FOR CONTRACT No.: 04-2A2504

INFORMATION HANDOUT

MATERIALS INFORMATION

1. USFWS Biological Opinion File No. 81420-2009-F-1058-2
2. USFWS Amended Biological Opinion File No. 81420-2009-F-1058-R001
3. USACE Nationwide 404 Permit
4. RWQCB 401 Permit
5. Streambed Alternation Agreement1600 Permit
6. National Marine Fishery Service Letter of Concurrence
7. 2010 Final Environmental Impact Report/Environmental Assessment
8. 2013 Final Addendum Environmental Impact Report
9. SKT Tangent Terminal Installation Instructions for Steel Post Options, dated 11/06/12 Road Systems, Inc.
10. ET- Plus Guardrail End Treatment, Revised October 2009 Trinity Highway Products
11. X-Tension Guardrail End Terminal, dated 04/11/12 Barrier Systems

AVAILABLE AS SPECIFIED IN THE STANDARD SPECIFICATIONS

1. Foundation Report (FR) for the Nine Proposed Soil Nail Walls, dated March 6, 2012

ROUTE: 04-SCl-152 PM 0.0/5.2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2009-F-1058-2

JUL 14 2010

Mr. Jim Richards
Attn: Katie Thoreson
Office of Biological Sciences and Permits
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Biological Opinion on the Effects of the Proposed State Route 152 Hecker Pass Safety Improvement Project, Santa Clara County, California (Caltrans EA 2A2500) on the Threatened California Red-Legged Frog and Threatened California Tiger Salamander (Central Valley Distinct Population Segment)

Dear Mr. Richards:

This letter responds to a letter from the California Department of Transportation (Caltrans), dated June 4, 2009, requesting formal consultation for the proposed State Route (SR) 152 Hecker Pass Safety Improvement Project, Santa Clara County, California. Your letter was received by the U.S. Fish and Wildlife Service (Service) on June 9, 2009. This document represents the Service's Biological Opinion on the effects of the project on the threatened California red-legged frog (*Rana draytonii*) and threatened California tiger salamander (Central Valley Distinct Population Segment) (*Ambystoma californiense*) under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation (USDOT) acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act (NEPA) for environmental review, agency consultation and other actions pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007 through a Memorandum of Understanding (MOU) within the State of California: http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf.

Based on the information provided in the June 2009 Biological Assessment, Caltrans has determined that the project as proposed is likely to adversely affect the California red-legged frog and California tiger salamander. This Biological Opinion is based on: (1) the *Biological Assessment: Hecker Pass Safety Improvement Project* dated June 2009; (2) letter from Caltrans to the Service dated June 4, 2009; (3) project meeting and site visit conducted by the Service,

TAKE PRIDE IN AMERICA

California Department of Fish and Game (CDFG) and Caltrans on June 12, 2008; (4) miscellaneous correspondence and electronic mail concerning the proposed action between Caltrans and the Service; and (5) other information available to the Service.

Consultation History

June 10, 2008	The Service received an electronic copy of the project description and project figures from Caltrans.
June 11, 2008	The Service received an electronic copy of the Marbled Murrelet (Habitat) Assessment prepared by David Suddjian and dated May 5, 2008.
June 12, 2008	The Service attended a site visit with Alison Graff of Caltrans and Melissa Escaron of CDFG to review the project, biological findings, effects determination, project timing and scheduling, and avoidance and minimization measures.
June 17, 2008	The Service received an email from Brenda Blinn of the CDFG stating the Department concurs with the marbled murrelet habitat assessment that concluded the project area does not support suitable habitat for the species and consultation with the Department is not necessary.
June 8, 2009	The Service received an electronic copy of the Biological Assessment dated June 2009.
June 9, 2009	The Service received a letter requesting the initiation of formal consultation dated June 4, 2009 and a Biological Assessment for the California red-legged frog and California tiger salamander (Central Population).
July 30, 2009	The Service attended a project meeting with Caltrans to review the project scope, timeline, species determinations, effects analysis and avoidance and minimization measures.
April 27, 2010	The Service issued a draft Biological Opinion (81420-2009-F-1058-1) to Caltrans for review.
May 20, 2010	The Service received comments via email from Caltrans in regards to the draft Biological Opinion.
May 25, 2010	The Service received a hardcopy of comments from Caltrans in regard to the draft Biological Opinion dated May 24, 2010.
May 27, 2010	The Service sent an electronic copy of the Biological Opinion to the CDFG for their review in anticipation of Caltrans requesting a consistency determination.
June 2, 2010	The Service received review comments from the CDFG.
May 8, 2008 - June 8, 2010	Electronic and phone correspondence between Alison Graff, Katie Thoreson and Margaret Gabil of Caltrans, Melissa Escaron and Brenda Blinn of the CDFG, and Jerry Roe of the Service.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description, inclusive of the proposed compensation and proposed conservation measures, was provided by Caltrans and is an excerpt from the June 2009 Biological Assessment (Caltrans 2009) with minor modifications for reasons of clarity and accuracy provided by the Service.

Project Description

Caltrans assigned by the FHWA, is proposing to improve safety of portions of State Route (SR) 152 by making improvements to a 5.06-mile stretch of roadway between the Santa Cruz County Line (post mile [PM] 0.14) and PM 5.20. The proposed project area is seven miles west of the City of Gilroy, California, in western Santa Clara County, between the Santa Cruz County line and 0.17 miles east of Watsonville Road. The project occurs in the Mount Madonna and Watsonville East, California U.S. Geological Survey (USGS) 7.5 minute quadrangle, in Township 11 South, Range 5 East. The existing alignment is a two-lane highway with 12 foot lanes in both directions, and shoulders ranging from none to 15 feet wide within the project limits.

To address the high rate of cross-centerline accidents the Project proposes to widen existing lanes and shoulders, overlay the existing pavement, remove trees to increase sight distance, construct retaining walls, and add a left-turn lane from eastbound SR 152 to Watsonville Road. These improvements will occur along SR 152 in five locations between PM 0.14/5.20 in accordance with the design plans (Appendix A in Caltrans 2009):

1. Location 1: PM 0.14/0.26
2. Location 2: PM 0.94/1.11
3. Location 3: PM 1.22/1.47
4. Location 4: PM 2.57/3.20
5. Location 5: PM 4.77/5.20

Location 1:

The existing infrastructure at Location 1 (PM 0.14/0.26) includes 12 foot traveled lanes, a left shoulder that varies from 0 to 4 feet, and a right shoulder that varies from none to ten feet, with a turnout on the northern side of Location 1 (PM 0.26). An eastbound right curve with a radius of 68 feet has two signed locations for speeds of 15 miles per hour (mph). This location also includes three existing culverts; two 18 inch diameter corrugated metal pipes (culverts C1 and C2) and one 42 inch diameter reinforced concrete pipe (Culvert C3). Unlined gutters drain the roadway. At Location 1, Caltrans proposes to:

1. Remove trees;
2. Construct two soil nail retaining walls;
3. Widen existing 12 foot lanes;
4. Overlay pavement; and
5. Install warning signs.

Location 2:

The existing infrastructure at Location 2 (PM 0.94/1.11) includes 12 foot traveled lanes with no road shoulder. An eastbound left curve with a radius of 215 feet has two signs for a speed of 25 mph. This location also includes one existing 42 inch diameter corrugated metal pipe culvert (Culvert C4). At Location 2, Caltrans proposes to:

1. Remove trees;
2. Construct one soil nail retaining wall;
3. Widen existing 12-foot lanes;
4. Improve shoulders;
5. Extend existing culverts;
6. Overlay pavement; and
7. Install warning signs.

Location 3:

The existing infrastructure at Location 3 (PM 1.22/1.47) includes 12 foot traveled lanes with no road shoulder. A turnout on the northern side of the road has a 15 foot shoulder. This location also includes three existing culverts; a 30 inch, 36 inch, and 18 inch diameter corrugated metal pipe culvert (culverts C5, C6, and C7). At Location 3, Caltrans proposes to:

1. Remove trees;
2. Construct 3 soil nail retaining walls;
3. Widen existing 12-foot lanes;
4. Improve shoulders;
5. Overlay pavement; and
6. Install warning signs.

Location 4:

The existing infrastructure at Location 4 (PM 2.57/3.20) includes 12 foot traveled lanes with no road shoulder. Two T-intersections in this location on the northern side provide access to the Sprig Lake parking lot and a horse trailhead and parking area. This location also includes six existing culverts; one 21 inch diameter steel inlet pipe/corrugated metal pipe (Culvert C8), two 18-inch diameter corrugated metal pipes (culverts C9 and C10), two 24 inch diameter corrugated metal pipes (culverts C11 and C12), and one 12 to 18 inch diameter corrugated metal pipe (Culvert C13). At Location 4, Caltrans proposes to:

1. Construct five soil nail walls and one Type 5 retaining wall;
2. Widen existing 12 foot lanes;
3. Improve shoulders; and
4. Overlay pavement.

Location 5:

The existing infrastructure at Location 5 (PM 4.77/5.20) includes 12 foot traveled lanes, eight-foot shoulders, and areas where shoulder width varies from two to four feet. There is a T-intersection on the northern side where Watsonville Road intersects with SR 152, as well as

nine commercial and residential driveways in this location. This location also includes two existing culverts; one 32 inch diameter corrugated metal pipe (Culvert C14) and one 40 x 28inch corrugated steel pipe arc (Culvert 15). At Location 5, Caltrans proposes to:

1. Widen existing 12 foot lanes;
2. Provide left turn channelization at the Watsonville Road intersection;
3. Improve shoulders; and
4. Overlay pavements.

Biological Study Area

Caltrans evaluated an area defined as the Biological Study Area (BSA) for potential effects to natural resources from the proposed Project. Generally, the BSA was delineated to include the project footprint, action area, and the existing Caltrans right-of-way (ROW), which extends approximately 30 feet on either side of the roadway centerline. When evaluating the potential for occurrence of federally listed species in the project vicinity, the area studied was based on Service guidelines and is defined for each species in Chapter 4 of the Biological Assessment (Caltrans 2009).

Construction Activities

Shoulder and Lane Widening

Shoulder and lane widening will require excavation and fill to develop new surface for expanding the shoulder. The shoulders will be graded and compacted with graders, rollers, and water trucks to prepare for paving. The existing pavement will be saw cut and the new pavement expanded outward from the cut. Asphalt emulsion will be applied to the saw cut edge and asphalt concrete paving machines will place pavement to the design edge of pavement with a suitable lift to match the existing pavement edge. The equipment required for this work will include a blade, backhoe, paver, roller, and spreader. Vehicles required include a truck for materials, a labor pick-up truck, and a water truck.

Retaining Walls

A total of 12 retaining walls will be constructed within the project footprint. The following are the locations and expected dimensions of the walls:

Location 1:

1. Wall W1A (Soil Nail Wall); Station 08+50 to 11+06.808
   Maximum Dimensions: 17.2 feet high, 256.81 feet long, 3 feet wide.
2. Wall W1B (Soil Nail Wall); Station 12+59.223 to 14+66.359.
   Maximum Dimensions: 19.2 feet high, 207.14 feet long, 3 feet wide.

Location 2:

1. Wall W2A (Soil Nail Wall); Station 50+85.276 to 55+15.896.
   Maximum Dimensions: 29 feet high, 430.62 feet long, 3 feet wide.

Location 3:

1. Wall W3A (Soil Nail Wall); Station 65+75 to 67+42.847.
   Maximum Dimensions: 11.2 feet high, 167.85 feet long, 3 feet wide.
2. Wall W3B (Soil Nail Wall); Station 70+64.695 to 72+72.49.
   Maximum Dimensions: 10.2 feet high, 207.80 feet long, 3 feet wide.
3. Wall W3C (Soldier Pile Wall); Station 75+00 to 76+25.
   Maximum Dimensions: 5.19 feet high, 125 feet long, 3 feet wide.

Location 4:

1. Wall W4A (Soil Nail Wall); Station 134+60 to 137+52.496.
   Maximum Dimensions: 31.2 feet high, 292.50 feet long, 3 feet wide.
2. Wall W4B (Soil Nail Wall); Station 138+24.999 to 138+82.296.
   Maximum Dimensions: 14.18 feet high, 57.30 feet long, 3 feet wide.
3. Wall W4C (Soil Nail Wall); Station 139+51.102 to 150+07.177.
   Maximum Dimensions: 32.17 feet high, 1,056.08 feet long, 3 feet wide.
4. Wall W4D (Soil Nail Wall); Station 151+65.208 to 157+49.309.
   Maximum Dimensions: 23.17 feet high, 584.10 feet long, 3 feet wide.
5. Wall W4E (Type-5 Retaining Wall); Station 159+73.082 to 161+77.527.
   Maximum Dimensions: five feet high, 204.45 feet long, 3 feet wide.
6. Wall W4F (Soil Nail Wall); Station 163+49.982 to 166+594.956.
   Maximum Dimensions: 12 feet high, 344.97 feet long, 3 feet wide.

Soil Nail Walls

Soil nail walls function as retaining walls. They are essentially vertical masonry slabs that are held against a hillside by means of long "nails" drilled horizontally into the ground. The nails are about 0.7 to 1.5 times as high as the wall is long, depending on the soil condition of the site. They are placed in rows at five-foot intervals, starting approximately two feet below the top of the wall, and are driven in at a 15 to 20 degree downward angle using horizontal drilling equipment. Air or water is used during the drilling process to remove the loosened soil. The construction of the soil nail walls will involve excavating the hillside, drilling holes, installing the soil nails, and providing connectivity with existing drainage systems. The equipment required for this work will include a drilling machine, pump, forklift, crane, backhoe, and materials including wire mesh and soil nails (about 30 feet long). The slurry that is produced by the use of water during drilling will be fully contained and disposed of at an approved facility and will not be allowed to enter any drainage systems or waterways. The contractor will stage the construction of these walls from the roadbed. A long-armed backhoe will be used to cut back the hillside. From the roadway, a crane will suspend the backhoe and/or drilling machine at the required height for earth moving and drilling, or an earthen berm could be built at the base of the wall for the backhoe and drilling machine to work from.

Type-5 Wall:

A Type-5 wall is a retaining wall that consists of a reinforced vertical concrete wall stem and a concrete footing. A single Type-5 retaining wall will be installed in Location 4.

Drainage System

Within the boundaries of the BSA, a total of 16 culverts cross under SR 152. The diameters of the culverts range from 12 to 72 inches. Table 1 shows their post mile locations, types, and dimensions. Repairs to the existing drainage culverts include replacing or extending inlets and outlets, extending downdrains to the bank of the creek, and trenching for culvert placement. Increase of runoff from the increase in paved surface is expected to be minor because most of the runoff flowing through the project drainage systems is from the upland areas. Runoff from the upland areas, except those that shed directly through Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek, will discharge to the unlined gutters on the northern side of SR 152 and then drain through the culverts. Runoff from the roadway surface in the project area will also drain into the unlined gutters on both sides of the roadway, and then through the culverts as required. The collected runoff will then flow through Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek into Uvas Creek, and eventually to the receiving water, the Pajaro River.

Table 1. Existing Culverts

Culvert ID	PM	Culvert Type[1]	Diameter (inches)	Location Crossed
1A	0.02	CMP	18	Location 1
1B	0.22	RCP	42	Location 1
2A	1.11	CMP	24	Location 2
3A	1.22	CMP	30	Location 3
3B	1.32	CMP	36	Location 3
3C	1.39	CMP	18	Location 3
4A	2.61	SIP/CMP	21	Location 4
4B	2.67	CMP	18	Location 4
4C	2.69	CMP	18	Location 4
4D	2.76	CMP	24	Location 4
4E	2.82	CMP	24	Location 4
4F	2.99	CMP	12/18	Location 4
4G	3.07	RCP	72	Location 4
5A	4.81	CMP	36	Location 5
5B	4.87	CMP	12	Location 5
5C	4.93	CMP	30	Location 5

[1] Type
CMP corrugated metal pipe
RCP reinforced concrete pipe
SIP steel inlet pipe

Treatment Best Management Practices (BMPs)

Three potential treatment BMPs have been proposed within the action area: one biofiltration strip and two biofiltration swales, located in Locations 1, 4, and 5.

Biofiltration Strip:

Biofiltration strips are vegetated surfaces that remove pollutants by filtration through grass, sedimentation, adsorption to soil or grass, and infiltration into the soil. Biofiltration strips are mainly effective at removing debris and solid particles, although some constituents may be removed by adsorption to the soil. Preliminary investigation into the site conditions of the Project suggests that the climate and site conditions are favorable for the establishment of vegetation within the available ROW. The preliminary proposed locations for biofiltration strips are Locations 1, 4, and 5.

Biofiltration Swale:

Biofiltration swales are vegetated channels that remove pollutants by filtration through grass, sedimentation, adsorption to soil or grass, and infiltration through the soil. Biofiltration swales are mainly effective at removing debris and solid particles, although some constituents may be removed by adsorption to the soil.

Biofiltration swales are feasible and are considered the secondary preferred treatment method, as the feasibility requirements are similar to biofiltration strips. Preliminary investigation into the site conditions of the Project suggests that the climate and site conditions are favorable for the establishment of vegetation within the available ROW. The preliminary proposed locations for biofiltration swales are Locations 1, 4, and 5.

Pavement Friction and Overlay

On all locations open grade asphalt concrete will be used for overlay to improve surface friction.

Equipment Staging

The contractor will determine the location of the equipment staging area in coordination with the resident engineer and Caltrans biologist. The biologist will work with the contractor and resident engineer to ensure that equipment is not staged in an Environmentally Sensitive Area (ESA). Two potential staging areas have been identified, including the Mount Madonna Inn Restaurant parking lot (Station 417+75) in Santa Cruz County along SR 152, and an area west of Location 5 (Station 252+00) within Caltrans' right-of-way (ROW) north of SR 152.

Access Roads

Access (haul) roads are limited to Route 152 because it is the primary east-west route between Gilroy and Watsonville. No access roads outside of the temporary construction easements and staging areas shown on the plans will be required.

Site Clean-up and Restoration

All construction-related materials including the ESA fencing will be removed after construction activities are completed. The temporary construction easements and staging areas will be cleaned up, recontoured to original grade, and revegetated with appropriate native species, as necessary. Permanent erosion control, including soil stabilization measures such as hydroseeding and coir netting, will be applied to all temporarily affected project areas to minimize erosion after construction.

Post-project Maintenance

When the project is completed, maintenance will be performed by Caltrans or by approved contractors hired by Caltrans for those tasks. Standard Caltrans practices for cleaning, repairing, and otherwise maintaining SR 152 throughout the length of the project area will be followed.

General Conservation Measures

To reduce potential effects to sensitive biological resources, Caltrans proposes to incorporate construction BMPs and avoidance and minimization measures into the proposed roadway construction project. These measures will be communicated to the contractor through the use of special provisions included in the contract bid solicitation package. These measures include the following:

1. **Seasonal Avoidance**. Construction actions will be scheduled to minimize effects on listed species and habitats. Except for limited vegetation clearing (necessary to minimize effects to nesting birds), work will be conducted outside the rainy season from October 15 through April 15.

2. **Minimize Nighttime Work**. To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active listed species.

3. **Environmental Awareness Training**. Before the onset of construction activities, a qualified biologist will conduct an education program for construction personnel. At a minimum the training will include a description of California red-legged frog, California tiger salamander, and other listed species; migratory birds and their habitats; the occurrence of these species within the action area; an explanation of the status of these species and protection under the Act and Migratory Bird Treaty Act (MBTA); the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of the Act.

4. **Environmentally Sensitive Area Fencing**. Prior to the start of construction, ESAs – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high-visibility orange fencing. Construction work areas include the active construction site and all areas providing support for the project including areas used for vehicle parking, equipment and material storage and staging, access roads, etc. The ESA fencing will remain in place throughout the duration of the project, while construction activities are ongoing and will prevent the encroachment of construction equipment/personnel from entering sensitive habitat areas. The final project plans will depict all locations where ESA fencing will be installed and how it will be installed. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. In addition, hydrological features (i.e., topographic depressions, drainage ditches, culverts, etc.) outside of the project footprint will not be manipulated (i.e., re-routed, dredged, filled, graded, etc.). This will avoid

potential effects to wetlands and waters outside of the project footprint that are hydrologically connected to wetland features within the project footprint.

5. **Wildlife Exclusion Fencing**. Prior to the start of construction, Wildlife Exclusion Fencing (WEF) will be installed along the project footprint in all areas where California red-legged frogs and California tiger salamanders could enter the project site. In cooperation with the Service and CDFG the location of the fencing will be determined by the Resident Engineer and Service-approved biologist based on habitat suitability. The final project plans will show where and how the WEF will be installed. The bid solicitation package special provisions will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of the project, while construction activities are ongoing, and will be regularly inspected and fully maintained. Upon project completion the WEF will be completely removed and the areas returned to original condition or better

6. **Best Management Practices**. Storm Water Pollution Prevention Plans (SWPPP) and erosion control BMPs will be developed and implemented to minimize any wind or water-related erosion (Appendix B of the Biological Assessment). The SWPPP will provide guidance for design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. Protective measures will include, at a minimum:

   a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or water courses.

   b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses, except at established commercial gas stations or established vehicle maintenance facility.

   c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.

   d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

   e. Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, covering temporary access road entrances and exits with rock (rocking), and covering temporary stockpiles when weather conditions require.

   f. Coir rolls or straw wattles will be installed along or at the base of slopes during construction to capture sediment.

   g. Protection of graded areas from erosion using a combination of silt fences, fiber rolls along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas.

   h. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from the highway, or other impervious surfaces will be incorporated to the maximum extent practicable.

7. **Construction Site Restrictions**. The following site restrictions will be implemented to avoid or minimize adversely affecting sensitive habitats and harm or harassment to listed species:

   a. A speed limit of 15 mph in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.

   b. Construction access, staging, storage, and parking areas, will be located within the project ROW outside of any designated ESA or outside of the ROW in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.

   c. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.

   d. All food and food-related trash items will be enclosed in sealed trash containers and removed completely from the site at the end of each day.

   e. No pets from project personnel will be allowed anywhere in the action area during construction.

   f. No firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State or Federal law enforcement officials.

   g. All equipment will be maintained such that there will be no leaks of automotive fluids such as gasoline, oils or solvents and a Spill Response Plan (SRP) will be prepared. Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 50 feet from wetlands and aquatic habitats.

   h. Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance will occur at least 50 feet from any aquatic habitat unless separated by topographic or drainage barrier or unless it is an already existing gas station. Staging areas may occur closer to the project activities as required.

8. **Avoidance of Entrapment**. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than one-foot deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled they must be thoroughly inspected for trapped animals. All replacement pipes, culverts, or similar structures stored in the action area overnight will be inspected before they are subsequently moved, capped and/or buried. If at any time a listed species is discovered, the Resident Engineer and Service-approved biologist will be immediately informed. The Service-approved biologist will determine if relocating the species is necessary and will work with the Service and CDFG prior to handling or relocating unless otherwise authorized.

9. **Vegetation Removal**. Any vegetation that is within the cut and fill line or growing in locations where permanent structures will be placed (e.g., road alignment, shoulder widening, soil-nail walls, etc.) will be cleared. Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. A Service-approved biologist will be present during all vegetation clearing and grubbing activities. If at any point California red-legged frogs, California tiger salamanders or other listed species are discovered during these activities, the protocol for observance and handling California red-legged frogs or California tiger salamanders outlined below will be implemented. All clearing and grubbing of woody vegetation will occur by hand or using light construction equipment such as backhoes and excavators. If clearing and grubbing occurs between February 1 and August 31, a qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed including a perimeter buffer of 100 feet for passerines and 500 feet for raptors before clearing activities begin. All nest avoidance requirements of the MBTA and CDFG Code will be observed. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses and environmental clearances for properly disposing of such materials. After project completion, all temporarily affected areas will be returned to original grade and contours to the maximum extent practicable, protected using appropriate erosion control methods, and revegetated with native species appropriate for the region and habitat communities on site.

10. **Reduce Spread of Invasive Species**. To reduce the spread of invasive non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species, Caltrans will comply with Executive Order 13112. This order is provided to prevent the introduction of invasive species and provide for their control in order to minimize the economic, ecological, and human health impacts. In the event that high- or medium-priority noxious weeds, as defined by the California Department of Food and Agriculture or the California Invasive Plant Council, are disturbed or removed during construction-related activities, the contractor will contain the plant material associated with these noxious weeds and dispose of it in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area should be covered to the extent practicable with heavy black plastic solarization material until the end of the project.

11. **Revegetation**. All slopes or unpaved areas affected by the proposed project will be re-seeded with native grasses and shrubs to stabilize the slopes and bare ground against erosion. Following construction, native plant species will be installed at the disturbed area(s).

12. **Proper Use of Erosion Control Devices**. To prevent California red-legged frogs and California tiger salamanders from becoming entangled or trapped in erosion control materials, plastic mono-filament netting (erosion control matting) or similar material will not be used within the action area. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

13. **Preconstruction Surveys**. Preconstruction surveys will be conducted by a Service-approved biologist immediately prior to the initiation of any ground disturbing activities within or adjacent to suitable California red-legged frog or California tiger salamander habitat. These surveys will comprise walking transects while conducting visual encounter surveys within areas that will be subject to staging, vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. All fossorial mammal burrows will be inspected for signs of California red-legged frog or California tiger salamander usage to the maximum extent practicable. If it is determined that a burrow may be occupied by a California red-legged frog and/or California tiger salamander, the burrow will be excavated by hand, if possible, and the individual(s) relocated in accordance with the observation and handling protocol promulgated by the Service.

14. **Biological Monitoring**. A Service-approved biologist will be present onsite to monitor for California red-legged frogs and California tiger salamanders. Through communication with the Resident Engineer or their designee, the biologist may stop work if deemed necessary for any reason to protect listed species and will advise the Resident Engineer or designee on how to proceed accordingly. The biologist will be present during all construction activities where a listed species could occur. The biologist will conduct clearance surveys at the beginning of each day within or adjacent to suitable California red-legged frog and California tiger salamander habitat and regularly throughout the workday when construction is occurring within or adjacent to suitable California red-legged frog and California tiger salamander habitat.

15. **Protocol for Species Observation and Handling**. If California red-legged frogs or California tiger salamanders are encountered in the action area, work within 50 feet of the animal will cease immediately and the Resident Engineer and Service-approved biologist will be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the animal(s), it may be left at the location of discovery and monitored by the Service-approved biologist. All project personnel will be notified of the finding and at no time shall work occur within 50 feet of the animal without a biological monitor present. If it is determined by the Service-approved biologist that relocating the California red-legged frog(s) or California tiger salamander(s) is necessary, the following steps will be followed:

    a. Prior to handling and relocation the Service-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (Service 2005a) and *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Service 2003). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle amphibians after working in other aquatic habitats.

    b. California red-legged frogs and California tiger salamanders will be captured by hand, dipnet or other Service-approved methodology, transported by hand, dipnet or temporary holding container, and released as soon as practicable the same day of capture. Handling of California red-legged frogs and California tiger salamanders will be minimized to the maximum extent practicable. Holding/transporting containers and dipnets will be thoroughly cleaned and

disinfected prior to transporting to the action area and will be rinsed with freshwater onsite immediately prior to usage unless doing so would result in the injury or death of the animal(s) due to the time delay.

c. California red-legged frogs and California tiger salamanders will be relocated to the nearest suitable habitat outside of the area where actions would not result in harm or harassment, and released on the same side of SR 152 where it was discovered. The individual(s) will be released within suitable habitat in the Caltrans ROW or another property acceptable to the property owner, and the Service/CDFG will be notified. If suitable habitat cannot be identified, the Service/CDFG should be contacted to determine an acceptable alternative. If California tiger salamanders are captured from burrows, they will be relocated to the nearest active burrow network outside of the work zone. The release burrow(s) will be actively occupied by ground squirrels, since inactive burrows can collapse if not maintained. No more than two juvenile or adult California tiger salamanders will be released into the same burrow. Transporting California red-legged frogs and California tiger salamanders to a location other than the location described herein will require written authorization of the Service.

Proposed Conservation Measures

Proposed Compensation

To minimize effects to the California red-legged frog and California tiger salamander, Caltrans in coordination with the Service will create, restore, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects, suitable habitat for each species or suitable multi-species habitat if appropriate (Table 2). Alternatively, credits will be purchased at a Service-approved conservation bank. On-site restoration of temporarily affected areas (i.e., coyotebrush scrub, purple needlegrass/native grasslands, and landscaped/agricultural lands) may qualify as compensation at a 1:1 ratio once conditions are returned to baseline conditions as determined by the Service.

Table 2: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Effect	Compensation		Effect	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	0.76	1.1:1	0.836	6.32	3:1	18.96	19.796
California tiger salamander	0.67	1.1:1	0.737	2.30	3:1	6.90	7.637

Analytical Framework for Jeopardy

Jeopardy Determinations

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components: (1) *Status of the Species;* (2) *Environmental Baseline*, which evaluates the California red-legged frog and California tiger salamander range-wide conditions, the factors responsible for that condition, and their survival and recovery needs; and evaluates the condition of these species in the action area, the factors responsible for that condition, and the relationship

of the action area to the survival and recovery of these species; (3) *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on these species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on them.

In accordance with policy and regulation, this jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the California red-legged frog and California tiger salamander current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the range-wide survival and recovery of the California red-legged frog and California tiger salamander and the role of the action area in the survival and recovery of species as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the Service considers the action area to comprise 16.88 acres and encompasses the 5.06mile section of SR 152 from the Santa Cruz County line (PM 0.14) eastward to PM 5.20 in Santa Clara County, California. The action area encompasses the project footprint, the two identified staging areas, access routes, Caltrans ROW limits, project-specific construction easements within the ROW, and adjacent lands in some cases extending several hundred feet from the project footprint depending on the nature of the disturbance and sensitivity of the species to disturbance, that may result in take of listed species due to disturbance from noise, vibration, heavy equipment operation and increased human activity. Habitat within the action area is, in part, comprised of redwood forest, Coast live oak forest, coyote brush scrub, and purple needle grass grassland vegetation communities, as well as agricultural/landscaped lands and existing paved roadways and shoulders. The action area includes three hydrologic features including Blackhawk Creek, Bodfish Creek, and an unnamed tributary to Bodfish Creek.

Status of the Species and Environmental Baseline

<u>California Red-legged Frog</u>

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813). A revision to critical habitat was published on March 17, 2010 (75 FR 12816). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended coastally from the vicinity of Elk Creek in Mendocino County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986; Fellers 2005). The California red-legged frog was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFG 2010).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, California red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. California red-legged frogs breed between November and April in still or slow-moving water with emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.), and overhanging willows (*Salix* spp.) (Storer 1925, Hayes and Jennings 1988). California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female California red-legged frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984). Individuals occurring in coastal drainages are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold season.

During other parts of the year, habitat includes nearly any area within one to two miles of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Fellers (2005), this can include vegetated areas with coyote brush (*Baccharis pilularis*), California blackberry thickets (*Rubus ursinus*), and root masses associated with willow (*Salix* spp.) and California bay (*Umbellularia californica*) trees. Sometimes the non-breeding habitat used by California red-legged frogs is extremely limited in size. For example, non-breeding California red-legged frogs have been found in a six-foot wide coyote brush thicket growing along a tiny intermittent creek surrounded by heavily grazed grassland (Fellers 2005). Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting California red-legged frog populations and survival.

California red-legged frogs do not exhibit a distinct breeding migration (Fellers 2005). Dispersal distances are typically less than 0.5 miles, with a few individuals moving up to one to two miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as movements between aquatic sites and were most often associated with breeding activities. Bulger reported that non-migrating California red-legged frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, e.g. California blackberry, poison oak and coyote brush. Dispersing California red-legged frogs in northern Santa Cruz County traveled distances from 0.25 miles to more than two miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment, Tatarian (2008) noted that a 57 percent majority of California red-legged frogs fitted with radio transmitters in the Round Valley study area in eastern Contra Costa County stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak of seasonal terrestrial movement occurring in the fall months, with movement commencing with the first 0.2 inches of precipitation. Movements away from the source pools tapered off into spring. Upland movement activities ranged from three to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the bases of trees or rocks, logs, and a downed barn door; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from one to four days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Uplands closer to aquatic sites were used more often and California red-legged frog refugia were more commonly associated with areas exhibiting higher object cover, e.g. woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand results in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3½ to seven months following hatching and reach sexual maturity two to three years of age for males and females, respectively (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than one percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live eight to ten years (Jennings *et al.* 1992). Populations of California red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of larval California red-legged frogs is not well studied, but is likely similar to that of other ranid frogs, feeding on algae, diatoms, and detritus by grazing on the surface of rocks and

vegetation (Kupferberg 1996a, 1996b, 1997; Fellers 2005). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific tree frogs (*Hyla regilla*), three-spined stickleback (*Gasterosteus aculeatus*) and to a limited extent, California mice (*Peromyscus californicus*), which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger California red-legged frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult California red-legged frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination; feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs (*Rana aurora aurora*) in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (Moyle 1976, S. Barry 1992, Hunt 1993, Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile red-legged frogs, and suggested that bullfrogs could prey on subadult red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction. Both California and northern California red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to suitable habitat has also impacted California red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that block California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks (*Gasterosteus aculeatus*) in northwestern California. Ingles (1932a, 1932b, and 1933 cited in Fellers 2005) reported four species of trematodes from California red-legged frogs, but he later synonymized two of them (found them to be the same as the other two).

The recovery plan for California red-legged frogs identifies eight Recovery Units (Service 2002). The establishment of these Recovery Units is based on the Recovery Team's determination that

various regional areas of the species' range are essential to its survival and recovery. The status of the California red-legged frog will be considered within the smaller scale of Recovery Units as opposed to the overall range. These Recovery Units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the draft recovery plan is to protect the long-term viability of all extant populations within each Recovery Unit. Within each Recovery Unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy will allow for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Environmental Baseline

The action area is not located within designated critical habitat, but is located in the Diablo Range/Salinas Valley Recovery Unit and is adjacent to the Watsonville Slough-Elkhorn Slough Core Area (Unit 19) (USFWS 2002). The conservation needs for the Watsonville Slough-Elkhorn Slough Core Area, which based on the proximity can be applied to the action area, are to: (1) protect existing populations; (2) protect habitat connectivity; (3) reduce impacts of agriculture; (4) improve water quality; and (5) reduce impacts of urbanization. According to the Biological Assessment (Caltrans 2009a), the project is located within the known range of the California red-legged frog, but no breeding habitat was identified within the action area. The report identified suitable upland and dispersal habitat as present in the action area comprising riparian and redwood forest at Locations 1 to 4; suitable upland and dispersal habitat comprising coast live oak woodland, coyote brush scrub and purple needle grass grasslands at Location 4; and suitable non-breeding aquatic habitat is present within Bodfish Creek and the unnamed tributary to Bodfish Creek that parallels SR-152 adjacent to Locations 1 to 4. Field surveys conducted by URS biologists identified upland refugia within the action area comprising boulders, rocks, downed trees and leaf litter.

Seven occurrences have been reported within five miles of the project footprint dating from 1997 to 2000 comprising all life history stages located in the redwood forests to the northwest and southwest, and in the grasslands and coast live oak woodlands to the southeast (CDFG 2010). Habitat connectivity between the project footprint and these sightings is uninterrupted and consists of intact, medium to high quality habitat comprising redwood and mixed evergreen forests, riparian forests, coyote brush scrub, annual grasslands, intermittent and perennial streams, stock ponds and other suitable water bodies that may support one or more life history stages. Within the project footprint at Locations 1 to 4, habitat suitability supports California red-legged frog upland and dispersal activities. The action area at these locations also encompasses the unnamed tributary to Bodfish Creek that crosses through Location 1 and parallels the project footprint to the south at Locations 2 to 4. Location 5 and the proposed staging area in the paved lot of the Mt. Madonna Inn and Restaurant southwest of Location 1 does not support suitable habitat for the California red-legged frog; however, these locations are within the range of the species and dispersal of California red-legged frogs through these locations cannot be ruled out. Based on the prevalence of California red-legged frogs within the region, connectivity to adjacent occupied habitats and the presence of suitable habitat within the action area, the Service has determined there is a reasonable potential for California red-legged frogs to inhabit or disperse through the action area.

California Tiger Salamander

Listing Status: The final rule listing the Central Valley Distinct Population Segment of the California tiger salamander as a threatened species was published on August 4, 2004 (69 FR 47212). Critical habitat was designated on August 23, 2005 in 19 counties for the Central Valley Distinct Population Segment (70 FR 49380).

Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Recorded adult measurements have been as much as 8.2 inches long (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism (differences in body appearance based on gender) with males tending to be larger than females. California tiger salamander coloration generally consists of random white or yellowish markings against a black body. The markings on adults California tiger salamanders tend to be more concentrated on the lateral sides of the body, whereas other California tiger salamander species tend to have brighter yellow spotting that is heaviest on the dorsal surface.

Distribution: The California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and Inner Coast Ranges (Storer 1925; Shaffer *et al.* 1993; Jennings and Hayes 1994). The species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer *et al.* 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County. Three distinct California tiger salamander populations are recognized and correspond to Santa Maria area within Santa Barbara County, the Santa Rosa Plain in Sonoma County, and vernal pool/grassland habitats throughout the Central Valley.

Status and Natural History: The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, California tiger salamanders are otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Trenham *et al.* 2001; Shaffer *et al.* 2004). Because they spend most of their lives underground, California tiger salamanders are rarely encountered even in areas where they are abundant. Subadult and adult California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Although ground squirrels have been known to eat Califorina tiger salamanders, the relationship with their burrowing hosts is primarily commensal (an association that benefits one member while the other is not affected) (Loredo *et al.* 1996; Semonsen 1998).

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets and other invertebrates that provide likely prey for California tiger salamanders. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain

sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Burrows inhabited by California tiger salamanders have often been referred to as aestivation sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that California tiger salamanders remain active in their underground dwellings. Van Hattem (2004) found that California tiger salamanders move, feed, and remain active in their burrows. Because California tiger salamanders arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that California tiger salamanders actively feed while underground. Recent direct observations have confirmed this (Trenham 2001; Van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Shaffer *et al.* 1993; Trenham *et al.* 2000; Stebbins 2003). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Male California tiger salamander are typically first to arrive and generally remain in the ponds longer than females. Results from a seven year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless, and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

While in the ponds, adult California tiger salamanders mate and then the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Egg-laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, eggs may be attached to objects such as rocks and boards (Jennings and Hayes 1994). Clutch sizes from a Monterey County study had an average of 814 eggs (Trenham *et al.* 2000). Seasonal pools may not exhibit sufficient depth, persistence, or other necessary parameters for adult breeding during times of drought (Barry and Shaffer 1994). After breeding and egg-laying is complete, adults leave the pool and return to upland refugia (Loredo *et al.* 1996; Trenham 1998a). Adult California tiger salamanders often continue to emerge nightly for approximately the next two weeks to feed amongst their upland habitat (Shaffer *et al.* 1993).

California tiger salamander larvae typically hatch within ten to 24 days after eggs are laid (Storer 1925). The peak emergence of these metamorphs is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham *et al.* 2000). The larvae are aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific treefrogs, western spadefoot toads (*Spea hammondii*), and California red-legged frogs (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water

column in deeper water. Young California tiger salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The California tiger salamander larval stage is typically completed in three to six months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973).

