San Felipe Creek Restoration Project
Mitigation Monitoring Annual Report
Year 2 – 2020

Prepared for:

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Corps File No. 2017-00322S
CIWQS Place No. 836012 (bkw)
Notification # 1600-2017-0309-R3

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ACOE	U.S. Army Corps of Engineers
Habitat Agency	Santa Clara Valley Habitat Agency
HRS	Habitat Restoration Sciences Inc.
MMP	San Felipe Creek Restoration Project Mitigation and Monitoring Plan
project	San Felipe Creek Restoration Project
WY	Water Year

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Summary

This report summarizes the monitoring results for Year 2 (2020) of the San Felipe Creek Restoration Project (project), which 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 (Habitat Plan) (ICF International 2012) and Regional General Permit 18 (ACOE 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 restores 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

Monitoring began in October 2018 following the completion of construction activities and will extend for a 10-year period through October 2028. Qualitative monitoring was conducted during Year 1 (2019) and Year 2 (2020), and quantitative monitoring began in Year 2. This report describes project monitoring methods, results, and recommendations for Year 2. It also includes site maintenance and adaptive management activities.

The success of the project site is determined through comparison of the monitoring data to the performance standards and success criteria described in the San Felipe Creek Restoration Project Mitigation and Monitoring Plan (MMP) (Dudek 2019). These include wetland re-establishment success criteria, wetland rehabilitation and enhancement performance standards, and stream and riparian buffer performance standards. In Year 2, the project has met some but not all performance standards. The site met the performance standards related to hydrology and geomorphology, however there are some deficiencies in performance related to the vegetation criteria, including container plant survival, absolute cover of wetland species, and relative cover of native species. Site challenges that influenced site performance have been identified and include feral pig activity, irrigation system reliability, and a below average water year. A Remedial Plan Memorandum (Appendix E of this report) has been developed that summarizes adaptive management recommendations to correct performance deficiencies in the project, with the intent to bring the project back into conformance with performance standards.

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1 Project Information

1.1 Permit Holder

Permit Holder

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1.2 Permit Information

This document was prepared in accordance with the measures and stipulations 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 (bkw)
- 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 Location

The San Felipe Creek Restoration Project (project) site is located in the Joseph D. Grant County Park in unincorporated Santa Clara County, California (Figure 1, Project Location). 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 approximate center of the project site corresponds to 37°19′37.50″ north latitude and 121°42′20.0″ west longitude.

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, Project Design).

1.4 Project Description

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 have converted to upland plant species (denuded of riparian vegetation). Legacy agricultural activities have 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 (ACOE 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.

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, all of these methods are considered under the umbrella term "restoration." The anticipated size of each project element is provided in Table 1, Aquatic Resource Mitigation Types and Amounts.

1.4.1 Improve Corral Trail and Lower Hotel Trail

Prior to restoration efforts, the Corral Trail was lower than the surrounding fields and 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 by 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. Disturbed areas adjacent to roads (e.g., the sidelines) were seeded with native upland plant species; the trail itself was not seeded.

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 high-density polyethylene pipe located at the same elevation. The pipes are redundant and are included to (a) prolong the life of the drainage lenses and avoid erosion of the Corral Trail from overtopping and (b) 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 do 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 immediately upstream of and adjacent to Corral Trail were seeded with

native upland plant species; disturbed areas resulting from the trail improvements immediately downstream of Corral Trail were also seeded with native upland plant species. The trail itself was not seeded.

1.4.2 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) was created 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 proposed revegetation treatments were prescribed on the 65% construction drawings and are shown on the as-builts (see Appendix A, As-Built Drawings). 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 is a small head cut along San Felipe Creek just downstream of the Corral Trail. 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, 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, however, 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 revegetation treatments are shown on the as-builts, Appendix A. 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.

1.4.3 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 of native species. The restoration approach and plant palettes were tailored to the intermittent flow regime of these areas. The revegetation treatments are shown on the as-builts, Appendix A.

Additionally, a new ephemeral creek (ED03) and floodplain feature (ID03-05) was 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. The revegetation treatments are shown on the as-builts, Appendix A.

1.4.4 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 these species: 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. The revegetation treatments are shown on the as-builts, Appendix A.

1.4.5 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. The revegetation treatments are shown on the as-builts, Appendix A. 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.

1.4.6 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 invasive plant species control and installation of permanent exclusion fencing to improve wetland habitat diversity and function. Non-native invasive plants that 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 pigs, 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 invasive plant species and the pigs are controlled.

Table 1. Aquatic Resource Mitigation Types and Amounts

Feature	Aquatic Resource Type	Work Description	Mitigation type	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	Enhancement	0.32	1,000
ED01 (Boyds Creek Abandoned Channel)	Ephemeral Stream	Log jams	Rehabilitation	0.06	1,281
ED02 (Ephemeral Drainage)	Ephemeral stream	Creation	Establishment	0.56	490
ED03 (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 Wetland)	Spring wetland	Fencing	Enhancement	0.15	N/A

Table 1. Aquatic Resource Mitigation Types and Amounts

Feature	Aquatic Resource Type	Work Description	Mitigation type	Acreage	Linear feet
ID03-01, ID03-01A, ID03-02, ID03-03, ID03-04, ID03-05) Inset Channel Floodplains	Buffer	Grading and riparian plantings	Buffer restoration	1.24	N/A

Note: N/A =not applicable.

1.5 Restoration Implementation and Monitoring Schedule

Project construction began in late summer 2018 and continued through November 2018. Implementation of the restoration program began once grading of the channel areas and installation of the intended improvements were complete, as per the final as-built engineering plans. Seeding of the project site took place October 23 and 25, 2018. Planting of woody vegetation and plugs took place November 7 through November 19, 2018. Santa Clara Habitat Agency (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 2020). Maintenance and monitoring are ongoing, and remedial actions to improve site performance and achievement of success criteria are underway. On October 21, 2020, a meeting was held with the regulatory agencies to notify them of Year 2 container plant mortality within riparian buffer areas and to discuss the preliminary remedial plan. The implementation schedule for the overall restoration program and status is presented in Table 2.

Table 2. Restoration Implementation Schedule

Implementation Task	Schedule	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/ Conducting Remedial Actions
Seed Mix Application	Following weed eradication and before container planting.	Complete/ Conducting Remedial Actions
Container Planting and Cutting Installation	Following weed eradication and container planting.	Complete/ Conducting Remedial Actions
Establishment Period: Assessment of Installation, Seed Germination, and Plant Establishment	Weekly during initial 120-day period following seeding and container plant installation.	Complete

Table 2. Restoration Implementation Schedule

Implementation Task	Schedule	Status
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 2 complete; ongoing
Biological 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 2 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: Dudek 2019.

Dudek is conducting the long-term biological monitoring during the 10-year period. Habitat Restoration Sciences Inc. (HRS) is conducting the long-term 10-year maintenance work, under Dudek monitoring coordination and Habitat Agency oversight. Dudek biologists Laura Burris and Michelle (Lasthenia) Lee conducted the monitoring in 2020. Site observations were conducted on September 23 and October 28, 2020, by Dudek's Mike Sweesy, Laurie Monarres, and Project Manager John Zanzi, along with staff from HRS and the Habitat Agency. Dudek scientists Sheldon Leiker and Elizabeth Geisler were on site with Mr. Zanzi and HRS and Habitat Agency staff on October 28, 2020, to assist with initial remedial action efforts.

Annual reports for the 10-year maintenance and monitoring period will be submitted each year for compliance with the permit reporting requirements (by December 31 to accommodate California Department of Fish and Wildlife requirements). During the long-term (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 and success criteria outlined in the San Felipe Creek Restoration Project Mitigation and Monitoring Plan (MMP) (Dudek 2019).

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2 Monitoring Methods – Year 2

2.1 Overview

Monitoring methods consist of a combination of quantitative and qualitative data collection to assess restoration progress in relation to the success criteria described in the MMP (Dudek 2019), and further discussed herein. Qualitative monitoring was prescribed quarterly during Year 1, beginning with successful completion of initial 120-day maintenance period, and bi-annually during Years 2 through 10. Quantitative monitoring (transects and plots) is prescribed in the late spring/early summer during Years 2 through 10. Monitoring methods and timing, as well as associated success criteria type, are summarized in Table 3.

Table 3. Mitigation Monitoring Methods and Timing

Monitoring Task	Monitoring Year		Success Criteria
	Years 1 and 2	*Years 3 through 10*	
Wetlands			
Quantitative Monitoring: Vegetation – Belt Transects	April–June, beginning in Year 2	Annually, April–June	Relative and absolute cover; species richness, cover of non-native species
Hydrologic Monitoring	October 1– September 30	October 1–September 30	Hydroperiod and groundwater levels
Qualitative Monitoring	Quarterly, beginning with successful completion of 120-day maintenance period; bi-annually Year 2	Bi-annually	Plant survival and vigor, wildlife usage
Non-Wetlands Waters			
Quantitative Monitoring: Vegetation – Point-Intersect Transects	April–June, beginning in Year 2	Annually, April–June	Relative and absolute cover; species richness, cover of non-native species
Hydrologic Monitoring	N/A	N/A	Peak flow and stage
Qualitative Monitoring	Quarterly, beginning with successful completion of 120-day maintenance period; bi-annually Year 2	Bi-annually	Plant survival and vigor, wildlife usage

Source: Dudek 2019.
Note: N/A = not applicable.

Dudek performed the quantitative and qualitative vegetation monitoring for Year 2, and Balance Hydrologics performed the hydrologic monitoring. The following sections detail the qualitative and quantitative monitoring methods.

2.2 Qualitative Monitoring

Dudek biologists visited the project site on May 7, June 3, June 30, and October 28, 2020, to qualitatively assess conditions within the wetland re-establishment, rehabilitation, and enhancement areas. Though bi-annual

visits are prescribed starting in Year 2, Dudek performed additional visits to observe and document site conditions. Forty permanent photo-documentation stations that were previously established to record the progress of the revegetation program and the status of plant establishment over the 10-year period were revisited two times in 2020, and qualitative monitoring forms were filled out at each of the four visits. Photo documentation methods included taking a photo in each cardinal direction at each station. A standardized field form was used to document current conditions, site performance issues, and provide recommendations for maintenance and management. 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; assessment of soil moisture and plant stress; review of erosion control methods, dead plant counts and recommendations for fall replacement plantings; and assessment of channels and sediment deposits on floodplains. The results of the qualitative monitoring are discussed in Section 4, Results – Year 2.

Qualitative hydrologic monitoring was conducted by Balance Hydrologics. Hydrologic monitoring includes performing storm-event and post-winter channel reconnaissance and documentation of bed and bank erosion; investigating stability of log jams in channels; verifying the condition and aggradation behind staked wood jams, condition of drainage lenses under the Corral Trail, and condition of the Lower Hotel Trail Arizona Crossing; and checking for sediment deposition on floodplains, seasonal high-water marks, and runoff patterns. Results of the hydrologic monitoring are summarized in Section 4.

2.3 Quantitative Monitoring

Dudek biologists visited the project site on May 7, June 3, and August 6, 2020, to perform quantitative monitoring. As outlined in the MMP, quantitative monitoring measures the development of vegetation in the project site through data collection using two types of transect methods, depending on the type of vegetation present. Emergent wetland areas are monitored using belt-transect methodology, and shrub and forested habitat are monitored using line-intercept methodology. Permanent transect locations were established during Year 2 by the biological monitor at the time of the first sampling event. The success of the project site in Year 2 was determined through comparison of the transect data to the performance standards and success criteria described in the MMP. This includes comparison of the measured parameters on the project site to the same parameters at reference sites that support functioning ecosystems similar to the ones created on the project site. The shrub-and-forested habitat reference site was identified in the MMP and consists of a riparian area on San Felipe Creek upstream of the project site. The emergent wetland reference site was identified during the first sampling event in Year 2 and is located in a portion of existing wetland SW03. The performance standards and Year 2 results are presented in Section 4.

In addition to vegetation monitoring, quantitative hydrologic data is gathered annually throughout the 10-year monitoring period to assess the depth and ponding duration of restored wetlands and flow of restored stream channels. Shallow monitoring wells equipped with near-continuous water level recorders were installed in seasonal wetlands to evaluate water ponding durations and depths. A streamflow gaging station was installed on Boyds Creek upstream of the project area, and at the downstream end of the project site. Stream stage monitoring stations were installed at created inset floodplains. Geomorphic monitoring consists of channel cross-section and topographic surveys following years in which peak flows are measured to exceed the 2-year flow. No fewer than 3 geomorphic monitoring events will be conducted during the 10-year monitoring period, and one of those monitoring events will be reserved for the final year of monitoring. The success of the project site in Year 2 was determined

through comparison of hydrologic data to performance standards outlined in the MMP. The Year 2 hydrologic results are summarized in Section 4.

2.3.1 Wetland Re-Establishment, Rehabilitation, and Enhancement Monitoring

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 success criteria/standards. Permanent belt transects measuring 30 to 50 meters long were established in the revegetation areas at representative locations. At each transect, 1-meter by 1-meter quadrats were placed at 10-meter intervals. The location and number of belt transects in each feature was determined by the biological monitor during the first sampling event in Year 2. Data collected at each plot along the belt transects included species, absolute cover, and survival of container plants. Results were compared to the performance criteria and are summarized in Section 4.

The target water regime for the restored wetlands on site is to provide continuous ponding sufficient to maintain hydrophytic vegetation in a normal rainfall year. Hydrologic monitoring included monitoring maximum depth of inundation and shallow groundwater levels (as a proxy for soil moisture) near restored wetlands in conjunction with the vegetation monitoring. A summary of the Year 2 hydrologic results is presented in Section 4.

2.3.2 Stream and Riparian Buffer Monitoring

Data for stream and riparian restoration areas was collected using the line intercept transect method of vegetation sampling to document achievement of the performance standards in the project site. In Year 2, permanent vegetation transect sampling stations were established within the mitigation site to measure year-to-year changes in plant cover and species composition. Data collected for each transect included species, absolute percent cover, survival of installed vegetation, and height of perennial installed shrubs and trees. Results were compared to the performance criteria and are summarized in Section 4.

Shallow monitoring wells were installed to assess flow in restored stream channels. The shallow monitoring wells consist of drive-point piezometers or hand-augured borings with 2-inch screened PVC casings, installed between 4 and 8 feet below the ground surface. Streamflow gaging stations were established and maintained by Balance Hydrologics. Performance is summarized in Section 4.

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3 Site Maintenance Activities

Site maintenance was performed by HRS throughout the project site during Year 2, and maintenance efforts were informed by the monitoring efforts of Dudek biologists. Maintenance and monitoring are prescribed for 10 years or until the project performance standards have been met. Maintenance visits include control of weeds, trash and debris removals, fence and signage maintenance, adjustments to the irrigation system, and other related activities. Plant establishment maintenance was conducted weekly during the initial 120-day period following installation, and at a minimum monthly during Year 1 and Year 2.

Weed management is driven by requirements of the MMP and refined by site-specific conditions. Weeds and exotic non-native 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. The California Invasive Plant Council (Cal-IPC) identifies, lists, and ranks species that threaten native species. Per the MMP, species ranked "moderate" or "high" are considered weeds and are monitored for comparison to the project performance standards. In practice, weed management includes consideration of additional factors. For example, the attempt to control wild oats (*Avena barbata*), a Cal-IPC "moderate" plant, is infeasible due to its ubiquity in the project site grassland and attempting to control this particular species would cause greater impact on wetland functions and value than its removal would lift. Additionally, medusahead grass (*Elymus caput-medusae*), a Cal-IPC "high," species that is a legacy of past site land use, is generally controlled to maximize forage value for livestock, which is not the goal of the restoration project. Thus, for the purposes of the management activities, weeds and exotic non-native species include those species that provide the greatest threat to onsite mitigation functions and values and include the following species: yellow star thistle (*Centaurea solstitialis*), bull thistle (*Cirsium vulgare*), Himalayan blackberry (*Rubus armeniacus*), perennial pepperweed (*Lepidium latifolium*), whitetop (*Lepidium draba*), common teasel (*Dipsacus fullonum*), and mustards (*Brassica* and *Hirschfeldia* spp.).

HRS' site management activities in Year 2 also included some adaptive management activities to address unforeseen site challenges. Adaptive management activities were necessitated by significant challenges including feral pig (*Sus scrofa*) activity and coordination issues and are being implemented by the Project team. Adaptive management efforts are guided by the Remedial Plan Memorandum, included as Appendix E. Table 4 shows HRS' maintenance dates, activities and site notes to date for Year 2, including some adaptive management efforts that are underway and discussed further in Section 5 of this report.

Table 4. Site Management Activities – Year 2

Date	Management Activities	Site Notes
Week of 4/20/2020	Weed management, fence repair, irrigation inspection	String trimmed and spot sprayed weeds primarily in riparian planting areas and around pump house.
5/6/2020–5/7/2020	Weed management and irrigation inspection	Spot sprayed weeds and assessed irrigation.
5/11/2020–5/14/2020	Weed management and site inspection	Spot sprayed weeds.
5/19/2020–5/20/2020	Weed management	Spot sprayed weeds.

Table 4. Site Management Activities – Year 2

Date	Management Activities	Site Notes
6/10/2020–6/11 2020	Weed management and irrigation.	String trimmed around plant cages on all log jams, irrigated all plants in the riparian areas, hand weeding inside the plant cages at the log jams. Hand-weeded in riparian areas in southwest area of site, irrigated all grasses and plants at log jams. Repaired irrigation.
6/15/2020–6/16/2020	Weed management	Spot sprayed weeds.
6/29/2020–6/30/2020	Weed management and irrigation	Hand-cut Himalayan blackberry, spot sprayed around ponds and star thistle in riparian areas, irrigated riparian areas.
7/8/2020–7/9/2020	Weed management and irrigation	Spot sprayed non-natives in Areas 1 and 2. Area 1 included the northern portion of SW04 and SW02 and extended west to the border of ID03-02, and north to the area between ID01 and ED01. Area 2 surrounded Area 1 and extended south and east to the installed fencing, and north beyond ED01 to the access road.
7/23/2020	Weed management and irrigation	Hand weeding and performing irrigation.
7/29/2020–7/31/2020	Weed management, fence repairs and irrigation inspection	Fence repairs on the Arizona Crossing and Corral Trail where the gate was pushed down. Bagged and removed Himalayan blackberry on the perimeter fencing and creek crossings. Spot sprayed bull thistle and star thistle. Also spot sprayed mustard and birds foot trifle. Made some repairs to the 2-inch PVC pipe that was in the riparian area near ID03.
8/3/2020	Weed control/irrigation check	Continued spot spraying the non-native plants, completed ID02 and SW02 locations. Irrigation is running fine, lots of pressure. All four tanks are full.
8/10/2020 and 8/12/2020	Irrigation	Water was found gushing out of the pump house, the union fitting had loosened up. Irrigated using a 2-inch pump.
8/17/2020	Irrigation	Maintenance performed on the solar pump.
9/4/2020	Irrigation	New solar pump and a new float switch installed. Cleaned the solar panels.
9/8/2020 and 9/10/2020	Irrigation	Returned to site to check pump. Pressure was not building so we removed the pressure tank and repaired a leak.
9/14/2020–9/15/2020	Irrigation repairs	Repaired broken pipe and drip tubing and sprinkler heads damaged by feral pigs on the site.
9/22/2020	Irrigation inspection	Checked all the nodes in the field and marked their locations. Found a few areas where pigs had damaged the irrigation lines and a 2-inch valve. Repairs were made.
9/28/2020–10/1/2020	Irrigation inspection	Site visit to review entire irrigation system. Repaired irrigation lines (2 areas) that run from the tank up the hill. Worked on the solar pump to get it to the correct working pressure. Cut off pressures have been set for the pump to kick on at 30 PSI and shut off at 55 PSI. Also went through the system and reprogrammed the run times. Made repairs as needed.

Table 4. Site Management Activities – Year 2

Date	Management Activities	Site Notes
10/8/2020	Site inspection and irrigation check	Walked the entire irrigation areas and made repairs as needed. Most due to pig activity.
10/15/2020	Irrigation inspection	Thorough irrigation system inspection was conducted. Water holding tanks were about halfway full. Inspected water holding tanks and water inlet valve. Manually checked other valves with pump and all seemed to have great pressure and no breaks to report. A few heads had pig damage around them. Inspected all valves for damage and repaired as needed. Coverage was great and water pressure seemed to be holding steady.
10/26/2020 and 10/28/2020	Irrigation inspection, planting preparation (adaptive management)	Thorough irrigation system inspection was conducted. Holding tanks were less than half full when first arrived on site. Noticed a lot of pig activity around the heads on valves 4–6, which are the valves by the pump shed. Pig activity in this area has increased drastically. Most of the heads showed signs of pig damage around them and many were knocked over but not broken. Valves were repaired as needed. Before leaving, noticed that no water was coming into the holding tanks, however in the morning water was observed coming in. Discussed with Santa Clara Park officials at the top of the hill by the main holding tank. They mentioned that power was shut off to the park and thus they had to shut the water coming into the holding tank. The park was going to be without power for at least a day and a half they said. Cleaned off solar panels also while we waited for flagging to commence. Went through site with Dudek and flagged new plant locations.
11/2/20	Irrigation, planting (adaptive management)	When first arrived, irrigation holding tanks were at 60% capacity. Finished digging holes for Sections: ID03-1A, ID03-03, ID03-04. 100 holes remaining to dig in last section. Soaked the holes with water. Capped all the sprinkler heads.
11/3/2020	Irrigation, planting (adaptive management)	Finished digging all the holes in the morning for section ID03-5. Finished laying out the ½" drip line for section ID03-1A. Started planting and finished about 70% of ID03-1A. Combined organic potting soil with existing soil to use as back fill for planting. Before leaving, watered all the plants and protected the ones not yet planted with T-stakes and chicken wire.
11/4/2020	Irrigation, planting (adaptive management)	Finished planting in sections ID03-3 and ID03-4. Finished installing ½" NDF drip tubing for last section of ID03-5. Watered in all the plants twice yesterday once before lunch and another at the end of the day. Once finished planting, installed drip irrigation in section ID03-01A. 55% complete with drip in this section. At the end of the day protected the plants not yet planted.

Table 4. Site Management Activities – Year 2

Date	Management Activities	Site Notes
11/5/2020	Irrigation, planting (adaptive management)	Finished putting all the plants in the ground and watered them. In the locations where planted the wire rush we pre-watered the ground. Most of the wire rush was planted in areas where there was significant pig damage. Completed drip installation for section ID03-0A1 and about 90% with ID03-03. Buried drip line anywhere it crossed the dirt path. In the morning when we first arrived saw a large pig leaving SW03. Also found fresh pig activity in that section when we were planting.
11/6/2020	Irrigation, planting (adaptive management)	Finished installing drip in section ID03-04. Watered all plants in ID03-05 and SW02-SW03. Began installing drip tubbing on some of the wire rush in the wetland area.
11/9/2020	Irrigation	In the morning temperature was 30 degrees. Identified four split ball valves from water freezing in the lines. Repaired one that was between the pump and our water tanks. The other three were on the same manifold and didn't have enough spare ball valves or reducer bushing to repair today. Had two broken swing joints most likely caused by pigs and two fractured lateral lines caused by freezing in the lines. Finished installing all the drip in section ID03-05 and began running the ½" drip line to the rest of the Valley Oaks that survived from the original planting. Purged irrigation lines and shut off the gate valve at the pump before we left for the day.
11/10/2020	Irrigation (adaptive management), site inspection	First half of the day finished making irrigation repairs. In the morning all the Elderberry had a blackish color and drooping down. Some of the Toyons also had discolored leaves but browner in color. Finished installing the drip on the rest of the plants (wire rush & California bulrush) in the wetland area. Ran the drip and checked for problems on all areas installed for this project. Again, before leaving at end of the day we purged the system and shut pump off because we are forecasted for rain Thursday and Friday.
11/16/2020	Irrigation (adaptive management), site inspection	Today there was a significant amount of pig damage around a lot of the new plantings. About 20 plants were completely uprooted and were lying off to the side of their holes. Replanted and adjusted drip lines. Also repaired 4 broken irrigation lines, caused by the pigs. Next biggest problem was from the pigs digging around most the plants in ID03-05 and all the drip emitters had to be readjusted. Irrigation pump was left off due to rain in tomorrow's forecast. Soils in all sections had a good amount of moisture throughout.
11/19/2020	Irrigation, site inspection	Found a lot of new pig damage in areas ID03-1A and ID03-05. There were about ten plants that had been uprooted. Section ID03-02 had significant amount of pig damage for the first time. Plants still look bad from the hard frost we had about a week ago. Healthiest looking plants are the California Coffeeberry and worst looking

Table 4. Site Management Activities – Year 2

Date	Management Activities	Site Notes
		plants are the Blue Elderberry. Fixed all drip emitters and replanted everything. There was a section of fence west of ID03-05 that looked as if something had jumped over into the site. Rescheduled all irrigation to only run anything connected to a drip system and for a minimum of one hour run time per valve.
11/20/2020	Irrigation, site inspection	Turned pump back on and repressurized our irrigation lines. Went through each valve to check for breaks or leaks and found two new breaks. After repairing breaks, watered each zone for about 40 minutes. Drip emitters all seemed to be functioning fine. Once finished watering everything, we depressurized main lines and switched off pump. We staked a section of the pig fence where it looked as if an animal had jumped through. Lastly repaired a leak coming from one of our storage tanks.
11/24/20	Irrigation, site inspection	We had a fractured union fitting off our irrigation pump. Repaired the break and stopped the water leaking into the shed. Quickly went through and inspected a few plants and didn't find any new pig damage. Set up 6 game cameras in areas where we may have pigs breaching the fence.
12/3/2020	Irrigation, site inspection	Found no new signs of pig damage in any of the sections. After pressurizing the irrigation lines, we found 8 breaks on the lateral lines, most likely cause from freezing temperatures. Once everything was repaired, we ran each valve connected to drip for 1 hour. Plants all got a good soaking and health wise there doesn't seem to be any real change. They still all look discolored and sickly except for the coffeeberry that stayed green. Went through and checked our game cameras.

Site maintenance activities and adaptive management efforts continue to be implemented through December 2020. Adaptive management efforts completed in Year 2 are described in more detail in Section 5 of this report.

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4 Results – Year 2

4.1 Overview

This section provides the results of the monitoring for Year 2 and provides a discussion of these results in relation to the performance standards outlined in the MMP. The ecologically based performance standards were established in the MMP to determine if the compensatory mitigation project is achieving its objectives. An overview of the status of the project site performance across all restoration features is presented in Table 5. The status was determined using the results of quantitative and qualitative monitoring in Year 2.

Table 5. Summary of Performance Standards for Year 2

Performance Standard	Wetland Rehabilitation and Enhancement	Non-Wetland and Riparian Buffer	Year 2 Status
Container Plants (minimum performance)	85% plant survivorship	85% plant survivorship	FAIL
Cuttings (minimum performance)	65% plant survivorship	65% plant survivorship	FAIL
Seeded Areas (minimum % of native plants)	55% cover	55% cover	PASS
Maximum Cover by Weed Species	15% cover	15% cover	PASS
Absolute Cover of Wetland Species (OBL or FACW)	≥75% reference absolute cover of wetland species	N/A	FAIL
Relative Cover of Native Species	≥75% relative cover of native species	≥75% relative cover of native species	FAIL
Target Species Richness	≥75% of reference site	≥75% of reference site	PASS
Hydrology	≥14 days of ponding or saturated soils in an average or above-average precipitation year	N/A	PASS
Hydrology – Inset Floodplains on San Felipe Creek	N/A	Inset floodplain inundation if peak flows exceed a 2-year event	PASS
Hydrology – Boyds Creek Alluvial Fan – Living Log Jams	N/A	Flow in two or more channels during the winter season	PASS
Channel Form	N/A	< 1 foot of channel bed elevation loss, averaged over reach and absent of significant knickpoint; presence of normal fluvial features such as channel bed grain size sorting, sandbar, slip face, and cutback formation.	PASS
Corral Trail Drainage Lenses	N/A	During- and post-storm: If Corral Trail is/was overtopped, positive flow off	PASS

Table 5. Summary of Performance Standards for Year 2

Performance Standard	Wetland Rehabilitation and Enhancement	Non-Wetland and Riparian Buffer	Year 2 Status
		of road maintained with no significant erosion of road or fill prism. Dry season: pipes are not plugged.	
Lower Hotel Trail Arizona Crossing	N/A	Articulated mat is stable and no significant knickpoints have formed.	PASS
Staked Wood Jams	N/A	Staked material is intact and in such a condition to capture sediment and organic material transported by creek.	PASS

The following sections provide a closer look at the project site through the qualitative and quantitative monitoring results, including photographic documentation and a discussion of how each restoration feature is performing related to the MMP success criteria.

4.2 Qualitative Monitoring

On May 7, June 3, June 30, and October 28, 2020, Dudek biologists visited the project site to qualitatively assess conditions within the wetland re-establishment, rehabilitation, and enhancement areas. Qualitative monitoring forms were filled out on each visit and are presented in Appendix B. Photos were obtained at the 40 permanent photo-documentation stations on multiple visits in Year 2, and representative photos and locations are presented in Figure 4, Qualitative and Quantitative Monitoring Reference, and Figure 5, Photographs. Photo documentation methods were discussed with the Habitat Agency in Year 2 and will be adjusted in the remaining monitoring years to better capture the restoration features. The exact photograph bearing will be recorded in future years to ensure features are properly captured and comparable across years.

Qualitative monitoring of vegetation in May and June of 2020 documented missing plants and failed plantings (e.g., willow stakes that had not sprouted). As shown in Table 6, Summary of Plant Survivorship at Each Restoration Site Feature, the riparian buffer planting area at ID03-05 was performing the best, with most willow cuttings surviving and a higher percent survival of woody plantings than the other planting areas. Surviving container plants are shown on Figure 3, Container Plant Survival. Invasive plants including broadleaved pepper weed (*Lepidium latifolium)*, Himalayan blackberry (*Rubus armeniacus)*, bull thistle (*Cirsium vulgare)* and yellow star thistle *(Centaurea solstitialis)* were identified. HRS was observed conducting weed management, and target species were discussed. Methods included herbicide use and hand removal, and are described in detail in Section, 3 Maintenance Activities. Wildlife observed during the May and June monitoring included California red-legged frog (*Rana draytonii*), western pond turtle (*Actinemys marmorata)*, red-tailed hawk (*Buteo jamaicensis)*, white-tailed kite (*Elanus leucurus*), turkey vulture (*Cathartes aura*), California newt larvae (*Taricha torosa*), Pacific chorus frog tadpole (*Pseudacris regilla*), and feral pig. Issues and recommendations related to feral pig activity, irrigation, and persistent weeds were noted and communicated to HRS.

Qualitative monitoring conducted in October of 2020 yielded similar results to the monitoring conducted in May and June of 2020. Missing and failed plants were noted, as well as feral pig damage, invasive plants, and erosion along San Felipe Creek at ID03-02. The October monitoring visit was conducted concurrently with a Dudek, HRS, and Habitat Agency site visit to begin remedial actions for the issues identified during Year 2. Remedial actions are described further in Section 5. Wildlife observed during the October visit included feral pig, red-tailed hawk, black phoebe (*Sayornis nigricans),* California quail (*Callipepla californica*), western scrub jay (*Aphelocoma californica*), spotted towhee (*Pipilo maculatus*), common buckeye (*Junonia coenia*), and cabbage white (*Pieris rapae*), among others.

Table 6. Summary of Plant Survivorship at Each Restoration Feature

Restoration Feature	Total Plants Installed (Oct/Nov 2018)[1]	Total Plants Remaining (Aug 2020)	Plant Survival
ED03-01	46	10	21%
ED03-02	46	12	25%
ED03-03	46	11	23%
ED03-04	46	12	25%
ED03-05	46	16	33%
ID02	108	2	2%
ID03-01A	354	67	20%
ID03-02	170	17	8%
ID03-03	74	10	17%
ID03-04	125	35	22%
ID03-05	385	180	47%
Log Jams	300	54	18%
Total	**1,746**	**426**	**22%**

Note:
[1] Seeding of the restoration sites occurred October 23 and 25, 2018. Planting of woody and shrub vegetation occurred November 7 through November 19, 2018.

The plant survival rates have been discussed in depth with the project team. Factors contributing to high container plant mortality include the following:

- **Feral pig damage.** One pig remained within the exclusion fence from January through August. Efforts to exclude the pig included the installation of a 1-way pig gate inserted into the existing perimeter fence. This allowed for successful live removal/exclusion of the pig from the restoration area, but a second individual gained access between August 18 and September 7 during SCU Lightening Fire Complex activities. The boar remains able to access to the enclosure as of December 20, 2020. The result of pig activities includes damage to irrigation systems and plantings.
- **Irrigation system operation.** Water pressure issues, damage to main and lateral lines (due to high flows, pig activities, and other sources), and temporary water services interruptions with the irrigation system prevented water from reaching plantings during critical periods of the first summer after installation.
- **County Parks coordination.** Water at the point of connection for the restoration areas was turned off multiple times by County Parks without notifying HRS, resulting in damage to the irrigation pump (e.g., burning out) and interruption of irrigation water to container plants.

Of note, the remaining plants appeared to be in good condition. Valley oak (*Quercus lobata*) and blue oak (*Quercus douglasii*) appear to be the hardiest of the trees surviving in the riparian planting areas and are generally thriving.

blue elderberry (*Sambucus nigra ssp. caerulea*), common snowberry (*Symphoricarpos albus*), and California rose (*Rosa californica*) are performing best out of the installed shrubs in the floodplain planting areas. Willow stakes had approximately 26% survival in the riparian and stream areas.

Balance Hydrologics conducted qualitative hydrologic monitoring on April 29, May 7, September 23, and September 30, 2020. Observations made during site visits did not indicate any new areas of problematic erosion during Year 2. Some of the in-stream structures shifted and areas of channel reconfiguration and sediment deposition were noted. The Corral Trail drainage lenses and Lower Hotel Arizona Crossing appeared in good condition and to be functioning properly. Detailed qualitative monitoring results can be found in the Year 2 Geomorphic and Hydrologic Monitoring Report, Appendix D to this report. On September 23, 2020, a collaborative end of year review of the project area was conducted and strategic actions for select areas which are presented as part of the Remedial Plan Memorandum in Appendix E.

4.3 Quantitative Monitoring

Dudek biologists visited the project site on May 7, June 3, and August 6, 2020, to conduct quantitative monitoring. Quantitative monitoring results with regard to the performance standards and success criteria are discussed in this section, and data is presented in Appendix C.

4.3.1 Wetland Re-Establishment Success Criteria

Results of quantitative monitoring in Year 2 indicate wetland re-establishment areas are on track to meeting the applicable interim performance standards. The performance standards for vegetation and hydrology in the wetland re-establishment areas discussed below. Transect data, species richness, and percent cover for each species is included in Appendix C.

Wetland Re-Establishment Standard 1 – Wetlands Re-Establishment Areas Must Meet All Three Wetland Parameters

The wetlands re-establishment areas under the jurisdiction of the U.S. Army Corps of Engineers (ACOE) must meet the definition of three-parameter ACOE-jurisdictional wetlands by the end of the 10-year maintenance and monitoring period. A delineation of the wetland establishment areas will be required prior to resource agency sign-off from ACOE and Regional Water Quality Control Board. If it is determined that the wetland establishment areas meet the vegetation and hydrology criteria for an ACOE wetland, but are lacking hydric soils, ACOE 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.

Discussion

This success criteria are not applicable in Year 2. Seasonal Wetland 04 (SW04) is the only wetland re-establishment feature on site and will be evaluated in Year 10 for evidence of meeting all three wetland parameters. According to the geomorphic and hydrologic monitoring report (Appendix D), the project has successfully restored wetland hydrology to this area. Vegetation monitoring in Year 2 showed SW04 had 77% native cover, 2.5% invasive cover, and 44% wetland plant cover. This site is on track to meet wetland parameters in Year 10.

Wetland Re-Establishment Standard 2 – Wetlands Re-Establishment Areas Must Be Self-Sustaining

The wetlands re-establishment mitigation areas must be self-sustaining by the end of the 10-year maintenance and monitoring period as evidenced by healthy wetland vegetation subsisting without irrigation in the preceding 2 years.

Discussion

This success criteria are not applicable in Year 2. SW04 is the only wetland re-establishment feature on site and will be evaluated in Year 10 for evidence of being a self-sustaining wetland. Based on the results of vegetation and hydrologic monitoring in Year 2 described above, this site is on track to be self-sustaining by the end of the 10-year maintenance and monitoring period.

Wetland Re-Establishment Standard 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.

Discussion

Quantitative vegetation monitoring began in Year 2 and showed SW04 had 77% native cover, 2.5% invasive cover, and 44% wetland plant cover. The seed mix used in this area contained 7 native species. A total of 11 different native species were documented in SW04 during the Year 2 monitoring. This shows positive recruitment of native species to the wetland re-establishment area. Data in the years to follow are anticipated to provide further document evidence of natural recruitment in SW04.

4.3.2 Wetland Rehabilitation and Enhancement Area Performance Standards

Based on qualitative and quantitative monitoring in Year 2, the wetland rehabilitation and enhancement areas are meeting some—but not all—interim performance standards. The performance standards for vegetation and hydrology in the wetland rehabilitation and enhancement areas are outlined in Table 7 and discussed further below.

Table 7. Wetland Feature Performance – Year 2

Wetland Performance Standards	Feature		
	SW02	*SW03*	*Overall Site Performance*
Wetland Performance Standard 1: Container plants will have a plant survivorship of no less than 85%.	✘	✘	✘
Wetland Performance Standard 2: Cuttings will have a plant survivorship of no less than 65%.	N/A	N/A	N/A
Wetland Performance Standard 3: Seeded areas will have at least 55% absolute cover.	✓	✓	✓
Wetland Performance Standard 4: Weed species will consist of no more than 15% cover.	✓	✘	✓

Table 7. Wetland Feature Performance – Year 2

Wetland Performance Standards	Feature		
	SW02	*SW03*	*Overall Site Performance*
Wetland Performance Standard 5: Absolute cover of wetland species will be greater than or equal to 75% of the reference population.	✖	✓	✖
Wetland Performance Standard 6: Relative cover of native species will be greater than or equal to 75%.	✖	✓	✖
Wetland Performance Standard 7: Target species richness will be greater than or equal to 75% of the reference site.	✓	✓	✓
Wetland Performance Standard 8: Hydrology will consist of greater than or equal to 14 days of ponding or saturated soils in an average or above-average precipitation year.	N/A	N/A	N/A

Note: N/A = not applicable. No cuttings were installed at SW02 or SW03. WY2020 was a below average rainfall year.

Wetland Performance Standard 1: Container Plants Will Have a Plant Survivorship of No Less than 85%

Discussion. Container survivorship was assessed during the quantitative monitoring visits. A total of 7,624 container plants were installed in the wetland enhancement areas during the planting period, consisting of a variety of sedges (*Carex* spp.) and rushes (*Juncus* spp.). After high rainfall in Year 1, 192 plants were missing and presumed dead and 30 were in poor condition due to prolonged saturation during the rainy season. In Year 2, planted sedges and rushes were indistinguishable from naturally occurring and recruited plants of the same species and, thus, container plants could not be accurately counted. Sedges had an absolute cover of 28% and rushes had a combined absolute cover of 26% in SW02. SW03 had lower rates of these species, indicating more die-off of planted sedges and rushes. Overall, the container plant survival in the wetland rehabilitation and re-establishment areas is estimated to be below 85% of the number at the time of planting. The low container plant survivorship can be attributed to multiple factors including feral pig damage in the restoration area damaging the irrigation system and plantings, irrigation issues, drought conditions, and invasive weeds. The low survivorship is being addressed with a Remedial Plan Memorandum (Appendix E) which includes supplementing more plantings, improving, and monitoring the irrigation system, and excluding all feral pigs from the restoration site. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Wetland Performance Standard 2: Cuttings Will Have a Plant Survivorship of No Less than 65%

Discussion. No cuttings were installed in the wetland rehabilitation or enhancement areas.

Wetland Performance Standard 3: Seeded Areas Will Have at Least 55% Absolute Cover

Discussion. Based on quantitative monitoring data gathered in Year 2, vegetative cover in seeded wetland rehabilitation and enhancement areas exceeded 55%. SW02 had an average absolute vegetative cover of 98%; SW03 had an average absolute vegetative cover of 87%. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C. This performance standard has been achieved.

Wetland Performance Standard 4: Weed Species Will Consist of No More than 15% Cover

Discussion. Based on quantitative data, weed species are present in the wetland rehabilitation and enhancement areas, and have absolute cover of less than 15% in SW02 and 16% in SW03. SW02 had an average of 8% weed cover, and SW03 had approximately 16% weed cover. This performance standard was achieved in SW02 but not in SW03. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C. Weed species of highest concern are broadleaved pepper weed, yellow star-thistle, and yellow mustard (*Brassica nigra*). More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Wetland Performance Standard 5: Absolute Cover of Wetland Species Will be Greater than or Equal to 75% of the Reference Population

Discussion. Per the MMP, quantitative data and comparison with the reference population upstream began in monitoring Year 2. Based on quantitative data gathered in Year 2, absolute cover of wetland species in wetland rehabilitation and enhancement areas was approximately 70% for SW02 and 83% for SW03, and the absolute cover of wetland species in the reference site was 50%. The average of absolute cover of wetland species in wetland rehabilitation and enhancement areas for the overall site was 74%. This performance standard has been achieved.

Wetland Performance Standard 6: Relative Cover of Native Species Will be Greater than or Equal to 75%

Discussion. Per the MMP, quantitative data and comparison with the reference population upstream began in monitoring Year 2. Based on quantitative data gathered in Year 2, Relative cover of native species in wetland rehabilitation and enhancement areas was approximately 63% for SW02 and 76% for SW03. This performance standard has been met for SW03 but not for SW02. When averaged together the performance standard criteria is not met. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Wetland Performance Standard 7: Target Species Richness Will be Greater than or Equal to 75% of the Reference Site

Discussion. Per the MMP, quantitative data and comparison with the reference population upstream began in monitoring Year 2. Based on quantitative data gathered in Year 2, target species richness in wetland rehabilitation and enhancement areas was approximately 77% of the species richness in the reference site for SW02 and 64% of the species richness in the reference site for SW03. When averaged together the performance standard criteria is not met. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Wetland Performance Standard 8: Hydrology Will Consist of Greater than or Equal to 14 Days of Ponding or Saturated Soils in an Average or Above-Average Precipitation Year

Discussion. 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. As discussed in the geomorphic and hydrologic monitoring results (Appendix D), WY2020 was well below the long-term average precipitation year; therefore, the 14-day ponding criteria was not applicable. The site is on track to meeting this performance standard in an average or above average precipitation year. Based on the data, groundwater and surface water levels onsite started rising with 13.7 inches of rain, and peak groundwater conditions occurred after approximately 17.6 inches of cumulative rainfall. SW02 and SW04 received intermittent sheet flow and inundation from storms on January 16, 2020, March 16,

2020, and April 5, 2020. These periods of inundation did not appear to be related to groundwater, and the inundation lasted one day or less per storm. SW03 was inundated for approximately nine days beginning on April 5, 2020. Saturated soils were still observed in SW03 on April 29, 2020. A more detailed discussion of the site's hydrology performance can be found in the Geomorphic and Hydrologic Monitoring Report (Appendix D).

Additionally, wildlife usage in the restored agricultural ditch was evidenced by the presence of California red-legged frog, as observed by Habitat Agency staff on June 29, 2019, and on May 20 and June 17, 2020 (Donovan, pers. comm. 2019; King, pers. comm. 2020). Habitat Agency staff also observed one adult western pond turtle (*Actinemys marmorata*) on May 20, and one hatchling western pond turtle on June 17, 2020 (King, pers. comm. 2020). Dudek staff performed amphibian surveys on June 3, 2020 per request of the Habitat Agency, and multiple species of amphibians (including California red-legged frog) were identified (Appendix C). Amphibians were identified in four of the five ponds in the restored agricultural ditch, and included tree frog tadpoles (*Hyla sp.*), California red-legged frog, western pond turtle, western toad tadpoles (*Anaxyrus boreas*), California newt larvae (*Taricha torosa*), and water boatmen (*Corixa sp.*). California red-legged frog were observed during the survey in two ponds, and western pond turtle was observed in one pond. Observations of California red-legged frog and western pond turtle were submitted to the California Natural Diversity Database (CNDDB) for sightings made by Dudek and Habitat Agency staff on August 31, 2020.

4.3.3 Stream and Riparian Buffer Performance Standards

The results of quantitative monitoring of the riparian buffer areas and streams, and how they compare to the performance standards, is discussed in the following sections. Performance standards for the restored riparian buffers pertain primarily to vegetative data while the performance standards for streams rely on hydrologic data; thus, they are discussed separately. Vegetation monitoring transect data is presented in Appendix C, and detailed hydrologic data can be found in the Geomorphic and Hydrologic Monitoring Report (Appendix D).

4.3.3.1 Riparian Buffer Performance

A summary of riparian buffer performance during Year 2 is presented in the Table 8. Features are discussed in greater detail below.

Table 8. Riparian Buffer Feature Performance – Year 2

Riparian Buffer Performance Standards	Feature/Riparian Buffer Planting Area								
	ID01	*ID03-01A*	*ID03-02*	*ID03-03*	*ID03-04*	*ID03-05*	*ED01*	*ED03*	*Overall Site Performance*
Riparian Buffer Performance Standard 1: Container plants will have a plant survivorship of no less than 85%.	✘	✘	✘	✘	✘	✘	✘	✘	✘
Riparian Buffer Performance Standard 2: Cuttings will have a	N/A	✘	✘	✘	N/A	✓	N/A	✘	✘

Table 8. Riparian Buffer Feature Performance – Year 2

Riparian Buffer Performance Standards	Feature/Riparian Buffer Planting Area								
	ID01	*ID03-01A*	*ID03-02*	*ID03-03*	*ID03-04*	*ID03-05*	*ED01*	*ED03*	*Overall Site Performance*
plant survivorship of no less than 65%.									
Riparian Buffer Performance Standard 3: Seeded areas will have at least 55% cover.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Riparian Buffer Performance Standard 4: Weed species will consist of no more than 15% cover.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Riparian Buffer Performance Standard 5: Relative cover of native species will be greater than or equal to 75%.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Riparian Buffer Performance Standard 6: Target species richness will be greater than or equal to 75% of the reference site.	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: N/A = not applicable. No cuttings were installed at ID01, ID03-04, or ED01

Riparian Buffer Performance Standard 1: Container Plants Will Have a Plant Survivorship of No Less than 85%

Discussion. A total of 1,746 tree and shrub species in containers were installed in the stream mitigation areas during the planting phase of the project. After high rainfall in Year 1, 143 container plants were either dead or missing and presumed dead, 20 were in poor condition due to flooding, and 5 were in fair condition. In Year 2, monitoring results showed the site had 22% survivorship for container plants which is not meeting this performance standard (Refer to Figure 3 and Appendix C). The low container plant survivorship can be attributed to multiple factors including feral pig damage in the restoration area damaging the irrigation system and plantings, irrigation issues, drought conditions, and invasive weeds. The low survivorship is being addressed with a Remedial Plan Memorandum (Appendix E), which includes supplementing more plantings, improving, and monitoring the irrigation system, and excluding all feral pigs from the restoration site. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Riparian Buffer Performance Standard 2: Cuttings Will Have a Plant Survivorship of No Less than 65%

Discussion. A total of 400 willow cuttings were installed along living log jams and in the riparian enhancement areas during the planting phase of the project in Year 1. Willow stakes have approximately 26% survival in the riparian and stream areas which does not meet the criteria for this performance standard. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C and presented in Figure 3. Additional cuttings will be installed January 2021. Additional data will be collected in monitoring Year 3 to assess the success of the original and supplemental cuttings. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Riparian Buffer Performance Standard 3: Seeded Areas Will Have at Least 55% Cover

Discussion. Based on quantitative monitoring data gathered in Year 2, vegetative cover in seeded riparian buffer enhancement and restoration areas exceeded 55%. San Felipe Creek (ID03-01B, ID03-02, ID03-03, ID03-04) had an average absolute vegetative cover of 81%; ID03-01A had an average absolute vegetative cover of 100%; and ED03 had an average total vegetative cover 99%. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C. This performance standard has been achieved.

Riparian Buffer Performance Standard 4: Weed Species Will Consist of No More than 15% Cover

Discussion. Based on quantitative data, weed species are present in the stream and riparian buffer rehabilitation and enhancement areas, but have absolute cover of less than 15%. San Felipe creek (ID03-01B, ID03-02, ID03-03, ID03-04) had an average of 5.6% weed cover, ID03-01A had approximately 7% weed cover, and ED03 had approximately 6.5% weed cover. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C. Weed species of highest concern are yellow star-thistle and yellow mustard. Italian thistle (*Carduus pycnocephalus*) is also present throughout the stream enhancement areas. This performance standard has been achieved.

Riparian Buffer Performance Standard 5: Relative Cover of Native Species Will be Greater than or Equal to 75%

Discussion. Based on quantitative data gathered in Year 2, relative cover of native species within the stream and riparian buffer rehabilitation and enhancement areas was 50% and did not achieve the 75% native relative cover criteria for this performance standard. San Felipe Creek had an average relative native cover of 44%, ID03-01A had an average relative native cover of 47%, and ED03 had an average relative native cover of 65%. A detailed summary of the Year 2 vegetation monitoring data is provided in Appendix C. The low relative cover of native species can be attributed to multiple factors including feral pig damage in the restoration area damaging the irrigation system and plantings, irrigation issues, and invasive weeds. The low survivorship is being addressed with a Remedial Plan Memorandum (Appendix E), which includes supplementing more plantings, improving and monitoring the irrigation system, and excluding all feral pigs from the restoration site. More information on the adaptive management being used to address this performance failure can be found in Section 5 of this report and the Remedial Plan Memorandum (Appendix E).

Riparian Buffer Performance Standard 6: Target Species Richness Will be Greater than or Equal to 75% of the Reference Site

Discussion. Per the MMP, quantitative data and comparison with the reference population upstream began in monitoring Year 2. Based on quantitative data gathered in Year 2, species richness in riparian buffer enhancement

areas was approximately 236% of the reference site. Of note, the riparian reference site consists of mature riparian cover that has shaded the understory and limited species richness. This performance standard is met.

4.3.3.2 Stream Performance

A summary of stream performance during Year 2 is presented in the Table 9. Features are discussed in greater detail below.

Table 9. Stream Feature Performance – Year 2

Stream Performance Standards	Feature								
	ID01	*ID02*	*ID03 (Reaches 1, 3, 4)*	*ID03 (Reach 2)*	*ED01*	*ED02*	*ED03*	*AD01*	*Overall Site Performance*
Stream Performance Standard 7: Inset floodplains will be inundated if peak flows exceed a 2-year event.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Stream Performance Standard 8: Living log jams in Boyds Creek alluvial fan will contain flow in two or more channels during the winter season.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stream Performance Standard 9: There will be less than 1 foot of channel bed elevation loss averaged over reach and absent of a significant knickpoint.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stream Performance Standard 10: 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.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stream Performance Standard 11: The articulated mat at	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 9. Stream Feature Performance – Year 2

Stream Performance Standards	Feature								
	ID01	*ID02*	*ID03 (Reaches 1, 3, 4)*	*ID03 (Reach 2)*	*ED01*	*ED02*	*ED03*	*AD01*	*Overall Site Performance*
the Lower Hotel Trail Arizona Crossing will be stable, and no significant knickpoints will have formed.									
Stream Performance Standard 12: Staked wood jams will be intact and in such a condition to capture sediment and organic material transported by the creek.	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: N/A = not applicable. There was no 2-year event in WY2020.

Stream Performance Standard 7: Inset Floodplains Will be Inundated if Peak Flows Exceed a 2-year Event

Discussion. Per the geomorphic and hydrologic monitoring report (Appendix D), a 2-year streamflow event did not occur during WY2020. Since the 2-year event did not occur, this performance standard is not applicable.

Stream Performance Standard 8: Living Log Jams in Boyds Creek Alluvial Fan Will Contain Flow in Two or More Channels During the Winter Season

Discussion. Per the geomorphic and hydrologic monitoring report (Appendix D), a storm on April 5, 2020, generated flow in two channels within Boyds Creek alluvial fan. This performance standard has been achieved.

Stream Performance Standard 9: There will be less than 1 foot of Channel Bed Elevation Loss Averaged Over Reach and Absent of a Significant Knickpoint

Discussion. According to the geomorphic and hydrologic monitoring report (Appendix D), no additional quantitative data was collected since Year 1 to assess this performance standard; however, qualitative assessments of the site did not indicate any new areas of problematic erosion during WY2020. This performance standard is being achieved. This performance standard will continue to be monitored in future monitoring years, and adaptive management recommendations will be provided where necessary.

Stream Performance Standard 10: 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.

Discussion. As discussed in the geomorphic and hydrologic monitoring report (Appendix D), the Arizona Crossing is performing as designed, and no erosion was observed along the Corral Trail. The pipes performed well in WY2020 and were not plugged in the dry season. This performance standard has been achieved.

