LIVE OAK
ASSOCIATES, INC.

RESTORATION PLAN
DRY CREEK BRIDGE REPLACEMENT PROJECT
TOLLHOUSE, FRESNO COUNTY, CA

Prepared By:

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December 8, 2022 Project No. 2738-01

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1.0 INTRODUCTION

Live Oak Associates, Inc. (LOA) has prepared this Restoration Plan ("plan") for the County of Fresno's Dry Creek Bridge Replacement Project on Burrough Valley Road ("project"). The project is the replacement of the existing Burrough Valley Road bridge over Dry Creek, with associated improvements at the Burrough Valley Road / Tollhouse Road intersection, and replacement of an existing box culvert on Tollhouse Road north of that intersection. The project is located in eastern Fresno County, south of the community of Tollhouse and approximately 25 miles northeast of the City of Fresno.

This plan presents the County's strategy for restoring all areas to be temporarily impacted by the project to pre-construction contours and conditions, as required by the project's Clean Water Act Section 401 Water Quality Certification (WQC; WDID No. 5C10CR00079). Consistent with the State Water Resources Control Board's 2019 *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, the restoration effort is described in terms of design, implementation, assessment, and maintenance.

1.1 PROJECT SUMMARY

The project will replace the existing, structurally deficient bridge and culvert with wider structures that are consistent with current standards. The existing bridge is approximately 23 feet wide, and is characterized by a three-span timber stringer superstructure with a reinforced concrete slab deck. It will be replaced with a cast-in-place prestressed concrete slab bridge, approximately 34 feet wide. The existing box culvert will be replaced with a two-cell precast concrete box culvert structure, approximately 6 feet high by 12 feet wide.

The replacement bridge has been designed to provide 2 feet of freeboard above the 100-year storm event, consistent with Central Valley Flood Protection Board criteria for rural minor streams. This will require raising the elevation of the Burrough Valley Road / Tollhouse Road intersection, which will in turn require profile improvements on Tollhouse Road. Other project elements include the establishment of a temporary detour and creek crossing downstream of the existing bridge, to be utilized and maintained for the duration of construction, and improvement of the bridge approaches. All work will take place within an area of approximately 4 acres ("project site").

The project will be implemented in two phases. Phase 1 will consist of tree and vegetation removal, and is scheduled to begin in January 2023. All remaining project activities, including demolition of the existing bridge and culvert, will take place during Phase 2, scheduled to begin in April 2023. Construction and subsequent restoration activities are anticipated to be completed by February 2024.

1.2 EXISTING CONDITIONS

The project site is located in the southern Sierra Nevada foothills, at an elevation of approximately 1,600 feet above sea level. The area immediately surrounding the site consists of rolling foothills that are part of the larger contiguous area of rolling hills between California's Central Valley and the Sierra Nevada mountains.

The site consists of short segments of Burrough Valley Road and Tollhouse Road, adjoining shoulders and turnouts within the County-owned right-of-way (ROW), a short segment of Dry Creek and an associated tributary, and undeveloped rangeland bordering these uses. The site supports a dense riparian woodland flanking Dry Creek; dominant tree species in this area include red willow (*Salix laevigata*), Northern California black walnut (*Juglans hindsii*), and western sycamore (*Platanus racemosa*). Outside of the stream corridor, the site supports an oak savannah dominated by blue oak (*Quercus douglasii*), with a variety of grasses and forbs in the understory. The site's roads and adjacent shoulders have been disturbed and are covered with gravel fill, as is typical of well-traveled roadways. The site is subjected to extensive cattle grazing during the winter months.

The project site contains three soil mapping units: Auberry coarse sandy loam, 3 to 9 percent slopes; Auberry coarse sandy loam, 9 to 15 percent slopes, and Grangeville soils, channeled (NRCS 2022). The Auberry mapping units describe deep, well-drained soils formed from quartz residuum with medium runoff. The Grangeville mapping unit describes a very deep, somewhat poorly drained soil formed in moderately coarse-textured alluvium dominated by granitic sources.

2.0 DESIGN AND IMPLEMENTATION

The project will result in temporary, ground-disturbing impacts both within and outside of the Dry Creek channel. These impacts will primarily be associated with the proposed temporary detour/creek crossing and creek diversion. The proposed detour is approximately 300 feet long, extending from Burrough Valley Road near the eastern end of the project site to Tollhouse Road south of the Burrough Valley Road / Tollhouse Road intersection. The detour will require vegetation removal and grading along its length, and temporary placement of soil and rock slope protection at the creek crossing. Other temporary impacts will include use of roadway shoulders and the staging/equipment area.

All temporarily impacted areas will be restored as close as possible to pre-construction conditions. Near-term restoration activities will include (1) recontouring to match the natural topography of the site and (2) native hydroseeding to stabilize soils. During and following this effort, measures will be taken to prevent encroachment of invasive plant species. The design and implementation of these restoration components are described in detail in the following sections.

Longer-term restoration activities will include the replacement of impacted trees and shrubs at a 3:1 ratio, as separately described in a Revegetation Plan prepared in support of the project's Section 1602 Notification of Lake or Streambed Alteration (see Appendix A: Revegetation Plan).

2.1 RECONTOURING

A grading plan has been developed based on preconstruction conditions documented by the County's survey crew (see Appendix B: Grading Plan). Prior to construction, a survey crew will measure and map existing elevations of the temporary impact area. The area will be staked to mark where the known elevations are. The stakes will be labeled with cut/fill guidelines and elevations specific to their position on the slope.

The Contractor may also use a GPS system to plot the data points gathered by the survey team to build additional topography maps. By using the maps and following the staking, equipment operators will be able to match the postconstruction grade to the baseline contours of preconstruction conditions as close as possible.

Specific activities to be undertaken as part of the recontouring effort will include grading, excavation and fill, and compaction. Equipment likely to be used will include an excavator, roller, and a water truck. The excavator will be used to perform the earthwork itself, while hoses from the water truck will be used to feed water to the recontoured areas to aid compaction. Sheep-foot rollers or smooth-wheeled rollers may also be used for compaction activities. Workers on foot will guide the hoses, direct the excavator operator, and perform finish compacting and recontouring using shovels. All earthwork will be carried out in compliance with Caltrans Standard Specifications, Section 19 Earthwork.

2.2 HYDROSEEDING

All disturbed soils will be hydroseeded and mulched for soil stabilization. Other erosion control materials that may be used include, but are not limited to, biodegradable erosion control blankets, cuttings, and container stock. All erosion control activities will be in compliance with Caltrans Standard Specifications, Section 21 Erosion Control.

The seed mix will consist of California native grasses and forbs suited to the habitats and climatic conditions of the project vicinity. Both annual and perennial species will be utilized to facilitate both immediate colonization and long-term cover, and preference will be given to species with high pollinator value and other ecological benefits. Potential species to be included in the mix are presented in Table 1 on the following page. These species were determined by using the Postmile Services and Caltrans Highway Planting Database and Specification Tool (see Appendix C: Seed Specifications). The seeds will be purchased from one or more plant nurseries specializing in California native species. Seeds will be applied using appropriate hydraulic spray equipment in a manner consistent with the Caltrans Standard Specifications.

2.3 TIMING

The recontouring effort will be initiated immediately following the completion of bridge and culvert construction, anticipated for January 2024. Hydroseeding will immediately follow recontouring, in January or February 2024. Collectively, these activities will have a duration of 3 to 4 weeks, and are anticipated to be completed by February 2024.

Table 1. Potential seed species for seed mix.

Scientific Name	Common Name
Achillea millefolium	Western Yarrow
Acmispon americanus	Spanish Lotus
Bromus carinatus	California Brome
Carex praegracilis	Clustered Field Sedge
Elymus glaucus	Blue Wildrye
Elymus triticoides	Beardless Wildrye
Festuca microstachys	Small Fescue
Festuca octoflora	Sixweeks Fescue
Hordeum brachyantherum	Meadow Barley
Layia platyglossa	Coastal Tidytips
Lasthenia californica	California Goldfields
Lupinus bicolor	Bicolor Lupine
Nemophila menziesii	Baby Blue Eyes
Trifolium willdenoyii	Tomcat Clover

2.4 INVASIVE SPECIES MANAGEMENT

In order to minimize the accidental introduction of new invasive species onto the project site, the following measures will be implemented both during and following construction.