Larval development and metamorphosis can vary and is often site-dependent. Length of larvae collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Semlitsch *et al.* 1988; Pechmann *et al.* 1989; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1988) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval California tiger salamanders, and five of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

Following metamorphosis, juveniles leave the rearing pools and disperse into adjacent upland habitat. Dispersal can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but rare summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia. Although likely rare, larvae may over-summer in permanent ponds. Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for two to five years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

Lifetime reproductive success for California tiger salamander species is low. Results from one study suggest that the average female tiger salamander bred 1.4 times and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals may not breed until they are four to six years old. While California tiger salamanders may survive for more than ten years, many breed only once, and in one study, less than five percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well human-caused

factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of California tiger salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). After breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before attempting to breed again (Trenham *et al.* 2000).

California tiger salamanders are known to travel large distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any individual, but California tiger salamanders in Santa Barbara County have been recorded dispersing up to 1.24 miles from their breeding ponds (Sweet 1998). California tiger salamanders are also known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds at distances ranging from 1,900 to 2,200 feet (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, California tiger salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile salamanders were within 2,099 feet of the pond, with the remaining five percent being found at even greater distances. Preliminary results from the 2003 and 2004 trapping efforts at the same study site detected juvenile California tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham *et al.*, unpublished data). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds (Ben Fitzpatrick, University of California at Davis, personal communication, 2004). In Santa Barbara County, juvenile California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult California tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously sited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to

have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks (*Quercus* spp.), than in more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as terrestrial movement corridors (Trenham 2001). In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Threats: Documented or potential California tiger salamanders predators include coyotes (*Canis latrans*), raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), opossums (*Didelphis virginiana*), egrets (*Egretta species*), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), garter snakes (*Thamnophis species*), bullfrogs, California red-legged frogs, mosquito fish, and crayfish (*Procrambus* spp.).

The California tiger salamander is imperiled throughout its range due to a variety of human activities (69 FR 47212). Current factors associated with declining California tiger salamander populations include habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern tiger salamander (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats include predation and competition from introduced exotic species; possible commercial over-utilization; diseases; various chemical contaminants; road kill; and certain unrestrictive mosquito and rodent control operations. Currently, these various primary and secondary threats are largely not being offset by existing Federal, State, or local regulatory mechanisms. The California tiger salamander is also prone to chance environmental or demographic events, to which small populations are particularly vulnerable.

Environmental Baseline

The action area is not located within designated critical habitat. According to the Biological Assessment (Caltrans 2009), the project is located within the known range of the California tiger salamander, and suitable upland and dispersal habitat is present in the action area at Location 5. Habitat within the action area at Location 5 provides suitable upland and dispersal California tiger salamander habitat comprising agricultural/landscaped lands within the 1.24mile maximum reported dispersal range of the species. Caltrans (2009) identified 15 ponds, stock ponds, reservoirs and other water bodies within a 1.24mile radius of the project footprint of Location 5; four of which lie within 0.5mile of the project footprint. No potential breeding habitat is present within the action area. Upland habitat within the action area at Location 5 supports an active Beechey ground squirrel colony(s), which provides suitable California tiger salamander refugia habitat. The staging area at Mt. Madonna Inn and Restaurant and Locations 1 to 4 are not located within the range of the species and do not support suitable breeding, upland or dispersal habitat for California tiger salamanders. The nearest reported occurrences (CNDDB Occurrence Number [Occ. #] 892 and 892) comprise several adults and juveniles captured during pitfall trapping surveys near perennial stock ponds approximately 1.2 miles to the northeast in 2005 (CDFG 2010). Dispersal from these locations is bisected by Uvas Creek, which may act as a

barrier to dispersal. However, survey data within suitable habitat west of Uvas Creek is unavailable. Based on the prevalence of California tiger salamanders within the action area, and the presence of suitable habitat within and adjacent to the action area, the Service has determined there is a reasonable potential for California tiger salamanders to inhabit and disperse through the action area.

Effects of the Action

The Service defines temporary and permanent effects as areas denuded, manipulated, or otherwise modified from their pre-project conditions, thereby removing one or more essential components of a listed species' habitat as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, parking, etc. Temporary effects are limited to one season and at a minimum, are fully restored to baseline habitat values or better within one year following initial disturbance. Permanent effects are not temporally limited and include all effects not fulfilling the criteria for temporary effects. Areas subject to ongoing operations and maintenance are also considered permanent.

California Red-legged Frog and California Tiger Salamander

The proposed project will likely adversely affect the threatened California red-legged frog by killing, harming and/or harassing juveniles and adults inhabiting areas of suitable non-breeding aquatic, upland and dispersal habitat; and adversely affect the threatened California tiger salamander by killing, harming and/or harassing juveniles and adults inhabiting burrows and other upland refugia within grasslands and ruderal habitat. Project effects were minimized by Caltrans by reducing the project footprint to the minimum area necessary to construct the proposed safety project. The project as proposed in the Biological Assessment (Caltrans 2009) and in the project description of this Biological Opinion would result in the permanent removal of 6.32 acres of California red-legged frog upland and dispersal habitat and 2.30 acres of California tiger salamander upland and dispersal habitat, and will temporarily affect 0.76-acre of California red-legged frog upland and dispersal habitat and 0.67 acres of California tiger salamander upland and dispersal habitat. The Service has determined that the permanent and temporary loss and/or degradation of California red-legged frog and California tiger salamander habitat will result in take of all California red-legged frogs and California tiger salamanders within these areas as a direct result of habitat loss. As outlined in Table 2, Caltrans has proposed a habitat compensation measure to provide minimization for the effects on the California red-legged frog and California tiger salamander by creating, restoring, or setting aside suitable habitat for each species at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects. This habitat will be conserved in perpetuity with appropriate management which will benefit both the California red-legged frog and California tiger salamander.

Aspects of the proposed action most likely to affect the California red-legged frog and California tiger salamander are largely confined to the construction phase. Temporal loss of habitat will result from the removal and/or disturbance of vegetation within the project footprint comprising California red-legged frog and California tiger salamander upland and dispersal habitat. Construction noise, vibration, and increased human activity during the construction phase of the project may interfere with normal behaviors – feeding, sheltering, movement between refugia and foraging grounds, and other California red-legged frog and California tiger salamander essential behaviors – resulting in avoidance of areas that have suitable habitat but intolerable levels of disturbance. Caltrans proposes to minimize these effects by restricting ground disturbance, clearing and grubbing to the dry season from April 15 to October 15, locating

construction staging, storage and parking areas outside of sensitive habitat to the maximum extent practicable; clearly marking construction work boundaries with high-visibility ESA fencing, conducting preconstruction surveys and environmental monitoring during revegetation removal activities, and revegetating all unpaved areas disturbed by project activities.

If unrestricted, the construction activities proposed have the potential to result in the introduction of chemical contaminants to the site. California red-legged frogs and California tiger salamanders using these areas could be exposed to contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants or prey species. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. However, Caltrans proposes to eliminate these risks by implementing a SWPPP, erosion control BMPs and an SRP, which will consist of refueling, oiling or cleaning of vehicles and equipment a minimum of 50 feet from aquatic resources; installing coir rolls, straw wattles and/or silt fencing to capture sediment and prevent runoff or other harmful chemicals from entering the wetland; and locating staging, storage and parking areas away from aquatic habitats.

Preconstruction surveys and the relocation of individual California red-legged frogs and California tiger salamanders may avoid injury or mortality; however, capturing and handling California red-legged frogs may result in stress and/or inadvertent injury during handling, containment, and transport. Caltrans proposes to minimize these effects by using qualified Service-approved biologists, limiting the duration of handling, and relocating amphibians to suitable nearby habitat in accordance with Service/CDFG guidance.

If unrestricted, biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytridiomycosis, caused by chytrid fungus (*Batrachochytrium dendrobatidis*), may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2001, Weldon *et al.* 2004). Caltrans proposes to eliminate these risks by implementing proper decontamination procedures prior to and following aquatic surveys and handling amphibians. These will minimize the risk of transferring diseases through contaminated equipment or clothing. Relocation of California red-legged frogs and California tiger salamanders out of construction areas that would otherwise result in mortality or injury if capture and relocation was not implemented increases the likelihood of survival of those individuals when they are handled properly and released nearby.

The amount of take resulting from construction activities and the removal of habitat will be partially minimized by installing wildlife exclusion fencing to deter California red-legged frogs and California tiger salamanders from wandering onto the construction site; educating workers about the presence of California red-legged frogs and California tiger salamanders, their habitat, identification, regulatory laws, and avoidance and minimization measures; and requiring a Service-approved biologist to be present to monitor project activities during construction.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future

Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. No other State, Tribal, local or private actions are anticipated in the action area within the foreseeable future.

The global average temperature has risen by approximately 0.6 degrees centigrade during the 20th Century (IPCC 2001, 2007; Adger et al 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007; Adger et al. 2007), and that it is "very likely" that it is largely due to increasing concentrations of greenhouse gases (carbon dioxide, methane, nitrous oxide, and others) in the global atmosphere from burning fossil fuels and other human activities (Cayan et al. 2006, EPA Global Warming webpage http://yosemite. epa.gov; Adger et al. 2007). Eleven of the twelve years between 1995 and 2006 rank among the twelve warmest years since global temperatures began in 1850 (Adger et al. 2007). The warming trend over the last fifty years is nearly twice that for the last 100 years (Adger et al. 2007). Looking forward, under a high emissions scenario, the International Panel on Climate Change estimates that global temperatures will rise another four degrees centigrade by the end of this Century; even under a low emissions growth scenario, the International Panel on Climate Change estimates that the global temperature will go up another 1.8 degrees centigrade (International Panel on Climate Change 2001).

The increase in global average temperatures affects certain areas more than others. The western United States, in general, is experiencing more warming than the rest of the Nation, with the 11 western states averaging 1.7 degrees Fahrenheit warmer temperatures than this region's average over the 20th Century (Saunders et al. 2008). California, in particular, will suffer significant consequences as a result of global warming (California Climate Action Team 2006). In California, reduced snowpack will cause more winter flooding and summer drought, as well as higher temperatures in lakes and coastal areas. The incidence of wildfires in California also will increase and the amount of increase is highly dependent upon the extent of global warming. No less certain than the fact of global warming itself is the fact that global warming, unchecked, will harm biodiversity generally and cause the extinction of large numbers of species. If the global mean temperatures exceed a warming of two to three degrees centigrade above pre-industrial levels, 20 to t30 percent of plant and animal species will face an increasingly high risk of extinction (International Panel on Climate Change 2001, 2007).

The mechanisms by which global warming may push already imperiled species closer or over the edge of extinction are multiple. Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (International Panel on Climate Change 2001, 2007; California Climate Action Team 2006; Lenihan et al. 2003). Extreme events, in turn may cause mass mortality of individuals and significantly contribute to determining which species will remain or occur in natural habitats. As the global climate warms, terrestrial habitats are moving northward and upward, but in the future, range contractions are more likely than simple northward or upslope shifts. Ongoing global climate change (Anonymous 2007; Inkley et al. 2004; Adger et al. 2007; Kanter 2007) likely imperils the California red-legged frog and California tiger salamander and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California red-legged frog and California tiger salamander; the environmental baseline for the action area; the effects of the proposed SR 152 Hecker Pass Safety Improvement Project and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is likely to result in take of California red-legged frog and California tiger salamander, but is not likely to jeopardize the continued existence of these species. Although the existing road way and the proposed modifications will permanently reduce habitat for California red-legged frogs and California tiger salamanders, and could result in the harm, harassment, injury and/or mortality of individuals within the action area, the effects to the larger populations within western Santa Clara County is unlikely to significantly affect the recovery of these species. Implementation of appropriate habitat compensation and the incorporation of appropriate design measures to minimize the effects to California red-legged frogs and California tiger salamanders will likely alleviate the risk of take to the local population.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to Caltrans, as appropriate, in order for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to require its contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

California Red-Legged Frog

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect due to their cryptic nature and wariness of humans. Losses of this species may also be difficult to quantify due to a lack of baseline survey data and seasonal/annual fluctuations in their numbers due to environmental or human-caused disturbances. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent

and temporary loss/degradation of suitable habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental of the proposed action as: (1) the injury and mortality of no more than two adult or juvenile California red-legged frogs, and (2) the capture, harm and harassment of all California red-legged frogs within the action area. Incidental take of eggs or larval California red-legged frogs is not anticipated, since the project will not affect breeding or rearing habitat. Upon implementation of the following Reasonable and Prudent Measures, California red-legged frogs within the action area in proportion to the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are exempted under this opinion.

California Tiger Salamander

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because of its cryptic nature, subterranean lifestyle, and predominately nocturnal behavior. Losses of this species may also be difficult to quantify due to a lack of baseline survey data and seasonal/annual fluctuations in their numbers due to environmental or human-caused disturbances. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent and temporary loss/degradation of suitable habitat, and capture and relocation efforts; therefore, the Service is authorizing take incidental of the proposed action as: (1) the injury and mortality of no more than two adult or juvenile California tiger salamanders, and (2) the capture, harm and harassment of all California tiger salamanders within the action area. Incidental take of eggs or larvae is not anticipated, since the project will not affect breeding or rearing habitat. Upon implementation of the following Reasonable and Prudent Measures, California tiger salamanders within the action area in proportion to the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the California red-legged frog and California tiger salamander and is not likely to jeopardize the continued existence of these species.

Reasonable and Prudent Measures

The following reasonable and prudent measure is necessary and appropriate to minimize the effect of the proposed action on the California red-legged frog and California tiger salamander:

1. Harassment, harm, injury, capture and mortality to the California red-legged frog and California tiger salamander shall be minimized by fully implementing the Conservation Measures in this Biological Opinion and adhering to the minimization measures described below in the Terms and Conditions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above.

1. The following Terms and Conditions implement Reasonable and Prudent Measure one (1)

   a. All work shall be done according to this Biological Opinion, the Biological Assessment dated June 2009, letter from Caltrans dated June 4, 2009 and all other supporting documentation submitted to the Service. Caltrans shall be responsible for fully implementing all Conservation Measures and Terms and Conditions of this Biological Opinion as specified. In the event of a conflict between any of these documents, Caltrans, the Resident Engineer or their designee shall contact the agencies of which conditions are in conflict for resolution prior to proceeding with the activity affected.

   b. Caltrans shall ensure the Resident Engineer or their designee shall have full authority to implement and enforce all Conservation Measures and Terms and Conditions of this Biological Opinion. The Resident Engineer or their designee shall maintain a copy of this Biological Opinion onsite whenever construction is in progress. Their name(s) and telephone number(s) shall be provided to the Service at least thirty (30) calendar days prior to ground-breaking at the project. Prior to ground-breaking, the Resident Engineer shall submit a letter to the Service verifying he/she is in possession of a copy of this Biological Opinion, and has read and understands the Conservation Measures and Terms and Conditions of this Biological Opinion.

   c. Caltrans shall require all contractors to comply with the Act in the performance of the work and shall include Special Provisions that include the Conservation Measures and the Terms and Conditions of this Biological Opinion in the solicitation for bid information for all contracts for the project that are issued by them to all contractors. Caltrans shall inform all contractors involved in the project of the requirements of the Biological Opinion. If the contractor(s) violates the conditions of this Biological Opinion or independently seek off-site staging, storage, disposal, borrow, vehicle parking, lay down areas, etc., outside of the designated areas described in the Project Description of this Biological Opinion as provided by Caltrans, such areas shall be subject to the requirements of endangered species consultations with the Service, National Marine Fisheries Service (NMFS) and CDFG. In such cases, reinitiation of formal consultation with the Service shall be the responsibility of Caltrans as such actions are considered interrelated and interdependent, and have not been evaluated under this Biological Opinion. All other agency permits and agreements shall be the responsibility of Caltrans and its contractor(s).

   d. Caltrans shall compensate for the effects of take of California red-legged frogs and California tiger salamanders resulting from the net loss of habitat and temporal loss between the time the effects are incurred and the time when the compensation habitat is fully functional. As described in the project description, Caltrans shall protect 19796 acres of California red-legged frog habitat and 7.637 acres of California tiger salamander habitat acres in perpetuity through on- or off-site habitat restoration, the purchase of conservation bank credits, acquisition of land, or a combination of these options. The Service encourages Caltrans to seek habitat that comprises high quality breeding, foraging, sheltering, migration and/or dispersal habitat, or provides a functional linkage to areas of occupied habitat(s)

to facilitate the (re)colonization from source populations. The habitat shall have a conservation easement, management plan, and funding endowment to manage the habitat in perpetuity; all of which shall be reviewed and approved by the Service/CDFG and completed within 18 calendar months following the date of project ground-breaking. Within 6 month following the issuance of this Biological Opinion, Caltrans shall submit a Conceptual Compensation Plan to the Service/CDFG detailing a comprehensive compensation scheme(s) and timelines to achieve full habitat functions and values. Caltrans shall comply with all applicable CDFG regulations pertaining to mitigation for species designated as fully protected and/or listed by the State.

1. **On-Site Habitat Restoration**. At a minimum, Caltrans shall restore temporarily disturbed habitat(s), i.e. coyotebrush scrub, purple needlegrass/native grasslands, and landscaped/agricultural lands, to original contours and baseline conditions. Credit for on-site restoration of areas subject to temporary disturbance at a ratio of 1:1 shall be achieved once the habitat is returned to and functions at baseline conditions or better as determined by the Service. Additional compensation at a ratio of 0.1:1 will help offset the temporal effect of the disturbance during which time the habitat is unsuitable for California red-legged frogs and California tiger salamanders during the construction phase of the proposed action.

2. **Conservation Bank Credits**. Caltrans shall purchase conservation bank credits at a Service/CDFG-approved conservation bank whose service area encompasses the action area for the species listed above. Conservation bank credits shall be purchased and documentation provided to the Service and CDFG comprising the Agreement for Sale of Conservation Credits, Bill of Sale, Payment Receipt and Updated Credit Ledger within 30 calendar days prior to project ground-breaking.

3. **Off-Site Habitat Acquisition & In-perpetuity Preservation**. Caltrans shall contribute toward the acquisition of habitat approved by the Service and CDFG. Acquisition of land shall either be through a conservation easement or fee title. The conservation easement shall name the Service and CDFG as third-party beneficiaries or grantees, and shall be held by an entity qualified to hold conservation easements subject to Service and CDFG approval. The endowment to manage the land and monitor the conservation easement shall be based on the management plan or a PAR (or PAR-equivalent) analysis. The endowment shall be secured with a Funding Assurance Letter stating that sufficient funds to compensate for the effects to listed species, i.e. mitigate impacts, have been budgeted into the State Route 152 Hecker Pass Safety Improvement Project Expenditure Authorization. The Funding Assurance letter shall be signed by the District Deputy Director of Project Management and the District Deputy Director of Environmental Planning and Engineering and approved by Service and CDFG's Offices of the General Counsel. The Funding Assurance Letter provides evidence that Caltrans has allocated sufficient funding to implement the proposed compensation/mitigation, monitoring and reporting requirements including habitat conservation credits or land

acquisition costs, costs of managing the compensation/mitigation lands, and an endowment. The Funding Assurance Letter shall be provided to the Service and CDFG for approval prior to project ground-breaking. The endowment shall be held by a Service/CDFG-approved entity in an amount agreed to by the Service and CDFG. A management plan shall be developed prior to or concurrent to the acquisition of land and shall include at a minimum: a description of existing habitats and proposed habitat creation, restoration and/or enhancement; success criteria for habitat modification; monitoring criteria for California red-legged frogs and California tiger salamanders; an integrated pest management plan; and adaptive management strategies. Caltrans shall submit the management plan to the Service/CDFG for approval.

e. A Service-approved biologist(s) shall be onsite during all activities that may result in take of California red-legged frogs and California tiger salamanders. The qualifications of the biologist(s) shall be presented to the Service for review and written approval at least thirty (30) calendar days prior to ground-breaking at the project site. The Service-approved biologist(s) shall keep a copy of this Biological Opinion in their possession when onsite. Through the Resident Engineer or their designee, the Service-approved biologist(s) shall be given the authority to communicate verbally or by telephone, email or hardcopy with Caltrans personnel, construction personnel or any other person(s) at the project site or otherwise associated with the project. Through the Resident Engineer or their designee, the Service-approved biologist(s) shall have the authority to stop project activities if he/she determines any of the Conservation Measures or Terms and Conditions of this Biological Opinion is not being fulfilled. If the Service-approved biologist(s) exercises this authority, the Service shall be notified by telephone and email within 24 hours. The Service contact is the Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

f. The Service-approved biologist shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying the listed species encountered, including the time and location of the observation; (3) the time the specimen was identified and by whom and its condition; and (4) a description of any actions taken. The Service-approved biologist shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service, CDFG, and/or their designated agents upon request. All monitoring records shall be provided to the Service upon completion of the monitoring work.

g. If verbally requested through the Resident Engineer or their designee, before, during, or upon completion of ground breaking and construction activities, Caltrans shall ensure the Service, CDFG, and/or their designated agents can immediately and without delay, access and inspect the project site for compliance with the Project Description, Conservation Measures, and Terms and Conditions of this Biological Opinion.

Reporting Requirements

Proof of environmental training shall be provided to the Endangered Species Program, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, California 95825-1846. Observations of California red-legged frogs, California tiger salamanders, or any listed or rare species should be reported to the California Natural Diversity Database (CNDDB) within thirty (30) calendar days of the observation.

Injured California red-legged frogs or California tiger salamanders must be cared for by a licensed veterinarian or other qualified person, such as the Service-approved biologist. Dead animals shall be placed in a zip-lock® plastic storage bag with a piece of paper indicating the date, time, location and name of the person who found it. The bag shall be placed in a freezer located in a secure location until instructions are received from the Service regarding the disposition of the specimen or until the Service takes custody of the specimen. The Service must be notified within 24 hours of the discovery of death or injury resulting from project-related activities or is observed at the project site. Notification shall include the date, time, and location of the incident or finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are the Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660.

Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (1) dates that construction occurred; (2) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (3) an explanation of failure to meet such measures, if any; (4) known project effects on the California red-legged frogs or California tiger salamanders, if any; (5) incidental take of these species, if any; (6) documentation of employee/contractor environmental education; and (7) other pertinent information.

Caltrans shall report to the Service any information about take or suspected take of listed wildlife species not authorized by this Biological Opinion. Caltrans must notify the Service via electronic mail and telephone within twenty-four (24) hours of receiving such information. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. The individual animal shall be preserved, as stated above, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species and critical habitat. Conservation recommendations are discretionary measures to further minimize the effects to listed species and critical habitat. They also serve as suggestions of how action agencies can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act, or recommend studies improving an understanding of a species' biology or

ecology. Wherever possible, conservation recommendations should be tied to tasks identified in recovery plans. The Service is providing the following conservation recommendations:

1. Caltrans should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-legged Frog* (Service 2002).

2. Caltrans should consider participating in the planning for a regional habitat conservation plan for the California red-legged frog, California tiger salamander, and other listed and sensitive species in Santa Clara County.

3. Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog, California tiger salamander, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate.

4. Sightings of any listed or sensitive animal species should be reported to the CNDDB of the CDFG. A copy of the reporting form and a topographic map clearly marked with the location the animals were observed also should be provided to the Service.

5. Caltrans should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California red-legged frog, California tiger salamander, and other listed and common animals. Caltrans should include photographs, plans, and other information in their biological assessments if they incorporate "wildlife friendly" crossings into their projects.

6. Caltrans should provide roosting habitat for bats, when designing bridges, overpasses and other suitable structures whenever possible.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and/or proposed species or their habitats, the Service requests notification of the implementation of these recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the proposed State Route 152 Hecker Pass Safety Improvement Project, Santa Clara County, California. As provided in 50 CFR §402.16 and in the terms and conditions of this Biological Opinion, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions concerning this opinion on the proposed State Route 152 Hecker Pass Safety Improvement Project, Santa Clara County, California, please contact Jerry Roe or Ryan Olah at the letterhead address or at (916) 414-6600.

Sincerely,

for

Susan K. Moore
Field Supervisor

cc:
Amy Sparks, California Department of Transportation, Oakland, CA
Melissa Escaron, California Department of Fish and Game, Oakland, CA

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United States Department of the Interior

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Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
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In Reply Refer To:
81420-2009-F-1058-R001

MAY 29 2012

Ms. Melanie Brent, Office Chief
Caltrans District 4 Environmental Analysis
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation on the Biological Opinion on the Effects of the State Route 152 Hecker Pass Safety Improvement Project, Santa Clara County, California (Caltrans EA 2A250)

Dear Ms. Brent:

This letter is a reinitiation of the Biological Opinion issued by the U.S. Fish and Wildlife Service (Service) on July 14, 2010, (Service File No.: 81420-2009-F-1058) for the State Route 152 (SR 152) Hecker Pass Safety Improvement Project located in Santa Clara County, California. Reinitiation of consultation was requested by the California Department of Transportation (Caltrans) on March 16, 2012, and was received in our office on March 20, 2012, to address the effects of changes to the proposed project on the threatened California red-legged frog (*Rana draytonii*) and threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*). Reinitiation of consultation is exercised under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act (NEPA) for environmental review, agency consultation and other action pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007 through a Memorandum of Understanding (MOU) within the State of California (http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf).

The following changes are made to the July 14, 2010, biological opinion:

1. Add the following to the **Consultation History** on page 2:

March 20, 2012	The Service received a request from Caltrans dated March 16, 2012, to reinitiate formal consultation to address

	changes to the project design that may affect the California red-legged frog and California tiger salamander.
March 1, 2012 - May 22, 2012	Electronic and phone correspondence between Caltrans, and the Service.

2. Change the **Project Description** on Page 3 from:

Caltrans assigned by the FHWA, is proposing to improve safety of portions of State Route (SR) 152 by making improvements to a 5.06-mile stretch of roadway between the Santa Cruz County Line (post mile [PM] 0.14) and PM 5.20. The proposed project area is seven miles west of the City of Gilroy, California, in western Santa Clara County, between the Santa Cruz County line and 0.17 miles east of Watsonville Road. The project occurs in the Mount Madonna and Watsonville East, California U.S. Geological Survey (USGS) 7.5 minute quadrangle, in Township 11 South, Range 5 East. The existing alignment is a two-lane highway with 12 foot lanes in both directions, and shoulders ranging from none to 15 feet wide within the project limits.

To address the high rate of cross-centerline accidents the Project proposes to widen existing lanes and shoulders, overlay the existing pavement, remove trees to increase sight distance, construct retaining walls, and add a left-turn lane from eastbound SR 152 to Watsonville Road. These improvements will occur along SR 152 in five locations between PM 0.14/5.20 in accordance with the design plans (Appendix A in Caltrans 2009):

1. Location 1: PM 0.14/0.26
2. Location 2: PM 0.94/1.11
3. Location 3: PM 1.22/1.47
4. Location 4: PM 2.57/3.20
5. Location 5: PM 4.77/5.20

Location 1:

The existing infrastructure at Location 1 (PM 0.14/0.26) includes 12 foot traveled lanes, a left shoulder that varies from 0 to 4 feet, and a right shoulder that varies from none to ten feet, with a turnout on the northern side of Location 1 (PM 0.26). An eastbound right curve with a radius of 68 feet has two signed locations for speeds of 15 miles per hour (mph). This location also includes three existing culverts; two 18 inch diameter corrugated metal pipes (culverts C1 and C2) and one 42 inch diameter reinforced concrete pipe (Culvert C3). Unlined gutters drain the roadway. At Location 1, Caltrans proposes to:

1. Remove trees;
2. Construct two soil nail retaining walls;
3. Widen existing 12 foot lanes;
4. Overlay pavement; and
5. Install warning signs.

Location 2:

The existing infrastructure at Location 2 (PM 0.94/1.11) includes 12 foot traveled lanes with no road shoulder. An eastbound left curve with a radius of 215 feet has two signs for a speed of 25 mph. This location also includes one existing 42 inch diameter corrugated metal pipe culvert (Culvert C4). At Location 2, Caltrans proposes to:

1. Remove trees;
2. Construct one soil nail retaining wall;
3. Widen existing 12-foot lanes;
4. Improve shoulders;
5. Extend existing culverts;
6. Overlay pavement; and
7. Install warning signs.

Location 3:

The existing infrastructure at Location 3 (PM 1.22/1.47) includes 12 foot traveled lanes with no road shoulder. A turnout on the northern side of the road has a 15 foot shoulder. This location also includes three existing culverts; a 30 inch, 36 inch, and 18 inch diameter corrugated metal pipe culvert (culverts C5, C6, and C7). At Location 3, Caltrans proposes to:

1. Remove trees;
2. Construct 3 soil nail retaining walls;
3. Widen existing 12-foot lanes;
4. Improve shoulders;
5. Overlay pavement; and
6. Install warning signs.

Location 4:

The existing infrastructure at Location 4 (PM 2.57/3.20) includes 12 foot traveled lanes with no road shoulder. Two T-intersections in this location on the northern side provide access to the Sprig Lake parking lot and a horse trailhead and parking area. This location also includes six existing culverts; one 21 inch diameter steel inlet pipe/corrugated metal pipe (Culvert C8), two 18 inch diameter corrugated metal pipes (culverts C9 and C10), two 24 inch diameter corrugated metal pipes (culverts C11 and C12), and one 12 to 18 inch diameter corrugated metal pipe (Culvert C13). At Location 4, Caltrans proposes to:

1. Construct five soil nail walls and one Type 5 retaining wall;
2. Widen existing 12 foot lanes;
3. Improve shoulders; and
4. Overlay pavement.

Location 5:

The existing infrastructure at Location 5 (PM 4.77/5.20) includes 12 foot traveled lanes, eight-foot shoulders, and areas where shoulder width varies from two to four feet. There

is a T-intersection on the northern side where Watsonville Road intersects with SR 152, as well as nine commercial and residential driveways in this location. This location also includes two existing culverts; one 32 inch diameter corrugated metal pipe (Culvert C14) and one 40 x 28inch corrugated steel pipe arc (Culvert 15). At Location 5, Caltrans proposes to:

1. Widen existing 12 foot lanes;
2. Provide left turn channelization at the Watsonville Road intersection;
3. Improve shoulders; and
4. Overlay pavements.

To:

Caltrans, assigned by the FHWA, is proposing to improve safety of portions of SR 152 by making improvements to a 5.05-mile stretch of roadway between the Santa Cruz County Line (post mile [PM] 0.14) and PM 5.19. The proposed project area is seven miles west of the City of Gilroy, California, in western Santa Clara County, between the Santa Cruz County line and 0.16-mile east of Watsonville Road. The project occurs in the Mount Madonna and Watsonville East, California U.S. Geological Survey (USGS) 7.5-minute quadrangle, in Township 11 South, Range 5 East. The existing alignment is a two-lane highway with 12-foot lanes in both directions, and shoulders ranging from none to 15 feet wide within the project limits.

To address the high rate of cross-centerline accidents the Project proposes to widen existing lanes and shoulders, overlay the existing pavement, remove trees to increase sight distance, construct retaining walls, and add a left-turn lane from eastbound SR 152 to Watsonville Road. These improvements will occur along SR 152 in five locations between PM 0.14/5.19 in accordance with the design plans (Appendix A in Caltrans 2009):

1. Location 1: PM 0.14/0.29
2. Location 2: PM 0.94/1.11
3. Location 3: PM 1.19/1.48
4. Location 4: PM 2.54/3.18
5. Location 5: PM 4.73/5.19

Location 1:

The existing infrastructure at Location 1 (PM 0.14/0.29) includes 12-foot traveled lanes, a left shoulder that varies from 0 to 4 feet, and a right shoulder that varies from 0 to 10 feet, with a turnout on the northern side of Location 1 (PM 0.26). An eastbound right curve with a radius of 68 feet has two signed locations for speeds of 15 miles per hour (mph). This location also includes four existing culverts; three 18 inch diameter corrugated metal pipes (culverts C1, C2 and C4) and one 42 inch diameter reinforced concrete pipe (Culvert C3). Unlined gutters drain the roadway. At Location 1, Caltrans proposes to:

1. Remove trees;
2. Construct two soil nail retaining walls;
3. Widen existing shoulders to 8 feet;

4. Overlay pavement to improve roadway super-elevation;
5. Install warning signs;
6. Extend existing culverts;
7. Acquire 0.54-acre of additional right-of-way on both sides of the roadway;
8. Modify existing culverts to accommodate widened shoulders;
9. Add drainage systems on and around the roadway; and
10. Construct on biofiltration swale and grated line drain.

Location 2:

The existing infrastructure at Location 2 (PM 0.94/1.11) includes 12-foot traveled lanes with no road shoulder. An eastbound left curve with a radius of 215 feet has two signs for a speed of 25 mph. This location also includes one existing 42 inch diameter corrugated metal pipe culvert (Culvert C4). At Location 2, Caltrans proposes to:

1. Remove trees;
2. Construct one soil nail retaining wall;
3. Widen existing shoulders to 8 feet;
4. Modify existing culverts to accommodate widened shoulders;
5. Overlay pavement to improve roadway super-elevation;
6. Install warning signs;
7. Acquire 0.89-acre of additional right-of-way on both sides of the roadway; and
8. Add drainage systems on and around the roadway.

Location 3:

The existing infrastructure at Location 3 (PM 1.19/1.48) includes 12-foot traveled lanes with no road shoulder. A turnout on the northern side of the road has a 15-foot shoulder. This location also includes three existing culverts; a 30 inch, 36 inch, and 18 inch diameter corrugated metal pipe culvert (culverts C5, C6, and C7). At Location 3, Caltrans proposes to:

1. Remove trees;
2. Construct 1 soil nail retaining walls;
3. Widen existing shoulders to 8 feet;
4. Overlay pavement and to improve roadway super-elevation;
5. Install warning signs;
6. Acquire 0.97-acre of additional right-of-way on both sides of the roadway;
7. Modify existing culverts to accommodate widened shoulders; and
8. Add drainage systems on and around the roadway.

Location 4:

The existing infrastructure at Location 4 (PM 2.54/3.18) includes 12-foot traveled lanes with no road shoulder. Two T-intersections in this location on the northern side provide access to the Sprig Lake parking lot and a horse trailhead and parking area. This location also includes six existing culverts; one 21 inch diameter steel inlet pipe/corrugated metal

pipe (Culvert C8), two 18 inch diameter corrugated metal pipes (culverts C9 and C10), two 24 inch diameter corrugated metal pipes (culverts C11 and C12), and one 12 to 18 inch diameter corrugated metal pipe (Culvert C13). At Location 4, Caltrans proposes to:

1. Construct five soil nail walls and one Type 5 concrete retaining wall;
2. Widen existing; shoulders to 8 feet;
3. Overlay pavement;
4. Acquire 4.89 acres of additional right-of-way on both sides of the roadway;
5. Modify existing culverts to accommodate widened roadway; and
6. Relocate 16 utility poles and two underground conduits.

Location 5:

The existing infrastructure at Location 5 (PM 4.73/5.19) includes 12-foot traveled lanes, 8-foot shoulders, and areas where shoulder width varies from two to four feet. There is a T-intersection on the northern side where Watsonville Road intersects with SR 152, as well as nine commercial and residential driveways in this location. This location also includes two existing culverts; one 32 inch diameter corrugated metal pipe (Culvert C14) and one 40 x 28 inch corrugated steel pipe arc (Culvert 15). At Location 5, Caltrans proposes to:

1. Widen existing shoulders to 8 feet;
2. Provide left turn channelization at the Watsonville Road intersection;
3. Overlay pavements;
4. Acquire 2.28 acres of additional right-of-way on both sides of the roadway;
5. Add drainage systems on and around the roadway;
6. Construct one biofiltration swale and infiltration trenches on each side of the roadway;
7. Relocate 11 utility poles, a utility vault and three underground conduits; and
8. Install warning signs.

3. Change the *Construction Activities* under the **Project Description** on Page 5 from:

Shoulder and Lane Widening

Shoulder and lane widening will require excavation and fill to develop new surface for expanding the shoulder. The shoulders will be graded and compacted with graders, rollers, and water trucks to prepare for paving. The existing pavement will be saw cut and the new pavement expanded outward from the cut. Asphalt emulsion will be applied to the saw cut edge and asphalt concrete paving machines will place pavement to the design edge of pavement with a suitable lift to match the existing pavement edge. The equipment required for this work will include a blade, backhoe, paver, roller, and spreader. Vehicles required include a truck for materials, a labor pick-up truck, and a water truck.

Retaining Walls

A total of 12 retaining walls will be constructed within the project footprint. The following are the locations and expected dimensions of the walls:

Location 1:

1. Wall W1A (Soil Nail Wall); Station 08+50 to 11+06.808
   Maximum Dimensions: 17.2 feet high, 256.81 feet long, 3 feet wide.
2. Wall W1B (Soil Nail Wall); Station 12+59.223 to 14+66.359.
   Maximum Dimensions: 19.2 feet high, 207.14 feet long, 3 feet wide.

Location 2:

1. Wall W2A (Soil Nail Wall); Station 50+85.276 to 55+15.896.
   Maximum Dimensions: 29 feet high, 430.62 feet long, 3 feet wide.

Location 3:

1. Wall W3A (Soil Nail Wall); Station 65+75 to 67+42.847.
   Maximum Dimensions: 11.2 feet high, 167.85 feet long, 3 feet wide.
2. Wall W3B (Soil Nail Wall); Station 70+64.695 to 72+72.49.
   Maximum Dimensions: 10.2 feet high, 207.80 feet long, 3 feet wide.
3. Wall W3C (Soldier Pile Wall); Station 75+00 to 76+25.
   Maximum Dimensions: 5.19 feet high, 125 feet long, 3 feet wide.

Location 4:

1. Wall W4A (Soil Nail Wall); Station 134+60 to 137+52.496.
   Maximum Dimensions: 31.2 feet high, 292.50 feet long, 3 feet wide.
2. Wall W4B (Soil Nail Wall); Station 138+24.999 to 138+82.296.
   Maximum Dimensions: 14.18 feet high, 57.30 feet long, 3 feet wide.
3. Wall W4C (Soil Nail Wall); Station 139+51.102 to 150+07.177.
   Maximum Dimensions: 32.17 feet high, 1,056.08 feet long, 3 feet wide.
4. Wall W4D (Soil Nail Wall); Station 151+65.208 to 157+49.309.
   Maximum Dimensions: 23.17 feet high, 584.10 feet long, 3 feet wide.
5. Wall W4E (Type-5 Retaining Wall); Station 159+73.082 to 161+77.527.
   Maximum Dimensions: five feet high, 204.45 feet long, 3 feet wide.
6. Wall W4F (Soil Nail Wall); Station 163+49.982 to 166+594.956.
   Maximum Dimensions: 12 feet high, 344.97 feet long, 3 feet wide.

To:

Utility Relocation

The proposed work would require relocating several existing utility poles, underground cables, or other utility infrastructure components to retain functionality after the project. These utility conflicts would occur at Locations 4 and 5 only; there are no such relocations at Locations 1, 2, or 3. The conflicting infrastructure components would be relocated within the areas previously identified as permanently or temporarily impacted. Table 1 summarizes the location and type of the affected utility infrastructure components.