Stream Performance Standard 11: The Articulated Mat at the Lower Hotel Trail Arizona Crossing Will be Stable, and No Significant Knickpoints Will Have Formed.

Discussion. As discussed in Stream Performance Standard 10, the Lower Hotel Trail Arizona crossing is performing as designed, and no erosion or knickpoints formed in monitoring Year 2. This performance standard has been achieved.

Stream Performance Standard 12: Staked Wood Jams Will be Intact and In Such a Condition to Capture Sediment and Organic Material Transported by the Creek.

Discussion. Based on the geomorphic and hydrologic monitoring report (Appendix D), the staked wood jams are intact and functioning as intended. In WY2019, the staked wood jams trapped more sediment than in WY2020, but this process is expected, and the jams are still functional and trapping sediment. More information on recommendation to improve the staked wood jams can be found in Section 5 of this report.

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5 Recommendations for Adaptive Management

5.1 Overview

Per the MMP, if revegetation efforts fail to meet performance standards in any year, remedial actions are recommended to bring the project to a level of conformance (Dudek 2019). On October 21, 2020, a meeting was held with the regulatory agencies to notify them of Year 2 container plant mortality within riparian buffer areas and to discuss the preliminary remedial recommendations. In direct coordination with the Habitat Agency, a Remedial Plan Memorandum (Appendix E) has been prepared that directs the operations, maintenance, and monitoring work going forward to meet the project goals and objectives and performance standards. In addition, the remedial plan considers adaptive management as stated in the MMP and summarized in Table 10.

Table 10. Project Objectives, Metrics, and Example Adaptive Management Strategies

Project Goal or Objective	Desired Condition	Example Monitoring Metric	Potential Adaptive Management Action if Desired Condition Is Not Achieved
Enhance native vegetation diversity, vigor, and cover.	Increase in target species extents	Percent relative cover of native species	Replanting of non-successful areas; Enhanced control of invasive plant species
Repair historical features (e.g., roads and trails), and erosion features that have altered natural streamflow and groundwater flow patterns.	Roads no longer capture runoff; Natural drainage patterns are maintained; Channels are vertically stable, with minimal downcutting	Field observation of overland flow and drainage patterns	Road maintenance and re-establishment of natural drainage patterns; Channel roughness elements may be added or grading may occur to avoid or correct ditch recapture
Increase frequency of flows into remnant valley bottom channels.	Valley floor wetlands and depressional swales receive more runoff than under existing conditions	Field observation of overland flow and drainage patterns	Maintenance of living log jams; Maintenance of drainage lenses; Maintenance of Arizona crossing; Channel roughness elements may be added to distribute flows into multiple channels

Table 10. Project Objectives, Metrics, and Example Adaptive Management Strategies

Project Goal or Objective	Desired Condition	Example Monitoring Metric	Potential Adaptive Management Action if Desired Condition Is Not Achieved
Increase connectivity of alluvial fan distributary channels using geomorphically appropriate dispersion features (e.g., instream wood structures).	Remnant channels are occupied by flows on a near-annual basis	Direct observation or evidence of flow in two or more channels during the winter season	Channel roughness elements may be added to distribute flows into multiple channels
Re-establish functioning floodplains by setting back and sloping banks and creating inset floodplains and stabilizing channel banks with log structures and plantings.	Created inset floodplains are inundated by 2-year flows; Channel bed elevations do not become lower; Channel width-depth ratios become stable, with little to no variation over time	Streamflow and stream stage data; Channel cross-section and/or topographic data	Channel roughness may be increased to force higher stages at a given flow, or floodplain surfaces may be lowered
Enhance aquatic and valley bottom habitat by increasing groundwater storage and supporting riparian woodland revegetation.	Increased groundwater storage; Increased woodland areas	Groundwater level monitoring data; Habitat mapping	Groundwater infiltration strategies may be increased; Irrigation timing may be modified
Enhance and re-establish existing wetland resources.	Development of wetland plant communities, hydric soils, and ponding durations longer than 14 days	Plant survey and water depth monitoring data	Replanting of non-successful areas, drainage modifications

The remedial plan focuses on 5 primary actions, (1) feral pig control, (2) irrigation system reliability, (3) replacement planting, (4) channel dynamics, and (5) operations, maintenance, and monitoring. These actions are summarized below, and provided in detail in the Remedial Plan Memorandum in Appendix E.

5.2 Feral Pig Control

Site observations showed two conditions that contribute to feral pig damage: lack of effective exclusion along sections of the exclusion fence, and insufficient means to remove feral pigs from the site once inside. Recommendations for remediation of feral pig damage consist of 1) fence reinforcement, 2) swing gate modification, and 3) additional 1-way pig gates. Specific design updates can be found in can be found in the Remedial Plan Memorandum (Appendix E).

Implementation of remedial actions for feral pig control is underway. Fence improvements were made by HRS and another subcontractor, Southwest Fence and Supply Company, in Fall 2020. HRS reinforced the northern 450 linear

feet of fence and tightened and stretched the wire for the eastern 600 linear feet. Southwest Fence and Supply Company replaced the fencing at the northern San Felipe Creek crossing, the southern San Felipe Creek crossing, and the northern Boyds Creek Crossing. The woven wire and pressure-treated posts were replaced with steel posts and suspension swing gates with welded wire panels and aluminum siding. The swing gates swing open in the downstream direction when needed to allow for passage of debris. This improvement will reduce the amount of maintenance required after storm events. Fence reinforcements continued into December.

In early November, the northeast swing gate that provides access to the site was retrofitted for reliable passive closure. This, and all other project gates that provide user access will have information signs installed on both sides advising all users to close and latch the gate upon use. This action should reduce the amount of feral pigs entering the site. The Habitat Agency is also working with the County on an enhanced pig trapping program and has committed to installing one additional 1-way pig gate. Additional one-way pig gates are recommended to increase the frequency of opportunities along the fence line where baited areas can be found by pigs to exit the mitigation site. This approach will improve near term and long-term feral pig control.

A more detailed account of remedial actions related feral pig control can be found in the Remedial Plan Memorandum (Appendix E).

5.3 Irrigation System Reliability

Irrigation system upgrades are needed to support establishment of the original and replacement plantings. The upgrades began in November 2020. The existing irrigation system is being overhauled and retrofitted as a drip irrigation system. It is expected that 2 drip emitters per plant will be sufficient due to their flow rates and systems will be operated for 2 watering events per week, minimum. HRS will monitor the irrigation system operation and plant health and if and where needed, will install an additional drip emitter and/or will conduct additional watering events. In areas where drip irrigation was initially installed, the existing systems are being re-set, with anchored drip tubing, and drip emitters added to total 2 emitters for each plant. In order to maintain the drip irrigation system, on-grade tubing and PVC is being anchored, pipes crossing access roads are receiving hose ramp pipe protectors, pipes crossing creeks are being reinstalled with cable supports, and any new PVC pipe installed as part of the irrigation system retrofit will be Schedule 40 UV-resistant PVC. Lastly, at the start of the 2021 irrigation season the entire irrigation system will be tested and inspected to confirm it is operating properly; any needed repairs will be conducted for a fully operational system. A detailed description of the irrigation system remedial actions can be found in the Remedial Plan Memorandum in Appendix E.

5.4 Replacement Planting

The replacement planting actions summarized in this section are focused on addressing Year 2 plant survivorship performance standards. The proposed species composition and densities are based upon the data collected to-date during on-site qualitative and quantitative monitoring, input from project hydrologists, botanists and restoration specialists, and input from the Habitat Agency. The proposed plant species and quantities have been designed to meet project performance standards using 2 phases of replacement plantings based primarily on nursery container stock availability. A summary of each planting phase is described below, and a detailed description of the replacement planting, planting areas and species lists can be found in the Remedial Plan Memorandum in Appendix E.

5.4.1 Phase 1 – Fall 2020

Based on the annual monitoring conducted by Dudek and calculated mortality of the original plantings, an initial replacement container plant order was procured by HRS from The Watershed Nursery in Richmond, California. Only available species with propagules collected in Santa Clara and Alameda Counties are being used, applying more strict guidance on plant sourcing than appears in the MMP and project permits. The replanting includes container plants, willow pole cuttings, and reseeding. A total of 751 container plants were installed during the fall of 2020 replanting. Plant species include mulefat, valley oak, toyon (Heteromeles arbutifolia)[1]*, California coffeeberry, Fremont cottonwood (Populus fremontii)*, California blackberry, arroyo willow, blue elderberry, wire rush (Juncus balticus ssp. Ater)*, and California bulrush (Schoenoplectus californicus)*. In addition to nursery grown container stock, 100 willow (*Salix spp*.) pole cuttings were harvested on site and installed in selected locations where soil moisture and hydrology are believed to be conducive to success. The replacement plant list was developed with a consideration of existing site conditions and monitoring results, with the goals of establishing species that will tolerate the range of hydrologic conditions at the site and providing diverse riparian and wetland habitats. The majority of the replacement plantings occurred in the floodplain restoration areas and at log jams. Areas of sediment accretion/deposition were favored over areas that demonstrate scour. In SW02 and SW03, the rush and bulrush planting areas include areas where extensive pig rooting has occurred. In addition, select areas that were seeded in 2018 and have since been eroded by the feral pigs will be reseeded in Fall 2020. A detailed description of the Phase 1 replacement planting, planting areas, and species numbers and lists can be found in the Remedial Plan Memorandum in Appendix E.

5.4.2 Phase 2 – Fall 2021

To supplement the Phase 1 - Fall 2020 replacement plantings, and to ensure enough quantities are available to exceed the plant performance requirements, site-appropriate species propagules were collected this fall to be grown in containers over the winter, spring and summer for planting in fall 2021. Approximately 720 container plants will be installed in Phase 2. The species palette recommends additional species not originally included in 2018: coyote brush (*Baccharis pilularis*), California mugwort (*Artemisia douglasiana*), toyon, and Fremont's cottonwood. The additional species were approved by Brian Wines of the San Francisco Bay Regional Water Quality Control Board on October 21, 2020 by way of a phone call and email follow-up. The container plants will be supplemented with approximately 50 willow pole cuttings to be harvested and installed by HRS in winter 2022. In response to site conditions, more Sycamores and less oaks will be planted throughout the project. Sycamore plants will be installed in deposition areas and in slip faces (where the hydraulic energy is less) within the channel and upstream of the log jams. Elderberry (*Sambucus nigra ssp. Caerulea*), coffeeberry (*Frangula californica*), California buckeye *(Aesculus californica)*, and coyote brush plants will be installed along with valley oaks in select locations so that oaks are not planted too densely. Where valley oaks have established in planting areas, other smaller statured species such as elderberry, coffeeberry, and coyote brush will be installed to provide structural diversity and minimize competition between oaks. In addition, the smaller statured species can serve as nurture plants, placed in a manner that allows the plant to capture atmospheric moisture (e.g., fog) and deliver that moisture to the soil near the oak plantings. A detailed description of the Phase 2 replacement planting, planting areas, and species numbers and lists can be found in the Remedial Plan Memorandum in Appendix E.

[1] *Denotes species not included in the original plant palette. These species are recommended as replacement plants to add to the species richness and habitat complexity of the project site and have been observed to occur within the San Felipe Creek watershed in the project vicinity.

5.5 Channel Dynamics

The upstream floodplain restoration area on San Felipe Creek (ID03-02) is currently functioning as expected with respect to the anticipated dynamic channel movement, sediment sequestration, and sediment transport continuity as outlined in the MMP. However, a cut-off channel became incised in flood events during winter 2019-20. In order to offset the risk of new channel incision evolving to become a dominant and/or incised single thread channel, a debris jam made of natural materials will be installed in summer 2021. Additionally, one log jam on Boyds Creek that was damaged and the easternmost log that was dislodged was replaced during the week of October 26, 2020. In intermittent drainage ID-02, and as planned, additional boards may be installed at the structures as sediment accumulates and consolidates, in accordance with the project design and pending Balance's monitoring efforts in winter/spring 2021. A detailed description of the channel dynamics remedial actions can be found in the Remedial Plan Memorandum in Appendix E.

5.6 Operations, Maintenance, and Monitoring

The project's operations, maintenance and monitoring will be modified going forward, and responsibilities will fall on both Dudek/HRS and the Habitat Agency. In addition, it is anticipated that Balance Hydrologics will provide adaptive management construction oversight for debris jam and log jam replacement. Qualitative monitoring of ongoing operation and maintenance will occur approximately 8 times per year (1 visit each month anticipated in March through October). Quantitative vegetation monitoring will occur annually in the month of April. Site operations and maintenance will be ongoing throughout the year with a minimum of 1 day per week. A detailed summary of the modified roles and responsibilities and operations, maintenance, and monitoring can be found in the Remedial Plan Memorandum in Appendix E.

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6 References

ACOE (U.S. Army Corps of Engineers). 2016. Regional General Permit 18 Santa Clara Valley Habitat Plan Regional General Permit. January 2016.

Donovan, T. 2019. Presence of California red-legged frog. Personal communication between T. Donovan (Santa Clara Valley Habitat Agency) and L. Monarres (Dudek). June 29, 2019.

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

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

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.

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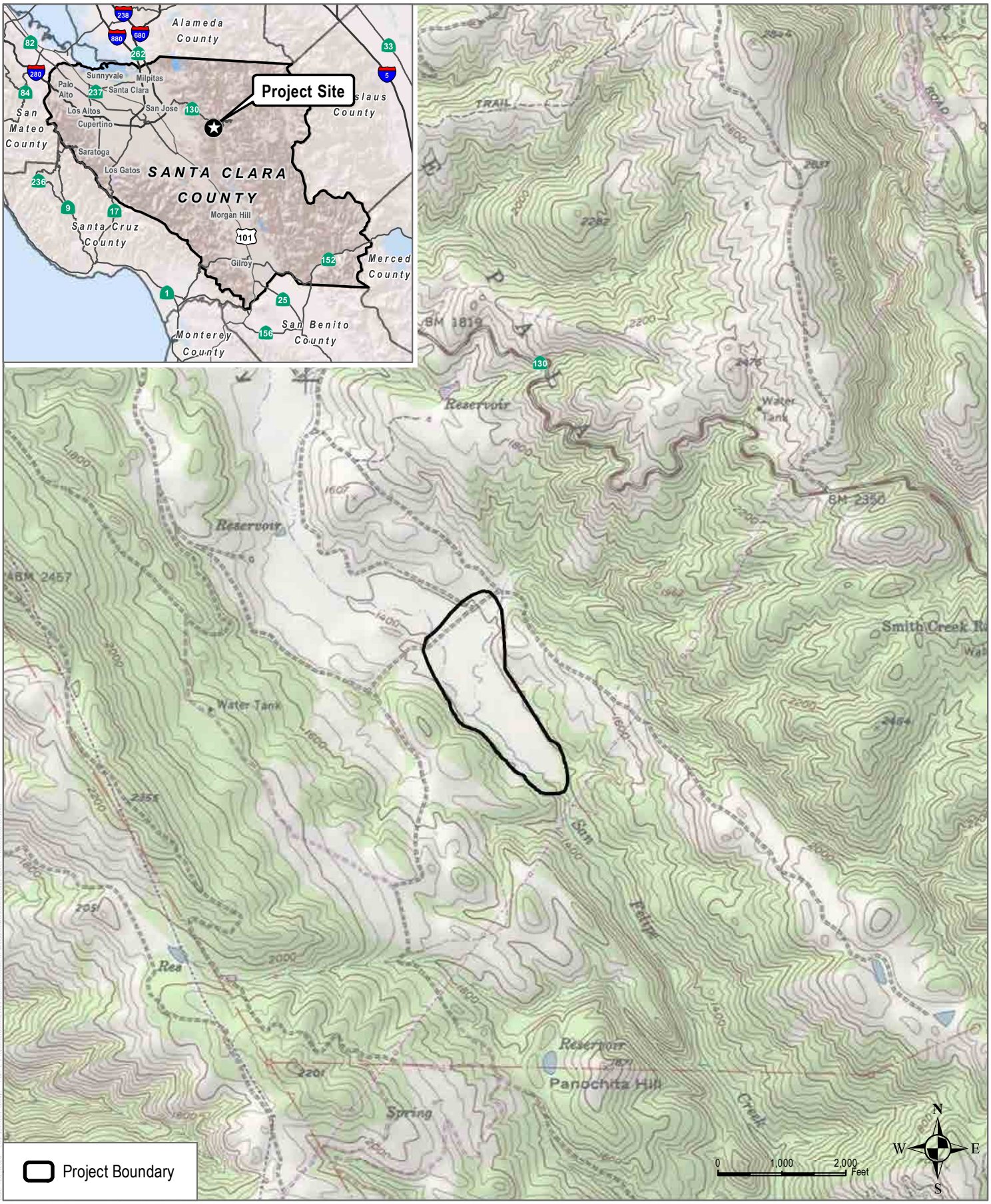

SOURCE: USGS 7.5-Minute Series Lick Observatory Quadrangle

FIGURE 1

Project Location

San Felipe Creek Restoration Project

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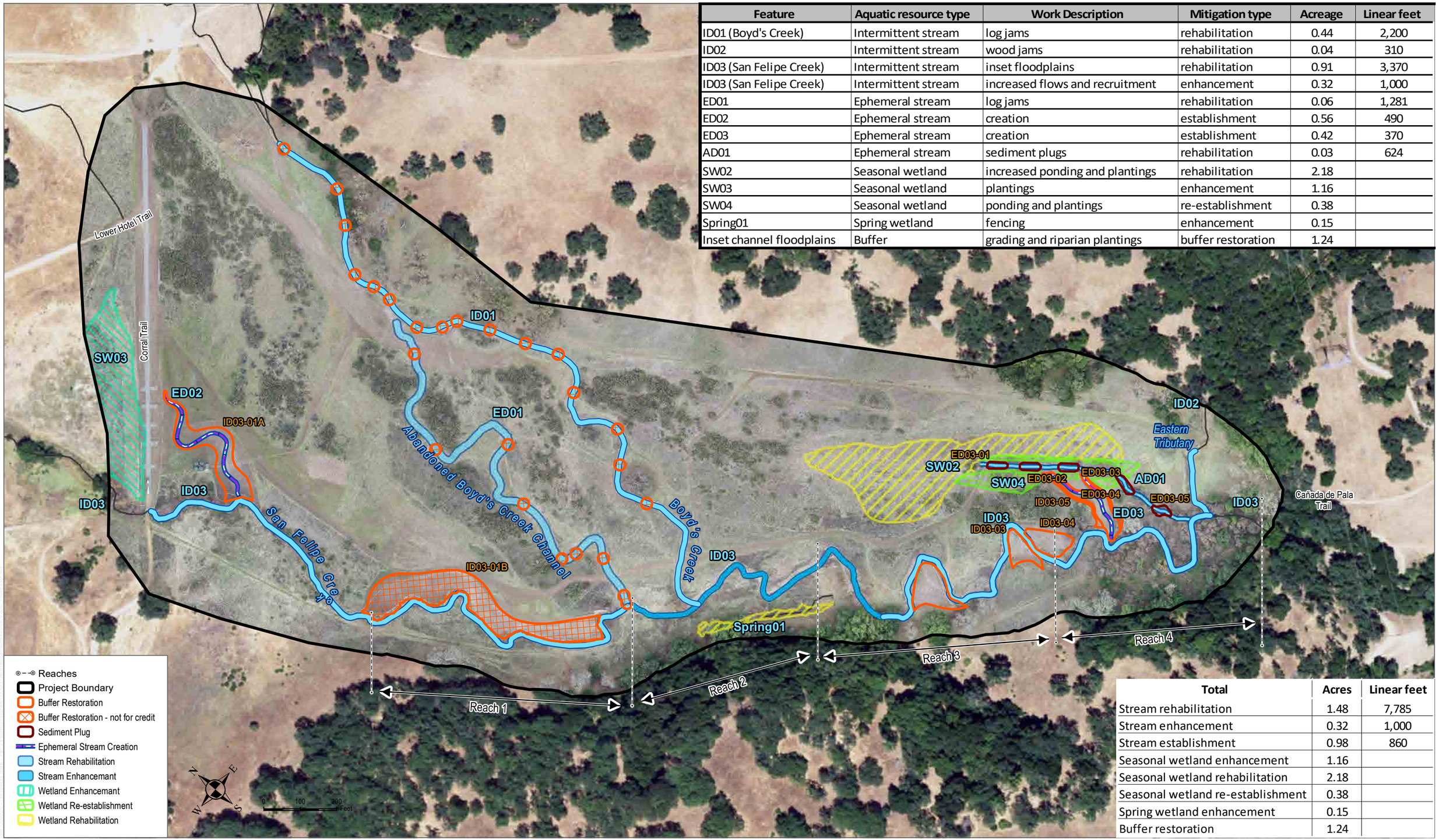
Feature	Aquatic resource type	Work Description	Mitigation type	Acreage	Linear feet
ID01 (Boyd's Creek)	Intermittent stream	log jams	rehabilitation	0.44	2,200
ID02	Intermittent stream	wood jams	rehabilitation	0.04	310
ID03 (San Felipe Creek)	Intermittent stream	inset floodplains	rehabilitation	0.91	3,370
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

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FIGURE 2

Project Design

San Felipe Creek Restoration Project

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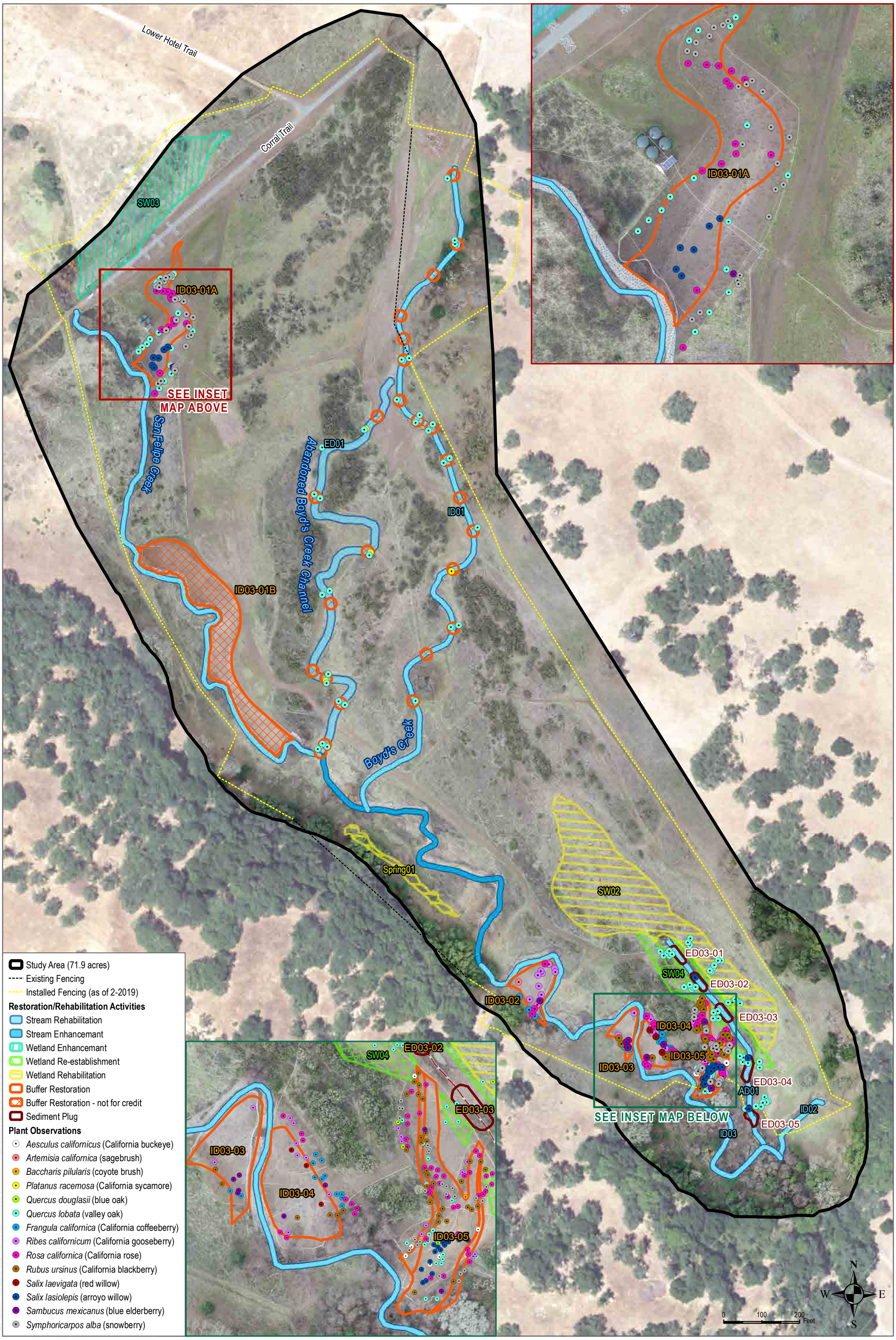

SOURCE: Balance Hydrologics 2017, USDA 2018

FIGURE 3

Container Plant Survival - Monitoring Year 2 (2020)

San Felipe Creek Restoration Project

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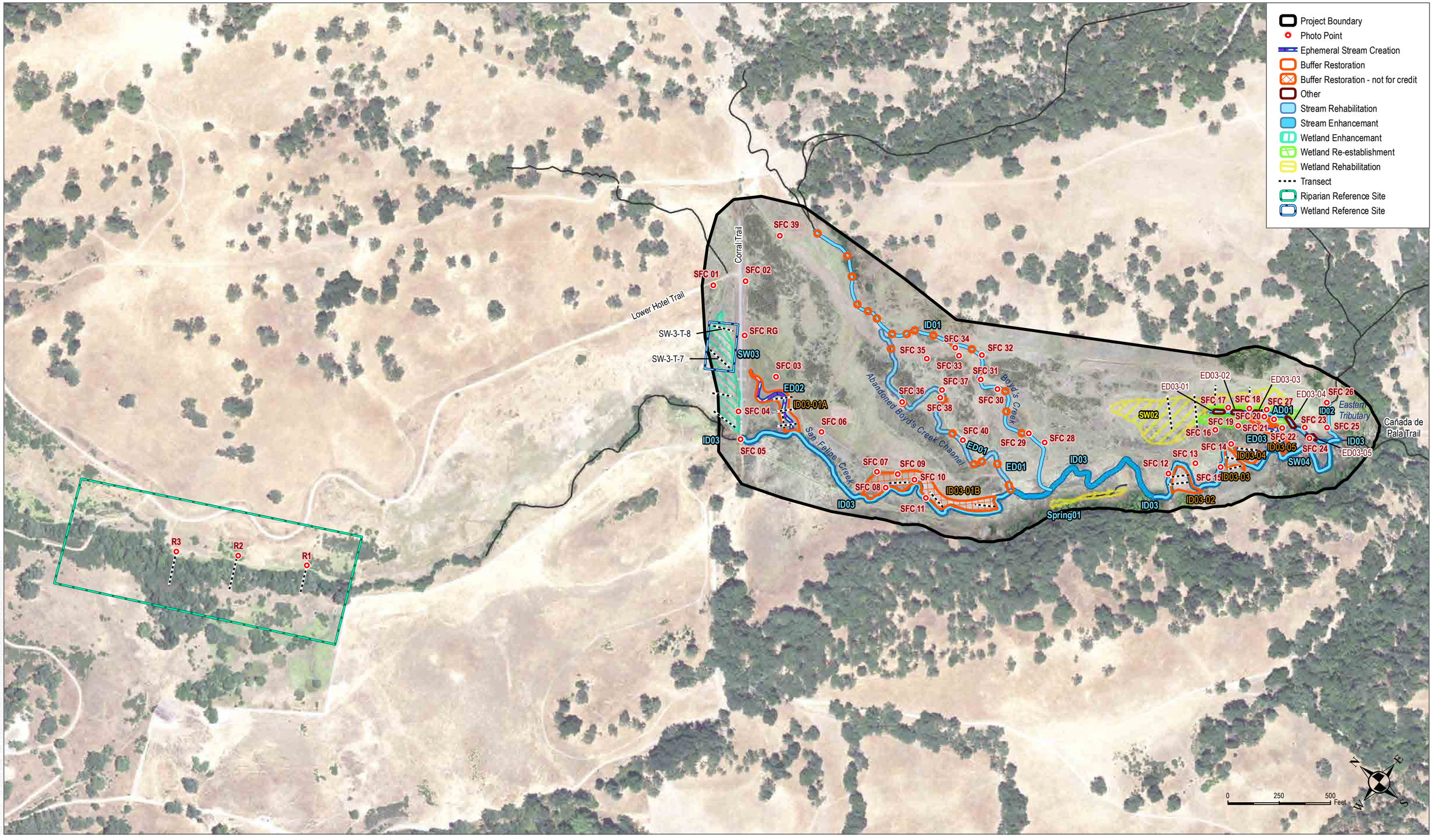

SOURCE: Bing Maps 2020

FIGURE 4

Qualitative and Quantitative Monitoring Reference

San Felipe Creek Restoration Project

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Photo 1a: East - SW03 - 06/19/2019

Photo 1b: East - SW03 - 10/28/2020

Photo 2a: Southwest - SW03 - 06/19/2019

Photo 2b: Southwest - SW03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5a

Photo Points

San Felipe Creek Restoration Project

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Photo 3a: Southwest - ED02 - 09/30/2019

Photo 3b: Southwest - ED02 - 10/28/2020

Photo 4a: Northeast - SW03 - 06/19/2019

Photo 4b: Northeast - SW03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5b

Photo Points

San Felipe Creek Restoration Project

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Photo 5a: South - ID03 - 09/30/2019

Photo 5b: South - ID03 - 10/28/2020

Photo 6a: West - ID03 - 09/30/2019

Photo 6b: West - ID03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5c

Photo Points

San Felipe Creek Restoration Project

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Photo 7a: Southwest - ID03 - 06/19/2019

Photo 7b: Southwest - ID03 - 10/28/2020

Photo 8a: South - ID03 - 06/19/2019

Photo 8b: South - ID03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5d

Photo Points

San Felipe Creek Restoration Project

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Photo 9a: West - ID03 - 09/30/2019

Photo 9b: West - ID03 - 10/28/2020

Photo 10a: Southwest - ID03 - 06/19/2019

Photo 10b: Southwest - ID03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5e

Photo Points

San Felipe Creek Restoration Project

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Photo 11a: West - ID03 - 06/19/2019

Photo 11b: West - ID03 - 10/28/2020

Photo 12a: South - ID03 - 09/30/2019

Photo 12b: South - ID03 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5f

Photo Points

San Felipe Creek Restoration Project

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Photo 13a: North - ID03 - 09/30/2019

Photo 13b: North - ID03 - 10/28/2020

Photo 14a: West - ID03 - 06/19/2019

Photo 14b: West - ID03 - 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5g

Photo Points

San Felipe Creek Restoration Project

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Photo 15a: West - ID03 - 06/19/2019

Photo 15b: West - ID03 - 10/28/2020

Photo 16a: East - ES03-01 / SW04 - 09/30/2019

Photo 16b: East - ED03-01 / SW04 - 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5h

Photo Points

San Felipe Creek Restoration Project

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Photo 17a: - ED03-01 / SW02 - 09/30/2019

Photo 17b: East - ED03-01 / SW02 - 10/28/2020

Photo 18a: - East - ED03-02 / SW02 - 09/30/2019

Photo 18b: - East - ED03-02 / SW02 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5i

Photo Points

San Felipe Creek Restoration Project

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Photo 19a: South - ED03-02 / SW04 - 06/19/2019

Photo 19b: South - ED03-02 / SW04 - 10/28/2020

Photo 20a: Northeast - ED03-03 / SW04 - 06/19/2019

Photo 20b: Northeast - ED03-03 / SW04 - 10/28/2020

SOURCE: Dudek 2020

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FIGURE 5j

Photo Points

San Felipe Creek Restoration Project

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Photo 21a: East - ED03-03 / AD01 - 09/30/2019

Photo 21b: East - ED03-03 / AD01 - 10/28/2020

Photo 22a: North - ED03-04 / AD01 - 09/30/2019

Photo 22b: North - ED03-04 / AD01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5k

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 23a: Northeast - ED03-04 / AD01 - 09/30/2019

Photo 23b: Northeast - ED03-04 / AD01 - 08/06/2020

Photo 24a: North - ED03-05 / AD01 - 09/30/19

Photo 24b: North - ED03-05 / AD01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5I

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 25a: South - ID02 - 09/30/2019

Photo 25b: South - ID02 - 10/28/2020

Photo 26a: West - ID02 - 06/16/19

Photo 26b: West - ID02- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5m

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 27a: East - ED03-03 / SW02 - 09/30/2019

Photo 27b: East - ED03-03 / SW02 - 10/28//2020

Photo 28a: North - ID01 - 09/30/2019

Photo 28b: North - ID01- 08/06/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5n

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 29a: Southwest - ID01- 06/19/2019

Photo 29b: West - ID01 - 10/28/2020

Photo 30a: South - ID01 - 09/30/19

Photo 30b: South - ID01- 08/06/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5o

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 31a: East - ID01- 06/19/2019

Photo 31b: East - ID01 - 08/06/2020

Photo 32a: Southwest - ID01 - 06/19/19

Photo 32b: Southwest - ID01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5p

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 33a: Southeast - ID01- 09/30/2019

Photo 33b: Southeast - ID01 - 10/28/2020

Photo 34a: East - ID01 - 06/19/19

Photo 34b: East - ID01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5q

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 35a: East - ID01- 09/30/2019

Photo 35b: East - ID01 - 10/28/2020

Photo 36a: West - ID01 - 09/30/19

Photo 36b: West - ID01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5r

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 37a: West - ED01- 06/19/2019

Photo 37b: West - ED01 - 10/28/2020

Photo 38a: North - ED01 - 06/19/19

Photo 38b: North - ED01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5s

Photo Points

San Felipe Creek Restoration Project

INTENTIONALLY LEFT BLANK

Photo 39a: South - ID01- 09/30/2019

Photo 39b: South- ID01 - 10/28/2020

Photo 40a: Southwest - ED01 - 09/30/19

Photo 40b: Southwest- ED01- 10/28/2020

SOURCE: Dudek 2020

DUDEK

FIGURE 5t

Photo Points

San Felipe Creek Restoration Project

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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 CONFERTIFOLIUM	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.

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 SPECIES 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.

AS-BUILT DRAWINGS

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

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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

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 MX 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.

AS-BUILT DRAWINGS

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 (CALIPC) 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; HABITAT AGENCY

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AS-BUILT DRAWINGS	JZ	03-08-19

DESIGNED BY	DRAWN BY	CHECKED BY	IN CHARGE	DATE
DUDEK	P KULCHAWIK	J ZANZI	J ZANZI	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

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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 5.0E.

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

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

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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

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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)	MAXIMUM COVER BY WEED SPECIES
1	90% PLANT SURVIVORSHIP [1]	70% PLANT SURVIVORSHIP [1]	50% COVER	20% COVER
2	85% PLANT SURVIVORSHIP [1]	65% PLANT SURVIVORSHIP [1]	55% COVER	15% COVER
3	25% VEGETATED COVER	15% VEGETATED COVER	60% COVER	10% COVER
4	30% VEGETATED COVER	20% VEGETATED COVER	65% COVER	10% COVER
5	35% VEGETATED COVER	25% VEGETATED COVER	70% COVER	10% COVER
6	40% VEGETATED COVER	30% VEGETATED COVER	70% COVER	10% COVER
7	45% VEGETATED COVER	35% VEGETATED COVER	70% COVER	10% COVER
8	50% VEGETATED COVER	40% VEGETATED COVER	70% COVER	10% COVER
9	55% VEGETATED COVER	45% VEGETATED COVER	70% COVER	10% COVER
10	60% VEGETATED COVER	50% VEGETATED COVER	70% COVER	10% COVER

[1] PLANT SURVIVORSHIP 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.

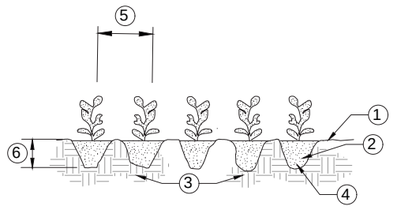
14. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD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

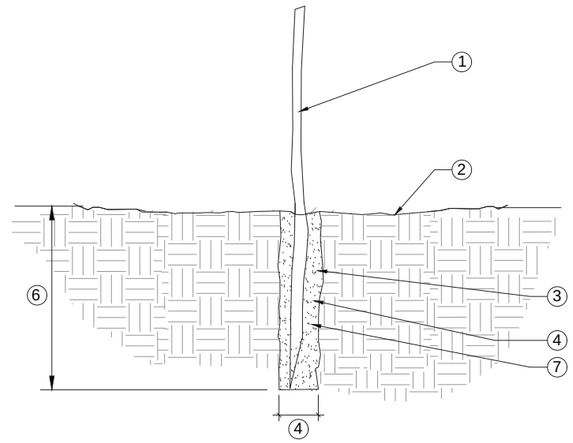
17. IN ADDITION, PLANT PROTECTION CAGES AND EXCLUSION FENCING WILL BE INSPECTED BY THE CONTRACTOR DURING PLANT ESTABLISHMENT SITE VISITS AND MAINTAINED AS INSTALLED IN AN UPRIGHT AND IN EFFECTIVE CONDITION.

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



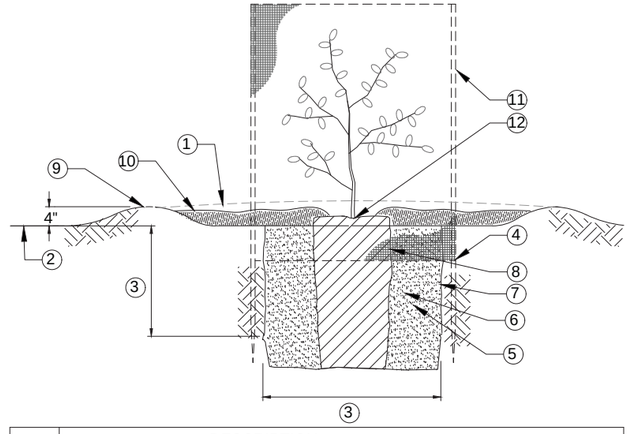
ITEM	DESCRIPTION
1	FINISH GRADE
2	ROOT BALL
3	AMENDED SOIL (PER NOTES)
4	WATER AND TAMP BACKFILL MIX WELL
5	SEE PLANT LISTS FOR SPECIES AND SPACING
6	DEPTH OF ROOT BALL

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
SANTA CLARA VALLEY HABITAT AGENCY

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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
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SHEET
5.0E

P:\300.ENVIRONMENTAL\100054 SAN FELIPE CREEK RESTORATION\13-AS-BUILTS_REVEG\1 CAD\REVEG AS-BUILTS_05-0 REVEG NOTES.DWG

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-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-01REVEG 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
ar/(510) 704-1000 • fax (510) 704-1001
www.balancehydro.com

DUDEK, HRS

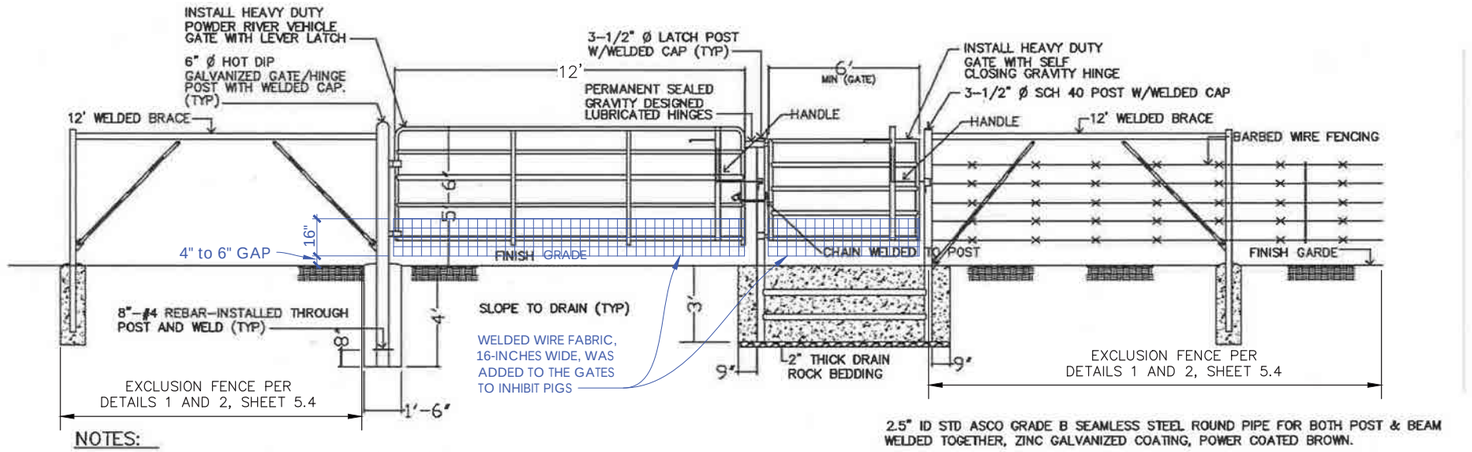
SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

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

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.

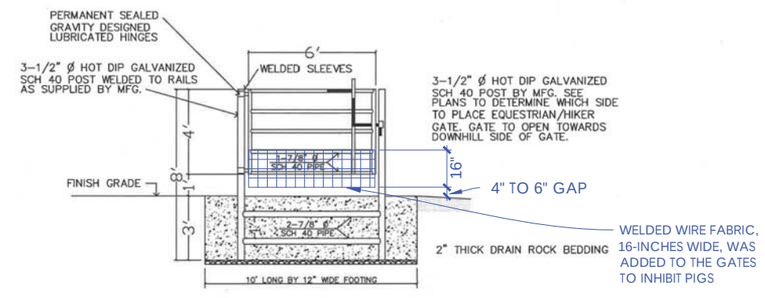
2. VEHICLE GATE TO BE HEAVY DUTY TUBE GATE, AS MFG. BY POWDER RIVER CO., OR EQUAL. GATE SHALL BE IN WIDTH INDICATED IN SPECIFICATIONS GREEN IN COLOR BY MFG. AS AVAILABLE AT:

   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



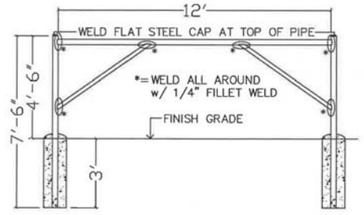
NOTES:

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
SANTA CLARA VALLEY HABITAT AGENCY

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www.balancehydro.com
DUDEK
HRS

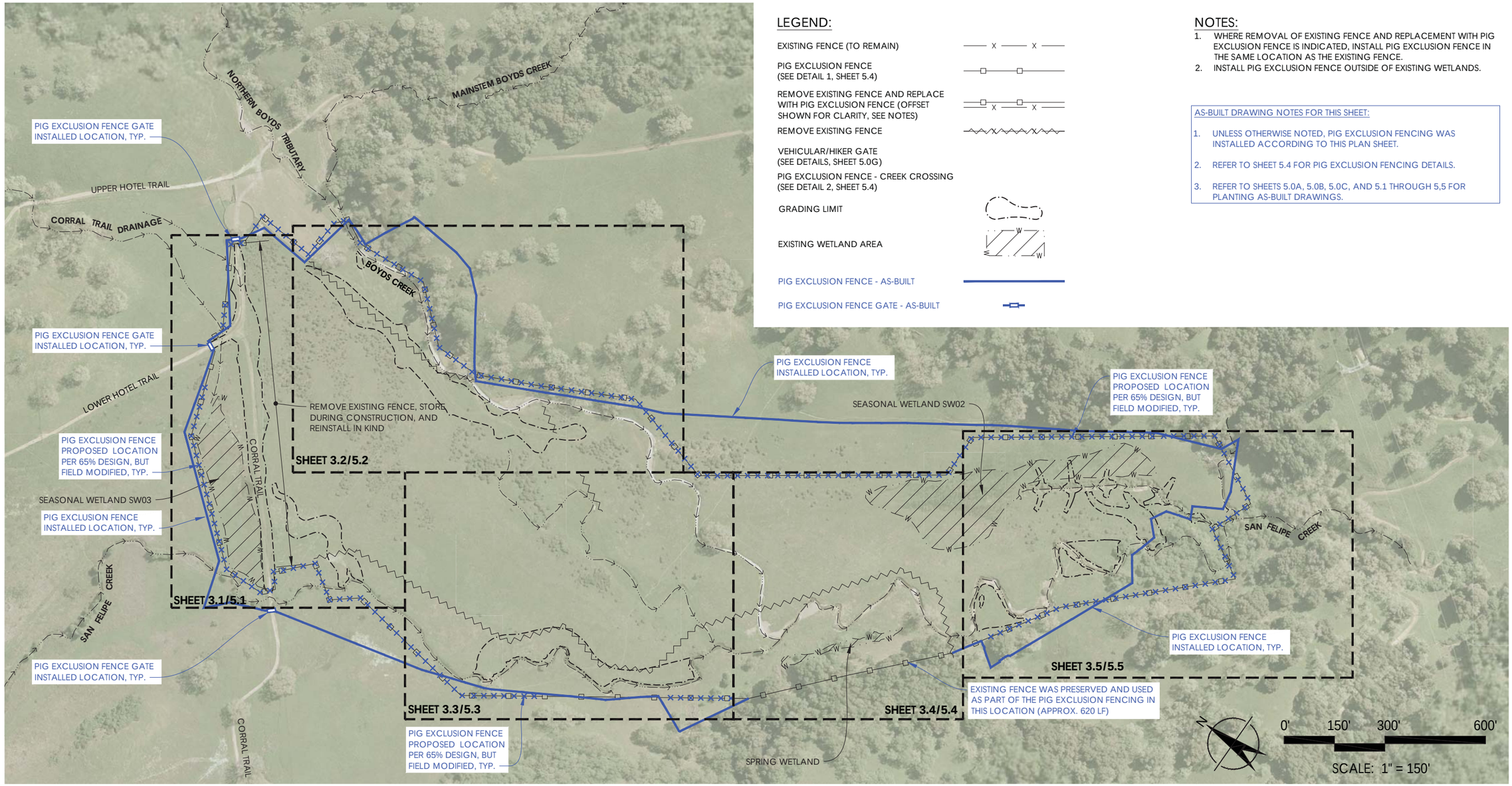
SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-08-19	JZ

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

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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	IN CHARGE	E BALLMAN
DRAWN BY	P KULCHAWIK	DATE	11-14-2017
CHECKED BY	D SHAW		

FENCING PLAN OVERVIEW

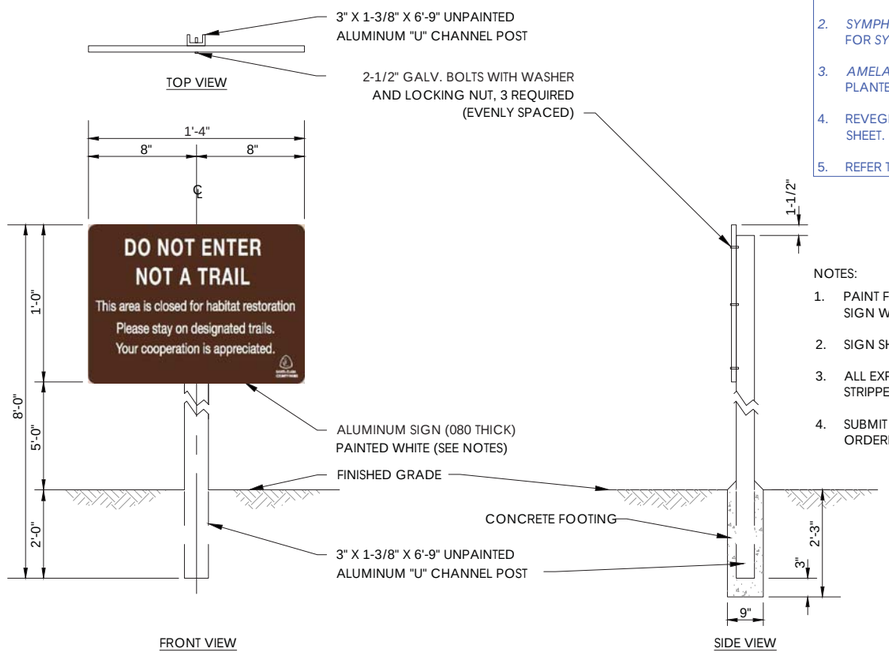
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

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.