- Equipment will be washed prior to bringing it onto the project site
- Equipment will be inspected upon its arrival on the project site to ensure that it is free of mud and seed-bearing material
- Only certified noxious weed-free erosion control materials will be used. All straw and seed material shall be certified as weed-free prior to being used on the project site.

If necessary, invasive species removal will be conducted prior to restoration activities for all temporarily impacted areas. If present, invasive trees and shrubs will be removed using mechanical methods such as chainsaws and hand tools. Invasive grasses and forbs may be removed using chemical and/or mechanical methods.

3.0 ASSESSMENT AND MAINTENANCE

The following performance criteria have been established for the restored areas:

- Minimum 70 percent vegetative cover above ordinary high water
- Non-native plant cover not substantially greater than surrounding areas

Restored areas will be assessed for a period of one year or until the performance criteria are met, whichever is longer. Maintenance will occur in response to any issues that are identified. Assessment and maintenance activities are described in the following sections.

3.1 ASSESSMENT

Restored areas will be visually inspected during the rainy season for one year following the completion of restoration activities, or until performance criteria are met, whichever is longer. During each inspection, the surveyor will (1) estimate overall vegetative cover and non-native plant cover, (2) note the presence of any invasive plant species that have become established, (3) check for signs of erosion, sedimentation, water quality pollution, or other deleterious effects to Dry Creek or its tributary, both within and downstream of the project site, and (4) identify any maintenance actions that are needed.

If water quality pollution is found to be occurring, the County will notify the Central Valley Regional Water Quality Control Board within three working days.

3.2 MAINTENANCE

Because the hydroseeding effort will take place during the rainy season and involve California native, locally appropriate species, the restored areas are expected to be self-sustaining, and no supplemental irrigation or other forms of regular maintenance are proposed. However, any maintenance actions that are identified during the periodic inspections described above will be implemented as soon as possible by the County or its contractor. Such actions may include:

- Repeat hydroseeding to increase vegetative cover
- Removal of non-native or invasive plant species

- Installation of erosion control blankets, straw wattles, or other devices to address any near-term erosion or water quality pollution issues

4.0 LITERATURE CONSULTED

California Department of Transportation (Caltrans). 2017. Natural Environment Study (Minimal Impacts). Dry Creek Bridge Replacement Project, Bridge No. 42C-0134 / 11-027, Fresno County, California.

_____. 2018. Standard Specifications. Published by the State of California, California State Transportation Agency, Department of Transportation. Available: https://dot.ca.gov/-/media/dot-media/programs/design/documents/2018-std-plns-for-web-a11y.pdf

Live Oak Associates (LOA). 2022. Updated Tree Survey for Trees Proposed for Removal, Dry Creek Bridge Replacement Project on Burrough Valley Road, Fresno County, CA. Published September 19, 2022. Revisions October 18, 2022.

Natural Resources Conservation Service (NRCS). 2022. U.S. Department of Agriculture. Web Soil Survey. Available: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

APPENDIX A:

REVEGETATION PLAN

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November 29, 2022 Project No. 2738-01

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1.0 INTRODUCTION

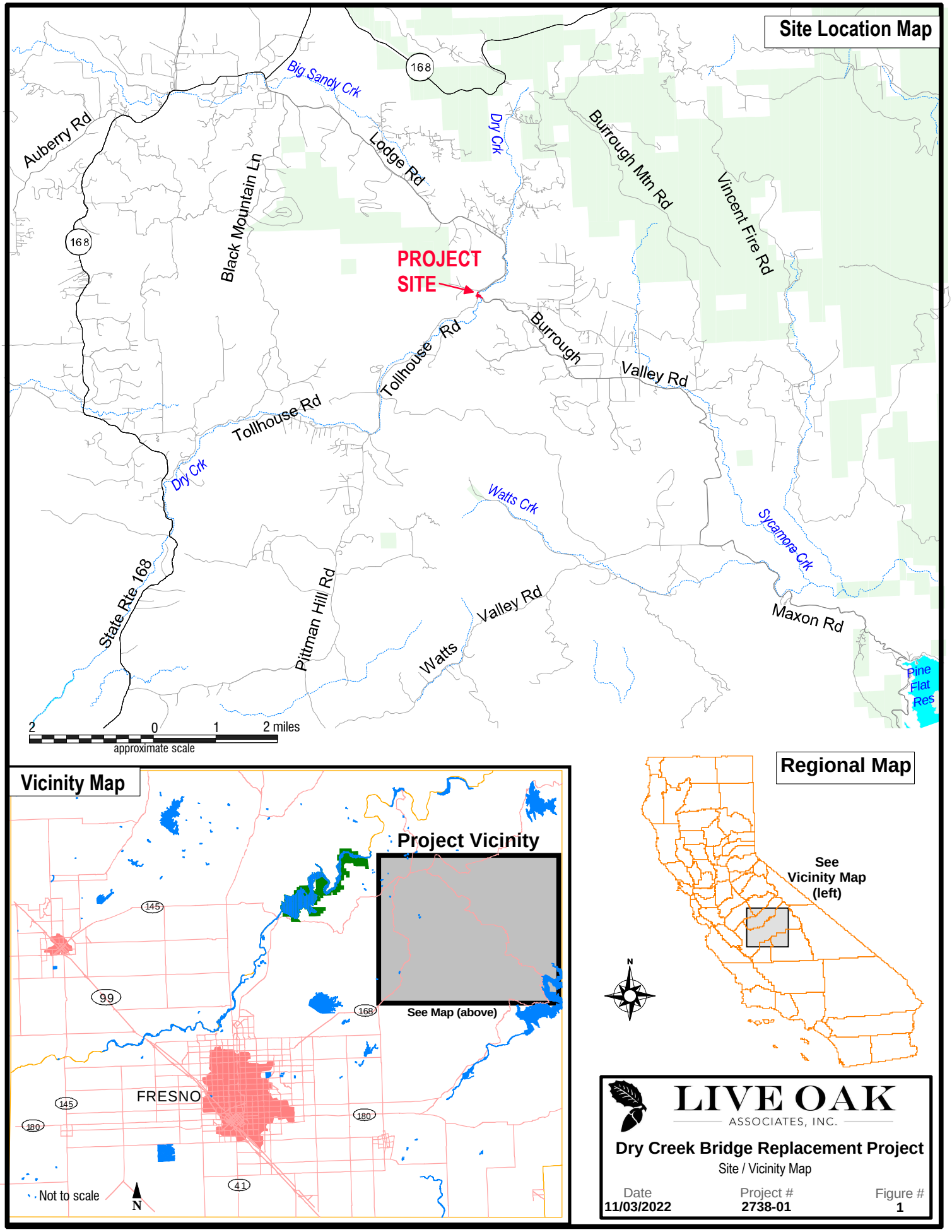
Live Oak Associates, Inc. (LOA) has prepared this Revegetation Plan ("plan") for the County of Fresno's Dry Creek Bridge Replacement Project ("project"). This plan describes compensatory measures for removal of approximately 45 riparian and upland trees within an approximately 3-acre project site. It is intended to support the County's Section 1602 Notification of Lake or Streambed Alteration (Notification No. EPIMS-FRE-21935-R4), for which an operation of law authorization was issued by California Department of Fish and Wildlife (CDFW) on September 20, 2022.