Table 1: Utility Conflict Summary Information

Location	Conflict Type
4	11 Verizon poles
	4 Verizon and PG&E poles
	1 Verizon underground telephone cable
	1 Verizon underground fiber optic cable
5	9 Verizon and PG&E poles
	2 PG&E poles
	1 PG&E road crossing
	1 Verizon underground telephone cable w/ crossing
	1 Verizon underground fiber optic cable
	1Verizon vault
	1 Verizon road crossing
	1 guy wire (unspecified)

Shoulder and Lane Widening

Shoulder and lane widening will require excavation and fill to develop new surface for expanding the shoulder. The shoulders will be graded and compacted with graders, rollers, and water trucks to prepare for paving. The existing pavement will be saw cut and the new pavement expanded outward from the cut. Asphalt emulsion will be applied to the saw cut edge and asphalt concrete paving machines will place pavement to the design edge of pavement with a suitable lift to match the existing pavement edge. The equipment required for this work will include a blade, backhoe, paver, roller, and spreader. Vehicles required include a truck for materials, a labor pick-up truck, and a water truck.

Retaining Walls

A total of 12 retaining walls will be constructed within the project footprint. The following are the locations and expected dimensions of the walls:

Location 1:

1. Wall W1A (Soil Nail Wall); Station 08+40 to 10+60
   Maximum Dimensions: 13.42 feet high, 220 feet long, 1-foot wide, 2 feet deep.
2. Wall W1B (Soil Nail Wall); Station 12+86 to 15+07.
   Maximum Dimensions: 14.70 feet high, 221 feet long, 1-foot wide, 5.33 feet deep.

Location 2:

1. Wall W2A (Soil Nail Wall); Station 65+61 to 68+33.
   Maximum Dimensions: 32.61 feet high, 272 feet long, 1-foot wide, 5.35 feet deep.

Location 3:

1. Wall W3A (Soil Nail Wall); Station 49+94 to 55+60.
   Maximum Dimensions: 14.09 feet high, 566 feet long, 1-foot wide, 4.94 feet deep.

Location 4:

1. Wall W4A (Soil Nail Wall); Station 134+40 to 137+55.
   Maximum Dimensions: 31.79 feet high, 315 feet long, 1-foot wide, 4.97 feet deep.
2. Wall W4B (Soil Nail Wall); Station 138+12 to 138.82.
   Maximum Dimensions: 10.50 feet high, 70 feet long, 1-foot wide, 2 feet deep.
3. Wall W4C (Soil Nail Wall); Station 139+78 to 150.15.
   Maximum Dimensions: 30.38 feet high, 1,037 feet long, 1-foot wide, 5.3 feet deep.
4. Wall W4D (Soil Nail Wall); Station 152+29 to 157.97.
   Maximum Dimensions: 19.25 feet high, 568 feet long, 1-foot wide, 5.63 feet deep.
5. Wall W4E (Type-5 Retaining Wall); Station 165+20 to 166+84.364.
   Maximum Dimensions: 6-9 feet high, 165 feet long, 1-foot wide, 12.5 feet deep.
6. Wall W4F (Soil Nail Wall); Station 163+20 to 167.
   Maximum Dimensions: 10.63 feet high, 380 feet long, 1-foot wide, 4.99 feet deep.

4. Rename Table 1 as Table 2 under the **Project Description** on page 7:

5. Add the following text after Table 2 (formerly Table 1) under the *Drainage Work* subheading under the **Project Description** on page 7:

Location 1

Drainage System # 1

1A Station 7+62.892 +/-
Install a 36 inch type Galvanized Metal Pipe (GMP) inlet with grate. Connect it to type GO inlet at Station 8+29.1 with an 18 inch diameter RGRCP.

1B Station 8+27.887
Existing 18" diameter Concrete Metal Pipe (CMP) cross culvert. Inlet side: Remove existing 36 inch GMP inlet, cut existing 18 inch diameter CMP cross culvert by 3-foot and install a type GO drainage inlet (DI).

Drainage System # 2

1C Station 7+65 to Station 12+50
Install grated line drain and directing outfall to bioswale. Place rock slope protection at the outlet end.

Drainage System # 3

1D Station 10+70 to Station 11 +30 +/-
Install two G-2 type drainage inlets at Station 10+50 +/- and Station 10+70 +/-. Install 18 inch diameter rubber gasket reinforced concrete pipe (RGRCP) to connect (DI) and drain runoff at Station 11 +30 +/-. Install flared end section (FES) at Station 11 +30 +/- with rock slope protection.

Drainage System # 4

1E Station 12+40 (runoff bottle neck)
Install an OCP type drainage inlet.

1F Station 13+65 and Station 13+90 (super transition area)
Install type G-2 DIs on both the locations.

1G Station 12+40 through Station 14+68
Connect DIs from item 1E through to 1H with an 18 inch diameter RGRCP to DI at Station 14+68.

1H Station 14+68
Existing 18 inch diameter CMP cross culvert. Inlet side: Remove existing 36 inch GMP DI, extend existing 18 inch diameter CMP cross culvert by 4-foot and install a modified G-2 DI at Station 14+67+/.

Location 2

Drainage System # 5

2A Station 48+40
Install a 36 inch type GMP inlet at Station 48+40 with grate. Connect it to the DI at Station 50+50.211 with an 18 inch diameter RGRCP 210.22-foot long.

2B Station 50+50.211
Existing 18 inch diameter CMP cross culvert.
Inlet side: Remove existing 36 inch diameter GMP DI, extend existing 18 inch diameter cross culvert by 7.5-foot and install a type G-2 DI.

Drainage System # 6

2C Station 52+99.93 to Station 55+20.021
Install G-2 DIs at Station 52+99.93, Station 53+99.98, Station 55+10, and at Station 55+20.021. Install manholes at Station 53+50.83 and Station 54+45.634. Connect them and join with DI at Station 55+20.021 using 18-foot diameter RGRCP.

2D Station 55+20.021 to Station 58+36.84
Existing 18 inch diameter CMP cross culvert Inlet side: Remove existing U-shaped headwall. Extend existing 18 inch diameter cross culvert northward by 5-foot. Install side opening OCP type inlet at Station 58+12, 25-foot +/- west of the existing DI, for intercepting the gully runoff. Install 36 inch diameter GMP DIs at Station 58+36.84.
Connect the GMP (at Station 58+36.84) and the OCP type DI at (Station 58+12)

with the 18 inch diameter pipe. Connect OCP type DI to G-2 type DI at Station 55+20.021.

Location 3

Drainage System # 7

3A Station64+77.1
Inlet side: Remove existing 36 inch diameter GMP inlet, extend existing 30 inch diameter cross culvert as required, and replace GMP DI in kind.

Drainage System # 8

3B Station 65+30 to Station 67+33
Place two type GO DI at Station 65+30 and G-2 DI at Station 67+33. Install a manhole at Station 66+20.52. Connect them and join with DI at Station 69+90.5 using 18-foot diameter RGRCP.

3C Station 69+90.5
Inlet side: Remove the existing headwall, extend the existing cross culvert as required, and install a 48 inch diameter GMP inlet. Adjust two existing G-2 DI to grade.

Drainage System # 9 and 10

3D Existing 24 inch diameter CMP cross culvert at Station 73+39.4 and Station 78+36.4
Inlet side: Remove existing 36 inch diameter GMP DI, extend existing 24 inch diameter cross culvert as required, and replace GMP DI in kind.

Location 4

Drainage System # 11

4A Station 132+75 +/- to Station 137+70 including existing concrete barrier
Inlet side: Install an OCP at Station 134+30 and G-2 DIs at Station 135+50 and Station 136+50. At Station 137+70, install an OCP at the back of the barrier and GDO at the front of the barrier. Connect all DIs with an 18 inch diameter RGRCP to the DI at Station 137+70.

Drainage System # 12

4B Station 137+70 to Station 140+ 80 +/-; existing nail wall
Inlet side: Remove existing 36 inch diameter GMP, extend 24 inch CMP by 9-foot, at Station 139+10, and place a GT-4 or two G-2 type DIs. At Station 140+70, place a 36 inch diameter OCP at the back of the wall and GDO or two G-2 type DIs in the front of the wall. Connect all inlets with 18 inch RGRCP.

Drainage System # 13

4C Station 140+80 to Station 141+70; existing nail wall
Inlet side: Remove existing 36 inch diameter GMP and extend 18 inch CMP by 12-foot. At Station 141+ 67, install an OCP at the back of the wall and GDO or GT-4 or two G-2 type DIs at the front wall.

Drainage System # 14

4D Station 141+70 to Station 145+00 +/-; existing nail wall.
Inlet side: At Station 145+ 00 +/-, install a 36 inch diameter OCP behind the wall and GT-4 or two G-2 types DIs in the front wall. Connect all DIs with 18 inch diameter RGRCP. Remove the existing GMP at Station 145+03.4 and extend existing 24 inch diameter CMP cross culvert by 11-foot.

Drainage System # 15

4E Station 145+00 +/- to Station 149+00; existing nail wall
Inlet side: At Station 147+00, install a GT-4 or two G-2 type DIs. At Station 149+00, install an OCP DI behind the wall and two G-2 type DIs at the front of the wall. Connect the DIs with 18 inch diameter RGRCP. Remove existing GMP at Station 149+04.5 and extend existing 24 inch diameter CMP cross culvert by 6-foot.

Drainage System # 16

4F Station 149+00 to Station 157+92; existing nail wall
Inlet side: At Station 155+00, install a GT-4, GDO or two G-2 type DIs. At Station 156+60, install a GO, GT-4 or two G-2 DIs. At Station 157+92 +/- remove the existing GMP, extend the cross culvert as required and install a GDO or two GO type inlets. Connect the DIs with 18 inch diameter RGRCP.

Drainage System # 17

4H Station 161+60 to Station 163+00 +/-
Inlet side: Shorten existing 12 inch diameter CMP cross culvert by 2-foot. Install FES at Station 161+60 +/-. From Station 163+00 +/- to Station 161+00 grade to shoulder to direct runoff towards the DI of the cross culvert.

Drainage System # 18

4I Station 163+00 to Station 168+30 +/-; existing nail wall
Inlet side: Install a G-2 type DI at Station 164+10 and at Station 164+20. Install a manhole at Station 165+27+/-. Install GO DIs at Station 166+20 and at Station 166+50. Install a 48 inch diameter GMP inlet at Station 168+27, connect all the DIs with 18 inch diameter RGRCP, remove the existing headwall at Station 168+28, and adjust existing 40 inch diameter CMP cross culvert as needed.

Location 5

Drainage System # 19

5A Station 253+26 +/-
Inlet side: Remove existing FES at Station 253+39 and Station 253+ 45. Cut existing 42 inch wide x 29 inch high CMP by 8-foot. Install a 48 inch diameter OCP to intercept flow from 24 inch diameter CMP. Install a manhole at Station 253+45 and connect all inlets with 30 inch diameter CMP.

Drainage System # 20

5B Station 257+24.9 to Station 258 + 26.0; existing 12 inch diameter CMP
Remove and replace existing 12 inch diameter CMP with FES.

Drainage System # 21

5C Station 260+15.4; existing 42 inch wide x 29 inch high CMP cross culvert
Inlet side: Remove existing FES, extend CMP cross culvert by 6-foot and replace FES.
Outlet side: Remove existing FES, extend CMP cross culvert by 11-foot, replace FES and place rock slope protection 10 feet wide x 20 feet long.

6. Rename Table 2 as Table 3 under the **Project Description** on page 7:

7. Change the *General Conservation Measure 12* under the **Project Description** on Page 12 from:

Proper Use of Erosion Control Devices. To prevent California red-legged frogs and California tiger salamanders from becoming entangled or trapped in erosion control materials, plastic mono-filament netting (erosion control matting) or similar material will not be used within the action area. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds

To:

Proper Use of Erosion Control Devices. To prevent California red-legged frogs and California tiger salamanders from becoming entangled, trapped or injured, erosion control materials that use plastic or synthetic mono-filament netting shall not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute or twine, or tackified hydroseeding compounds.

8. Change the *Proposed Conservation Measures* under the **Project Description** on Page 14 from:

To minimize effects to the California red-legged frog and California tiger salamander, Caltrans in coordination with the Service will create, restore, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects, suitable habitat for each species or suitable multi-species habitat if appropriate (Table 2). Alternatively, credits will be purchased at a Service-approved conservation bank. On-site restoration of temporarily affected areas (i.e., coyotebrush scrub, purple needlegrass/native grasslands, and landscaped/agricultural lands) may qualify as compensation at a 1:1 ratio once conditions are returned to baseline conditions as determined by the Service.

Table 2: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Effect	Compensation		Effect	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	0.76	1.1:1	0.836	6.32	3:1	18.96	19.796
California tiger salamander	0.67	1.1:1	0.737	2.30	3:1	6.90	7.637

To:

To minimize effects to the California red-legged frog and California tiger salamander, Caltrans in coordination with the Service will create, restore, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects, suitable habitat for each species or suitable multi-species habitat if appropriate (Table 3). Alternatively, credits will be purchased at a Service-approved conservation bank. On-site restoration of temporarily affected areas (i.e., coyotebrush scrub, purple needlegrass/native grasslands, and landscaped/agricultural lands) may qualify as compensation at a 1:1 ratio once conditions are returned to baseline conditions as determined by the Service.

Table 3: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Effect	Compensation		Effect	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	6.56	1.1:1	7.22	6.39	3:1	19.17	26.39
California tiger salamander	1.97	1.1:1	2.17	2.80	3:1	8.40	10.57

9. Change the second paragraph under the **Effects of the Action** on page 25 from:

The proposed project will likely adversely affect the threatened California red-legged frog by killing, harming and/or harassing juveniles and adults inhabiting areas of suitable non-breeding aquatic, upland and dispersal habitat; and adversely affect the threatened California tiger salamander by killing, harming and/or harassing juveniles and adults inhabiting burrows and other upland refugia within grasslands and ruderal habitat. Project effects were minimized by Caltrans by reducing the project footprint to the minimum area necessary to construct the proposed safety project. The project as proposed in the Biological Assessment (Caltrans 2009) and in the project description of this Biological Opinion would result in the permanent removal of 6.32 acres of California red-legged frog upland and dispersal habitat and 2.30 acres of California tiger salamander upland and dispersal habitat, and will temporarily affect 0.76-acre of California red-legged frog upland and dispersal habitat and 0.67 acres of California tiger salamander upland and dispersal habitat. The Service has determined that the permanent and temporary loss and/or degradation of California red-legged frog and California tiger salamander habitat will result in take of all California red-legged frogs and California tiger salamanders within these areas as a direct result of habitat loss. As outlined in Table 2, Caltrans has proposed a habitat compensation measure to provide minimization for the effects on the California red-legged frog and California tiger salamander by creating, restoring, or setting aside suitable habitat for each species at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects. This habitat will be conserved in perpetuity with appropriate management which will benefit both the California red-legged frog and California tiger salamander.

To:

The proposed project will likely adversely affect the threatened California red-legged frog by killing, harming and/or harassing juveniles and adults inhabiting areas of suitable non-breeding aquatic, upland and dispersal habitat; and adversely affect the threatened California tiger salamander by killing, harming and/or harassing juveniles and adults inhabiting burrows and other upland refugia within grasslands and ruderal habitat.

Project effects were minimized by Caltrans by reducing the project footprint to the minimum area necessary to construct the proposed safety project. The project as proposed in the Biological Assessment (Caltrans 2009), letter from Caltrans dated March 16, 2012, and in the project description of this Biological Opinion would result in the permanent removal of 6.39 acres of California red-legged frog upland and dispersal habitat and 2.80 acres of California tiger salamander upland and dispersal habitat, and will temporarily affect 6.56-acre of California red-legged frog upland and dispersal habitat and 1.97 acres of California tiger salamander upland and dispersal habitat. The Service has determined that the permanent and temporary loss and/or degradation of California red-legged frog and California tiger salamander habitat will result in take of all California red-legged frogs and California tiger salamanders within these areas as a direct result of habitat loss. As outlined in Table 3, Caltrans has proposed a habitat compensation measure to provide minimization for the effects on the California red-legged frog and California tiger salamander by creating, restoring, or setting aside suitable habitat for each species at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects. This habitat will be conserved in perpetuity with appropriate management which will benefit both the California red-legged frog and California tiger salamander.

10. Change **Term and Condition 1.d.** on page 30 from:

Caltrans shall compensate for the effects of take of California red-legged frogs and California tiger salamanders resulting from the net loss of habitat and temporal loss between the time the effects are incurred and the time when the compensation habitat is fully functional. As described in the project description, Caltrans shall protect 19796 acres of California red-legged frog habitat and 7.637 acres of California tiger salamander habitat acres in perpetuity through on- or off-site habitat restoration, the purchase of conservation bank credits, acquisition of land, or a combination of these options. The Service encourages Caltrans to seek habitat that comprises high quality breeding, foraging, sheltering, migration and/or dispersal habitat, or provides a functional linkage to areas of occupied habitat(s) to facilitate the (re)colonization from source populations. The habitat shall have a conservation easement, management plan, and funding endowment to manage the habitat in perpetuity; all of which shall be reviewed and approved by the Service/CDFG and completed within 18 calendar months following the date of project ground-breaking. Within 6 month following the issuance of this Biological Opinion, Caltrans shall submit a Conceptual Compensation Plan to the Service/CDFG detailing a comprehensive compensation scheme(s) and timelines to achieve full habitat functions and values. Caltrans shall comply with all applicable CDFG regulations pertaining to mitigation for species designated as fully protected and/or listed by the State.

1. On-Site Habitat Restoration. At a minimum, Caltrans shall restore temporarily disturbed habitat(s), i.e. coyotebrush scrub, purple needlegrass/native grasslands, and landscaped/agricultural lands, to original contours and baseline conditions. Credit for on-site restoration of areas subject to temporary disturbance at a ratio of 1:1 shall be achieved once the habitat is returned to and functions at baseline conditions or better as determined by the Service. Additional compensation at a ratio of 0.1:1 will help offset the temporal effect of the disturbance during which time the habitat

is unsuitable for California red-legged frogs and California tiger salamanders during the construction phase of the proposed action.

2. Conservation Bank Credits. Caltrans shall purchase conservation bank credits at a Service/CDFG-approved conservation bank whose service area encompasses the action area for the species listed above. Conservation bank credits shall be purchased and documentation provided to the Service and CDFG comprising the Agreement for Sale of Conservation Credits, Bill of Sale, Payment Receipt and Updated Credit Ledger within 30 calendar days prior to project ground-breaking.

3. Off-Site Habitat Acquisition & In-perpetuity Preservation. Caltrans shall contribute toward the acquisition of habitat approved by the Service and CDFG. Acquisition of land shall either be through a conservation easement or fee title. The conservation easement shall name the Service and CDFG as third-party beneficiaries or grantees, and shall be held by an entity qualified to hold conservation easements subject to Service and CDFG approval. The endowment to manage the land and monitor the conservation easement shall be based on the management plan or a PAR (or PAR-equivalent) analysis. The endowment shall be secured with a Funding Assurance Letter stating that sufficient funds to compensate for the effects to listed species, i.e. mitigate impacts, have been budgeted into the State Route 152 Hecker Pass Safety Improvement Project Expenditure Authorization. The Funding Assurance letter shall be signed by the District Deputy Director of Project Management and the District Deputy Director of Environmental Planning and Engineering and approved by Service and CDFG's Offices of the General Counsel. The Funding Assurance Letter provides evidence that Caltrans has allocated sufficient funding to implement the proposed compensation/mitigation, monitoring and reporting requirements including habitat conservation credits or land acquisition costs, costs of managing the compensation/mitigation lands, and an endowment. The Funding Assurance Letter shall be provided to the Service and CDFG for approval prior to project ground-breaking. The endowment shall be held by a Service/CDFG-approved entity in an amount agreed to by the Service and CDFG. A management plan shall be developed prior to or concurrent to the acquisition of land and shall include at a minimum: a description of existing habitats and proposed habitat creation, restoration and/or enhancement; success criteria for habitat modification; monitoring criteria for California red-legged frogs and California tiger salamanders; an integrated pest management plan; and adaptive management strategies. Caltrans shall submit the management plan to the Service/CDFG for approval.

To:

The compensation measures proposed by Caltrans and outlined in Table 3 will minimize the effects of harm on the California red-legged frog and California tiger salamander. Habitat considered for compensation shall comprise high quality breeding, foraging, sheltering, migration and/or dispersal habitat. Caltrans shall comply with all applicable California Department of Fish and Game (CDFG) regulations pertaining to mitigation for species designated as fully protected and/or listed by the State. Compensation shall be

implemented in accordance with the Selected Review Criteria for section 7 Off-Site Compensation provided in Appendix A. If the proposed compensation scheme is not fully implemented, Caltrans shall provide an alternative compensation scheme to be reviewed and approved by the Service/CDFG

11. Throughout the document change the Service contact information from:

The Service contact is Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

To:

The Service contact is Coast-Bay/Forest-Foothills Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

This concludes the reinitiation of formal consultation on the SR 152 Hecker Pass Safety Improvement Project. The remainder of the July 14, 2010, biological opinion is unchanged. If you have questions concerning this reinitiation, please contact Jerry Roe or Ryan Olah, Coast-Bay/Forest Foothills Division Chief, at (916) 414-6600.

Sincerely,

E. Tattersall

For Susan K. Moore
Field Supervisor

cc:
Melisa Escaron, California Department of Fish and Game, Yountville, California

APPENDIX A

Sacramento Fish and Wildlife Office
Selected Review Criteria for Section 7 Off-Site Compensation

Property Assurances and Conservation Easement

- ☐ Title Report (preliminary at proposal, and Final Title Insurance at recordation), shall be no older than six months;
- ☐ Property Assessment and Warranty;
- ☐ Subordination Agreement **[if there is any outstanding debt on the property]**;
- ☐ Legal Description and Parcel Map;
- ☐ Conservation Easement (should use the current SFWO standardized CE template); or
- ☐ Non-Template Conservation Easement;

Site Assessment and Development

- ☐ Phase I Environmental Site Assessment;
- ☐ Restoration or Habitat Development Plan;
- ☐ Construction Security ***[if applicable]***;
- ☐ Performance Security ***[if applicable]***;

Site Management

- ☐ Interim Management Plan;
- ☐ Interim Management Security Analysis and Schedule;
- ☐ Long-Term Management Plan;
- ☐ Endowment Fund Analysis and Schedule;
- ☐ Endowment Funding Agreement or Trust Agreement or Declaration of Trust

**Guidelines to assist in understanding what is required are detailed on the following pages.

Guidelines

Real Estate Assurances and Conservation Easement (CE)

Title Report

1. Who holds fee title to property? Should be the Project Applicant. If not, there may be liability and contracting issues.
2. Are there any liens or encumbrances (existing debts or easements) on the property?
    a. Review Preliminary Title Report to evaluate liens and encumbrances (see Property Assessment and Warranty, below).
    b. Could any of these liens or encumbrances potentially interfere with either biological habitat values or ownership? If existing easements can potentially interfere with the conservation values/habitat of the property, those portions of the land should be deducted from the total compensation acreage available on the site.

Property Assessment and Warranty

1. Property owner should submit a Property Assessment and Warranty, which discusses every exception listed on the Preliminary Title Report and Final Title Insurance Policy, evaluating any potential impacts to the conservation values that could result from the exceptions (see below).
2. The Property Assessment and Warranty should include a summary and full explanation of all exceptions remaining on the title, with a statement that the owner/Grantor accepts responsibility for all lands being placed under the CE as available for the primary purposes of the easement, as stated in the easement, and assures that these lands have a free and clear title and are available to be placed under the CE.

Subordination Agreement

1. A Subordination Agreement is necessary if there is any outstanding debt on the property. Review Subordination Agreement language for adequacy—the lending bank or other lien holder must agree to fully subordinate each lien or encumbrance under the CE.

Legal Description and Parcel Map

1. Ensure accuracy of map, and location and acreage protected under the CE.
2. Both the map and the legal description should explain the boundaries of the individual project compensation site. The site should *not* have 'leftover' areas for later use.
3. Ask for an easement map to be prepared (if applicable), showing all easements on the property.

Conservation Easement from Template

1. Who will hold the easement?
    a. Must have third-party oversight by a qualified non-profit or government agency. Qualifications include:

i. Organized under IRS 501(c)(3);
ii. Qualified under CA Civil Code § 815;
iii. Bylaws, Articles of Incorporation, and biographies of Board of Directors on file at, and approved, by SFWO.
1. Must meet requirements of SFWO, including 51% disinterested parties on the Board of Directors;

b. Must be accredited by the Land Trust Accreditation Commission http://www.landtrustaccreditation.org/home.

2. Project Applicant should submit a redline version showing all of their proposed revisions in track changes, along with an explanation of all deviations from the template.

Non-Template Conservation Easement

1. If not using the CE template, the Project Applicant should specify objections they have to the template. This may substantially delay processing as the non-template CE will require review by the Solicitor's Office. Alternate CEs must be approved by the SFWO prior to recording.
2. The Project Applicant must either 1) add SFWO as a third-party beneficiary, or 2) add language throughout the document, in all appropriate places, that will assure SFWO the right to enforce, inspect, and approve any and all uses and/or changes under the CE prior to occurrence (including land use, biological management or ownership).
3. Include, at a minimum, language to:
   a. Reserve all mineral, air, and water rights under the CE as necessary to maintain and operate the site in perpetuity;
   b. Ensure all future development rights are forfeited;
   c. Ensure all prohibited uses contained in the CE template are addressed; and
   d. Link the CE, Management Plan, and the Endowment Trust Fund within the document (e.g., note that each exists to support the others, and where each of the documents can be located if a copy is required).
4. Insert necessary language, particularly, but not exclusively, per: (can compare to CE template)
   a. Rights of Grantee
   b. Grantee's Duties
   c. Reserved Rights
   d. Enforcement
   e. Remedies
   f. Access
   g. Costs and Liabilities
   h. Assignment and Transfer
   i. Merger
   j. Notices

Site Assessment and Development

Phase I Environmental Site Assessment

1. The Phase I ESA must show that the compensation site is not subject to any recognized environmental conditions as defined by the American Society for Testing and Materials (ASTM) Standard E1527-05 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, available at http://www.astm.org/Standards/E1527.htm, (i.e., the presence or likely presence of any Hazardous Substances or petroleum products).
2. If the Phase I ESA identifies any recognized environmental conditions, the Project Applicant must represent and warrant to the SFWO that all appropriate assessment, clean-up, remediation, or removal action has been completed.
3. Phase II ESA may be required to investigate subsurface conditions.

Restoration or Habitat Development Plan *[not required if doing preservation only]*

1. The overall plan governing construction and habitat establishment activities required to be conducted on the Property, including, without limitation, creation, restoration, and enhancement of habitat.
   a. This plan should include the baseline conditions of the Property including biological resources, geographic location and features, topography, hydrology, vegetation, past, present, and adjacent land uses, species and habitats occurring on the property, a description of the activities and methodologies for creating, restoring, or enhancing habitat types, a map of the approved modifications, overall habitat establishment goals, objectives and Performance Standards, monitoring methodologies required to evaluate and meet the Performance Standards, an approved schedule for reporting monitoring results, a discussion of possible remedial actions, and any other information deemed necessary by the SFWO.
2. Any permits and other authorizations needed to construct and maintain the site shall be included and in place prior to the start of construction of the habitat.
3. Full construction plans for any habitat construction must be *SFWO-approved prior* to the start of construction of the habitat.

Construction Security

1. The Project Applicant shall furnish a Construction Security in the amount of 100% of a reasonable third party estimate or contract to create, restore, or enhance habitats on the property in accordance with the Restoration or Habitat Development Plan.
2. Construction Security can be drawn on should the project proponent default.
3. The Construction Security shall be in the form of an irrevocable standby letter of credit or a cashier's check.
   a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Construction Security shall be in favor of a third party approved by the SFWO.

c. Language in a draft letter of credit to be approved by the SFWO.

Performance Security *[only necessary if habitat is being restored, enhanced, or constructed]*

1. The Project Applicant shall furnish a Performance Security in the amount of 20% of the Construction Security.
2. Performance Security can be drawn on should the Performance Standards not be met, if remedial action becomes necessary.
3. The Performance Security shall be in the form of an irrevocable standby letter of credit or a cashier's check.
   a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Construction Security shall be in favor of a third party approved by the SFWO.
   c. Language in a draft letter of credit to be approved by the SFWO.

Site Management

Interim Management Plan

1. The Interim Management Plan should identify the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the Endowment Fund has been fully funded for one year and all the Performance Standards in the Development Plan have been met. This may be the same as the Long-term Management Plan.

Interim Management Security Analysis and Schedule

The purpose of the Interim Management Security is to allow the endowment to grow for at least one year without any disbursements, and is a safeguard to ensure that there will be enough funds in the endowment to pay for future management costs. The period can be longer than one year, and is often 3 years for Conservation Banks. Many endowments have recently experienced losses in principal.

1. The Project Applicant shall furnish an Interim Management Security (in the form of a standby letter of credit) in the amount equal to the estimated cost to implement the Interim Management Plan during the first year of the Interim Management Period, as set for in the Interim Management Security Analysis and Schedule.
2. The Interim Management Security Analysis and Schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Interim Management Plan. The total annual expenses should include administration and contingency costs.
3. The Interim Management Security must:
   a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
   b. Be held according to minimum standards for assuring maximum success in earning potential, and will assurances for no loss of principle.

c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

Long-Term Management Plan (LTMP)

1. The LTMP template identifies the long-term management, monitoring and reporting activities to be conducted.
2. The LTMP should include at minimum:
   a. Purpose of the Project and purpose of the LTMP;
   b. A baseline description of the setting, location, history, and types of land use activities, geology, soils, climate, hydrology, habitats present (once project meets Performance Standards), and species descriptions;
   c. Overall management, maintenance and monitoring goals; specific tasks and timing of implementation; and discussion of any constraints, which may affect goals;
   d. The Endowment Fund Analysis and Schedule (see below);
   e. Discussion of Adaptive Management actions for reasonably foreseeable events and possible thresholds for evaluating and implementing Adaptive Management;
   f. Rights of access to the Property and prohibited uses of the Property as provided in the CE; and
   g. Procedures for Property transfer, land manager replacement, amendments, and notices.
3. The LTMP must be incorporated by reference in the CE.
4. The LTMP is considered a living document and may be revised as necessary upon agreement of the land manager, easement holder, and SFWO.

Endowment Fund Analysis and Schedule

1. Can use a PAR or PAR-like analysis and must be based upon the final, approved LTMP.
   a. The analysis should be reviewed by the land manager.
2. The analysis and schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Management Plan. The total annual expenses should include administration and contingency costs (contingency can be included on each line item). Unless there is a separate endowment for the purpose of monitoring and reporting on the CE conditions, then, the analysis should also include costs of
   - Monitoring and reporting CE conditions;
   - Defending the CE; and
   - Liability insurance.
3. The Endowment Fund must:
   a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
   b. Be held according to minimum standards for assuring maximum success in earning potential, and will include assurances for no loss of principle.

c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

Endowment Funding Agreement

1. This is the agreement between the endowment holder and the Project Applicant, as to how the endowment is to be funded, held and disbursed;
2. USFWS is not signatory to this agreement, but should be made a third-party beneficiary of the agreement;
3. USFWS has approval authority over the language in the document, and it must state that modifications or transfer of the endowment to another holder are only allowed with USFWS approval;
4. This agreement can also be called: "Trust Agreement", "Declaration of Trust"
5. When the National Fish and Wildlife Foundation (NFWF) holds the endowment, they call this a "Recipient Agreement", and may have an additional MOA with the Project Applicant.

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET, 16TH FLOOR
SAN FRANCISCO, CALIFORNIA 94103-1398

MAY 10 2013

REPLY TO
ATTENTION OF

Regulatory Division

Subject: File Number 2009-00377S

California Department of Transportation (Caltrans), District 4
Mr. Jeffrey Jensen
111 Grand Avenue
Mail Station 8A
Oakland, California 94612

Dear Mr. Jensen:

This correspondence is in reference to your submittal of May 31, 2012, concerning Department of the Army (DA) authorization to implement the Hecker Pass Safety Improvement Project located along State Route (SR) 152 (Hecker Pass) at five locations between post mile (PM) 0.14 and 5.20 near the city of Gilroy, Santa Clara County, California (37.0004, -121.68359).

Work includes widening of existing shoulders, overlaying the existing pavement, removing trees to increase sight distance, constructing retaining walls, and adding a left-turn lane from eastbound SR 152 to Watsonville Road. At four locations 10 retaining walls will be installed on the north side of Hecker Pass. Two retaining walls (222' x13.42' and 221' x 14.7') will be installed at location 1. One retaining wall (566' x 14') will be installed at location 2. One retaining wall (272' x 32.6') will be installed at location 3. Six retaining walls (315' x 31.79', 70' x 10.5', 1,037 x 30.38', 568' x 19.25', 380' x 10.63', and 170' x 5') will be installed at location 4. In total 22 culverts will be repaired or improved including replacing or extending inlets or outlets, extending downdrains toward the bank of Bodfish Creek, and trenching for culvert replacement. Several existing utility poles or underground cables require relocation. Work will result in the permanent fill of 3,843 square feet (0.09 acre) and temporary disturbance of 2,525 square feet (0.06 acre) of Other Waters of the U.S. All work shall be completed in accordance with the plans and drawings titled "*USACE File #2009-00377S, Hecker Pass Safety Improvement Project - State Route 152 (EA 2A250), May 2, 2013, Figures 1 to 20*" (enclosure 1).

Section 404 of the Clean Water Act (CWA) generally regulates the discharge of dredged or fill material below the plane of ordinary high water in non-tidal waters of the United States, below the high tide line in tidal waters of the United States, and within the lateral extent of wetlands adjacent to these waters. Section 10 of the Rivers and Harbors Act generally regulates construction of structures and work, including excavation, dredging, and discharges of dredged or fill material, occurring below the plane of mean high water in tidal waters of the United States; in former diked baylands currently below mean high water; outside the limits of mean high water but affecting the navigable capacity of tidal waters; or below the plane of ordinary

high water in non-tidal waters designated as navigable waters of the United States. Navigable waters of the United States generally include all waters subject to the ebb and flow of the tide; and/or all waters presently used, or have been used in the past, or may be susceptible for future use to transport interstate or foreign commerce.

The enclosed delineation maps titled, "*Hecker Pass Safety Improvement Project - State Route 152, Extent of U.S. Army Corps of Engineers' Jurisdiction*" dated May 2, 2013, sheets 1 through 6, accurately depict the extent and location of wetlands and other waters of the United States within the boundary area of the site that are subject to U.S. Army Corps of Engineers' regulatory authority under Section 404 of the Clean Water Act (enclosure 2). This approved jurisdictional determination supersedes the jurisdictional determination dated November 17, 2009, and is based on the current conditions of the site, as verified during a field investigation of November 21, 2012, and a review of available digital photographic imagery. This approved jurisdictional determination will expire in five (5) years from the date of this letter, unless new information or a change in field conditions warrants a revision to the delineation map prior to the expiration date.

You are advised that the approved jurisdictional determination may be appealed through the U.S. Army Corps of Engineers' *Administrative Appeal Process*, as described in 33 C.F.R. Part 331 (65 Fed. Reg. 16,486; Mar. 28, 2000), and outlined in the enclosed flowchart and *Notification of Administrative Appeal Options, Process, and Request for Appeal* (NAO-RFA) Form. If you do not intend to accept the approved jurisdictional determination, you may elect to provide new information to this office for reconsideration of this decision. If you do not provide new information to this office, you may elect to submit a completed NAO-RFA Form to the Division Engineer to initiate the appeal process; the completed NAO-RFA Form must be submitted directly to the Appeal Review Officer at the address specified on the NAO-RFA Form. You will relinquish all rights to a review or an appeal, unless this office or the Division Engineer receives new information or a completed NAO-RFA Form within 60 days of the date on the NAO-RFA Form. If you intend to accept the approved jurisdictional determination, you do not need to take any further action associated with the Administrative Appeal Process.

Based on a review of the information in your submittal, the project qualifies for authorization under Department of the Army Nationwide Permit(s) (NWPs) 14 for Linear Transportation Projects and NWP 12 for Utility Lines, 77 Fed. Reg. 10,184, February 21, 2012, pursuant to Section 404 of the CWA of 1972, as amended (33 U.S.C. § 1344 *et seq*). The project must be in compliance with the terms of the NWP, the general conditions of the Nationwide Permit Program, and the San Francisco District regional conditions cited in enclosure 3. You must also be in compliance with any special conditions specified in this letter for the NWP authorization to

remain valid. Non-compliance with any term or condition could result in the revocation of the NWP authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This NWP authorization does not obviate the need to obtain other State or local approvals required by law.

This verification will remain valid until March 18, 2017, unless the NWP authorization is modified, suspended, or revoked. Activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon a NWP will remain authorized provided the activity is completed within 12 months of the date of a NWP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 C.F.R. § 330.4(e) and 33 C.F.R. §§ 330.5 (c) or (d). This verification will remain valid if, during the time period between now and March 18, 2017, the activity complies with any subsequent modification of the NWP authorization. The Chief of Engineers will periodically review NWPs and their conditions and will decide to either modify, reissue, or revoke the permits. If a NWP is not modified or reissued within five years of its effective date, it automatically expires and becomes null and void. It is incumbent upon you to remain informed of any changes to the NWPs. Changes to the NWPs would be announced by Public Notice posted on our website (http://www.spn.usace.army.mil/Missions/Regulatory.aspx). Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, enclosure 4, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the Central Coast Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification to the Corps prior to the commencement of work.

General Condition 18 stipulates that project authorization under a NWP does not allow for the incidental take of any federally-listed species in the absences of a biological opinion (BO) with incidental take provisions. As the principal federal lead agency for this project, Caltrans initiated consultation with the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to address project related impacts to list species, pursuant to Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*). Special conditions below indicate required compliance with consultation documents.

In order to ensure compliance with this NWP authorization, the following special conditions shall be implemented:

1. To remain exempt from the prohibitions of Section 9 of the Endangered Species Act, the non-discretionary Terms and Conditions for incidental take of federally-listed California red-legged frog and California tiger salamander shall be fully implemented as stipulated in the Biological Opinion entitled, "*Biological Opinion on the Effects of the Proposed State Route 152 Hecker Pass Safety Improvement Project, Santa Clara County, California (Caltrans EA 2A2599) on the Threatened California Red-Legged Fog and Threatened California Tiger Salamander (Central Valley Distinct Population Segment)* " (pages 1 - 41) dated July 14, 2010 (enclosure 5). Project authorization under the NWP is conditional upon compliance with the mandatory terms and conditions associated with incidental take. Failure to comply with the terms and conditions for incidental take, where a 'take' of a federally-listed species occurs, would constitute an unauthorized take and non-compliance with the NWP authorization for your project. The USFWS is, however, the authoritative federal agency for determining compliance with the incidental take statement and for initiating appropriate enforcement actions or penalties under the Endangered Species Act.

2. The NMFS concurred with the determination that the project was not likely to adversely affect South-Central California coast steelhead (*Oncorhynchus mykiss*) Distinct Population Segment and designated critical habitat for this species. This concurrence was premised, in part, on project work restrictions outlined in enclosure letter dated March 13, 2013 (enclosure 6). These work restrictions are incorporated as special conditions to the NWP authorization for your project to ensure unauthorized incidental take of species and loss of critical habitat does not occur.