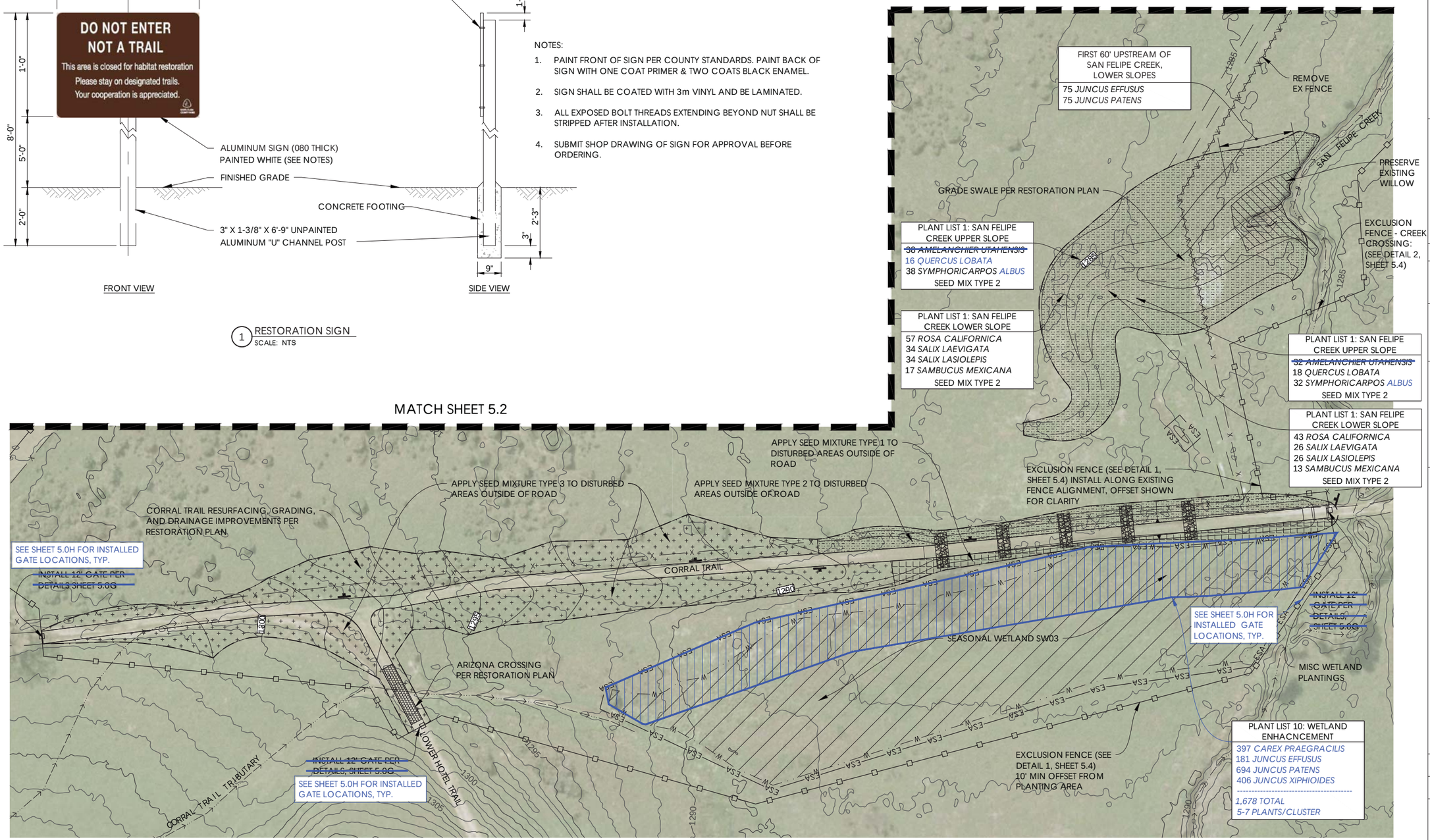
LEGEND:

- 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



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

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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
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

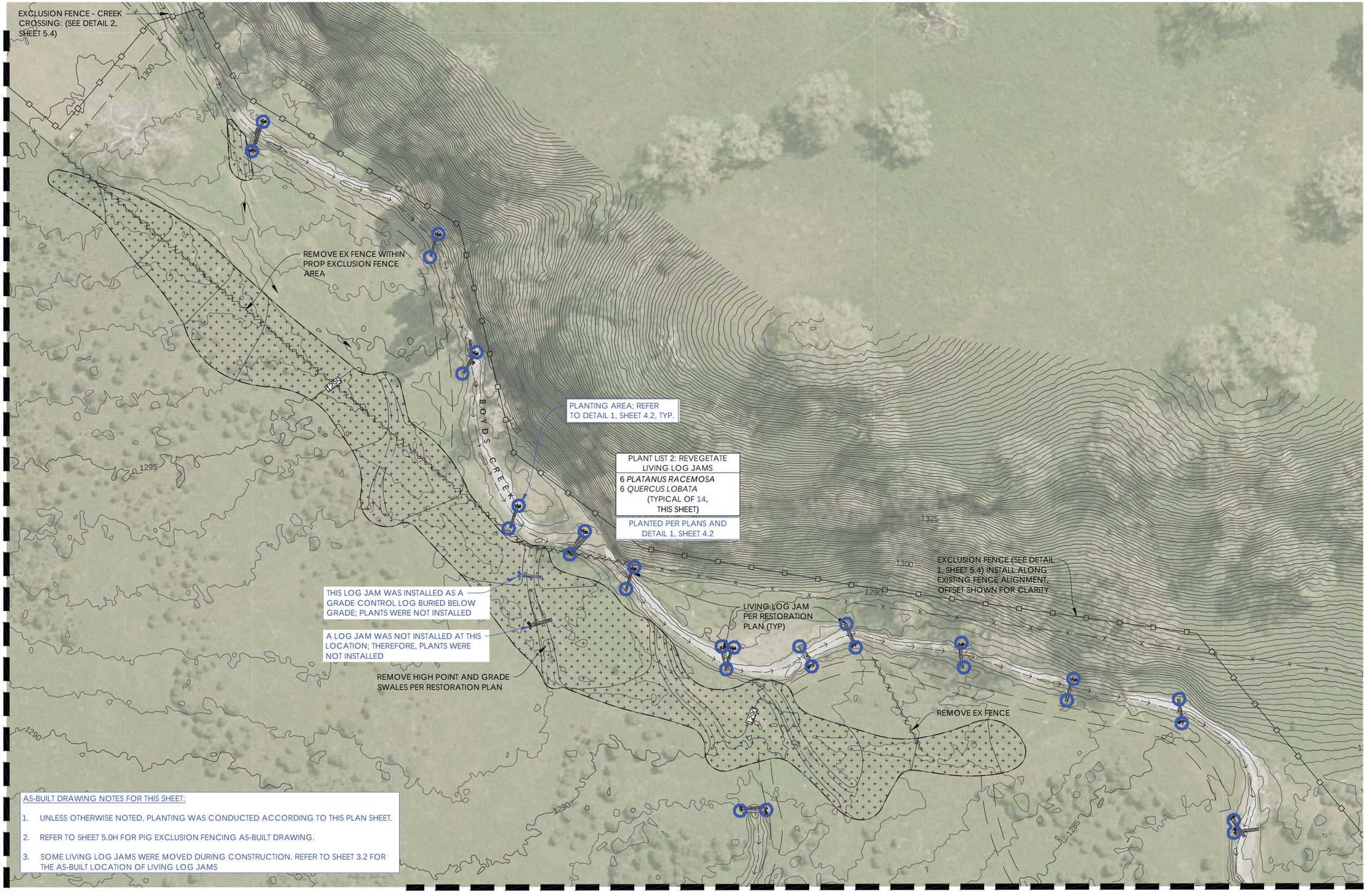
CORRAL TRAIL PLANTING & FENCING PLAN

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

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

MATCH SHEET 5.3

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

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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

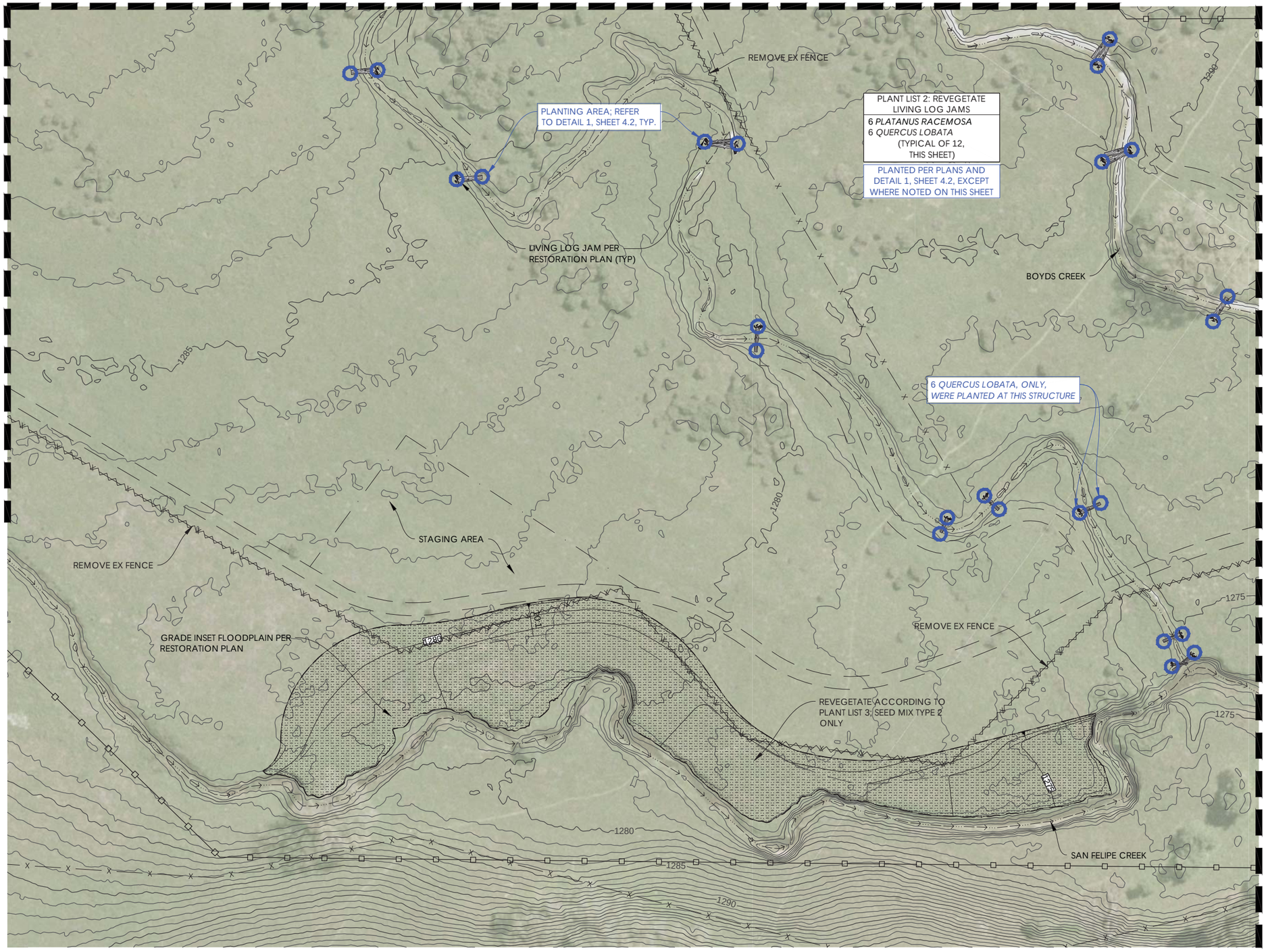
PROJECT NUMBER
215108

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:\1300.ENVIRONMENTAL\100654 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-1TO5-40SCALE.DWG

PREPARED FOR:

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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

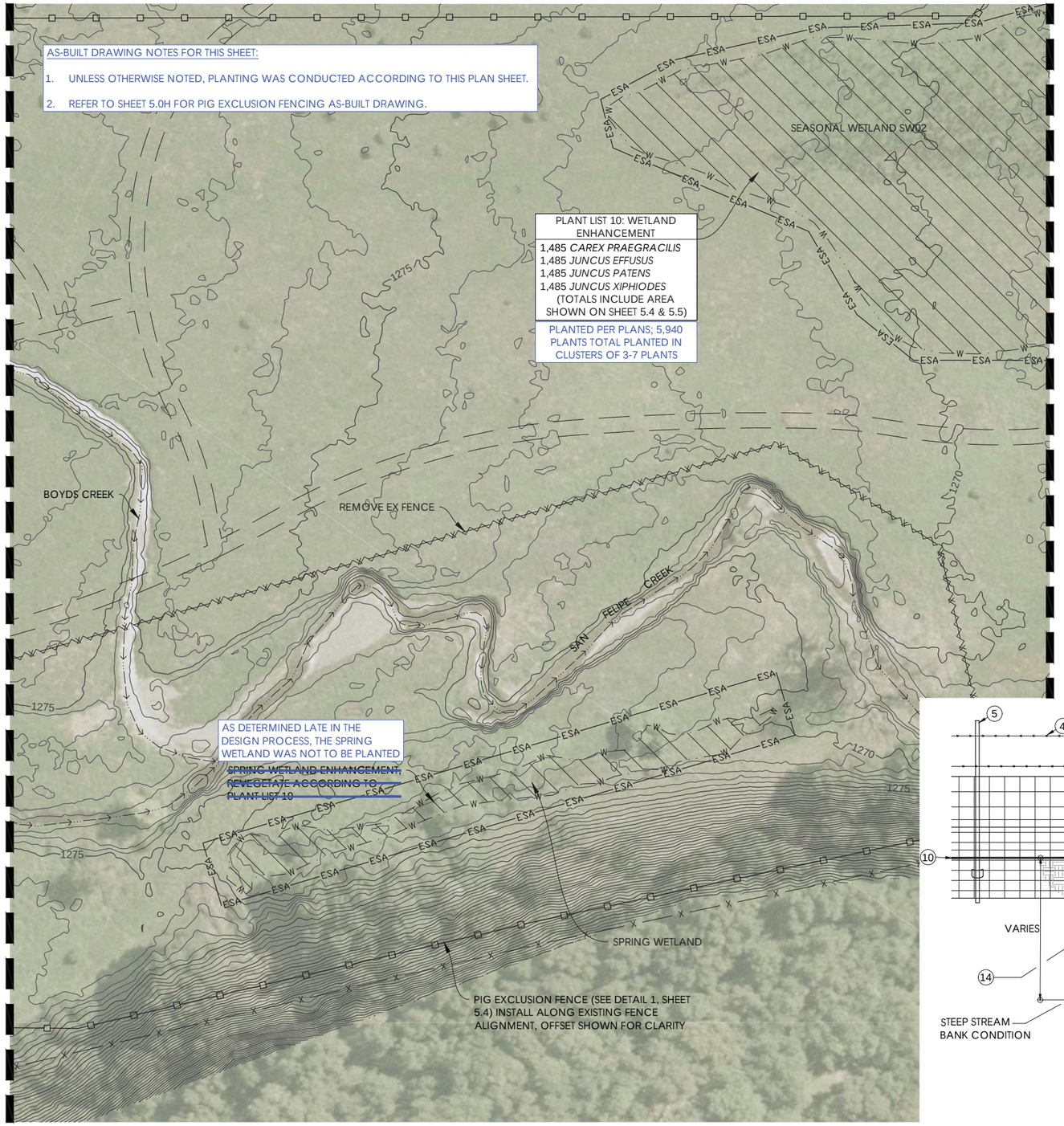
PROJECT NUMBER
215108

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.



MATCH SHEET 5.3

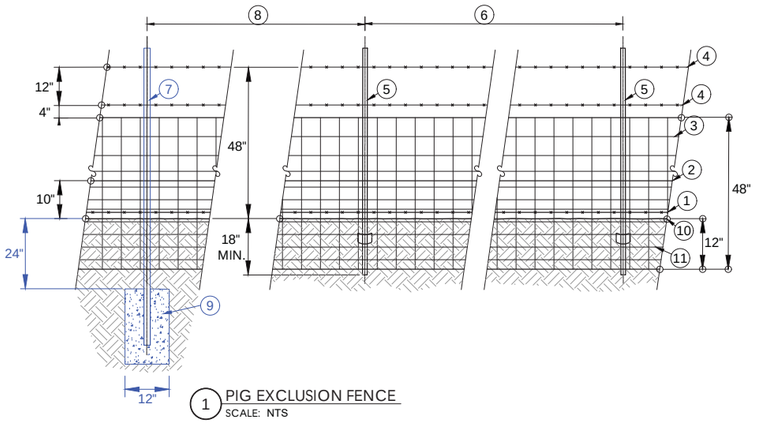
MATCH SHEET 5.5

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

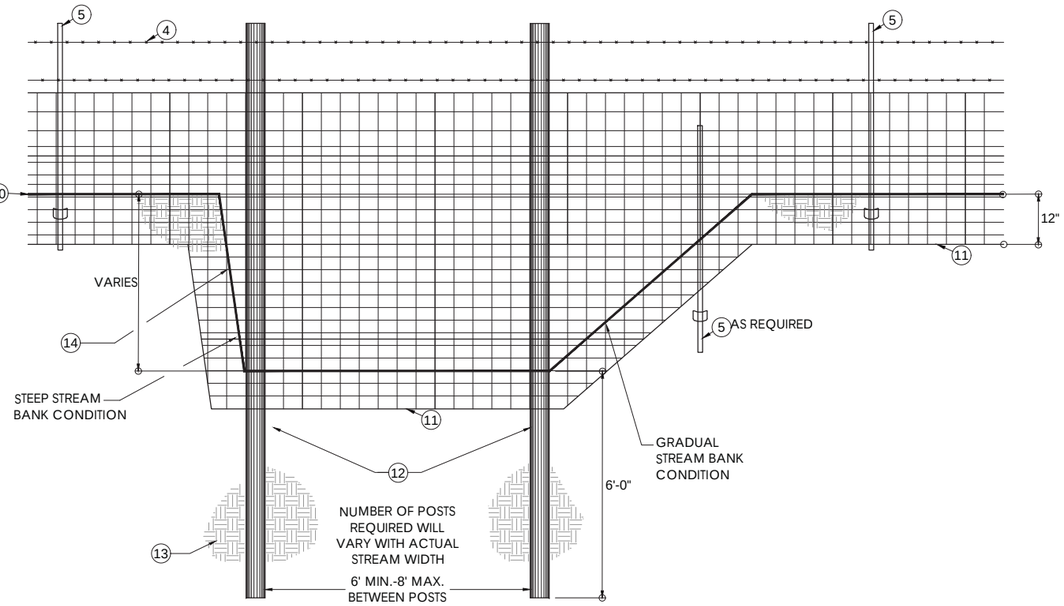
0' 40' 80' 160'

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

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

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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

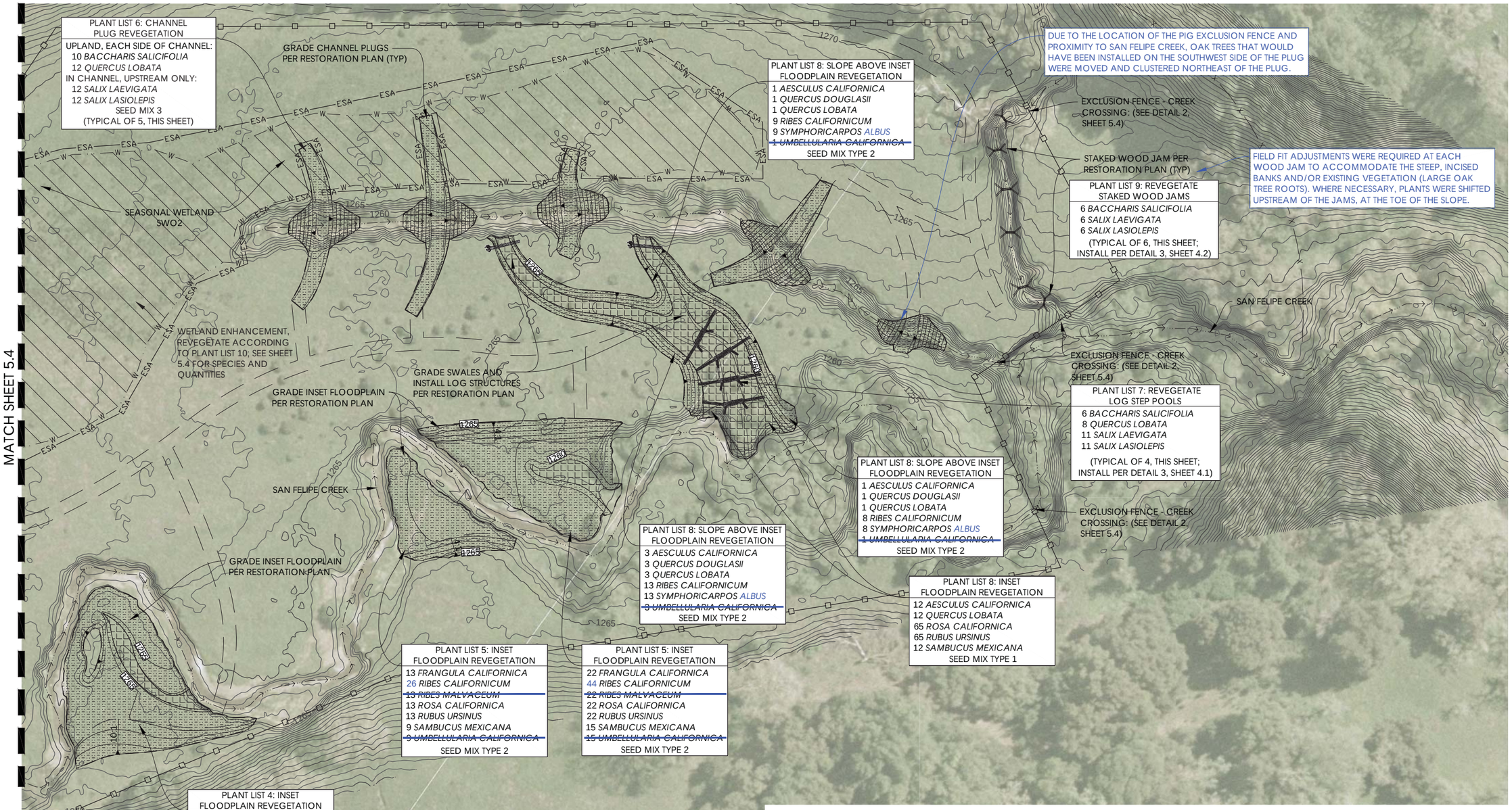
SAN FELIPE CREEK REACH 2 PLANTING & FENCING PLAN

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

Qualitative Monitoring Data Forms

DUDEK

Qualitative Monitoring Form –
San Felipe Creek Restoration Area

Biologist: L Burris **Date:** 5/7/2020

Weather Conditions: ~80°, sunny, breezy

Woody Vegetation

Are any plantings failing (check one)? ☒Yes ☐No

Observations:
Trees and shrubs missing from cages. GPS-ed failed plantings, need to return to finish

Invasive Weedy Species

Are any new infestations present (check one)? ☒Yes ☐No

Observations:
Himalayan blackberry and whitetop have cropped up in riparian and wetland areas, respectively.

General Observations

Wildlife Observed: CA red-legged frog and Western pond turtle in ponds.

Are there issues with (check all that apply):

☒Irrigation ☐Trash or Vandalism ☐Fencing and Signage ☐Herbivory ☒Erosion ☒Other

Describe: Pig damage noted - rooting

General Notes and Observations:
HRS is conducting weed management - need more focused control of thistle & Lepidium

Management Recommendations

- Spoke w/ HRS staff onsite during site visit - they will target whitetop during next spraying.

DUDEK

Qualitative Monitoring Form –
San Felipe Creek Restoration Area

Biologist: L. Burris, C. Seltenrich **Date:** 6/3/2020

Weather Conditions: Sunny, 85-90°, faint breeze

Woody Vegetation

Are any plantings failing (check one)? ☒Yes ☐No

Observations:
Continued to document failed plantings. Some willow stakes have not sprouted.

Invasive Weedy Species

Are any new infestations present (check one)? ☒Yes ☐No

Observations:
Bull thistle along margins of ponds & Himalayan blackberry along San Felipe creek noted.

General Observations

Wildlife Observed: Western toad tadpole, Pacific chorus frog tadpole, White-tailed kite, California newt larvae

Are there issues with (check all that apply):

☐Irrigation ☐Trash or Vandalism ☐Fencing and Signage ☐Herbivory ☐Erosion ☒Other

Describe:
Pig still present in exclusion area

General Notes and Observations:

Management Recommendations

Provided location & recommendations to HRS for weed control

DUDEK

Qualitative Monitoring Form –
San Felipe Creek Restoration Area

Biologist: L. Burris **Date:** 6/30/2020

Weather Conditions: 84° F, sunny, calm

Woody Vegetation

Are any plantings failing (check one)? ☒Yes ☐No

Observations:
Continued to document/GPS failed container plants.

Invasive Weedy Species

Are any new infestations present (check one)? ☒Yes ☐No

Observations:
Many Fuller's teasel that were treated were not killed - need to re-spray or hand-remove.

General Observations

Wildlife Observed: Red-tailed hawk, Acorn woodpecker, turkey vulture

Are there issues with (check all that apply):

☒Irrigation ☐Trash or Vandalism ☐Fencing and Signage ☐Herbivory ☐Erosion ☐Other

Describe:
Some riparian areas near the pumphouse don't appear to be getting any water - check w/ HRS.

General Notes and Observations:

Management Recommendations

Continue irrigation during summer months, continue weed control - hand remove persistent weeds, if necessary.

DUDEK

Qualitative Monitoring Form –

San Felipe Creek Restoration Area

Biologist: Lasthenia Lee **Date:** 10-28-2020

Weather Conditions: sunny, winds 0-5 mph, ~65-72°F (10:30-4:39)

Woody Vegetation

Are any plantings failing (check one)? ☒Yes ☐No

Observations: Quantitative monitoring was conducted earlier this season and planting failures were documented.

Invasive Weedy Species

Are any new infestations present (check one)? ☐Yes ☐No

Observations: Lot of Hir inc throughout site
Cirvul, Tae med, Cen sol, Dipsacus sp.

General Observations

Wildlife Observed: wild pigs (rooting), W. scrub jay, red-tailed hawk, common buckeye, Mylitta crescent, Cabbage white, Acmon blue, black phoebe, CA quail, spotted towhee, w. fence lizard, skipper butterfly: Hesperiidae), deer (scat)

Are there issues with (check all that apply):

☐Irrigation ☐Trash or Vandalism ☐Fencing and Signage ☒Herbivory ☒Erosion ☐Other

Describe:

Pig rooting + damage to some plantings throughout the site. Erosion along banks @ FD 03-02

General Notes and Observations:

Pig damage is being addressed by installing a pig exclusion fence.

Management Recommendations

Remove old rebar + cages that occur occasionally onsite. Some cages need repairs where gaps near the bottom can allow animals to enter the cage.

Some plantings that are still relatively small do not have cages. Recommend evaluating whether or not some plantings need cages.

Appendix C

Quantitative Monitoring Data Tables

Table 1. Summary of Year 2 Survival of Woody Container Plants

Features	Sum of Original Quantity Installed	Sum of Quantity Remaining	Average Survival (%)
ED03-01	46	10	21%
ED03-02	46	12	25%
ED03-03	46	11	23%
ED03-04	46	12	25%
ED03-05	46	16	33%
ID02	108	2	2%
ID03-01A	354	67	20%
ID03-02	170	17	8%
ID03-03	74	10	17%
ID03-04	125	35	22%
ID03-05	385	180	47%
Log Jams	300	54	18%
Total	**1,746**	**426**	**22%**

Table 2. Year 2 Survival of Woody Container Plants

Feature	Species	Comon Name	Original Quantity Installed	Quantity Remaining	Survival
ID03-01A	*Quercus lobata*	valley oak	34	16	47%
	Rosa californica	California wildrose	100	14	14%
	Salix laevigata	red willow	60	0	0%
	Salix lasiolepis	arroyo willow	60	11	18%
	Sambucus mexicana	blue elderberry	30	1	3%
	Symphoricarpos albus	common snowberry	70	25	36%
ID03-02	*Rhamnus californica*	California coffee berry	30	3	10%
	Ribes californicum	hillside gooseberry	60	10	17%
	Rosa californica	California wildrose	30	3	10%
	Rubus ursinus	California blackberry	30	0	0%
	Sambucus mexicana	blue elderberry	20	1	5%
ID03-03	*Rhamnus californica*	California coffee berry	13	2	15%
	Ribes californicum	hillside gooseberry	26	2	8%
	Rosa californica	California wildrose	13	0	0%
	Rubus ursinus	California blackberry	13	2	15%
	Sambucus mexicana	blue elderberry	9	4	44%
ID03-04	*Rhamnus californica*	California coffee berry	22	10	45%
	Ribes californicum	hillside gooseberry	44	7	16%
	Rosa californica	California wildrose	22	9	41%
	Rubus ursinus	California blackberry	22	4	18%
	Sambucus mexicana	blue elderberry	15	2	13%
	Salix laevigata	red willow	0	3	0%

Table 2. Year 2 Survival of Woody Container Plants

Feature	Species	Comon Name	Original Quantity Installed	Quantity Remaining	Survival
ID03-05	*Aesculus californica*	California buckeye	17	3	18%
	Baccharis salicifolia	mulefat	24	0	0%
	Quercus douglasii	blue oak	5	2	40%
	Quercus lobata	valley oak	49	11	22%
	Ribes californicum	hillside gooseberry	30	8	27%
	Rosa californica	California wildrose	65	32	49%
	Rubus ursinus	California blackberry	65	29	45%
	Salix laevigata	red willow	44	24	55%
	Salix lasiolepis	arroyo willow	44	44	100%
	Sambucus mexicana	blue elderberry	12	2	17%
	Symphoricarpos albus	common snowberry	30	25	83%
ED03-01	*Baccharis salicifolia*	mulefat	10	0	0%
	Quercus lobata	valley oak	12	9	75%
	Salix laevigata	red willow	12	0	0%
	Salix lasiolepis	arroyo willow	12	1	8%
ED03-02	*Baccharis salicifolia*	mulefat	10	0	0%
	Quercus lobata	valley oak	12	11	92%
	Salix laevigata	red willow	12	0	0%
	Salix lasiolepis	arroyo willow	12	1	8%
ED03-03	*Baccharis salicifolia*	mulefat	10	0	0%
	Quercus lobata	valley oak	12	10	83%
	Salix laevigata	red willow	12	0	0%
	Salix lasiolepis	arroyo willow	12	1	8%
ED03-04	*Baccharis salicifolia*	mulefat	10	0	0%
	Quercus lobata	valley oak	12	6	50%
	Salix laevigata	red willow	12	0	0%
	Salix lasiolepis	arroyo willow	12	6	50%
ED03-05	*Baccharis salicifolia*	mulefat	10	0	0%
	Quercus lobata	valley oak	12	7	58%
	Salix laevigata	red willow	12	0	0%
	Salix lasiolepis	arroyo willow	12	9	75%
ID02	*Baccharis salicifolia*	mulefat	36	0	0%
	Salix laevigata	red willow	36	0	0%
	Salix lasiolepis	arroyo willow	36	2	6%
Log Jams	*Platanus racemosa*	California sycamore	150	6	4%
	Quercus lobata	valley oak	150	48	32%

Table 3. Year 2 Summary of Wetland Quantitative Vegetation Monitoring Data

Species	Common Name	Wetland Indicator Status	Feature Average Percent Cover			
			SW02	*SW03*	*SW04*	*Reference Site*
Native						
Achillea millefolium	common yarrow	FACU	0	0	8	4
Acmispon americanus	Spanish clover	FACU	0	0	2	0
Barbarea orthoceras	American yellowrocket	FACW	1	0	0	1
Bromus carinatus	California brome	NL	4	0	0	0
Carex praegracilis	clustered field sedge	FACW	28	0	0	6
Cyperus eragrostis	tall flatsedge	FACW	2	0	4	0
Elymus glaucus	slender wheatgrass	FACU	0	5	13	15
Elymus trachycaulus	blue wildrye	FAC	1	49	1	11
Festuca microstachys	small fescue	NL	3	0	0	0
Festuca rubra	red fescue	FAC	0	0	2	0
Hordeum brachyantherum	meadow barley	FACW	0	0	15	3
Juncus effusus	soft rush	FACW	3	4	1	8
Juncus patens	western rush	FACW	6	5	0	9
Juncus xiphioides	irisleaf rush	OBL	18	14	0	7
Lupinus bicolor	miniature lupine	NL	0	0	2	1
Frangula californica	California coffee berry	NL	0	0	2	0
Rosa californica	California wildrose	FAC	0	0	7	0
Rubus ursinus	California blackberry	FACU	0	0	5	0
Salix lasiolepis	arroyo willow	FACW	0	0	8	0
Sisyrinchium bellum	western blue-eyed grass	FACW	0	0	2	0
Symphoricarpos albus	common snowberry	FACU	0	0	6	0
		Total Native	**62**	**75**	**78**	**65**
Non-native						
Avena fatua	wild oat	NL	0	0	5	3
Brassica nigra (l)	black mustard	NL	4	4	1	9
Bromus hordeaceus	soft brome	FACU	5	0	3	2
Centaurea solstitialis (l)	yellow star-thistle	NL	2	5	0	4
Cirsium vulgare (l)	bull thistle	FACU	0	1	0	1
Convolvulus arvensis	field bindweed	NL	2	0	0	0
Dipsacus fullonum	Fuller's teasel	FAC	0	1	0	1
Elymus caput-medusae (l)	medusahead	NL	2	2	2	7
Festuca perennis	perennial rye grass	NL	0	0	9	0
Gastridium phleoides	nit grass	FACU	0	0	0	1
Geranium dissectum	cutleaf geranium	NL	4	0	0	1
Hordeum marinum	seaside barley	FAC	8	0	1	0
Lepidium latifolium (l)	perennial pepper weed	FAC	0	4	0	2
Lythrum hyssopifolia	hyssop loosestrife	OBL	1	4	0	2
Polypogon monspeliensis	annual rabbitsfoot grass	FACW	0	0	2	0

Table 3. Year 2 Summary of Wetland Quantitative Vegetation Monitoring Data

Species	Common Name	Wetland Indicator Status	Feature Average Percent Cover			
			SW02	*SW03*	*SW04*	*Reference Site*
Rumex crispus	curly dock	FAC	6	0	1	1
Rumex pulcher	fiddle dock	FAC	2	4	0	2
		Total Non-Native	**36**	**24**	**23**	**34**
Summary Statistics						
		Total Vegetation Cover	**98**	**87**	**100**	**82**
		Total Wetland Plant Cover	**70**	**83**	**43**	**51**
		Total Invasive/Weed Cover	**8**	**16**	**3**	**22**
		Relative Native Cover	**63**	**76**	**78**	**80**
		Relative Wetland Plant Cover	**72**	**83**	**43**	**63**

Note: I = Invasive species
Wetland Status: UPL = upland; FACU = Facultative upland; FAC = Faculative; FACW = Facultative wetland; OBL = Obligate; NL= Not listed.

Table 4. Year 2 Summary of Stream and Riparian Buffer Quantitative Vegetation Monitoring Data

Species	Common Name	Feature Average Percent Cover							
		ID03-01A	*ID03-02*	*ID03-03*	*ID03-04*	*ID03-05*	*ED03-04*	*ID03-01B*	*Refernce Site*
Native									
Achillea millefolium	common yarrow	8	6	2	8	3	0	0	0
Acmispon americanus	Spanish clover	1	4	0	1	14	18	2	0
Artemisia californica	California sagebrush	0	0	0	0	0	0	0	0
Baccharis pilularis	coyote brush	0	2	0	0	4	0	0	10
Centromadia fitchii	Fitch's tarweed	0	0	0	2	4	0	4	0
Cyperus eragrostis	tall flatsedge	0	0	0	0	2	4	4	0
Elymus glaucus	slender wheatgrass	19	1	1	2	0	0	1	0
Festuca rubra	red fescue	0	2	0	0	2	0	0	0
Frangula californica	California coffee berry	0	5	10	5	0	0	0	0
Heliotropium curassavicum	salt heliotrope	0	9	4	5	0	0	0	0
Hordeum brachyantherum	meadow barley	9	0	0	0	6	0	30	0
Juncus bufonius	toad rush	0	0	0	0	0	0	1	0
Juncus effusus	soft rush	1	0	0	0	1	0	0	0
Lupinus bicolor	miniature lupine	2	1	0	0	0	0	2	0
Lupinus nanus	sky lupine	1	0	0	0	0	0	0	0
Madia gracilis	grassy tarweed	0	0	0	0	1	0	0	0
Phyla nodiflora	turkey tangle fogfruit	0	0	0	3	0	0	0	0
Quercus lobata	valley oak	1	0	0	0	2	11	0	68
Ribes californicum	hillside gooseberry	0	5	5	1	0	0	0	0
Rosa californica	California wildrose	1	1	0	6	0	0	0	0
Rubus ursinus	California blackberry	0	3	6	6	8	0	0	0
Rumex salicifolius	willow dock	0	3	0	7	1	0	0	0
Salix lasiolepis	arroyo willow	1	0	0	6	7	38	0	18

Table 4. Year 2 Summary of Stream and Riparian Buffer Quantitative Vegetation Monitoring Data

Species	Common Name	Feature Average Percent Cover							
		ID03-01A	*ID03-02*	*ID03-03*	*ID03-04*	*ID03-05*	*ED03-04*	*ID03-01B*	*Refernce Site*
Sambucus mexicana	blue elderberry	0	2	6	0	0	0	0	0
Sisyrinchium bellum	western blue-eyed grass	2	1	0	0	0	0	0	0
Stipa pulchra	purple needlegrass	0	0	0	0	0	0	0	0
Symphoricarpos albus	common snowberry	3	0	0	0	5	0	0	0
Total Native		**47**	**46**	**35**	**52**	**59**	**70**	**44**	**96**
Non-native									
Avena barbata	wild oat	10	15	14	11	10	21	20	4
Brassica nigra (I)	black mustard	1	4	2	5	6	0	4	1
Bromus hordeaceus	soft brome	4	8	2	0	0	4	5	0
Carduus pycnocephalus (I)	Italian plumeless thistle	0	0	0	0	0	0	0	1
Centaurea solstitialis (I)	yellow star-thistle	0	0	0	1	0	0	0	0
Elymus caput medusae (I)	medusahead	6	0	0	1	0	0	0	0
Festuca perennis	perennial rye grass	27	3	0	12	21	0	22	0
Hordeum murinum	seaside barley	1	0	0	4	0	0	0	0
Medicago polymorpha	burclover	0	0	1	1	0	0	0	0
Mentha pulegium	pennyroyal	0	0	0	0	0	0	0	0
Polypogon monspeliensis	annual rabbitsfoot grass	0	0	0	0	0	0	1	0
Rumex crispus	curly dock	0	0	0	5	2	4	1	0
Rumex pulcher	fiddle dock	0	0	0	2	0	0	0	0
Trifolium hirtum	rose clover	1	0	1	0	0	0	0	0
Total Non-native		**53**	**31**	**21**	**42**	**40**	**29**	**52**	**6**
Summary Statistics									
Total Vegetation Cover		**100**	**76**	**56**	**94**	**99**	**99**	**96**	**102**
Total Invasive/Weed Cover		**7**	**4**	**3**	**7**	**7**	**0**	**4**	**2**
Relative Native Cover		**47**	**60**	**63**	**56**	**59**	**71**	**46**	**94**

Note: I = Invasive species

Table 5. Year 2 Summary of Amphibian Monitoring Data

AD01 Pond Number	Percent Inundation	Max Water Depth (ft)	Temperature (°F)	Species Present
1	60	2.0	69	Tree frog tadpoles, CRLF, WPT
2	60	2.5	70	Tree frog tadpoles, western toad tadpoles, CRLF
3	65	2.0	80	Tree frog tadpoles, western toad tadpoles
4	65	3.5	69	Tree frog tadpole, western toad tadpole, California newt larvae, water boatmen
5	45	1.0	80	None

*CRLF = California Red-Legged Frog; WPT = Western Pond Turtle

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Appendix D

Geomorphic and Hydrologic Monitoring Report

YEAR 2 GEOMORPHIC AND HYDROLOGIC MONITORING, SAN FELIPE CREEK RESTORATION PROJECT, JOSEPH D. GRANT PARK, SANTA CLARA COUNTY, CALIFORNIA

Report prepared for:

John Zanzi and Michael Sweesy, Dudek

Prepared by:

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

Balance Hydrologics, Inc.

December 2020

A report prepared for:

John Zanzi and Michael Sweesy
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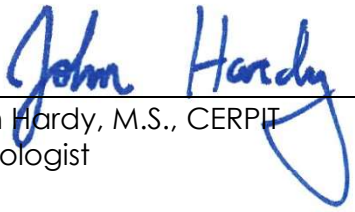
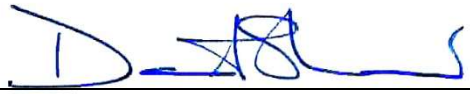
Year 2 Geomorphic and Hydrologic Monitoring, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California

 Project Assignment: 215108
by

Eric Donaldson, P.G.
Project Manager



John Hardy, M.S., CERPIT
Hydrologist



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

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December 23, 2020

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APPENDICES

EXECUTIVE SUMMARY

This report summarizes the annual geomorphic and hydrologic monitoring results for Year 2 monitoring (Water Year[1] 2020, WY2020) 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 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 registered in the state of California, under subcontract to Habitat Restoration Sciences (HRS) and in coordination with Dudek. This report provides a brief description of the project, the success criteria set forth in the San Felipe Creek Restoration Project Mitigation and Monitoring Plan (MMP, Monarres and others 2018), monitoring methods, monitoring results, and recommendations based on the second year of post-project monitoring.

WY2020 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 diminished recharge. Shallow groundwater data suggests that the valley-fill aquifer never fully saturated, and that groundwater flow toward San Felipe Creek occurred predominantly from the right (west) bank. Streamflow at San Felipe Creek and Boyds Creek was intermittent and never exceeded a 2-year event, meaning that a topographic survey was not required for WY2020. 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 actions for select areas. This adaptive management is discussed in the WY2020 adaptive management technical memorandum (Sweesy, 2020). During the end of year site visit, no new areas of apparent problematic erosion were observed. At the time of this report, the project is performing as intended and is meeting the hydrologic and geomorphic success criteria laid out in the MMP.

[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, WY2020 occurred from October 1, 2019 through September 30, 2020.

1. SITE DESCRIPTION AND MONITORING CRITERIA

The San Felipe Creek Restoration project (Project) site is located along San Felipe Creek in Halls Valley at approximately 1300 feet elevation North American Vertical Datum of 1988 (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 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 sustainable and dynamic channel and floodplain functions along San Felipe and Boyds Creeks between the Corral Trail and Cañada de Pala Trail.

Legacy agricultural activities have 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 restoration of San Felipe Creek 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. We have catalogued relevant hydrologic and geomorphic success criteria

and associated monitoring approaches 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. 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 3 topographic surveys are required over the course of the 10-year monitoring period, and one survey will be reserved for Year-10 monitoring.

2.1 Hydrologic Monitoring

2.1.1 WY2020 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. The station is located within the same 24-inch mean annual precipitation (MAP) isohyet (contour of equal rainfall) as the project site, as based on the Santa Clara County Drainage Manual (Schaaf and Wheeler, 2007), thus UCBO rain gage provides an estimate of rainfall at the project site.

2.1.2 WY2020 Water Levels and Streamflow Monitoring

We established a stream, wetland, and groundwater-level monitoring network following completion of construction 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 have established three streamflow gages, two on San Felipe Creek (SFUS and SFDS) and one on Boyds Creek (BCUS). 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[3]. 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 adequate and practical. Additional measurements will be taken opportunistically, but due to the limited surface flows at the site during Year 2, 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 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 was 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.

Peak stage near floodplains: In order to most accurately record peak stage and document whether floodplains were inundated, we installed six additional water level recorders at select locations across the project site. Data from these

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

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 stations are shown in **Figure 2**.

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 referred to 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.
- Pre-existing enhanced and restored wetlands that are within or near the project area are referred to in terms of the names 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 near wetland features and the plug ponds at ED03. Peak stage gages are placed in channels associated with the Boyds Creek alluvial fan as well as in the channel that drains the ponded areas at ED03.

2.2 Geomorphic Monitoring

2.2.1 Qualitative Observations

Balance staff will visit the site during the wet and dry season to observe streamflow conditions, areas of surface ponding, document evidence of runoff patterns, and inspect the stability of constructed features. Hydrologic observations are catalogued in field observer logs. When practical and safe, a small unmanned aerial vehicle (UAV, or drone) is used to collect oblique 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, as described below.

Channel evolution monitoring metrics are intended to identify whether channel bed and banks, large wood, and floodplain benches evolved and if aggradation or scour took place over the year. During years when SFUS peak flows exceed the 2-year recurrence threshold, geomorphic change surveys are conducted using a UAV which is flown over the project area to collect detailed aerial photography and topographic data. These flights are ground point controlled based on RTK surveys using a Leica Zeno GG04 plus Smart Antenna and referenced to the NAD83 California zone 3 (US ft) datum (EPSG:2227). Using Agisoft™ software, orthoimages and digital elevation models (DEM) are produced from each flight. To check the quality of the generated DEM's, we compare manually-collected survey data to corresponding DEM elevations[4].

Comparison of the as-built DEM with up-to-date topography allows us to create a DEM-of-difference (DOD)- a spatially explicit map of topographic change (aggradation and degradation) that occurred over the water year.

[4] Survey points were collected during Year-0 as-built surveys for comparison and archived.

3. MONITORING RESULTS

3.1 Overview of Annual Conditions

WY2020 was a dry year, with below average annual precipitation. WY2020 was characterized by a few low to moderate intensity storms that mainly occurred between early March and late May. The annual peak flow occurred on April 5, 2020 and is estimated to have been approximately 36 cfs at the SFUS stage and estimated streamflow station. This is less than the estimated 2-year flow (**Table 3**). Therefore, topographic surveys were not conducted.

3.1.1 Rainfall

Annual precipitation in the vicinity of the Project site was 18.8 inches during WY2020, as recorded at the UCBO station (**Figure 4**), well below 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 9-year period of record is 28.4 inches.

Annual precipitation during WY2020 was characterized by several low intensity storms in November through January, almost no rainfall in February, and a few low to moderate intensity storms that occurred relatively late in the season, with nearly half of the measured rainfall occurring between March and May 2020. The largest WY2020 events were multi-day storms that occurred in March and April. From March 14 to March 17, 2020, 3.7 inches of rain was recorded. From April 4 to April 7, 2020, 2.5 inches of rain was recorded. Peak 24-hour rainfall was 1.7 inches, recorded on April 5, 2020, and resulted in the peak stage and streamflow measured across the site.

3.1.2 Hydrologic Monitoring Results

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) began after approximately 14 inches of seasonal rainfall occurred at the Blue Oak Reserve whereas streamflow at the San Felipe Creek upstream station (SFUS) began after approximately 17 inches of seasonal rainfall. Streamflow was intermittent on both Boyds Creek and San Felipe

Creek. After the late winter storms, the BCUS became dry while flow and ponding persisted at SFUS for longer, with ponding persisting in pools in the absence of continuous flow in the channel. The annual peak flows on both San Felipe and Boyds Creeks were recorded on April 5, 2020, with flow peaks at BCUS and SFUS estimated to be 23 and 36 cfs, respectively (**Figure 4** and **Figure 5**). It should be noted that we did not collect enough calibration data at SFDS to generate flow estimates from the record of stage. When sufficient data are collected, we will add a record of streamflow to **Figure 6**. Until then, SFUS and BCUS will suffice for estimating streamflow.

As noted above, 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 7a** and **7b**) and Boyds Creek (**Figures 8a** and **8b**). Water level in Piezometer 16-2 suggests that groundwater levels in the alluvial aquifer underlying the site began rising to near the surface[5] on March 21, 2020, after approximately 13 inches of cumulative seasonal rainfall. However, water levels were not detected in Piezometer 19-1 and Piezometer 16-5 until April 5, 2020, after approximately 17 inches of cumulative seasonal rainfall.

Filling of the aquifer in the vicinity of the Boyds Creek alluvial fan closely followed intermittent streamflow in Boyds Creek and the initial and intermittent streamflow in San Felipe Creek (**Figures 7b** and **8b**), which occurred on April 5, 2020. This was also observed at Boyds Creek avulsion channels BCA3 and BCA4 (**Figure 9**). The response at BCA3 was immediate and only persisted for roughly 9 hours, whereas the response at BCA4, which is centered in the Boyds Creek alluvial fan, was initiated on April 7, 2020 and lasted for several days. We attribute the delayed response at BCA4 to aquifer recharge as the onset of streamflow corresponds to peak groundwater conditions at Piezometer 16-5. We surmise that hydrologic response at Piezometer 16-5 is primarily driven by infiltration from portions of Boyds Creek. These data and observations suggest that during the early part of the wet season, aquifer recharge to the Boyds Creek alluvial fan occurs by way of a 'losing stream' condition along Boyds Creek.

[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.

Similarly, this 'losing stream' relationship is also indicated by hydraulic gradients between the San Felipe Creek channel (SFUS) and Piezometers 19-1 and 16-2, where water surface elevations at the right (west) bank and in the stream are higher than that in the valley on the left side of the stream. Unlike WY2019, this relationship persisted through the season, indicating that the valley-fill aquifer never fully saturated, and that groundwater flow toward San Felipe Creek occurred predominantly from the right (west) bank. Groundwater conditions at Piezometer 16-2 mostly remained higher than San Felipe Creek (**Figure 7b**) through the season, which suggests that San Felipe Creek is supported by groundwater which emanates from the western hillside late into spring.

Groundwater and surface water gages (Piezometer 16-3 and ADWW, respectively) in the vicinity of the restored agricultural ditch (ED03) are presented in **Figure 10**. Similar to groundwater conditions at project monitoring locations upstream, groundwater conditions adjacent to the restored agricultural ditch did not rise to near the ground surface until the onset of heavy rains in mid-March and early April, as reflected in the groundwater hydrograph from Piezometer 16-3. It appears that water levels in the restored agricultural ditch (ED03) did not rise high enough to spill out over the bank and inundate the gage at ADWW. However, data from ADWW indicates that intermittent sheet flow and inundation occurred during the storms that occurred of January 16, 2020, March 16, 2020, and April 5, 2020.

Surface ponding in the seasonal wetland at station CTSW is presented in **Figure 11**. Inundation of the wetland initiated in early April and lasted approximately nine days. Photographs of the wetland taken during the April 29, 2020 site visit shows moist/saturated soils around the gage, 24 days after the storm of April 5 (**Figure 12**).

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

The MMP states that the wetland success criteria is 14 days of inundation/saturation in normal to wet years. Because rainfall during WY2020 was well below the long term average, the site is still meeting the wetland hydrology success criterion.

The data indicate that groundwater and surface water levels began to rise after about 13.7 inches of rain occurred, with peak groundwater conditions occurring after approximately 17.6 inches of cumulative rainfall. This contrasts with conditions during WY2019, when groundwater response and streamflow commenced after about 11.0 inches and 13.6 inches, respectively. This difference may be attributed to a hydrologic

'reset' that occurred during the dry spell that occurred from late January to early March, and overall diminished aquifer recharge with below average rainfall.

Based on the record at station ADWW (**Figure 9**), seasonal wetland areas (SW02 and SW04) at the south end of the site near the restored agricultural ditch (ED03) experienced intermittent sheet flow and inundation during the storms that occurred on January 16, 2020, March 16, 2020, and April 5, 2020. These periods of inundation did not last more than one day each and do not appear to be linked to groundwater elevations in Piezometer 16-3. Ponding on the west side of the restored agricultural ditch at ADWW did occur during WY2019, an above-average rainfall year, so it appears that the project had restored wetland hydrology to these former wetlands directly adjacent to the incised agricultural ditch, however, the timing and intensity of rainfall during WY2020 was insufficient to generate a sustained surface water response. Site-visit notes collected by SCVHA staff suggest the upstream side of each plug pond went dry around the following dates:

ED03-01: between August 7, 2020 and August 12, 2020

ED03-02: week of July 15, 2020

ED03-03: week of July 22, 2020

ED03-04: between August 6, 2020 and September 9, 2020

ED03-05: week of July 15, 2020

The Corral Trail Wetland (SW03) was inundated for nine days beginning on April 5, 2020 (**Figure 10**), with saturated conditions observed on April 29, 2020.

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

A 2-year streamflow event did not occur during WY2020, therefore, this success criteria is not applicable.

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

Success Criteria 3 (**Table 1**) mandates that flows from Boyds Creek 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. The April 5, 2020 storm generated flow at the BCA3 and BCA4 channels (**Figure 11**).

3.5 Geomorphic Monitoring Results

3.5.1 Geomorphic Observations

Balance staff visited the project site on April 29,2020, May 7, 2020, September 23, 2020, and September 30, 2020 to make visual observations of the constructed project elements. Ground-based and aerial photographs were taken on September 23, 2020 and stitched together to create an orthorectified mosaic aerial photograph of the entire site.

The annual peak flows on both San Felipe and Boyds Creeks were recorded on April 5, 2020, estimated to be 23 and 36 cfs at BCUS and SFUS, respectively. Because these flows were below the 2-year recurrence flow for these sites (37 cfs and 44 cfs, respectively), topographic data were not processed to evaluate geomorphic change during WY2020. **Appendix B** presents the aerial orthomosaic photograph taken on December 21, 2018, **Appendix C** presents the aerial orthomosaic photograph taken on October 16, 2019, and **Appendix D** presents the aerial orthomosaic photograph taken on September 23, 2020. For comparison, we have attached the as-built drawings in **Appendix E**[6].

3.6 Success Criterion 4: Less Than One Foot of Elevation Loss in Stream Channels, Averaged Over Reach and Absent of a Significant Knick Point

We did not collect data to detect topographic change and evaluate success criterion 4 during WY2020. However, observations made during site visits did not indicate any new areas of problematic erosion during WY2020. For the purposes of the success criterion, we take reach 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.

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

[6] 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.

actions for select areas. This adaptive management is discussed in the WY2020 adaptive management technical memorandum (Sweesy, 2020).

3.6.1 ED01-01 - Boyds Creek Alluvial Fan

In WY2019, three logs[7] from two separate living log jams floated downstream. Logs placed as part of the living log jams were not anchored during construction and therefore movement of logs was anticipated. In many cases, we observed localized erosion within 1 to 10 feet of the placed logs, along 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. During the September 30, 2020 site visit, it did not appear that any new problematic erosion associated with placed logs occurred during WY2020. Though localized scour and deposition greater than one foot occurred locally, no net degradation or lowering of the streambed was observed. This is consistent with the expected response described in the MMP; the living log jams are functioning as intended. Plantings at the living log jams (**Figure 12**) could take years to establish and restore wood function. Based on a collaborative review at the end of WY2020, the Team decided to replace one log in an effort to protect three oak plantings. This adaptive management is discussed in the WY2020 adaptive management technical memorandum (Sweesy, 2020). Beyond planned adaptive management for WY2020, we will continue to monitor placed logs and make adaptive management recommendations if floodplain inundation, bed elevation success criteria are not met, or if vegetative survivorship success criteria are threatened.

3.6.2 Graded Swale (ID03-01a)

No erosion was noted at the graded swale, and the feature appears to be functioning as intended. The 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.

3.6.3 San Felipe Creek Graded Floodplain ID03-01

No notable erosion or deposition was noted between WY2019 and WY2020 end-of-year site inspections. We noted, however, that grasses are establishing well on the floodplain

[7] Restoration structures constructed of wood (i.e. living log jams [ID01-01]and log drop structures [ID03-05]) are labeled using letters to facilitate identification during monitoring. Lettering is in no particular order.

and we anticipate those will provide additional soil strength. Thus, the channel and floodplain morphologies are within the expected range of outcomes and is meeting Success Criterion 4.

3.6.4 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. Storm flows appear to have inundated and flowed across the created floodplain features with enough velocity to form a new channel. In 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 have formed a backwater pool/channel at low flows.

Year 1 topographic data (Donaldson and others, 2020) indicated that some areas of the floodplain at ID03-02, on 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 during WY2020 suggest the cutoff channel changed little during WY2020 (**Figure 14**). The channel incision is localized and appears to be accompanied by a similar amount of deposition in the original channel, thus extensive channel incision on San Felipe Creek is not anticipated as a result of current channel dynamics. Thus, we interpret that Success Criterion 4 is being met at this location. However, based on a collaborative review at the end of WY2020, the Team seeks to offset the risk of a new channel evolving to become a dominant and/or incising single thread channel. Thus, the Team has proposed to install an engineered debris jam in the inlet of the new channel to force flows to spread across the created floodplain area. This plan is described in the Draft San Felipe Creek Restoration Remediation Plan (Sweesy, 2020).

Similar to ID03-02, the constructed floodplains at ID03-03 and ID03-04 were reconfigured during WY2019 high flows, but a distinct new channel alignment did not form 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 active channel dynamics within the inset and widened floodplain corridors. We therefore do not recommend adaptive management of the other floodplain features at this time. If incision in excess

of one foot begins to propagate upstream or downstream of the reach (see map of reaches in Appendix A), adaptive management may be warranted at ID03-03 and ID03-04.

3.6.5 Created Channel ID03-05

During WY2019, we observed 1-3 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 E** for boundary fence alignment). With the exception of the dramatic increase in vegetative cover, the bank erosion appears to not have changed during WY2020 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.

3.7 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 (**Figure 15**). The PVC pipes in the drainage were not clogged and appeared to function well through WY2020. There was no evidence (e.g. high water marks) that the Corral Trail did not overtop during WY2020. No deleterious erosion or deposition was observed along the Corral Trail. The articulated mat Arizona Crossing constructed on the Lower Hotel Trail is performing as designed and no deleterious erosion or deposition was noted.