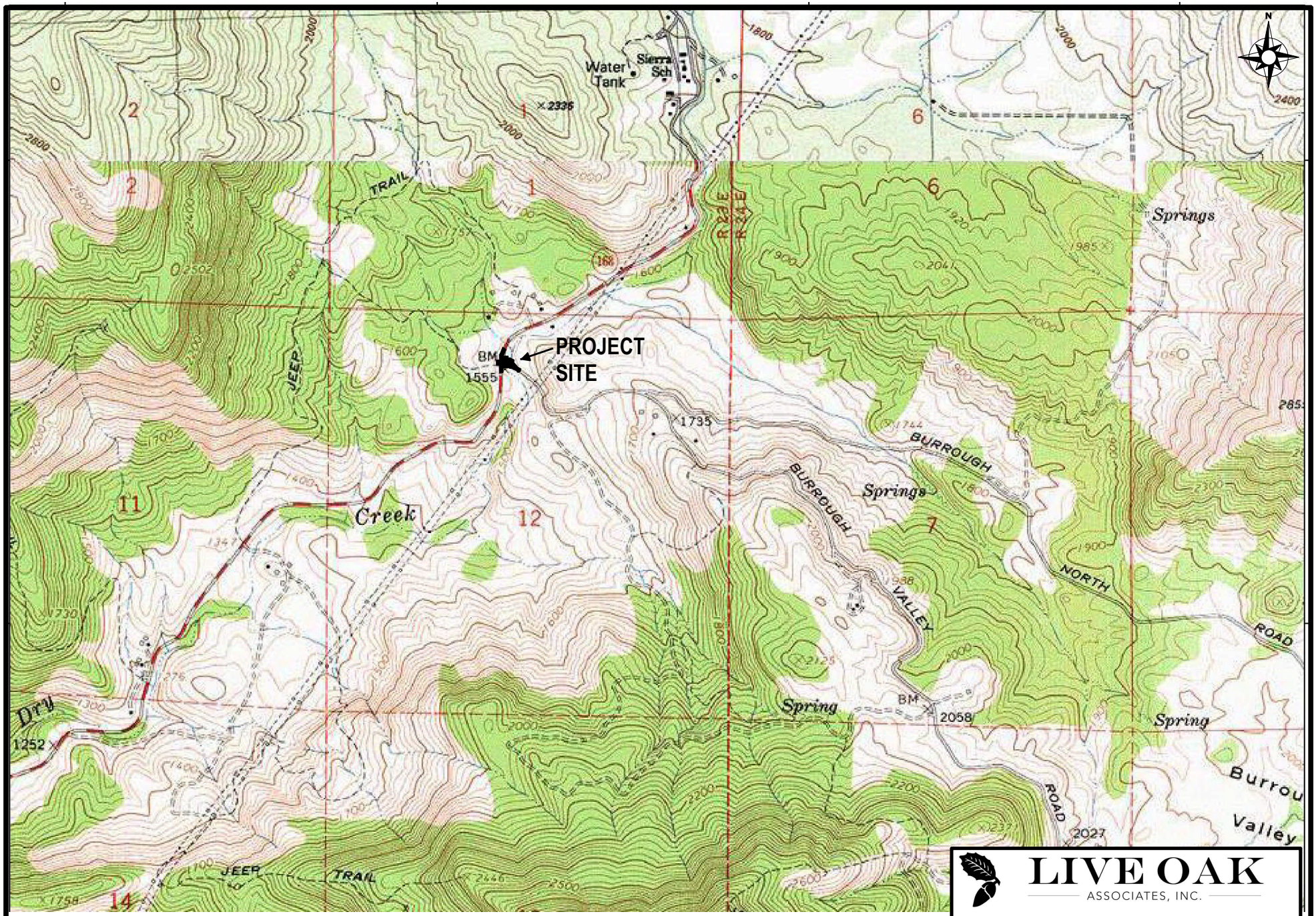
The project site is located on Burrough Valley Road in eastern Fresno County, south of the community of Tollhouse and approximately 25 miles northeast of the City of Fresno (Figure 1). The project site may be found on the *Humphreys Station* U.S. Geological Survey (USGS) 7.5-minute quadrangle in Section 12 of Township 11 South, Range 23 East, Mount Diablo Base and Meridian (Figure 2). The project site is rural; surrounding land uses include rural residential uses, agriculture, and undeveloped open space.

1.1 PROJECT DESCRIPTION

The existing Dry Creek Bridge (No. 42C0134) is a two-lane bridge with a non-standard guardrail that was built in 1925 and widened in 1972. The bridge consists of a three-span timber stringer superstructure with a reinforced concrete slab deck and a thin asphalt concrete surface. The superstructure is supported by reinforced concrete pier walls and abutment walls on shallow spread footings, which have been exposed by localized creek channel scour. The existing bridge is approximately 23 feet wide and 62 feet long. The concrete wing walls of the bridge have been extended with a stacked tire retaining wall system to account for the difference between the bridge length and creek channel width.

The existing bridge would be removed to accommodate a new cast-in-place prestressed concrete slab bridge measuring 34 feet 11 ½ inches wide by 114 feet long; the replacement structure would accommodate two 12-foot-wide traffic lanes, two 4-foot-wide shoulders, and two Type 836 concrete barriers. The replacement structure would meet the Central Valley Flood Protection Board's criteria for rural minor streams (2 feet of freeboard above the 100-year storm water surface elevation) and would improve the integrity and functionality of the existing creek crossing. In


Site Location Map
Big Sandy Crk
168
Auberry Rd
Black Mountain Ln
Lodge Rd
Dry Crk
Burrough Mtn Rd
Vincent Fire Rd
168
PROJECT SITE
Tollhouse Rd
Burrough Valley Rd
Tollhouse Rd
Dry Crk
Watts Crk
Sycamore Crk
State Rte 168
Pittman Hill Rd
Valley Rd
Watts
Maxon Rd
Pine Flat Res
2 0 1 2 miles
approximate scale
Vicinity Map
Project Vicinity
145
99
168
See Map (above)
FRESNO
145
180
180
41
Not to scale
N
Regional Map
See Vicinity Map (left)
N
LIVE OAK
ASSOCIATES, INC.
Dry Creek Bridge Replacement Project
Site / Vicinity Map
Date
11/03/2022
Project #
2738-01
Figure #
1



From USGS
Humphrey's Station 7.5' Quadrangle 1965

LIVE OAK
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Dry Creek Bridge Replacement Project
U.S.G.S. Quadrangle

Date	Project #	Figure #
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order to provide 2 feet of freeboard above the 100-year storm event, the elevation of the Burrough Valley Road/Tollhouse Road intersection will be raised, requiring profile improvements on Tollhouse Road. The existing box culvert on Tollhouse Road north of Burrough Valley Road would also be removed and replaced due to its structural condition and hydraulic deficiencies. The replacement culvert would consist of a two cell 6-foot high (4-foot clear) by 12-foot wide (12-foot clear) precast concrete box culvert structure. The invert of the replacement box culvert will be buried by approximately 2 feet of native creek bed soil so as to provide a natural creek bed through the structure.

During construction of the proposed project, traffic on Burrough Valley Road would be maintained through the construction of a temporary detour and creek crossing downstream of the existing bridge. The temporary detour and creek crossing would consist of a cofferdam system across the creek channel with pipe culverts to pass the maximum anticipated summertime flow of Dry Creek. The detour would be located south of the southwestern corner of the existing bridge span, adjacent to the existing alignment of Burrough Valley Road, which will connect Tollhouse Road to Burrough Valley Road. Upon completion of the detour, traffic would be shifted onto the detour to convey traffic through the project site for the duration of project activities.

2.0 EXISTING CONDITIONS OF THE REVEGETATION AREA

2.1 REGIONAL SETTING

The project is located in the southern Sierra Nevada foothills, northeast of the City of Fresno in eastern Fresno County, California. Like most of California, the Sierra Nevada foothills experience a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures commonly exceed 95 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely exceed 60 degrees Fahrenheit, with daytime highs often near 50 degrees Fahrenheit. Annual precipitation in the vicinity of the project is about 26 inches, almost 85% of which falls between the months of October and April. Nearly all precipitation falls in the form of rain, with occasional snow.

2.2 REVEGETATION SITE

The project site is located on County Right-of-Way (ROW) and private land immediately adjacent to Dry Creek. The roadways and adjacent shoulders have been disturbed and are covered with gravel fill, as is typical of well-traveled roadways. The adjacent habitats are relatively undeveloped, though extensive cattle grazing occurs during winter months. Soils in the project site are typical of the Sierra Nevada foothills, with deep soils derived from quartz and formed from alluvium in the river channels. The elevations of the site range from 1,558 feet to 1,625 feet above sea level.

All revegetation work will be completed on site, in and around areas proposed for project-related disturbance. Four disjunct planting sites are proposed: two west of Tollhouse Road, and two east of Tollhouse Road. The two planting sites west of Tollhouse Road are characterized primarily by blue oak (*Quercus douglasii*) woodland; however, the northern of these two sites include a short reach of a tributary of Dry Creek near the location of the existing culvert.

The two planting sites east of Tollhouse Road include substantial riparian habitat associated with Dry Creek, dominated by western sycamore (*Platanus racemosa*) trees with an herbaceous understory. Dry Creek's riparian vegetation is lacking shrubs and thickets. This planting area also includes upland woodland supported by blue oak, valley oak (*Quercus lobata*), and other oak species, with an understory of grasses and forbs.

3.0 RESPONSIBLE PARTIES

The County of Fresno Department of Public Works and Planning is the project proponent and the applicant for all permits. The County is responsible for ensuring that the compensation plan is implemented successfully.