3. The permittee shall notify the Corps in writing of the anticipated start and stop dates of construction, at least 5 days prior to the initiation of construction.

4. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, if temporary structures, work, and discharges, including cofferdams, are required.

5. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows.

6. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations.

7. Within 1-year of initiation of temporary impact to a jurisdictional feature, you shall re-contour the temporarily impacted area and replant it with appropriate soil-stabilizing native species.

8. A post construction report shall be submitted 45 days after the conclusion of construction activities. The report shall document construction activities and contain as-built drawings (if different from drawings submitted with application) and include before and after photographs. Efforts to restore temporarily impacted areas shall be documented.

You may refer any questions on this matter to Paula Gill of my Regulatory staff by telephone at 415-503-6776 or by e-mail at Paula.C.Gill@usace.army.mil. All correspondence should be addressed to the Regulatory Division, South Branch, referencing the file number at the head of this letter.

The San Francisco District is committed to improving service to our customers. My Regulatory staff seeks to achieve the goals of the Regulatory Program in an efficient and cooperative manner, while preserving and protecting our nation's aquatic resources. If you would like to provide comments on our Regulatory Program, please complete the Customer Service Survey Form available on our website: http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copies Furnished (w/o enclosures):

CA RWQCB, San Luis Obispo, CA
U.S. EPA, San Francisco, CA
CA SWRCB, Sacramento, CA
CDFW, Yountville, Ca
USFWS, Sacramento, Ca
NMFS, Santa Rosa, Ca

May 24, 2013

Fariba Zohoury
California Department of Transportation
111 Grand Avenue
Oakland, CA 94612
Email: fariba_zohoury@dot.ca.gov

VIA ELECTRONIC MAIL

Dear Fariba Zohoury:

TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION NUMBER 34313WQ01 FOR HECKER PASS SAFETY IMPROVEMENT PROJECT EA 2A250, SANTA CLARA COUNTY

Thank you for the opportunity to review your December 17, 2012 application for water quality certification of the Hecker Pass Safety Improvement Project EA 2A250 (Project). The application was completed on December 17, 2012. The project, if implemented as described in your application and with the additional mitigation requirements and conditions required by this Water Quality Certification, appears to be protective of beneficial uses of State waters. Therefore, are issuing the enclosed Technically Conditioned Letter of Certification.

At this time, we do not anticipate issuing additional requirements based on your application. Should new information come to our attention that indicates a water quality problem, we may require additional monitoring and reporting, issue Waste Discharge Requirements, or take other action.

Your Section 401 Water Quality Certification application and California Environmental Quality Act (CEQA) documents indicate that project activities have the potential to affect beneficial uses and water quality. The Central Coast Regional Water Quality Control Board (Central Coast Water Board) issues this Certification to protect water quality and associated beneficial uses from project activities. We need reports to determine compliance with this Certification. All technical and monitoring reports requested in this Certification, or any time after, are required per Section 13267 of the California Water Code.

Failure to submit reports required by this Certification, or failure to submit a report of technical quality acceptable to the Executive Officer, may subject you to enforcement action per Section 13268 of the California Water Code. The Central Coast Water Board will base enforcement actions on the date of certification. Any person affected by this Central Coast Water Board action may petition the State Water Resources Control Board (State Water Board) to review this action in accordance with California Water Code Section 13320; and Title 23, California Code of Regulations, Sections 2050 and 3867-3869. The State Water Board, Office of Chief Counsel, PO Box 100, Sacramento, CA 95812, must receive the petition within 30 days of the date of this Certification. We will provide upon request copies of the law and regulations applicable to filing petitions.

If you have questions please contact **Jon Rohrbough** at (805) 549-3458 or via email at Jon.Rohrbough@waterboards.ca.gov, or Phil Hammer at (805) 549-3882. Please mention the above certification number in all future correspondence pertaining to this project.

Sincerely,

for
Kenneth A. Harris
Interim Executive Officer

S:\Section 401 Certification\Certifications\Santa Clara\2013\Hecker Pass Safety Imp_34313WQ01\401 Certification Hecker Pass Safety Imp 34313WQ01.doc

Enclosure: Action on Request for CWA Section 401 Water Quality Certification

cc: With enclosures

Cyrus Vafai
Caltrans
Email: cyrus_vafai@dot.ca.gov

Holly Costa
U.S. Army Corps of Engineers
Email: holly.n.costa@usace.army.mil

Paula Gill
U.S. Army Corps of Engineers
Email: paula.c.gill@usace.army.mil

Scott Wilson
California Department of Fish and Game
Email: swilson@dfg.ca.gov

Melissa Escaron
California Department of Fish and Game
Email: Melissa.escaron@wildlife.ca.gov

Jerry Roe
U.S. Fish and Wildlife Service
Email: jerry_roe@fws.gov

Joel Casagrande
NOAA
Email: joel.casagrande@noaa.gov

401 Program Manager
State Water Resources Control Board
Division of Water Quality
Email: Stateboard401@waterboards.ca.gov

U.S. Environmental Protection Agency
Email: R9-WTR8-Mailbox@epa.gov

Mackenzie Billings
Central Coast Water Board
Email: mbillings@waterboards.ca.gov

Jon Rohrbough
Central Coast Water Board
Email: Jon.Rohrbough@waterboards.ca.gov

Action on Request for
Clean Water Act Section 401 Water Quality Certification
for Discharge of Dredged and/or Fill Materials

PROJECT: Hecker Pass Safety Improvement Project EA 2A250

APPLICANT: Fariba Zohoury
California Department of Transportation
111 Grand Avenue
Oakland, CA 94612

ACTION:
1. ☐ Order for Standard Certification
2. ■ Order for Technically-conditioned Certification
3. ☐ Order for Denial of Certification

STANDARD CONDITIONS:

1. This Certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment per section 13330 of the California Water Code and section 3867 of Title 23 of the California Code of Regulations (23 CCR).

2. This Certification action is not intended to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed per 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license was being sought.

3. The validity of any non-denial Certification action (Actions 1 and 2) is conditioned upon total payment of the fee required under 23 CCR section 3833, unless otherwise stated in writing by the certifying agency.

ADMINISTRATIVE CONDITIONS:

1. This Certification is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any conditions contained in any other permit or approval issued by the State of California or any subdivision thereof may result in the revocation of this Certification and civil or criminal liability.

2. In the event of a violation or threatened violation of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of Section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this Certification.

3. In response to a suspected violation of any condition of this Certification, the Central Coast Water Board may require the holder of any permit or license subject to this Certification to furnish, under penalty of perjury, any technical or monitoring reports the Central Coast Water Board deems appropriate, provided that the burden, including costs, of the reports shall have a reasonable relationship to the need for the reports and the benefits obtained from the reports.

4. In response to any violation of the conditions of this Certification, the Central Coast Water Board may add to or modify the conditions of this Certification as appropriate to ensure compliance.

5. The Central Coast Water Board reserves the right to suspend, cancel, or modify and reissue this Certification, after providing notice to the applicant, if the Central Coast Water Board determines that the Project fails to comply with any of the terms or conditions of this Certification.

6. A copy of this Certification, the application, and supporting documentation must be available at the Project site during construction for review by site personnel and agencies. A copy of this Certification must also be provided to the contractor and all subcontractors who will work at the Project site. All personnel performing work on the proposed Project shall be familiar with the content of this Certification and its posted location on the Project site.

7. The California Department of Transportation (Caltrans) shall grant Central Coast Water Board staff, or an authorized representative, upon presentation of credentials and other documents as may be required by law, permission to enter the Project site at reasonable times, to ensure compliance with the terms and conditions of this Certification and/or to determine the impacts the Project may have on waters of the State.

8. Caltrans must, at all times, fully comply with the application, engineering plans, specifications, and technical reports submitted to support this Certification; all subsequent submittals required as part of this Certification; and the attached Project Information and Conditions. The conditions within this Certification and attachment(s) supersede conflicting provisions within applicant submittals.

9. Caltrans shall notify the Central Coast Water Board within 24 hours of any unauthorized discharge to waters of the U.S. and/or State; measures that were implemented to stop and contain the discharge; measures implemented to clean-up the discharge; the volume and type of materials discharged and recovered; and additional BMPs or other measures that will be implemented to prevent future discharges.

10. This Certification is not transferable to any person except after notice to the Executive Officer of the Central Coast Water Board. The Applicant shall submit this notice in writing at least 30 days in advance of any proposed transfer. The notice must include a written agreement between the existing and new responsible party containing a specific date for the transfer of this Certification's responsibility and coverage between the current responsible party and the new responsible party. This agreement shall include an acknowledgement that the existing responsible party is liable for compliance and violations up to the transfer date and that the new responsible party is liable from the transfer date on.

11. This Certification expires simultaneous with the expiration date of the associated U.S. Army Corps of Engineers (Corps) authorization or permit, or in five years from the date of this

Certification, whichever date comes first, except as specified in Additional Condition 1, below. If a Corps authorization or permit was unnecessary for this project due to coverage under a non-reporting Nationwide Permit (NWP), this Certification expires when the non-reporting NWP expires. If the Corps issues a one-year grace period for uncompleted projects that began under a NWP that has since expired, this Certification is valid during the grace period for such projects.

12. The total fee for this project is $10,412. The remaining fee payable to the Central Coast Water Board is $9,265.

ADDITIONAL CONDITIONS

1. Construction on the Project shall not begin without Central Coast Water Board Executive Officer approval of the final *Hecker Pass Safety Improvement Project Mitigation and Monitoring Plan* (Final MMP). Caltrans shall submit the Final MMP for Executive Officer approval. If Caltrans fails to obtain Executive Officer approval of the Final MMP by September 1, 2013, this Water Quality Certification expires on September 2, 2013. The Executive Officer will either approve the Final MMP or identify required changes to the Final MMP within 30 days of submittal.

2. Caltrans has developed a draft *Hecker Pass Safety Improvement Project Mitigation and Monitoring Plan*, dated May, 2013 (Draft MMP). The Final MMP shall include the following additional elements:
   - All areas subject to temporary Project impacts shall be restored to pre-project conditions.
   - Onsite mitigation for permanent project impacts shall consist of at least 1.4 acres of concentrated trash removal in and adjacent to Bodfish Creek, and at least 3.35 acres of native riparian understory planting adjacent to Bodfish Creek.
   - Offsite mitigation for permanent project impacts shall consist of preservation of 18 acres of second-growth redwood forest on the parcel known as Fall Creek 1, located at the head of Manson Creek in Santa Cruz County. The Final MMP shall clearly describe Caltrans' role and contribution in acquiring and preserving the Fall Creek 1 area, and how its role and contribution compare to that of other parties, such as Sempervirens.

3. Concentrated trash removal shall consist of hand removal of significant trash deposits in and adjacent to Bodfish Creek. Caltrans shall remove all noticeable trash and litter from Bodfish Creek adjacent to the Project site, but shall not count areas where trash is sparsely deposited toward the 1.4 acre trash removal requirement.

4. Caltrans shall provide features discouraging littering and/or illicit dumping of trash, such as signage or exclusionary fencing, at all locations along S.R. 152 within the Project Area where there is room for motorists to pull off the road on the side of the highway adjacent Bodfish Creek. Signage shall include a message discouraging littering and trash dumping and shall clearly indicate the fine that can be levied against violators and the telephone number motorists can call to report violators.

5. Caltrans shall remove all non-native plants from riparian understory planting areas prior to planting.

6. Riparian understory planting used as mitigation for permanent project impacts shall provide riparian habitat value and function that significantly exceeds pre-project conditions. Riparian understory planting used as mitigation for permanent project impacts shall not occur in

areas subject to temporary impacts except to provide enhancement beyond pre-project conditions.

7. Caltrans shall provide protection for onsite mitigation areas in perpetuity through enactment of an easement or other encumbrance that ensures preservation of the mitigation site(s) in perpetuity. Caltrans shall provide protection in perpetuity for the offsite mitigation area through enactment of a permanent conservation easement or similar instrument.

CENTRAL COAST WATER BOARD CONTACT PERSON:

Jon Rohrbough
(805) 549-3458
Jon.Rohrbough@waterboards.ca.gov

Please refer to the above certification number when corresponding with the Central Coast Water Board concerning this project.

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that as long as all the conditions listed in this Certification are met, any discharge from the Hecker Pass Safety Improvement Project EA 2A250 shall comply with the applicable provisions of sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated pursuant to State Water Board Water Quality Order No. 2003-0017-DWQ, which requires compliance with all conditions of this Certification.

Except insofar as may be modified by any preceding conditions, all Certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with the applicant's project description and the attached Project Information and Conditions, and (b) compliance with all applicable requirements of the Central Coast Water Board's policies and Water Quality Control Plan (Basin Plan).

for _____ May 24, 2013
Kenneth A. Harris Date
Interim Executive Officer
Central Coast Water Board

PROJECT INFORMATION AND CONDITIONS

Application Date	Received: December 17, 2012 Completed: December 17, 2012
Applicant	Fariba Zohoury California Department of Transportation 111 Grand Avenue Oakland, CA 94612 Fariba_Zohoury@dot.ca.gov 510-715-9846
Applicant Representatives	Cyrus Vafai California Department of Transportation 111 Grand Avenue Oakland, CA 94612 Cyrus_Vafai@dot.ca.gov 510-286-5585
Project Name	Hecker Pass Safety Improvement Project EA 2A250
Application Number	34313WQ01
Type of Project	Highway widening
Project Location	Santa Clara County Latitude: From 36.990817 N to 37.013441 N Longitude: From 121.65154 W to 121.714598 W
County	Santa Clara County
Receiving Water(s)	Bodfish Creek 305.20 Santa Cruz Mountains Hydrologic Unit
Water Body Type	Streambed
Designated Beneficial Uses	Municipal and Domestic Supply (MUN) Agricultural Supply (AGR) Ground Water Recharge (GWR) Water Contact Recreation (REC-1) Non-Contact Recreation (REC-2) Wildlife Habitat (WILD) Cold Fresh Water Habitat (COLD) Warm Fresh Water Habitat (WARM) Migration of Aquatic Organisms (MIGR) Spawning, Reproduction, and/or Early Development (SPWN) Rare, Threatened or Endangered Species (RARE) Commercial and Sport Fishing (COMM)
Project Description (purpose/goal)	The purpose of this project is to improve safe driving conditions on S.R. 152 through Hecker Pass. Central Coast Regional Water Quality Control Board (Central Coast Water Board) staff understands that the project includes the following activities in various locations totaling approximately 1.67 miles: 1. Widen existing paved shoulders to 8 feet; 2. Remove trees to construct shoulders and to provide improved sight lines; 3. Excavate cuts on the uphill side of S.R. 152;

	4. Construct nine retaining walls on the uphill side of S.R. 152; 5. Modify or extend 15 culverts, including placement of RSP; 6. Modify drainage systems adjacent to S.R. 152; 7. Provide left-turn channelization in S.R. 152 at the intersection with Watsonville Road; 8. Overlay pavement to improve roadway super-elevation; and 9. Install warning signs.
U.S. Army Corps of Engineers Permit No	Nationwide Permit 14 – Linear Transportation Projects
Federal Public Notice	N/A
Dept. of Fish and Game Streambed Alteration Agreement	Streambed Alteration Agreement is pending. Final, signed copy shall be forwarded immediately upon execution.
Status of CEQA Compliance	Environmental Impact Report Lead Agency: California Department of Transportation
Total Certification Fee	$10,412
Area of Disturbance	Approximately 3.62 acres total Streambed: 0.001 acres permanent, 0.003 acres temporary Riparian Area: 8,550 linear feet and 3.37 acres permanent Other Waters: 0.161 acres permanent, 0.086 acres temporary
Dredge Volume	Approximately 246 cubic yards
Compensatory Mitigation Requirements	1. The project shall include the following compensatory mitigation for 3.62 acres of permanent and temporary impacts to streambed, riparian area, and other waters: a. At least 1.4 acres of concentrated trash removal in Bodfish Creek; b. At least 3.35 acres of native riparian understory planting adjacent to Bodfish Creek; and c. Preservation of 18 acres of second-growth redwood forest in the area known as Fall Creek 1, located at the head of Manson Creek in Santa Cruz County. 2. Caltrans shall implement compensatory mitigation installation, maintenance, and monitoring as described in the final *Hecker Pass Safety Improvement Project Mitigation and Monitoring Plan*, as approved by Central Coast Water Board Executive Officer prior to the beginning of construction. 3. Offsite compensatory mitigation shall be completed within 12 months of the commencement of project construction. Onsite compensatory mitigation shall be installed within 12 months of completion of project construction.
Project Requirements	<u>Project practices that are required to comply with 401 Water Quality Certification are as follows:</u> 1. All work performed within waters of the State shall be completed in a manner that minimizes impacts to beneficial uses and habitat. Measures shall be employed to minimize land disturbances that will adversely impact the water quality of waters of the State. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Project implementation. 2. No construction activities shall be conducted below top of creek

	banks or in other waters of the State during the winter period (October 1 – May 30), unless prior written approval has been obtained from Central Coast Water Board staff. Requests to conduct construction activities below top of creek banks or in other waters of the State during the winter period shall be submitted to Central Coast Water Board staff at least 21 days prior to the planned winter period work date. 3. Erosion and sediment control measures shall be on site prior to the start of construction and kept on site at all times so they are immediately available for installation in anticipation of rain events. 4. Caltrans shall implement and maintain an effective combination of erosion and sediment control measures (e.g., revegetation, fiber rolls, erosion control blankets, hydromulching, compost, straw with tackifiers, temporary basins) to prevent erosion and capture sediment. Caltrans shall implement and maintain washout, trackout, dust control, and any other applicable source control BMPs. 5. Erosion and sediment control measures and other construction BMPs shall be implemented and maintained in accordance with all specifications governing their proper design, installation, operation, and maintenance. 6. Caltrans shall not conduct construction activities below top of creek banks or in other waters of the State during rain events. Caltrans shall implement effective erosion control, sediment control, and other protective measures prior to the start of any rain events. If work below top of creek banks or in other waters of the State is allowed during the time period between October 1 and May 30 (pursuant to Project Requirement No. 2 above), Caltrans shall not conduct construction activities below top of creek banks or in other waters of the State on any day for which the National Weather Service has predicted a 25% or more chance of at least 0.1 inch rain in 24 hours. In preparation for any such predicted rain event between October 1 and May 30, Caltrans shall install effective erosion control, sediment control, and other protective measures no later than the day prior to the predicted rain event. Construction activities below top of creek banks or in other waters of the State may resume after the rain has ceased, the National Weather Service predicts clear weather, and site conditions are dry enough to continue work without discharge of sediment or other pollutants from the project site. 7. Any material stockpiled that is not actively being used during construction shall be covered with plastic unless reserved for seed banking, which requires alternative erosion and dust control BMPs. 8. Caltrans shall retain a spill plan and appropriate spill control and clean up materials (e.g., oil absorbent pads) onsite in case spills occur. 9. Caltrans shall confine all trash and debris in appropriate enclosed bins and dispose of the trash and debris at an

	approved site at least weekly. 10. All construction vehicles and equipment used on site shall be well maintained and checked daily for fuel, oil, and hydraulic fluid leaks or other problems that could result in spills of toxic materials. 11. Caltrans shall designate a staging area for equipment and vehicle fueling and storage at least 100 feet away from waterways, in a location where fluids or accidental discharges cannot flow into waterways. 12. All vehicle fueling and maintenance activity shall occur at least 100 feet away from waterways, and in designated staging areas. 13. Dewatering and stream diversion measures are not authorized based on the application. If the project requires dewatering or diversion, Caltrans shall submit detailed dewatering/ diversion plans for Central Coast Water Board staff approval at least 21 days prior to any dewatering or diversion. Dewatering/diversion plans shall include the area to be dewatered, timing of dewatering, and method of dewatering to be implemented. All temporary dewatering/diversion methods shall be designed to have the minimum necessary impacts to waters of the State to isolate the immediate work area. All dewatering/diversion methods shall be installed such that natural flow is maintained upstream and downstream of the project area. Any temporary dams or diversions shall be installed such that the diversion does not cause sedimentation, siltation, or erosion upstream or downstream of the project area. All dewatering/diversion methods shall be removed immediately upon completion of dewatering/diversion activities. Dewatering or diversion shall not commence until applicant has obtained Central Coast Water Board staff approval of the dewatering/diversion plans. 14. All post-construction stormwater treatment and infiltration BMPs shall be implemented and functioning prior to completion of the project. 15. All construction-related equipment, materials, and any temporary BMPs no longer needed shall be removed and cleaned from the site upon completion of the project. 16. Central Coast Water Board staff shall be notified if mitigations as described in the 401 Water Quality Certification application for this project are altered by the imposition of subsequent permit conditions by any local, state or federal regulatory authority. The Applicant shall inform Central Coast Water Board staff of any modifications that interfere with compliance with this Certification.
Monitoring and Reporting Requirements	The Applicant shall conduct the following monitoring: 1. Visually inspect the project site and areas of waters of the State adjacent to project impact areas following completion of project construction and for five subsequent rainy seasons to ensure that the project is not causing excessive erosion, stream instability, or other water quality problems. If the project does cause water quality problems, contact the Central Coast Water Board staff member overseeing the project. Caltrans will be

	responsible for obtaining any additional permits necessary for implementing plans for restoration to prevent further water quality problems. 2. Monitor the riparian understory planting compensatory mitigation site for five years. If success criteria are not achieved within that time, continue annual monitoring and maintenance until success criteria are achieved. Compensatory mitigation monitoring shall include assessment of growth, survival, percent cover, general health and stature, signs of reproduction, progress towards achieving success criteria, and any other measures identified in the final *Hecker Pass Safety Improvement Project Mitigation and Monitoring Plan*, as approved by the Central Coast Water Board Executive Officer. Caltrans shall provide the following reporting to RB3_401Reporting@waterboards.ca.gov: 1. Project Commencement Notification - Contact Central Coast Water Board staff when the project begins to allow for a site visit. 2. Streambed Alteration Agreement - Submit a signed copy of the Department of Fish and Game's streambed alteration agreement to the Central Coast Water Board immediately upon execution and prior to any discharge to waters of the State. 3. Project Completion Report - Within 30 days of project completion, submit a project completion report that contains: a. Date of construction initiation; b. Date of construction completion; c. Status of post-construction BMPs; d. A summary of daily activities, monitoring and inspection observations, and problems incurred and actions taken; e. Clearly identified photo-documentation of all areas of permanent and temporary impact, prior to and after project construction; f. Clearly identified representative photo-documentation of other project areas, prior to and after project construction; and g. Photo-documentation of all permanent post-construction BMPs. 4. Annual Report – The Applicant shall submit to the Central Coast Water Board an Annual Report by May 31 of each year following the issuance of this Certification, regardless of whether project construction has started or not. The Applicant shall submit Annual Reports until the Applicant has conducted all required monitoring, mitigation has achieved all success criteria, and the Applicant has notified the Central Coast Water Board of mitigation completion. Each Annual Report shall include at a minimum: a. The status of the project: construction not started, construction started, or construction complete. b. The date of construction initiation, if applicable. c. The date of construction completion, if applicable

	d. If project construction is complete, a description of the results of the annual visual inspection of the project site and areas of waters of the State adjacent to project impact areas, including: i. Erosion conditions; ii. Stream stability conditions; iii. Water quality and beneficial use conditions; iv. Representative photographs of the project site and areas of waters of the State adjacent to project impact areas; and v. If the visual inspection monitoring period is over, but water quality problems persist, the Annual Report shall identify corrective measures to be undertaken, including extension of the monitoring period until the project is no longer causing excessive erosion, stream instability, or other water quality problems. e. Mitigation reporting, if mitigation installation has started, including the following information: i. Date of initiation of mitigation installation and date mitigation installation was completed; ii. Analysis of monitoring data collected in the field; iii. Quantification of growth, percent cover, survival, general health and stature, signs of reproduction, and documentation of progress toward achieving all mitigation performance criteria; iv. Qualitative and quantitative comparisons of current mitigation conditions with preconstruction conditions and previous mitigation monitoring results; v. Any remedial or maintenance actions taken or needed; vi. Any additional information specified in the final *Hecker Pass Safety Improvement Project Mitigation and Monitoring Plan*, as approved by the Central Coast Water Board Executive Officer; and vii. Annual photo-documentation representative of the riparian understory planting mitigation areas, taken from vantage points from which Central Coast Water Board staff can identify changes in size and cover of plants. Compare photos of installed mitigation with photos of the mitigation areas prior to installation. f. A description of mitigation completion status that identifies the amount of mitigation monitoring and maintenance remaining, or certifies that mitigation is complete and all required mitigation monitoring and maintenance has been conducted and all success criteria achieved. If the monitoring period is over, but all success criteria have not been achieved, the Annual Report shall identify corrective measures to be undertaken, including extension of the monitoring period until the criteria are met.

State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

April 12, 2013

Mr. Jeffrey G. Jensen
California Department of Transportation
111 Grand Avenue
Oakland, CA 94623

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2012-0208-R3
State Route 152 Hecker Pass Safety Improvements Project

Dear Mr. Jensen:

Enclosed is the final Streambed Alteration Agreement ("Agreement") for the State Route ("Project"). Before the Department may issue an Agreement, it must comply with the California Environmental Quality Act ("CEQA"). In this case, the Department, acting as a responsible agency, filed a notice of determination ("NOD") on April 12, 2013 based on information contained in the Environmental Impact Report the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 30-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this matter, please contact Melissa Escaron, Staff Environmental Scientist, at (925)786-3045 or Melissa.escaron@wildlife.ca.gov.

Sincerely,

Karen Weiss for

Scott Wilson
Acting Regional Manager
Bay Delta Region

cc: Chris Jannusch
California Department of Transportation

Lieutenant Nores
Warden Quintal-Thomson
Melissa Escaron

CALIFORNIA DEPARTMENT OF FISH AND GAME
BAY DELTA REGION
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558
(707) 944-5520
WWW.DFG.CA.GOV

STREAMBED ALTERATION AGREEMENT
NOTIFICATION NO. 1600-2012-0208-R3
Bodfish Creek and Unnamed Tributary, and Blackhawk Creek

CALIFORNIA DEPARTMENT OF TRANSPORTATION
HECKER PASS SAFETY IMPROVEMENT PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and California Department of Transportation (Permittee) or as represented Jeffrey G. Jensen.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on May 12, 2012 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement

PROJECT LOCATION

The project is located along State Route 152, at 5 locations between Post Miles (PM) .14 and 5.9, in the County of Santa Clara, State of California.

PROJECT DESCRIPTION

Caltrans proposes to improve the safety on State Route (SR) 152 by making improvements to a 5.05-mile section of roadway between PM 0.14 and PM 5.19, 0.17 mile east of Watsonville Road. The existing alignment is a two-lane highway with 12-foot lanes. Caltrans proposes to widen existing shoulders, overlay the existing

pavement, remove trees to increase sight distance, construct retaining walls, and add a left-turn lane from eastbound SR 152 to Watsonville Road. To accommodate the proposed improvements, several culverts within DFG jurisdiction will be modified:

- PM 0.2, uphill side of SR 152- A new culvert and 3 cubic yards of rock slope protection (RSP) will be installed.
- PM 0.23, downhill side of SR 152- A new culvert and 5.3 cubic yards of RSP will be installed.
- PM 1.22, uphill side of SR 152- Existing culvert inlet will be extended by 2 feet upstream
- PM 2.61, uphill side of SR 152- Existing culvert will be extended upstream by 11 feet. The existing inlet will be removed, 3.37 cubic yards excavated, and a new inlet and 4.68 cubic yards of fill will be placed.
- PM 2.83, uphill side of SR 152- The existing inlet is being replaced by 2 new inlets. The existing culvert will be extended 9 feet upstream to the first new inlet and 6.6 feet upstream to the second new inlet. Approximately 3.5 cubic yards of excavation and 4.9 cubic yards of backfill are proposed.
- PM 3.2, uphill side of SR 152- The existing headwall is being removed and replaced with a vertical drainage inlet. The culvert will be extend 2.2 feet upstream to accommodate the widening.

Approximately 157 trees within DFG jurisdiction will be removed to accommodate the proposed project. This Agreement covers utility pole and underground cable utility relocations within DFG jurisdiction.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include:

- Redwood forest
- Riparian habitat
- Aquatic invertebrates
- Amphibians
- Nesting birds
- California red legged frogs and habitat
- Foothill yellow legged frogs and habitat
- Western pond turtles and habitat
- San Francisco dusky footed woodrats and habitat

The adverse effects the project could have on the fish or wildlife resources identified above include:

- Redwood forest habitat degradation
- Sensitive species mortality
- Disruption of bird nesting

- Water quality degradation
- Short-term release of contaminants

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.

1.2 Providing Agreement to Persons at Project Site. Permittee shall maintain onsite at all times, a copy of the Agreement and any extensions and amendments to the Agreement.

1.3 Notification of Conflicting Provisions. Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.

1.4 Project Site Entry. Permittee agrees that DFG personnel may, with notification of the Resident Engineer, enter the project site at any time to verify compliance with the Agreement.

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below. These conditions apply only to DFG jurisdiction as described in the Project Description above.

2.1 To minimize adverse impacts to fish and wildlife all work within the bed, bank, channel, and associate riparian habitat shall be confined to the period of June 15 to October 15. Revegetation work is not confined to this time period.

2.2 At least 30-days prior to commencing project activities covered by this Agreement, the Permittee shall submit to DFG, for review and approval, the qualifications for a number of biologists (Qualified Biologist) that shall oversee the implementation of the conditions in this Agreement. At a minimum, the Qualified Biologists shall have a combination of academic training and professional experience in biological sciences and related resource management activities. The Qualified Biologists shall communicate to the Resident Engineer when any activity is not in

compliance with this Agreement and the Resident Engineer shall immediately stop the activity that is not in compliance with this Agreement.

2.3 If Project activities will occur between February 15 and September 1, a Qualified Biologist shall conduct pre-construction surveys for nesting birds no more than one week prior to construction. Surveys shall consist of multiple days of observations. If nesting birds are found, a 50-foot radius buffer shall be established around the nest, a 300-foot- foot radius buffer in the case of raptors, e.g. hawks, owls, and eagles. The area shall be avoided. A buffer of less than 300 feet, but no less than 100 feet, may be used if a Qualified Biologist, experienced in raptor behavior, is assigned to monitor the behavior of any raptor nesting within 300 feet of Project activities. The Qualified Biologist shall have authority, through the Resident Engineer, to order the cessation of all Project activities within 300 feet of any raptor nest if the birds exhibit abnormal nesting behavior which may cause reproductive failure (nest abandonment and loss of eggs and/or young). Abnormal nesting behaviors which may cause reproductive harm include, but are not limited to: defensive flights/vocalizations directed towards Project personnel, standing up from a brooding position, and flying away from the nest. Project activities within 300 feet of the nest shall not resume until the Qualified Biologist has consulted with DFG and both the Qualified Biologist and DFG confirm that the bird's behavior has normalized or the young have left the nest.

2.4 A Qualified Biologist shall conduct Pre-construction surveys immediately prior to the initiation of any ground disturbing activities within or adjacent to suitable California red-legged frog (CRLF) habitat. These surveys will comprise walking transects while conducting visual encounter surveys within areas that will be subject to staging, vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. All mammal burrows shall be inspected for signs of CRLF usage to the maximum extent practicable. If it is determined that the burrow may be occupied by a CRLF, the Permittee shall adhere to the relocation techniques described in condition 2.6.

2.5 A Qualified Biologist shall be present onsite to monitor for CRLF during construction activities located within suitable CRLF habitat. Through communication with the Resident Engineer, a Qualified Biologist may stop work if deemed necessary for any reason to protect CRLF and will advise the Resident Engineer on how to proceed accordingly. A Qualified Biologist will conduct clearance surveys at the beginning of each day within or adjacent to suitable CRLF and habitat and regularly throughout the workday when construction is occurring within or adjacent to suitable CRLF. If CRLF are encountered in the action area, work within 50 feet of the animal will cease immediately and the Resident Engineer and a United State Fish and Wildlife Service (USFWS)/DFG-approved biologist will be notified. At no time shall work occur within 50 feet of a CRLF without a Qualified Biologist present.

2.6 Prior to handling and relocation, a USFWS/DFG-approved Qualified Biologist will take precaution to prevent introduction of amphibian diseases in accordance with the Revised Guidance on Site Assessments and Field Surveys for the California Red-

legged Frog (USFWS 2005). CRLF will be captured by hand, dipnet, or other USFWS-approved methodology, transported by hand, dipnet or temporary holding container, and release as soon as practicable the same day of capture. Handling of CRLF will be minimized to the maximum extent practicable Holding/transporting containers and dipnets will be thoroughly cleaned and disinfected and will be rinsed with freshwater onsite immediately prior to usage unless doing so would result in the injury or death of the animal due to the time delay. CRLF will be relocated to the nearest suitable habitat outside of the area where actions would not result in harm or harassment, and released on the same side of State Route 152 where it was discovered. The individual(s) will be released within suitable habitat in the Caltrans right-of-way or another property acceptable to the property owner, and the USFWS and DFG will be notified. If suitable habitat cannot be identified, the USFWS and DFG shall be contacted to determine an acceptable alternative.

2.7 To prevent inadvertent entrapment of CRLF, or other animals during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered with plywood or similar materials at the end of each workday or the holes or trenches will contain one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals.

2.8 A Qualified Biologist will survey the work site in the vicinity of Location 4 no more than 48 hours before the start of work activities for signs of western pond turtles, western pond turtle nesting activity (recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Pre-construction surveys to detect western pond turtles will focus on potentially suitable aerial and aquatic basking habitat (logs, branches, rootwads, riprap), and the shoreline and adjacent warm, shallow waters, where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Preconstruction surveys to detect western pond turtles nesting activity will be concentrated within approximately 325 feet of suitable aquatic habitat and will focus on areas along south- or west- facing slopes with bare, hard-packed clay or silt soils or sparse vegetation of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist will contact DFG to determine whether relocation and/or exclusion buffers are appropriate. If DFG approves of moving the animal, the Qualified Biologist shall be allowed sufficient time to move the western pond turtle from the work site before work activities begin.

2.9 A Qualified Biologist shall, prior to start of construction, conduct a survey of the project area and a 30-foot buffer to determine the location of existing woodrat dens. Survey data shall be recorded and mapped in relation to the construction footprint. A 30 foot equipment exclusion buffer shall be established around dens that can be avoided, within these buffers all vegetation shall be retained and nests shall remain undisturbed. If it is determined that the project cannot avoid a den(s), then a trapping and relocation effort shall be implemented in accordance with the methods described herein. If

suitable habitat is not available for relocation of the woodrats, off-site locations shall be identified. Trapping of the woodrats shall be conducted by a Qualified Biologist with a current DFG collection permit to trap the species, and relocate the animals. The trapping shall occur outside of the breeding period, between September and December. Two trapping methods shall be employed in order to trap and relocate as many resident woodrats as possible. The first method shall involve use of Tomahawk live traps measuring approximately 5 x 5 x 16 inches, and baited with oatmeal, peanut butter, and fresh apples. Traps shall be placed in close proximity to the woodrat den, and checked every day. Trapping may be discontinued after three days if no woodrats are caught. Trapping shall not be conducted during heavy rains or during full moons. The second method of trapping shall be used after the live traps have been set and checked for rodents. A Qualified Biologist shall install a containment fence around each woodrat den and then dismantle the den and catch any woodrats that try to escape. Woodrat house materials shall be collected along with the woodrats, and relocated at a designated area identified during the pre-construction survey. Trapped woodrats and their den materials shall be relocated and released at the same time. Regardless of whether any woodrats are caught, any woodrat dens that would be impacted during construction shall be removed and relocated. Den materials shall be collected by hand, and placed into bags for transportation to the relocation area identified during the pre-construction survey. A minimum of 75 percent of the nest materials shall be collected from the original dens. Den materials shall be placed in a pile near a tree or rock in an area with similar overstory and understory characteristics as the original location. Understory vegetation shall be dense (at least 90% canopy cover) and provide abundant locations for den construction. Ideal areas would be close to willow thickets, poison oak patches, or Coast live oak concentrations that provide abundant shade. If possible, they shall also be located near a water source or small stream.

2.10 Permittee shall comply with all applicable state and federal laws, including the California and Federal Endangered Species Act. This Agreement does not authorize the take of any state or federally endangered listed species. Liability for any take or incidental take of such species remains the responsibility of the Permittee for the duration of the project. Any unauthorized take of listed species may result in prosecution and nullification of the Agreement.

2.11 Night work shall be minimized to the maximum extent practicable.

2.12 If any wildlife is encountered during the course of project activities, said wildlife shall be allowed to leave the area unharmed and on their own volition.

2.13 The perimeter of the work site shall be adequately fenced using high visibility Environmentally Sensitive Area (ESA) fencing to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by the ESA fencing.

2.14 Prior to the start of construction, Wildlife Exclusion Fencing (WEF) shall be installed along the project footprint in all areas where sensitive species could enter the work site. The location of the WEF will be determined by the Resident Engineer, in consultation with a Qualified Biologist based on habitat suitability. The final project plans will show where and how the WEF will be installed. The bid solicitation package special provisions will clearly describe acceptable fencing material and proper WEF installation and maintenance.

2.15 Permittee shall conduct work defined in the above project description, and within the project area, during periods of dry weather. The project area is defined as the bed, bank, channel, and associated riparian habitat. The Permittee shall monitor forecasted precipitation. When ¼ inch or more of precipitation is forecasted to occur, the Permittee shall stop work before precipitation commences. No activity of the project may be started if its associated erosion control measures cannot be completed prior to the onset of precipitation. After any storm event, the Permittee shall inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sediment problems and take corrective action as needed. Seventy-two hour weather forecasts from National Weather Service shall be consulted and work shall not start back up until runoff ceases and there is less than a 30% forecast for precipitation for the following 24-hour period.

2.16 Permittee shall utilize erosion control measures throughout all phases of operation where sediment runoff from exposed slopes threatens to enter waterways. At no time shall silt laden runoff be allowed to enter the stream or directed to where it may enter the stream. Erosion control installations shall be monitored for effectiveness and shall be repaired or replaced as recommended by a Water Quality Monitor to the Resident Engineer or designated representative. As needed to prevent sediment transport, Permittee shall deploy soil stabilizer such as hydroseeding, netting, erosion control mats, mulch, fiber rolls, silt fences, check dams, and flow velocity dissipation devices. Permittee shall stabilize and equip construction site entrances and exits with tire washing capability. Materials containing monofilament or plastic shall not be used. Erosion and sediment control measures shall be installed prior to unseasonable rain storms.

2.17 Hydroseed mixes shall not contain exotic plant species. Prohibited exotic plant species include those identified in the California Exotic Pest Plant Council's database, which is accessible at: http://www.cal-ipc.org/ip/inventory/weedlist.php.

2.18 To the extent practicable, Permittee shall leave the root masses of removed trees and shrubs in place. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations.

2.19 If the gradient of the streambed is altered during project operations, Permittee shall return its contours as close as possible to pre-project conditions. Pre-project

condition shall be defined by engineered plans dated prior to the commencement of the project.

2.20 Concrete shall be excluded from surface water for a period of 30-days after it is poured/sprayed. During that time the concrete shall be kept moist and runoff from the concrete shall not be allowed to enter any water body. Commercial sealants may be applied to the concrete surface where difficulty in excluding flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it shall be prevented from flowing towards surface water.