3.8 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. All of the staked debris jams appear to have trapped sediment and debris during WY2019, but it appears that the reach transported more sediment than it received from upstream, and the hand-built debris jams appear to be less full of sediment and debris at the end of WY2020 than was observed at the end of WY2019. This process is to be expected, and it appears all the staked debris jams are functioning as intended (**Figure 15**). At this time, we recommend adding a second course of staked debris jams, as outlined in the MMP, during summer 2021. At this point as all jams are considered to be "full", trapped sediment and debris has had the opportunity to consolidate, and the channel would benefit from additional aggradation.

4. CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

The San Felipe Creek Restoration Project is performing as intended and is meeting the hydrologic and geomorphic success criteria laid out in the MMP. In WY2020, all applicable success criteria were met.

Based on Year 1 and Year 2 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.
- Boyds Creek appears to lose flow to the alluvial aquifer under a wider range of conditions than San Felipe Creek, which appears to receive groundwater discharge from the western hillside.
- 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.
- Year 1 monitoring data suggested the restoration project increases the rate of groundwater recharge and the volume of storage. Aquifer saturation appeared to have been achieved after approximately 11 inches of rainfall during WY2019. In contrast, during WY2020, with below-average rainfall; water levels did not rise in Piezometer 16-2 until after approximately 14 inches of rainfall, and groundwater levels in the vicinity of Piezometer 16-2 did not approach the ground surface until approximately 17 inches of rainfall. We attribute this to the mid-winter dry spell which occurred just WY2020.
- At this time, we recommend adding the second course of staked debris jams during summer 2021, as all the jams are stabilizing with aggraded sediment.

Based on input from the project Team, and an order to improve plant survivorship and cover, we have recommended two locations where adaptive management may benefit the project:

- Three placed logs moved during this first year following implementation, as was anticipated. Boyds Creek is performing as desired and currently meets the success criteria of less than 1 foot of vertical streambed elevation change in a dynamic setting. The Team has recommended replacing one of the dislodged logs in an effort to protect three oak plantings. This adaptive management

action is described in the draft adaptive management plan (Sweesy, 2020) and will be evaluated and included in the Year 3 monitoring report. We anticipate that more logs may move during future events and we will continue to monitor log movement and make adaptive management recommendations which encourage success of riparian plantings if needed.

- At ID03-02 channel incision is localized and appears to be accompanied by a similar amount of deposition in the original channel, thus extensive channel incision on San Felipe Creek is not anticipated as a result of current channel dynamics. However, based on a collaborative review at the end of WY2020, the Team seeks to offset the risk of a new channel evolving to become a dominant and/or incising single thread channel. Thus, the Team has proposed to install an engineered debris jam in the inlet of the new channel to force flows to spread across the created floodplain area. This plan is described by Sweesy (2020).

This monitoring program is scheduled and funded to continue through Year 3, and Balance will continue monitoring with respect to the success criteria, with additional attention on the processes affecting the above areas of interest.

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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

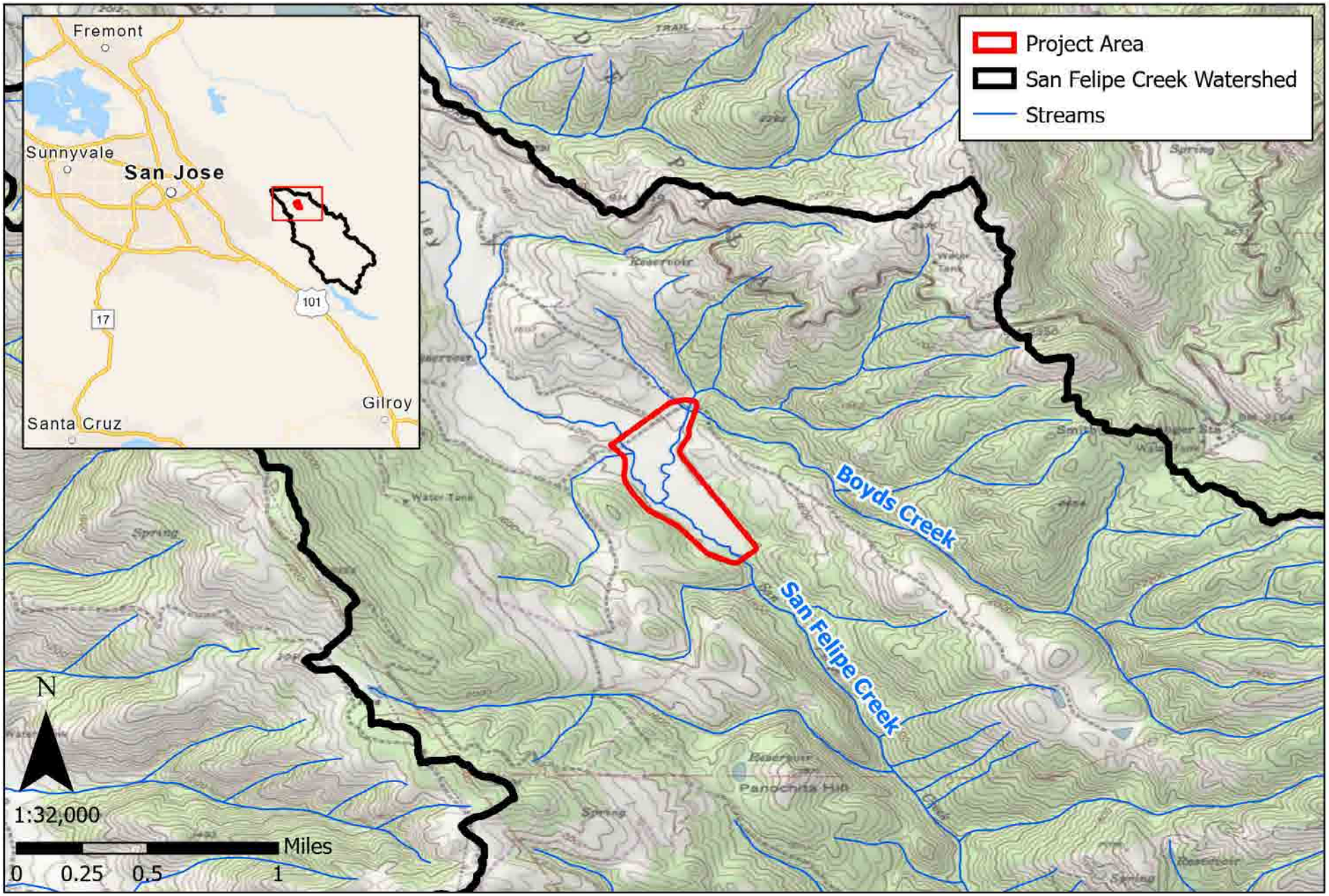
Station Name	Gage type	Station Description
Seasonal wetland water level gages and piezometers		
Piezometer 16-2	Piezometer	Formerly Piezometer A, to the west of San Felipe Creek near station SFUS (adjacent to project area ID03-01)
Piezometer 19-1	Piezometer	To the east of San Felipe Creek near station SFUS (adjacent to project area ID03-01)
Piezometer 16-5	Piezometer	Formerly Piezometer C, to the 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	Between SW02 and SW04 (agricultural ditch wetland) (channel that drains the ponded areas at ED03)
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 avulsion channels (in project area ED01-01)
BCA2	Water level	Boyds Creek avulsion channels (in project area ED01-01)
BCA3	Water level	Boyds Creek avulsion channels (in project area ED01-01)
BCA4	Water level	Boyds Creek avulsion channels (in project area ED01-01)
ADDC	Water level	Water level gage in SW04 (agricultural ditch wetland) drainage channel (in project area ID03-05)
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*	*Incising Agricultural Channel*	*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

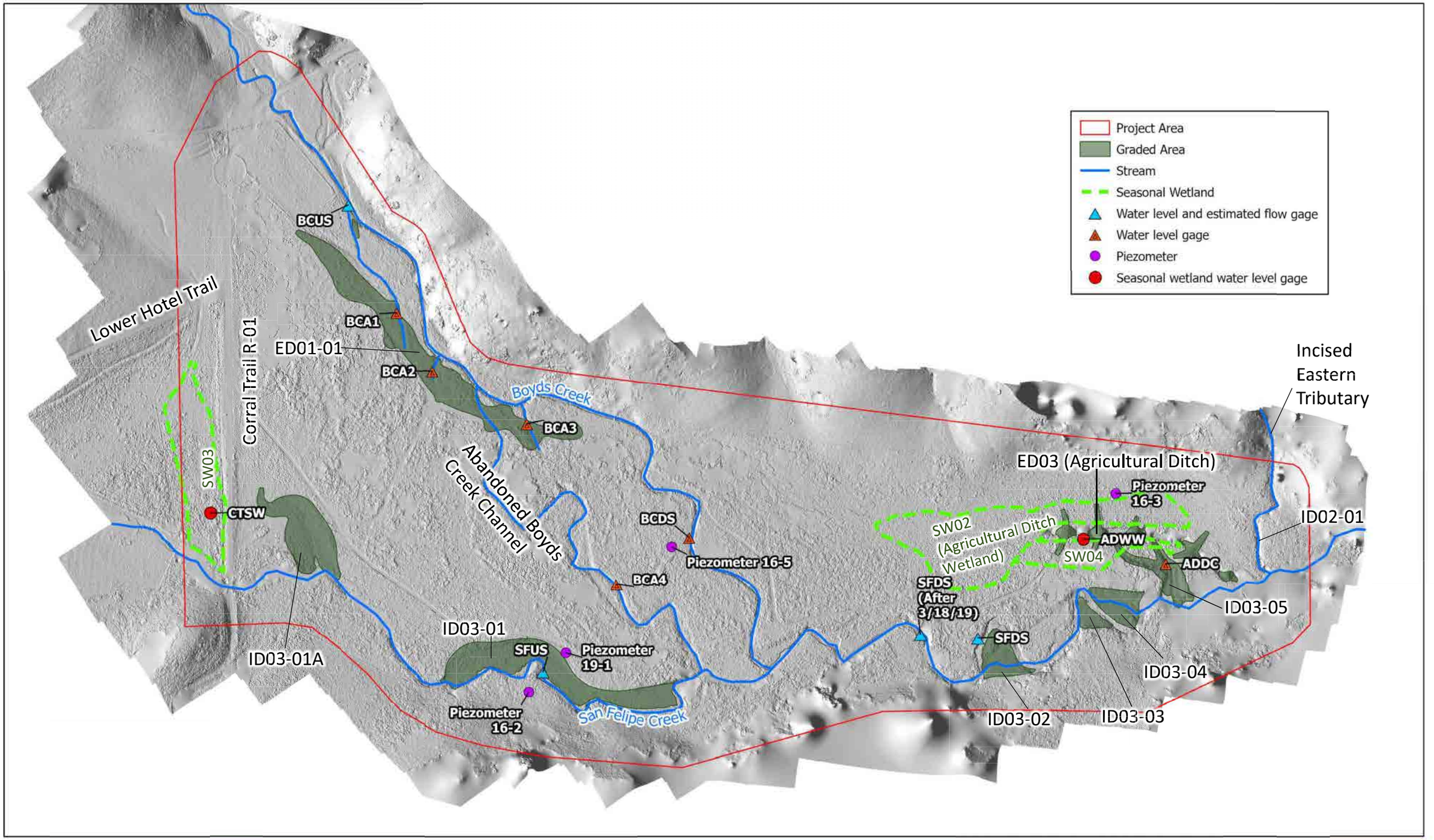


Balance Hydrologics

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

W:\Projects\215108.aprx

Source: ESRI 2020, Balance Hydrologics 2020



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

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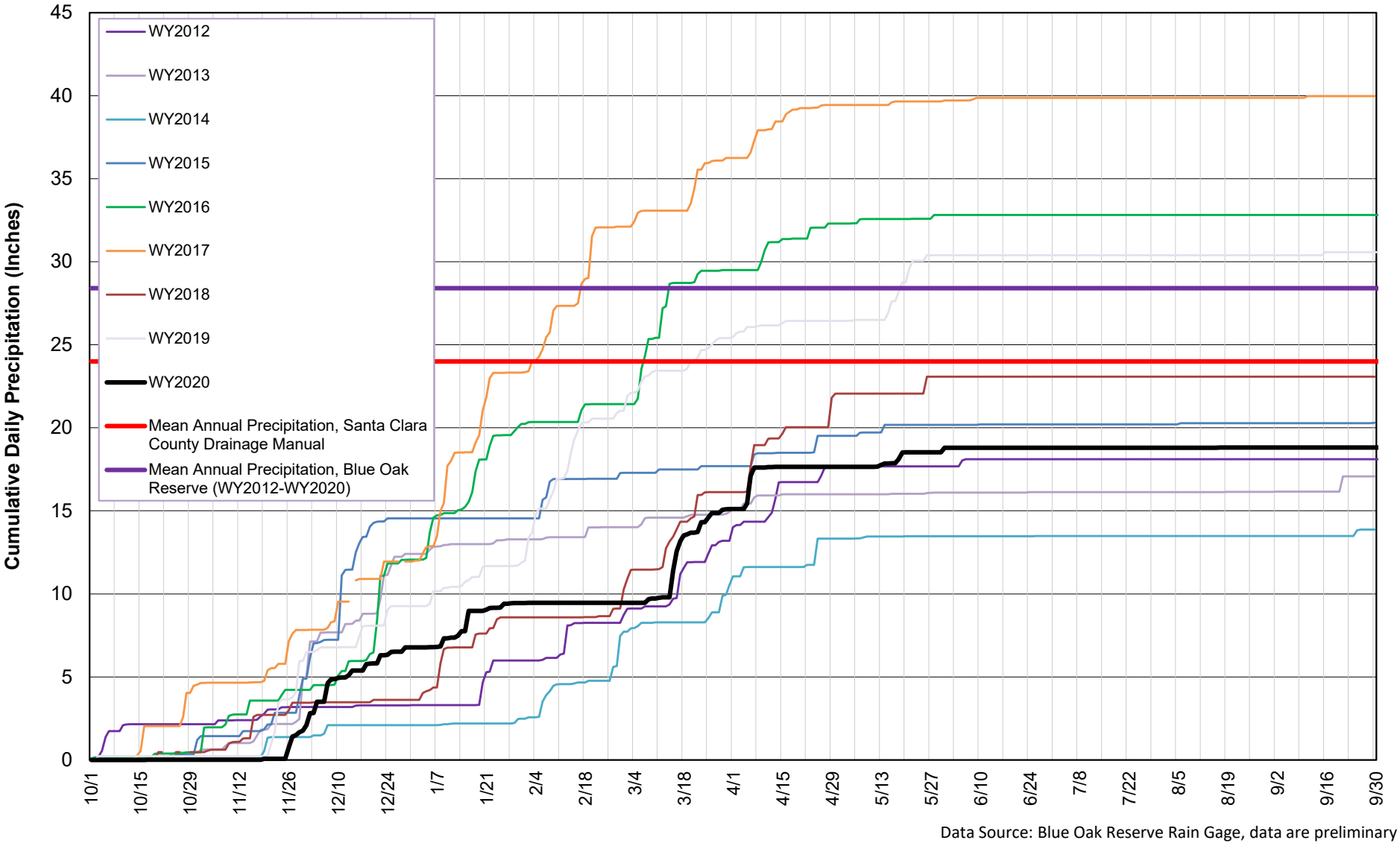
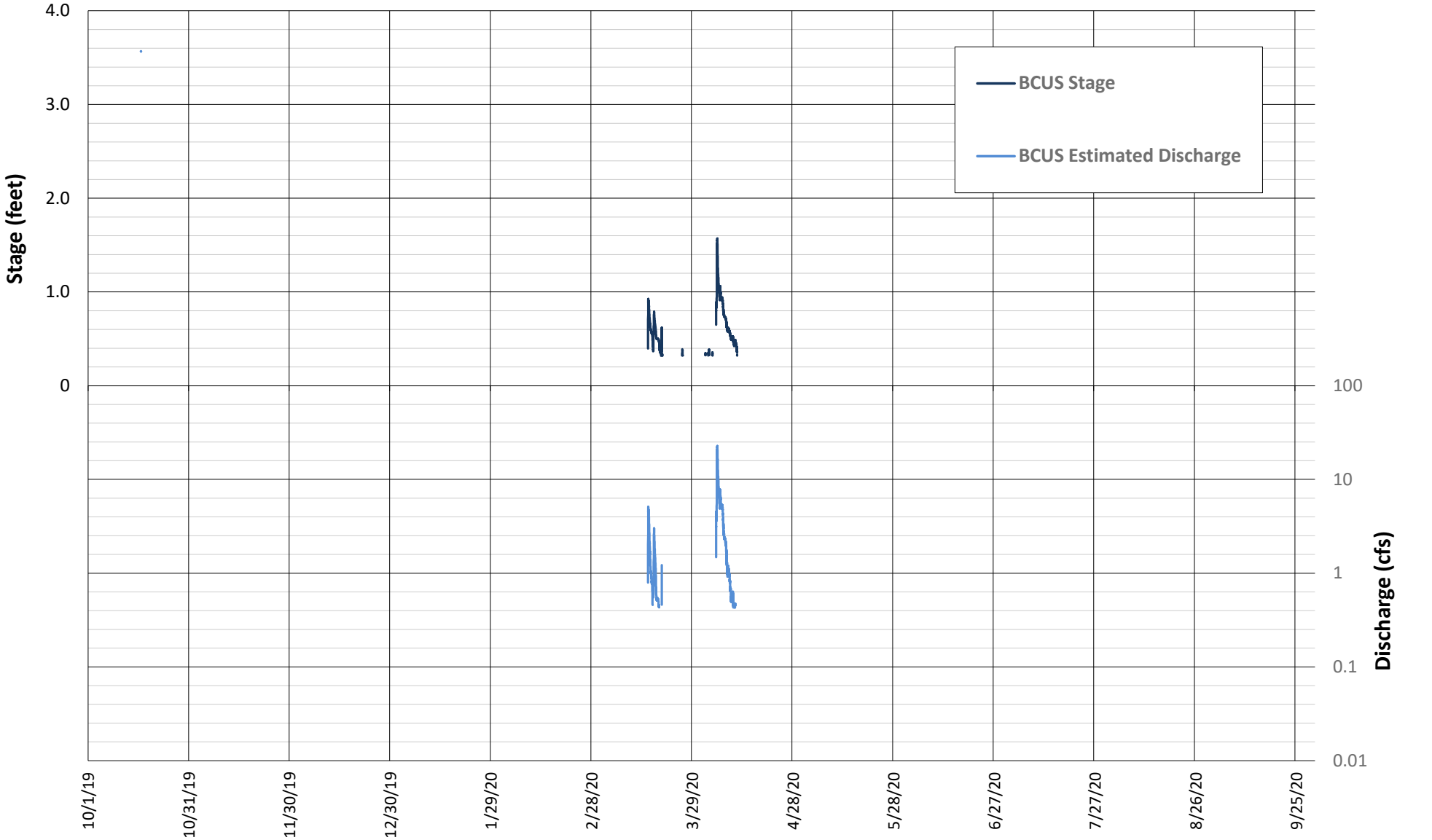


Data Source: Blue Oak Reserve Rain Gage, data are preliminary

Balance Hydrologics™

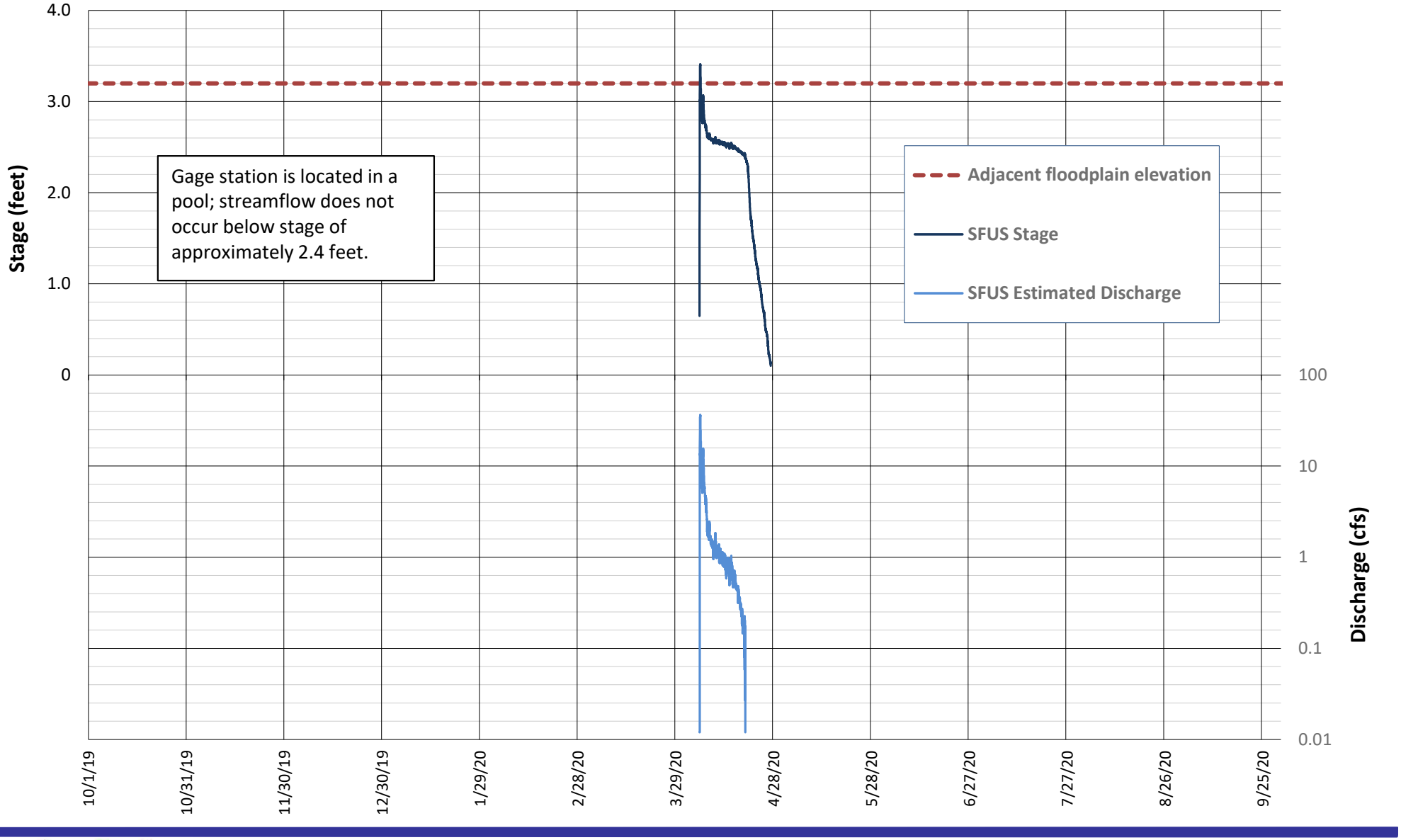
Figure 3. **Cumulative daily precipitation, Blue Oak Reserve, San Jose, California, water years 2012 - 2020.** Total annual rainfall in WY2020 was well below the long-term mean annual precipitation (approximately 24 inches per Santa Clara County Drainage Manual), and the 9-year average at the Blue Oak Reserve (28.4 inches).



Balance Hydrologics

215108 BCUS,SFDS,SFUS Work up.xlsx

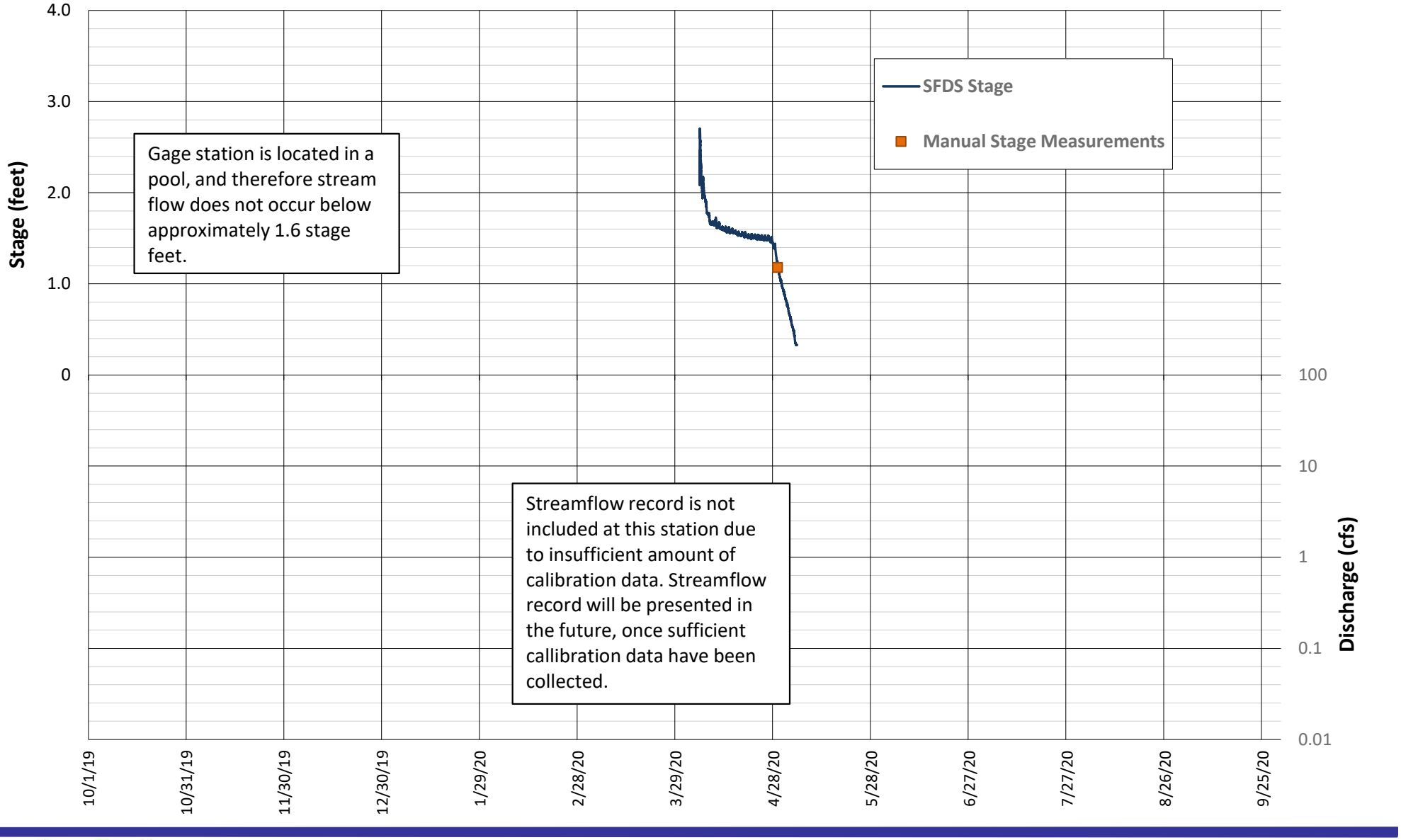
Figure 4. Water level and estimated discharge at the Boyds Creek upstream station (BCUS), water year 2020, San Felipe Creek Restoration Project, Santa Clara County, California. Record of flow is an estimate based on limited calibration measurements.



Balance Hydrologics

Figure 5. Water level and estimated discharge at the San Felipe Creek upstream station (SFUS), water year 2020, San Felipe Creek Restoration Project, Santa Clara County, California

215108 BCUS,SFDS,SFUS Work up.xlsx



Balance Hydrologics

Figure 6. Water level at the San Felipe Creek downstream station (SFDS), water year 2020, San Felipe Creek Restoration Project, Santa Clara County, California

215108 BCUS,SFDS,SFUS Work up.xlsx

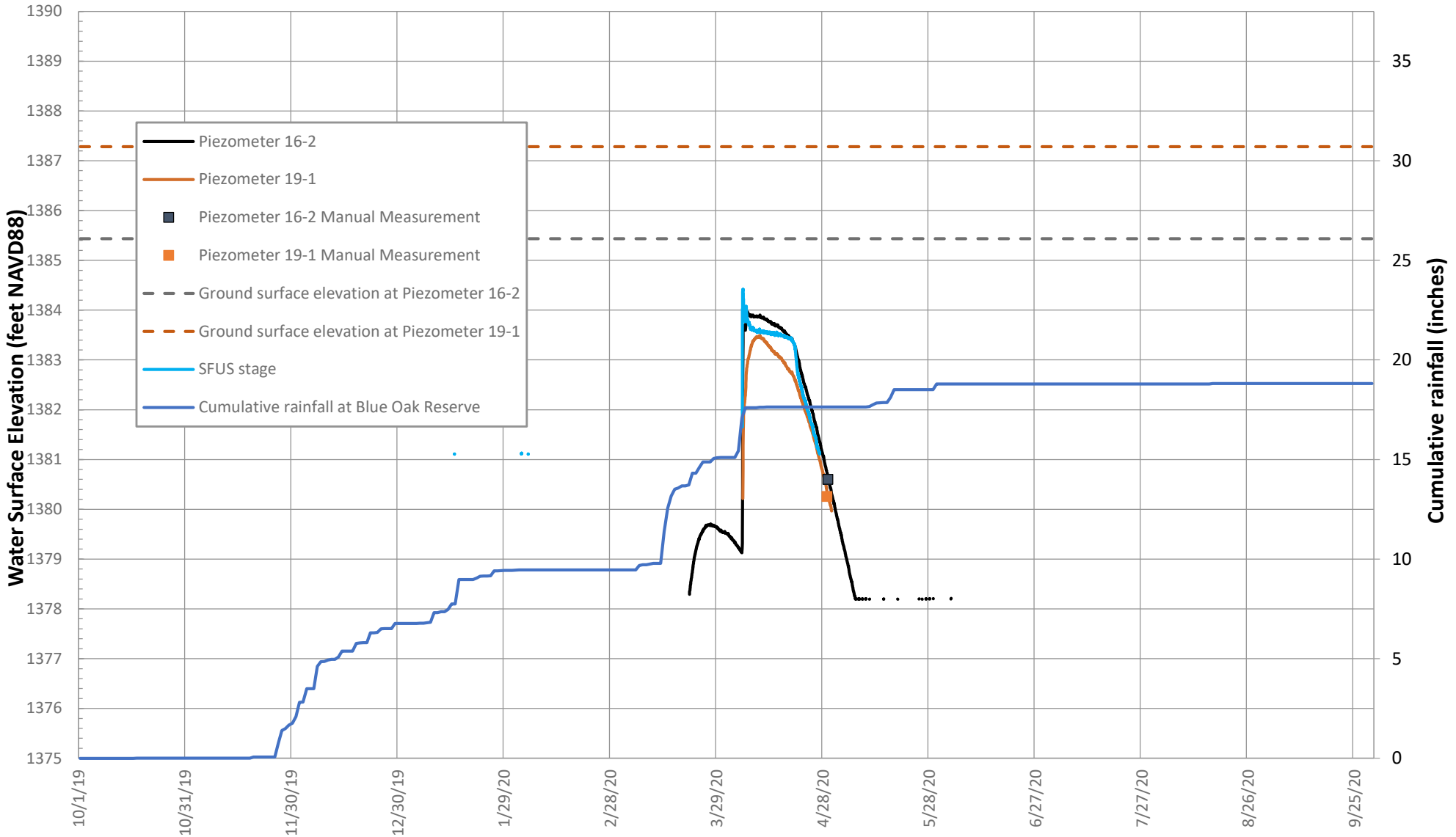


Figure 7a. **Shallow groundwater levels at Piezometers 16-2 and 19-1, and surface water level in San Felipe Creek (SFUS), WY2020. San Felipe Creek Restoration Project, Santa Clara County, California.**

Balance Hydrologics

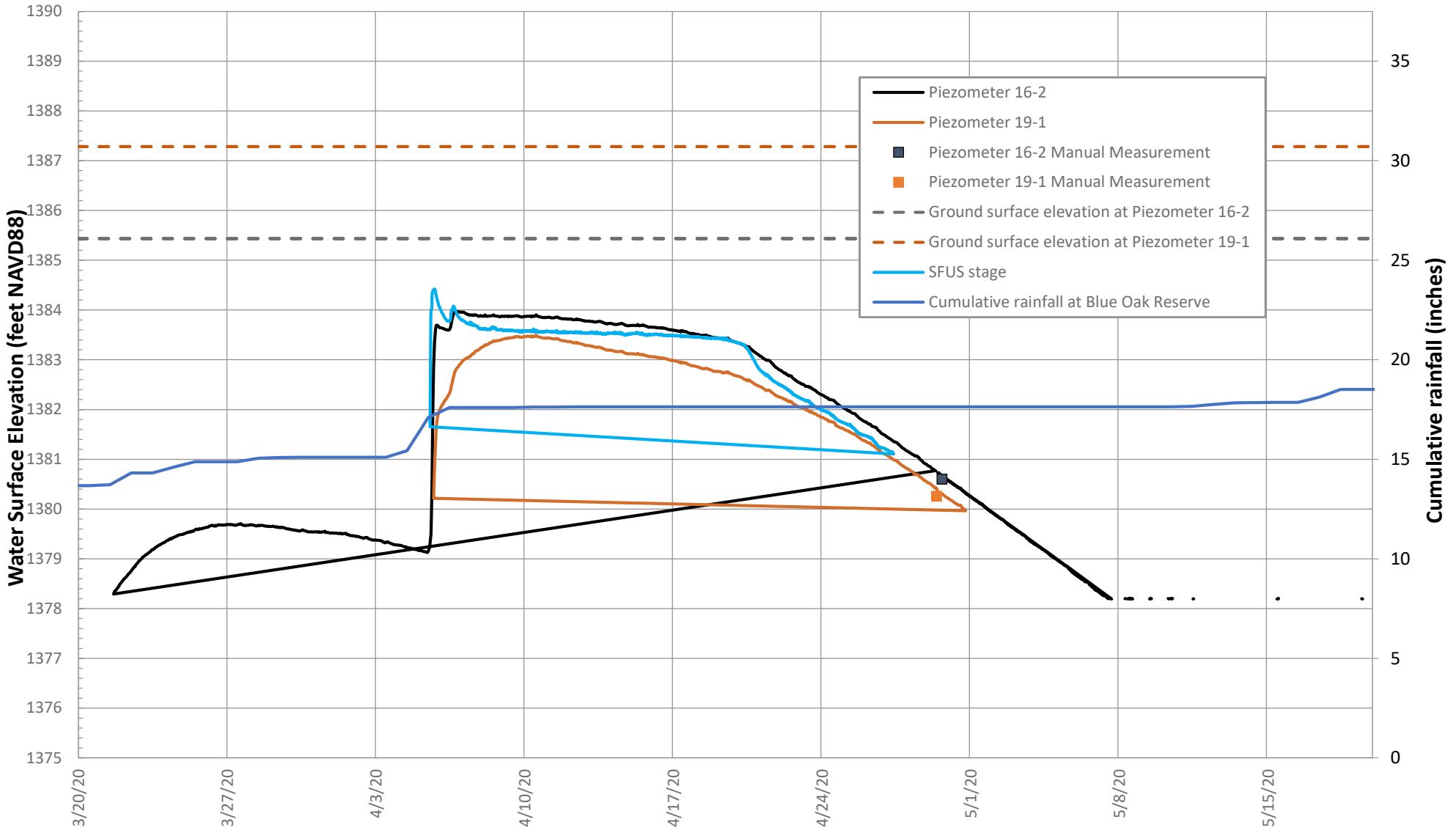
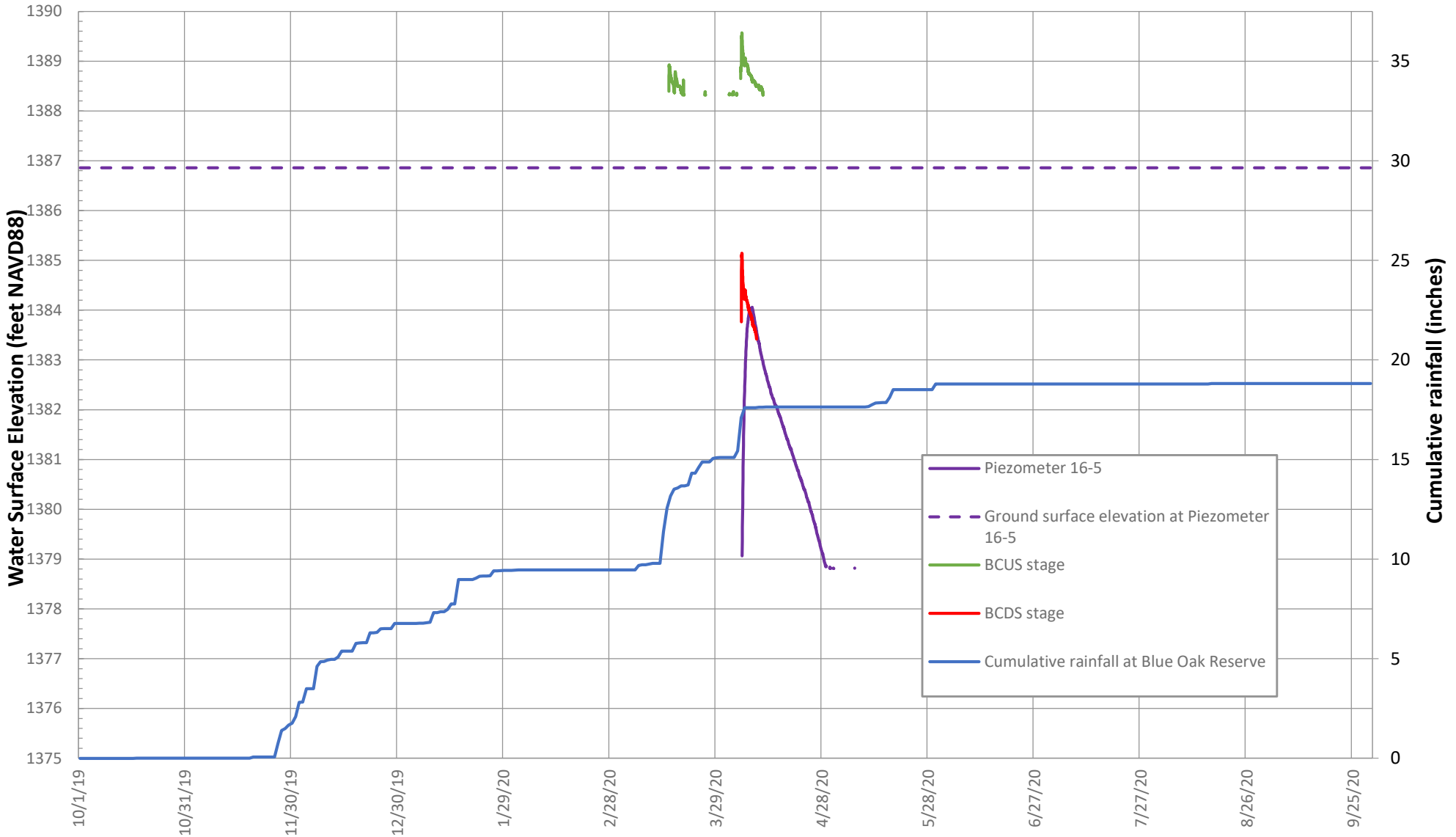


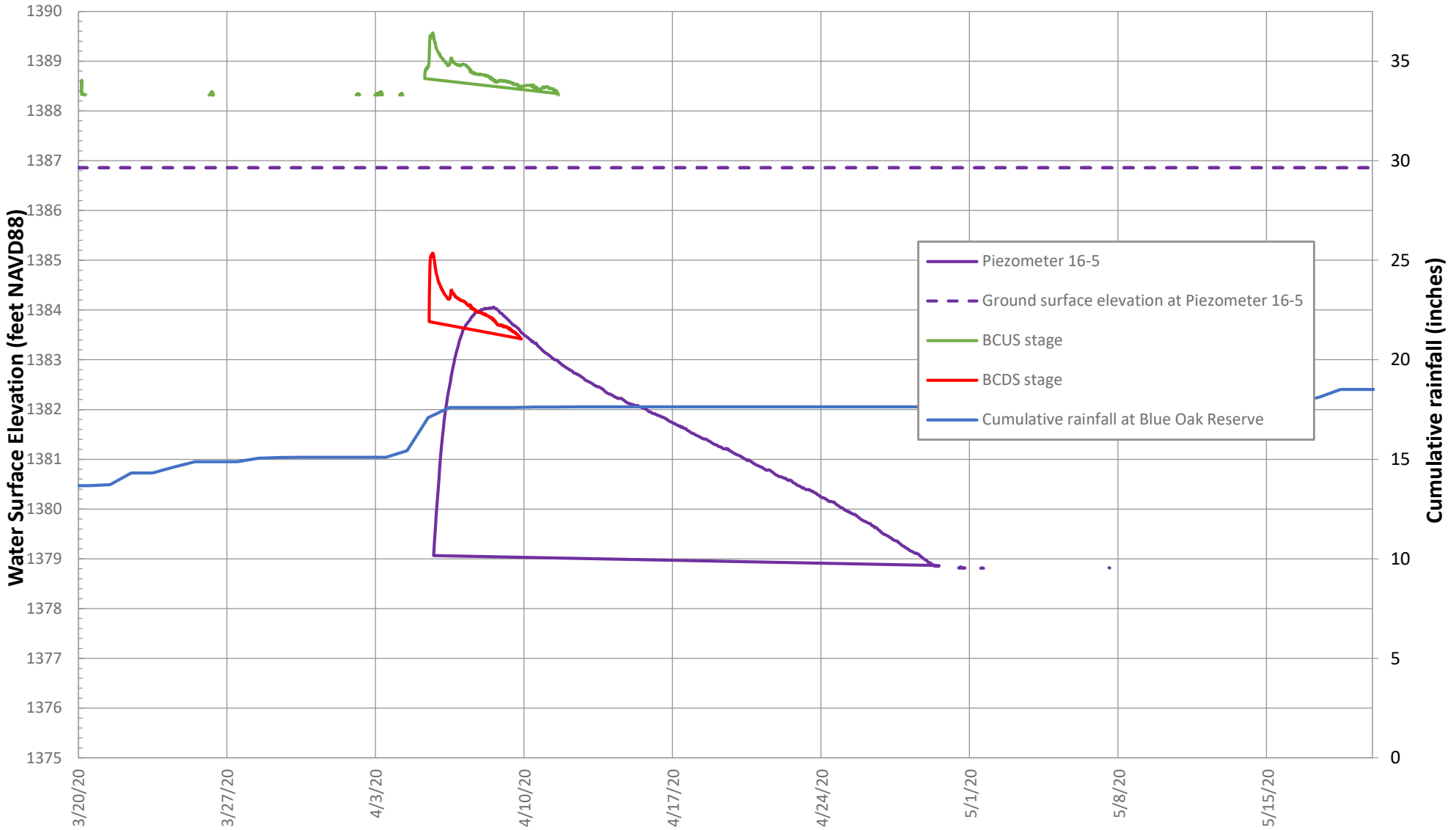
Figure 7b. Shallow groundwater levels at Piezometers 16-2 and 19-1, and surface water levels in San Felipe Creek (SFUS), March 20, 2020 through May 20, 2020. San Felipe Creek Restoration Project, Santa Clara County, California.

Balance Hydrologics



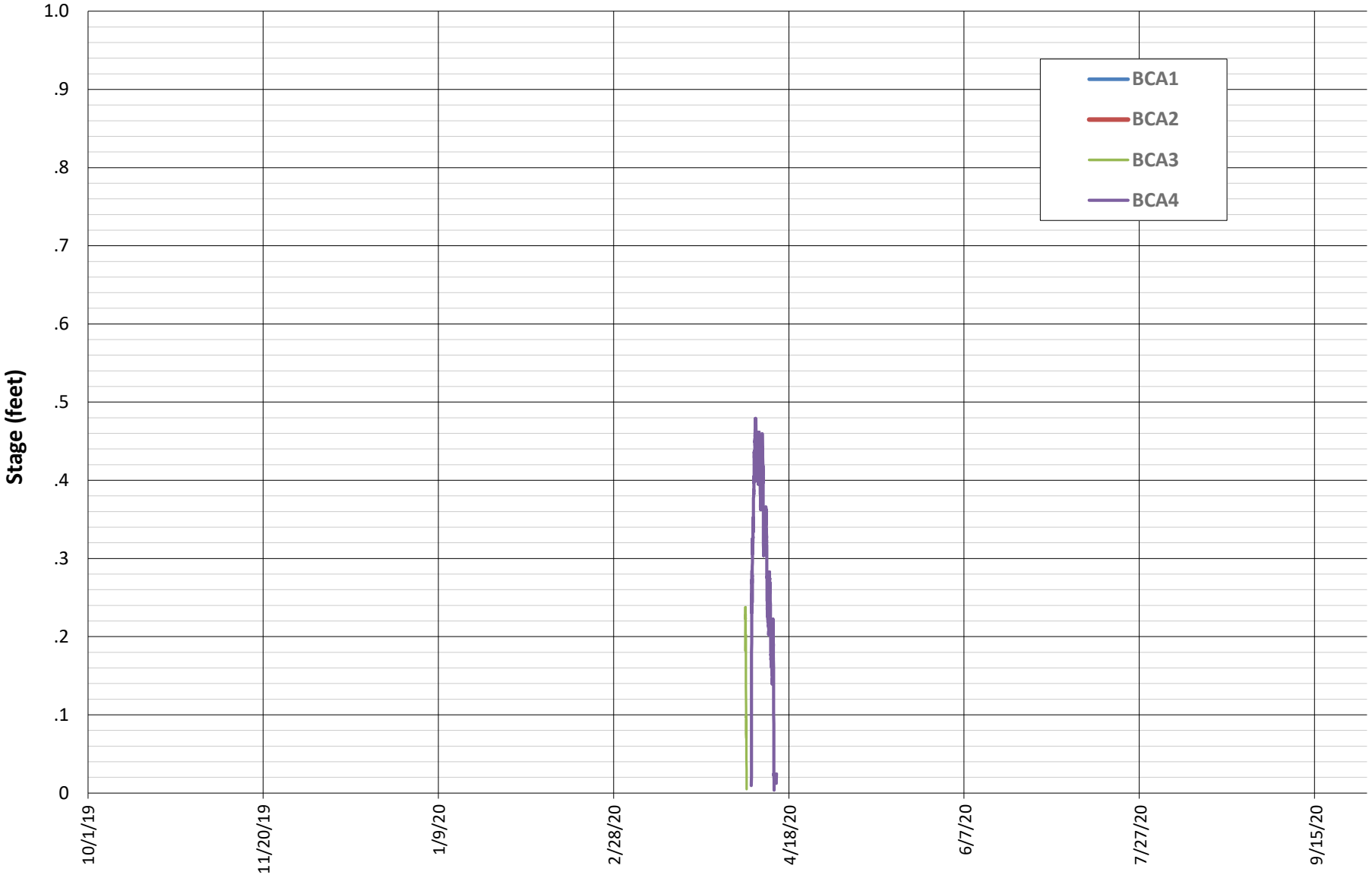
Balance Hydrologics

Figure 8a. Shallow groundwater levels at Piezometer 16-5, and surface water levels in Boyds Creek upstream station (BCUS) and Boyds Creek downstream (BCDS), WY2020. 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 of surface water and groundwater levels.



Balance Hydrologics

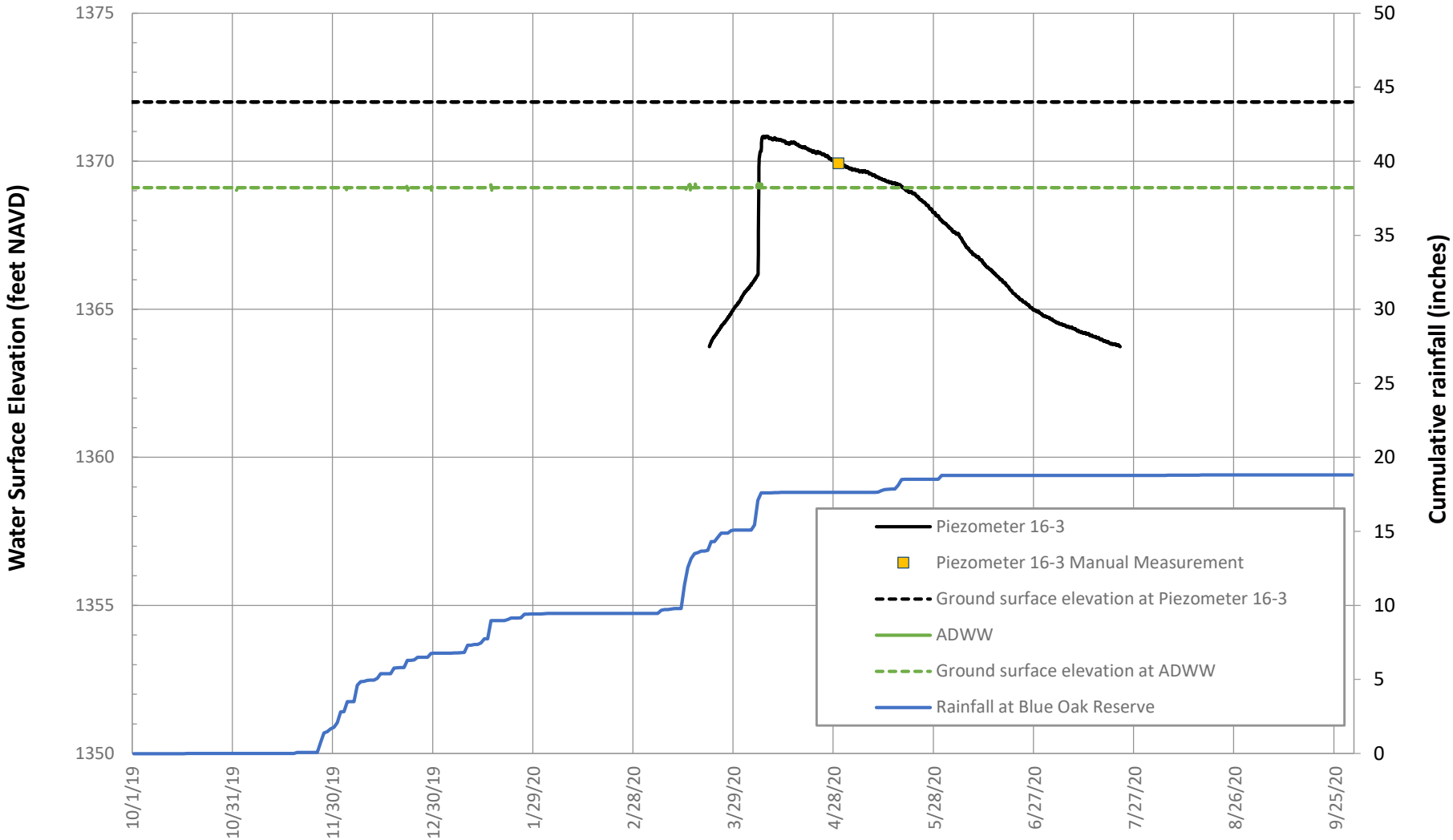
Figure 8b. Shallow groundwater levels at Piezometer 16-5, and surface water levels in Boyds Creek upstream (BCUS) and Boyds Creek downstream (BCDS), March 20, 2020 through May 20, 2020. San Felipe Creek Restoration Project, Santa Clara County, California.



Balance Hydrologics

21510 stream gages.xlsx

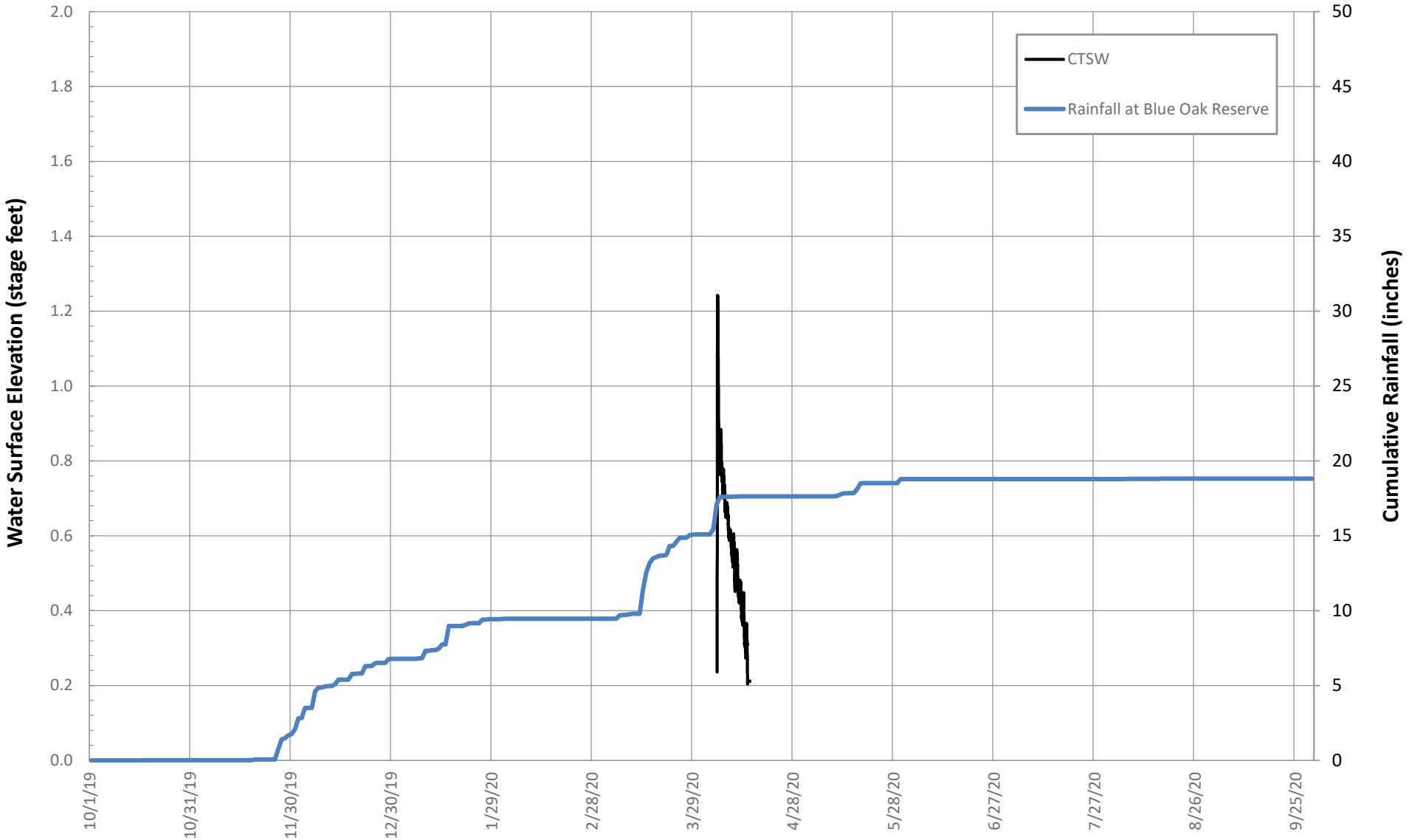
Figure 9. Water levels at the Boyds Creek avulsion channel stations, WY2020, San Felipe Creek Restoration Project, Santa Clara County, California.