The contact for the County of Fresno is:

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The County will be responsible for site preparation, installation and maintenance of the replacement plantings, irrigation of the plantings, and monitoring of the revegetation area, as described in detail in the following sections.

4.0 IMPLEMENTATION

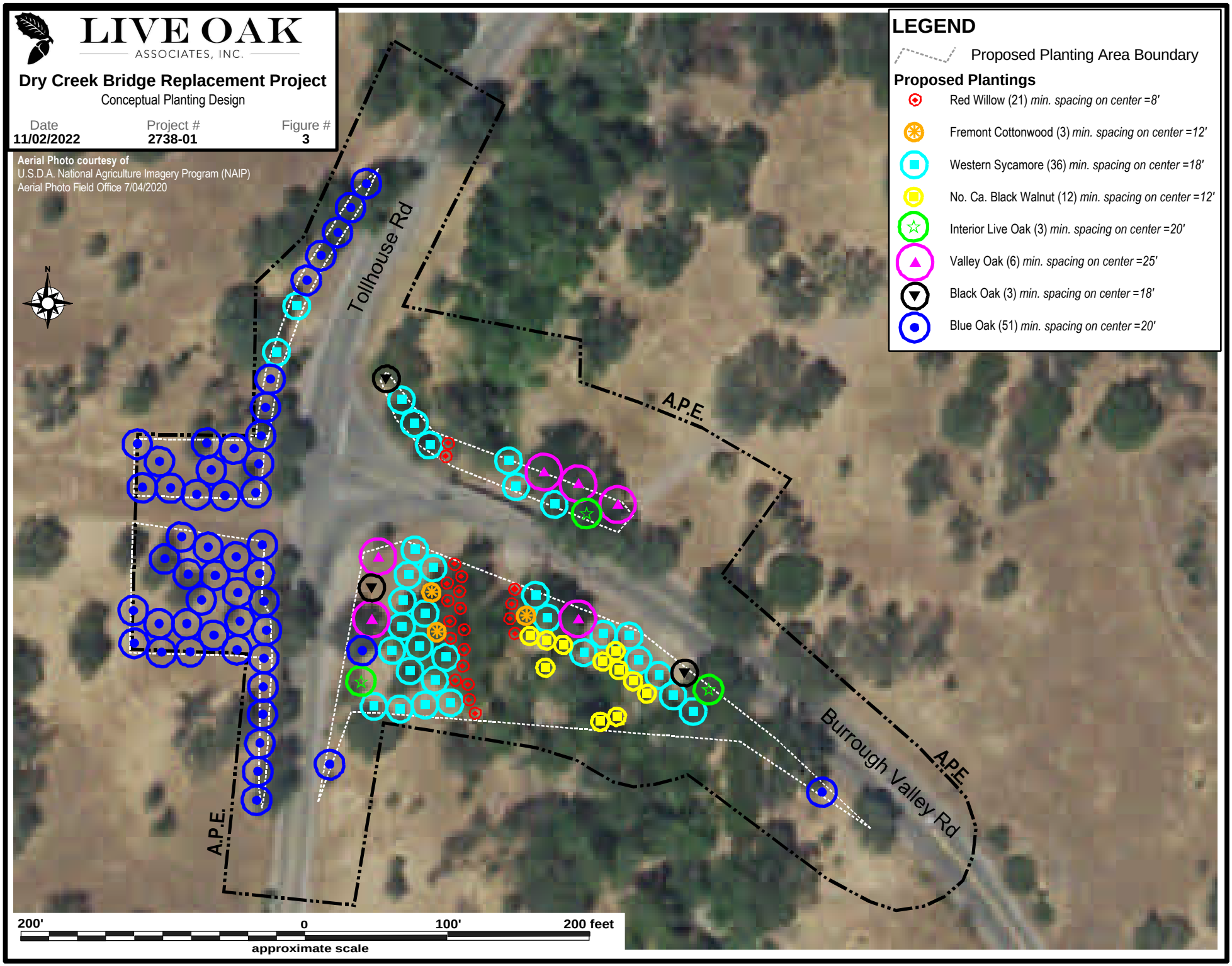
4.1 REVEGETATION STRATEGY

The objective of this revegetation plan is to facilitate successful replacement of riparian and upland trees removed as a result of the bridge replacement project. Impacted trees will be replaced at a ratio of 3:1. Based on anticipated removal of 45 trees, 135 replacement trees will be provided. Tree species to be planted on-site will be those identified for potential removal by LOA during a site visit conducted in September 2022 (LOA 2022) and confirmed in follow-up fieldwork by the County in October 2022; namely, western sycamore, Fremont cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), Northern California black walnut (*Juglans hindsii*), interior live oak (*Quercus wislizeni*), valley oak, black oak (*Quercus kelloggii*), and blue oak. The general location, minimum number, and spacing of plantings, by species, is presented in Table 1. All methods for installation and maintenance for this revegetation project are consistent with the Caltrans Standard Specifications.

The planting area totals approximately 1.4 acres. The plantings will be located in areas where trees were removed or in areas suitable for trees within the project site. These locations are along Dry Creek, its associated floodplain, and in grassland upland areas. The location and configuration of the plantings are illustrated in Figure 3 and conform to the tree spacing provided in Table 1.

Table 1. Replacement Species, Spacing, Number, and Location

Tree Species	Minimum Spacing on Center (ft.)	Minimum Number for Planting	General Location
Red willow (*Salix laevigata*)	8	21	Creek/Riparian
Fremont cottonwood (*Populus fremontii*)	12	3	Riparian
Western sycamore (*Platanus racemosa*)	18	36	Riparian
Northern California black walnut (*Juglans hindsii*)	12	12	Riparian
Interior live oak (*Quercus wislizeni*)	20	3	Upland


LIVE OAK
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Dry Creek Bridge Replacement Project
Conceptual Planting Design
Date
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Aerial Photo courtesy of
U.S.D.A. National Agriculture Imagery Program (NAIP)
Aerial Photo Field Office 7/04/2020
LEGEND
Proposed Planting Area Boundary
Proposed Plantings
Red Willow (21) min. spacing on center =8'
Fremont Cottonwood (3) min. spacing on center =12'
Western Sycamore (36) min. spacing on center =18'
No. Ca. Black Walnut (12) min. spacing on center =12'
Interior Live Oak (3) min. spacing on center =20'
Valley Oak (6) min. spacing on center =25'
Black Oak (3) min. spacing on center =18'
Blue Oak (51) min. spacing on center =20'
Tollhouse Rd
A.P.E.
A.P.E.
A.P.E.
Burrough Valley Rd
200'
0
100'
200 feet
approximate scale

Table 1. Replacement Species, Spacing, Number, and Location (Continued)

Tree Species	Minimum Spacing on Center (ft.)	Minimum Number for Planting	General Location
Valley oak (*Quercus lobata*)	25	6	Upland
Black oak (*Quercus kelloggii*)	18	3	Upland
Blue oak (*Quercus douglasii*)	20	51	Upland

4.1.1 Site Preparation

Tree removal prior to the revegetation effort will include removal of stumps and roots to a minimum depth of 12 inches below finished grade. Planting locations will then be flagged by the revegetation contractor generally adhering to the layout presented in Figure 3, while allowing for variances, as determined in the field, to mimic a natural vegetation landscape, or account for localized poor planting substrate such as rocks. Flagged plant locations will adhere to the minimum spacing requirements presented in Table 1 and will not be placed within the dripline of any existing trees or shrubs to be preserved. Prior to planting, all groundcovers will be removed at each planting location within a 6 foot diameter centered at each tree.

4.1.2 Timing of Planting Effort

All planting, including any replacement plantings, should occur during the fall or early winter. Planting will be scheduled to occur during the first fall or winter after construction activities are completed within the designated planting areas. Construction is expected to be complete in the planting areas by February 1, 2024; the planting effort is tentatively planned for fall of 2024.

4.1.3 Plant Materials

The 135 replacement plantings can consist entirely of potted nursery stock or a mix of locally collected cuttings and potted nursery stock. Nursery stock is anticipated to consist of 1-gallon containers. Container stock plants must come from a nursery inspected by the Department of Food and Agriculture. Each container plant must be inspected for health, and a non-root-bound, well-

developed root system prior to purchase at the nursery. The tree species chosen for planting will represent the species that are removed from the site (see Table 1). All container trees must be individually labeled, identifying the plants by species to assure proper identification during purchasing and planting.