2.21 Staging and storage areas for equipment, materials, fuels, lubricants and solvents, shall be located outside of the creek channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek shall be positioned over drip pans. Any equipment or vehicles driven and/or operated above or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.

2.22 Refueling of mobile construction equipment and vehicles shall not occur within 50 feet of any water body, or anywhere that spilled fuel could drain to a water body. Refueling of stationary equipment requiring breakdown and setup to move will remain in place. All equipment shall be refueled with appropriate drip pans, absorbent pads, and water quality Best Management Practices. Equipment and vehicles operating in the project area shall be checked and maintained daily to prevent leaks of fuels, lubricants, or other liquids.

3. Compensatory Measures

3.1 At the issuance of this Agreement DFG has not approved an offsite mitigation location. At least 3 months prior to commencement of construction the Permittee shall submit a detailed Redwood Forest Riparian Habitat Mitigation Plan (Habitat Mitigation Plan) to DFG for review and written approval. The Habitat Mitigation Plan shall mitigate permanent redwood forest riparian habitat impacts at a minimum of a 3:1 acreage ratio. The Habitat Mitigation Plan shall address all tree impacts irrespective of diameter at breast height. The Habitat Mitigation Plan shall include proposed mitigation locations, a plant palette of native species to be used, success criteria, a monitoring and reporting schedule, and corrective actions to be taken if mitigation measures do not meet the approved success criteria. The Permittee shall monitor the survival and vigor of offsite plantings for a period of 5 years to ensure attainment of 75% survivorship of the planting palette. Permittee shall control invasive species as needed to ensure attainment of 75% survivorship for a period of 5 years. Offsite mitigation may include a combination of habitat restoration, creation, enhancement, and/or preservation of habitat that will support a similar plant community to that found at the project site, as documented by the February 2, 2012 Memorandum entitled Results of the Hecker Pass Safety Improvements Project Tree Survey. The planting palette shall include, but not limited to

the following species: coast redwood, tanoak, California bay laurel, California woodfern, California blackberry, and madrone.

3.2 Permittee shall provide a funding assurance letter signed by the Caltrans Deputy District Directors of Environmental Planning and Engineering and Project Management for DFG written approval. The funding assurance letter shall provide an estimated cost to fund the implementation of the Habitat Mitigation Plan, and a commitment to fund the full cost of implementation of the Habitat Mitigation Plan.

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

To Permittee:

California Department of Transportation
Jeffrey G. Jensen
111 Grand Ave.
(510) 622-8729
Jeffrey_jensen@dot.ca.gov

To DFG:

Department of Fish and Game
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
Attn: Lake and Streambed Alteration Program – Melissa Escaron
Notification #1600-2012-0208-R3
mescaron@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)). .

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on December 31, 2017, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION

Jeffrey G. Jensen — 4/5/2013 Date

Office Chief Biological Sciences and Permits

FOR DEPARTMENT OF FISH AND GAME

Karen Weiss for — 4/12/13 Date

Scott Wilson

Acting Regional Manager

Prepared by: Melissa Escaron
Staff Environmental Scientist

Date Sent: October 16, 2012
Revision Sent: April 4, 2013

FOR DEPARTMENT USE ONLY				
Date Received	Amount Received	Amount Due	Date Complete	Notification No.
6/22/12	$ 4,482.75	$		1600-2012-0208-3

CK# 082-201448
CA Dept of Transportation

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

Escarsn
Quintal-Thomas
Pyres

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

Fish & Game
JUN 22 2012
Yountville

1. APPLICANT PROPOSING PROJECT

Name	Jeffrey G. Jensen		
Business/Agency	California Department of Transportation, District 4		
Street Address	111 Grand Ave.		
City, State, Zip	Oakland, CA 94612		
Telephone	(510) 622-8729	Fax	(510) 286-6374
Email	jeffrey_jensen@dot.ca.gov		

2. CONTACT PERSON (*Complete only if different from applicant*)

Name	Chris Jannusch		
Street Address	111 Grand Ave.		
City, State, Zip	Oakland, CA 94612		
Telephone	(510) 286-5230	Fax	(510) 286-6374
Email	christopher_jannusch@dot.ca.gov		

3. PROPERTY OWNER (*Complete only if different from applicant*)

Name			
Street Address			
City, State, Zip			
Telephone		Fax	
Email			

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name	State Route (SR) 152 Hecker Pass Safety Improvements Project			
B. Agreement Term Requested	☑ Regular (*5 years or less*) ☐ Long-term (*greater than 5 years*)			
C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (*year*)	Ending (*year*)	Start Date (*month/day*)	End Date (*month/day*)	
2013	2015	06/01	11/01	543.00

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.		
A.	☑ Standard *(Most construction projects, excluding the categories listed below)*	
B.	☐ Gravel/Sand/Rock Extraction (*Attachment A*)	*Mine I.D. Number:* _____
C.	☐ Timber Harvesting (*Attachment B*)	THP *Number:* _____
D.	☐ Water Diversion/Extraction/Impoundment (*Attachment C*)	*SWRCB Number:* _____
E.	☐ Routine Maintenance (*Attachment D*)	
F.	☐ DFG Fisheries Restoration Grant Program (FRGP)	*FRGP Contract Number:* _____
G.	☐ Master	
H.	☐ Master Timber Harvesting	

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. ***Note: The Department may not process this notification until the correct fee has been received.***

	A. Project	B. Project Cost	C. Project Fee
1	SR 152 Hecker Pass Safety Improvement Project (full cost is far higher,	$5,000,000.00	$4,482.75
2	so the maximum fee applies)		
3			
4			
5			
		D. Base Fee *(if applicable)*	
		E. TOTAL FEE ENCLOSED	$4,482.75

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?

☐ Yes (*Provide the information below*) ☑ No

Applicant: _____ Notification Number: _____ Date: _____

B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?

☑ No ☐ Yes (*Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.*)

☐ *Continued on additional page(s)*

8. PROJECT LOCATION

A. Address or description of project location.

(*Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway*)

Caltrans proposes to improve the safety of portions of SR 152 between the Santa Cruz County line and 0.16 mile east of Watsonville Road. The project occurs in the Mount Madonna and Watsonville East, California U.S. Geological Survey (USGS) 7.5-minute quadrangles, in Township 11 South, Range 5 East. The existing alignment is a two-lane highway with 12-foot (ft) lanes in both directions, and shoulders ranging from 0 to 15 feet (ft) wide within the project limits. Improvements will occur along SR 152 in five locations between post mile (PM) 0.14 and 5.19 in accordance with the design plans.

Location 1: PM 0.14/0.29
Location 2: PM 0.94/1.11
Location 3: PM 1.19/1.48
Location 4: PM 2.54/3.18
Location 5: PM 4.73/5.19

☑ *Continued on additional page(s)*

B. River, stream, or lake affected by the project.	Bodfish Creek and unnamed tributary, Blackhawk Creek
C. What water body is the river, stream, or lake tributary to?	Pajaro River
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts?	☐ Yes ☑ No ☐ Unknown
E. County	Santa Clara

F. USGS 7.5 Minute Quad Map Name	G. Township	H. Range	I. Section	J. ¼ Section
Mount Madonna and Watsonville East	11S	5E		

☐ *Continued on additional page(s)*

K. Meridian (*check one*)	☐ Humboldt ☑ Mt. Diablo ☐ San Bernardino

L. Assessor's Parcel Number(s)

See addendum.

☑ *Continued on additional page(s)*

M. Coordinates (*If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes*)

Latitude/Longitude	*Latitude:* Please see Addendum	*Longitude:* Please see Addendum	
	☐ Degrees/Minutes/Seconds	☐ Decimal Degrees	☐ Decimal Minutes
UTM	*Easting:*	*Northing:*	☐ Zone 10 ☐ Zone 11
Datum used for Latitude/Longitude or UTM	☐ NAD 27	☐ NAD 83 or WGS 84	

9. PROJECT CATEGORY AND WORK TYPE *(Check each box that applies)*

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	☐	☐	☐
Bank stabilization – rip-rap/retaining wall/gabion	☑	☐	☐
Boat dock/pier	☐	☐	☐
Boat ramp	☐	☐	☐
Bridge	☐	☐	☐
Channel clearing/vegetation management	☑	☑	☐
Culvert	☑	☑	☐
Debris basin	☐	☐	☐
Dam	☐	☐	☐
Diversion structure – weir or pump intake	☐	☐	☐
Filling of wetland, river, stream, or lake	☑	☑	☐
Geotechnical survey	☐	☐	☐
Habitat enhancement – revegetation/mitigation	☑	☐	☐
Levee	☐	☐	☐
Low water crossing	☐	☐	☐
Road/trail	☐	☑	☐
Sediment removal – pond, stream, or marina	☐	☐	☐
Storm drain outfall structure	☐	☐	☐
Temporary stream crossing	☐	☐	☐
Utility crossing : Horizontal Directional Drilling	☐	☐	☐
Jack/bore	☑	☑	☑
Open trench	☑	☑	☑
Other *(specify)*:	☐	☐	☐

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

The California Department of Transportation (Caltrans) District 4 (District) proposes to improve the safety of SR 152 from the Santa Cruz County line to 0.16 mile east of Watsonville Road. The proposed project includes widening the existing shoulders, overlaying the existing pavement, removing trees to increase sight distance, constructing retaining walls, and adding a left-turn lane from eastbound SR 152 to Watsonville Road. The purpose of the Hecker Pass Safety Improvement Project (project) is to reduce the number of cross-centerline accidents along this corridor.

Additional project description information is included in the attached Addendum.

☑ *Continued on additional page(s)*

B. Specify the equipment and machinery that will be used to complete the project.

The equipment required for this work would include blades, backhoes, pavers, rollers, spreaders, drilling machines, pumps, forklifts, cranes, and materials including wire mesh and soil nails. Vehicles required include a trucks for materials, labor pick-up trucks, and water trucks.

☐ *Continued on additional page(s)*

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).	☑ Yes ☐ No (*Skip to box 11*)
D. Will the proposed project require work in the wetted portion of the channel?	☐ Yes (*Enclose a plan to divert water around work site*) ☑ No

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

Approximately 297.3 cubic yards of material will be placed within roadside drainages, small seasonal stream channels, and existing culverts. The cause of this fill is grading, material placement for road beds, and improvements to the drainage system to better direct rain water runoff. The volume was estimated from Caltrans 95% design plans and via guidance with Caltrans engineering. More details are in the addendum.

☑ *Continued on additional page(s)*

B. Will the project affect any vegetation? ☑ Yes (*Complete the tables below*) ☐ No

Vegetation Type	Temporary Impact	Permanent Impact
see addendum	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____
	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
see addendum		

☑ *Continued on additional page(s)*

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☑ Yes *(List each species and/or describe the habitat below)* ☐ No ☐ Unknown

☑ *Continued on additional page(s)*

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

The sources are the Biological Opinion, the EIR/EA, and the Natural Environment Study prepared for this project.

☐ *Continued on additional page(s)*

E. Has a biological study been completed for the project site?

☑ Yes (*Enclose the biological study*) ☐ No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

☑ Yes (*Enclose the hydrological study*) ☐ No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

12. MEASURES TO PROTECT FISH, WILDIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

Permittee will adhere to Section 401 and 402 of the Clean Water Act and will implement Caltrans Best Management Practices to control sediment and reduce erosion. These methods are discussed in more detail in the addendum.

☑ *Continued on additional page(s)*

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

General avoidance and minimization efforts will be incorporated into the design and implemented to reduce potential impacts to natural communities and plant and animal species. These measures will include minimizing the project footprint, providing environmental education for the construction crew, and delineating the work area and all environmentally sensitive areas with fencing. These require that an onsite biological monitor be present during activities that may impact sensitive biological resources. These measures are discussed in more detail in the addendum.

☑ *Continued on additional page(s)*

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

Compensatory mitigation will be provided as required by the various regulatory agencies for impacts on the resources under their jurisdictions. This includes impacts associated with endangered and other special-status species and their habitats, jurisdictional waters of the United States, and tree removal. Mitigation for these impacts is discussed further in the addendum.

☑ *Continued on additional page(s)*

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

A. USACE 404 Nationwide Permit #14 ☑ Applied ☐ Issued

B. Regional Water Quality Control Board 401 (in progress) ☑ Applied ☐ Issued

C. Others - see addendum ☑ Applied ☐ Issued

D. Unknown whether ☐ local, ☐ state, or ☐ federal permit is needed for the project. (*Check each box that applies*)

☑ *Continued on additional page(s)*

14. ENVIRONMENTAL REVIEW

A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?

☑ Yes (*Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each*)

☐ No (*Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared*)

☐ Notice of Exemption	☐ Mitigated Negative Declaration	☑ NEPA document (*type*): Env. Assessment
☐ Initial Study	☑ Environmental Impact Report	☐ CESA document (*type*):
☐ Negative Declaration	☐ Notice of Determination *(Enclose)*	☑ ESA document (*type*): Biological Opinion
☐ THP/ NTMP	☐ Mitigation, Monitoring, Reporting Plan	

B. State Clearinghouse Number (*if applicable*)	2009042029		
C. Has a CEQA lead agency been determined?	☑ Yes (*Complete boxes D, E, and F*)	☐ No (*Skip to box 14.G*)	
D. CEQA Lead Agency	California Department of Transportation		
E. Contact Person	Cristin Hallissy	F. Telephone Number	(510) 622-8717

G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.

This is not part of a larger project.

☐ *Continued on additional page(s)*

H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?

☑ Yes (*Enclose proof of payment*) ☐ No (*Briefly explain below the reason a filing fee has not been paid*)

Fee will accompany this application.

Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.

15. SITE INSPECTION

Check one box only.

☐ In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.

☑ I request the Department to first contact (*insert name*) Chris Jannusch at (*insert telephone number*) (510) 286-5230 to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.

16. DIGITAL FORMAT

Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?
☑ Yes (Please enclose the information via digital media with the completed notification form) ☐ No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.

Carin D. Martinez for
Signature of Applicant or Applicant's Authorized Representative

June 12, 2012
Date

Jeffrey G. Jensen
Print Name

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

March 13, 2013

In response, refer to:
SWR-2012-4877

Bijan Sartipi
District Director
California Department of Transportation, District 4
111 Grand Avenue
Oakland, California 94623

Dear Mr. Sartipi:

Thank you for your January 23, 2013, letter requesting initiation of informal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The California Department of Transportation (Caltrans) is now acting as the lead agency for this project as per the agreement with the Federal Highway Administration (FHWA) in accordance with Section 6005(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 1969 (42 U.S.C. 4351 *et seq.*) and all or part of the FHWA Secretary's responsibilities for environmental review, consultation, or other action required under any environmental law with respect to one or more highway projects within the state. Therefore, Caltrans is now considered the federal action agency for ESA consultations with NMFS for federally funded projects. This letter also serves as consultation under the provisions of the Fish and Wildlife Coordination Act (FWCA) of 1934, as amended. The consultation pertains to Caltrans' proposed Hecker Pass Safety Improvement Project along State Route (SR) 152 in Santa Clara County, California. Caltrans proposes to improve safety on SR 152 by making improvements to a 5.05 mile section of roadway between post mile (PM) 0.14 and 5.19. The existing alignment of SR 152 is a two-lane highway with 12-foot lanes in both directions and shoulders ranging from zero to 15 feet wide within the project limits. Caltrans proposes to widen existing shoulders, overlay existing pavement, remove trees where necessary to increase site distance, construct retaining walls, and add a left turn lane from eastbound SR 152 to Watsonville Road. The purpose of the Hecker Pass Safety Improvement Project is to reduce the number of cross-centerline accidents along this corridor, which serves as a major link connecting Santa Cruz and Santa Clara counties.

The 5.05 mile section of SR 152 includes five separate locations, or reaches of roadway, where improvement activities will occur. State Route 152 parallels Bodfish Creek at most of these locations and crosses over Blackhawk Canyon Creek, a tributary to Bodfish Creek. Both Bodfish and Blackhawk Canyon creeks are utilized by the South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and both are

designated as critical habitat for this DPS. At these five locations, the distance from the creek/riparian zone and the roadway varies considerably and most (*e.g.,* Locations 1, 2, and 3) are entirely located upstream of the anadromous portions of Bodfish Creek. The upstream limit of Location 4 begins at the upstream limit of anadromy in Bodfish Creek. At this location, the road runs parallel to the riparian zone, and it is within this location the roadway crosses over Blackhawk Canyon Creek. Location 5 (the downstream most location) is located a considerable distance away (*i.e.,* approximately 800 feet) from Bodfish Creek.

All proposed work will be conducted above the ordinary high water mark (OHWM), which defines the lateral extent of critical habitat. However, some of the proposed activities have the potential to indirectly impact critical habitat including modifications to existing culverts, clearing and grubbing to the cut-fill line, and tree removal. Such impacts to steelhead habitat may include increased sedimentation of spawning and rearing habitats and a loss of shade from tree removal.

To address erosion issues on steep slopes within the project limits, Caltrans proposes to construct nine soil nail walls and one, type-5 retaining wall. All of the soil nail walls will be constructed outside of the riparian corridor along the north side of the roadway (*i.e.*, upland side as opposed to the riparian side). One retaining wall will be constructed at Location 4 on the riparian side of the roadway. This retaining wall will be constructed within Caltrans' right-of-way, with the toe of the wall located at least 21 feet upslope of the OHWM. Construction of all walls will be conducted from the roadway, and machinery will not enter the riparian corridor. The construction of the soil nail walls would involve excavating the hillside, drilling holes, installing the soil nails, and providing continued connectivity of existing drainage systems. The slurry that is produced from the use of water during drilling would be fully contained and disposed of at an approved facility and would not be allowed to enter any drainage system or waterway. The retaining wall will consist of a vertical reinforced-concrete wall stem and a concrete footing which will range from 6 to 8 feet tall, will be approximately 170 feet long, and approximately one foot wide. All of the walls would include end treatments such as architectural treatments and an anti-graffiti coating.

Caltrans proposes to modify 22 culverts within the project area, all of which are located in ephemeral drainages with no fish species present at any time of year. Repairs or improvements to the existing drainage culverts include replacing or extending inlets or outlets, extending downdrains toward the bank of Bodfish Creek, and trenching for culvert placement. Additional culverts, steel pipe inlets, grate line drains, and other drainage system infrastructure will be constructed.

Caltrans proposes to remove up to 850 trees within the 5.05 mile extent of the project limits. Most trees proposed for removal occur on the north side of SR 152 (*i.e.,* the upland side). The number of trees to be removed from the riparian corridor along the south side of SR 152 includes: 9 trees at Location 1, 35 trees at Location 2, 33 trees at Location 3, and 80 trees at Location 4 (approximately 157 trees total). Location 5 is located far from the riparian zone and therefore no riparian trees will be removed. Tree species include coast redwood (*Sequoia sempervirens*), tanoak (*Lithocarpus densiflora*), big-leaf maple (*Acer macrophyllum*), coast live oak (*Quercus agrifolia*), toyon (*Heteromeles arbutifolia*), and California bay (*Umbellularia*

californica). These trees range in size (defined as diameter at breast height, DBH) from 4 to 40 inches DBH.

Caltrans has proposed several Best Management Practices (BMPs) including several steelhead-specific measures to reduce or eliminate the potential for adverse impacts to steelhead and their designated critical habitat. Working mainly along the north side of SR 152 is one way Caltrans seeks to minimize impacts on S-CCC steelhead, their designated critical habitat. Other measures will include restricting work to between June 15 and October 15, developing a Storm Water Pollution Prevention Plan for the project, providing environmental education for the construction crews, delineating and fencing of environmentally sensitive areas, and by using silt fences and other erosion control measures to minimize sedimentation in Bodfish Creek. Caltrans (2012) provides a complete list of all proposed minimization measures.

Endangered Species Act

In its January 23, 2013 letter, Caltrans asked for concurrence with a finding that the Hecker Pass Safety Improvement Project would not likely adversely affect threatened South-Central California Coast (S-CCC) steelhead (*Oncorhynchus mykiss*) or its designated critical habitat. Bodfish Creek and its tributary Blackhawk Canyon Creek are designated as critical habitat for the S-CCC steelhead DPS (70 FR 52488). Although the project may result in temporary impacts to designated critical habitat in Bodfish Creek resulting from upland tree removal or sedimentation following construction, Caltrans has determined these impacts are unlikely to cause destruction or adverse modification that appreciably diminishes the value of critical habitat for S-CCC steelhead.

The life history of steelhead is summarized by Busby *et al.* (1996) and Shapovalov and Taft (1954). Bodfish Creek is a small, unregulated tributary to Uvas Creek which flows to the Pajaro River in southern Santa Clara County. Along Location 4, surface flow is present throughout the dry season in most years and juvenile steelhead are typically present in moderate to high abundances (Casagrande 2010, 2012). Since 2005, annual sampling of juvenile steelhead has been conducted in Bodfish Creek including one site within Location 4. During this time, juvenile steelhead densities at this site, when surface water was present, have ranged from 16.1 to 75.6 fish per 100 feet of stream (Casagrande 2012). The site was dry in October of 2007 and 2008.

Take of juvenile steelhead individuals is not anticipated because there will be no creek dewatering or fish relocation activities and all proposed construction activities will occur above the OHWM. Also, Caltrans will implement several BMPs to minimize erosion and sediment delivery to Bodfish Creek.

Although Caltrans proposes to remove up to 850 trees as part of this project, a majority of the trees (approximately 82 percent) are located on the upland side of the roadway and do not contribute to the riparian environment (*e.g.,* source of large woody debris) or critical habitat. Of the trees on the riparian side, all are located immediately adjacent to the roadway shoulder (*i.e.,* top of bank) leaving a vast majority of the trees within the riparian zone un-impacted. Furthermore, Bodfish Creek flows west to east through a fairly confined canyon which is

naturally shady and therefore impacts to stream shading and water temperature will be negligible. The removal of trees on the riparian side of the roadway will have some indirect impacts to critical habitat such as the loss of future large woody debris recruitment to the creek and a slight reduction in the delivery of allochthonous debris to the creek. Caltrans has proposed compensatory measures (*i.e.,* the purchase of 10 acres of conservation easement at an off-site location in the San Lorenzo River Watershed in Santa Cruz County) to offset these impacts.

NMFS considers the possibility of adverse effects to listed S-CCC steelhead and their designated critical habitat during project implementation to be insignificant because: (1) the proposed culvert activities on ephemeral tributaries will be conducted during the dry; (2) no work will occur below the OHWM along Bodfish Creek; (3) tree removal will be limited to those absolutely necessary to achieve safety goals; (4) Caltrans will implement multiple BMPs and other measures to minimize disturbances and to preclude potential adverse effects to the river; and (5) the improvements to drainage systems will help prevent more catastrophic embankment failures and sedimentation in Bodfish Creek.

Although a large number of trees will be removed, NMFS believes there will not be an appreciable loss of shade over Bodfish Creek because the high density of trees along the creek that will not be affected by the project and the naturally steep canyon walls of the drainage will continue to provide adequate sources of shade. In addition, per the mitigation requirements of the California Department of Fish and Wildlife, Caltrans will offset permanent impacts to 3.37 acres of riparian habitat by purchasing a conservation easement consisting of approximately 10 acres and/or by donating some of the large redwood logs removed during this project for local habitat enhancement projects.

Based on the best available information, NMFS concurs with Caltrans' determination that threatened S-CCC steelhead are not likely to be adversely affected by the activities proposed for the Hecker Pass Safety Improvement Project. Regarding designated critical habitat, NMFS has determined the proposed the Hecker Pass Safety Improvement Project is not likely to adversely affect designated critical habitat for S-CCC steelhead. This concludes informal consultation in accordance with 50 CFR 402.13(a) for the proposed Hecker Pass Safety Improvement Project in Santa Clara County, California. However, further consultation may be required if: (1) new information reveals effects of the project that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) current project plans change in a manner that causes an effect to listed species or critical habitat not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

Fish and Wildlife Coordination Act

The purpose of the FWCA is to ensure wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662]. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer

recommendations for the conservation of species and habitats beyond those currently managed under the ESA. Pursuant to FWCA, NMFS recommends that Caltrans investigate future opportunities for the use of large trees removed during projects such as the Hecker Pass Safety Improvement Project that will ultimately enhance local wildlife populations and their habitats.

Please contact Mr. Joel Casagrande at (707) 575-6016, or via email at joel.casagrande@noaa.gov should you have any questions concerning this consultation.

Sincerely,

for Rodney R. McInnis
Regional Administrator

cc: Stuart Kirkham, Caltrans, Oakland
Chris Jannusch, Caltrans, Oakland
Melissa Escaron, CDFW, Yountville
Jerry Roe, USFWS, Sacramento
Paula Gill, USACE, San Francisco
Copy to File: ARN: 151416-SWR-2012-SR01874

Literature Cited

Busby, P. J., T. C. Wainwright, G. J. Bryant, L. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-27. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington. August, 1996.

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Casagrande, J. 2010. Distribution, abundance, growth and habitat use of steelhead in Uvas Creek, California. Master's Thesis. San José State University. 174 pp.

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Shapovalov, L., and A. C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. California Department of Fish and Game Fish Bulletin 98: 375 p.

70 FR 52488. September 2, 2005. Final Rule: Endangered and Threatened Species: Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of Commerce. Federal Register, Volume 70 Pages 52487-52627.

Hecker Pass Safety Improvement Project

SANTA CLARA COUNTY, CALIFORNIA
DISTRICT 4 – SCL – 152, (PM 0.14/5.20)
EA 2A2500/EFIS 0400000813

Final Environmental Impact Report/Environmental Assessment

Prepared by the
State of California Department of Transportation

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

November 2010

General Information About This Document

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Jared Goldfine, Environmental Planning, P.O. Box 23660, Oakland, CA 94623; (510) 286-6203 Voice, or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

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04-SCL-152-PM 0.14/5.2
SCH#2009042029
EA 2A2500/EFIS 0400000813

Construct safety improvements along State Route 152, from the Santa Cruz County line, to just west of the Gilroy city limits (post mile 0.14 to post mile 5.20).

FINAL ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2) (C) and 49 USC 303

THE STATE OF CALIFORNIA
Department of Transportation

11-5-10
Date of Approval

Bijan Sartipi
Director, District 4
California Department of Transportation
NEPA and CEQA Lead Agency

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Summary

The California Department of Transportation (Department) is proposing roadway safety improvements on portions of State Route (SR) 152 from 0.14 miles east of the Santa Cruz County line to 0.17 miles east of Watsonville Road. Figures 1.1-1 and 1.1-2 show the project location and project vicinity. The purpose of the project is to reduce the number of cross-centerline accidents along this highway corridor. Within the project limits, SR 152 is a two-lane undivided conventional east-west highway, located within a rural setting of Santa Clara County. The existing highway consists of two 12-foot-wide opposing traffic lanes with outside paved shoulders that vary from less than 1 foot to more than 8 feet in width. Accidents on this segment of the highway have involved vehicles that cross the roadway centerline. The proposed roadway improvements are designed to improve sight distance on this segment of the highway, thereby reducing the number and severity of cross-centerline accidents.

This document addresses the environmental impacts of a “Build Alternative” and a “No-Build Alternative.” In general, the ”Build Alternative” includes improving the existing lanes and shoulders, overlaying the existing pavement, removing trees, constructing retaining walls to accommodate shoulder widening, and adding a left-turn lane from eastbound SR 152 to Watsonville Road. Within the limits of the project, the improvements would be constructed in five spot locations. The “No-Build Alternative” would not result in any improvements to this portion of SR 152.

This document addresses the potential of the proposed build alternative to have adverse impacts on the environment. Potential impacts and avoidance, minimization, and mitigation measures are summarized in Table S-1.

The proposed project is a joint project by the California Department of Transportation (Department) and the Federal Highway Administration (FHWA), and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The Department is the lead agency under CEQA and NEPA. In addition, FHWA’s responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the Department under its assumption of responsibility pursuant to 23 United States Code (U.S.C.) 327.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a “lower level” document is prepared for NEPA. One of the most commonly seen joint document types is an Environmental Impact Report/Environmental Assessment (EIR/EA).

Following receipt of public comments on the Draft EIR/EA and circulation of the Final EIR/EA, the Department has taken actions regarding the environmental document. The Department has certified the EIR/EA, issued Findings and a Statement of Overriding Considerations under CEQA, and issued a Finding of No Significant Impact (FONSI) under NEPA. In addition to NEPA and CEQA compliance, the project is subject to other federal, state, and local laws, policies, and guidelines that are addressed in this EIR/EA. Applicable

regulatory consultation or approvals have been completed or may be needed from the following agencies:

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species Review and Comment on 404 Permit	Biological Opinion 81420-2009-F-1058-2 was received by the Department on July 14, 2010, and accepted by the Department on October 19, 2010..
United States Army Corps of Engineers	Section 404 Nationwide Permit with pre-construction notification for filling or dredging waters of the United States.	A Section 404 Nationwide Permit pre-construction notification will be submitted to the Corps.
California Department of Fish and Game	1602 Agreement for Streambed Alteration Section 2081 (b) 0.1Incidental Take Permit Agreement for Threatened and Endangered Species	An application for a 1602 Agreement for streambed alteration and a Section 2081 (b) 0.1 Incidental Take permit Agreement for Threatened and Endangered Species will be submitted to the California Department of Fish and Game during design..
Central Coast Regional Water Quality Control Board	Section 401 Water Quality Certification	An Application for water quality certification will be submitted to the Central Coast Regional Water Quality Control Board

Table S-1. Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential impact of No Build Alternative	Potential impact of Build Alternative	Avoidance, minimization, and/or mitigation measures
Land Use	None	The build alternative would be inconsistent with some elements of the Santa Clara County General Plan related to visual/aesthetic resources. The project would require the acquisition of farmland. The project would require the acquisition of parkland	None
Growth	None	None	None
Community Impacts: Relocations	None	None	None
Community Impacts: Environmental Justice	None	None	None
Utilities and Emergency Services	None	Utility relocations are anticipated during project construction. Further investigation would occur during the project design phase	None
Traffic and Transportation, Pedestrian and Bicycle Facilities	The number and incidence of cross-centerline accidents would not be reduced under the No Build Alternative	Brief, intermittent traffic disruptions would occur during project construction. No permanent adverse impacts would occur	None
Visual/Aesthetics	None	Trees would be removed and retaining walls would be constructed, altering views from the roadway	Recommended measures to minimize visual impacts are described under Visual/Aesthetics (Section 2.1.3.4)
Cultural Resources	None	None	None
Hydrology and Floodplains	None	None	None
Water Quality and Storm Water Runoff	None	Increased impervious area could increase the sediment load in storm water runoff	Appropriate BMPs and measures are described under Water Quality and Storm Water Runoff (Section 2.2.1.4)

Table S-1. Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential impact of No Build Alternative	Potential impact of Build Alternative	Avoidance, minimization, and/or mitigation measures
Geology, Soils, and Seismicity	None	Retaining walls could be subject to damage during a seismic event. Soils within the project area exhibit high levels of erosion, increased impervious area could accelerate storm water runoff, exacerbating soil erosion. Portions of the hillsides in locations 3&4 are historically susceptible to landslides and rock falls	Measures to minimize seismic and soil impacts are described under Geology/Soils/ Seismic/Topography (Section 2.2.2.4)
Hazardous Waste and Materials	None	Potential for presence of aerially deposited lead in soil adjacent to roadway. Potential for lead chromate in yellow roadway striping. Exposure to these contaminants during construction could affect safety and health	Measures to avoid and minimize impacts are described under Hazardous Waste and Materials (Section 2.2.3.4)
Air quality	None	None	None
Noise	None	None	None
Natural Communities	None	Approximately 148 trees would be removed	Measures to avoid natural communities and compensation for tree removal are described under Natural Communities (Section 2.3.1.3)
Wetlands and Other Waters of the United States	None	Approximately 0.013 acres of temporary impacts and 0.011 acres of permanent impacts would occur to waters of the US under the jurisdiction of the US Army Corps of Engineers	Measures to mitigate for loss of wetlands and other waters are described under Wetlands and Other Waters (Section 2.3.2.4)
Plant Species	None	None	None
Animal Species	None	There are numerous special-status animal species that have potential to occur in the project area and could be impacted in various ways through project	Avoidance and minimization measures are described under Animal Species (Section 2.3.3.4)

Table S-1. Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential impact of No Build Alternative	Potential impact of Build Alternative	Avoidance, minimization, and/or mitigation measures
		activities. Refer to the Animal Species section for detailed information	
Threatened and Endangered Species	None	There is potential that California red-legged frog and California tiger salamander could occur within the project area. The project would be likely to adversely affect both of these species	Measures to avoid, minimize, and mitigate impacts to California red-legged frog and California tiger salamander are described under Threatened and Endangered Species (Section 2.3.4.4)
Invasive Species	None	Project construction activities could have the potential to inadvertently spread invasive species if present	Measures to minimize and avoid the spread of invasive species are described under Invasive Species (Section 2.3.5.4)
Cumulative Impacts	None	Areas where development is permissible in the project area are limited, no lands are currently slated for changes in zoning, and no reasonably foreseeable future development projects are known. Therefore, no cumulative impacts as a result of the project are expected	None
Energy	None	None	None
Climate Change	None	None	None

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Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Department) is proposing roadway safety improvements on portions of State Route (SR) 152 from 0.14 miles east of the Santa Cruz County line to 0.17 miles east of Watsonville Road (post mile 0.14 to post mile 5.20). Figures 1.1-1 and 1.1-2 show the project location and project vicinity. The purpose of the project is to reduce the number of cross-centerline accidents along this corridor.

In general, the proposed project includes improving the existing lanes and shoulders, overlaying the existing pavement, removing trees, constructing retaining walls, and adding a left-turn lane from eastbound SR 152 to Watsonville Road.

This project is included in the Fiscal Year 2010 State Highway Operation and Protection Program (SHOPP). It is listed in the Metropolitan Transportation Commission's (MTC's) Transportation Improvement Program (TIP) Amendment #09-27, which was approved by MTC on September 26, 2009, by the Department on September 28, 2009, and by the Federal Highway Administration (FHWA) on October 27, 2009. The TIP Amendment describes the proposed project as being in Santa Clara County, from Hecker Pass to Uvas Creek, and states the project will improve sight distance, upgrade shoulders, and provide minor realignment.

1.2 Purpose and Need

1.2.1 Project Purpose

The purpose of the project is to reduce the number of cross-centerline and run-off-the road accidents along this highway corridor.

1.2.2 Project Need

Within the project limits, SR 152 is a two-lane undivided conventional east-west highway, located within a rural setting of Santa Clara County. The existing highway consists of two 12-foot (ft)-wide opposing traffic lanes with outside paved shoulders that vary from less than 1 ft to more than 8 feet (ft) in width.

1.2.2.1 Roadway Deficiencies

SR 152 within the project limits is in a heavily forested area of rural Santa Clara County. The existing alignment has sharp turns, narrow shoulders in many locations, and steep embankments and vegetation adjacent to the shoulders of the roadway. Truck-trailers over 45 ft long have already been banned from SR 152 between Watsonville and Gilroy since 1986, based on, among other factors, the limited roadway width, winding alignment of the highway, and the number of truck-involved accidents[1]. Adding to the available pullout areas would increase refuge opportunities for disabled vehicles. The inability of emergency response vehicles to use shoulders and bypass stalled traffic to reach disabled vehicles delays their response time.

[1] Department of Transportation, special truck restriction history (http://www.dot.ca.gov/hq/traffops/trucks/routes/restrict-hist-152.htm)

Improving safety along the present location of the highway cannot be accomplished without removal of vegetation, additional side slope grading, and construction of retaining walls and other slope stability measures.

A “clear recovery zone” (CRZ) would be added depending on the conditions along each of the five identified sections of SR 152 within the project limits. The CRZ is provided as a recovery area when errant vehicles leave the traveled way, offering the motorist the opportunity to regain control. A typical CRZ, 20 ft wide on a conventional highway, is an area cleared of fixed objects adjacent to the roadway including trees, utility poles, and signs.

1.2.2.2 State Route 152/Watsonville Intersection

There is no left turn lane pocket at the SR 152/Watsonville Road intersection, so eastbound vehicles back up in the highway lane if a car is waiting to make a left turn onto northbound Watsonville Road. Vehicles wanting to make a left turn can increase the potential for conflicts that may result in cross centerline accidents.

1.2.2.3 Traffic and Accident Data

A number of accidents on this segment of the highway have involved vehicles that cross the roadway centerline. The Department developed a list in 2004 of candidate major collision-reduction projects to the Headquarters of Traffic Safety program coordinator based on results from the Two- and Three-Lane Safety Monitoring program. Because a high number of cross-centerine accidents (CCAs) occurred within this portion of SR 152 during the study period, the Project was submitted and the District’s recommendation was approved by District Headquarters on June 21, 2004.

The average annual daily traffic along this segment of SR 152 as of 2008 is 5,900 vehicles, and is expected to increase to 9,500 vehicles in 20 years, by 2028. An 8-year study period between October 1, 2000, and September 30, 2008, generated detailed information about the number, type, frequency, and causes of accidents along this section of SR 152. The average number of accidents along the study corridor wasere 1.91 per million vehicles, which was higher than the statewide average of 1.49 per million vehicles.

The study found that 29 of the 176 accidents involved vehicles that crossed the centerline. Constructing the improvements proposed as part of this project would create an upgraded facility that would be better able to assist out-of-control motorists from crossing the centerline and would reduce CCAs.