Balance Hydrologics

A215108 DWW and ADWE Figure

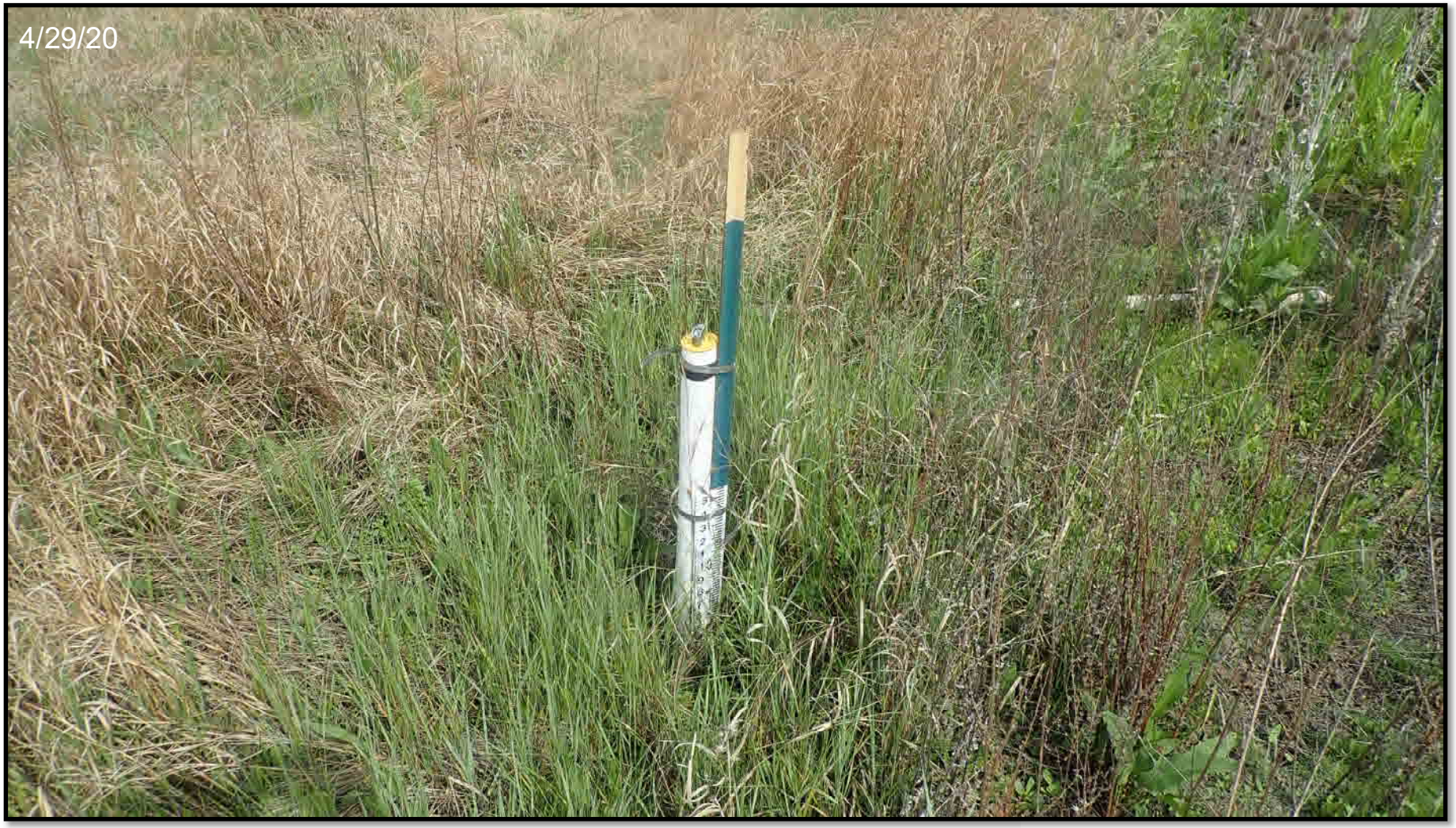
Figure 10. Water levels in the agricultural ditch (ADWW) and Piezometer 16-3, near Seasonal Wetlands SW02 and SW04, WY2020, San Felipe Creek Restoration Project, Santa Clara County, California.



Balance Hydrologics

Figure 11. Water level in the Corral Trail seasonal wetland (CTSW), WY2020, San Felipe Creek Restoration Project, Santa Clara County, California. Wetland ground surface varies, but is located at a stage of approximately 0.2 feet.

215108 CTSW



Balance Hydrologics

Figure 12. Seasonal wetland water level gage CTSW, seasonal wetland SW03, April 29, 2020, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California. Staff observed moist/saturated soils (visible in the foreground) on this day.

Source: Balance Hydrologics

Balance Hydrologics

Figure 13. Plantings at living log jams, September 23, 2020, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.

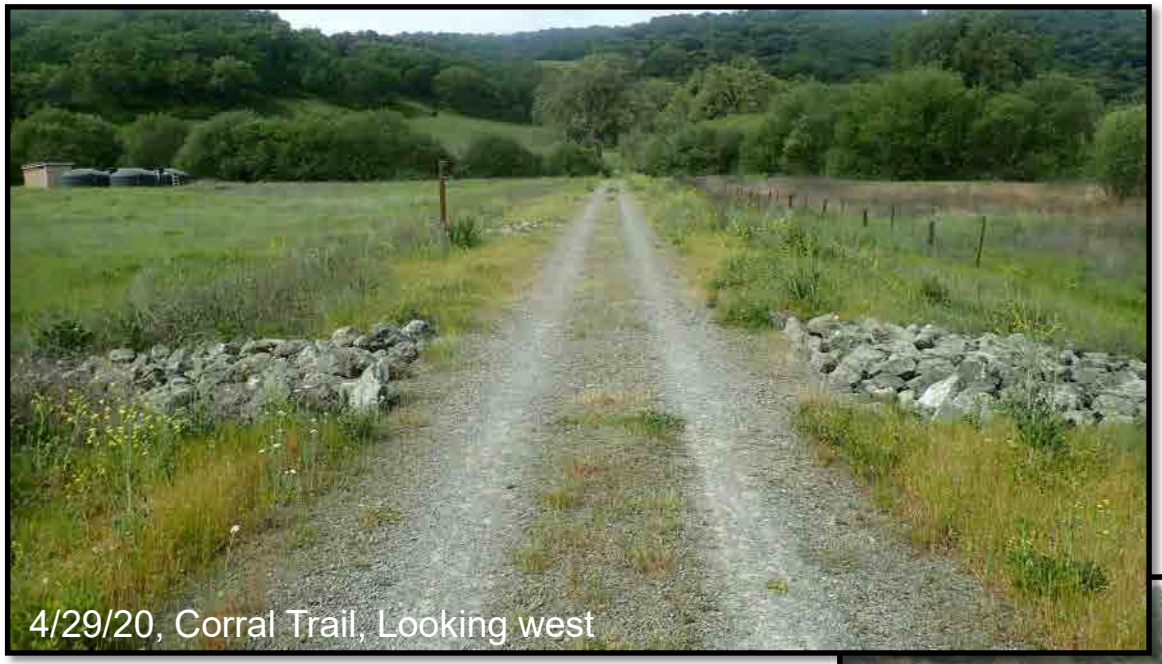
Source: Balance Hydrologics

Balance Hydrologics

Figure 14. Comparison of San Felipe Creek at created floodplain ID03-02 between Year-1 and Year-2, looking downstream, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.

215108 Photo Figures

Source: Balance Hydrologics



Balance Hydrologics

Figure 15. Corral Trail, April 29, 2020, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.

Source: Balance Hydrologics

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

Balance Hydrologics

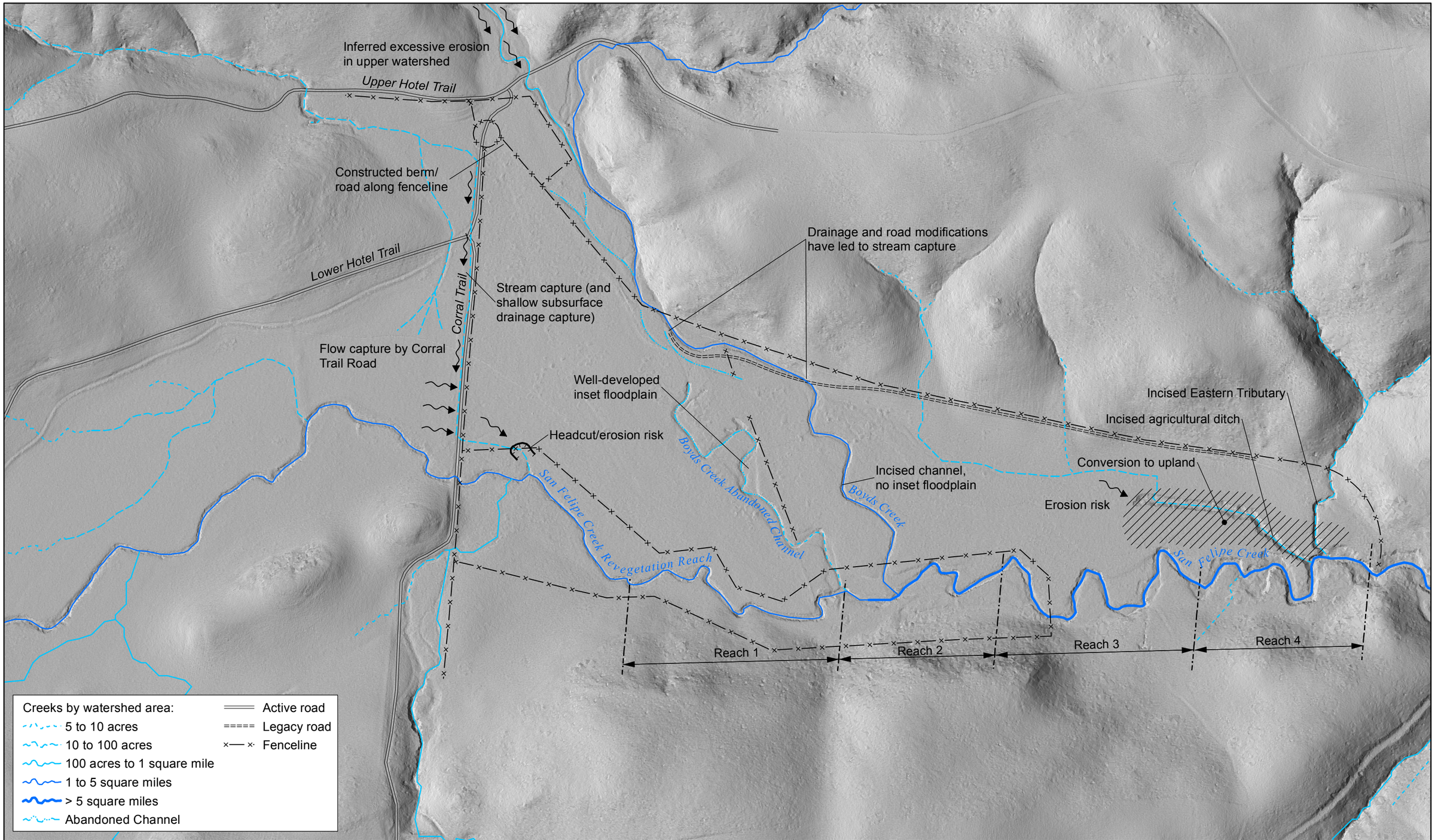
Figure 16. Staked debris jams at ID02-01, April 29, 2020, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California.

Source: Balance Hydrologics

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

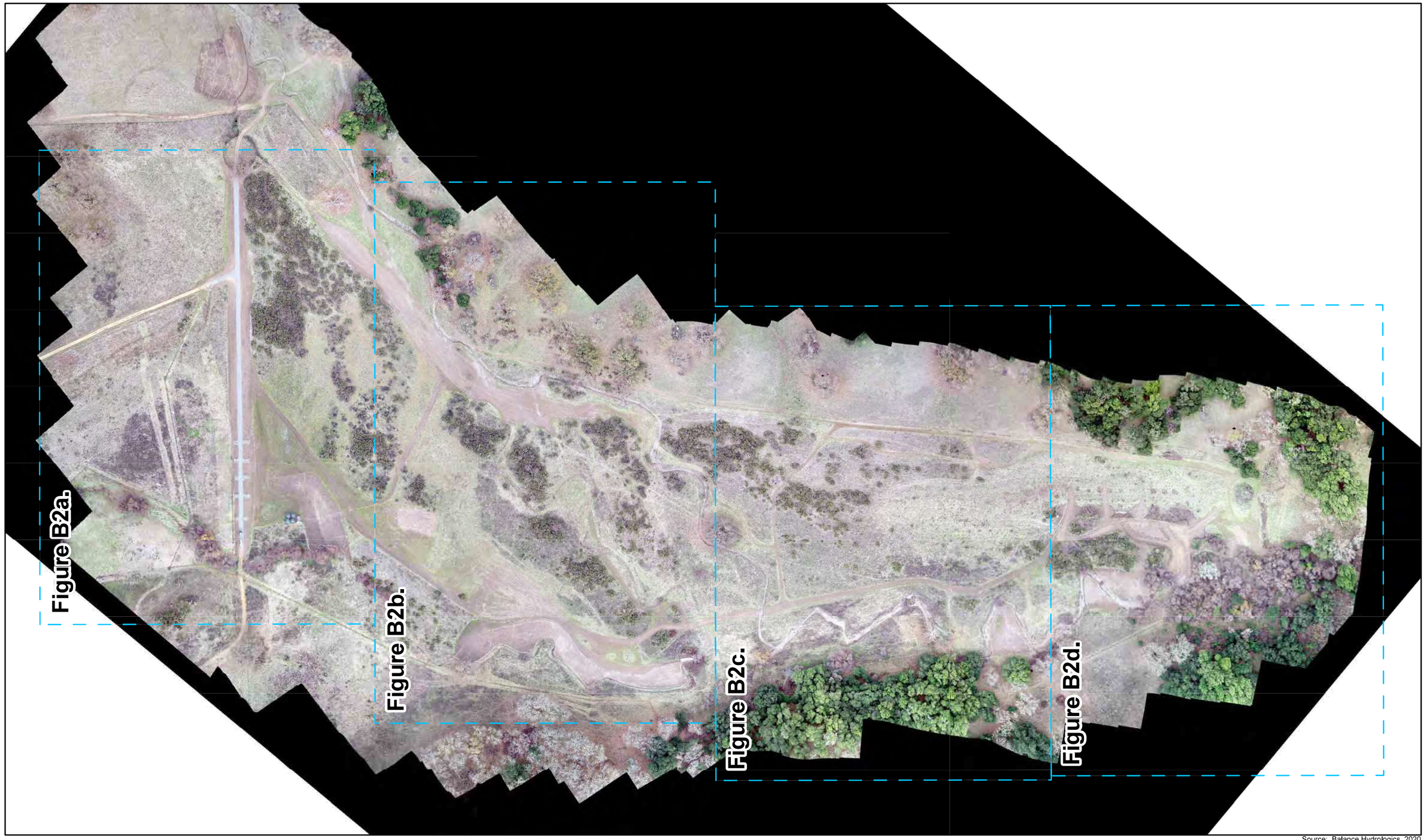
Note: impairment map was created pre-restoration.

Basemap source: EarthScope LiDAR mapping (2007)

0 150 300 600 Feet

APPENDIX B

December 21, 2018 Ortho-Aerial Photograph



Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.mxd

Figure B1. December 2018 Orthomosaic Image, December 21, 2018, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

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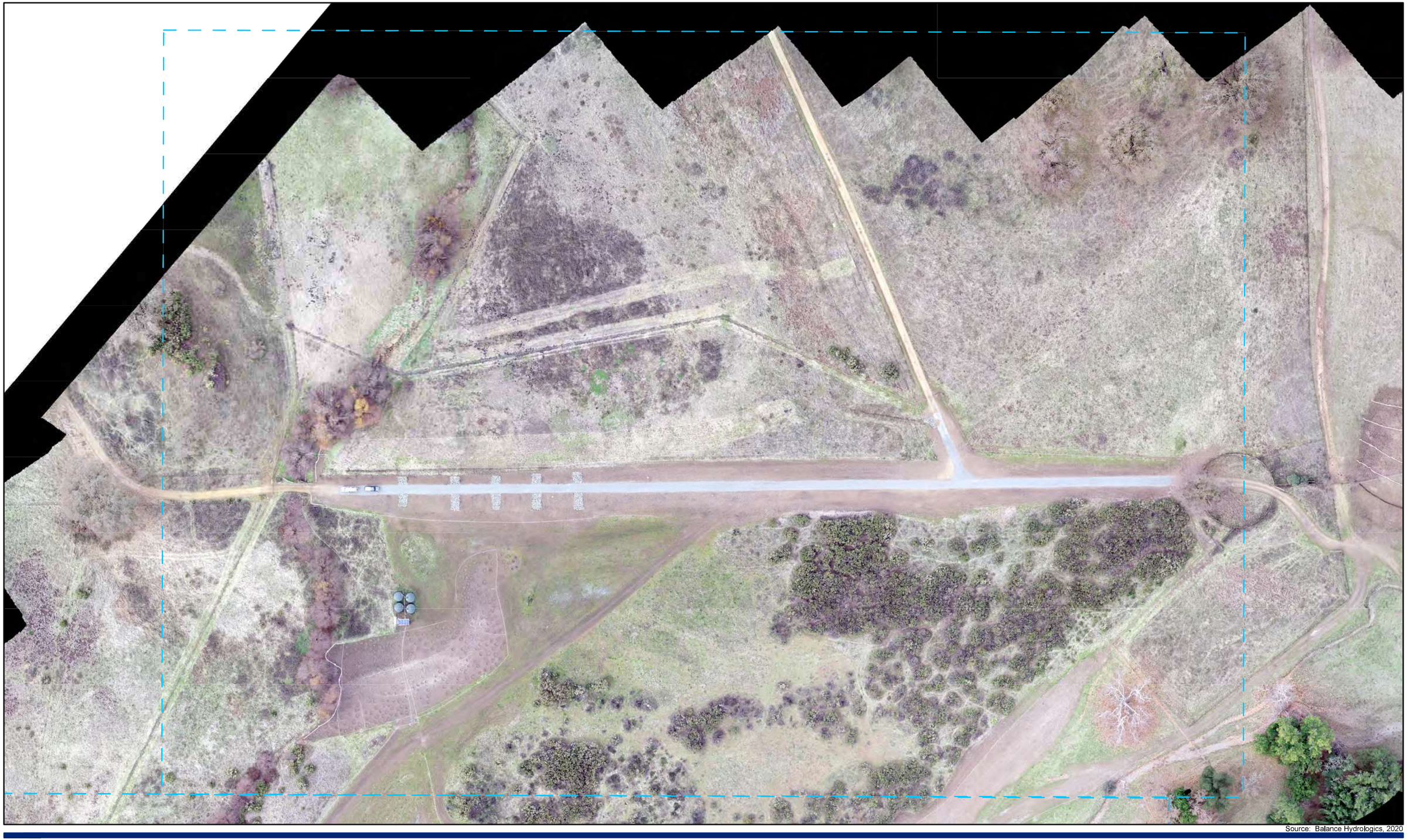

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure B2 a. December 2018 Orthomosaic Image, December 21, 2018, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

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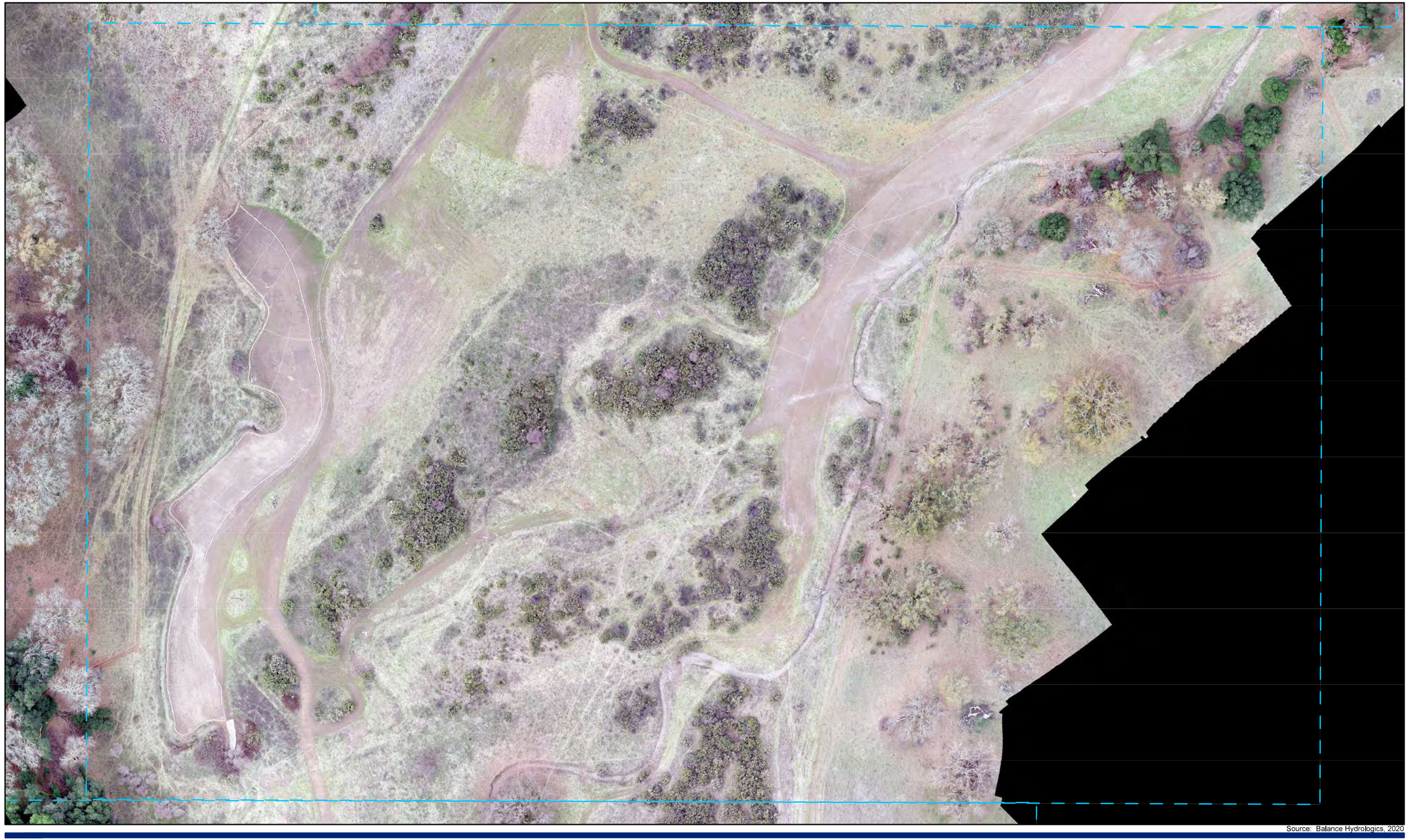


Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure B2 b. December 2018 Orthomosaic Image, December 21, 2018, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

N

Source: Balance Hydrologics, 2020

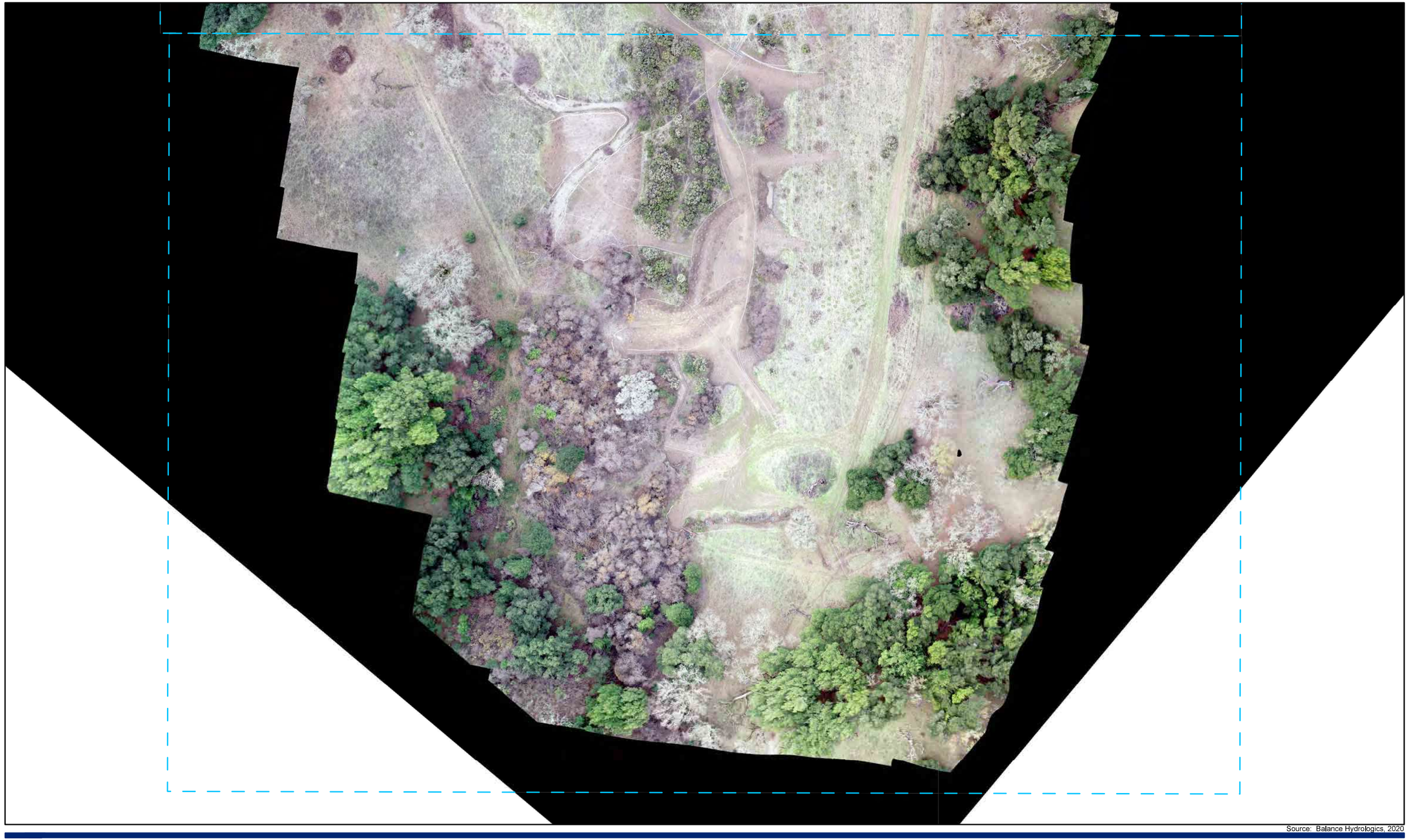
Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure B2 c. December 2018 Orthomosaic Image, December 21, 2018, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300



Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure B2 d. December 2018 Orthomosaic Image, December 21, 2018, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

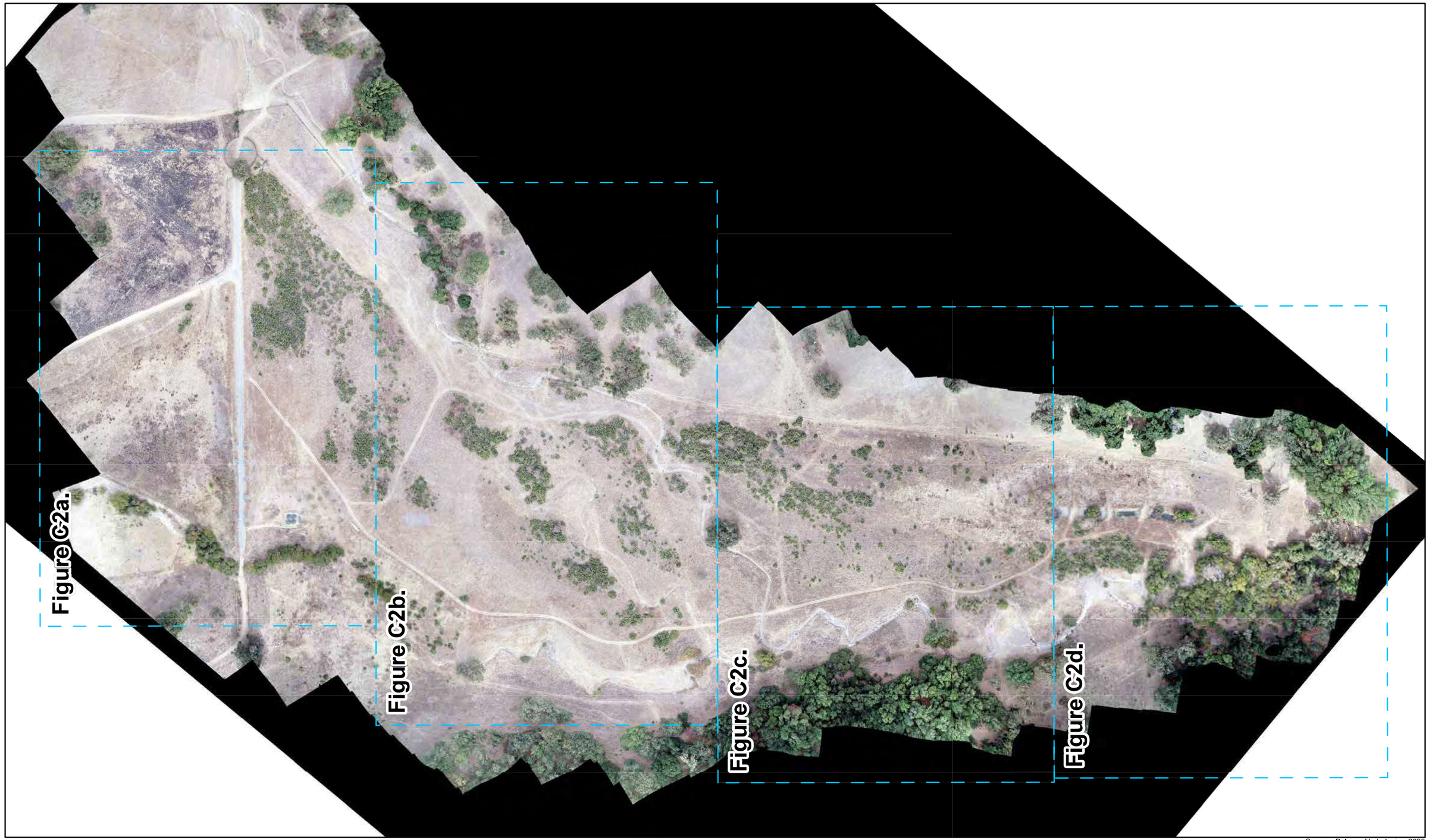
0 100 200 400 Feet

SCALE: 1:1,300

N

APPENDIX C

October 16, 2019 Ortho-Aerial Photograph



Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.mxd

Figure C1. October 2019 Orthomosaic Image, October 16, 2019, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

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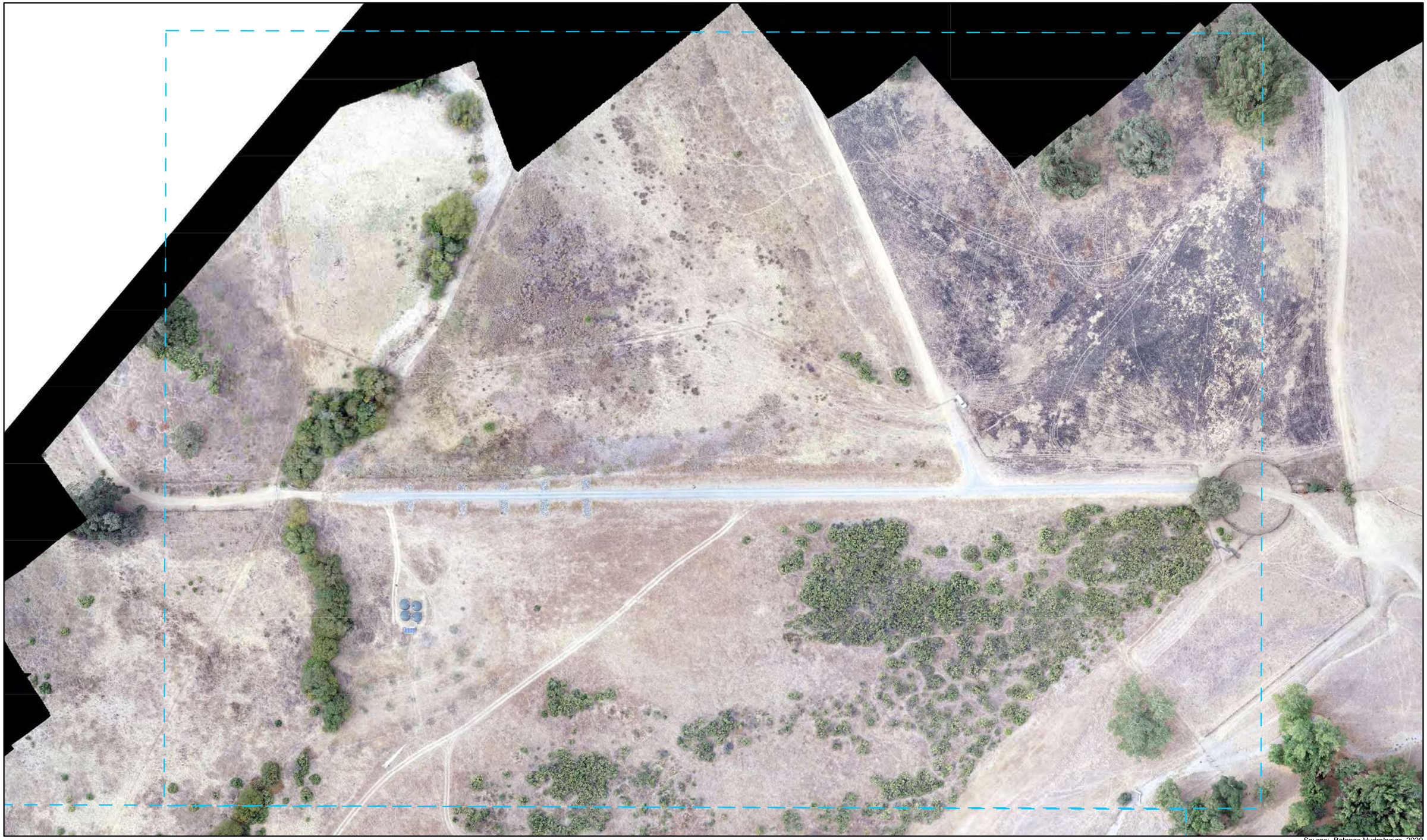

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure C2 a. October 2019 Orthomosaic Image, October 16, 2019, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure C2 b. October 2019 Orthomosaic Image, October 16, 2019, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

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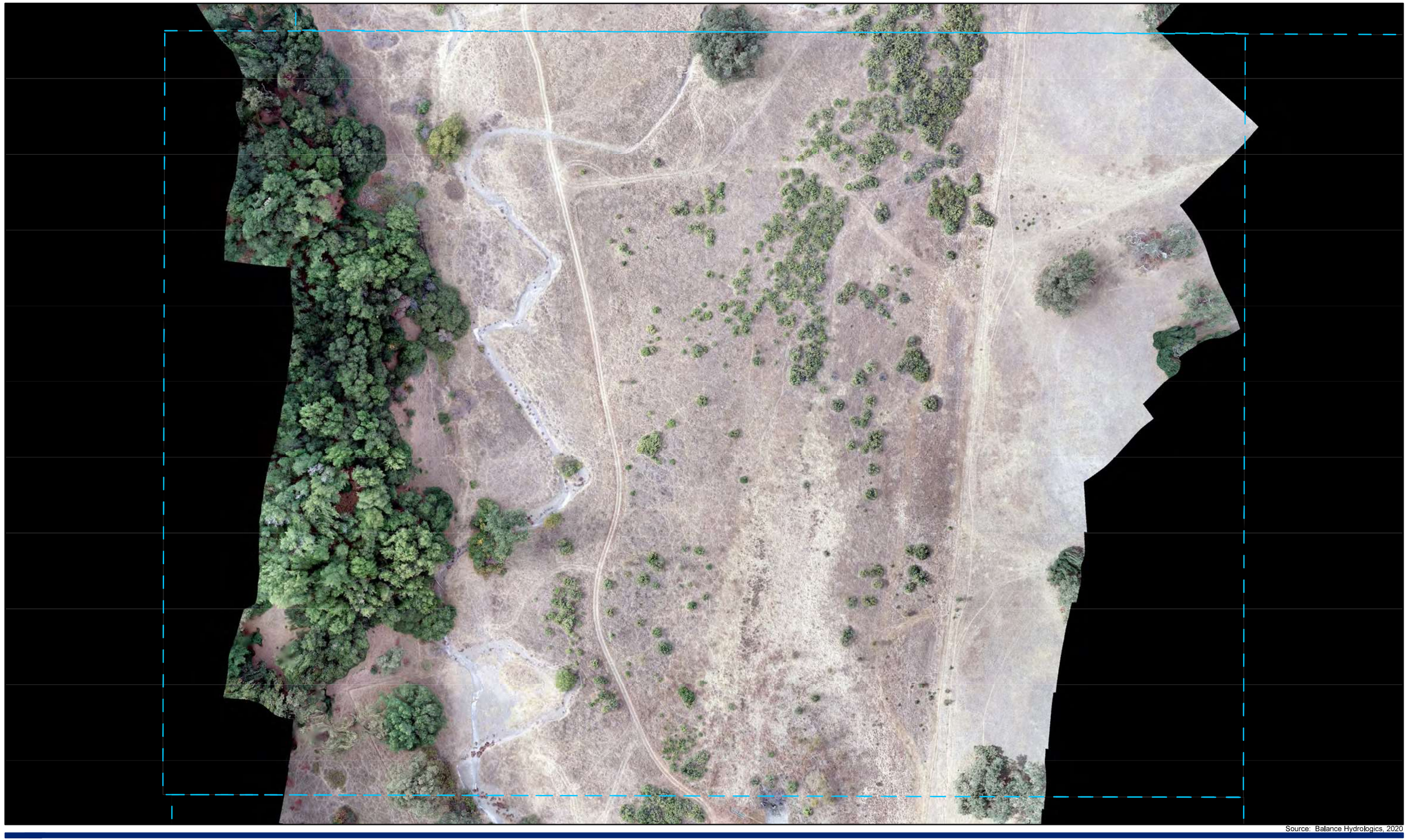

Source: Balance Hydrologics, 2020

Balance Hydrologics™

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Figure C2 c. October 2019 Orthomosaic Image, October 16, 2019, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

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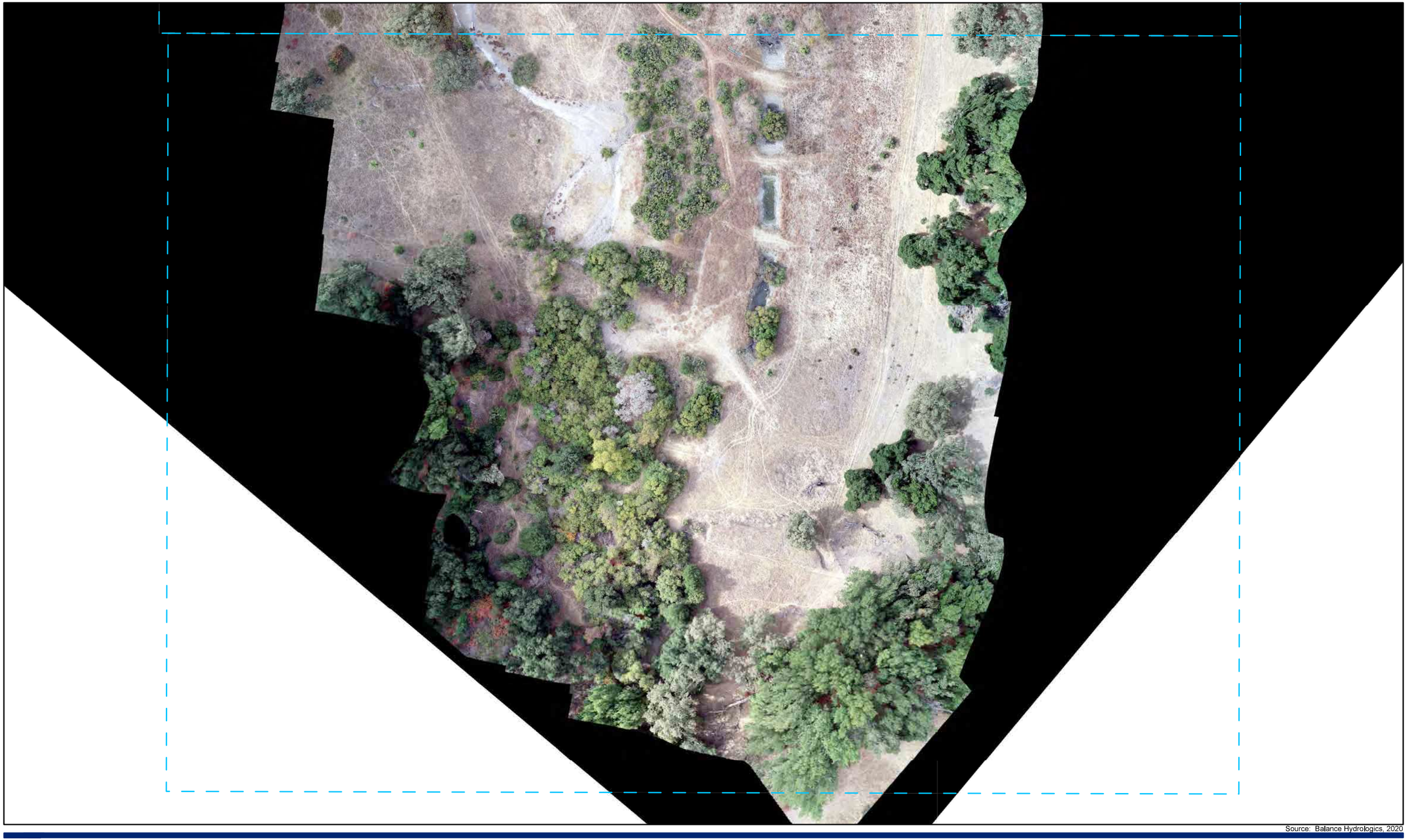

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure C2 d. October 2019 Orthomosaic Image, October 16, 2019, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

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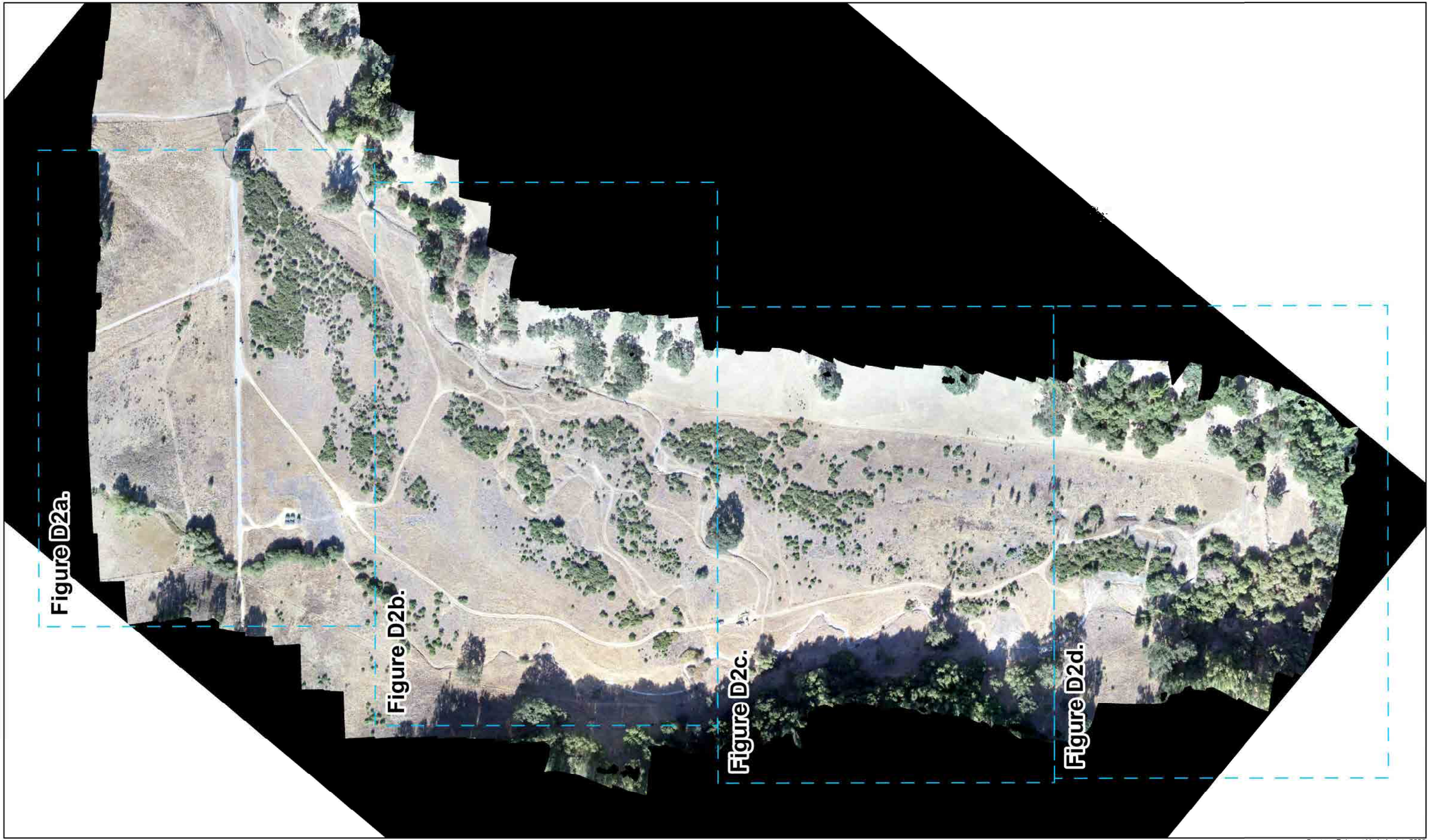
APPENDIX D

September 23, 2020 Ortho-Aerial Photograph



Source: Balance Hydrologics, 2020

Balance Hydrologics™

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Figure D1. September 2020 Orthomosaic Image, September 23, 2020, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

SCALE: 1:3,000

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Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure D2 a. September 2020 Orthomosaic Image, September 23, 2020, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure D2 b. September 2020 Orthomosaic Image, September 23, 2020, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

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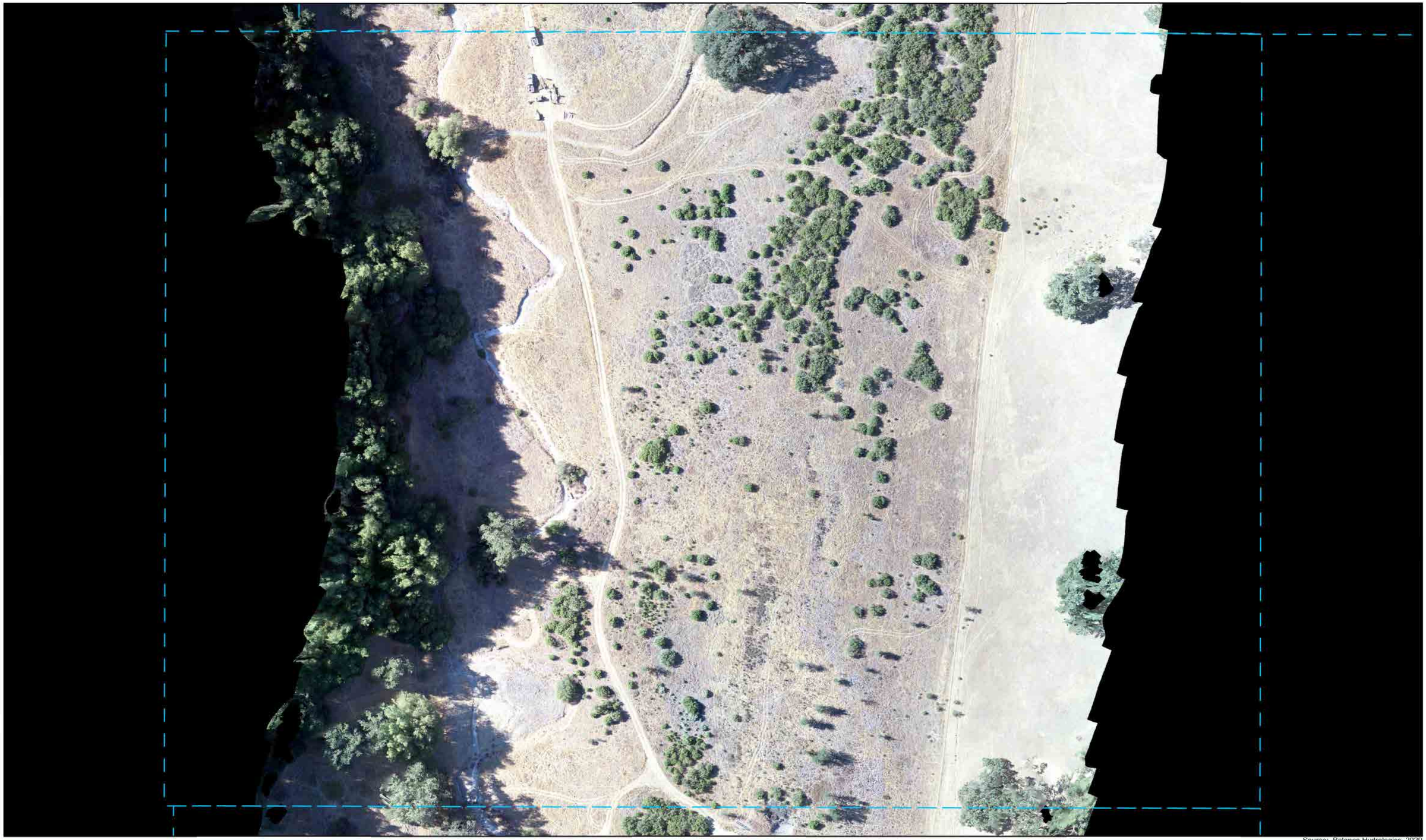

Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure D2 c. September 2020 Orthomosaic Image, September 23, 2020, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

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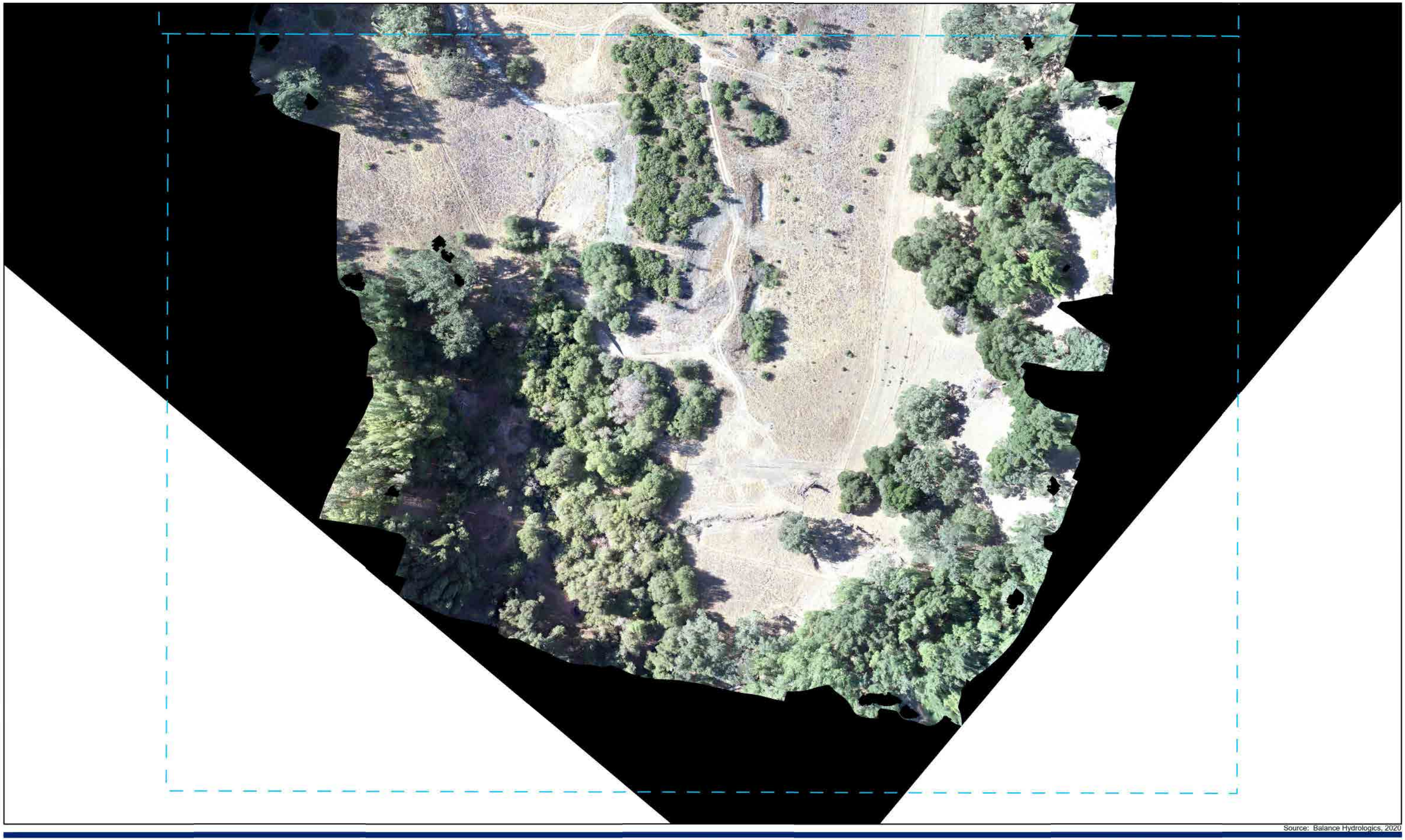


Source: Balance Hydrologics, 2020

Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.aprx

Figure D2 d. September 2020 Orthomosaic Image, September 23, 2020, San Felipe Creek Restoration, Joseph D. Grant Park, Santa Clara County, California

0 100 200 400 Feet

SCALE: 1:1,300

APPENDIX E

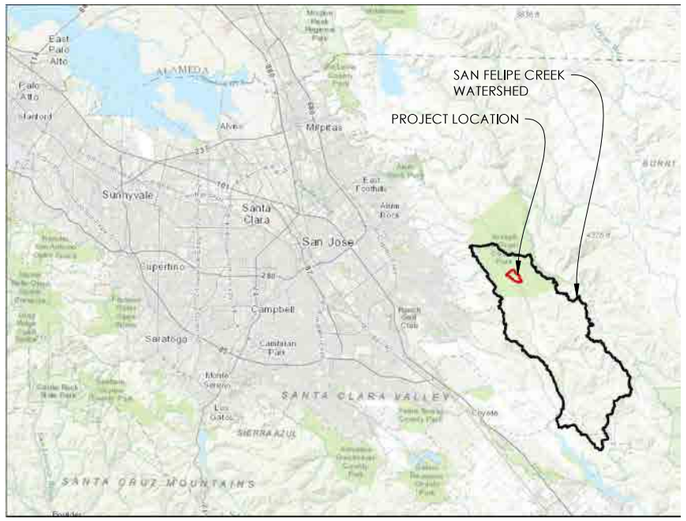
Project As-Built Drawings

SAN FELIPE CREEK RESTORATION

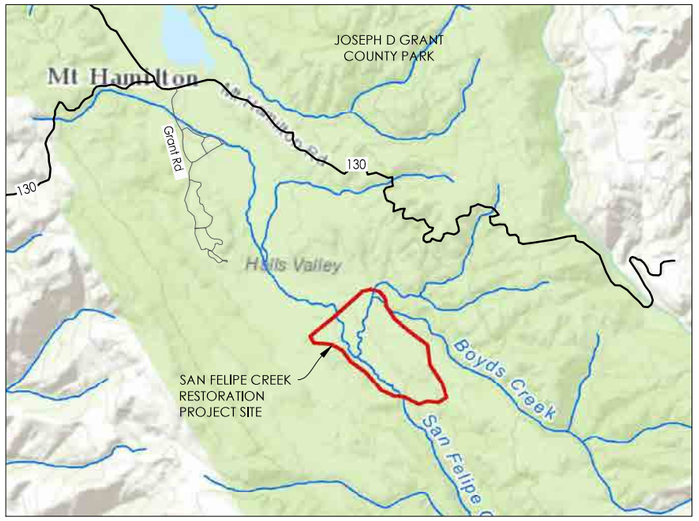
JOSEPH D GRANT COUNTY PARK

SANTA CLARA COUNTY, CALIFORNIA

VICINITY MAP



LOCATION MAP



SHEET INDEX

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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

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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 D ONALDSON
DRAWN BY P KUICHAWK
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.