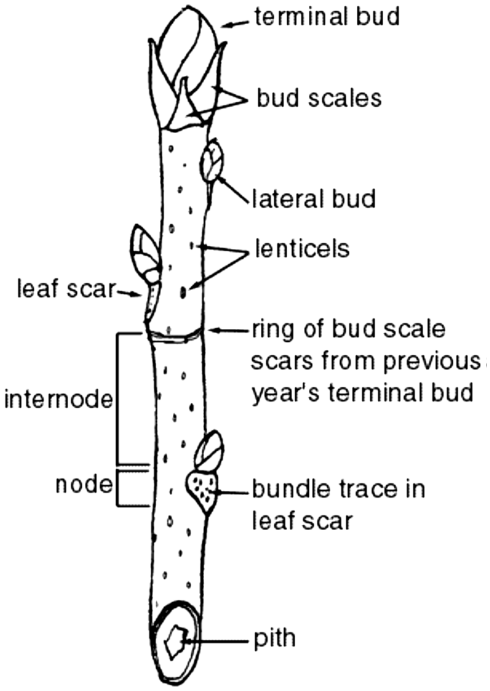
4.1.4 Harvesting and Planting Techniques for Cuttings

The following specifications shall be employed for harvesting and planting cuttings, should this planting option be implemented. Use of cuttings would only be an appropriate method for two of the replacement planting species, red willow (*Salix laevigata*) and Fremont cottonwood (*Populus fremontii*).

- Cuttings shall, to the extent feasible, be collected from local trees and shrubs along the Dry Creek Watershed near the project area or vicinity.
- Follow ethical harvest guidelines to conserve health of the donor stand. Remove no more than 25% of the branches from any single tree, never remove more than 50% of the overall canopy cover, and harvest the stems evenly through the stand (e.g. not from one side of the tree only).
- Cuttings shall be collected from dormant donor plants in the late-fall, as close to planting time as possible. Choose healthy stems that are relatively straight, covered in smooth bark (not damaged), and free of insect/pathogen damage.
- Cuttings shall have a diameter of approximately 0.75 to 1.5 inches and length of approximately 2 to 3 feet. All side branches of the cutting shall be removed to produce a single-stemmed cutting and is reasonably straight.
- The stems should be cut diagonally on the rooting end. Since this revegetation plan is for trees, do not cut the terminal bud (see Figure 4). Carefully remove any lateral branches with a sharp and clean pair of shears, do not tear the bark.
- The bottom half of the cuttings shall be soaked in water for 5 to 14 days prior to planting, which will increase the chances of root development in the soaked area that is necessary for the successful establishment of the cutting.
- Planting holes shall be prepared by pounding rebar or using a mechanical device for more difficult soil such as an augured tractor-mounted post hole digger, a one- or two-man post hole digger, a soil auger, a large bar, or a planting shovel to a depth of approximately 1 foot or more (depending on the length of the cuttings).
- Cuttings shall be planted with the terminal bud facing up, and 50-80% of the cutting below ground and at least 1 foot or more should remain above ground.
- The hole shall then be backfilled and tamped to assure no air gaps around underground portion of cutting. Air gaps can kill emerging roots.

- Immediately following installation, each plant shall be deeply soaked with sufficient water to reach the lower end of the cutting. This will also help eliminate air gaps.

Figure 4. Cutting Diagram



4.1.5 Container Planting Techniques

The following specifications shall be employed for installing container trees. See Appendix B for an illustration of these planting specifications.

- Planting holes shall be excavated to a depth of the root ball and 2-3 times the diameter of the plant container.
- Each planting hole shall be 2/3 backfilled with native soil excavated from the planting hole and shall remain somewhat loose. The remaining planting hole should have vertical sides with roughened surfaces and be the width and depth of the root ball.
- Planting holes shall be filled with water, and the water shall be allowed to percolate into the surrounding ground prior to plant installation. This should effectively remove any air pockets and allow good contact between the root ball and the surrounding soil.
- After trees are removed from containers, the sides and bottom of the root ball shall be lightly scarified to promote development of new roots. Any roots wrapped around the root ball shall be pulled loose, not broken.
- Roots shall be adequately protected at all times from the sun and/or drying winds prior to planting.
- Trees shall be planted with the roots untangled and spread out in the planting hole to promote even root penetration.

- Trees shall be set in planting holes so that the top of the root ball is at finished grade and the root crown is just above. The tree shall be set upright, not at an angle. No soil should be placed on top of the root ball.
- Backfill the space around the root ball with the native soil. Brace root ball by tamping native soil around the lower portion of the root ball. Place additional native soil around base and sides of ball in six-inch increments or "lifts." Lightly tamp each lift using foot pressure or hand tools to settle backfill, support the tree, and eliminate voids. Do not over compact the backfill or use mechanical or pneumatic tamping equipment. When the planting hole has been backfilled to three quarters of its depth, water shall be poured around the root ball and allowed to soak into the soil to settle the soil. Do not flood the planting space. If the soil is above field capacity, allow the soil to drain to below field capacity before finishing the planting. Air pockets shall be eliminated and backfill continued until the planting soil is brought to grade level.
- A four-inch high berm of native soil shall be planted around the outside of the root ball to retain water.
- Apply four inches of mulch covering the entire planting bed area including the berm. The planting area includes all soil that was loosened. Install no more than 1 inch of mulch over the top of the root ball inside the berm. The mulch shall be certified weed free.
- Immediately following installation, each plant shall be deeply soaked with sufficient water to reach the lower roots.

4.1.6 Plant Protection

Plantings may be subject to herbivory that could result in damage or loss of plants. Therefore, tree protectors shall be installed. For root protection, each root protector must be fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire with a closed bottom design. The height and diameter of the wire cylinder shall provide a minimum of 6 inches of clearance between the root ball and the sides to the bottom of the wire. The top edge of the cylinder must be a manufactured finished edge, uncut and free of sharp points.

For foliage protection, each foliage protector must be fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire approximately 4 feet high and 2 feet in diameter. The diameter may change based on the diameter of the planting. The wire edge at the top of the cylinder must be the manufactured finished edge. Other wire edges that are cut must be free of sharp points. Support stakes for the foliage protection must be one of the following:

1. 3/4-inch reinforcing steel bar a minimum of 5 feet long with an orange or red plastic safety cap that fits snugly onto the top of the reinforcing steel bar.

2. 2-inch nominal diameter or 2-by-2-inch nominal size wood stakes a minimum of 5 feet long. Wood stakes must be straight.

If jute mesh is used for foliage protection it must comply with the Caltrans Standard Specifications. The material required to hold the jute mesh cover in place must be 1/0-inch-diameter manila hemp twine. Any method of foliage protection needs to be installed within 2 days after planting.

Protective devices shall be maintained in place until plants are established or outgrow the fencing diameter and potentially need to be expanded. Once plants are established enough to survive herbivory, the cages shall be removed. The monitoring reports described in Section 4.4 of this report will state whether plant protection should remain in place for the following year or be removed.

4.2 MAINTENANCE

The replacement plantings will be actively maintained for the first three years of a planned five-year establishment period. The anticipated level of effort for maintenance activities during the first three years is once per week between May and September and once per month between October and April. During the final two years of the establishment period, maintenance activities will occur only in response to corrective actions identified during monitoring (see Section 4.4) and/or to care for any additional plantings that must be installed.

Maintenance site visits will entail watering, weed control, and foliage protection checks, as described in more detail in the following sections.

4.2.1 Supplemental Irrigation

The maintenance activity that will have the greatest influence on a successful planting effort is irrigation. Riparian plantings will require ample water to ensure successful establishment. Generally, plantings should be watered approximately once per week during the dry season, which is typically May through September at this locality. However, the actual irrigation schedule and amount of water supplied should be more precisely determined through monitoring of soil moisture and weather patterns.

No permanent irrigation infrastructure will be installed for this project; rather the plantings will be irrigated using a water truck. All cuttings and container trees will be hand watered using hoses

from a watering truck using low pressure to limit soil disturbance. The water will be filled within the berm for each plant to ensure slow drainage into the plant's root system. Adequate water shall be provided during each irrigation event to reach the rooting depth of the plants. The amount of water may need to be adjusted based on the health of the plant and these changes will be described in the monitoring report.