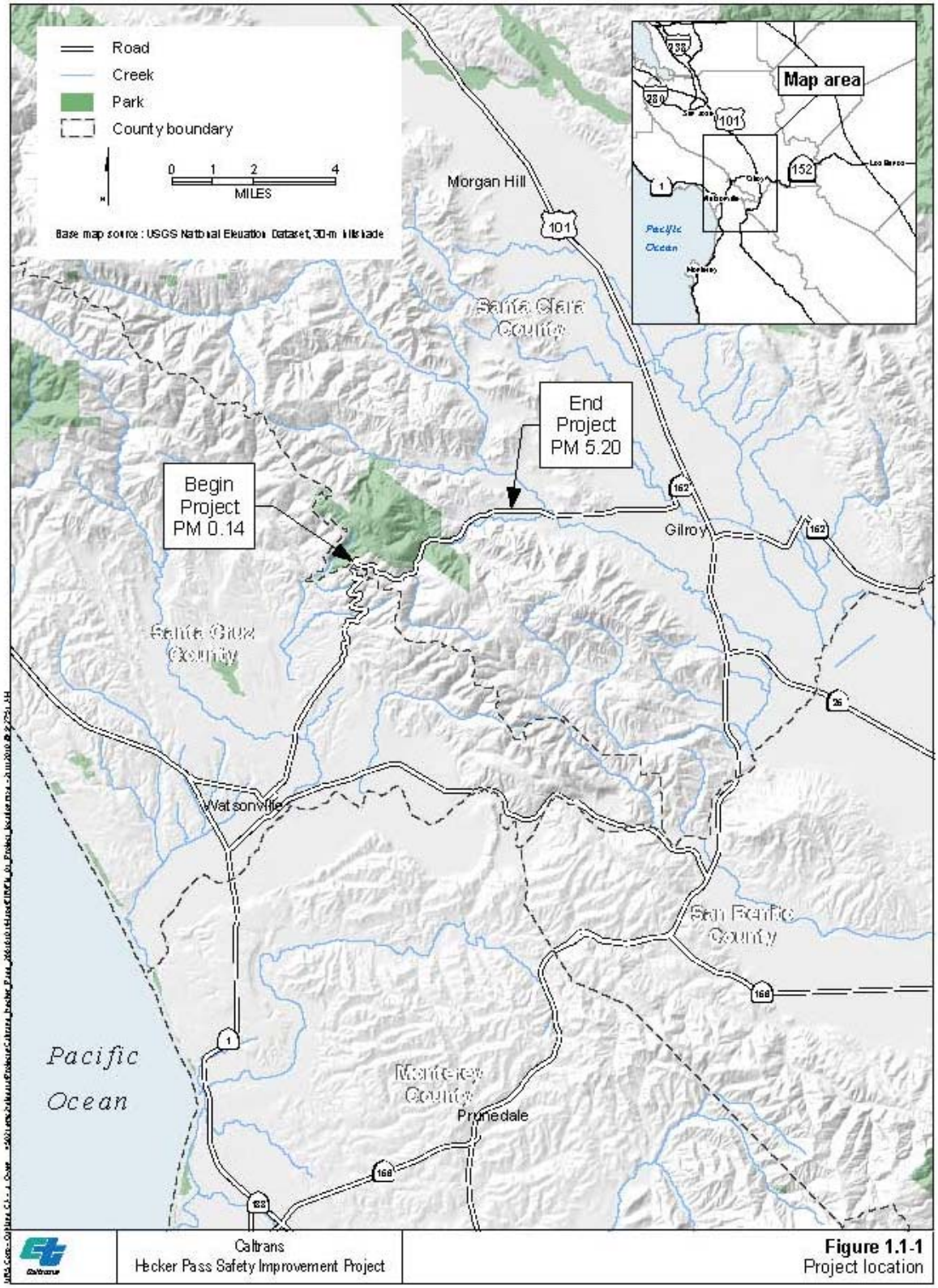

Figure 1.1-1. Project Location

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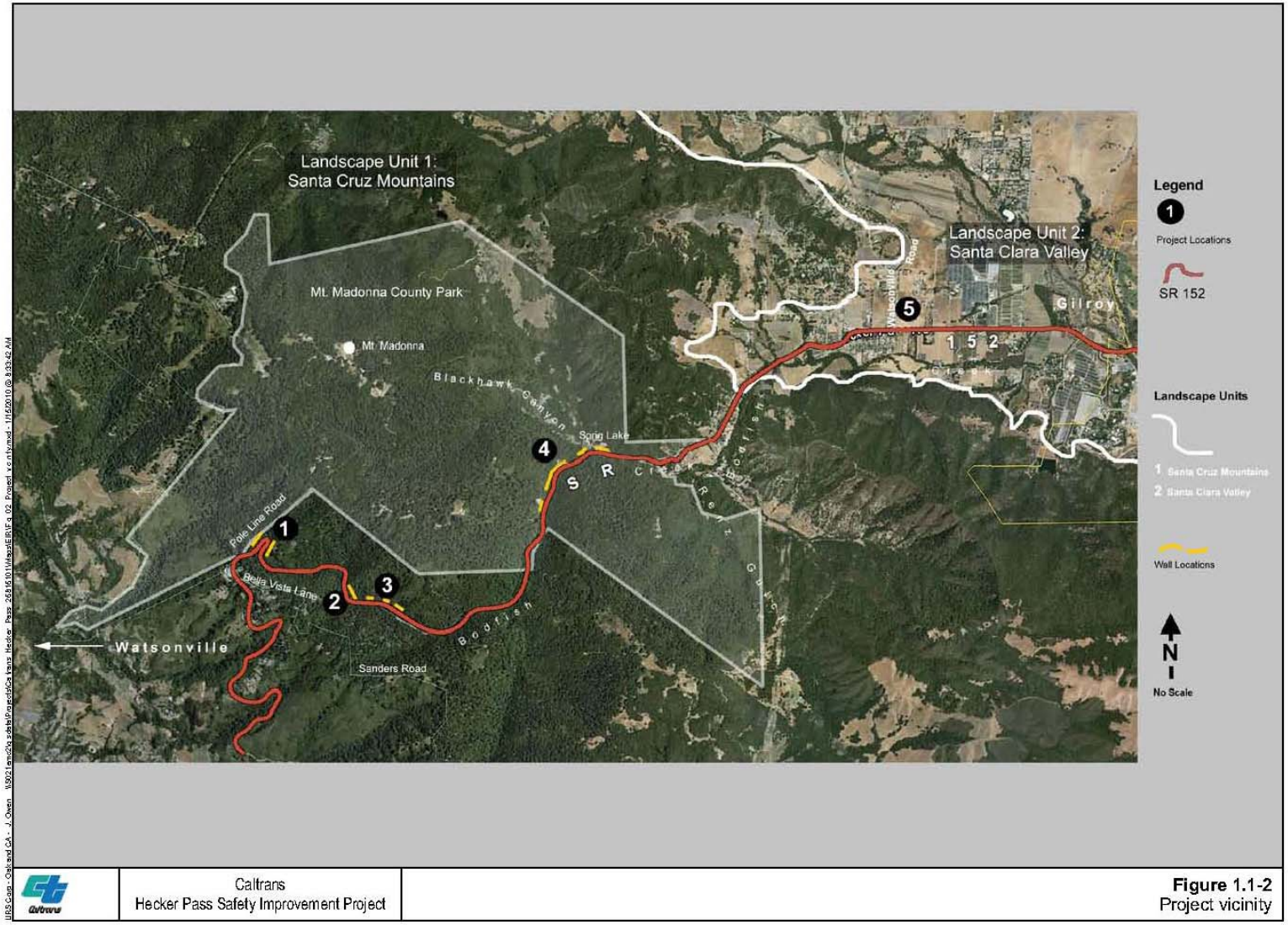

Figure 1.1-2. Project Vicinity

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1.2.2.4 Independent Utility and Logical Termini

As a safety project, the limits were defined based on the . Two- and Three-Lane Safety Monitoring Program. The five locations were identified as having higher than the statewide average number of CCA's. Segment 5 was defined to include adequate dimensions to incorporate the transitions for a new left turn lane pocket at Watsonville Road. The project would not result in any need for future improvements to adjoining highway segments, and would not preclude consideration of similar improvements along other segments of the highway in the future.

1.3 Project Description

This section describes the proposed action and the design alternatives that were developed to improve the safety along this portion of SR 152 reduce the incidence of cross centerline accidents, while avoiding or minimizing environmental impacts to the extent possible. A single "Build Alternative" and the "No-Build Alternative" are the alternatives under consideration and analyzed in this document. The purpose of the project is to reduce the number of cross-centerline and run-off-the road accidents along this highway corridor.

To construct the project, the Department will acquire new right-of-way, permanent easements for future maintenance, and temporary construction easements for construction throughout the project area. Additional details on roadway configurations at various locations throughout the project area are described in the following sections.

1.3.1 Alternatives

1.3.1.1 Build Alternative

The Build Alternative will involve various safety improvements on SR 152 at five separate locations between PM 0.14 and PM 5.20 (Figure 1.1-2):

- Location 1: PM 0.14/0.26
- Location 2: PM 0.94/1.11
- Location 3: PM 1.22/1.47
- Location 4: PM 2.57/3.20
- Location 5: PM 4.77/5.20

Location 1

The existing roadway configuration at Location 1 (PM 0.14/0.26) includes two 12-ft travel lanes with shoulders varying between 0 and 10 ft. This location also includes three existing culverts: two 18 inch (in) corrugated metal pipes, and one 42-in reinforced concrete pipe. At Location 1, the Build Alternative will include:

- Tree removal
- Construct ion of two soil nail retaining walls (vertical masonry slab walls attached into the hillside by soil nails) adjacent to the westbound travel lane. One wall would have an

approximate maximum height of 17.2 ft and an approximate length of 256.8 ft (Wall 1A) and one wall would have an approximate maximum height of 19.2 ft and an approximate length of 207.1 ft (Wall 1B)

- Widening the existing roadway to provide 8-ft wide shoulders
- Modifying/extending existing culverts to accommodate the widened roadway
- Overlaying pavement to improve the roadway superelevation
- Installing warning signs
- Constructing one biofiltration swale (vegetated channel), one biofiltration strip (vegetated grass cover) and slotted drain for a biofiltration swale to remove pollutants from stormwater runoff
- Acquireing approximately 0.12 acres of additional right-of-way on the northern side of the roadway to construct the improvements at this location.

Location 2

The existing infrastructure at Location 2 (PM 0.94/1.11) includes two 12-ft travel lanes with no road shoulders. This location also includes one existing 18-in corrugated metal pipe culvert and one existing 24-in corrugated metal pipe culvert. At Location 2, the Build Alternative willould include:

- Tree removal
- Construction of a soil nail retaining wall adjacent to the westbound travel lane with an approximate maximum height of 29.0 ft and an approximate length of 430.6 ft (Wall 2A)
- Widening the existing roadway to provide 8-ft-wide shoulders
- Overlaying pavement to improve the roadway superelevation
- Installing an 18-in culvert with two drainage inlets at the retaining wall, install one pipe inlet, and modify/extend the existing culvert to accommodate the widened roadway
- Installing warning signs
- Acquireing approximately 0.05 acres of additional right-of-way on the northern side of the roadway to construct the improvements at this location.

Location 3

The existing infrastructure at Location 3 (PM 1.22/1.47) includes two 12-ft travel lanes with no road shoulder. Location 3 has a turnout on the northern side of the road which has a 15-ft shoulder. This location also includes three existing culverts; a 30-in, 36-in, and 18-in corrugated metal pipe culvert. At Location 3, the Build Alternative will include:

- Tree removal
- Construction of two soil nail retaining walls adjacent to the westbound travel lane. One wall will have an approximate maximum height of 11.2 ft and an approximate length of 167.9 ft (Wall 3A) and one wall will have an approximate maximum height of 10.2 ft and an approximate length of 207.8 ft (Wall 3B)
- Constructing a soldier pile wall adjacent to the westbound travel lane with an approximate maximum height of 5.2 ft and an approximate length of 125.0 ft (Wall 3C)
- Widening the existing roadway to provide 0 to 12-ft-wide shoulders
- Overlaying pavement to improve the roadway superelevation
- Modifying/extending the existing culverts to accommodate the widened roadway
- Installing warning signs
- Acquireing approximately 0.07 acres of additional right-of-way on the northern side of the roadway to construct the improvements at this location.

Location 4

The existing infrastructure at Location 4 (PM 2.57/3.20) includes two 12-ft travel lanes with no road shoulder. Two T-intersections in this location on the northern side of the road provide access to the Sprig Lake recreation area parking lot that includes an equestrian staging area, horse trailheads, and a parking lot area. This location also includes seven existing culverts; one 21-in smooth interior plastic pipe/corrugated metal pipe, two 18-in corrugated metal pipes, three 24-in corrugated metal pipes, and one 6-ft by 8-ft high reinforced concrete box culvert. At Location 4, the Build Alternative will include:

- Tree removal
- Construction of five soil nail retaining walls adjacent to the westbound travel lane. One wall would have an approximate maximum height of 31.2 ft and an approximate length of 292.5 ft (Wall 4A), one wall would have an approximate maximum height of 14.2 ft and an approximate length of 57.3 ft (Wall 4B), one wall would have an approximate maximum height of 32.2 ft and an approximate length of 1056.1 ft (Wall 4C), one wall would have an approximate maximum height of 23.2 ft and an approximate length of 584.1 ft (Wall 4D), and one wall would have an approximate maximum height of 12.0 ft and an approximate length of 345.0 ft (Wall 4F)
- Constructing a concrete retaining wall adjacent to the westbound travel lane with an approximate maximum height of 5.0 ft and an approximate length of 204.5 ft (Wall 4E)
- Widening the existing roadway to provide 15-ft wide shoulders
- Overlaying pavement to improve the roadway superelevation
- Modifying/extending the existing culverts to accommodate the widened roadway

- Constructing two biofiltration swales and one biofiltration strip
- Installing warning signs
- Acquireing approximately 0.55 acres of additional right-of-way on the northern side of the roadway to construct the improvements at this location.

Location 5

The existing infrastructure at Location 5 (PM 4.77/5.20) includes 12-ft travel lanes and shoulders varying from 2 ft to 8 ft. There is a T intersection on the northern side where Watsonville Road intersects with SR 152, as well as nine commercial and residential driveways in this location. This location also includes three existing culverts; one 32-in corrugated metal pipe, one 12-in corrugated metal pipe (driveway) and one 42 x 29-in corrugated metal pipe arch. At Location 5, the Build Alternative will include:

- Tree removal
- Widening the existing roadway to provide 8-ft-wide shoulders
- Construction of an approximately 550-ft-long left-turn lane along eastbound SR 152 at Watsonville Road
- Overlaying pavement to improve the roadway superelevation
- Modifying/extending the existing culverts to accommodate the widened roadway
- Constructing four biofiltration swales and one biofiltration strip
- Installing warning signs
- Acquireing approximately 1.20 acres of additional right-of-way on the northern side of the roadway to construct the improvements at this location.

1.3.1.2 Drainage Repairs

Within the boundaries of the five improvement locations, a total of 17 culverts cross under SR 152. The diameters of the culverts range from 12 in to 72 in.

Repairs to the existing drainage culverts include replacing or extending inlets and outlets, extending downdrains to the bank of the creek, and trenching for culvert placement.

1.3.1.3 Utility Relocation

Two utility companies, Pacific Gas and Electric and Verizon, have aerial and underground communications facilities in the project area. Relocation of these facilities is anticipated. The Department is in discussion with these companies regarding the utility relocation.

1.3.1.4 Equipment Staging

The contractor will determine the location of the equipment staging area in coordination with the resident engineer. The resident engineer and the Department technical specialists will work with the contractor to ensure that equipment is not staged in an environmentally sensitive area.

Two potential staging areas have been identified, including the Mt. Madonna Inn Restaurant parking lot (Station [Sta] 417+75), in Santa Cruz County along SR 152, and an area west of Location 5 (Sta 252+00) within the Department's right-of-way north of SR 152.

1.3.1.5 Site Cleanup and Restoration

All construction-related materials would be removed after construction activities are completed. The temporary construction easements and staging areas will be cleaned up, recontoured to original grade, and revegetated with appropriate native species, as necessary. Permanent erosion control, including soil stabilization measures such as hydroseeding and coir netting, will be applied to all temporarily affected project areas to minimize erosion after construction.

1.3.1.6 Estimated Cost

The total project cost of the Build Alternative in the Year 20121 is summarized as follows:

Project Construction Capital	$18.97 M20.5 M
Right-of-Way Capital	$1.2 M
Total Estimated Project Cost	**$20.27 M**

M = million

1.3.2 Transportation System Management and Transportation Demand Management Alternatives

Transportation System Management (TSM) strategies focus on increasing the efficiency of the existing facility without adding additional lanes, while Transportation Demand Management (TDM) strategies focus on reducing vehicle trips. This is a safety improvement project and does not add capacity or affect vehicle trips. TSM and TDM measures are not applicable.

1.3.3 No Build (No Action) Alternative

The No-Build Alternative is being evaluated in accordance with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) requirements, and offers a basis of comparison with the Build Alternative. The No-Build Alternative will not provide any roadway improvements to SR 152.

1.3.4 Identification of a Preferred Alternative

In May of 2010, the Department formally identified the Build Alternative as the preferred alternative. This decision was made after considering comments from outside agencies, the public, and the internal Project Development Team. In accordance with CEQA, the Department has certified that the project complies with CEQA, adopted findings for all significant impacts identified, and certified a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance. A Notice of Determination has been filed with the State Clearinghouse that identifies the project's significant impacts, mitigation measures were included as conditions of project approval, that findings were made, and that a Statement of Overriding Considerations was adopted.

TheSimilarly, if the Department, as assigned by FHWA, determined thats the NEPA action does not significantly affect the environment., Tthe Department haswill issued a Finding of No Significant Impact (FONSI) in accordance with NEPA.

Since publication of the Draft Environmental Impact Report/Environmental Assessment (DEIR/EA) in February 2010, the Department has published new guidance on the preparation of EIR/EAs. The new guidance, mainly in the regulatory setting portions of the document, includes changes to the title page, and sections on climate change, wetlands, threatened and endangered species, and water quality. This document has been updated to reflect the new guidance. Changes made to the document are are indicated by a vertical line on the left side of the page.

1.3.5 Alternatives Considered but Eliminated from Further Discussion Prior to the Draft Environmental Document

The existing conditions throughout the project limits restricted the alternatives that could be considered. A screening-level assessment was conducted to determine other potential alternatives. This assessment addressed the potential for widening and improvements on the southern side of the roadway. Widening to the south would not require road cuts and retaining walls, potentially resulting in fewer aesthetic impacts. However, widening to the south would result in greater impacts to Bodfish Creek, including potential fill in the creek and sedimentation, impacts to special-status species, removal of a greater number of trees, and deposition of materials to support the widened roadway, which would also be greater biological habitat and visual impacts. Due to the larger number of potential impacts, widening on the southern side to the roadway was eliminated from further consideration.

1.4 Permits and Approvals Needed

Table 1.4-1 lists the environmental permits, reviews, and approvals that would be required for project construction.

Table 1.4-1: Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species Review and Comment on 404 Permit	The Department initiated formal Section 7 consultation with USFWS. A Biological Assessment was submitted June 2009.Biological Opinion 81420-2009-F-1058-2 was received on July 14, 2010, and accepted by the Department October 19, 2010.
United States Army Corps of Engineers	Section 404 Nationwide Permit with pre-construction notification for filling or dredging waters of the United States.	A Section 404 Nationwide Permit pre-construction notification will be submitted to the Corps.
California Department of Fish and Game	1602 Agreement for Streambed Alteration Section 2081 (b) 0.1 Incidental Take PermitAgreement for Threatened and Endangered Species	An application for a 1602 Agreement for streambed alteration and a Section 2081 (b) 80.1 Incidental Take PermitAgreement for Threatened and Endangered Species will be submitted to the California Department of Fish and Game during project design..
Central Coast Regional Water Quality Control Board	Section 401 Water Quality Certification	An application for water quality certification will be submitted during PS&E.

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

The environmental analyses discussed in this chapter are based on supporting technical studies that are not attached to this document. The purpose of this section is to provide a discussion of the affected environment, potential impacts, and avoidance, minimization, and/or mitigation measures. Each analyzed resource area includes a discussion of only the build alternative, the no-build alternative would not involve any construction activities, thus no environmental impacts would occur. The studies performed were based on compliance with CEQA and NEPA, completion of the CEQA Checklist included in Appendix B, and public outreach and agency consultation described in Chapter 4. A list of the technical studies is provided in Appendix G. Copies of the technical studies are available for review at District 4, Office of Environmental Analysis, and 111 Grand Avenue, Oakland, CA 94623-0660.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document.

Growth

The project activities and resulting transportation facility would provide safety improvements that would not alter or affect growth patterns within the project vicinity. The project would not add new travel lanes or additional capacity to SR 152, and would not create any new access to developed or undeveloped lands.

Coastal Zone

The project area is not located within the coastal zone.

Wild and Scenic Rivers

No wild and scenic rivers run through the project area.

Timberland

No timberland production zones are within the project area.

Community Impacts

This is a safety project that willould neitherot affect community character or cohesion, nor change public access, divide neighborhoods, separate residences from community facilities, change the quality of life, or increase urbanization or isolation. The project would not affect any community group, and would not cause disproportionately high and adverse effects on any minority or low-income populations, as per EO 12808, regarding environmental justice.

Relocations and Real Property Acquisitions

The project would not result in any relocations or residential/business displacements. Minor amounts of new right-of-way would be acquired along the highway frontage; this would not result in any adverse impacts.

Utilities/Emergency Services

Relocation of utilities within the project area would be required before construction begins and may include relocating above-ground utilities underground or moving utilities to the opposite side of the roadway from where construction activities would occur. Specific locations and types of utilities would be determined during the project design phase.

The project would not result in any impacts that would affect the movement of or access to emergency services through the project area. Emergency vehicles would be given priority over other vehicles to pass during project construction.

Hydrology and Floodplain

The project would not encroach into a floodplain.

Paleontology

The project would not involve substantial excavation and would not have any effects on paleontological resources.

Air Quality

This project is a safety improvement project that would not increase the roadway capacity. Thus, the project is exempt from an air quality analysis, conformity determination, and Mobile Source Air Toxics evaluation. There would be no adverse effects on air quality.

Noise

This project does not involve construction on a new horizontal or vertical alignment and would not result in any new traffic noise impacts. Brief, noticeable increases in noise levels may be experienced during construction of the project; however, these noise increases would be temporary and would revert to their original levels after construction ends.

Plant Species

Based on the results of focused plant surveys during April through July 2008 and extensive analysis of literature and database results, the Department determined that special-status plant species do not occur in the project area.

Energy

The project involves spot safety improvements. When balancing energy used during construction and operation against energy saved by reducing the frequency of traffic incidents, the project would not have substantial energy impacts.

2.1 Human Environment

2.1.1 Land Use

2.1.1.1 Existing and Future Land Use

Land use as determined by Santa Clara County consists of undeveloped open space at Locations 1, 2, and 3; regional parkland at Location 4 where the project area is within Mt. Madonna County Park; and medium scale agricultural and rural residential land use at Location 5. Adjacent land is undeveloped at Locations 1, 2, 3, and 4, while Location 5 is adjacent to low

density, rural, residential development and several small-scale wineries. No reasonably foreseeable future changes in land use are currently anticipated.

2.1.1.2 Consistency with State, Regional, and Local Plans and Programs

Regional Transportation Programslans

This project is included in the Fiscal Year 2010 State Highway Operation and Protection Program (SHOPP). It is listed in the Metropolitan Transportation Commission's (MTC's) Transportation Improvement Program (TIP) Amendment #09-27, which was approved by MTC on September 26, 2009, by the Department on September 28, 2009, and by the Federal Highway Administration (FHWA) on October 27, 2009. The TIP Amendment describes the proposed project as being in Santa Clara County, from Hecker Pass to Uvas Creek, and identifies its purposes as being to improve sight distance, upgrade shoulders, and provide minor realignment.

State Scenic Highway Program

The affected portion of SR 152 in Santa Clara County is not listed as an eligible State Scenic Highway in the State Scenic Highway Master Plan (Caltrans 2009a). However, Policy R-PR(i) 22 of the Scenic Highways Element of the Santa Clara County General Plan calls for nomination and designation of SR 152 in Santa Clara County as a State Scenic Highway, as discussed in greater detail below.

The four criteria used to determine whether a highway may be designated as scenic are:

- "The State or county highway consists of a scenic corridor that is composed of a memorable landscape that showcases the natural scenic beauty or agriculture of California..."
- "Existing visual intrusions do not significantly impact the scenic corridor…"
- "Demonstration of strong local support for the proposed scenic highway designation."
- "The length of the proposed scenic highway is not less than a mile and is not segmented."

Before a highway such as SR 152 in the project area may be designated as an official State Scenic Highway, it must be added by legislation to the list of eligible State Scenic Highways in California Streets and Highways Code Section 263. Should SR 152 be added to the list of eligible highways, the Department's Scenic Highway Guidelines define a specific process and criteria to determine eligibility of a highway for "scenic" status. These include that not more than one-quarter of the proposed scenic highway may be affected by visual intrusions. Visual intrusions may be natural or constructed elements, viewed from the highway, that adversely affect the scenic quality of a corridor. Examples of visual intrusions are buildings, unsightly land uses, parking lots, advertising, noise barriers, power lines and communication facilities, agriculture, exotic (nonnative) vegetation, clear-cutting, erosion, grading, and the roadway and associated structures themselves. Intrusions are classified as minor, moderate, or major, but in any case not more than one-quarter of the length should be impacted. Existing visual intrusions on SR 152 within Hecker Pass in Santa Clara County are negligible.

Santa Clara County General Plan 1995 - 2010

Countywide policies of the General Plan applicable to the proposed project are restated in the Rural Unincorporated Areas (Book B, Part 3) policies. The following applicable General Plan policies are taken from the Rural Unincorporated Areas Issues and Policies (Denoted as "R" in the policy number):

Parks and Recreation (denoted as "PR" in the policy number) Chapter, Scenic Highways:

R-PR(i) 22

"Add the following highways to the State Master Plan for Scenic Highways and designate them as official State Scenic Highways…b. Hecker Pass Highway (Highway 152); . . "

R-PR 41

"The visual integrity of the scenic gateways to the South County (Pacheco Pass, Hecker Pass, Route 101 south of Gilroy, and a Coyote greenbelt area north of Morgan Hill) should be protected."

The proposed project would potentially be inconsistent with both polices R-PR(i) 22 and R-PR 41. Visual intrusions (retaining walls) from the proposed project would adversely affect the scenic quality of the Hecker Pass Highway, and thus its potential for nomination.

R-PR 46

"Landscaping with drought-resistant native plants should be encouraged adjacent to scenic roads and highways."

The proposed project is consistent with policy R-PR 46. Mitigation measures in Section 2.1.3.4 discuss revegetation with locally native tree species and would thus conform to this policy.

R-PR 47

"Activities along scenic highways that are of a substantially unsightly nature, such as equipment storage or maintenance, fuel tanks, refuse storage or processing and service yards, should be screened from view."

The proposed project would be consistent with policy R-PR 47. Mitigation measures for screening of unsightly roadside equipment and material storage during construction are listed in Section 2.1.3.4.

Resource Conservation (denoted as "RC" in the policy number) Chapter, Scenic Resources

R-RC 96

"2. Limit development impacts on highly significant scenic resources, such as, ridgelines, prominent hillsides, streams, transportation corridors and county entranceways..."

The proposed project would be inconsistent with Policy R-RC 96. Mitigation measures have been included to minimize adverse visual impacts. However, those impacts are anticipated to remain significant.

Strategy #2: Limit Development Impacts on Highly Significant Scenic Resources

"General policies governing allowable uses and densities in rural areas do not preclude the need at times for special policies and measures to conserve scenic resources of special significance,

such as prominent hillsides and ridgelines highly visible from the valley, riparian areas, scenic transportation corridors, and county entranceways. Development of inappropriate design, location, scale, or density can have a disproportionately greater impact upon highly visible, prominent areas, such as ridgelines."

"Major entryways or 'gateways' to the County also deserve special consideration for scenic conservation and signage appropriate to the characteristics of the land and the area in general. For example, the scenic quality of major south County entranceways should be preserved to enhance residents' and visitors' appreciation of the area and its attractions."

"Informational signs compatible with the scenic resources of the area could be used to promote the area's attractions. Sound walls erected to minimize noise impacts along major thoroughfares may not be compatible with the enjoyment of scenic resource. All in all, there are many reasons to be proud of the scenic qualities of the rural areas, further reinforcing the importance of efforts to retain their scenic value."

The proposed project is potentially inconsistent with Strategy #2. Hecker Pass is identified as a major south County gateway in Policy R-PR 41, and would experience significant visual intrusion as a result of the project.

R-RC (i) 36

"Protect the scenic value of the following major County thoroughfares and entranceways through state scenic highway designation, including…b. Hecker Pass (152 west of Gilroy)…"

The proposed project is potentially inconsistent with Policy R-RC (i) 36. Due to their extent, visual intrusions from the proposed project would adversely affect the scenic quality of the Hecker Pass Highway.

R-RC 98

"Hillsides, ridgelines, scenic transportation corridors, major county entryways, stream environments, and other areas designated as being of special scenic significance should receive utmost consideration and protection due to their prominence, visibility, and overall contribution to the quality of life in Santa Clara County."

The proposed project would be inconsistent with Policy R-RC 98. Mitigation measures have been recommended for the proposed project to minimize adverse visual impacts. However, those impacts are anticipated to remain significant.

R-RC 101

"Roads, building sites, structures and public facilities shall not be allowed to create major or lasting visible scars on the landscape."

The proposed project would be consistent with Policy R-RC 101. Visual prominence of uphill, cut-slope retaining walls would be minimized by dark color surface treatment to reduce contrast and reflectivity.

Santa Clara County Countywide Trails Master Plan Update

County Parks, in partnership with other public agencies, is charged with furthering the implementation of the Countywide Trails Master Plan, part of the Parks and Recreation element of the County of Santa Clara General Plan (1995-2010). The following Countywide Trails

Master Plans routes are identified as future planned routes which are adjacent to or within the vicinity of the project area.

Hecker Pass Connector Trails

Route C30 – Designated as an on-street bicycle route within road right-of-way for on-road cycling. This route is located along SR 152.

Bay Area Ridge Trail: Santa Cruz Mountains

Route R5-A – Designated as a trail route within other public lands for hiking, cycling and equestrian use.

Bay Area Ridge Trail: Mt. Madonna-Coyote Lake

Route R5-E – Designated as a trail route within other public lands for hiking, cycling and equestrian use.

Santa Clara Valley HCP/NCCP

A Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP), the Santa Clara Valley HCP/NCCP, is currently being developed for the Santa Clara Valley, which provides coverage for the City of San Jose, City of Gilroy, City of Morgan Hill, County of Santa Clara, Santa Clara Valley Water District, and Valley Transportation Authority. The Santa Clara Valley HCP/NCCP is intended to identify and preserve important land that provides habitat for endangered and threatened species to enhance the long-term viability of endangered species and to mitigate for environmental impacts associated with planned development and public infrastructure operations and maintenance activities. The 2nd administrative Draft Habitat Plan was made available to the public on June 3, 2009, for which the comment period closed August 3, 2009. The estimated completion date of the Santa Clara Valley HCP/NCCP, including certification of the environmental review and completion of the Final HCP/NCCP, is slated for sometime in 2010 (ICF Jones and Stokes 2009).

Based on a review of the 2nd administrative Draft Habitat Plan (ICF Jones and Stokes 2009), the Hecker Pass Safety Improvement Project addresses the key special-status plant and wildlife species and sensitive natural resources covered under the Santa Clara Valley HCP/NCCP, and is in general compliance with the Habitat Plan in its current draft form.

2.1.1.3 Parks and Recreational Facilities

Mt. Madonna County Park, under the jurisdiction of Santa Clara County, is located adjacent to much of the northern side of the project area (Figure 1.1-2), and portions of the southern side of the project area. This park consists of 3,688 acres dominated by redwood forest characteristic of the Santa Cruz Mountain range. While SR 152 passes through Mt. Madonna County Park throughout the project limits, the only location within the park where project activities would occur is at Location 4.

Construction activities at Location 4 would involve the construction of retaining walls, necessitating the acquisition of a 0.55 acres of right-of-way at the southern boundary of Mt. Madonna County Park abutting SR-152. While parkland would be acquired, therey are no park facilities or amenities that would be taken by the project. Public use and, access and enjoyment of the park would not be impaired by project activities. The park is under the jurisdiction of the Santa Clara County Parks and Recreation Department which administers the county's parks and recreation programs and operates and maintains 287 parks throughout the County. As a Federal

project under the Department of Transportation, this project must comply with Federal law at 49 U.S.C. Section 303, commonly referred to as Section 4(f) of Department of Transportation Act of 1966. Section 4(f) declares the "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public parks and recreation land, wildlife and waterfowl refuges, and historic sites".

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project . . . requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, Sstate, or local significance, or land of an historic site of national, Sstate, or local significance (as determined by the Ffederal, Sstate, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- there is no prudent and feasible alternative to using that land; and
- the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Acquisition of the 0.55 acres of Mount Madonna County Park at Location 4 would be considered a "use" of a Section 4(f) resource, because parkland would be permanently incorporated into a transportation facility. As previously discussed, a very small amount of the total parkland (0.02 percent) would be acquired and no features, facilities or amenities that would affect recreational uses would be taken from the park. Because of the nature of the impact, the Department has concludedis proposing that this use isbe considered a "de minimis" use of the facility. De minimis impacts on publicly owned parks are defined as those that do not adversely affect the activities, features and attributes of the 4(f) resource. The officials with jurisdiction over the property must provide written concurrence that the project will not adversely affect the activities, features and attributes that qualify the property for protection under 4(f), and the public must be afforded the opportunity to review and comment of the effects of the project on the identified 4(f) resource.

The public was given the opportunity to comment on the effects of the project to the park resources during the comment period for the environmental document, and at the public meeting, held March 24, 2010 at the Gilroy High School library. The County of Santa Clara Parks and Recreation Department was the only entity to comment on potential impacts to the 4(f) resource. Responses to their letter can be found in section 4.3.

The Department explored avoidance, mitigation and enhancement measures to make theFollowing the public review period, the Department will request written concurrence from the Santa Clara County Parks and Recreation Department on the "de minimis" determination. Section 4(f) de minimis finding. In addition to avoiding as much of the park land as possible within the design process, the Department has committed to replacing native trees at a ratio of 3:1, as opposed to the original 1:1 ratio proposed in the DEIR/EA. Further information regarding tree replacement can be found in section 2.3.1.3 of this chapter.

Under Section 4(f), the possibility of a "constructive use" must also be considered. A constructive use can occur when proximity impacts are so severe that the protected activities, features or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. On the basis of the technical studies prepared for this project, it can be concluded

that the project would not involve any type of proximity impacts that would be considered a 'constructive use' of the Section 4(f) resource. The project improvements would not be visible to users from publicly accessible areas, in addition, the project would not cause any long-term or permanentor permanent increases in noise levels, nor would the project restrict access to the Park.

The Department and the Santa Clara County Department of Parks and Recreation held three coordination meetings in 2009 to discuss the proposed project and present information regarding Section 4(f) and the Department's proposal for a "de minimis" determination. The Department received written concurrence of the de minimis use of Mt. Madonna Park from the Santa Clara County Department of Parks and Recreation on August 20, 2010. A copy of this letter can be found in Appendix C. As previously discussed, the Department will request concurrence from Santa Clara County Department of Parks and Recreation on the "de minimis" determination following public review of this environmental document.

Additional information regarding the Section 4(f) regulations can also be found in Appendix C.

2.1.2 Farmlands

2.1.2.1 Regulatory Setting

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (7 United States Code [U.S.C.] 4201-4209; and its regulations, 7 Code of Federal Regulations [CFR] Part 658 require federal agencies, such as FHWA, to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the Farmland Protection Policy Act, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The California Environmental Quality Act requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

2.1.2.2 Affected Environment

The California Department of Conservation, Division of Land Resources Protection classifies and maps farmland to track farmland development throughout California. Farmland is mapped into categories ranging from Prime Farmland, which has the best combination of physical characteristics to sustain long-term agricultural production, to Grazing Land, which allows for the grazing of livestock.

Location 5 is the only portion of the project with the potential to affect farmland. The Department submitted a Farmland Conversion Impact Rating form to the National Resource Conservation Service (NRCS). It is anticipated that any farmland used by the project will be negligible, and that no mitigation will be required. The consultation process with the NRCS will be complete prior to approval of the final environmental document.was complete on March 09, 2010, upon receipt and completion of form NRCS-CPA-106. Through the coordination

process it was concluded that farmland required for the project is negligible, with a total score of 91 out of a possible 260, and that no mitigation is required.

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting certain parcels of land to agricultural or related open space use. In return, the landowners receive lower property tax assessments based on farming and open space use instead of the potential market value for highest and best use. One parcel with a Williamson Act contract is located within the project area at Location 5.

2.1.2.3 Environmental Consequences

Prime Farmland willould be acquired for construction of the project at Location 5. This portion of the parcel willould be incorporated into the transportation facility and willould no longer be used for agricultural production. This acquisition represents a narrow strip of 1.20 acres of farmland along the highway frontage and would not result in impacts that would preclude agricultural production on the remainder of the parcel or prevent access to the parcel. Further, there is approximately 421,383 acres of inventoried agricultural land in Santa Clara County (as of 2008), and approximately 28,850,836 acres of inventoried agricultural land in the state of California (as of 2006). Because the total acquisition of farmland is minimal in comparison the overall available amount of agricultural land in Santa Clara County and the state of California, farmland acquisition associated with this project willould be a less than significant impact.

2.1.2.4 Minimization, and/or Mitigation Measures

None required.

2.1.3 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.3.1 Regulatory Setting

The Department, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

The Department is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

2.1.3.2 Affected Environment

SR 152 serves as a major interconnection route between Route 101 and Interstate 5. Within the project area, SR 152 is a two-lane undivided east-west roadway, located in a rural setting of Santa Clara County. The roadway consists of two 12-ft opposing travel lanes with outside paved shoulders varying from 0 to 10 ft wide.

A number of accidents on this segment of the highway have involved vehicles that cross the roadway centerline. The Department developed a list in 2004 of candidate major collision-reduction projects to the Headquarters of Traffic Safety program coordinator based on results from the Two- and Three-Lane Safety Monitoring program. Because a high number of CCAs occurred within this portion of SR 152 during the study period, the Project was submitted and the District's recommendation was approved by District Headquarters on June 21, 2004.

The average annual daily traffic along this segment of SR 152 as of 2008 is 5,900 vehicles, and is expected to increase to 9,500 vehicles in 20 years, by 2028. An 8-year study period between October 1, 2000, and September 30, 2008, generated detailed information about the number, type, frequency, and causes of accidents along this section of SR 152. . The average number of accidents along the study corridor were 1.91 per million vehicles, which was higher than the statewide average of 1.49 per million vehicles. The study found that 29 of the 176 accidents involved vehicles that crossed the centerline.

2.1.3.3 Environmental Consequences

Brief, intermittent traffic disruptions (lane closures) willould occur during project construction, during which traffic willould be managed by a pilot vehicle or flagger. Access to and from the highway willould be unchanged.

The improvements associated with the build alternative are safety-related and willould not result in any changes to traffic operations along SR 152. The lane configuration and capacity of SR 152 willould be unchanged. Travel times, peak period performance, and level of service willould remain unchanged following construction.

The shoulder and lane widening willould provide additional width within the five roadway segments that would also benefit bicycle use by providing additional clearance from the vehicle lanes. The project does not include bike facilities (e.g., striped bike lanes) because the proposed improvements are limited to the proposed five roadway segments. The necessary width for a bike lane or facility that meets all Department design standards cannot be achieved along the entire highway without substantially greater right-of-way acquisition, slope grading, and retaining walls, which would have greater environmental impacts and costs that are beyond the scope of this project.

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

None required.

2.1.4 Visual/Aesthetics

2.1.4.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). To further emphasize this point, the Federal Highway administration in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest, taking into account adverse environmental impacts, including, among others, the destruction or disruption of aesthetic values.

Likewise, CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities." (California Public Resources Code [PRC] Section 21001[b])

SR 152 within Santa Clara County is not listed as an eligible State Scenic Highway in the state's Scenic Highway Master Plan. SR 152 is a Santa Clara County scenic highway, and is also identified in the Scenic Highways Element of the County General Plan as one of several roads to be nominated for State Scenic Highway status.

2.1.4.2 Affected Environment

The information in this section is summarized from the State Route 152 Safety Improvements Project Visual Impact Assessment (Caltrans 2009b). The project is situated in Hecker Pass, an east-west oriented canyon paralleling the stream course of Bodfish Creek, in the southernmost portion of the Santa Cruz Mountain Range. The project area consists of two distinct landscape units: the Santa Cruz Mountains/Hecker Pass (containing Locations 1, 2, 3, and 4) and the Santa Clara Valley (containing Location 5). Each landscape unit has a level of visual sensitivity related to viewer exposure to and from the project area, and the visual context of each landscape unit, as described below and in Section 2.1.3.3. The levels of visual sensitivity to viewer groups are defined as:

Low — Minor adverse change to the existing visual resource (i.e., decline in visual quality), with low viewer response to change in the visual environment. May or may not require mitigation.