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DUDEK

HRS

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DRAWN BY	P KULCHAWIK
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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

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 (R-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	2.40

SUMMARY OF EARTHWORK QUANTITIES:

ID	AREA (SF)	CUT (CY)	FILL (CY)	BORROW / SPOIL (-) (CY)
ED01-01	59,820	770	0	-770
ED01-02	100	30	30	0
ED02-01	22,930	630	0	-630
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	600	0	-600
ID03-03	4,300	170	0	-170
ID03-04	9,060	530	0	-530
ID03-05	12,680	1,190	0	-1,180
R-01	47,620	0	1,230	1,230
R-02	2,190	10	10	0
TOTAL	228,850	5,800	2,500	-3,300

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

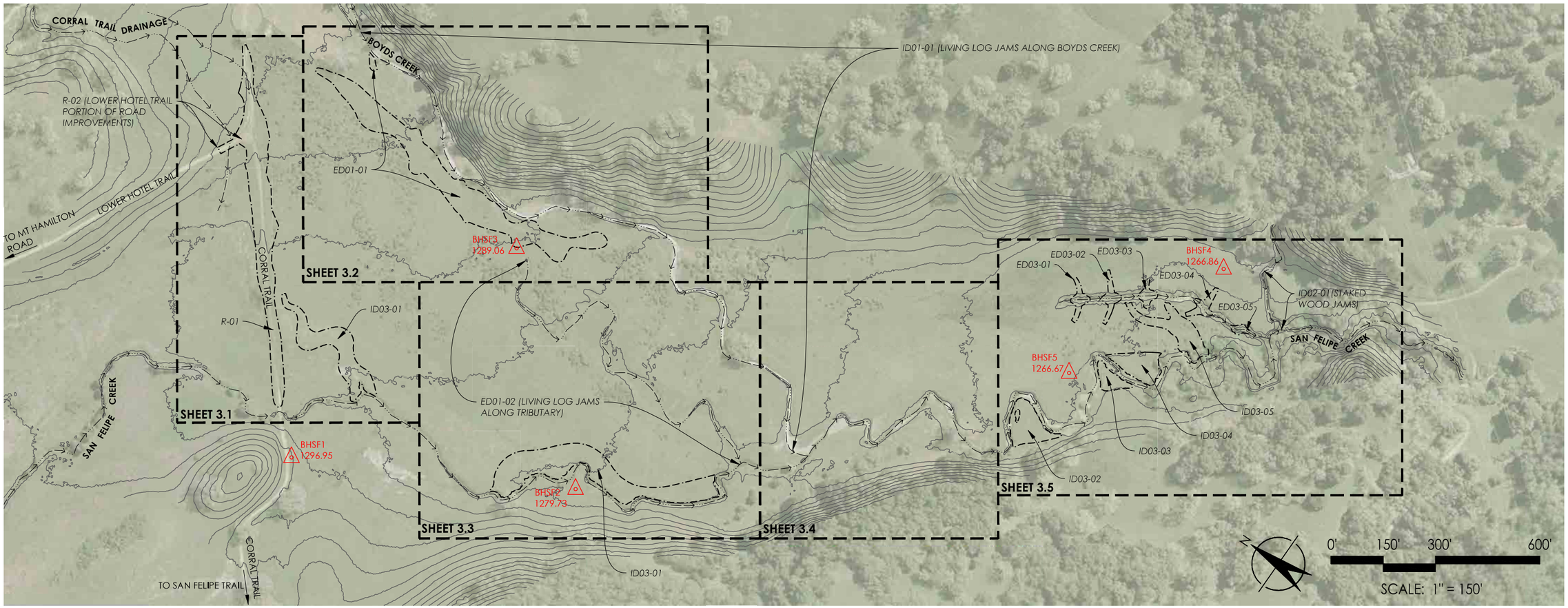
POINT	NORTHING	EASTING	ELEVATION
BMSF1	1,941,910.53	6,211,969.67	1,296.95
BMSF2	1,941,190.66	6,212,364.01	1,279.73
BMSF3	1,941,726.80	6,212,832.54	1,289.06
BMSF4	1,940,030.84	6,213,951.27	1,266.86
BMSF5	1,940,222.47	6,213,451.79	1,266.67

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

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

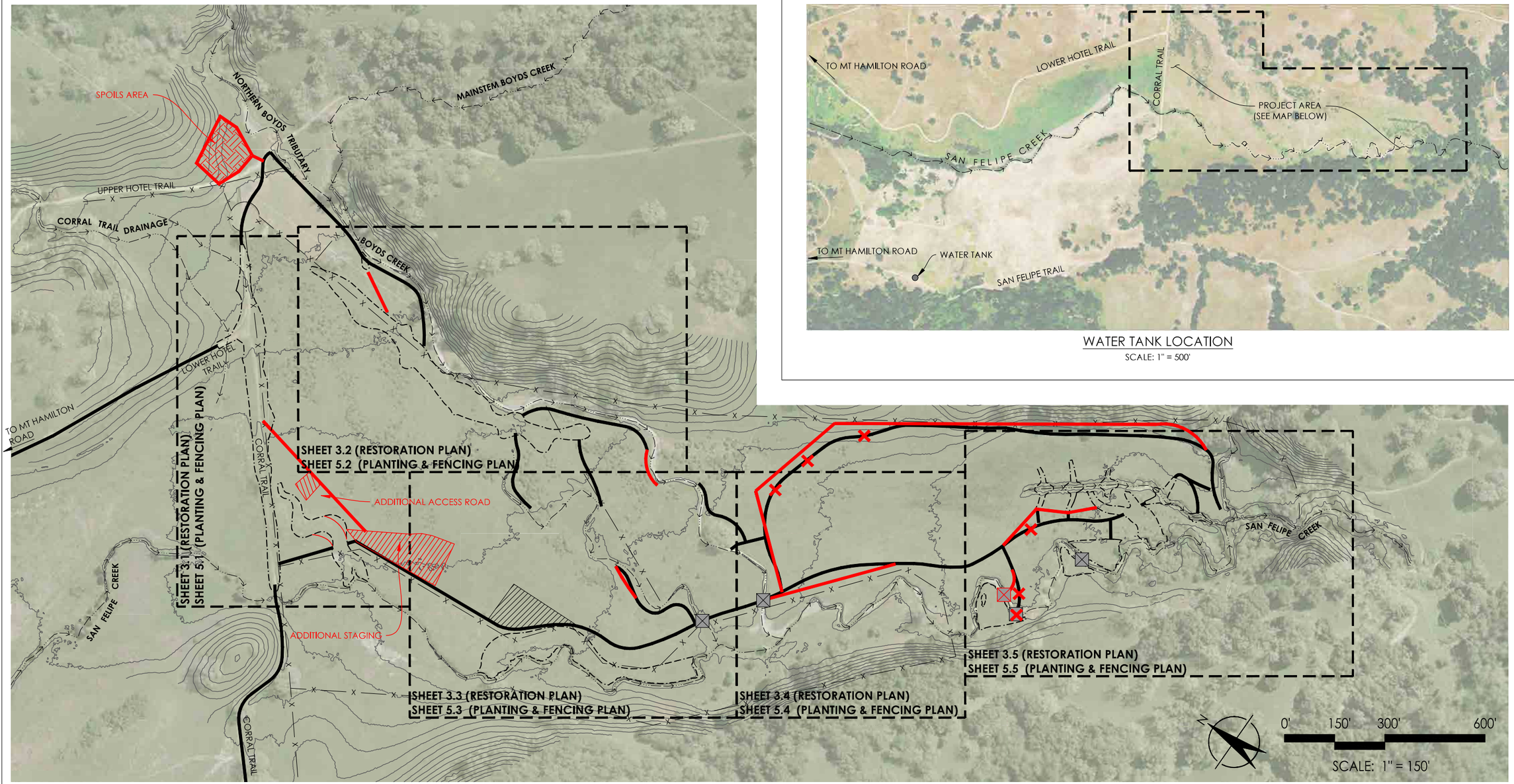
SUMMARY OF MATERIALS QUANTITIES

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

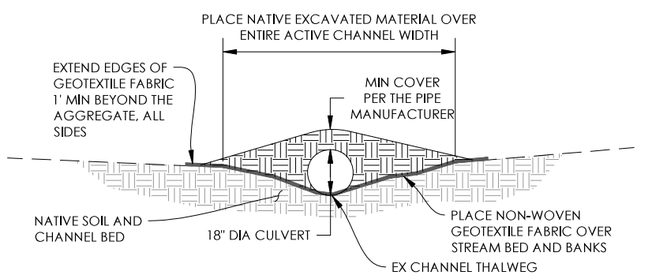
AS-BUILT DRAWINGS

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
Balance Hydrologics, Inc.

DUDEK

HRS

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 KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

OVERVIEW MAP AND SITE PREPARATION PLAN

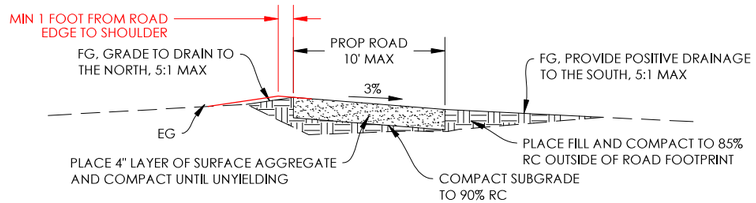
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108

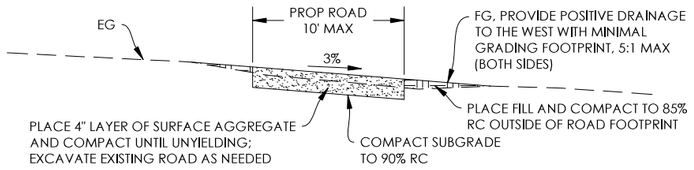
SCALE 1" = 150'

SHEET 3.0

W:\CAD\PROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-03-A-OVERVIEW - STANDARD\215108-03-A-OVERVIEW.DWG



1 CORRAL TRAIL TYPICAL SECTION
SCALE: NTS



2 LOWER HOTEL TRAIL TYPICAL SECTION
SCALE: NTS

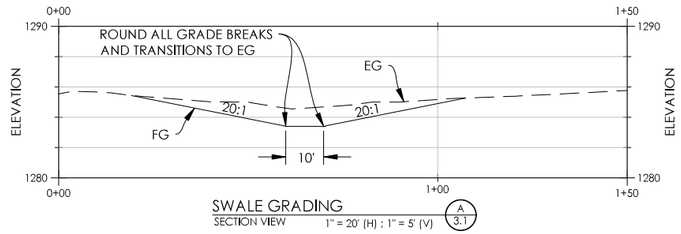
LEGEND:

- 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:

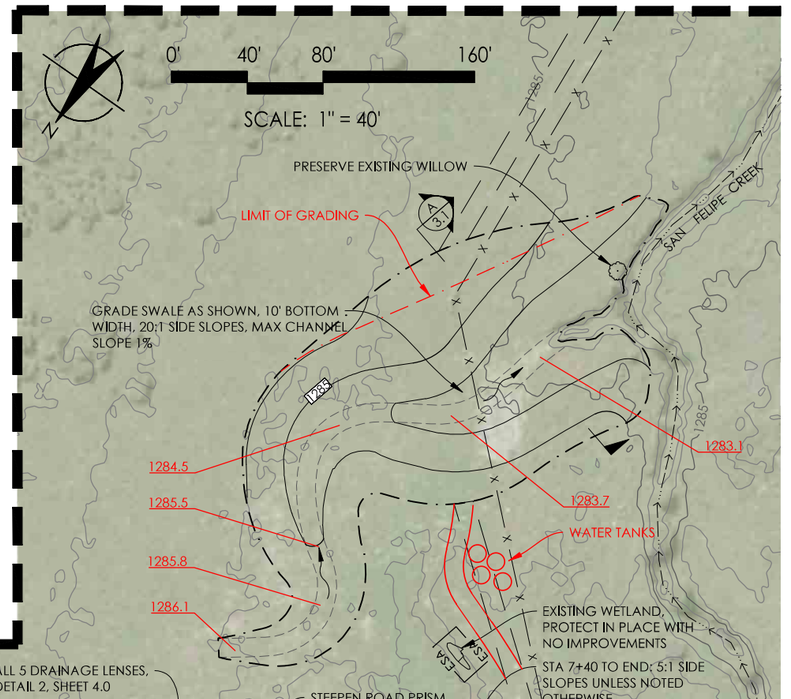
1. SEE SHEET 5.1 FOR PLANTING AND FENCING PLAN, INCLUDING EXTENTS OF FENCE REMOVAL.
2. CONSTRUCTION ACCESS ROUTES ARE SHOWN AS APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. ROAD GRADING MONUMENTS SHALL BE FLEXIBLE ROAD MARKERS 56" TALL BY 4" WIDE, AND SHALL BE MOUNTED ON A 12" GALVANIZED 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

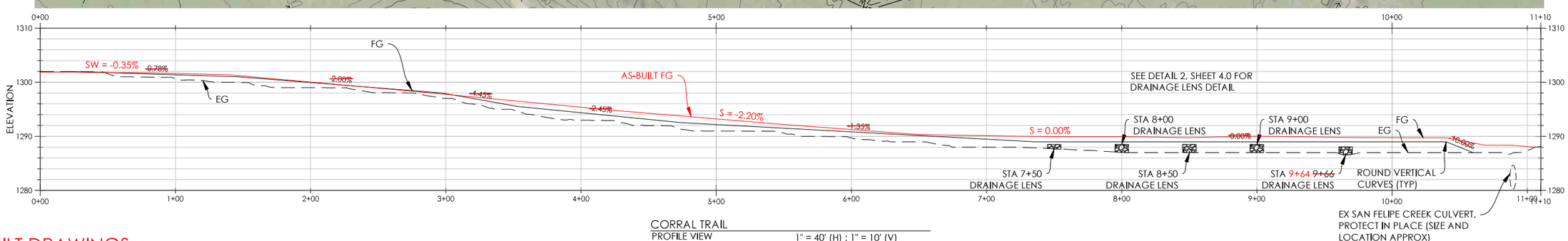


SWALE GRADING
SECTION VIEW 1" = 20' (H) ; 1" = 5' (V) A 3.1

MATCH SHEET 3.3



MATCH SHEET 3.2



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

AS-BUILT DRAWINGS

W:\CAD\PROJECTS\215108 SAN FELIPE\215108 ASBUILT FILES\AS BUILT DRAWINGS\215108-00-ASBUILT-TOS-40SCALE - STANDARD_215108-00-ASBUILT-TOS-40SCALE.DWG

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

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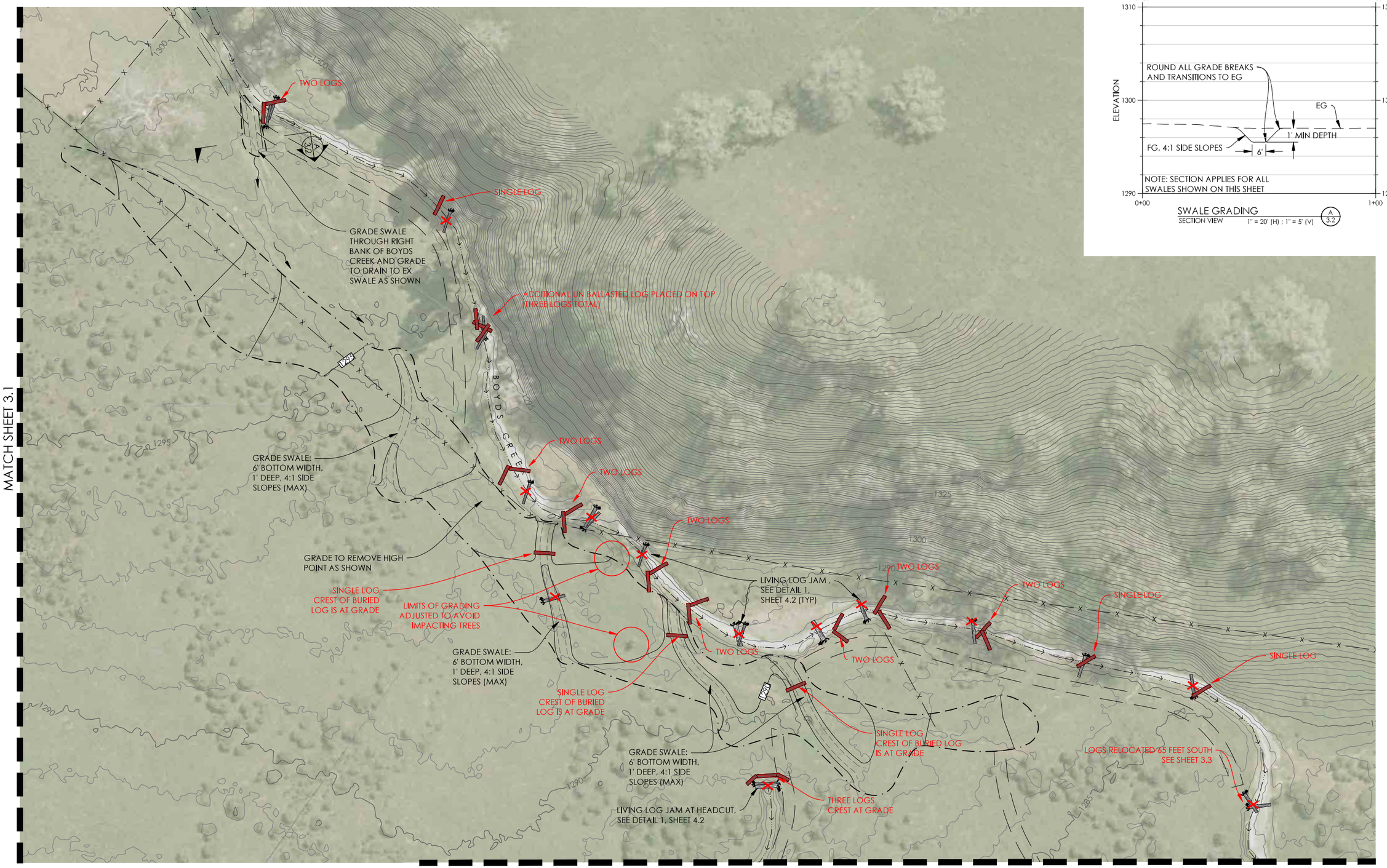
SUBMITALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-05-19	EB

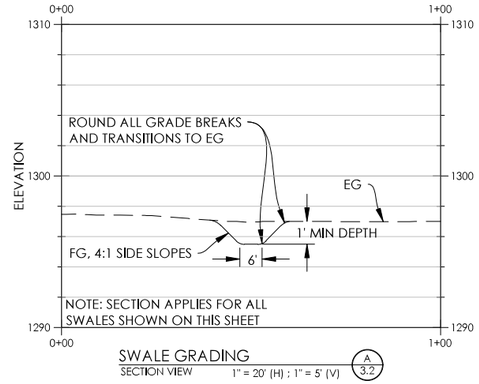
DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

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





SWALE GRADING
SECTION VIEW 1" = 20' (H) ; 1" = 5' (V) (A 3.2)

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:
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SANTA CLARA VALLEY HABITAT AGENCY

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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 KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

UPPER BOYDS CREEK RESTORATION PLAN

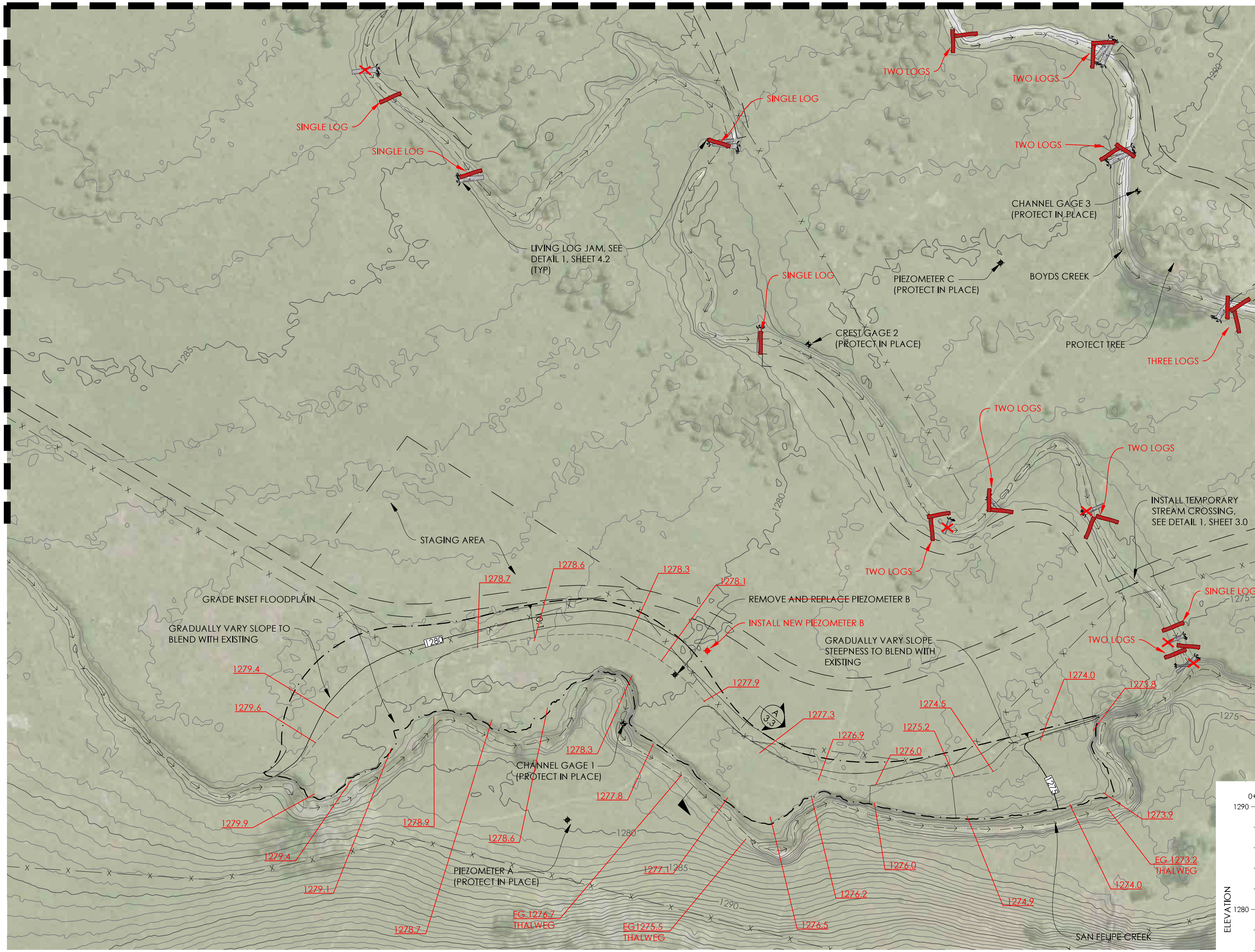
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE 1" = 40'
SHEET 3.2

W:\CAD\PROJECTS\215108 SAN FELIPE\215108 AS-BUILT FILES\AS BUILT DRAWINGS\215108-03-ITOS-40SCALE - STANDARD\215108-03-ITOS-40SCALE.DWG

MATCH SHEET 3.2

MATCH SHEET 3.1



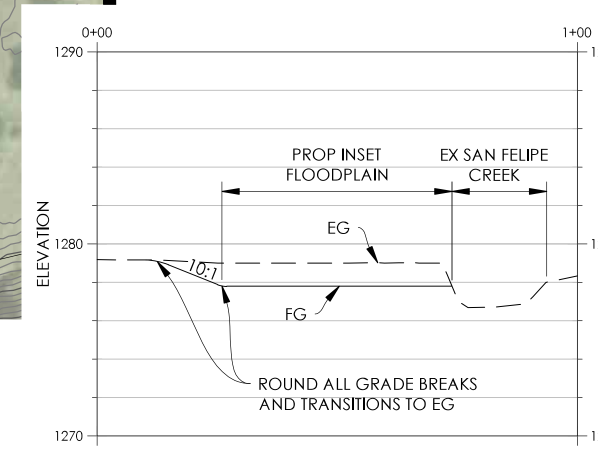
MATCH SHEET 3.4

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 SHET 3.0 FOR CHANGES TO ACCESS ROUTES

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.

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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

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

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AS-BUILT DRAWINGS

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:
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SANTA CLARA VALLEY HABITAT AGENCY

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	DATE	BY	SUBMITALS / 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

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

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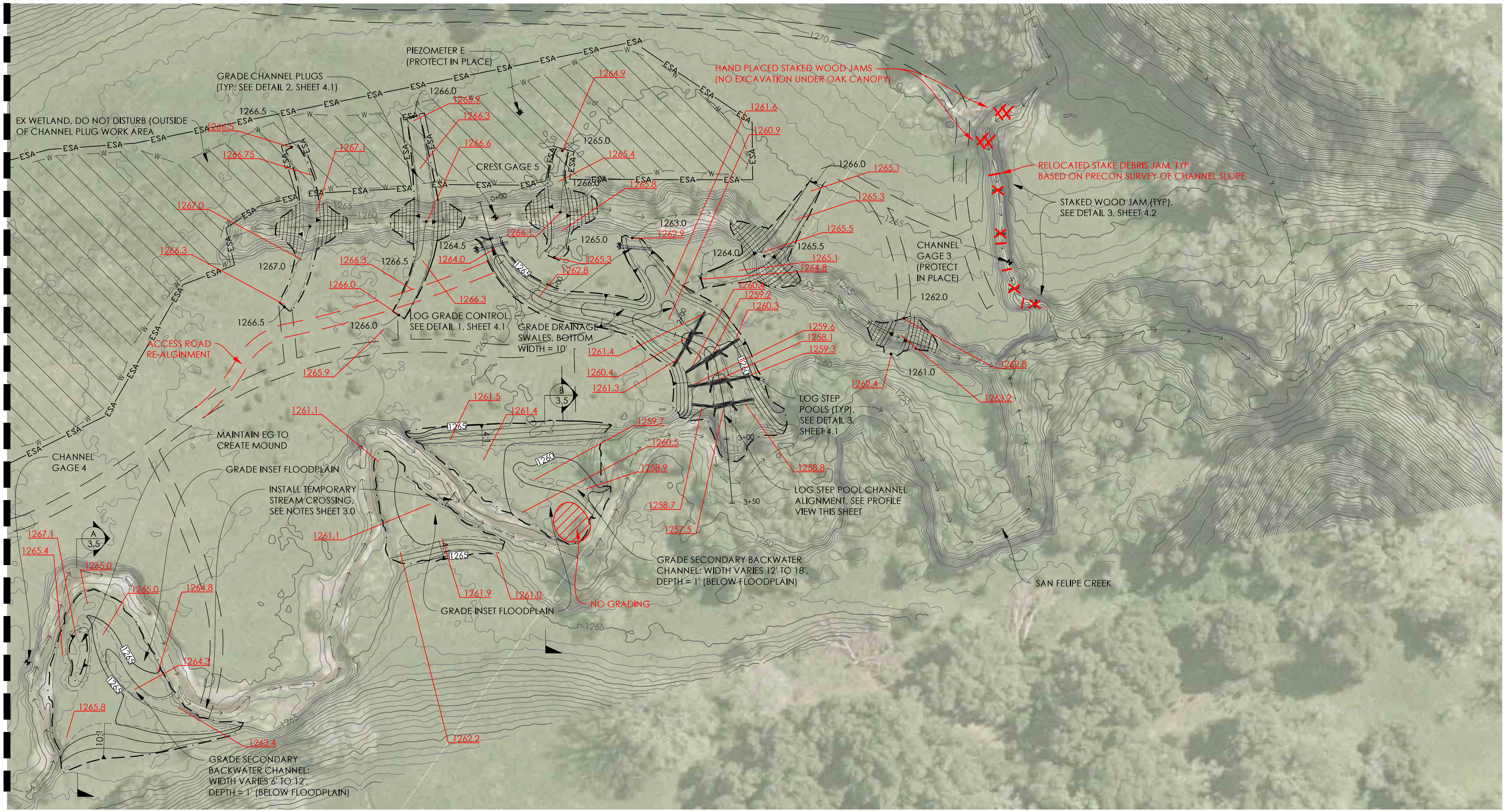
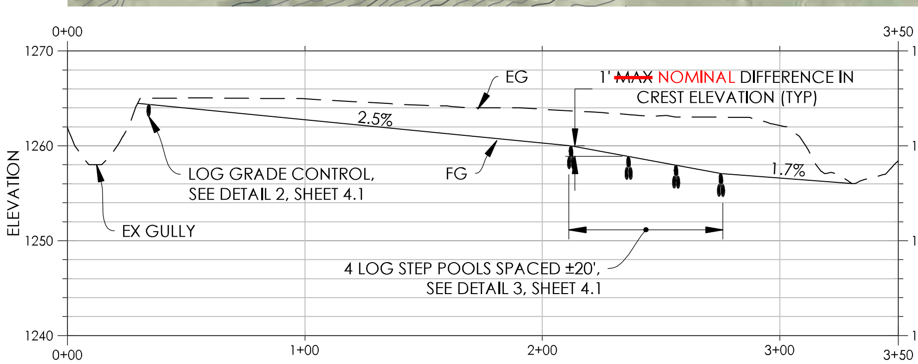
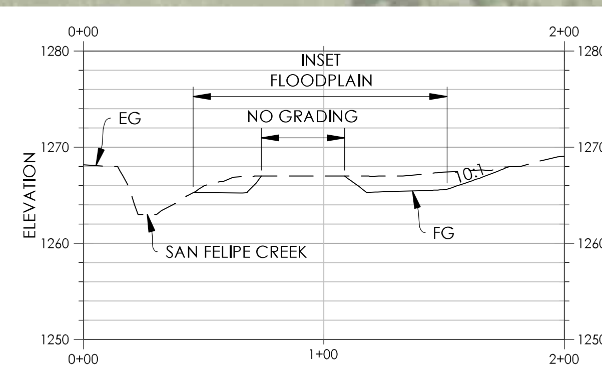
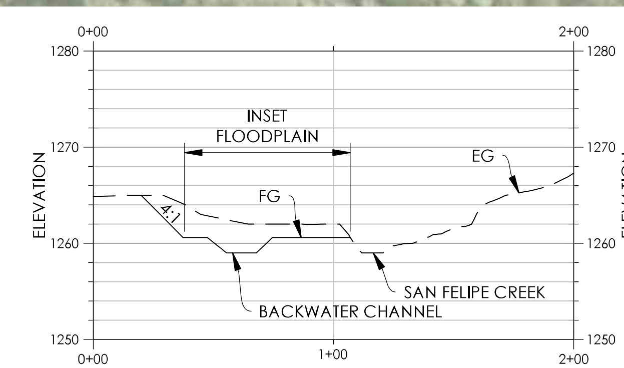




LOG STEP POOL CHANNEL
PROFILE VIEW 1" = 40' (H) ; 1" = 10' (V)



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

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

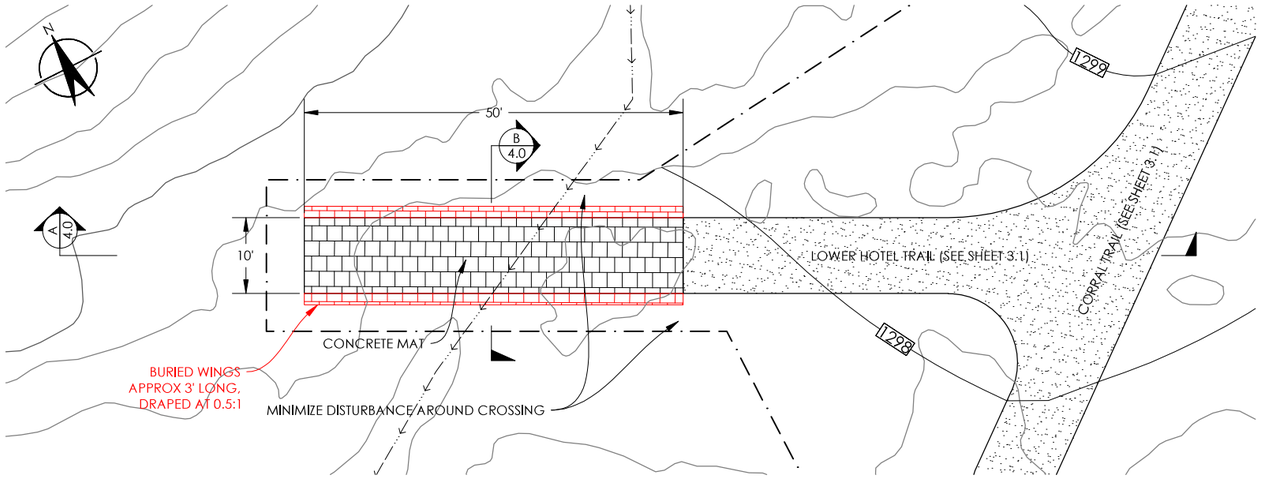
SAN FELIPE CREEK REACHES 3 & 4 RESTORATION PLAN

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

PROJECT NUMBER 215108

SCALE 1" = 40'

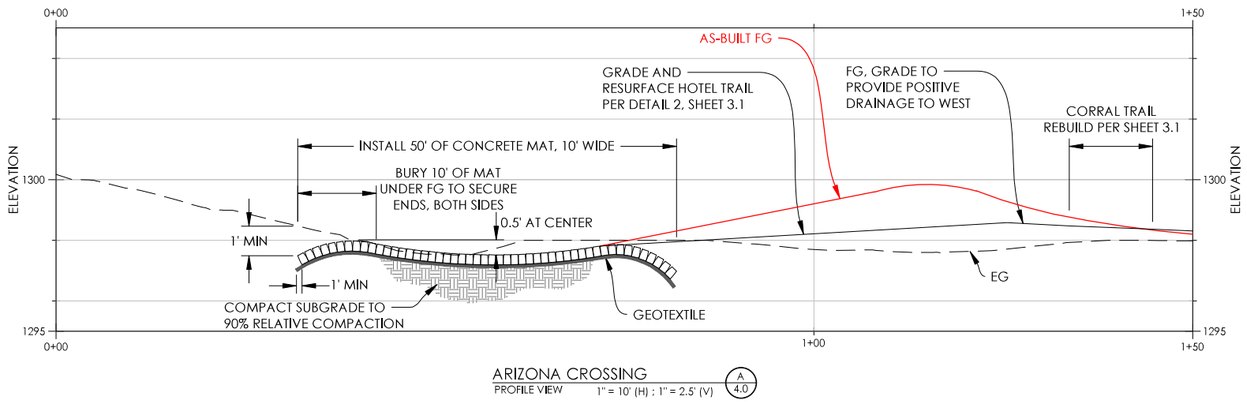
SHEET 3.5



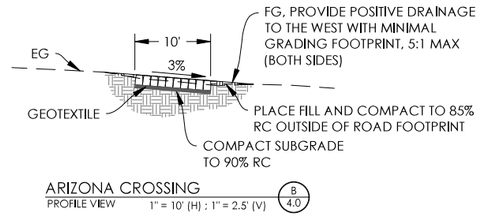
1 ARIZONA CROSSING
SCALE: 1" = 10'

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.

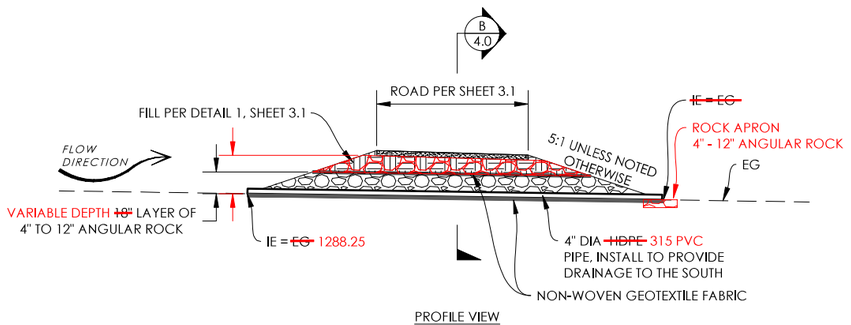
AS-BUILT NOTES:
1. THE BURIED WINGS ON THE ARIZONA CROSSING DETAIL ARE PER MANUFACTURERS RECOMMENDATION.
2. THE GRADES ON LOWER HOTEL TRAIL, BETWEEN THE ARIZONA CROSSING AND CORRAL TRAIL, WERE CHANGED TO IMPROVE FLOW SPLITTING AT THE TRAIL JUNCTION.



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

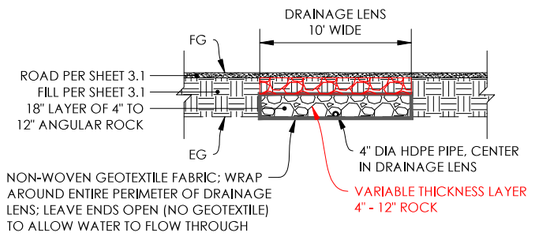


ARIZONA CROSSING
PROFILE VIEW 1" = 10' (H) : 1" = 2.5' (V) B 4.0



PROFILE VIEW

2 DRAINAGE LENS
SCALE: 1" = 5'



DRAINAGE LENS
SECTION VIEW 1" = 5' B 4.0

AS-BUILT DRAWINGS

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PREPARED FOR:
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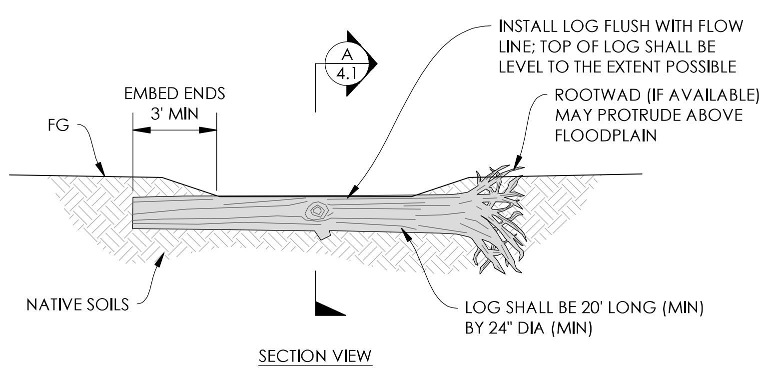
CONCEPT PLANS	03-27-17	TG
DRAFT 65% DESIGN	07-24-17	PK
FINAL 65% DESIGN	11-14-17	PK
AS-BUILT DRAWINGS	03-05-19	EB

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

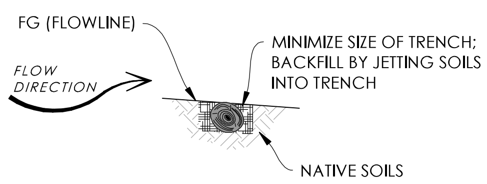
TRAIL DRAINAGE DETAILS

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

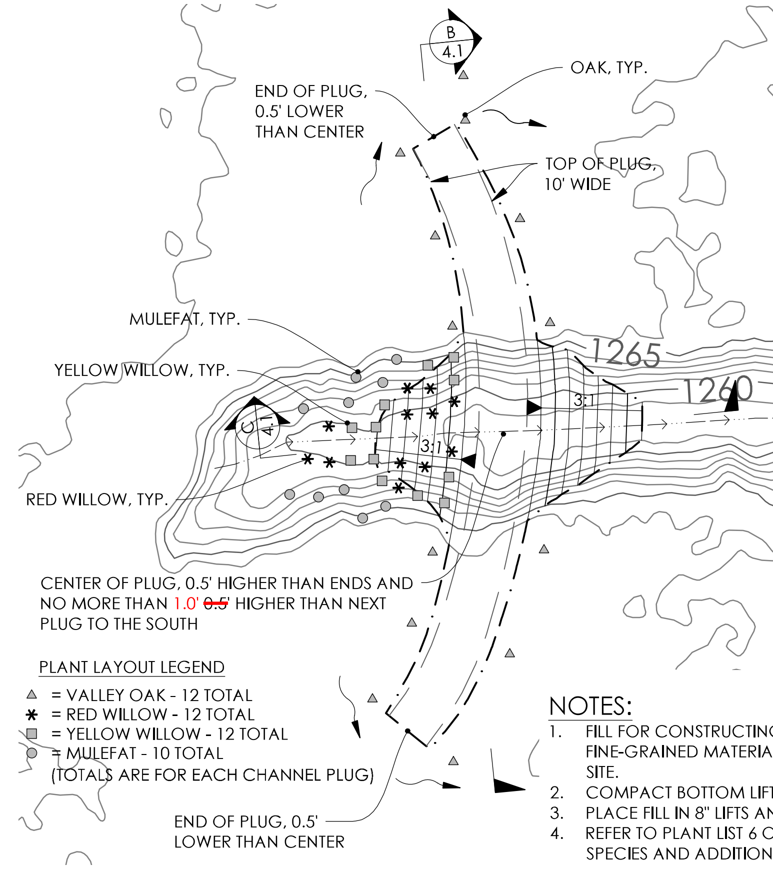
PROJECT NUMBER
215108
SCALE
AS SHOWN
SHEET
4.0



1 LOG GRADE CONTROL
SCALE: 1" = 5'



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



PLANT LAYOUT LEGEND

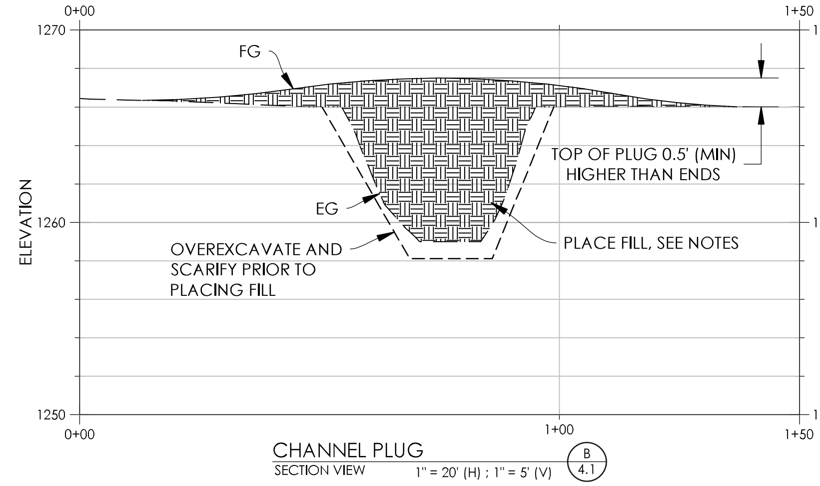
- △ = VALLEY OAK - 12 TOTAL
- * = RED WILLOW - 12 TOTAL
- ▢ = YELLOW WILLOW - 12 TOTAL
- ○ = MULEFAT - 10 TOTAL

(TOTALS ARE FOR EACH CHANNEL PLUG)

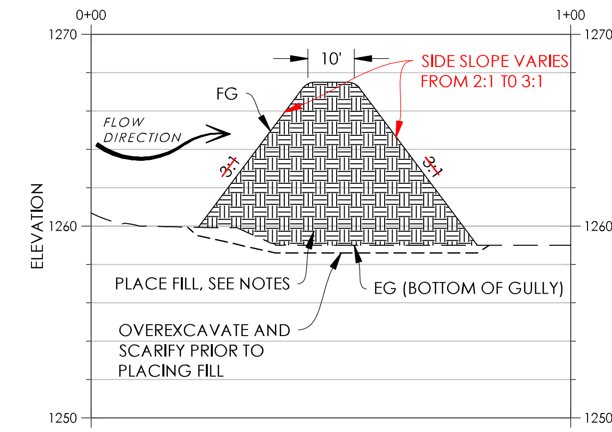
NOTES:

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

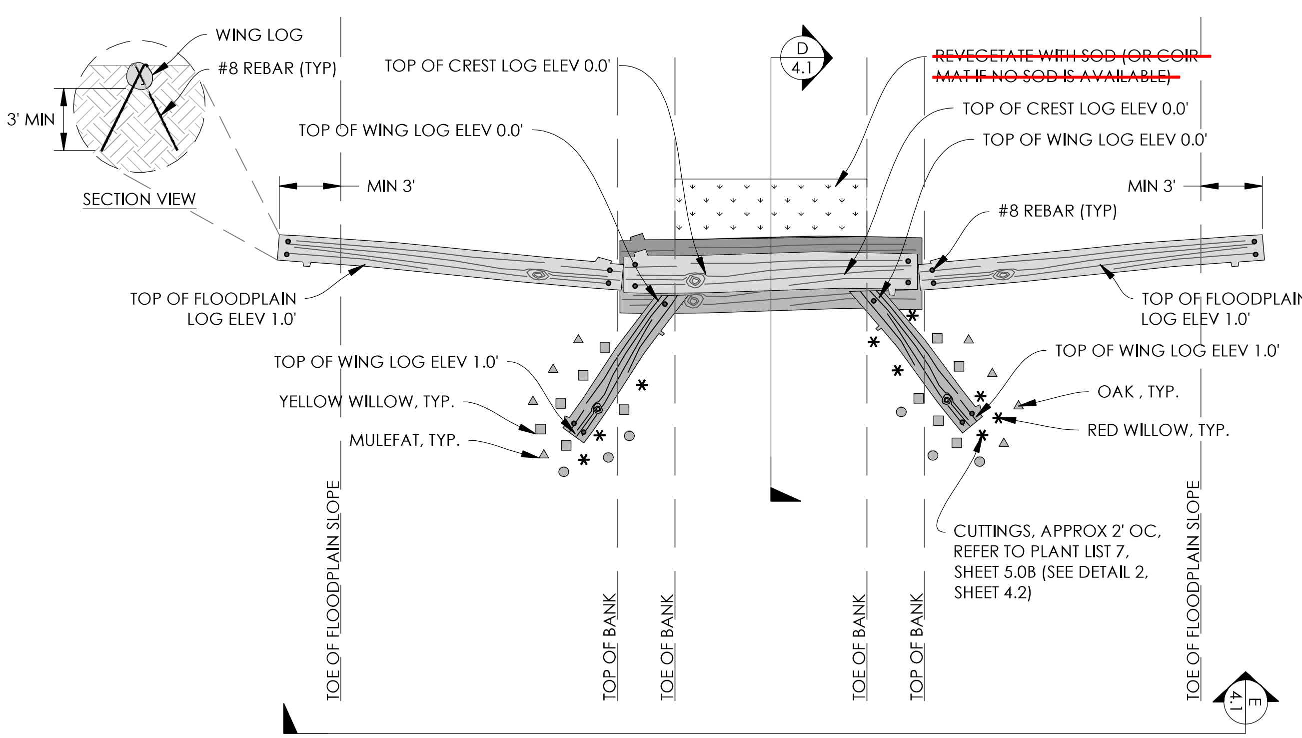
2 CHANNEL PLUG
SCALE: 1" = 20'



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



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

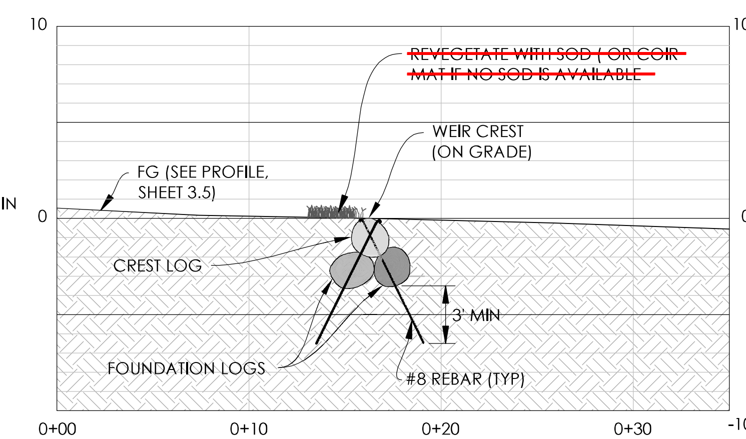


PLANT LAYOUT LEGEND

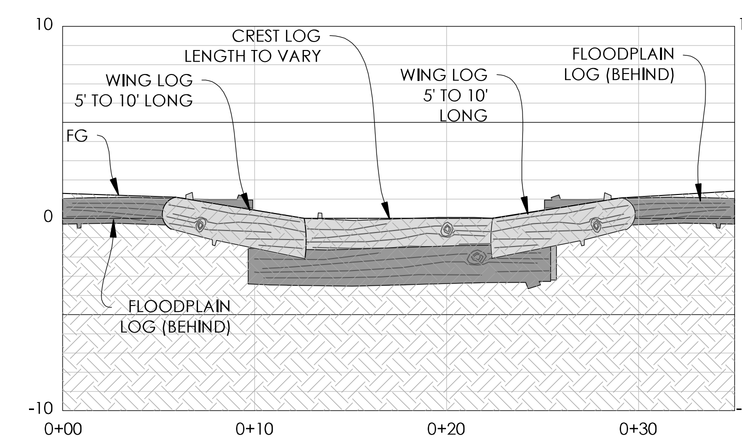
- △ = VALLEY OAK - 8 TOTAL
- * = RED WILLOW - 11 TOTAL
- ▢ = YELLOW WILLOW - 11 TOTAL
- ○ = MULEFAT - 6 TOTAL

(TOTALS ARE FOR EACH LOG STEP POOL STRUCTURE)

3 LOG STEP POOL
SCALE: 1" = 5'



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



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

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.