4.2.2 Weeding

During each maintenance visit, field staff will ensure that all planting areas are free of other plants within two feet around each planting, generally within the berm. Protection fencing may need to be opened to access the berm area for weeding. The use of mechanical devices such as weed-eaters risk damaging the small trunks of the young plantings, potentially killing the tree.

4.2.3 Plant Protection Maintenance Checks

The foliage protection will be checked at each maintenance visit. It should be insured that the fencing and stakes are not inhibiting growth of the tree and that all materials remain intact. If the foliage protection is inhibiting growth of the tree, the diameter of the foliage protection shall be expanded. Once the trees are well established, the fencing can be removed. An established tree typically takes one to three years and is determined by the amount of new growth (leaves and stems) the tree is producing. The new growth is reflective of an established root system, and a tree with an established root system can withstand grazing from herbivorous wildlife.

4.3 PERFORMANCE STANDARDS

In any given year, survivorship of the replacement plantings must be 70% or higher. Any individuals of the target species that naturally propagate during the five-year establishment period may be counted toward the survivorship goal; this will be assessed and quantified during the monitoring visits (see Section 4.4).

As long as performance standards are consistently achieved, replacement of plant materials will not be necessary. If mortality levels are excessive, the cause of mortality will be investigated, and corrective actions taken, as necessary, to resolve any problems prior to plant replacement. The adaptive management strategy will include replanting, if needed, to achieve restoration success

criteria. Plants shall be replaced only during the appropriate time of year as defined in Section 4.1.2.

4.4 MONITORING AND REPORTING

A monitoring and reporting program will be implemented to assess the success of the revegetation effort. The purpose of monitoring is to identify maintenance issues that may jeopardize the success of the mitigation, and to identify in a timely way if performance standards are not being met or if on an unsuccessful trajectory so that appropriate remedial measures can be implemented as soon as possible.

An initial monitoring will immediately follow tree planting in order to document baseline conditions of the planting effort and to determine if any specifications (such as the foliage protection) need to be adjusted. Each planting will receive a numerical tag that is hung either on the tree trunk or protection fencing and identifies the plant species. Although the Caltrans Standard Specifications only require tagging of container plantings, it is recommended that all plantings be tagged for accurate accounting of planting success. A global positioning system (GPS) unit, preferably with sub-meter accuracy, will be used to generate a map illustrating final planting locations.

Thereafter, the revegetation area will be monitored in Years 1, 3, and 5 following the initial planting effort. A longer monitoring period may be required if remedial measures, such as replanting, are implemented to meet performance standards. Monitoring visits will be conducted in late spring or summer when the plantings are completely leafed out. Monitoring observations will be summarized in reports ("monitoring reports"), to be finalized no later than December 31 of each monitoring year.

The following tasks will be completed during each monitoring event and addressed in the monitoring reports:

> **Visual Observations.** All plantings (alive and dead) will be inspected to ensure that they have their identification tags, and to identify potential problems (e.g., presence of invasive weeds, herbivory, erosion). Results will be documented on field data sheets. Recommendations for remedial measures identified in the visual inspection, if necessary, will be included in the monitoring report.

Photo Documentation. Photographs of the revegetation area will be taken from preset photo stations. Additional photographs will be taken of any potential problem areas. All photographs will be logged and representative photos included in each monitoring report.

Performance Monitoring. During each monitoring visit, the number of living tree saplings within the planting area, both planted and volunteer, will be quantified to determine if the revegetation effort is on a successful trajectory. It is recommended that notes on the condition of each tree are included in the monitoring effort based on the classifications below to aid with determining the success of each tree:

General Condition Rating (Structure/Health)

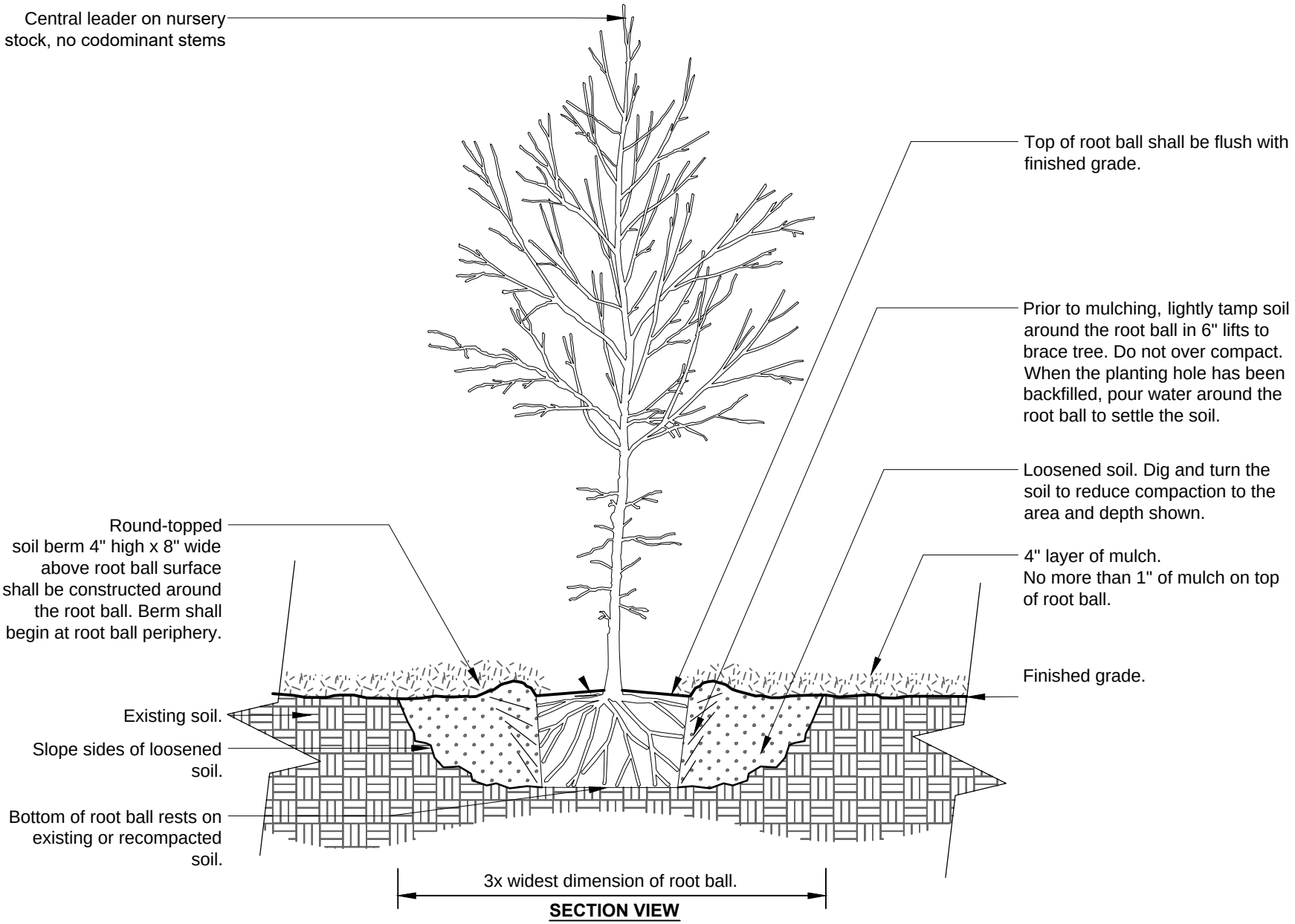
- Good- No major tree health defects, good structure and form typical for the species, foliage is typical, vigor is high/normal;
- Fair- At least one major tree health defect or structural defect, foliage is typical or minor dieback (≤ 10% of canopy), vigor is normal or in decline;
- Poor- 2 or more major tree health defects or structural defects that cannot be lessened, foliage showing extensive dieback (> 10% of canopy), vigor is in decline and driven by a stress response (epicormic sprouts);
- Dead- No or limited (< 20%) living tissue in the tree.

5.0 LITERATURE CONSULTED

Caltrans. 2018. Standard Specifications. Published by the State of California, California State Transportation Agency, Department of Transportation. Available: https://dot.ca.gov/-/media/dot-media/programs/design/documents/2018-std-plns-for-web-a11y.pdf

Live Oak Associates (LOA). 2022. Updated Tree survey for Trees Proposed for Removal, Dry Creek Bridge Replacement Project on Burrough Valley Road, Fresno County, CA. Published September 19, 2022. Revisions October 18, 2022.

