/2021

Photo 30d: South - ID01 - 6/6/2022

Photo 31a: East - ID01 - 6/19/2019

Photo 31b: East -ID01 - 08/06/2020

Photo 31c: East- ID01 - 6/21/2021

Photo 31d: East- ID01 - 6/6/2022

Photo 32a: South West - ID01 - 6/19/2019

Photo 32b: South West - ID01 - 10/28/2020

Photo 32c: South West - ID01 - 6/21/2021

Photo 32d: South West - ID01 - 6/6/2022

Photo 33a: South East - ID01 - 9/30/2019

Photo 33b: South East - ID01 - 08/06/2020

Photo 33c: South East - ID01 - 6/21/2021

Photo 33d: South East - ID01 - 6/6/2022

Photo 34a: East - ID01 - 6/19/2021

Photo 34b: East - ID01 - 10/28/2020

Photo 34c: East - ID01 - 6/21/2021

Photo 34d: East - ID01 - 6/6/2022

Photo 35a: East - ID01 - 9/30/2019

Photo 35b: East - ID01 - 10/28/2020

Photo 35c: East - ID01 - 6/21/2021

Photo 35d: East - ID01 - 6/6/2022

	
Photo 35(2)c: East - ID02 - 6/21/2021	Photo 35(2)d: East - ID02 - 6/6/2022

Photo 36a: West - ID01 - 9/30/2019

Photo 36b: West - ID01 - 10/28/2020

Photo 36c: West - ID01 - 6/21/2021

Photo 36d: West - ID01 - 6/6/2022

Photo 37a: West - ED01 - 6/19/2021

Photo 37b: West - ED01 - 10/28/2021

Photo 37c: West - ED01 - 6/21/2021

Photo 37d: West - ED01 – 6/6/2022

Photo 38a: North- ED01 - 6/19/2019

Photo 38b: North - ED01 - 10/28/2020

Photo 38c: North - ED01 - 6/21/2021

Photo 38d: North - ED01 - 6/6/2022

Photo 39a: South - ID01 – 9/30/2021

Photo 39b: South - ID01- 10/28/2021

Photo 39c: South- ID01 - 6/21/2021

Photo 39d: South- ID01 - 6/6/2022

Photo 40a: East - ED01 - 9/30/2019

Photo 40b: East - ED01 - 10/28/2020

Photo 40c: East - ED01 - 6/21/2021

Photo 40d: East - ED01 - 6/6/2022