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

AS-BUILT DRAWINGS

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

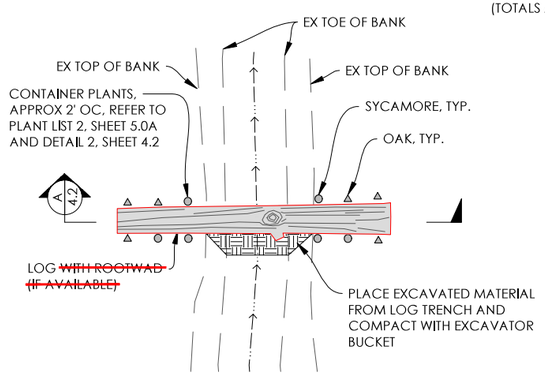
DESIGNED BY D DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

CHANNEL STABILIZATION DETAILS 1

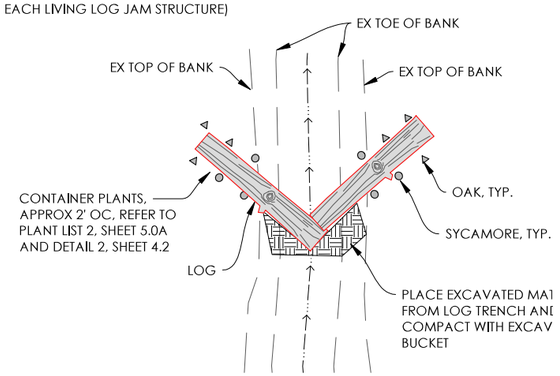
SAN FELIPE CREEK RESTORATION
SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE AS SHOWN
SHEET 4.1

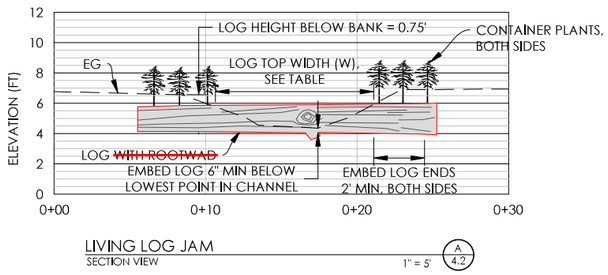
CONTAINER PLANT LAYOUT LEGEND
△ = VALLEY OAK - 6 TOTAL
⊙ = CALIFORNIA SYCAMORE - 6 TOTAL
(TOTALS ARE FOR EACH LIVING LOG JAM STRUCTURE)



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

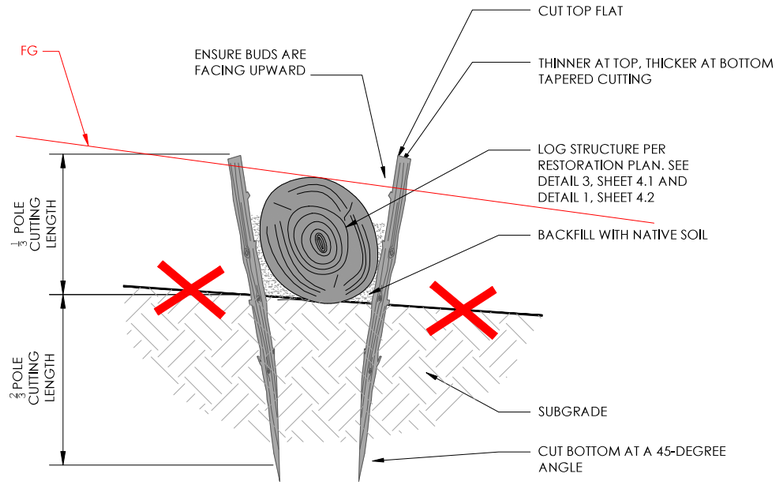


4 LIVING LOG JAM (TWO LOGS)
SCALE: 1" = 5'



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

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.



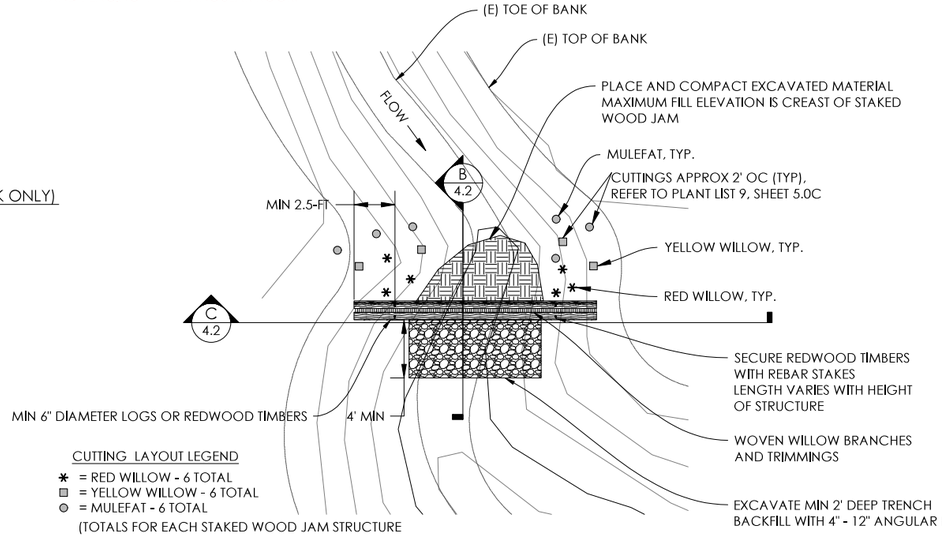
NOTES:
1. REFER TO PLANT LIST FOR PLANT SPECIES AND SIZE.
2. PLACE CUTTING CONCURRENT WITH ~~LOG WORK~~ PLANTING.

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.

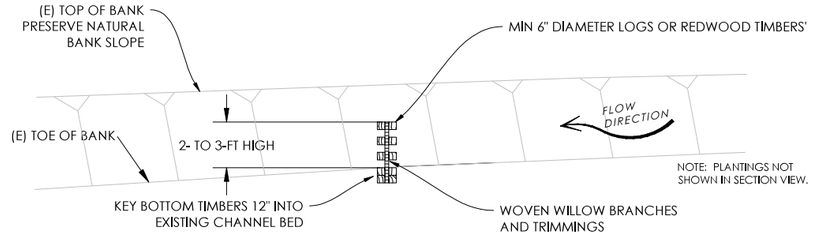
5 UPPER MOST STAKED DEBRIS JAM (HANDWORK ONLY)
SCALE: NTS

6 STAKED DEBRIS JAM (HANDWORK ONLY)
SCALE: NTS

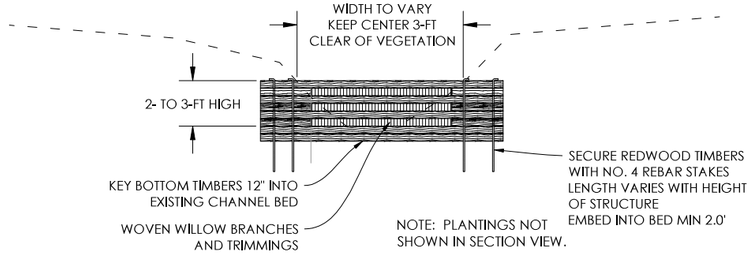


CUTTING LAYOUT LEGEND
* = RED WILLOW - 6 TOTAL
□ = YELLOW WILLOW - 6 TOTAL
⊙ = MULEFAT - 6 TOTAL
(TOTALS FOR EACH STAKED WOOD JAM STRUCTURE

3 STAKED WOOD JAM
SCALE: NTS



B STAKED WOOD JAM SECTION
SCALE: NTS



C STAKED WOOD JAM SECTION
SCALE: NTS

AS-BUILT DRAWINGS

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PREPARED FOR:
SANTA CLARA COUNTY PARKS
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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

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 CLARKIA	2
	ELYMUS GLAUCUS	BLUE WILD RYE	15
	ERIOGONUM FASCICULATUM	CALIFORNIA BUCKWHEAT	1.5
	ERIOPHYLLUM CONFERTIFOLIUM	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.

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 SPECIES 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 97,990 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.

AS-BUILT DRAWINGS

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PREPARED FOR: SANTA CLARA COUNTY PARKS; HABITAT AGENCY

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www.balancehydro.com

DUDEK; HRS

DESIGNED BY	DUDEK				
DRAWN BY	P KULCHAWIK	07-24-17	PK	DRAFT 65% DESIGN	
CHECKED BY	J ZANZI	11-14-17	PK	FINAL 65% DESIGN	
IN CHARGE	J ZANZI	03-08-19	JZ	AS-BUILT DRAWINGS	
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

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 (CALIPC) 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.

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

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AS-BUILT DRAWINGS

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 5.0E.

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.

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	JZ	03-08-19

DESIGNED BY DUDEK

DRAWN BY P KULCHAWIK

CHECKED BY J ZANZI

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

AS-BUILT DRAWINGS

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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

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PREPARED FOR: SANTA CLARA COUNTY PARKS HABITAT AGENCY

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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)	MAXIMUM COVER BY WEED SPECIES
1	90% PLANT SURVIVORSHIP [1]	70% PLANT SURVIVORSHIP [1]	50% COVER	20% COVER
2	85% PLANT SURVIVORSHIP [1]	65% PLANT SURVIVORSHIP [1]	55% COVER	15% COVER
3	25% VEGETATED COVER	15% VEGETATED COVER	60% COVER	10% COVER
4	30% VEGETATED COVER	20% VEGETATED COVER	65% COVER	10% COVER
5	35% VEGETATED COVER	25% VEGETATED COVER	70% COVER	10% COVER
6	40% VEGETATED COVER	30% VEGETATED COVER	70% COVER	10% COVER
7	45% VEGETATED COVER	35% VEGETATED COVER	70% COVER	10% COVER
8	50% VEGETATED COVER	40% VEGETATED COVER	70% COVER	10% COVER
9	55% VEGETATED COVER	45% VEGETATED COVER	70% COVER	10% COVER
10	60% VEGETATED COVER	50% VEGETATED COVER	70% COVER	10% COVER

(1) PLANT SURVIVORSHIP 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.

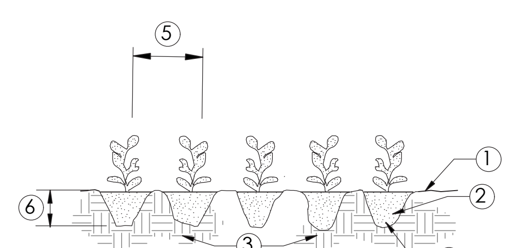
14. NATIVE HERBACEOUS VEGETATION THAT FAILS TO SHOW NEW GROWTH FROM ITS ROOT SYSTEM AFTER ONE DORMANT PERIOD AFTER PLANTING WILL BE CONSIDERED DEAD. RESEED AREAS ACCORDING TO THE DRAWINGS TO MEET THE PERFORMANCE RECOMMENDATIONS DESCRIBED HEREIN. DEAD VEGETATION WILL BE REMOVED BEFORE RESEEDING. ALL DEAD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

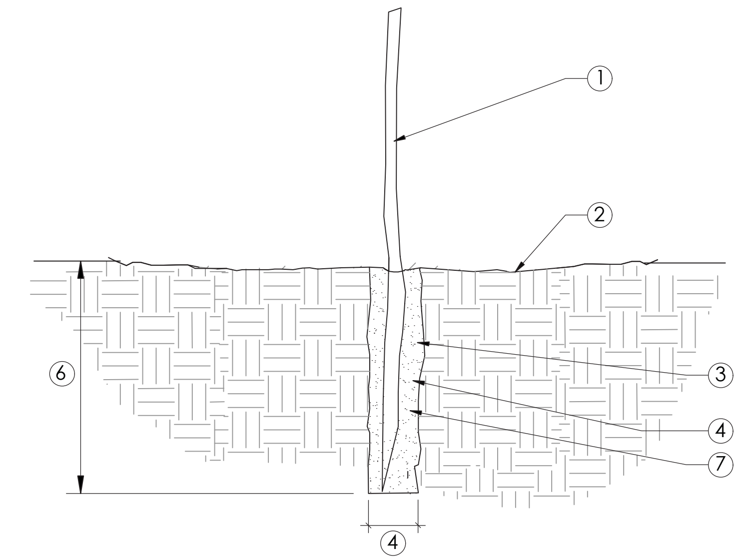
17. IN ADDITION, PLANT PROTECTION CAGES AND EXCLUSION FENCING WILL BE INSPECTED BY THE CONTRACTOR DURING PLANT ESTABLISHMENT SITE VISITS AND MAINTAINED AS INSTALLED IN AN UPRIGHT AND IN EFFECTIVE CONDITION.

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



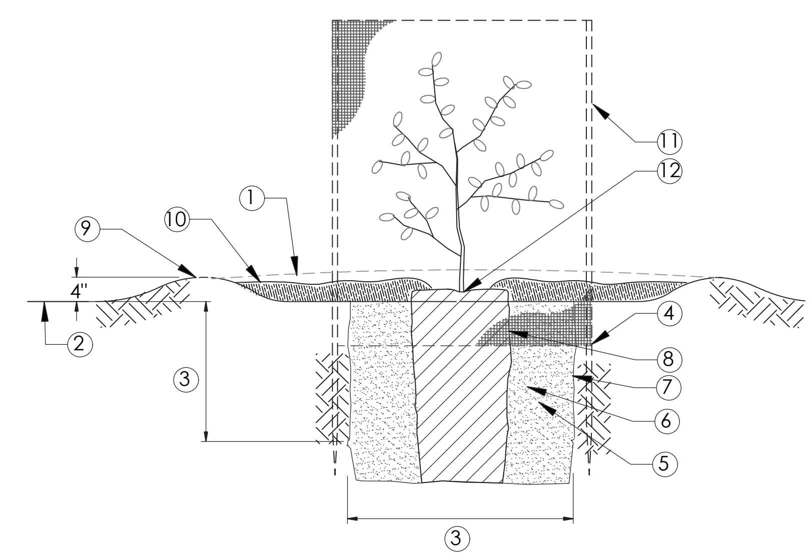
ITEM	DESCRIPTION
1	FINISH GRADE
2	ROOT BALL
3	AMENDED SOIL (PER NOTES)
4	WATER AND TAMP BACKFILL MIX WELL
5	SEE PLANT LISTS FOR SPECIES AND SPACING
6	DEPTH OF ROOT BALL

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

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AS-BUILT DRAWINGS

PREPARED FOR:

SANTA CLARA VALLEY HABITAT AGENCY

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HRS

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

PLANTING NOTES & DETAILS

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

PROJECT NUMBER
215108
SCALE
--
SHEET
5.0E

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.

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

Balance Hydrologics, Inc.

DUDEK

HRS

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

PRELIMINARY SOIL TEST RESULTS AND SOD NOTES

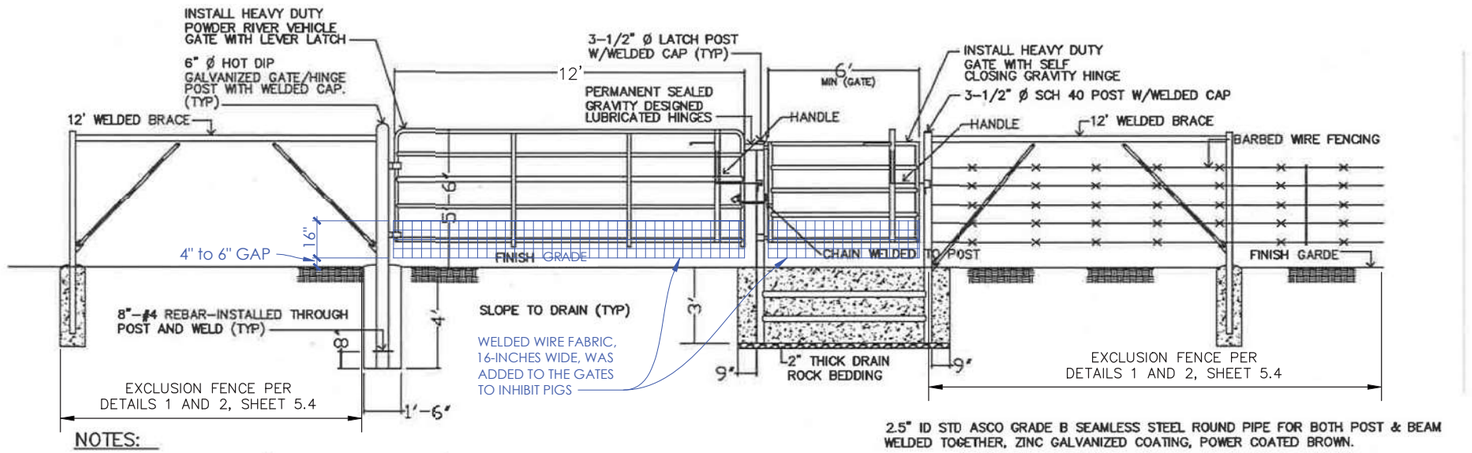
SAN FELIPE CREEK RESTORATION

SANTA CLARA COUNTY, CALIFORNIA
SANTA CLARA VALLEY HABITAT AGENCY

PROJECT NUMBER 215108
SCALE --
SHEET
5.0F

AS-BUILT DRAWINGS

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



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.

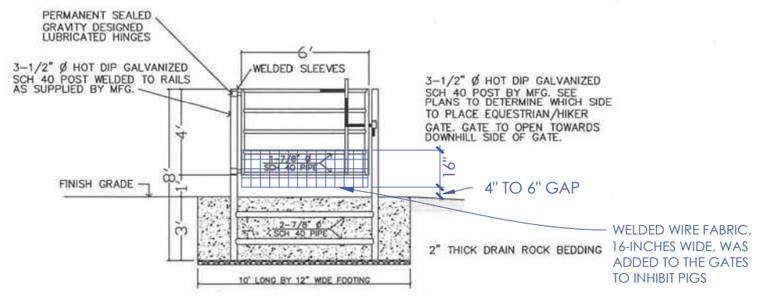
2. VEHICLE GATE TO BE HEAVY DUTY TUBE GATE, AS MFG. BY POWDER RIVER CO., OR EQUAL. GATE SHALL BE IN WIDTH INDICATED IN SPECIFICATIONS GREEN IN COLOR BY MFG. AS AVAILABLE AT:

   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



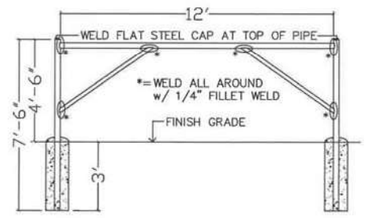
NOTES:

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\10054 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

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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

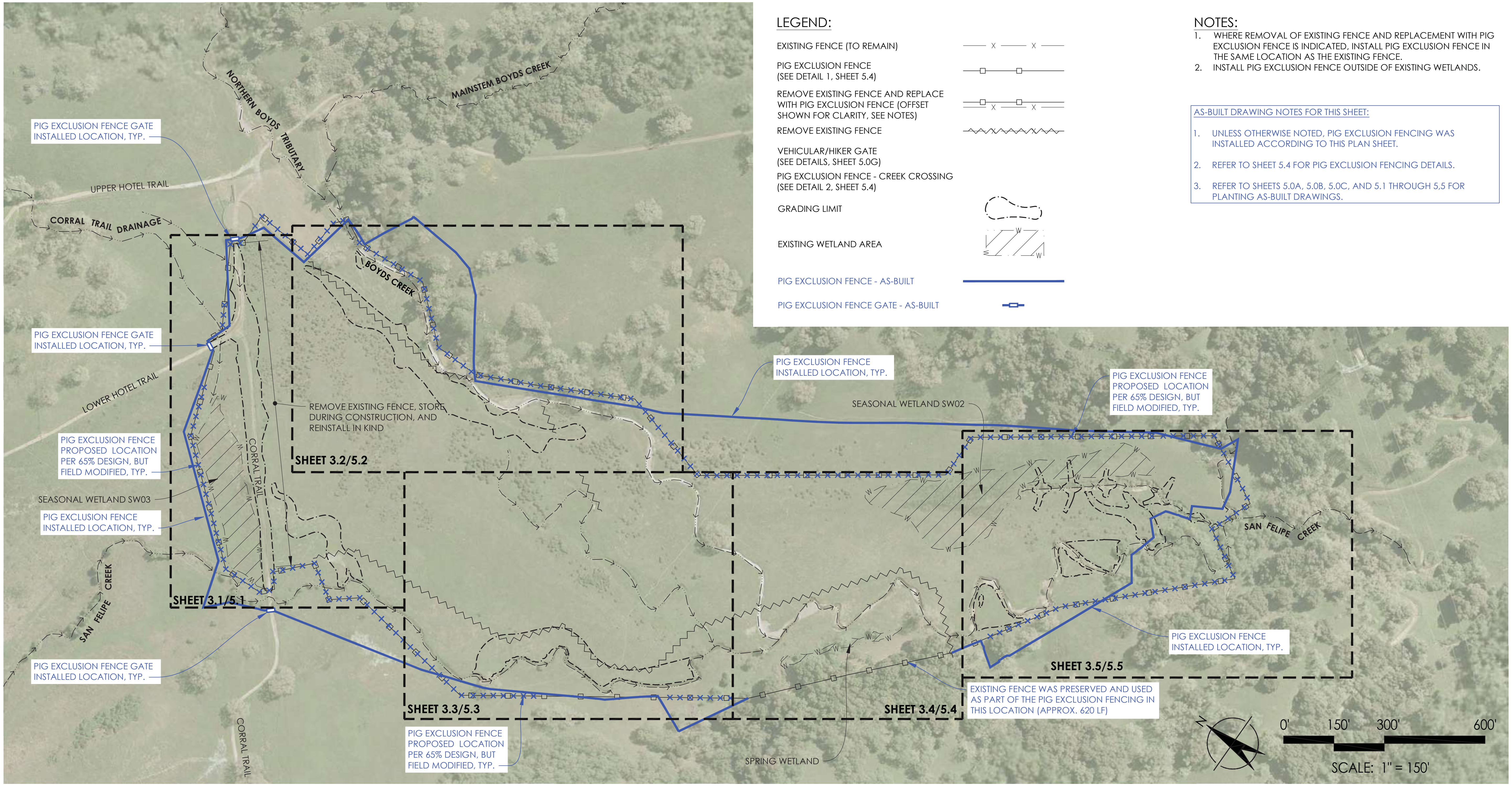
FENCE GATE DETAILS

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.

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

Balance Hydrologics, Inc.

DUDEK

HRS

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

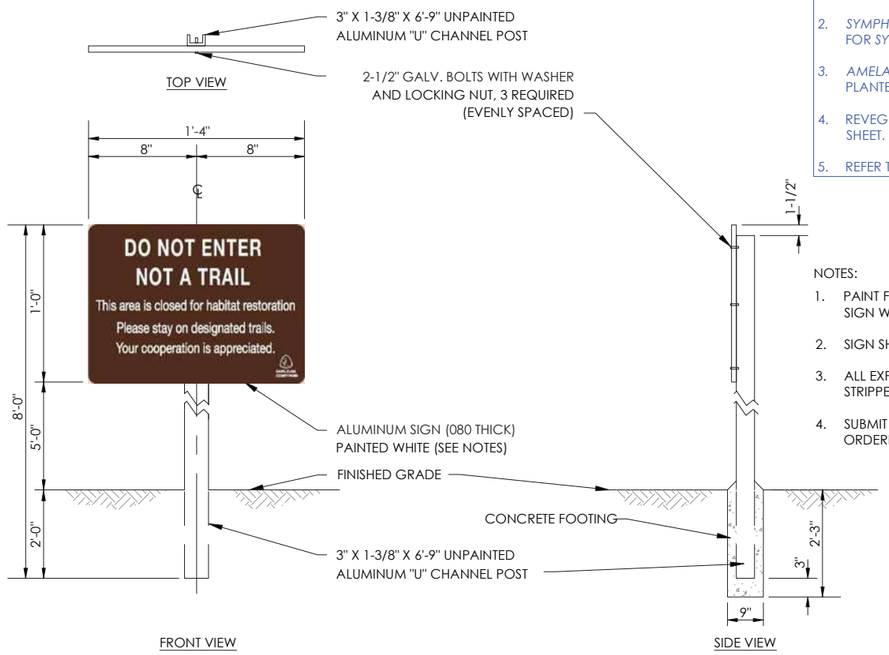
FENCING PLAN OVERVIEW

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\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-6 FENCING.DWG

AS-BUILT DRAWINGS



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.

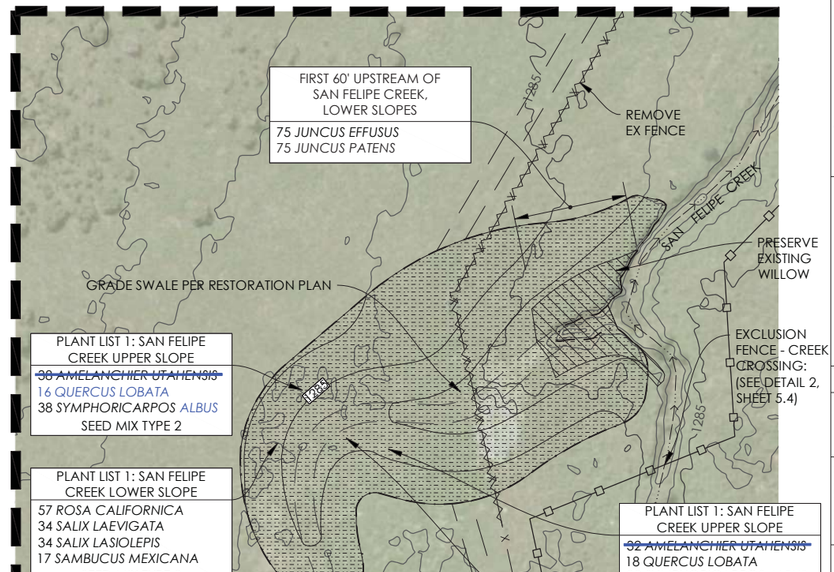
LEGEND:

- 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)

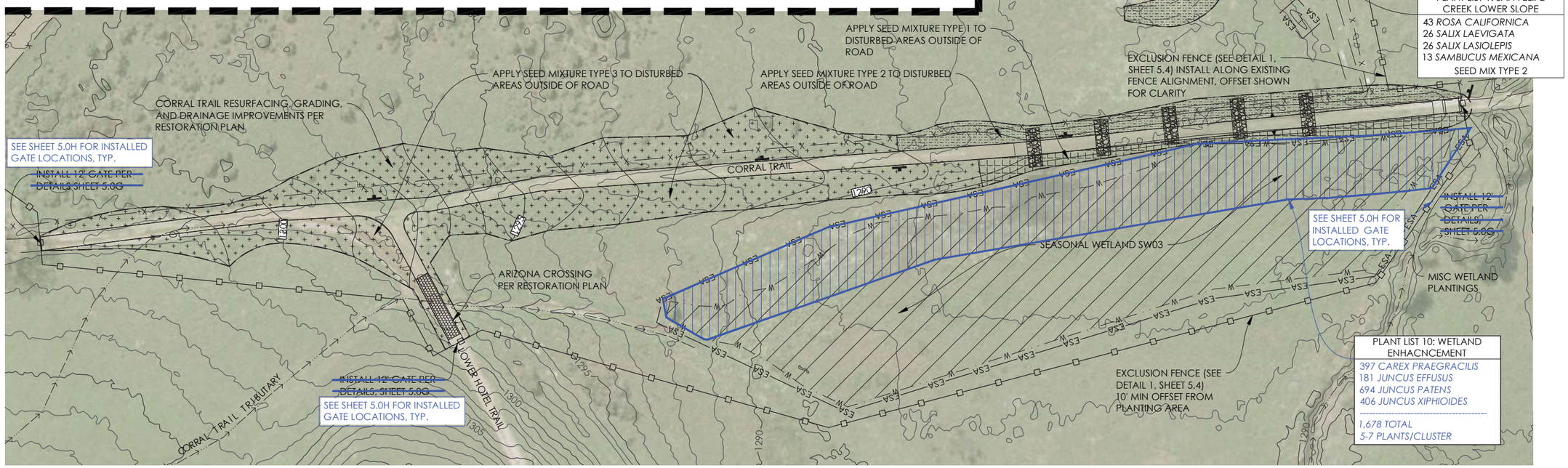
0' 40' 80' 160'

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\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 94710-2227
tel (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
CHECKED BY J ZANZI
IN CHARGE J ZANZI
DATE 11-14-2017

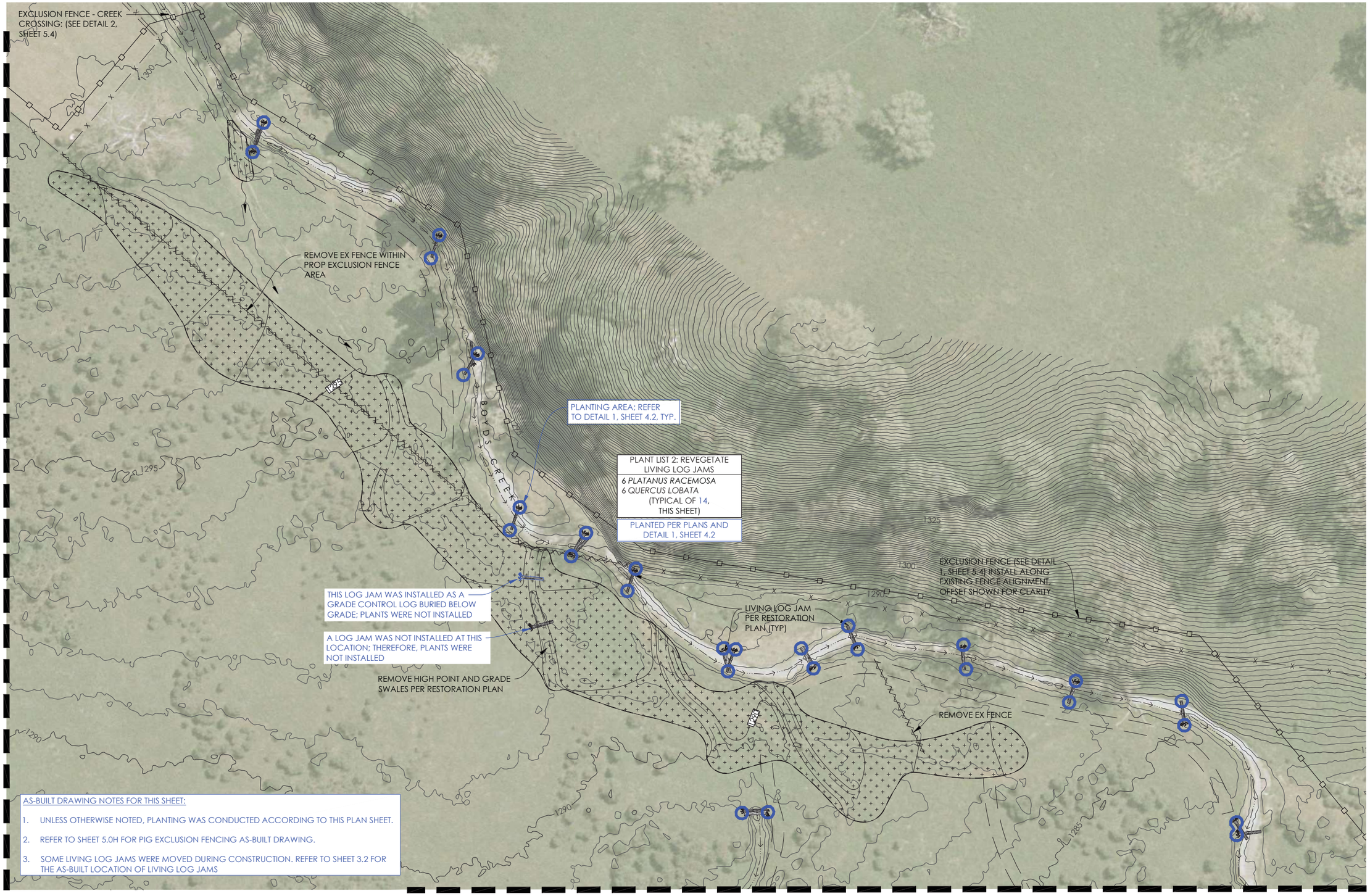
CORRAL TRAIL PLANTING & FENCING PLAN

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:\300.ENVIRONMENTAL\1006.4 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11TO5-405CALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS

SANTA CLARA VALLEY HABITAT AGENCY

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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

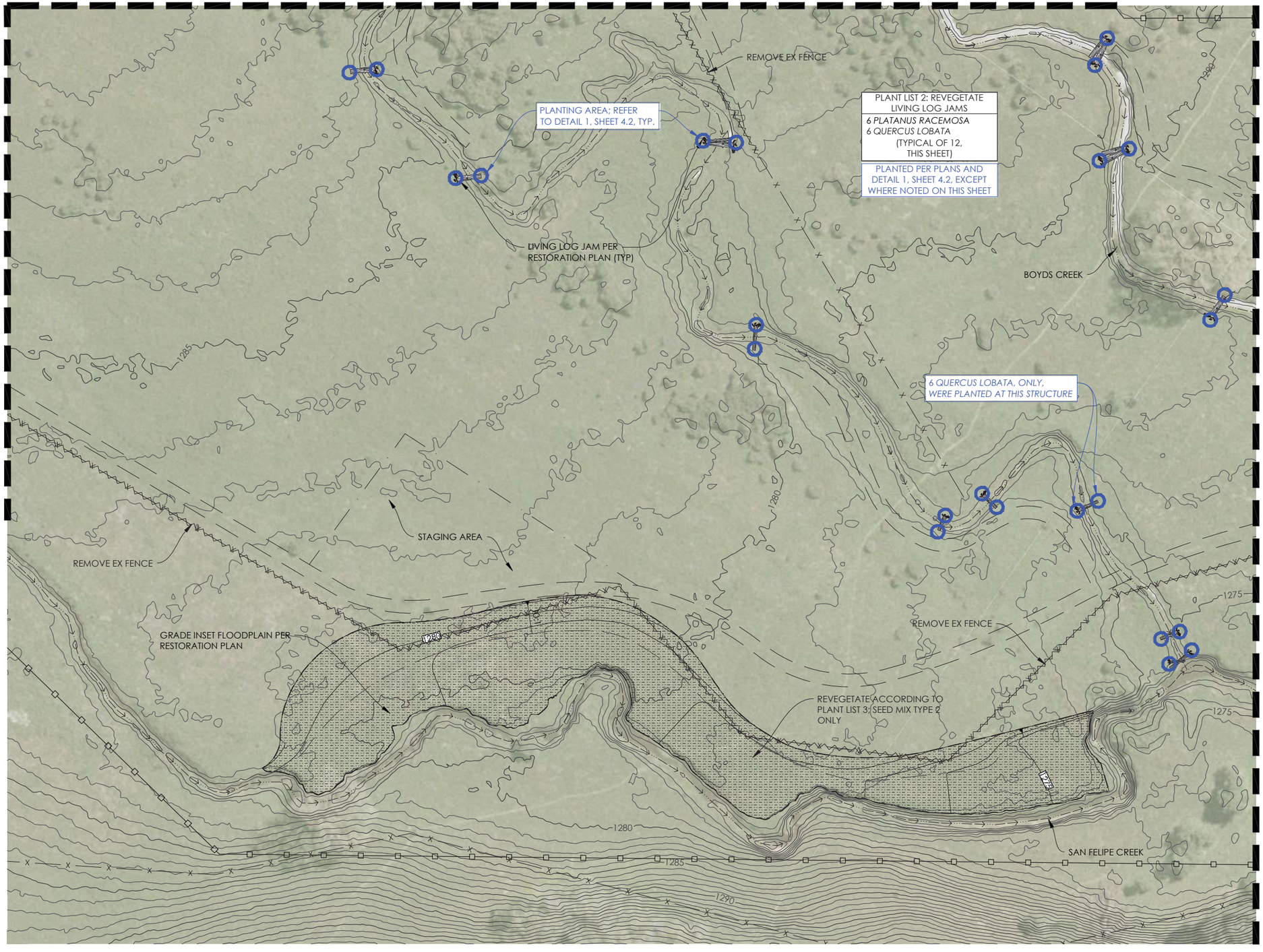
SCALE
1" = 40'

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\100545 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11TO5-40SCALE.DWG

PREPARED FOR:

SANTA CLARA COUNTY PARKS
HABITAT AGENCY

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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

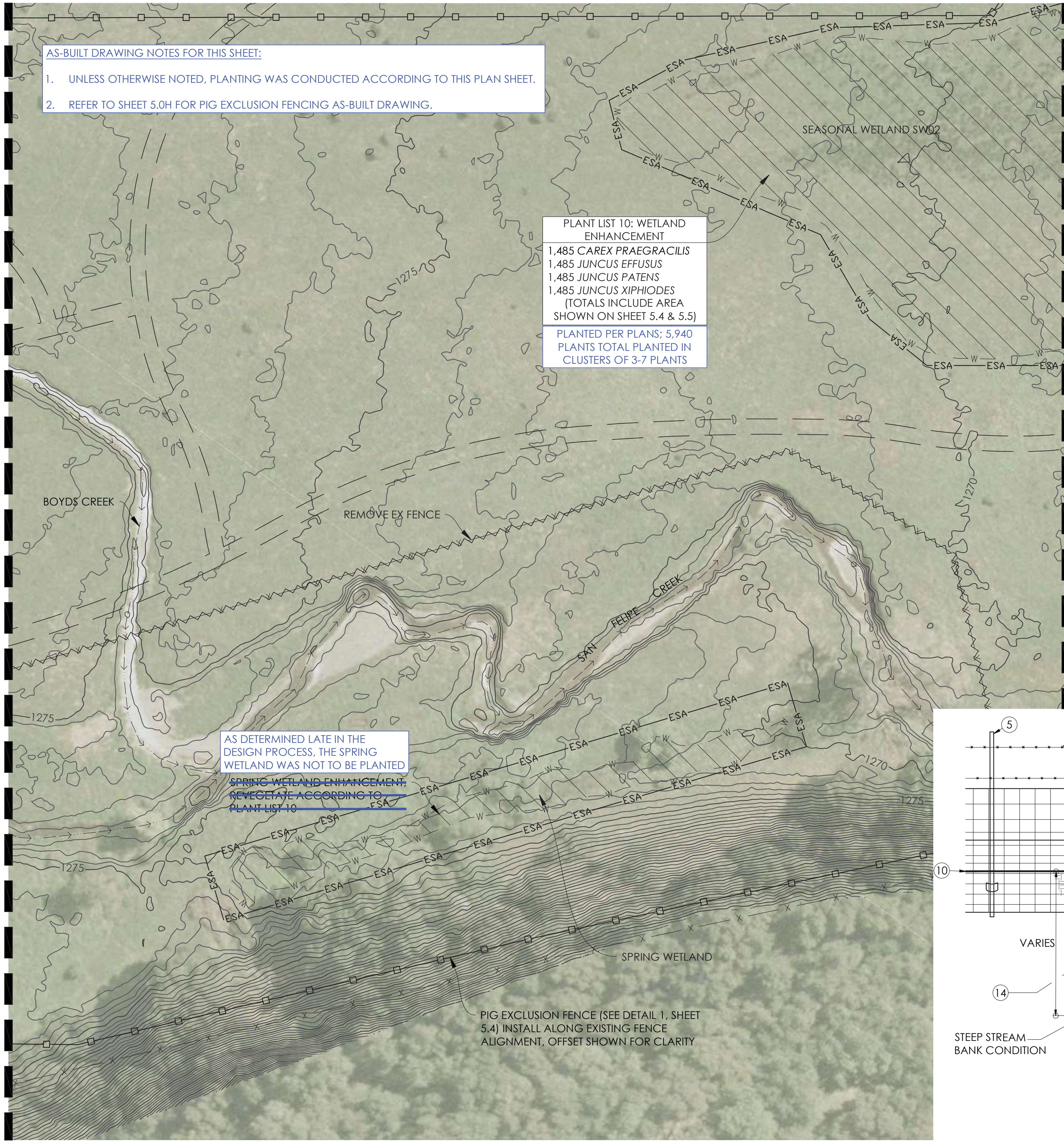
PROJECT NUMBER
215108

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.

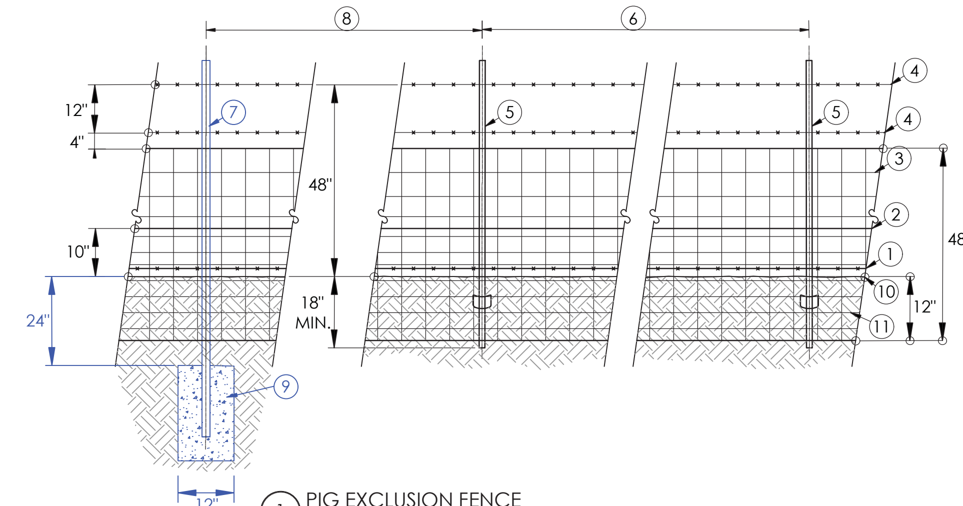


NOTE: AT ALL TIMES RETAIN EXISTING FENCES, AND MINIMIZE DISTURBANCE TO SAID FENCES UNLESS OTHERWISE INDICATED FOR REMOVAL

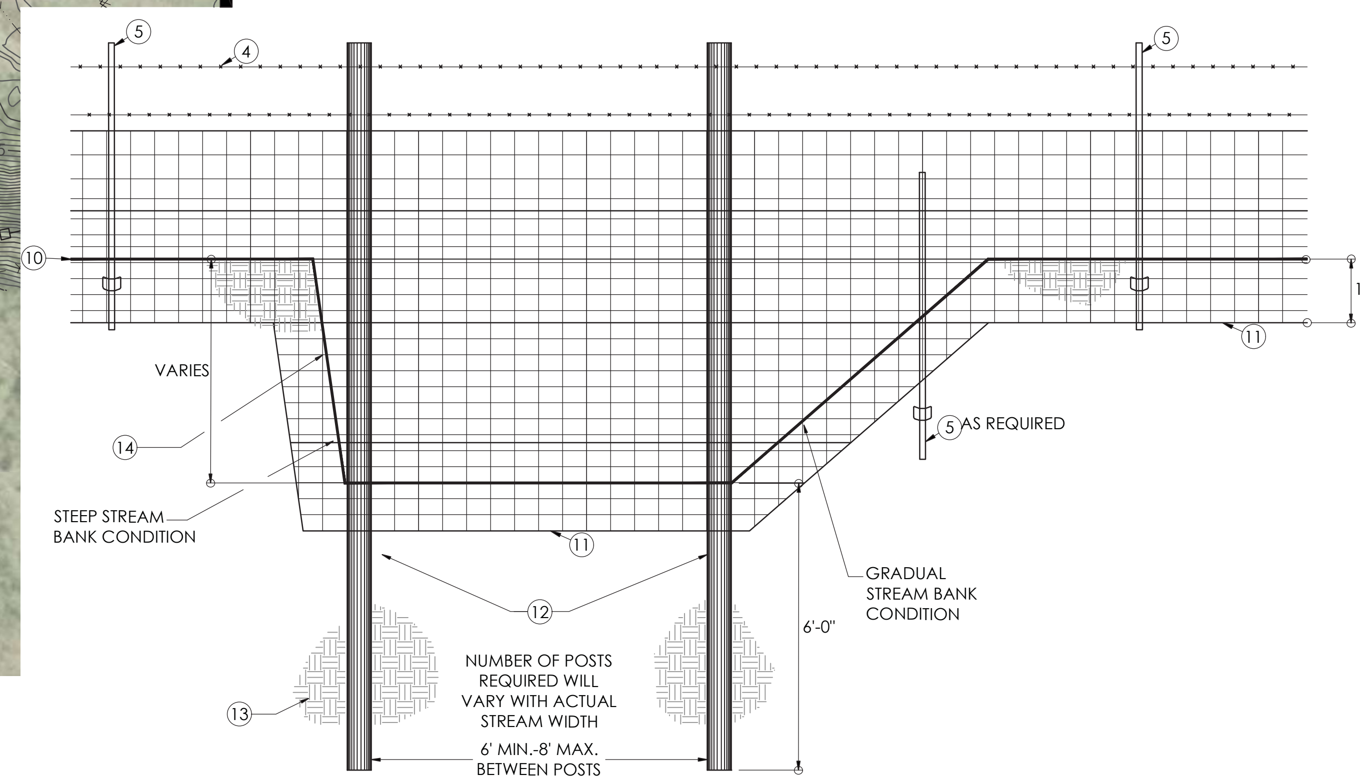
0' 40' 80' 160'

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

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

Balance Hydrologics, Inc.
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Berkeley, CA 94710-2227
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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

P:\300 ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\1-AS-BUILTS_REVEG\CAD\REVEG AS-BUILTS_05-11O5-405CALE.DWG

MATCH SHEET 5.4

PLANT LIST 6: CHANNEL PLUG REVEGETATION
UPLAND, EACH SIDE OF CHANNEL:
10 *BACCHARIS SALICIFOLIA*
12 *QUERCUS LOBATA*
IN CHANNEL, UPSTREAM ONLY:
12 *SALIX LAEVIGATA*
12 *SALIX LASIOLEPIS*
SEED MIX 3
(TYPICAL OF 5, THIS SHEET)

GRADE CHANNEL PLUGS PER RESTORATION PLAN (TYP)

SEASONAL WETLAND SWO2

WETLAND ENHANCEMENT, REVEGETATE ACCORDING TO PLANT LIST 10; SEE SHEET 5.4 FOR SPECIES AND QUANTITIES

GRADE INSET FLOODPLAIN PER RESTORATION PLAN

GRADE SWALES AND INSTALL LOG STRUCTURES PER RESTORATION PLAN

SAN FELIPE CREEK

GRADE INSET FLOODPLAIN PER RESTORATION PLAN

PLANT LIST 8: SLOPE ABOVE INSET FLOODPLAIN REVEGETATION
1 *AESCULUS CALIFORNICA*
1 *QUERCUS DOUGLASII*
1 *QUERCUS LOBATA*
9 *RIBES CALIFORNICUM*
9 *SYMPHORICARPOS ALBUS*
~~1 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

PLANT LIST 8: SLOPE ABOVE INSET FLOODPLAIN REVEGETATION
3 *AESCULUS CALIFORNICA*
3 *QUERCUS DOUGLASII*
3 *QUERCUS LOBATA*
13 *RIBES CALIFORNICUM*
13 *SYMPHORICARPOS ALBUS*
~~3 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

PLANT LIST 5: INSET FLOODPLAIN REVEGETATION
13 *FRANGULA CALIFORNICA*
26 *RIBES CALIFORNICUM*
~~13 *RIBES MALVACEUM*~~
13 *ROSA CALIFORNICA*
13 *RUBUS URSINUS*
9 *SAMBUCUS MEXICANA*
~~9 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

PLANT LIST 5: INSET FLOODPLAIN REVEGETATION
22 *FRANGULA CALIFORNICA*
44 *RIBES CALIFORNICUM*
~~22 *RIBES MALVACEUM*~~
22 *ROSA CALIFORNICA*
22 *RUBUS URSINUS*
15 *SAMBUCUS MEXICANA*
~~15 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

PLANT LIST 4: INSET FLOODPLAIN REVEGETATION
30 *FRANGULA CALIFORNICA*
60 *RIBES CALIFORNICUM*
~~30 *RIBES MALVACEUM*~~
30 *ROSA CALIFORNICA*
30 *RUBUS URSINUS*
20 *SAMBUCUS MEXICANA*
~~20 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

DUE TO THE LOCATION OF THE PIG EXCLUSION FENCE AND PROXIMITY TO SAN FELIPE CREEK, OAK TREES THAT WOULD HAVE BEEN INSTALLED ON THE SOUTHWEST SIDE OF THE PLUG WERE MOVED AND CLUSTERED NORTHEAST OF THE PLUG.

EXCLUSION FENCE - CREEK CROSSING: (SEE DETAIL 2, SHEET 5.4)

STAKED WOOD JAM PER RESTORATION PLAN (TYP)

FIELD FIT ADJUSTMENTS WERE REQUIRED AT EACH WOOD JAM TO ACCOMMODATE THE STEEP, INCISED BANKS AND/OR EXISTING VEGETATION (LARGE OAK TREE ROOTS). WHERE NECESSARY, PLANTS WERE SHIFTED UPSTREAM OF THE JAMS, AT THE TOE OF THE SLOPE.

PLANT LIST 9: REVEGETATE STAKED WOOD JAMS
6 *BACCHARIS SALICIFOLIA*
6 *SALIX LAEVIGATA*
6 *SALIX LASIOLEPIS*
(TYPICAL OF 6, THIS SHEET; INSTALL PER DETAIL 3, SHEET 4.2)

SAN FELIPE CREEK

EXCLUSION FENCE - CREEK CROSSING: (SEE DETAIL 2, SHEET 5.4)

PLANT LIST 7: REVEGETATE LOG STEP POOLS
6 *BACCHARIS SALICIFOLIA*
8 *QUERCUS LOBATA*
11 *SALIX LAEVIGATA*
11 *SALIX LASIOLEPIS*
(TYPICAL OF 4, THIS SHEET; INSTALL PER DETAIL 3, SHEET 4.1)

PLANT LIST 8: SLOPE ABOVE INSET FLOODPLAIN REVEGETATION
1 *AESCULUS CALIFORNICA*
1 *QUERCUS DOUGLASII*
1 *QUERCUS LOBATA*
8 *RIBES CALIFORNICUM*
8 *SYMPHORICARPOS ALBUS*
~~1 *UMBELLULARIA CALIFORNICA*~~
SEED MIX TYPE 2

EXCLUSION FENCE - CREEK CROSSING: (SEE DETAIL 2, SHEET 5.4)

PLANT LIST 8: INSET FLOODPLAIN REVEGETATION
12 *AESCULUS CALIFORNICA*
12 *QUERCUS LOBATA*
65 *ROSA CALIFORNICA*
65 *RUBUS URSINUS*
12 *SAMBUCUS MEXICANA*
SEED MIX TYPE 1

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_05-11TO5-40SCALE.DWG

PREPARED FOR:
SANTA CLARA COUNTY PARKS
HABITAT AGENCY

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DUDEK
HRS

SUBMITTALS / REVISIONS	DATE	BY
CONCEPT PLANS	03-27-17	TG
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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 E

Remedial Plan Memorandum

605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 F 760.632.0164

MEMORANDUM

To:	Edmund Sullivan, Santa Clara Valley Habitat Agency
From:	Mike Sweesy
Subject:	San Felipe Creek Restoration Project Remedial Plan – REVISED FINAL
Date:	December 9, 2020
cc:	Julie King and Will Spangler, Santa Clara Valley Habitat Agency; Kevin DiSabatino and Pete Trotta, HRS; David Shaw and Eric Donaldson, Balance Hydrologics; Laurie Monarres and John Zanzi, Dudek
Attachment(s):	Figure 1. Remedial Treatment Map Figure 2. Replacement Planting Program 2020 Attachment A. San Felipe Restoration Project Adaptive Management, 2020, Balance Hydrologics

As a follow-up to our conversation on September 11, 2020, this memorandum summarizes our recommendations for remedial actions to correct deficiencies in the San Felipe Creek Restoration Project with the intent to bring the project back into conformance with performance standards, chiefly container plant survival. The plan is based on internal discussions within the HRS-Dudek-Balance Hydrologics team, the conversation with Julie King and Will Spangler of the Santa Clara Valley Habitat Agency (Habitat Agency) about replacement plant species on September 18, 2020, and the site meeting with Julie King and Will Spangler on September 23, 2020. This plan directs the operations, maintenance and monitoring work going forward to meet the project goals & objectives and performance requirements as stated in the project Mitigation and Monitoring Plan, including Table 15, Wetland Rehabilitation and Enhancement Performance Standards, and Table 16, Non-Wetland Waters (Stream) and Riparian Buffer Performance Standards. In addition, the plan considers adaptive management as stated in the project Mitigation and Monitoring Plan and summarized in Table 18, Project Objectives, Metrics, and Example Adaptive Management Strategies.