APPENDIX A:
PLANTING DIAGRAM



TREE w/ BERM (EXISTING SOIL NOT MODIFIED)

APPENDIX B:

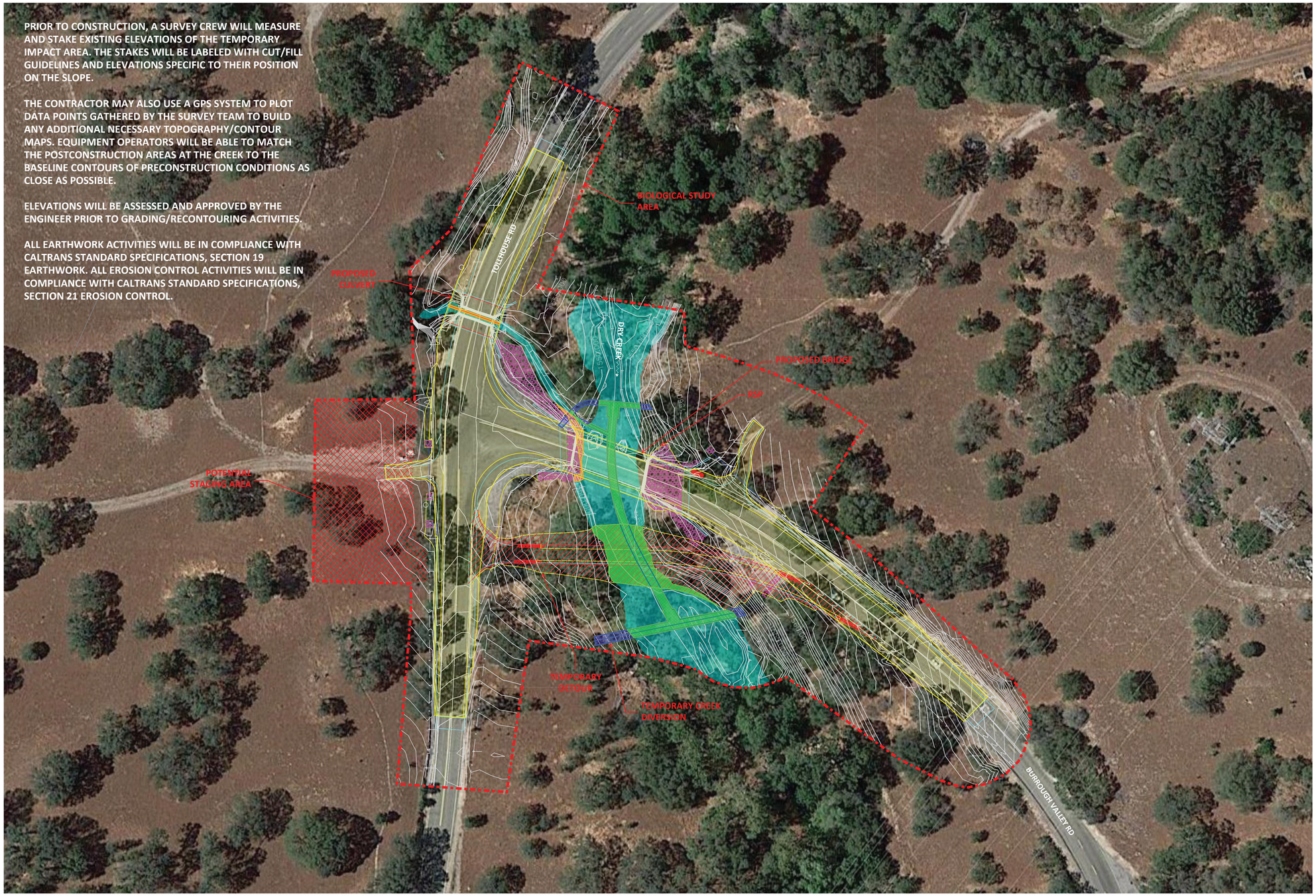
GRADING PLAN

PRIOR TO CONSTRUCTION, A SURVEY CREW WILL MEASURE AND STAKE EXISTING ELEVATIONS OF THE TEMPORARY IMPACT AREA. THE STAKES WILL BE LABELED WITH CUT/FILL GUIDELINES AND ELEVATIONS SPECIFIC TO THEIR POSITION ON THE SLOPE.

THE CONTRACTOR MAY ALSO USE A GPS SYSTEM TO PLOT DATA POINTS GATHERED BY THE SURVEY TEAM TO BUILD ANY ADDITIONAL NECESSARY TOPOGRAPHY/CONTOUR MAPS. EQUIPMENT OPERATORS WILL BE ABLE TO MATCH THE POSTCONSTRUCTION AREAS AT THE CREEK TO THE BASELINE CONTOURS OF PRECONSTRUCTION CONDITIONS AS CLOSE AS POSSIBLE.

ELEVATIONS WILL BE ASSESSED AND APPROVED BY THE ENGINEER PRIOR TO GRADING/RECONTOURING ACTIVITIES.

ALL EARTHWORK ACTIVITIES WILL BE IN COMPLIANCE WITH CALTRANS STANDARD SPECIFICATIONS, SECTION 19 EARTHWORK. ALL EROSION CONTROL ACTIVITIES WILL BE IN COMPLIANCE WITH CALTRANS STANDARD SPECIFICATIONS, SECTION 21 EROSION CONTROL.



	DATE	
DESIGNED: HFA	05/06/2021	DESIGN ENGINEER
DRAWN: HFA	05/06/2021	
CHECKED: JCH	05/06/2021	

FOR RIGHT OF WAY DATA AND ACCURATE ACCESS DETERMINATION, SEE DOCUMENTS IN THE DEPARTMENT OF PUBLIC WORKS AND PLANNING.

SCALE

0 50 100 Feet

LEGEND

- Biological Study Area
- Rock Slope Protection (RSP)
- Ordinary High Water Mark
- Potential Staging Area
- Temporary Detour
- Temporary Creek Diversion
- Roadway Work
- Contour Lines (1-foot intervals)

IMPACTS AREAS

- Permanent Impacts
- Temporary Impacts

DEPARTMENT OF PUBLIC WORKS AND PLANNING

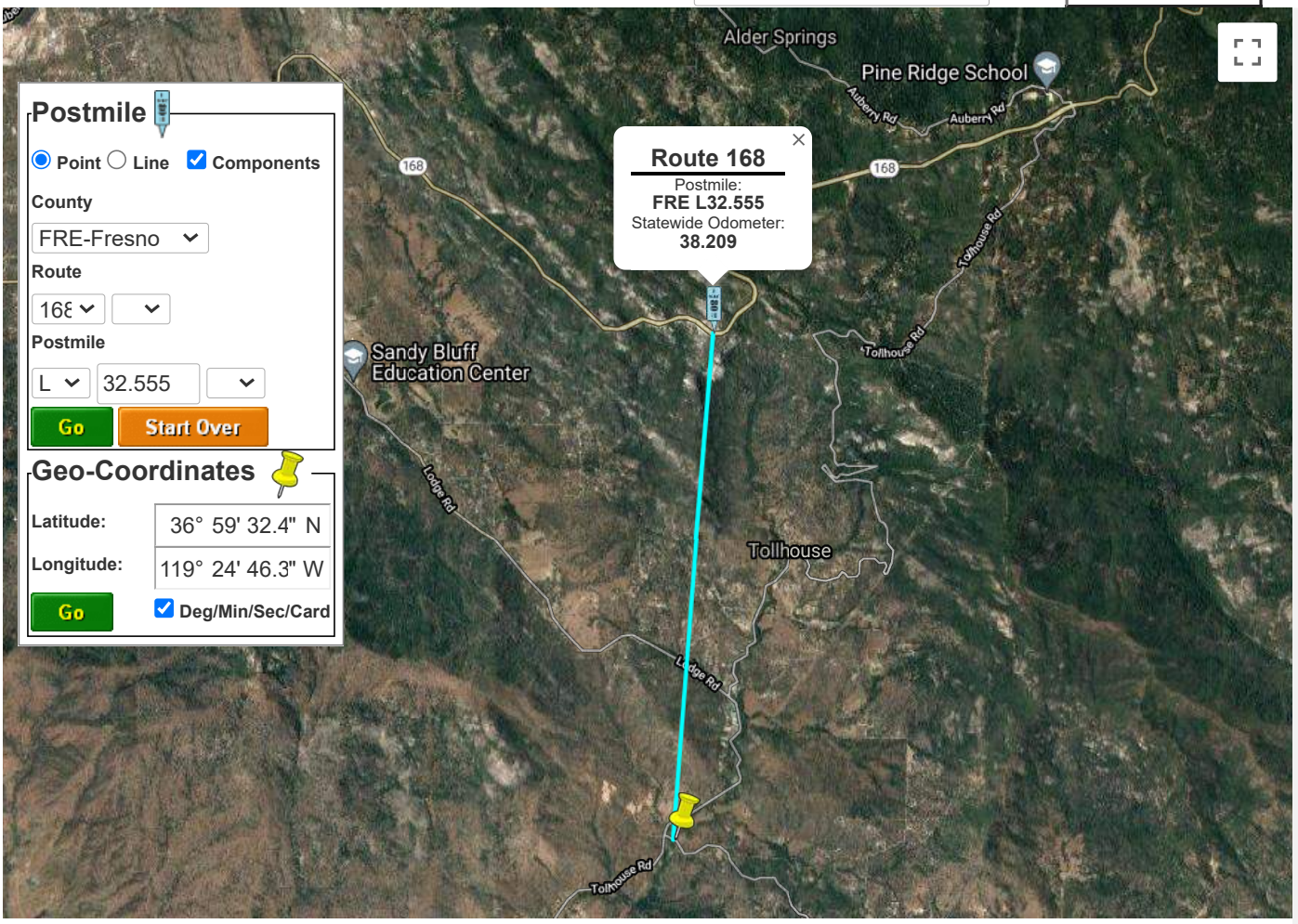
GRADING PLAN
DRY CREEK BRIDGE REPLACEMENT PROJECT