Moderate — Moderate adverse change to the visual resource with moderate viewer response. Impact can be mitigated within 5 years using conventional practices.

Moderately High — Moderate adverse visual resource change with high viewer response or high adverse visual resource change with moderate viewer response. Extraordinary mitigation practices may be required. Landscape treatment required would generally take longer than 5 years to mitigate.

High — A high level of adverse change to the resource and a high level of viewer response to visual change. Architectural design and landscape treatment may not fully mitigate the impacts. An alternative project design may be required to avoid highly adverse impacts.

Santa Cruz Mountains/Hecker Pass Landscape Unit

The Santa Cruz Mountains/Hecker Pass landscape unit extends from the western project limit to roughly 0.5 mile east of Blackhawk Canyon where Bodfish Creek diverges south from the highway (approximate SR 152 PM 3.7) and includes Locations 1, 2, 3, and 4. Along SR 152, this landscape unit is scenically highly intact, with little evidence of disturbance and steep slopes containing native mixed evergreen woodland, particularly tall redwood. The tall forest trees visually enclose the roadway and are the only visual image type seen by motorists on the roadway. Fleeting views of Bodfish Creek, which is parallel to and south of the highway, are visible at various locations. The visual character, visual quality, and viewer conditions of the SR 152 corridor are similar throughout Locations 1, 2, 3, and 4.

The Santa Cruz Mountains/Hecker Pass landscape unit is sparsely developed. Viewers in this area consist primarily of motorists on SR 152. Principal off-road, non-motorist, viewers in proximity to the project include residents on Bella Vista Lane above and south of Location 1 at the western terminus of the project corridor, visitors to Mt. Madonna County Park at the main entrance near Location 1, and park visitors at the secondary entrance at Location 4.

Overall, the visual quality of this landscape unit is considered to be high. Viewer sensitivity from the roadway is considered to be high due to the recreational and scenery-focused orientation of most motorists on this section of SR 152. Viewer sensitivity toward the roadway is considered to be low due to the lack of viewer exposure to the roadway.

Santa Clara Valley Landscape Unit

The Santa Clara Valley landscape unit includes Location 5. Although some surrounding land use in this landscape unit includes residential buildings, they are well screened from the roadway behind walls and landscaping. The overall visual scene is dominated by wooded riparian corridors of Bodfish Creek and its tributaries; undeveloped, wooded slopes of the Santa Cruz Mountain foothills at foreground and middle-ground distance; and the historical agricultural character of several surrounding wineries and associated vineyards. Walnut trees line both sides of SR 152 east of its intersection with Watsonville Road.

Location 5 is in a low-density, rural residential neighborhood and is thus visible to adjacent homes. Existing views to and from the road are generally well-screened by community walls, extensive tree screening, and other landscaping.

Overall, the visual quality of this landscape unit is considered to be moderately high. Viewer sensitivity from the roadway is also considered to be moderately high; this landscape unit is less recreation- and scenery-oriented than within the Santa Cruz Mountains/Hecker Pass landscape unit. Viewer sensitivity toward the project area by non-motorists is considered to be moderately high due to the moderate to high level of viewer exposure to the roadway

2.1.4.3 Environmental Consequences

Visual quality is characterized and evaluated in terms of the descriptors *vividness*, *intactness*, and *unity*. Vividness refers to the striking and distinctive quality that makes a landscape powerful and memorable; intactness is the visual integrity of the landscape and its freedom from encroaching elements; unity is the visual coherence and compositional harmony of a landscape. Visual impacts are identified as a combination of the degree of project-related change to visual character and quality (*the visual resource*), and *viewer response* or overall sensitivity and exposure to visual change.

Visually significant features of the proposed project would include the retaining walls and associated features. The proposed roadway widening would have minor visual effects, as discussed by location below. The no-build alternative would not result in any construction activities and would thus have no visual impacts.

Location 1

Before and after visual simulations of the proposed retaining Wall 1A at Location 1 are shown in Figures 2.1-1, 2.1-2, and 2.1-3. Figure 2.1-2 shows the simulated condition immediately after construction, Figure 2.1-3 shows the simulated condition 10 to 15 years after construction, with

anticipated re-vegetation along the top of the wall. Simulations for subsequent locations show the condition 10 to 15 years after construction.

Views from the Road

As shown in the simulations, anticipated visual project impacts from the roadway would include strong contrast with the existing landscape character and a strong decline in vividness, intactness, and unity due to highly prominent visual intrusion of the new retaining walls, accompanying vegetation removal, and installation of crash cushions along the roadway approach toward each retaining wall. Roadway widening and wall construction could require removal of a number of mature maple, madrone, and redwood trees. The resulting loss of tree canopy would represent a moderate decline in vividness in this road segment. The proposed walls with highly conspicuous crash cushions would introduce features of incompatible, artificial visual character and highly dominant scale, with a strong resulting decline in both intactness and unity. Views in this segment of SR 152 are highly enclosed by tree canopy on both sides of the road, which would emphasize the prominence and scale of the retaining walls.

In the context of high viewer sensitivity and high visual exposure, this would represent a high level of adverse change and a significant adverse impact. The retaining walls would incorporate context-sensitive color and texture treatment to reduce potential impacts. A sculpted rock wall texture treatment is depicted in the visual simulations; however, the final selection of texture would be made in consultation with local agencies. Whatever the selected texture, the intent of the treatment is to reduce overall wall contrast, incompatibility of character, and resulting decline in visual quality to the extent feasible.

Non-motorist views toward the project area

Despite the proximity of several homes on nearby Bella Vista Lane in the area south of Location 1, no views of the proposed project area from these offsite locations are evident due to dense intervening forest. Potential impacts to these viewers would thus be negligible.

Similarly, views from Pole Line Road, representing the main visitor entrance into Mt. Madonna County Park, would be entirely blocked by intervening forest and terrain. Park visitors would have views of the project area, but only as motorists passing by Location 1. Once on Pole Line Road, or elsewhere within the park, the proposed project area would not be visible. Potential impacts to visitors within the park would thus be negligible.

Figure 2.1-1. Existing westbound view facing location of proposed Wall 1A at Location 1

Figure 2.1-2. Simulated westbound view showing proposed Wall 1A at Location 1 soon after construction

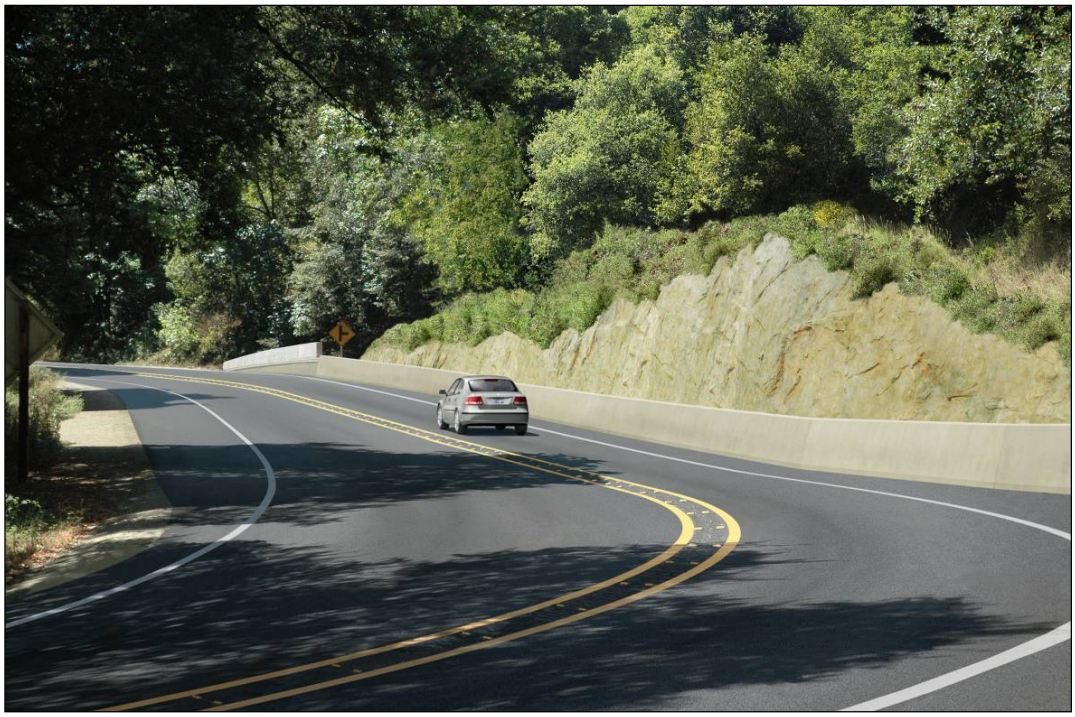

Figure 2.1-3. Simulated westbound view showing proposed Wall 1A at Location 1 with simulated re-vegetation 10–15 years after project construction

Location 2

Before and after visual simulations of proposed Wall 2A at Location 2 are shown in Figures 2.1-4 and 2.1-5.

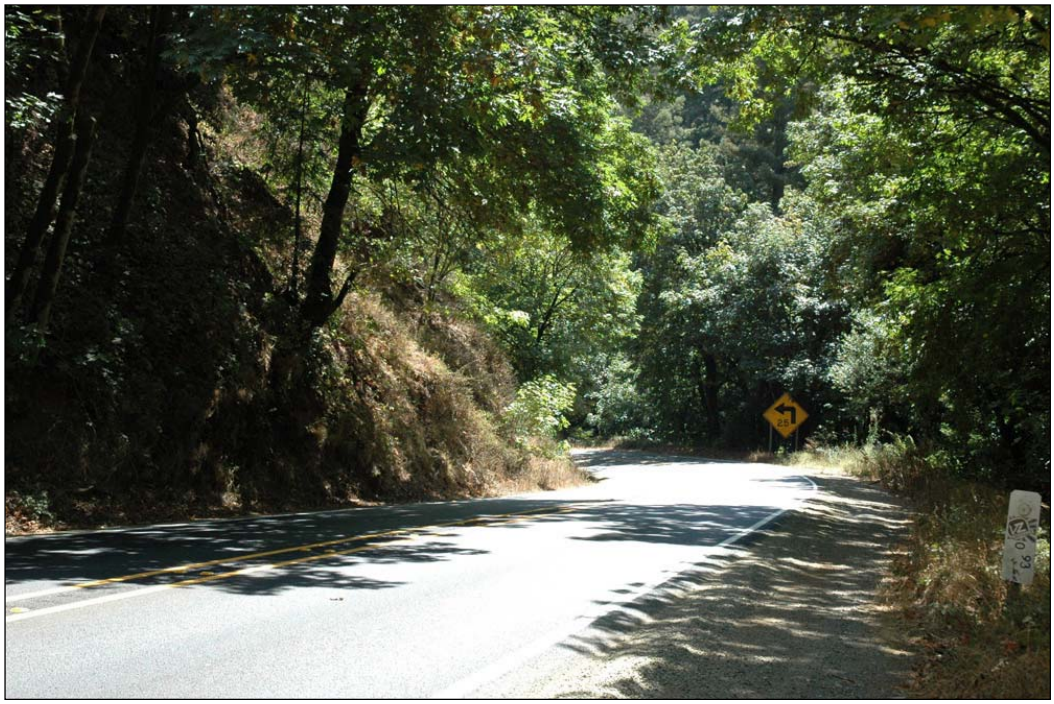

Figure 2.1-4. Existing eastbound view facing location of proposed Wall 2A at Location 2

Figure 2.1-5. Simulated eastbound view showing proposed Wall 2A at Location 2 with simulated re-vegetation 10 to 15 years following construction

Views from the Road

As depicted in the simulations, anticipated project impacts from the roadway willould include strong contrast with the existing landscape character, resulting in a moderate decline in vividness, and strong declines in intactness and unity due to highly prominent visual intrusion of the new retaining wall, and accompanying vegetation removal. Roadway widening and wall construction could require removal of a number of mature maple, madrone, and redwood trees. Context-sensitive wall treatments, including dark-colored staining, willould be applied. Nevertheless, the overall decline in visual quality and in this road segment willould remain strong.

In the context of high viewer sensitivity and high visual exposure, this would represent a high level of adverse change and a significant adverse impact.

Non-motorist views toward the project area

Viewers in proximity to Location 2 include one or more properties on Bella Vista Road and Sanders Road overlooking the highway from the southwest at distances of less than ¼ mile. However, as discussed for Location 1, views from all of the properties in this area would be largely or completely screened by dense intervening forest. Actual exposure to the proposed project area from these properties is thus negligible. Similarly, Location 2 would not be visible from within Mt. Madonna County Park. Adverse impacts on offsite views to the road are thus not anticipated at Location 2.

Location 3

Before and after visual simulations of the proposed Wall 3B at Location 3 are shown in Figures 2.1-6 and 2.1-7 below.

Views from the Road

As depicted in the simulations, anticipated visual project impacts from the roadway willould include strong contrast with the existing landscape character, resulting in a moderate decline in vividness due to tree removal, and strong declines in intactness and unity due to highly prominent visual intrusion of the new retaining walls. Roadway realignment and wall construction could require removal of a number of mature maple, madrone, and redwood trees. Context-sensitive wall treatments, including dark-colored staining, would be applied. Nevertheless, the overall decline in visual quality and in this road segment willould remain strong.

In the context of high viewer sensitivity and high visual exposure, this would represent a high level of adverse change and a significant adverse impact.

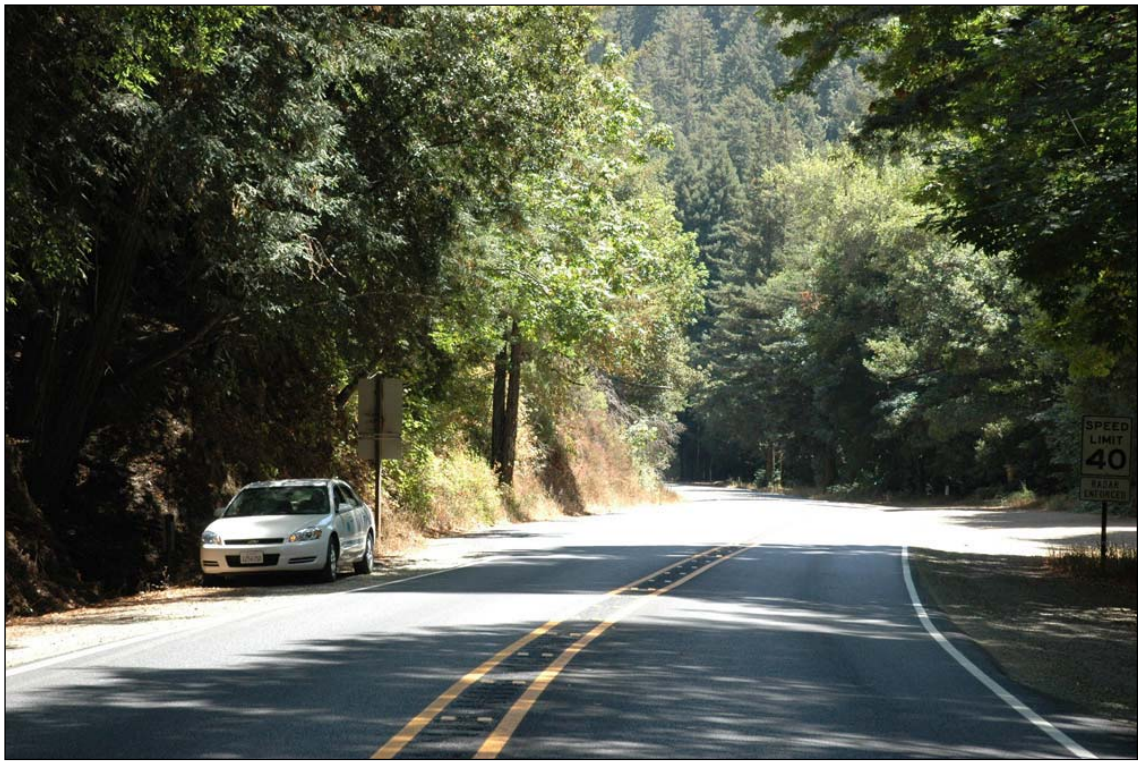

Figure 2.1-6. Existing eastbound view facing location of proposed Wall 3B at Location 3

Figure 2.1-7. Simulated eastbound view showing proposed Wall 3B at Location 3

Non-motorist views toward the project area

Location 3, which is immediately east of Location 2, is within foreground distance of the same residences on Bella Vista Lane and Sanders Road discussed above under Location 2. The same conditions apply as well: the project willould be largely or completely screened by existing forest from these properties. Visual exposure to project features at Location 3 is thus negligible. Location 3 is not visible from within Mt. Madonna County Park. Adverse impacts on offsite views to the road are thus not anticipated at Location 3.

Location 4

Before and after visual simulations of the proposed retaining walls at Location 4 are shown in Figures 2.1-8, 2.1-9, 2.1-10, 2.1-11, 2.1-12, and 2.1-13 below.

Views from the Road

As depicted in the simulations and similar to impacts discussed under Location 1, anticipated visual project impacts at Location 4 would include strong contrast with the existing landscape character, resulting in a moderate decline in vividness due to tree removal, and strong declines in intactness and unity due to highly prominent visual intrusion of the new retaining walls. Roadway re-alignment and wall construction could require removal of a number of mature maple, madrone, and redwood trees. Context-sensitive wall treatments, including dark-colored staining, willould be applied. Nevertheless, the overall decline in visual quality in this road segment would remain strong.

In the context of high viewer sensitivity and high visual exposure, this willould represent a high level of adverse change and a significant adverse impact.

Non-motorist views toward the project area

Views to the road from this road segment are very limited. Potential views from within Mt. Madonna County Park and the vicinity of the park entrance to proposed upslope walls are almost entirely blocked by intervening topography. Tree removal from proposed downslope Wall 4E at the park entrance would be visible from within the park parking lot. At the Mt. Madonna County Park entrance, trees along the highway would be removed; however, large trees and other vegetation on the park (north) side of the creek would remain, maintaining some screening. The wall itself would thus be visible from the parking area, but would be highly filtered by remaining trees and vegetation to its north, and relatively inconspicuous due to its below-grade location. In the context of high viewer sensitivity but limited, moderately low visual exposure, these moderate declines in visual quality as seen from within the park would not be significant.

Figure 2.1-8. Existing eastbound view facing location of proposed Wall 4C at Location 4

Figure 2.1-9. Simulated eastbound view showing proposed Wall 4C at Location 4 with simulated re-vegetation 10 to 15 years following construction

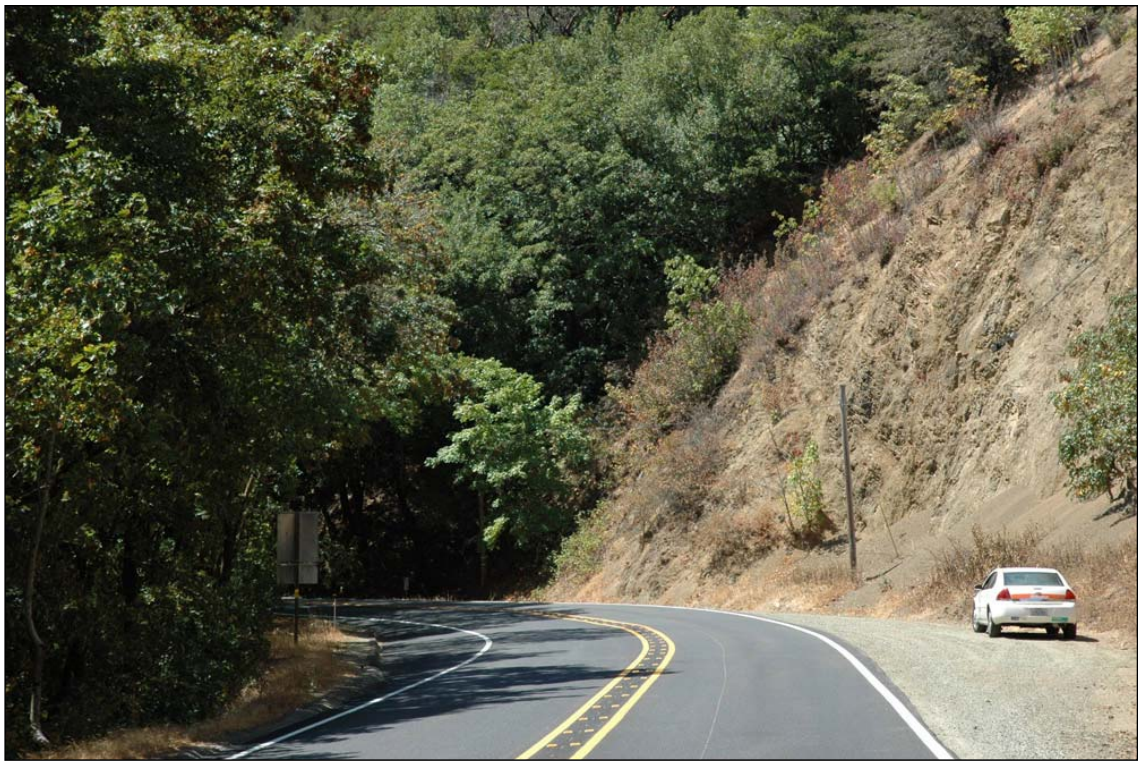

Figure 2.1-10. Existing westbound view facing location of proposed Wall 4C at Location 4

Figure 2.1-11. Simulated westbound view showing proposed Wall 4C at Location 4 with simulated re-vegetation 10 to 15 years following construction

Figure 2.1-12. Existing westbound view facing location of proposed Wall 4D at Location 4

Figure 2.1-13. Simulated westbound view showing proposed Wall 4D at Location 4 with simulated re-vegetation 10 to 15 years following construction

The principal visual impact of the proposed project to park visitors at this location will ould thus be experienced by motorists approaching the park entrance in views from the road, as described above. Outside of the park visitors within the Sprig Lake parking lot, no other off-road viewers are present in the viewshed of Location 4, either within or outside of Mt. Madonna County Park.

Location 5

From a visual standpoint, proposed project actions at Location 5 willould have minor impacts; they willould consist primarily of minor roadway widening, including adding a turn lane at the intersection of Watsonville Road, and creating standard 8-ft shoulders.

Views from the Road

The principal visual effect at this location willould be the removal of roughly 480 linear ft of existing mature walnut trees at the highway shoulder in the southeastern quadrant of the intersection of SR 152 and Watsonville Road. In addition, up to 10 similar walnut trees could be removed in the northeastern quadrant of the intersection. The two groups of trees form a remnant of an allee (double row of trees) lining the highway to the east of the intersection with Watsonville Road. From the perspective of motorists, this would represent a moderate decline in visual quality, but would not significantly alter the visual quality of the viewshed in this location, which would remain intact, rural in character, and moderately high in visual quality. From the perspective of motorists, this moderate decline in visual quality would be an adverse, but not signficant impact.

Non-motorist views toward the project area

The proposed removal of approximately 480 linear ft of mature walnut trees at the southern highway shoulder east of Watsonville Road willould be viewed by two affected properties, including the Rofinella/Thomas Kruse Winery, a locally listed and state-eligible historic landmark, resulting in a moderate decline in visual quality. The tree rows comprise a part of an allee lining both sides of the highway in this segment, and provide visual screening of the highway for the occupants of and visitors to the affected properties, as well as an attractive landscape element. In the context of a presumed high level of sensitivity due to its historic status and use as a visitor destination, this moderate decline in visual quality could nevertheless represent a potentially significant adverse impact.

Removal of up to 10 similar walnut trees on the highway frontage of a residence in the northeastern quadrant of the Watsonville Road intersection, comprising a part of the allee lining the highway in this segment, would have a less adverse effect due to their greater distance from the affected residence. Nevertheless, their loss would cause a moderate overall decline in visual quality as described above. Because residents are presumed to have a high level of viewer sensitivity, this moderate decline could be perceived as a significant adverse impact. In both cases, the affected trees are of modest stature.

Light and Glare

No substantial long-term light or glare impacts would occur as a result of the proposed project. Construction at night could result in glare impacts that interfere with safe navigation by motorists. Walls would be treated to have low reflectively and dark, subdued colors.

Construction Impacts

Construction staging within the highway corridor would be visible from the highway and would cause temporary impacts due to the presence of materials and equipment. Construction activities would have temporary impacts that would be visible to motorists, such as placement of safety barriers and signs, vegetation removal, slope grading, and temporary soil and rock exposure. In the worst case, such impacts would have the potential to be substantially adverse.

State Scenic Highway Program

As described in Section 2.1.1.2, the affected portion of SR 152 in Santa Clara County is not listed as an eligible State Scenic Highway in the State Scenic Highway Master Plan (Caltrans 2009a). However, Policy R-PR(i) 22 of the Scenic Highways Element of the Santa Clara County General Plan calls for nomination and designation of SR 152 in Santa Clara County as a State Scenic Highway, as discussed in greater detail below.

The four criteria used to determine whether a highway may be designated as scenic are:

- "The State or county highway consists of a scenic corridor that is composed of a memorable landscape that showcases the natural scenic beauty or agriculture of California..."
- "Existing visual intrusions do not significantly impact the scenic corridor…"
- "Demonstration of strong local support for the proposed scenic highway designation."
- "The length of the proposed scenic highway is not less than a mile and is not segmented."

Before a highway such as SR 152 in the project area may be designated as an official State Scenic Highway, it must be added by legislation to the list of eligible State Scenic Highways in California Streets and Highways Code Section 263. Should SR 152 be added to the list of eligible highways, the Department's Scenic Highway Guidelines define a specific process and criteria to determine eligibility of a highway for "scenic" status. These include that not more than one-quarter of the proposed scenic highway may be affected by visual intrusions. Visual intrusions may be natural or constructed elements, viewed from the highway, that adversely affect the scenic quality of a corridor. Examples of visual intrusions are buildings, unsightly land uses, parking lots, advertising, noise barriers, power lines and communication facilities, agriculture, exotic (nonnative) vegetation, clear-cutting, erosion, grading, and the roadway and associated structures themselves. Intrusions are classified as minor, moderate, or major, but in any case not more than one-quarter of the length should be impacted. Existing visual intrusions on SR 152 within Hecker Pass in Santa Clara County are negligible. However, visual intrusions (retaining walls) from the proposed project would adversely affect the scenic quality of this portion of SR 152, and thus reduce the potential for its nomination as a State Scenic Highway.

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures are described by project location below:

Locations 1, 2, and 3

To address the potential impacts of tree removal at these locations, the following tree replacement and revegetation measures will be implemented:

- Minimizing existing tree and forest removal to the greatest possible extent. The limit of work shall be kept to the minimum possible footprint, not to exceed 5 ft from the edge of the retaining wall. Priority shall be placed on preserving existing trees nearest the wall, to preserve views of the forest edge from the road to the greatest extent feasible.
- Tree replacement planting shall be implemented if appropriate to mitigate for major loss of tree canopy, as determined by the project landscape architect.

To address the potential impacts of visual intrusion from the new retaining walls, the following mitigation measures will be implemented:

- Minimizing overall wall height to the greatest extent feasible.
- Using context-sensitive wall texture and color treatment, in consultation with local agencies, to reduce visual contrast and enhance compatibility of visual character to the greatest extent feasible.
- Staining of bottom, safety-barrier portion of walls to reduce overall color contrast and visual intrusion.
- If feasible, walls shall be gutterless and without chain-link safety fence to reduce visual contrast.
- Wherever feasible and consistent with safety, the use of crash cushions at retaining walls shall be avoided to reduce the visual contrast with the natural environment.

Location 4

All avoidance, minimization, and mitigation measures that apply to Locations 1, 2, and 3 also apply to the Location 4. In addition to those measures, the following measures also apply to Location 4:

- To minimize the long-term visual effect of tree removal for Wall 4E, as seen from both inside and outside of the park, tree replacement and other supplemental native vegetation planting should be implemented where feasible adjacent to Wall 4E.
- To minimize the contrast in visual character and decline in visual quality as a result of Wall 4E as seen by park visitors, context-sensitive wall color and texture treatment should be applied. Color shall be dark to minimize contrast and reflectivity; texture treatment such as stacked stone, carved rock, or other similar treatment shall be used to articulate the wall surface and provide a more naturalistic, context-compatible visual character.

Location 5

- Minimization of existing tree removal to the greatest possible extent. The limit of work shall be kept to the minimum possible footprint.
- Where feasible, tree replacement planting shall be implemented to replace the lost tree screening and ‘allee’ pattern at the roadside.

Light and Glare

- Construction activities shall limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Construction impacts

- Unsightly material and equipment storage and staging shall not be visible within the foreground of the highway corridor to the extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and to nearby sensitive off-road receptors.
- Construction, staging, and storage areas shall be screened by visually opaque screening wherever they will be exposed to public view for extended periods of time.
- Construction activities shall be phased to minimize the duration of disturbance to the shortest feasible time.
- All areas disturbed by construction, staging, and storage shall be revegetated.

2.1.5 Cultural Resources

2.1.5.1 Regulatory Setting

“Cultural resources” as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures,

and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 773) (July 1, 2007).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. See Appendix C for specific information regarding Section 4(f) regulations.

Historical resources are considered under the CEQA, as well as California PRC Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet National Register of Historic Places (NRHP) listing criteria. It further specifically requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the SHPO before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

2.1.5.2 Affected Environment

Archaeological Resources

The Department prepared an archaeological survey report and historic property survey report in April 2009 in accordance with Section 106 of the NHPA and its implementing regulations. To develop an historic context and assess the sensitivity for intact buried historic and prehistoric archaeological resources, cultural resources site records, maps, and survey reports pertaining to the history and prehistory of the project area were reviewed.

In accordance with both Section 106 of the National Historic Preservation Act and CEQA, the Department delineated an archaeological Area of Potential Effect (APE), comprising all of the area that would be subject to ground disturbance to construct the proposed project. The APE was divided into five discontiguous subsegments conforming to the construction footprint of Locations 1-5, and additional areas for placement of temporary advance warning signs, new right-of-way, and potential construction staging locations. No previously recorded archaeological resources are within the APE, and no previously unrecorded archaeological resources were identified within the APE as a result of a March 5, 2009, field survey.

The California Native American Heritage Commission (NAHC) in Sacramento was contacted on January 28, 2009 requesting a search of sacred lands files and a list of local Native American organizations and individuals that may have information regarding cultural resources

in the area. On February 5, 2009, the NAHC indicated that no known cultural resources or archaeological sites were on file for the project area. The NAHC provided a list of nine Native American parties that may have potential interest in the project. On February 5, 2009, a letter was sent to all of the parties on the NAHC list; on March 4, 2009, receipt of these letters was verified by phone call. Responses were received from the Amah/Mutsun Tribe, the Indian Canyon Mutsun Band of Costanon, and the Muwekma Ohlone Tribe expressing concern about sensitive cultural resources in the area and requesting that a Native American monitor be present during construction. The Department extended invitations to the Amah/Mutsun Tribe and the Indian Canyon Mutsun Band of Costanon for a site visit to discuss potential cultural resources. Responses were not received from either tribe.

Historic Resources

Through the investigation described above, no NRHP-eligible properties were identified within the APE. One historic resource, the Rofinella Winery at 4390 Hecker Pass Road, is a designated Santa Clara County Landmark. This property was found to be eligible under Criteria 1 of the California Register of Historical Resources on the local level for its representation of an early winery developed by Italian immigrants, and is therefore considered an historic property for the purpose of compliance with CEQA.

2.1.5.3 Environmental Consequences

The Department has determined that a finding of no impact is appropriate for the Rofinella Winery at 4390 Hecker Pass Road because only minor right-of-way acquisition along the property's highway frontage would occur at this location. This alteration to the property would not impair the significance of the historical resource, pursuant to CEQA Guidelines 15064.5(b)(3).

In the Draft Environmental Impact Report/Environmental Assessment (DEIR/EA) the Department incorrectly identified the Rofinella Winery as a Santa Clara County Landmark. Following publication of the DEIR/EA, the Department learned that the subject property was instead listed as a resource in the Santa Clara County Heritage Resource Inventory, which is maintained by the Santa Clara County Heritage Commission and the Santa Clara County Board of Supervisors. Because it was thought to have County Landmark status, the Department regarded it as a property subject to Section (f) of the Department of Transportation Act. The FHWA's Section 4(f) policy paper dated March 1, 2005 states "If an historic site is determined not to be on or eligible for the National Register, but an official (such as the Mayor, President of the local historic society, etc.) formally provides information to indicate that the historic site is of local significance, FHWA may determine that it is appropriate to apply Section 4(f) in that case" (see Appendix C for more information on 4(f)).

The minor right-of-way acquisition will affect a row of trees along the highway frontage, and would not affect any buildings or any ancillary structures associated with the winery. At the time, Caltrans had determined that the impacts would be considered 'de minimis' as the principal attributes and features of the property would not be affected. Because the property does not have landmark status and because there has been no request at the local level for its consideration as a Section 4(f) resource, the department does not consider this property as a Section 4(f) resource. It should be noted that the treatment of the property would have been no different had it been determined to be subject to Section 4(f). Because the Rofinella Winery is a

Santa Clara County Landmark, Caltrans has determined that it is a property that is protected under Section 4(f). The minor right-of-way acquisition that would impact the property would affect only a row of trees along the highway frontage, and would not affect any buidings or any ancillary structures associated with the winery. It is those elements that are identified in the Santa Clara County Landmark designation. As such, Caltrans has determined that impacts to the winery would be considered "de minimis" with regards to Section 4(f). Additional information regarding the Section 4(f) regulations can be found in Appendix C.

No other potentially eligible prehistoric or historic properties were identified within the construction limits of the project. Due to the nature of the undertaking, the results of archival research, field survey, Native American consultation, and the modified and disturbed environmental context of the project area, it has been determined that no further archaeological work is required.

2.1.5.4 Avoidance, Minimization, and/or Mitigation Measures

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC, who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resources Studies so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

During coordination with Native American groups, a Native American cultural resources monitor was requested. The Department will determine whether a Native American cultural resources monitor is required during the design phase of the project based on specific anticipated construction activities.

2.2 Physical Environment

2.2.1 Water Quality and Storm Water Runoff

2.2.1.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NDPES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **NPDES Program**

  The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities,

and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The proposed Project will be programmed to follow the guidelines and procedures outlined in the 2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

- **Municipal Separate Storm Sewer System Program**

  The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, country, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

- **Construction Activity Permitting**

  Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)". Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, will become effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a DSA of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

  The newly adopted permit separates projects into Risk Levels 1 – 3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPP).

  Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWQCB to obtain coverage under the Construction General

Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Caltrans Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1-acre.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

2.2.1.2 Affected Environment

The Department prepared a Water Quality Report (Caltrans 2009d) and Draft Storm Water Data Report (Caltrans 2009e) for this project in 2009. The proposed project is under the jurisdiction of the Central Coast Regional Water Quality Control Board (Region 3), which is responsible for the implementation of the state and federal water quality protection laws and regulations in the vicinity of the project site.

Surface Water

The project area is located within the Pajaro River hydrologic unit and within two hydrologic sub-areas (HSA): the Santa Cruz Mountains HSA and the South Santa Clara Valley HSA. Four water bodies in the project area receive direct infusions of storm water: Bodfish Creek, Blackhawk Creek, and two unnamed springs. Uvas Creek is an indirect receiving water body. Water flows from Bodfish Creek into Uvas Creek at a confluence outside of the project area.

Groundwater

The project area is within the Llagas Creek Groundwater sub-basin of the Gilroy-Hollister Valley Groundwater Basin. The majority of the water supply for Santa Clara County is dependent on groundwater basins.

2.2.1.3 Environmental Consequences

The Department has performed many studies to monitor and characterize highway storm water runoff throughout the state. Pollutants of concern in Caltrans runoff found from the "Final Report of the Caltrans BMP Retrofit Pilot Program," were phosphorus, nitrogen, copper (total or dissolved), lead (total or dissolved), zinc (total or dissolved), sediments, general metals (unspecified metals), and litter. Some sources of these pollutants are natural erosion, phosphorus from tree leaves, combustion products from fossil fuels, trash and falling debris from motorists, and the wearing of brake pads. The proposed project would not increase traffic volumes; thus, pollutants from vehicle traffic are not expected to increase due to the project.

The primary pollutant of concern on the proposed project is sediment. During construction, earth-moving activities such as excavation and grading would result in soil disturbance. Disturbed soils are susceptible to high rates of erosion from wind and rain, and can result in sediment transport via storm water runoff from the project area. Erosion and sedimentation can

cause exceedance of local water quality criteria and may adversely affect biological resources in adjacent waterways.

Construction materials, waste handling, and the use of construction equipment could also result in storm water contamination and adversely impact water quality. Spills or leaks from heavy equipment and machinery can result in oil and grease contamination. Staging areas can also be a source of pollution due to the nature of materials typically stored and used at these sites, including stockpiled soils and other building materials, fuel, oils, and hydraulic fluids. Surface water impacts from pollutants of concern will be minimized by implementation of Best Management Practices (BMPs).

The estimated total disturbed soil area would be 6.4 acres and the increased impervious area would be 3.3 acres. Velocity or volume of downstream flow may increase due to the added impervious areas (roadway widening) for the project.

Soil excavation depth for project activities is anticipated to be a maximum of 6 ft, which is not expected to be deep enough to encounter groundwater. Therefore, project activities would not be expected to impact the groundwater basin. Additional geotechnical investigation would occur during the project design phase to determine the groundwater depth at locations where excavation would occur.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Section 401 of the Clean Water Act

Section 401 certification will be required for this project. Early discussion will be initiated regarding the handling and disposal of water during the design phase. Although not expected, if groundwater is encountered, it groundwater will be tested for potential contamination as a part of the Hazardous Waste Site Investigation. Proper handling and disposal of the groundwater will be based on the levels of contaminants reported in the Site Investigation Report.

Section 402 of the Clean Water Act

Consistent with the Department's NPDES permit and the Statewide Construction General Permit, BMPs will be incorporated to reduce the discharge of pollutants during construction as well as permanently to the Maximum Extent Practicable. These BMPs fall into three categories, Temporary Construction Site BMPs, Permanent Design Pollution Prevention BMPs, and Permanent Treatment BMPs.

Construction Site BMPs

Given that the anticipated soil disturbance would be greater than 0.4 hectare (1 acre), compliance with the NPDES permit will include the development of a SWPPP. The SWPPP will incorporate appropriate BMPs to control storm water runoff during construction activities. This dynamic document addresses the deployment of various erosion and water pollution control measures that are required commensurate with changing construction activities.

Approved erosion control BMPs are described in the Department's Construction Site Best Management Practices Manual (Caltrans 2003). Temporary erosion control and water quality measures will be defined in detail in the project SWPPP and designated as line items in the project's plans, specifications, and estimates. Temporary silt fence, concrete washout controls, stockpile covers, stabilized construction entrance/exits, and temporary soil stabilizers are some

of the temporary erosion and water pollution control measures that may be used in combination to prevent and minimize soil erosion and sediment discharges during construction.