The Remedial Plan focuses on 5 primary actions: feral pig control, irrigation system reliability, replacement planting, channel dynamics, and operations, maintenance, and monitoring. Refer to Figure 1, Remedial Treatment Map for treatment location identification numbers and additional information on the remedial actions.

Feral Pig Control

Site observations showed two conditions that contribute to feral pig damage: lack of effective exclusion along sections of the exclusion fence, and insufficient means to remove feral pigs from the site once inside. Recommendations for remedial of feral pig damage consist of 1) fence reinforcement, 2) swing gate modification, and 3) additional 1-way pig gates (Figure 1). All feral pig control actions will be conducted in fall 2020. In addition, the Habitat Agency is working with the Country on an enhanced pig trapping program.

Fence Reinforcement

The fence reinforcement remedial actions will be implemented in 2 Phases (Table 6).

Fence Reinforcement – Phase 1

Phase 1 fence reinforcement remedial actions were field identified during a site meeting on September 23, 2020 for 3 locations (Figure 1): 1) north side adjacent to the wetland enhancement (approximately 450 linear feet), 2) east side (approximately 600 linear feet), and 3) southeast end (approximately 300 linear feet).

At each location the following fence reinforcement actions will be conducted:

- Add a long T-post approximately every 3rd post to add stability; new posts will be driven 18-inches into undisturbed soil within 3 inches of the existing post; 3 hog ties will be used at each post to attach the old post to the new post to increase vertical rigidity.
- Add two 12-gauge vertical wire ties between every post to hold up the wire mesh to resist feral pig ability to climb over the fence.
- Add barbed wire immediately atop the woven wire mesh. The wire shall be tensioned between the two end posts.

During the week of October 26, 2020, HRS has reinforced the northern 450 linear feet, and tightened and stretched the wire for the eastern 600 linear feet. The Phase 1 fence reinforcement actions will be completed in December 2020.

Fence Reinforcement – Phase 2

Phase 2 fence reinforcement remedial actions are identified for 4 locations (Figure 1):

1. Along northern boundary from the western gate along Corral Trail past SW03, the Arizona crossing, past the eastern gate, and extending past the corner on the eastern side of Boyds Creek crossing – these are on either side of the Phase 1 remedial actions along this boundary (approximately 1,390 linear feet);
2. Along the remainder of the eastern perimeter and south to where it ties into the new fence installed by an independent contractor to the Habitat Agency (approximately 1,205 linear feet);
3. To west of and along ID03-1B (approximately 345 linear feet); and
4. To west of and along ID03-02, -03 and -04 (approximately 750 linear feet).

The following fence modifications will be implemented at each location:

- Add a long T-post approximately every 3rd post to add stability; new posts shall be driven 18-inches into undisturbed soil within 3 inches of the existing post; if problems arise in additional areas, additional t-posts may need to be installed along the rest of the perimeter; 3 hog ties will be used at each post to attach the old post to the new post to increase vertical rigidity.
- Add two 12- gauge vertical wire ties between every post to hold up the woven wire mesh to resist feral pig ability to climb over the fence.
- Add corner bracing.

In addition, the following fence enhancements be added over the entire length of the perimeter fence, with the exception of the section south of the new fence installed by an independent contractor to the Habitat Agency (approximate perimeter distance is 8,606 linear feet).

- Add barbed wire immediately atop the woven wire mesh. The wire shall be tensioned between the two end posts. Provide new end post bracing to allow sufficient tension that will hold up the woven wire mesh under downward pressure from animals.
- Add a double strand, twisted, heavy gauge wire along the very top of the fence to reduce the ability of feral pigs to cross over the fence.

If new areas are observed where pigs are entering the site over the fence, the same fence modifications will be implemented on those sections of fence.

Swing Gate Modification

The swing gate at the northeast corner was not manufactured per specifications due to miscommunication with the manufacturer. The gate could have been reordered to specifications, but the project schedule did not contain sufficient flexibility to accommodate this change. The gate was installed upon approval of the Habitat Agency's representative at the time of construction. The current gate is self-closing and has a pedestrian actuated latch that cannot be opened by feral pigs. Due to the substantial concrete footing, the gate cannot be rotated 180-degrees without significant cost and effort. To remedy the gate operation and function, the gate was retrofitted on November 5, 2020 for reliable passive closure; the retrofit actions included adjusting the hinges, removing the rubber pad, and filing-down the self-closing latch to allow for proper function.

In addition, all gates on and within the project will have information signs installed on both sides advising all users to close and latch the gate upon use. The information signs will also be installed on both sides of the new gate installed at the south end of the site as part of the new fence installed by an independent contractor to the Habitat Agency.

Additional One-way Pig Gates

There is currently 1 one-way pig gate recently installed by the Habitat Agency at the north end of the project. One set of gates within such a large area appears to be insufficient to quickly remove pigs from the site before significant damage that one pig can create over a relatively short period of time. The recommendation for additional one-way pig gates is to increase the frequency of opportunities along the fence line where baited areas can be found by pigs to exit the mitigation site. This approach will improve near term and long-term feral pig control. While Dudek recommend that multiple additional gates be installed and baited as appropriate by the Habitat Agency, the Habitat Agency has agreed to install 1 one-way pig gate at the Spring Wetland (Figure 1) to be field located by the Habitat Agency. All one-way pig gates will be operated and maintained by the Habitat Agency.

Irrigation System Reliability

Irrigation system upgrades are needed to support establishment of the original and replacement plantings. The existing irrigation system will be overhauled and retrofitted as a drip irrigation system. Each plant will be watered

using 2 pressure-compensating drip emitters (each with a flow rate of 2 gallons per hour) installed equidistant at each plant to provide appropriate water distribution around the rootball, redundancy to protect against emitter malfunction, and to promote deep watering to the plant rootball. It is expected that 2 drip emitters per plant will be sufficient due to their flow rates and systems will be operated for 2 watering events per week, minimum; HRS will monitor the irrigation system operation and plant health and if and where needed, will install an additional drip emitter and/or will conduct additional watering events.

The drip irrigation system will allow for deep watering with long run times because of the reduced demand on the limited water supply that is stored at the HRS tank farm. In addition, the low pressure required for drip emitters is well within the capacity of the existing pump system. More frequent watering events will support plant survival and growth and can minimize non-native invasive plant species growth as compared to a spray system. The drip systems shall be isolated, valved and operated by habitat type (e.g., wetland, riparian, upland). In areas where drip irrigation was initially installed, the existing systems will be re-set, drip tubing will be anchored, and drip emitters will be added to total 2 emitters for each plant. HRS will provide Dudek with a watering schedule (e.g., run times, watering days per valved system); Dudek will facilitate coordination of the watering schedule with the Habitat Agency.

In addition, on-grade drip irrigation tubing and PVC pipe will be anchored using rebar "U" stakes installed at a minimum of 10-feet on-center. All pipes crossing access roads will be protected with hose ramp pipe protectors. All pipes crossing creeks will be reinstalled with cable supports. The cable support will be attached to driven steel stakes on each end of the creek to suspend the PVC pipes. PVC will be connected to the cable support using hose clamps. Any new PVC pipe installed as part of the irrigation system retrofit will be Schedule 40 UV-resistant PVC. In case needed for future plant establishment maintenance, the existing sprinkler systems shall be retained but shall be isolated from the retrofitted drip systems using ball valves.

Note, the float valve issue in the water tanks has been fixed. In addition, improved communication with County Parks has occurred. The original float valve that was installed after pump failures was defective and have been replaced with a functioning valve. The float valve will shut down the pump when the water level in the tanks reaches a minimum level to protect the pump from pumping an empty tank.

Lastly, at the start of the 2021 irrigation season the entire irrigation system will be tested and inspected to confirm it is operating properly; any needed repairs will be conducted for a fully operational system.

Replacement Planting

The replacement planting actions summarized in this section are focused on addressing Year 2 plant survivorship performance standards. The proposed species composition and densities are based upon the data collected to-date during on-site qualitative and quantitative monitoring, input from project hydrologists, botanists and restoration specialists, and input from the Habitat Agency. The proposed plant species and quantities have been designed to meet project performance standards using 2 phases of replacement plantings based primarily on nursery container stock availability. Planting areas for each species are indicated in the tables below; planting areas are shown on Figures 1 and species, sizes and quantities are shown in Figure 2.

Phase 1 - Fall 2020

Based on the annual monitoring conducted by Dudek and calculated mortality of the original plantings, an initial replacement container plant order has been procured by HRS from The Watershed Nursery in Richmond, California, whose operations are compliant with Phytophthora BMPs (Table 1). The order was prepared in direct coordination with Dudek and Habitat Agency staff for species and quantities. The order was refined on the call with Julie King and Will Spangler on September 18, 2020.

Table 1. Container Plant List - 2020

Botanical Name	Common Name	Sizes	Quantity	Planting Area(s)
Baccharis salicifolia	Mulefat	D-16	92	ID03-1A; ID03-03, -04, -05
Quercus lobata	Valley oak	D-40S, D60S, 4-GAL	90	ID03-1A; ID03-03, -04, -05
Frangula californica	California coffeeberry	D-40	153	ID03-1A; ID03-03, -04, -05
*Heteromeles arbutifolia**	Toyon*	D-40	56	ID03-1A; ID03-03, -04, -05
*Populus fremontii**	Fremont cottonwood*	D-40	20	ID03-1A; ID03-03, -04, -05
Rubus ursinus	California blackberry	D-40	27	ID03-1A; ID03-03, -04, -05
Salix lasiolepis	Arroyo willow	TP4S	1	ID03-1A; ID03-03, -04, -05
Sambucus nigra ssp. Caerulea	Blue elderberry	D-40, 1-GAL	102	ID03-1A; ID03-03, -04,- 05
*Juncus balticus ssp. Ater**	Wire rush*	STUB	98	SW02, 03
*Schoenoplectus californicus**	California bulrush*	TB2	112	ED03-02; SW02, 03
		Total	**751**	

*Denotes species not included in the original plant palette. These species are recommended as replacement plants to add to the species richness and habitat complexity of the project site and have been observed to occur within the San Felipe Creek watershed in the project vicinity.

Plant species, sizes, quantities, and distribution are shown in Figure 2, Replacement Planting Program 2020. In SW02 and SW03, the rush and bulrush planting areas will include areas where extensive pig rooting has occurred.

Only available species with propagules collected in Santa Clara and Alameda Counties are being used, applying more strict guidance on plant sourcing than appears in the MMP and project permits. Larger container sizes are specified for replanting because larger plants are expected to be more durable under flow conditions and under the variable conditions occurring at the project site. Larger container stock is also easier to drip irrigate. The replacement plant list was developed with a consideration of existing site conditions and monitoring results, with the goals of establishing species that will tolerate the range of hydrologic conditions at the site and providing diverse riparian and wetland habitats. For example, mulefat (*Baccharis salicifolia*) was not originally installed in ID03-03 and ID03-04 due to anticipated hydrologic conditions. However, initial monitoring results indicate that the channel has evolved and moved since 2018, and the resulting hydrology will now be wetter and will likely support this species; as such it has been recommended as a replacement for dead shrubs in these locations.

In addition to nursery grown container stock, willow (*Salix spp.*) pole cuttings will be harvested on site and installed in selected locations where soil moisture and hydrology are believed to be conducive to success (Table 2). However, we are mindful that cuttings typically have a low survival rate, and this is expected on this site as well. All cuttings

will be collected from dormant on-site willow trees and planted in late fall/winter after soaking to stimulate initial root growth. Cuttings will be installed according the technical provisions in the planting notes and detail on sheets 5.0D and 5.0E of the design plans. Additionally, in the intermittent drainage (ID-02) willow cuttings will be installed upstream of the structures.

Table 2. Pole Cuttings - 2020

Botanical Name	Common Name	Sizes	Quantity	Planting Area(s)
Salix spp.	Willow	4-foot long	100	ID02; ID03-03, -04; ED03-01 through 03
		Total	**100**	

Pole cutting quantities, and distribution are shown in Figure 2, Replacement Planting Program 2020.

The majority of the replacement plantings will occur in the floodplain restoration areas and at log jams. Areas of sediment accretion/deposition will be favored over areas that demonstrate scour. Replacement planting locations were field reviewed by Dudek during the site meeting on September 23, 2020 and have been field located using pin flags by Dudek's Senior Restoration Specialist on October 28, 2020; concurrently, the Habitat Agency approved the locations on October 28, 2020 before plant installation which occurred during the first week of November 2020. Dudek provided a plant flagging key that used the same flag color per plant species as described in the October 2018 Plant Flagging Key. All container plants for woody species are being installed with plant protection cages to facilitate survivorship. Cages are being reused from previous plantings that did not survive as appropriate and new cages are being installed as necessary. Where needed, current plantings that have outgrown their current cages will have larger cages installed. Cages are being constructed from aviary wire and rebar in the same fashion as the original installation. Pole cuttings will not receive plant protection cages.

In addition, select areas that were seeded in 2018 and have since been eroded by the feral pigs will be reseeded in Fall 2020; the reseeding areas include but are not limited to the eastern slope at ID03-04), the cleared area at the south end of the site along the new fence installed by an independent contractor to the Habitat Agency, and the wetland areas (SW02 and SW03). The seed mixes (Table 3) vary from the original seed mixes due to species availability, and have been approved by the Habitat Agency. The mixes will be applied by hand broadcasting. Field decisions will be made to not reseed areas that might experience high creek flows that will wash out the reseeding efforts. A map of the reseeded areas will be provided to Habitat Agency.

Lastly, hand-weeding of nonnative vegetation from planting basins and within cages will be conducted for existing surviving plants.

This space has been intentionally left blank.

Table 3. Reseeding Mixes - 2020

RESEED MIX TYPE A – WETLAND MIX Apply to disturbed wetland areas as needed (in Planting Areas SW02 and SW03)			
Source	**Scientific Name**	**Common Name**	**Pure Live Seed (Pounds Per Acre)**
Alameda County	*Carex densa*	Dense Sedge	1.3
Contra Costa County	*Hordeum brachyantherum*	Meadow Barley	10.0
Alameda County	*Juncus patens*	Common Rush	1.0
		Total Mix Type A	**12.3**
RESEED MIX TYPE B – RIPARIAN MIX Apply to disturbed floodplain restoration areas as needed (in Planting Areas ID03-1A; ID03-03, -04, -05)			
Source	**Scientific Name**	**Common Name**	**Pure Live Seed (Pounds Per Acre)**
Alameda County	*Artemisia douglasiana*	California Mugwort	0.25
Alameda County	*Carex densa*	Dense Sedge	1.3
Alameda County	*Castilleja exserta*	Purple Owl's Clover	2.5
Alameda County	*Grindelia stricta*	Gumweed	2.0
Contra Costa County	*Hordeum brachyantherum*	Meadow Barley	10.0
Alameda County	*Juncus patens*	Common Rush	1.0
Santa Clara	*Mimulus (Diplacus) aurantiacus*	Sticky Monkeyflower	0.15
		Total Mix Type B	**17.2**
RESEED MIX TYPE C – UPLAND MIX Apply to disturbed upland areas, including but not limited to the south end of the site along the new fence installed by an independent contractor to the Habitat Agency			
Source	**Scientific Name**	**Common Name**	**Pure Live Seed (Pounds Per Acre)**
Santa Clara	*Acmispon glaber*	Deerweed	3.0
Santa Clara	*Artemisia californica*	Coastal Sagebrush	0.5
Santa Clara	*Elymus glaucus*	Blue Wildrye	12.0
Alameda County	*Eriogonum fasciculatum*	California Buckwheat	1.5
Alameda County	*Eschscholzia californica*	California Poppy	1.5
Santa Clara	*Lupinus bicolor*	Bicolor Lupine	4.0
Santa Clara	*Mimulus (Diplacus) aurantiacus*	Sticky Monkeyflower	0.15
Santa Clara	*Salvia millifera*	Black Sage	2.0
Santa Clara	*Stipa pulchra*	Purple Needle Grass	12.0
		Total Mix Type C	**36.65**

Phase 2 - Fall 2021

To supplement the Phase 1 - Fall 2020 replacement plantings, and to ensure enough quantities are available to exceed the plant performance requirements, site-appropriate species propagules will be collected this fall to be grown in containers over the winter, spring and summer for planting in fall 2021 (Table 4). The species palette recommends additional species not originally included in 2018: coyote brush (*Baccharis pilularis*), California mugwort (*Artemisia douglasiana*), toyon (*Heteromeles arbutifolia*), and Fremont's cottonwood (*Populus fremontii*). The additional species were approved by Brian Wines of the San Francisco Bay Regional Water Quality Control Board on October 21, 2020 by way of a phone call and email follow-up. Though considered, poison oak (*Toxicodendron diversilobum*) will not be prescribed as it will not be contract grown.

The Habitat Agency has procured the container plant propagule collection and will provide the container plants for the 2021 replanting efforts (Table 4). The plant propagules have been collected by the Watershed Nursery in Richmond, California, whose operations are compliant with Phytophthora BMPs, will be grown over the winter, spring and summer for installation in fall 2021. The container plants will be supplemented with willow pole cuttings to be harvested and installed by HRS in winter 2022 (Table 5). Cuttings will be installed according the technical provisions in the planting notes and detail on sheets 5.0D and 5.0E of the design plans.

In response to site conditions, more Sycamores and less oaks will be planted throughout the project. To facilitate plant establishment in consideration of potential flows in Boyds Creek, Sycamore plants will be installed in deposition areas and in slip faces (where the hydraulic energy is less) within the channel and upstream of the log jams in Boyds Creek (planting area ID01) and the ephemeral drainage north of Boyds Creek (planting area ED01) in accordance with the project design. In addition, these Sycamores will be anchored (e.g., with a rebar stake) to hold the plant in place under flow conditions. Elderberry (*Sambucus nigra ssp. Caerulea*), coffeeberry (*Frangula californica*), California buckeye *(Aesculus californica)*, and coyote brush plants will be installed along with valley oaks in select locations so that oaks are not planted too densely. Where valley oaks have established in planting areas, other smaller statured species such as elderberry, coffeeberry, and coyote brush will be installed to provide structural diversity and minimize competition between oaks. In addition, the smaller statured species can serve as nurture plants, placed in a manner that allows the plant to capture atmospheric moisture (e.g., fog) and deliver that moisture to the soil near the oak plantings.

All container plants for woody species will be installed with plant protection cages to facilitate survivorship as noted above. Pole cuttings will not receive plant protection cages.

This space has been intentionally left blank.

Table 4. Plant List - 2021

Botanical Name	Common Name	Sizes	Quantity	Planting Area(s)
Aesculus californica	California buckeye	TB4	80	ID03-02, ID01, ED01
Artemisia douglasiana	California mugwort	D-40	45	ID01, ED01
*Baccharis pilularis**	Coyote brush	D-40	65	ID03-02, ID01, ED01
Baccharis salicifolia	Mulefat	D-40	100	ID01, ED01
Frangula californica	California coffeeberry	D-40	75	ID03-02, ID01, ED01
*Heteromeles arbutifolia**	Toyon	D-40	40	ID03-02
Platanus racemosa	California sycamore	D-40	45	ID03-02, ID01, ED01
*Populus fremontii**	Fremont cottonwood	D-40	40	ID03-02
*Quercus agrifolia**	Coast live oak	D-40	40	ID03-02
Quercus lobata	Valley oak	D-40	40	ID03-02, ID01, ED01
Ribes californicum	California gooseberry	D-40	15	ID03-02
Rosa californica	California rose	D-40	30	ID03-02
Rubus ursinus	California blackberry	D-40	30	ID03-02
Sambucus nigra ssp. *Caerulea*	Blue elderberry	D-40	45	ID01, ED01
Symphoricarpos albus	Common snowberry	D-40	30	ID03-02
		Total	**720**	

*Denotes species not included in the original plant palette. These species are recommended as replacement plants to add to the species richness and habitat complexity of the project site and have been observed to occur within the San Felipe Creek watershed in the project vicinity.

Table 5. Pole Cuttings - 2021

Botanical Name	Common Name	Sizes	Quantity	Planting Area(s)
*Salix spp.***	Willow	4-foot long	50	ID03-02
		Total	**50**	

**Denotes willow cuttings to be installed as pole cutting fences, 5 rows with 10 cuttings in each row.

Channel Dynamics

The upstream floodplain restoration area on San Felipe Creek (ID03-02) is currently functioning as expected with respect to the anticipated dynamic channel movement, sediment sequestration, and sediment transport continuity as outlined in the MMP (Attachment A). However, a cut-off channel became incised in flood events during winter 2019-20 and we seek to offset the risk of new channel incision evolving to become a dominant and/or incised single thread channel. A debris jam made of natural materials will be installed in summer 2021 (Attachment A). The debris jam is intended to raise water surface elevations in order to enhance overbank flow onto and through the created inset floodplain and into secondary channels. This action will decrease the creek gradient and maintain channel and floodplain complexity that will support and sustain riparian plantings. These areas will be replanted with suitable plant species in fall 2021 and will be drip irrigated.

One log jam on Boyds Creek that was damaged and the easternmost log that was dislodged was replaced by HRS during the week of October 26, 2020. The log replacement was conducted to slow potential bank erosion until the adjacent oak plantings develop stronger root systems (Attachment A); care was taken to preserve adjacent oak plantings. The log jam will be replanted in fall 2021 according to the discussion above and drip irrigated.

In intermittent drainage ID-02, and as planned, additional boards may be installed at the structures as sediment accumulates and consolidates, in accordance with the project design and pending Balance's monitoring efforts in winter/spring 2021.

Operations, Maintenance, and Monitoring

The project's operations, maintenance and monitoring will be modified going forward, and responsibilities will fall on both Dudek/HRS and the Habitat Agency. In addition, it is anticipated that Balance Hydrologics will provide adaptive management construction oversight for debris jam and log jam replacement at the two locations presented in their adaptive management memorandum (Attachment A).

HRS/Dudek

Dudek's role will be increased to conduct oversight of HRS' operations and maintenance, and to conduct enhanced performance monitoring. This will result in improved and timely feedback and communication to inform and direct HRS for remedial actions to meet the project performance requirements. For the duration of the HRS contract, Dudek will conduct additional qualitative monitoring in addition to the quantitative monitoring that is currently part of the contract, as follows:

- Qualitative monitoring of ongoing operation and maintenance including irrigation and weed control - site observations and recommendations for remedial – 8 each per year (1 visit each month anticipated in March through October); and
- Quantitative monitoring will continue to be performed on the current semi-annual schedule for vegetation transect data collection and plant counts, cover assessments, plant health and recommendations for remedial actions/adaptive management in April.

In addition, to facilitate plant establishment, HRS will conduct more frequent and proactive operations and maintenance of the project site. It is anticipated that HRS will be on site a minimum of 1 day each week for the duration of the project. The on-site efforts will be variable for each weekly visit and will assess irrigation and plant performance and any exclusion fence issues or pig damage.

As part of their maintenance work, HRS will continue to perform regular non-native invasive plant species control according to the site's "Weed Management Plan". Depending on site conditions, weed cover, or related issues, additional maintenance visits may be needed in the late winter and early spring to control target species before developing seed. Invasive plant species control will be conducted to protect naturally recruiting native vegetation that has been observed in the project site. As part of the weed management efforts, hand-weeding of nonnative vegetation from planting basins and within cages will be conducted. Dudek's monitors may identify or flag native vegetation for HRS to protect. Lastly, HRS will provide Dudek with an updated watering schedule (e.g., run times,

watering days per valved system) each time the schedule is changed and at a minimum on a quarterly basis each year; Dudek will facilitate coordination of the watering schedule with the Habitat Agency.

It is anticipated that irrigation will be provided through fall 2022, with an incremental reduction in watering in 2022 to wean the plants off of a dependency on irrigation.

Habitat Agency

For the duration of the project, the Habitat Agency will be responsible for the following operations:

- Keeping all pig exclusion fence gates closed at all times in partnership with County Park staff;
- Operation and maintenance of at least 2 game cameras and 2 one-way pig gates;
- Coordinating with County Parks' maintenance services on an enhanced pig trapping program;
- Coordinating County Parks' maintenance services, including ensuring regular water service to the restoration site; and
- Conducting and facilitating quarterly maintenance meetings with the County, Dudek, and HRS during the irrigation season.

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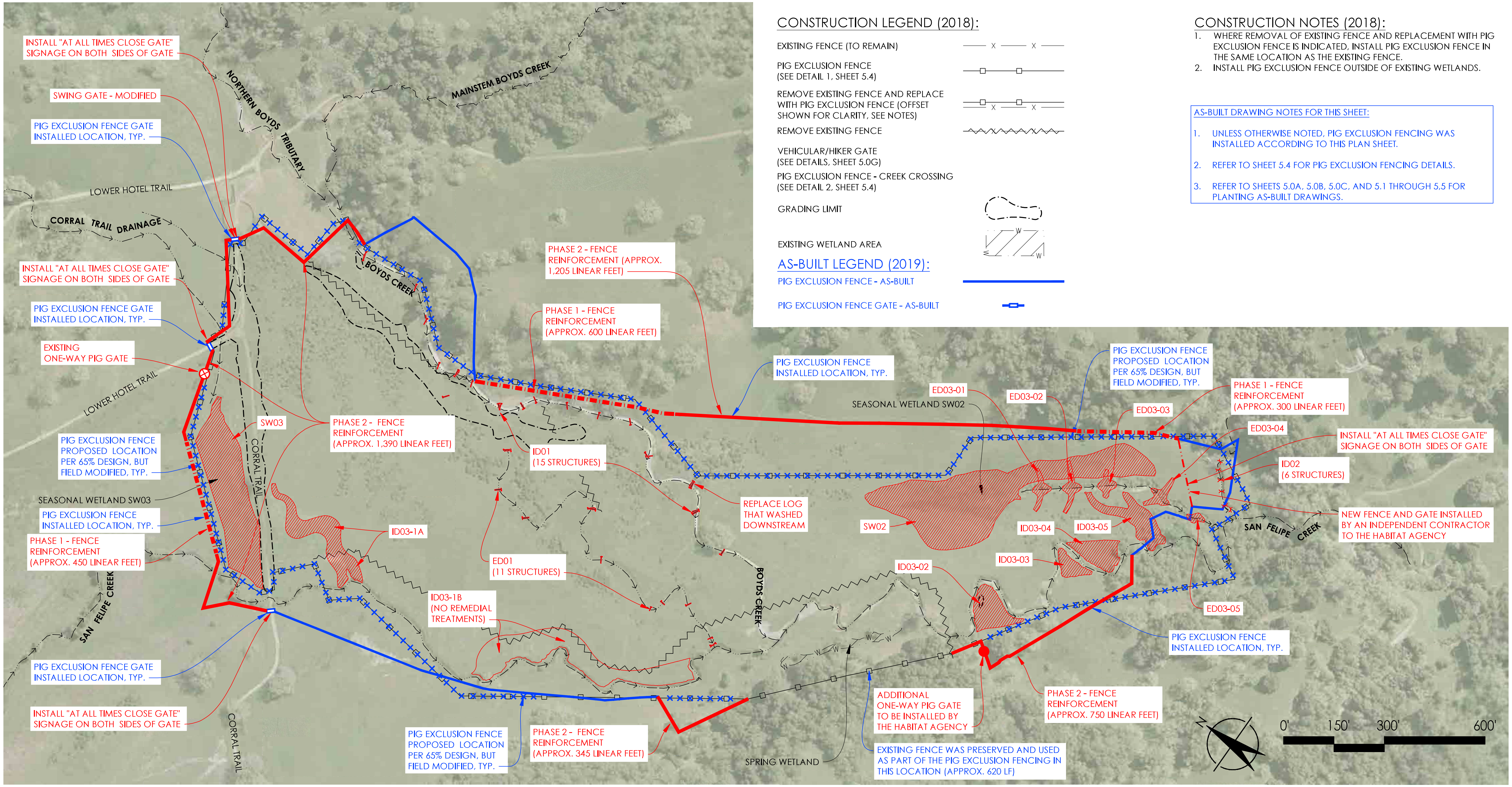
Schedule

Table 6 summarizes the anticipated schedule for implementation of the Remedial Plan.

Table 6. Remedial Schedule

Remedial Item	Anticipated Timing
Feral Pig Control	
Fence Reinforcement	
Fence Reinforcement – Phase 1	October/November/December 2020
Fence Reinforcement – Phase 2	Spring 2021
Swing Gate Modification	November 2020
One-way pig gate installation	December 2020/January 2021
Irrigation System Reliability	**Fall 2020 and Spring 2021**
Replacement Planting	
Container Planting – Phase 1	November 2020
Cutting Installation – Phase 1	January 2021
Reseeding	December 2020
Propagule Collection for Phase 2 Container Planting	Fall 2020/Winter 2021
Propagule Propagation and Growing for Phase 2 Container Planting	Winter/Spring/Summer 2021
Container Planting – Phase 2	October/November 2021
Cutting Installation – Phase 2	January 2022
Channel Dynamics	
Install one log jam on Boyds Creek	Fall 2020
Planting at log jam on Boyds Creek	Fall 2021
Install Debris Jam	Summer 2021
Plantings at ID03-02	Fall 2021
Operations, Maintenance and Monitoring	
Qualitative monitoring of ongoing operation and maintenance	Annually: 8 events per year (1 visit each month anticipated in March through October)
Quantitative monitoring - vegetation	Annually: 1 per year in April
Site operations and maintenance	Annually: minimum of 1 day each week



CONSTRUCTION LEGEND (2018):

- 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

AS-BUILT LEGEND (2019):

- PIG EXCLUSION FENCE - AS-BUILT
- PIG EXCLUSION FENCE GATE - AS-BUILT

CONSTRUCTION NOTES (2018):

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.

REMEDIAL TREATMENT LEGEND:

- FENCE REINFORCEMENT - PHASE 1
- FENCE REINFORCEMENT - PHASE 2
- FENCE AND GATE INSTALLED BY THE HABITAT AGENCY
- REPLANTING AREA AND IDENTIFICATION NUMBER (XX##-##)
- REPLANTING AT STRUCTURE AND IDENTIFICATION NUMBER (XX##-##)

NOTE:
THIS PLAN IS BASED ON THE AS-BUILT DRAWING FOR THE FENCING PLAN, DATED 03-08-19.

REMEDIAL TREATMENT PLAN

AS-BUILT DRAWINGS

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

Balance Hydrologics, Inc.
DUDEK
HRS

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
12-01-20	JZ	REMEDIAL TREATMENT PLAN

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

REMEDIAL TREATMENT PLAN

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

PROJECT NUMBER 10054
SCALE 1" = 150'
SHEET

FIGURE 1

P:\300 ENVIRONMENTAL\10054 SAN FELIPE CREEK RESTORATION\3-ADAPTIVE MANAGEMENT\REMEDIAL PLAN\GRAPHICS\FIG 1_REMEDIAL TREATMENT MAP.VSDWG

DUDEK

Figure 2. Replacement Planting Program 2020

10/28/2020 as conducted in the field with Dudek, HRS, and SCVHA

Container Plants - 2020

Plant Quantities per Planting Area

Botanical Name	Common Name	Sizes	Quantity	Plant Spacing (feet on-center)	Habitat	Planting Area(s)	ID-02	ID03-1A	ID03-03	ID03-04	ID03-05	ED03-01	ED03-02	ED03-03	ED03-04	ED03-05	SW02	SW03
Baccharis salicifolia	Mulefat	D-16	92	**6**	**wetland-riparian**	ID03-1A; ID03-03, -04, -05	0	40	12	12	28	0	0	0	0	0	0	0
Frangula californica	California coffeeberry	D-40	153	**6**	**riparian-upland**	ID03-1A; ID03-03, -04, -05	0	72	21	21	39	0	0	0	0	0	0	0
Heteromeles arbutifolia	Toyon	D-40	56	**6**	**upland**	ID03-1A; ID03-03, -04, -05	0	24	8	8	16	0	0	0	0	0	0	0
Populus fremontii	Fremont cottonwood	D-40	20	**12**	**riparian**	ID03-1A; ID03-03, -04, -05	0	9	3	3	6	0	0	0	0	0	0	0
Quercus lobata	Valley oak	D-40S, D60S, 4-GAL	90	**12**	**riparian-upland**	ID03-1A; ID03-03, -04, -05	0	42	12	12	24	0	0	0	0	0	0	0
Rubus ursinus	California blackberry	D-40	27	**6**	**riparian**	ID03-1A; ID03-03, -04, -05	0	12	3	3	8	0	0	0	0	0	0	0
Salix lasiolepis	Arroyo willow	TP4S	1	**2**	**wetland-riparian**	ID03-1A; ID03-03, -04, -05	0	0	0	0	1	0	0	0	0	0	0	0
Sambucus nigra ssp. Caerulea	Blue elderberry	D-40, 1-GAL	102	**6**	**riparian-upland**	ID03-1A; ID03-03, -04, -05	0	46	14	14	28	0	0	0	0	0	0	0
Juncus balticus ssp. Ater	Wire rush	STUB	98	**2**	**wetland**	SW02, 03	0	0	0	0	0	0	0	0	0	0	49	49
Schoenoplectus californicus	California bulrush	TB2	112	**2**	**wetland**	ED03-02; SW02, 03	0	0	0	0	0	0	20	0	0	0	46	46
		Total	**751**				**0**	**245**	**73**	**73**	**150**	**0**	**20**	**0**	**0**	**0**	**95**	**95**

Pole Cuttings - 2020

Cutting Quantities per Planting Area

Botanical Name	Common Name	Sizes	Quantity	Plant Spacing (feet on-center)	Habitat	Planting Area(s)	ID-02	ID03-1A	ID03-03	ID03-04	ID03-05	ED03-01	ED03-02	ED03-03	ED03-04	ED03-05	SW02	SW03
Salix spp.	Willow	4.5-foot long	100	**2**	**wetland-riparian**	ID02, ID03-03,-04; ED03-01 through 03	30	0	20	20	0	10	10	10	0	0	0	0

Notes: at ID-02: install 5 willow cuttings on the upstream side of each structure (6 structures total)
at ID03-03, -04: install 5 willow cuttings perpendicular to the creek flow
at ED03-01, -02, -03: install 5 willow cuttings on each side of and parallel to the drainage flow
at ED03-02: install a group of 20 bulrush plants upstream of the earthen plug
at SW02 and SW03, install wetland spp. in available locations within the weltand polygon

ATTACHMENT A

BALANCE HYDROLOGICS, Inc.

MEMO

To: John Zanzi and Mike Sweesy, Dudek
From: Eric Donaldson and Dave Shaw
Date: October 2, 2020

Subject: San Felipe Restoration Project Adaptive Management, 2020

On September 23, 2020, Eric Donaldson walked the San Felipe Restoration Project with the project consultant and client team (Team). Overall, the project appeared to be functioning well. In some locations, high flows have modified the channel, but the overall integrity of the meadow and restoration project does not appear to be in jeopardy. In particular Dudek identified two locations where physically modifying the creek and structures may benefit the project and help it meet the vegetative success criteria. The first location is depicted 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

The living log jam in question is shown on Attachment A and pictured below in Figure 1. While the log movement had no impact on the hydrologic success criteria, there are three juvenile oaks that have successfully germinated on the outside bank of Boyds Creek at this location and the Team recommends replacing the dislodged log with the goal of slowing bank erosion until the trees have a chance to grow larger and develop a stronger root system.

The engineer's representative should be on-site to direct log selection and placement. There are a number of logs on site from which the appropriate one should be selected and installed. We may utilize the log that was dislodged; however we may also select a log with some root-mass or branching, which may better achieve the desired function. The log should be placed longitudinally, embedded halfway into the bed and bank, roughly parallel to the bank and direction of flow, and backfilled with a well-graded sand, gravel, and cobble mixture to match the grade adjacent to the oaks. We recommend this material be sourced from ID03-02 (see below).

Figure 1

2. ID03-02

Figure 2 shows the cutoff channel that formed in 2019 as seen in May 2020. Figure 3 shows the upstream entrance to the cutoff channel. Overall, ID03-02 is currently functioning as expected with respect to the anticipated dynamic channel movement, sediment sequestration, and sediment transport continuity as outlined in the MMP.

The Team seeks to offset the risk of the new channel evolving to become a dominant and/or incised single thread channel. Geomorphically, we observe the reach to be a depositional reach that is sequestering large volumes of sediment in extreme events and then slowly metering it out in subsequent years to maintain sediment transport continuity. The straight nature of the current primary channel, however, may have been induced by a lack of established vegetation during the wetter-than-normal conditions and high flows experienced during Water Year 2019, the first year after construction of the project. In addition, an irrigation pipe may have exacerbated the condition by wracking debris, slowing flow and encouraging deposition in the former channel alignment. The irrigation pipe has already been relocated; however, it may need to be moved again as part of the adaptive measures described below.

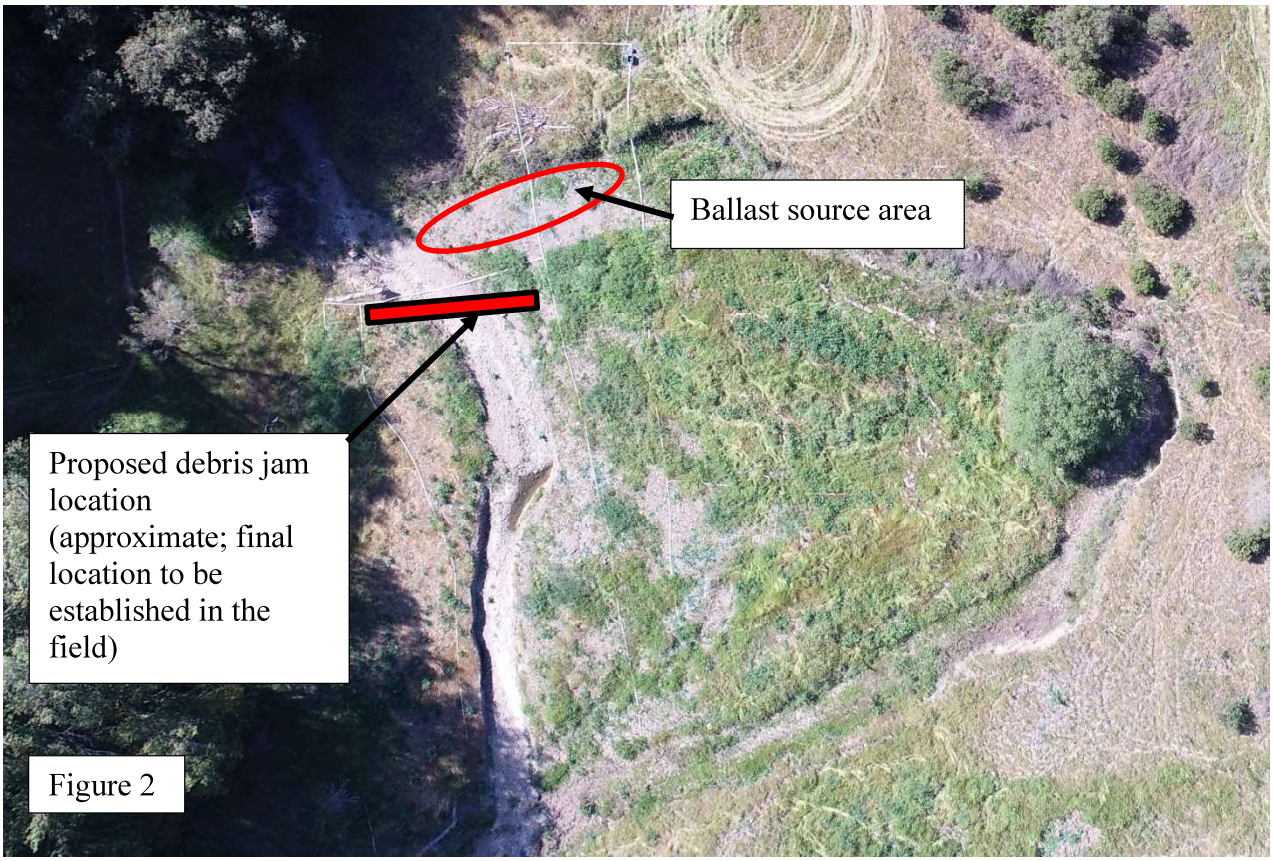


Figure 2

Figure 3

The proposed solution is to install a debris jam accompanied by slash in the newly-formed cutoff channel. The debris jams are intended to raise water surface elevations in order to enhance overbank flow onto and through the created inset floodplain and into secondary channels. The debris jam should be constructed at the location indicated in Figure 2 under the direction of the engineer's representative. A typical plan for constructing the debris jam is presented in Attachment C.

2.1. Debris Jam Posts

Posts proposed for the construction of debris jams should have a diameter of 3 to 4 inches, lengths of 2.0 to 5.0 feet. If post are driven, one end of each post should be sharpened to a point (length will vary depending on install location). If posts are placed in augered holes, the ends do not need to be sharpened. Posts may either be harvested or pre-fabricated. Harvested posts are preferred and the contractor should attempt to procure harvested posts first. If no suitable harvested posts are available on-site, pre-fabricated posts may be used. Harvested posts should be cut from branches of live willow from suitable plants within the project area. Exclusively cutting poles from one plant is not allowed. Harvested posts should be stored in a shaded area safe from damage by construction operations, with the sharpened end stored in water, if applicable. Pre-fabricated posts should be untreated pine, fir, redwood, or cedar, unless otherwise approved by the field representative. Posts should not have weaknesses such as cracks and splits through more than 25 percent of the post diameter.

2.2. Debris

Debris should consist of live willow branches with a stem diameter 2 inches or less. Debris should be 5' minimum length. There is no maximum length for debris. All leaves and minor branches should be kept intact to the extent practicable. Removed material should be stockpiled and placed as slash in the channel downstream of the debris jam. The same storage requirements as for harvested posts applies for debris.

2.3. Construction

Prior to installation, the engineer's representative should field identify the locations of the endpoints for the structure which, in turn, will dictate the final elevations and length of the debris jam. Posts should be driven into the ground angled to cross in the upstream and downstream directions and should penetrate the ground a minimum depth of 1.5 feet. Pre-drilling pilot holes to the full or partial burial depth of posts may be required. Once all posts have been installed, pack debris between the upstream and downstream rows of posts to the elevations and locations shown on the drawings. The top of the packed debris should be flush with the top of banks.

2.4. Ballast

At the direction of the engineer's representative, the contractor will remove up to 8 cubic yards of deposited material in the area depicted in Figure 2 to ballast around the base, upstream and downstream of the debris jam.

2.5. Slash placement

Slash should be placed in the channel downstream of the debris jam. Slash consisting of willow, sycamore and coyote brush, should be no less than 2 feet thick and occupy a channel length of no less than 50 feet downstream of structure.

Enclosures: Attachment A: Annotated As-built Sheet 3.3
Attachment B: Monitoring Map of site
Attachment C: Debris Jam Typical Sheet

MATCH SHEET 3.2

ATTACHMENT A

MATCH SHEET 3.1

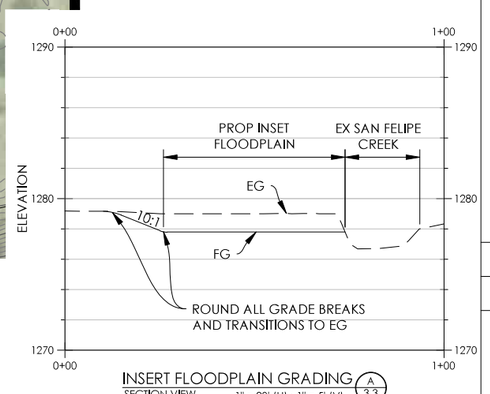
MATCH SHEET 3.4

The eastern-most log washed downstream.

SINGLE LOG
SINGLE LOG
SINGLE LOG
SINGLE LOG
TWO LOGS
TWO LOGS
TWO LOGS
TWO LOGS
TWO LOGS
TWO LOGS
TWO LOGS
THREE LOGS
LIVING LOG JAM, SEE DETAIL 1, SHEET 4.2 (TYP)
CHANNEL GAGE 3 (PROTECT IN PLACE)
PIEZOMETER C (PROTECT IN PLACE)
BOYDS CREEK
CREST GAGE 2 (PROTECT IN PLACE)
PROTECT TREE
INSTALL TEMPORARY STREAM CROSSING, SEE DETAIL 1, SHEET 3.0
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 1277.9 1277.3 1276.9 1276.0 1275.2 1274.5 1274.0 1273.8 1273.9 1279.4 1279.6 1279.9 1279.4 1279.1 1278.9 1278.6 1278.3 1277.8 1277.1 1276.2 1276.5 1276.0 1274.2 1274.0 1278.7
1290 1285 1280 1275 1270

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 SHET 3.0 FOR CHANGES TO ACCESS ROUTES

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
www.balancehydro.com

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

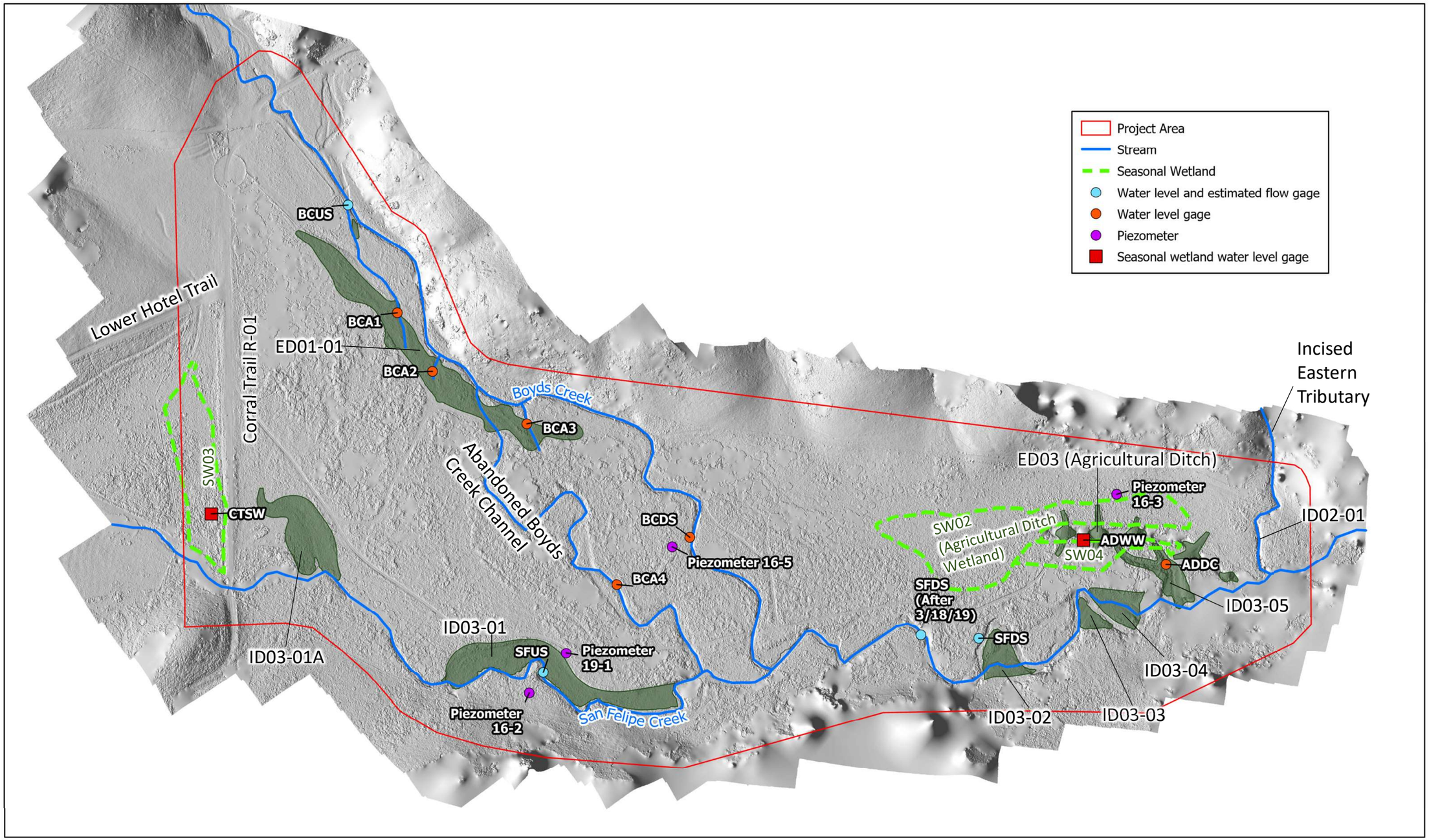
DESIGNED BY DONALDSON
DRAWN BY P KULCHAWIK
CHECKED BY D SHAW
IN CHARGE E BALLMAN
DATE 02-11-2019

SAN FELIPE CREEK 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

ATTACHMENT B



Balance Hydrologics™

W:\Projects\215108 San Felipe Creek\Map\WY19.mxd

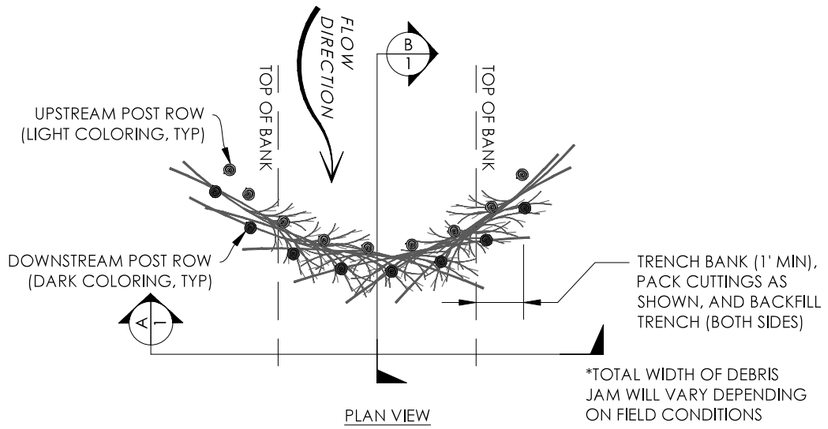
Figure 2. Monitoring Station Locations, San Felipe Creek Restoration Project, Joseph D. Grant Park, Santa Clara County, California

0 200 400 800 Feet

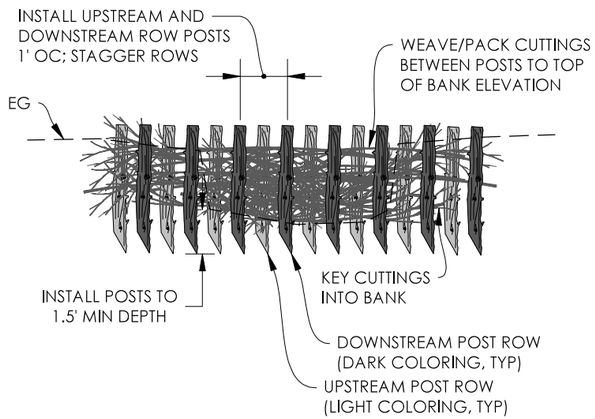
SCALE: 1:3,000

N

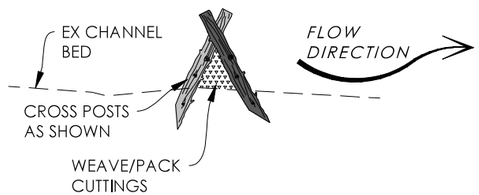
ATTACHMENT C



1 DEBRIS JAM - TYPICAL DETAIL
SCALE: NTS



DEBRIS JAM
ELEVATION VIEW
NTS
A
1



DEBRIS JAM
PROFILE VIEW
NTS
B
1

CONCEPTUAL DESIGN - NOT FOR CONSTRUCTION

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tel (510) 704-1000
www.balancehydro.com

BY	DATE	SUBMITTALS / REVISIONS
PK	20201002	ADAPTIVE MGMT SUBMITTAL

DESIGNED BY	DRAWN BY	CHECKED BY	IN CHARGE	DATE
PK	PK	ED		10-02-2020

NOT FOR CONSTRUCTION

DEBRIS JAM DETAIL

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

PROJECT NUMBER
220208

SCALE
AS NOTED

SHEET
1
OF 1