DRAWING NO. 1 SHEET NO. 1 TOTAL 1

APPENDIX C:
SEED SPECIFICATIONS

Postmile Services

Officially Designated State Scenic Highways | My Location | **Search map address** Search address | Close Infowindows



This application is being updated for digital accessibility and will continue to function while updates are in progress.

California Ecological Unit **M261Ep**
Lower Batholith

USFS Ecoregions of California 1997

Domain	**200**	**HUMID TEMPERATE DOMAIN**
Division	**M260**	**MEDITERRANEAN REGIME MOUNTAINS**
Province	**M261**	**FOREST-ALPINE MEADOWS OF WESTERN OCEANIC (MEDITERR**
Section	**M261E**	**Sierra Nevada Section**
Subsection	**M261Ep**	**Lower Batholith**

USDA-NRCS Major Land Resource Regions and Areas 1994

LRR1994	**D**	**Western Range and Irrigated**
MLRA1994	**22**	**Sierra Nevada Range**

Sunset Climate Zones 2001

		Precipitation (in)			Winter		Summer		
Zone	Extent	MinAvg	MaxAvg	Snow	Severity	LowestTempF	Severity	HiTempAvg	GrowDays
1A	Mountain and Intermountain	14		Moderate to Heavy	Very Cold	-40.00	Very Cold	60.00	50-100

Selected Seed Specifications

SpecID	Spec Type	Mix Type	Taxa Count	Sum PLS/ft2	Spec Details	Spec Excel All
1	Native Annual Wildflower	AnnForb	6	150	Spec1 details	Spec1 XLS
3	Annual Grassland	AnnGrass	2	144	Spec3 details	Spec3 XLS
19	Biofilter	AnnGrass--PerGrass / AnnForb--PerForb	8	353	Spec19 details	Spec19 XLS

Seed Specification 1
Native Annual Wildflower

PLS/ft2

Mix Type **AnnForb**

Spec Notes **These species are intolerant of burial under > 5 mm of mulch; DO NOT seed into alien annual grass matrix**

Common Name	Scientific Name	LB/AC	PLS/SQFT	% PLS	Seed/LB	Lifeform	Duration	Legume	Pollinator Value	Benefits to Pollinators	Pollinators	Flowering Month	Height (Ft.)	Commercially Available
California Goldfields	Lasthenia californica	3	118	52.61	3250000	08_Forb	Annual	Yes	High	Adult Food; Larval Food	Native Bees; Honey Bees; Butterflies; Larval Host (Moth)	Feb–Jun	1.5-1.3	Yes
Coastal Tidytips	Layia platyglossa	2	14	59.02	500000	08_Forb	Annual	Yes	Medium	Adult Food; Larval Food	Native Bees; Bombus; Larval Host (Moth)	Feb-May	0.5-2	Yes
Spanish Lotus	Acmispon americanus	4	7	77.04	103908	08_Forb	Annual	No	High	Adult Food; Larval Food	Native Bees; Bombus; Beetles, Wasps, Flies; Larval Host (Butterfly); Larval Host (Moth)	Apr–Jul	0.2-2	Yes
Bicolor Lupine	Lupinus bicolor	2	3	85.39	82900	08_Forb	Annual	No	High	Adult Food; Larval Food	Native Bees; Bombus; Honey Bees; Beetles, Wasps, Flies; Larval Host (Butterfly)	Mar-Jun	0.25-1.3	Yes
Baby Blue Eyes	Nemophila menziesii	1	4	83.93	227000	08_Forb	Annual	Yes	High	Adult Food; Larval Food	Native Bees; Bombus; Honey Bees; Larval Host (Butterfly); Larval Host (Moth)	Mar–Jun	0.5	Yes
Tomcat Clover	Trifolium willdenovii	2	4	63.08	140000	08_Forb	Annual	No	High	Adult Food; Larval Food	Native Bees; Bombus; Honey Bees; Larval Host (Butterfly)	Apr-May	1	Yes

Seed Specification 3
Annual Grassland

PLS/ft2

Mix Type **AnnGrass**

Spec Notes **Pioneer species of a context Annual Grassland assemblage**

Common Name	Scientific Name	LB/AC	PLS/SQFT	% PLS	Seed/LB	Lifeform	Duration	Legume	Pollinator Value	Benefits to Pollinators	Pollinators	Flowering Month	Height (Ft.)	Commercially Available
Small Fescue	Festuca microstachys	7	74	83.16	551334	10_TrueGrass	Annual	Yes				Apr-Jun	2.5	Yes
Sixweeks Fescue	Festuca octoflora	2	71	96.04	1600000	10_TrueGrass	Annual	Yes				Mar-Jun	2	Yes

Seed Specification 19
Biofilter

PLS/ft2

Mix Type **AnnGrass--PerGrass / AnnForb--PerForb**

Spec Notes **Promotes biofiltration of unwanted chemicals potentially present in runoff water**

Common Name	Scientific Name	LB/AC	PLS/SQFT	% PLS	Seed/LB	Lifeform	Duration	Legume	Pollinator Value	Benefits to Pollinators	Pollinators	Flowering Month	Height (Ft.)	Commercially Available
Western Yarrow	Achillea millefolium	1	47	76.61	2700000	08_Forb	Perennial>3Yr	Yes	Very High	Adult Food; Larval Food; Nesting and Structure (Bees)	Native Bees; Bombus; Honey Bees; Beetles, Wasps, Flies; Moths; Butterflies; Nesting and Structure (Bees); Larval Host (Moth)	Apr-Aug	1-3	Yes
California Brome	Bromus carinatus	25	48	83.30	100000	10_TrueGrass	Perennial>3Yr	Yes	None Known		Wind	Feb-Mar	1-5	Yes
Clustered Field Sedge	Carex praegracilis	5	49	64.00	665000	11_Graminoid	Perennial>3Yr	Yes	None Known		Wind	May–Jun	2-3.5	Yes
Blue Wildrye	Elymus glaucus	25	46	80.61	100000	10_TrueGrass	Perennial<3Yr	Yes	None Known		Wind	May–Jul	1-5	Yes
Barley	Hordeum brachyantherum	25	50	87.89	98160	10_TrueGrass	Perennial>3Yr	Yes	None Known		Wind	Jun–Jul	2-3.3	Yes
Beardless Wildrye	Elymus triticoides	15	43	84.80	145800	10_TrueGrass	Perennial>3Yr	Yes	None Known		Wind	Jun-Jul	2-4.3	Yes
Spanish Lotus	Acmispon americanus	10	18	77.04	103908	08_Forb	Annual	No	High	Adult Food; Larval Food	Native Bees; Bombus; Beetles, Wasps, Flies; Larval Host (Butterfly); Larval Host (Moth)	Apr–Jul	0.2-2	Yes
Small Fescue	Festuca microstachys	5	53	83.16	551334	10_TrueGrass	Annual	Yes				Apr-Jun	2.5	Yes