Permanent Design Pollution Prevention BMPs

Design Pollution Prevention BMPs are permanent measures to improve storm water quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Erosion control measures will be provided on all disturbed areas to the extent feasible. These measures will use a combination of source and sediment control measures to prevent and minimize erosion from soil-disturbed areas. Source controls can use erosion control netting in combination with hydroseeding.

The biodegradable netting is effective in providing good initial mechanical protection while seed applied during the hydroseeding operation germinates and establishes itself. Other forms of source control such as tacked straw may also be used when applicable. Sediment controls such as biodegradable fiber rolls can be used to retain sediments and to help control runoff from disturbed slope areas. These measures will be evaluated for site-specific conditions during the design phase.

Outlet protection and velocity dissipation devices placed at the downstream end of culverts and channels are also Design Pollution Prevention BMPs that reduce runoff velocity and control erosion and scour. The need for these devices for this project will also be further evaluated during the design phase.

Generally, as velocities and volume of flow increase, so could the sediment loading. Effects to downstream flow will be further investigated during the design phase and the use of appropriate Design Pollution Prevention BMPs to address this concern will be considered.

Permanent Treatment BMPs

This project will be required to incorporate treatment BMPs. Treatment BMPs are permanent devices and facilities treating storm water runoff. The Department-approved treatment BMPs are biofiltration swales, infiltration basins, detention basins, traction sand traps, dry weather flow diversions, media filters, gross solids removal devices, multi-chamber treatment trains, and wet basins.

2.2.2 Geology/Soils/Seismic/Topography

2.2.2.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

2.2.2.2 Affected Environment

A preliminary geotechnical report (Caltrans 2009c) was prepared for this project. This section of Route 152 is a narrow two-lane highway in steep mountainous terrain. The project area is undeveloped and vegetation consists of typical coastal redwood forest. Bodfish Creek flows adjacent to the alignment throughout the project limits. The streambed is a rocky, irregular channel with a steep grade and significant erosion on the banks.

Site Geology and Soils

The geologic units can be classified and specified according to the location of the five sites included in this project, as follows:

Locations 1, 2, and 3
These three locations are in the Sierra Azula block and underlain by two rock units; the siltacious shale and sandstone of Mt. Pajaro, and the sandstone of Mt. Madonna. Soils at these three locations are characterized as Felton silt loam. These soils are well drained and are underlain by interbedded shales and sandstone at a depth of 20 to 30 in. Permeability in the subsoil is moderately slow. Runoff is very rapid and the hazard of erosion is very high. These soils have moderate shrink-swell potential and corrosivity.

Location 4
This location is mostlyprimarily in the Sierra Azula block. The northeastern portion of this location is in the New Almaden block. The rock units consist of volcanic rocks, sandstone and mudstone, mottled mudstone and sandstone of Mt. Chaul, and alluvial fan deposits. Soils at this location are characterized as Felton silt loam, Los Gatos gravelly loam, and Gilroy clay loam. Felton silt loam is described above. Los Gatos gravelly loam is well drained and underlain by metamorphosed shale at a depth of 25 to 50 in. Runoff is very rapid and the hazard of erosion is very high, and it has a moderate shrink-swell potential. Gilroy clay loam is well drained, underlain by igneous rock at a depth of 18 to 36 in. Runoff is rapid and the hazard of erosion is high.

Location 5
This location is entirely underlain by Pleistocene alluvial fan deposits and surrounded to the north and to the south by the Temblor Sandstone of the New Almaden Block. Soils at this location consist of San Ysidro loam and Pleasanton gravelly loam. Both of these soil types have moderate corrosivity, moderate shrink-swell potential, and none to slighta low hazard of erosion.

Seismicity

The project area is within the San Andreas Fault system, which is a complex belt of major fault zones and extremely high seismicity extending roughly northwestward from northern Mexico through western California. The San Andreas Fault is an active fault located 1.09 miles from Location 1 and 4.55 miles from Location 5. The Sargent and Castro Faults are part of the San Andreas Fault system, the Sargent Fault crossing at Location 4 and the Castro Fault crossing approximately 0.3 mile east of Location 4. Both have produced major earthquakes in historic time (documented since 1836).

Slope Stability

There is a past history of landslides within the project area. These landslides and rock fall sites located within locations 3 and 4 are identified in table 2.2-1 below.

Table 2.2-1: Landslide and Rockslide Information by Location

Number	Location Number	Approximate Post Mile	Landslide/Rock Slide Information
1	Location 3	1.45	Slope comprised of landslide debris
2	Location 4	2.58	Toothpick landslide, 1997
3	Location 4	2.68	"Old scar" landslide 1997
4	Location 4	2.84	Old landslide scarp and rock fall problem
5	Location 4	2.9	Minor shallow Landslides

2.2.2.3 Environmental Consequences

There is the potential for fault rupture and strong ground shaking within the project limits during a seismic event. With respect to project activities, this is of concern for the new structures that will be constructed (retaining walls). The majority of the walls that will be constructed will be soil-nail retaining walls, which are moderately sized and flexible. In the event of a strong seismic event, the exterior shotcrete facing of these walls could be damaged but the walls would still be functional, minimizing damage to the roadway facility and hazards to the traveling public. The ground at the project sites is suitable for construction, and structures would be built to minimize damage due to expected ground shaking.

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

The field exploration and investigation performed during final project design would included subsurface boring. Laboratory tests may include corrosion, moisture content, density, plasticity index, graduation, consolidation, and triaxial tests. Vertical and horizontal borings werewill be advanced at all sites where fill or walls are proposed. Horizontal borings were drilled are recommended at all soil nail wall locations to determine whether the contractor will have to case the holes for the soil nails.

The soil nail walls and retaining wall at Location 4 may require a fault study, which would likely include trenching to verify the exact location of the Sargent and Castro Faults that cross the project area limit. The strike of the fault is a design parameter for soil nail wall design. Preliminary recommedations were made in the Preliminary Geotechnical Report for all walls at locations 3 and 4 where there is a history of landslides or rockslides. During the design phase addtional site specific information will be collected and analyzed to inform the final design of the walls.

Based on these studies, the proposed retaining walls will be appropriately designed for the site conditions and will be built to minimize damage due to expected ground shaking, rock fall, or landsliding.

Mitigation for the potential reactivation of the landslides and rock fall sites referred to in Table 2.2-1 may include avoidance, different wall type, installation of rock nets and minimizing cut slopes to a maximum of 2:1.

2.2.3 Hazardous Waste/Materials

2.2.3.1 Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, EO 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

2.2.3.2 Affected Environment

An Initial Site Assessment (ISA) (Caltrans 2009f) was completed in August 2009. In conjunction with the ISA, a search of environmental regulatory databases was completed by Environmental Data Resources, Inc. to determine whether documentation exists related to hazardous materials sites or incidents that would warrant further investigation.

A review of regulatory databases revealed no known hazardous materials sites or incidents in the project area. However, a former gas station site at the intersection of SR 152 and Watsonville Road may contain abandoned underground storage tanks.

In addition, any yellow traffic paint, yellow thermoplastic paint/tape, or markings placed before 1990 could contain lead chromate as the pigment.

Aerially deposited lead (ADL) may be present in soils near the roadway, the source of which is primarily the use of lead in gasoline, a practice that was phased out in the mid-1970s. Typically, ADL exists in the top 6 in of soil adjacent to the roadway shoulder.

2.2.3.3 Environmental Consequences

As stated above, the ISA prepared for this project revealed an abandoned gas station at the intersection of SR 152 and Watsonville Road. Additional investigation to determine the presence of underground storage tanks will be conducted to determine whether any potential adverse impacts will occur during project construction.

Any yellow traffic paint, yellow thermoplastic paint/tape, or markings placed before 1990 could contain lead chromate as the pigment, which, if removed during construction, could generate airborne heavy metal debris in excess of the threshold established by Title 22 of the California Code of Regulations.

The ADL level of surface soil along highway corridors can reach concentrations in excess of the hazardous waste threshold, requiring disposal at either a Class I landfill or onsite stabilization. Contaminated soil could be encountered during construction.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

There is a potential for residual ADL in the surface soil. Testing for ADL will be performed during the final design stage. If ADL is found, special handling of the contaminated soil will be required and will include implementing a health and safety plan. If contaminated soil or groundwater is encountered during excavations, all activities involving contaminated soil or groundwater will be planned to comply with regulatory agency requirements. It is estimated that it would cost $200,000 to handle contaminated soil according to regulatory requirements.

Existing yellow roadway striping that would be affected will be tested for lead-based paint. If present, lead-based paint will be handled and disposed of in compliance with regulatory agency requirements.

2.3 Biological Environment

The following sections are summarized from the Natural Environment Study (Caltrans 2009) approved on January 21, 2010.

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the federal Endangered Species Act are discussed in Section 2.3.4, Threatened and Endangered Species. Wetlands and other waters are also discussed in Section 2.3.2.

2.3.1.1 Affected Environment

Vegetation Communities

Vegetation communities are assemblages of plant species that occur together in the same area, defined by species composition and relative abundance[2]. Four vegetation communities have been identified within the project area: coast live oak forest, purple needlegrass alliance, and redwood forest, in addition to the paved roadway and shoulders and landscaped/agricultural lands. Another vegetation community, coyote brush scrub, is found along SR 152 in the project area, but does not occur within the boundaries of any of the five specific project locations. Table 2.3-1 presents the areas of these communities found at the project locations.

Table 2.3-1: Total Area of Habitats within the Project Footprint (in acres)

Vegetation Community	Project Area Location					Total Area (acres)
	1	2	3	4	5	
Coast Live Oak forest	–	–	–	0.69	–	0.69
Coyote Brush Scrub	–	–	–	–	–	–
Purple Needlegrass/Native Grassland	–	–	–	0.05	–	0.05
Redwood Forest	0.58	0.56	0.57	1.66	–	3.37
Landscaped/Agricultural Lands	–	–	–	–	2.97	2.97
Roadway/Paved/Shoulder	0.11	0.29	0.36	0.35	0.78	1.88
				Total		8.97

Coast Live Oak Forest Alliance – Coast live oak (*Quercus agrifolia*) forests were found in Location 4. Other prevalent tree species common within these coast live oak woodlands are madrone (*Arbutus menziesii*) and California bay laurel (*Umbellularia californica*). The understory included common shrubs such as California coffeeberry (*Rhamnus californica*), toyon (*Heteromoles arbutifolia*), and scattered bunches of blue wildrye (*Elymus glaucus*).

Purple Needlegrass Alliance/Native Grassland – One occurrence of grassland was found at Location 4, surrounded by coast live oak woodland. The grassland contains a relatively high percent cover of native bunchgrasses, possibly the product of restoration efforts by Mt. Madonna County Park staff. Plant species of this vegetation community include purple

[2] The plant communities in the project area were classified using *A Manual of California Vegetation*. (Sawyer, J.O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, CA.)

needlegrass (*Nassella pulchra*), annual brome species (*Bromus* sp.), coast buckwheat (*Erigonium latifolium*), and tarweed (*Madia* sp.). Many annual forb species are found throughout the grassland area, including species of fireweed (*Epilobium* sp.), geranium (*Geranium* sp.), lupine (*Lupinus* sp.), clover (*Trifolium* sp.), and plantain (*Plantag*o sp.).

Redwood Forest Alliance – Redwood forest is the most common vegetation type found in the project area. Redwood forest is found in Locations 1, 2, 3, and 4. These evergreen forests are characterized by a prominence of coast redwood (*Sequoia sempervirens*). Understory trees and shrubs include tanoak (*Lithocarpus densiflorus*), California bay laurel, California woodfern (*Dryopteris arguta*), California blackberry, and madrone.

Landscaped/Agricultural Lands – All areas in Location 5 have undergone ornamental landscaping or are under agricultural management. Characteristics of these lands include manicured turf grass with ornamental trees lining the fences of residential communities, businesses, and agricultural fields.

Roadway/Shoulder – The roadway and adjoining paved areas and shoulders are highly disturbed and provide little to no value for wildlife species.

Coyote Brush Scrub Alliance – Coyote brush scrub alliance community is present within the project area, but does not occur within the boundaries of the project footprints at any of the specific locations. This area is likely a product of restoration activities associated with Sprig Lake and is found on the banks of a perennial stream. This community is dominated by coyote brush (*Baccharis pilularis*) and common rush (*Juncus effusus*). Several young arroyo willows (*Salix laevigata*) were found in this area. Other common herbaceous species include blue wildrye and mugwort (*Artemisia douglasiana*). This vegetation type is surrounded by coast live oak woodland and redwood forest.

Other habitats within the project area include aquatic habitats consisting of palustrine persistent emergent wetlands, rivers, and culverts. Riverine habitat encompasses three drainages: Bodfish Creek, an unnamed tributary to Bodfish Creek, and Blackhawk Creek.

Trees

There were 1,273 trees mapped in the project area. Within the project footprint are a total of 148 trees with a diameter at breast height (dbh) in excess of 6 in..

Santa Clara Valley HCP/NCCP

As described in Section 2.1.1.2, a Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) is currently being developed for the Santa Clara Valley. The estimated completion date of the Santa Clara Valley HCP/NCCP, including certification of the environmental review and completion of the Final HCP/NCCP, is slated for sometime in 2010 (ICF Jones and Stokes 2009).

Based on a review of the second administrative Draft Habitat Plan (ICF Jones and Stokes 2009), the Hecker Pass Safety Improvement Project addresses the key special-status plant and wildlife species and sensitive natural resources covered under the Santa Clara Valley HCP/NCCP, and is in general compliance with the Habitat Plan in its current draft form.

2.3.1.2 Environmental Consequences

Vegetation Communities

Table 2.3-2 lists the potential temporary and permanent impacts to vegetation communities from roadway construction. Temporary impacts to habitat are those that can be restored and revegetated after construction is completed. Permanent impacts to habitat include those areas lost due to circumstances such as the increased paved surface that will remain after construction is complete. Species- or habitat-specific measures are expanded upon in the sections that follow.

Table 2.3-2: Areas of Temporary and Permanent Impact to Vegetation Communities in the Project Footprint

Vegetation Community	Project Area Location [Impacts Acreage]					Total Area Acres
	1	2	3	4	5	
Temporary Impacts						
Coastal Oak Forest	–	–	–	0.08	–	0.08
Coyote Brush Scrub	–	–	–	–	–	0.00
Purple Needlegrass/Native Grassland	–	–	–	0.01	–	0.01
Redwood Forest	–	–	–	–	–	0.00
Landscaped/Agricultural Lands	–	–	–	–	0.67	0.67
Roadway/Paved/Shoulder	–	–	–	–	0.78	0.78
Total Temporary Impacts						**1.54**
Permanent Impacts						
Coastal Oak Forest	–	–	–	0.61	–	0.61
Coyote Brush Scrub	–	–	–	–	–	0.00
Purple Needlegrass/Native Grassland	–	–	–	0.04	–	0.04
Redwood Forest	0.58	0.56	0.57	1.66	–	3.37
Landscaped/Agricultural Lands	–	–	–	–	2.30	2.30
Roadway/Paved/Shoulder	0.11	0.29	0.36	0.35	–	1.11
Total Permanent Impacts						**7.43**
					Total Impact	**8.97**

Trees

California law allows state agencies to supersede county or local ordinances with regard to tree removal outside of the highway right-of-way. The Department typically mitigates for the removal of any tree with a dbh in excess of 6 in. The project may require the removal of a number of roadside trees meeting this criterion. It is anticipated that approximately 148 trees within the project footprint would be removed to facilitate construction activities, as shown in Table 2.3-3.

Table 2.3-3: Number of Existing and Impacted Trees in the Project Footprint, by Species

Tree Species	Total Trees in Project Area	Total Trees to Be Removed from Each Location					Total Trees to Be Removed within the Project Footprint
		1	2	3	4	5	
Alder	6	-	-	-	-	-	0

Table 2.3-3: Number of Existing and Impacted Trees in the Project Footprint, by Species

Tree Species	Total Trees in Project Area	Total Trees to Be Removed from Each Location					Total Trees to Be Removed within the Project Footprint
		1	2	3	4	5	
Almond	3	-	-	-	1	1	2
Cedar	87	-	-	-	10	-	10
Cottonwood	6	-	-	-	-	2	2
Fir	8	-	-	-	-	1	1
Joshua	4	-	-	-	-	2	2
Madrone	12	-	-	-	-	-	0
Maple	207	8	5	0	3	0	16
Oak	214	-	3	-	8	7	18
Olive	3	-	-	-	-	2	2
Pine	5	-	-	-	-	-	0
Redwood	459	36	1	5	6	3	51
Spruce	1	-	-	-	-	-	0
Walnut (black)	2	-	-	-	-	2	2
Walnut (English)	31	-	-	-	-	31	31
Yew	1	-	-	-	-	-	0
other	224	4	1	0	3	3	11
Total Trees	1,273						
Total Trees per Location		48	10	5	31	54	
Total Trees to Be Removed within the Project Footprint							148

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Vegetation Communities

General avoidance and minimization efforts will be incorporated into the design and implemented to reduce potential impacts to natural communities and plant and animal species. These measures will include minimizing the project footprint, providing environmental education for the construction crew, and delineating the work area and all environmentally sensitive areas with fencing. These require that an onsite biological monitor be present during activities that may impact sensitive biological resources. No compensatory mitigation is required for impacts to the communities.

Trees

Replacement trees will be planted at a ratio of 31:1 ratio for all native trees, and trees located within the riparian zone within California Department of Fish and Game jurisdiction with a dbh of 6 inches or greater. Trees having a dbh in excess of 6 in that are in the riparian zone and within California Department of Fish and Game (CDFG) jurisdiction will be replaced at a 3:1 ratio All other trees will be replaced at a 1:1 ratio. Trees will be planted onsite in the project area to the extent possible, after the completion of roadway construction. Offsite planting areas will be sought if onsite mitigation is not possible.

2.3.2 Wetlands and Other Waters

2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States (U.S.), including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (ACOE) with oversight by the Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds that: (1) there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the CDFG and the RWQCB. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600 through 1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

2.3.2.2 Affected Environment

A Natural Environment Study was approved on January 21, 2010. The Jurisdictional Wetland Delineation for this project was approved by the ACOE on December 28, 2009.

Approximately 0.006 acre of potentially jurisdictional wetland was identified near Location 4. Because this wetland abuts a perennial tributary of Bodfish Creek, the wetland falls under ACOE's jurisdiction. The wetland found near Location 4 is characterized by hydrophytic vegetation including an herbaceous layer dominated by spreading rush, mugwort, and bitter cress. Young arroyo willow trees occur in the shrub layer. However, this wetland lies outside of the project footprint and the project limits, and project activities will not affect this wetland feature.

In addition, 16 culverted features are located within the project limits. Culvert modifications are planned for 15 of these culverts. Of those 15 culverts scheduled for some type of modification, 8 were identified during the jurisdictional delineation as waters that are potentially not under the jurisdiction of the ACOE. The remaining 7 culverts were identified as potentially jurisdictional "other waters of the U.S." and/or waters of the State.

2.3.2.3 Environmental Consequences

The wetland community located in the vicinity of Location 4 lies outside of the project footprint and project activities will not affect this wetland feature.

Repairs to culverts within the project area will result in approximately 566 square feet (ft^2;0.013 ac) of culverted waters, of which approximately 465 ft^2 (0.011 ac) are waters of the U.S. and State and approximately 101 ft^2 (0.002 ac) are classified as waters of the State. Culvert extensions within the project limits will result in permanent impacts to approximately 488 ft^2 (~0.011 ac) of waters: 114 ft^2 (0.002 ac) of waters of the U.S. and State, and 374 ft^2 (0.009 ac) of Waters of the State.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

The Department will limit construction activities to the smallest area possible to complete the work in an effort to minimize impacts to the existing riverine habitat in Bodfish Creek. A Department biologist will clearly delineate this limited construction area for incorporation in the project plans and specifications. The Department will use environmentally sensitive area (ESA) fencing to delineate protected areas and to confine workers and equipment to the designated construction areas. The ESA fencing will preclude access to the stream channel and riparian habitat along Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek, except as necessary for construction access.

Potential instream impacts to Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek aquatic resources and fisheries will be minimized by adhering to State Standard Specifications for avoidance of water pollution (Section 7-1.01g) and by implementing BMPs. These measures include detailed recommendations for keeping heavy machinery out of the water, limiting the amount of material (excavated or construction materials) that enter the streams, and maintaining flows at all times. The State Standard Specifications require the contractor to prepare a plan to control water pollution during construction.

All temporary impacts will be restored to pre-construction conditions. Compensatory mitigation for permanent impacts to waters of the U.S. will not likely be required by the ACOE; however, mitigation may be required by the RWQCB for waters of the State.

2.3.3 Animal Species

2.3.3.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.4 below. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act (MBTA)
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

2.3.3.2 Affected Environment

The following sections are summarized from the Natural Environment Study (Caltrans 2009) approved on January 21, 2010.

Various special-status animal species that are not listed as threatened or endangered were determined to have some potential to occur within the project area. These species are discussed below.

Foothill Yellow-Legged Frog

The foothill yellow-legged frog (*Rana boylii*), a California Species of Special Concern, was once common in most Pacific drainages throughout the foothills of California extending from the Oregon border south to the San Gabriel River system in Los Angeles County at elevations ranging from near sea level to 1,940 meters above sea level. Foothill yellow-legged frogs inhabit and remain close to shallow, small to medium streams with cobble substrates beneath which they deposit their eggs (Jennings and Hayes 1994).

A review of the California Natural Diversity Database (CNDDB) and the Museum of Vertebrate Zoology collections database shows that the project area occurs within the recognized range of the foothill yellow-legged frog. Although no contemporary records have been reported, a single adult/juvenile foothill yellow-legged frog was collected in the vicinity of the unnamed tributary to Bodfish Creek in 1939.

The portion of Bodfish Creek adjacent to the project limits in Locations 1 through 4 provides potentially suitable non-breeding aquatic habitat for foothill yellow-legged frogs. It contains appropriate shallow stream habitat with cobble bottom necessary for foothill yellow-legged frogs.

Although potentially suitable aquatic habitat for the species may be present offsite in the vicinity of the project limits and a foothill yellow frog was once collected in the vicinity of the unnamed tributary to Bodfish Creek within Location 1, the foothill yellow-legged frog is a predominantly aquatic species that is unlikely to venture far from the water. For these reasons, there is a low potential for foothill yellow-legged frog to occur within the project footprint.

Western Pond Turtle

The western pond turtle (*Emys* (=*Clemmys*) *marmorata*), a California Species of Special Concern, is one of two freshwater turtles native to California. Western pond turtles are distributed along much of the western coast from Puget Sound in Washington south to the Baja Peninsula, Mexico. Pond turtles inhabit permanent or semi-permanent freshwater ponds, streams, rivers, stock ponds, lakes, reservoirs, marshes, sloughs, and agricultural canals and regularly use basking sites such as matted vegetation, woody debris, and mud banks for thermal regulation. Pond turtles are omnivorous and feed on a variety of aquatic and terrestrial invertebrates, fish, amphibians, and aquatic plants.

Western pond turtles have been reported within the project area. In 2000, two western pond turtles were observed adjacent to Location 4 in Sprig Lake Pond, which is a former impoundment along Blackhawk Creek and a tributary to Bodfish Creek. Although this impoundment has since been removed, western pond turtles may still inhabit this portion of Blackhawk Creek and nest in the surrounding uplands.

White-Tailed Kite

White-tailed kites (*Elanus leucurus*), a state-listed fully protected species, are year-round residents of Central and coastal California, inhabiting grasslands, agriculture fields, oak woodlands, savannah, and riparian habitats in rural and urban areas. They breed in a variety of habitats including grasslands, cultivated fields, oak woodlands, and suburban areas where prey – typically small mammals (primarily California voles), reptiles, and occasionally birds – is abundant. Nests are typically built in trees 9 to 60 ft tall (Wheeler 2003) near a water source and may occur in suburban areas with adjacent open areas with abundant prey. Breeding occurs between February and July, and double-brooding occurs in some years. During the non-breeding season, white-tailed kites may roost communally at certain sites (Dunk 1995).

Although white-tailed kites were not observed onsite during the site visits, the species has been recorded breeding in the project vicinity (Bousman 2005), including an occurrence of a white-tailed kite recorded as a “probable” nesting individual in 1994, approximately 2 miles northeast of the project limits (CDFG 2009). In addition, the ornamental and native trees at Location 5 could potentially act as suitable nesting habitat for the species, as they are near a potentially suitable prey base (as evidenced by the presence of small mammal burrows) and a riparian corridor (Bodfish Creek is less than 1,000 ft away). The denser redwood and coat live oak forests, of Locations 1 through 4 do not provide appropriate breeding habitat for the species. These trees do not contain the appropriate structure for white-tailed kite nests and the habitat is

not preferred by white-tailed kites for hunting. Agricultural habitats in Location 5 may provide appropriate breeding habitat for this species.

Burrowing Owl

Burrowing owls (*Athene cunicularia*), a California Species of Special Concern, range in northern California throughout the Central Valley, the inner and outer coastal regions, and portions of the San Francisco Bay Area. They inhabit areas with low vegetation in agricultural fields, grasslands and desert communities, and also occur in urban and suburban areas subject to regular human disturbance. Burrowing owls require mammal burrows, typically those created by ground squirrels, for escape cover and nesting. However, debris piles, rocks, concrete debris, etc. are also used in lieu of burrows. The breeding season occurs from February 1 to August 31, but peaks between late April and July in most years.

Although burrowing owls were not observed onsite during the site visits, the species has been recorded breeding within Santa Clara County and in the project vicinity, including an occurrence of two adult burrowing owls near a burrow in mid-January 1993, approximately 2 miles northeast of the project area.

Ground squirrel and California meadow vole burrows, which provide potential nesting and foraging habitat for burrowing owl, are scattered along the northern and southern sides of Location 5, concentrated in isolated patches along the vegetated roadside shoulder and throughout the adjacent agricultural fields.

Migratory Birds

In addition to white-tailed kite and burrowing owl, eight other special-status migratory bird species were identified as having some potential to nest, forage, roost, or winter near the project area. These special-status bird species are discussed together below.

Five raptors (bird of prey) – Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), golden eagle (*Aquila chrysaetos*), long-eared owl (*Asio otus*), and merlin (*Falco columbarius*) – and three passerines (perching birds) – yellow warbler (*Dendroica petechia brewsteri*), loggerhead shrike (*Lanius ludovicianus*), and purple martin (*Progne subis*) were identified as having some potential to nest, forage, roost, or winter onsite. This list includes species of special concern (Cooper's hawk, sharp-shinned hawk, loggerhead shrike, long-eared owl, merlin, yellow warbler, and purple martin) or that are fully protected (golden eagle) under the California Fish and Game code.

These species use a variety of habitats including native and non-native annual grasslands, oak woodlands, coniferous forest, riparian corridors, and rural/suburban neighborhoods, all of which are present within or adjacent to the project. None of these species were observed onsite during the site visits; however, many have been recorded breeding within Santa Clara County and in the project vicinity (Bousman 2005). All eight migratory bird species considered here can be expected to nest, forage, roost, and winter onsite or in the project vicinity corresponding to each species' specific habitat needs and the time of year.

Although the migratory bird species described above were not observed onsite during the site visits, these species have been recorded breeding within Santa Clara County and in the project vicinity (Bousman 2005). During the January 24, 2008, site visit, a vacant hummingbird

(unknown sp.) nest constructed out of lichen and moss was observed in a shrub north of the Sprig Lake parking lot, between the lot and Blackhawk Creek. Additional stick nests, most likely remnants from the 2007 or earlier breeding seasons, were observed in the tree canopy of the oak woodlands and redwood forest throughout Locations 1 through 4 in the project limits.

San Francisco Dusky-Footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectans*), a California Species of Special Concern, is one of 11 recognized subspecies native to California. The San Francisco dusky-footed woodrat typically prefers chaparral, oak woodland, and redwood forest and riparian corridor habitats with moderate to dense understory and moderate canopy cover. Woodrats exhibit high site fidelity and construct stick nests elevated in trees or at ground level in dense brush, on the periphery of large rocks, stumps, or tree trunks, or in hollow stumps and trunks; such nests may last and be inhabited for tens of years by successive woodrat generations. Woodrats are generalist herbivores and live in loosely cooperative societies.

A single San Francisco dusky-footed woodrat sticknest was observed during the January 14, 2008, site reconnaissance visit adjacent to the unnamed tributary to Bodfish Creek near Location 1. Approximately 0.75 mile east of the project area, as many as 23 individual San Francisco dusky-footed woodrat stick nests were recorded in the vicinity of the Uvas Creek Scour Project, upstream and downstream of the Uvas Creek Bridge along SR 152 (H.T. Harvey and Associates 2007).

2.3.3.22.3.3.3 Environmental Consequences

Foothill Yellow-Legged Frog

While possibly located nearby, it is very unlikely that the foothill yellow-legged frog is present within the project footprint. Temporary and permanent impacts to the species, if present, are anticipated to be the same as the impacts to the California red-legged frog and will be mitigated through the precautionary avoidance and minimization measures to be taken for California red-legged frog, as described in Section 2.3.4.4. Avoidance and minimization measures established to protect water quality and other special-status species will further ensure that this species is minimally impacted by the project.

Western Pond Turtle

While possibly located nearby, it is very unlikely that the western pond turtle is present within the project footprint. If present, temporary and permanent impacts to the species are anticipated to be the same as the impacts to the California red-legged frog. Avoidance measures will be implemented as described in Section 2.3.3.4.

White-Tailed Kite

The project may result in impacts such as nest disturbance or abandonment during incubation, nestling, or fledging stages; temporary shifts in foraging patterns or territories, noise or light pollution; and winter roost abandonment to white-tailed kite at Location 5, if this species were to nest near this location at the time of construction. The Project will require the removal of an estimated 148 trees, 54 of which are within the project footprint at Location 5. Although no permanent impacts to white-tailed kite are anticipated, temporary impacts can be avoided and/or minimized by implementing the minimization measures described in Section 2.3.3.4.

Burrowing Owl

The landscaped, agricultural lands in Location 5 of the project area show evidence of small mammal burrowing activity. These burrows may provide suitable nesting and foraging habitat for burrowing owl. The project may potentially result in temporary impacts such as nest disturbance or abandonment and/or temporary shifts in foraging patterns or territories to approximately 2.97 acres of potential burrowing owl habitat. These impacts can be avoided and/or minimized by implementing the minimization measures described in Section 2.3.3.4.

Migratory Birds

The project may result in temporary impacts such as nest disturbance or abandonment during incubation, nestling, or fledging stages; temporary shifts in foraging patterns or territories; noise or light pollution; and winter roost abandonment to sensitive bird species in all project locations. These impacts can be avoided and/or minimized by implementing the minimization measures described in Section 2.3.3.4.

San Francisco Dusky-Footed Woodrat

It is unlikely that the San Francisco dusky-footed woodrat is present within the project footprint and permanent impacts to the species are not anticipated. Avoidance and minimization measures described in Section 2.3.3.4 will be implemented as a precaution in the event that any woodrats move in to the project footprint before construction begins.

2.3.3.32.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Foothill Yellow-Legged Frog

Due to the close proximity of potential foothill yellow-legged frog habitat and an historical record confirming the species' presence within the unnamed tributary to Bodfish Creek, the precautionary measures to avoid or minimize impacts to California red-legged frog (Section 2.3.4.4) will be sufficient to avoid or minimize impacts to foothill yellow-legged frog.

Western Pond Turtle

Due to the proximity of western pond turtles in the vicinity of the project area and a known occurrence of western pond turtle in the vicinity of Location 4 of the project, the measures to avoid or minimize impacts to California red-legged frog (Section 2.3.4.4) together with the following measures will avoid or minimize impacts to western pond turtle:

1. A qualified biologist will survey the work site in the vicinity of Location 4, no more than 48 hours before start-of-work activities begin, for signs of western pond turtles and/or western pond turtle nesting activity (i.e., recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Preconstruction surveys to detect western pond turtles will focus on potentially suitable aerial and aquatic basking habitat such as logs, branches, rootwads, and rip-rap, as well as the shoreline and adjacent warm, shallow waters where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Preconstruction surveys to detect western pond turtle nesting activity will be concentrated within approximately 1,300 ft of suitable aquatic habitat and will focus on areas along south- or west-facing slopes with bare hard-packed clay or silt soils or a sparse vegetation of short grasses or forbs. If western pond turtles or their nesting sites are found, the

biologist will contact CDFG to determine whether relocation and/or exclusion buffers are appropriate. If CDFG approves of moving the animal, the biologist shall be allowed sufficient time to move the western pond turtle(s) from the work site before work activities begin.

White-Tailed Kite

To ensure compliance with the MBTA (16 U.S.C. 703-712) and California Fish and Game Code (§§3503, 3511, and 3513), and minimize impact to the white-tailed kite, the following species-specific avoidance and minimization measures will be implemented:

1. Preconstruction bird surveys will be conducted by a qualified biologist no more than 2 weeks before construction begins for activities occurring during the breeding season (February 1 to August 31) or during the wintering period (September 1 to January 31) for sensitive wintering species.

2. If active nests of special-status bird species are found in the vicinity of the limits of grading or construction work, within 100 ft of passerine nests or within 300 ft of raptor nests, a non-disturbance buffer will be established at a distance sufficient to minimize nest/roost disturbance based on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential disturbance. Buffer size will be determined in cooperation with CDFG and USFWS.

3. If rescheduling work around active nests/roosts of special-status bird species is infeasible, a qualified biologist will monitor nests for signs of disturbance. If it is determined that project activities are resulting in nest/roost disturbance, work will cease immediately, and the CDFG and the USFWS will be contacted for guidance.

Burrowing Owl

To ensure compliance with the MBTA (16 U.S.C. 703-712) and California Fish and Game Code (§§3503, 3511, and 3513), and avoid and minimize impacts to the burrowing owl, Caltrans will implement the precautionary measures to avoid or minimize impacts to white-tailed kite , together with the following precautionary measures to avoid or minimize impacts to burrowing owl:

1. Within 30 days before construction begins, burrowing owl preconstruction surveys will be conducted at Location 5 of the project area by a qualified biologist in accordance with CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 1995) and the California Burrowing Owl Consortium's Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993). Preconstruction surveys, consisting of winter season surveys (between December 1 and January 31) and nesting season surveys (between April 15 and July 15), will be conducted for Location 5 of the project area and within a 500-ft buffer where possible, to identify and map active burrowing owl burrows. Surveys will consist of walking transects of no more than 100 ft apart.

2. Occupied burrows will not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFG verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that

juveniles from the occupied burrows are foraging independently and are capable of independent survival.

3. If burrowing owls are detected in the project footprint or within 500 ft of the project footprint, a non-disturbance buffer will be established within a 160-ft radius surrounding occupied burrows during the nonbreeding season (September 1 through January 31) or within a 250-ft radius surrounding occupied burrows during the breeding season of February 1 through August 31.

4. If avoidance is not feasible and owls must be moved away from the disturbance area, one of the two following passive relocation techniques (as described below) will be used rather than trapping. At least 1 full week will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

    - **Passive Relocation – With One-Way Doors**. Owls will be excluded from burrows in the immediate impact zone and within a 160-ft buffer zone by installing one-way doors in burrow entrances to allow the birds to leave the burrow, but not return. One-way doors (e.g., modified dryer vents) will be left in place 48 hours to ensure owls have left the burrow before excavation. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily for 1 week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside.

    - **Passive Relocation – Without One-Way Doors**. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows may then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

Migratory Birds

To ensure compliance with the MBTA and California Fish and Game Code (§§3503, 3511, and 3513), the precautionary measures to avoid or minimize impacts to white-tailed kite (described above) will be sufficient to avoid or minimize impacts to migratory birds.

San Francisco Dusky-Footed Woodrat

Potential presence of the San Francisco dusky-footed woodrat can be avoided by taking the following avoidance and minimization measures:

1. Several months in advance of construction activities, surveys will be conducted in all forested areas in the project footprint to locate active woodrat stick nests.

2. If active woodrat stick nests are found within the project footprint area at the time of construction, relocation measures, developed in conjunction with CDFG, will be

implemented to ensure that the project footprint is clear of woodrat nests before construction.

2.3.4 Threatened and Endangered Species

Based on the site reconnaissance, a review of available databases and literature, and the project biologists' familiarity with local flora and fauna, a total of 21 federally proposed and federally listed endangered or threatened plant and wildlife species were considered as part of this assessment (USFWS 2008a) (Appendix B). Of these, 15 taxa were ruled out based on the lack of suitable habitat, local range restrictions, regional extirpations, lack of connectivity between areas of suitable or occupied habitat, and/or incompatible land use and habitat degradation/alteration of on-site or adjacent lands.

Two species listed as threatened or endangered, the California red-legged frog and the California tiger salamander occur within the project limits. These species are addressed in this section. A complete list of all species considered as part of this assessment, their regulatory status, habitat requirements, local occurrences, and evaluations are listed in Table 2.3-1.

Table 2.3-1: Federally Listed Species from the U.S. Fish and Wildlife Service Species List and the California Natural Diversity Database[1]

Scientific Name	Common Name	Federal Status State Status CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Potential Presence in the Study Area / Rationale
PLANTS					
Ceanothus ferrisae	coyote ceanothus	FE -- CNPS 1B.1	Chaparral, coastal scrub, and valley and foothill grassland/serpentinite; known from five occurrences in the Mt. Hamilton Range; Elevation range: 394-1,509 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Chorizanthe pungens var. *pungens*	Monterey spineflower	FT -- CNPS 1B.2	Chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland/sandy; Elevation range: 10-1,476 feet.	Present	**Does not occur.** Suitable habitat is present within or in the vicinity of the BSA, but field surveys of the action area were negative. Species not considered further.
Chorizanthe robusta var. *robusta*	robust spineflower	FE	Chaparral (maritime), cismontane woodlands (openings), coastal dunes, and coastal scrub/sandy or gravelly; Elevation range: 10-984 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Dudleya setchellii	Santa Clara Valley dudleya	FE -- CNPS 1B.1	Cismontane woodland, valley and foothill grasslands/serpentinite, rocky; Elevation range: 196-1,492 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Holocarpha macradenia	Santa Cruz tarplant	FT (CH) SE CNPS 1B.1	Coastal prairie, coastal scrub; Elevation range: 32-721 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further
Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewelflower	FE -- CNPS 1B.1	Valley and foothill grassland (serpentinite); Elevation range: 147-2,624 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Trifolium amoenum	two-fork clover	FE -- CNPS 1B.1	Coastal bluff scrub, valley, and foothill grassland (sometimes serpentinite); Elevation range: 16-1,361 feet.	Present	**Does not occur.** Suitable grassland habitat is present at Location 4, but field surveys of the action area were negative. Species not considered further.

Table 2.3-1: Federally Listed Species from the U.S. Fish and Wildlife Service Species List and the California Natural Diversity Database[1]

Scientific Name	Common Name	Federal Status State Status CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Potential Presence in the Study Area / Rationale
INVERTEBRATES					
Euphydryas editha bayensis	bay checkerspot butterfly	FT (CH) -- Xerces-CI	A California endemic butterfly restricted to native grasslands on rock outcrops in serpentine soil. Host plant is the dwarf plantain (*Plantago erecta*). *Orthocarpus densiflorus* and *O. purpurascens* are secondary host plants. Restricted to San Francisco, Alameda, Contra Costa, San Mateo, and Santa Clara Counties.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
FISH					
Eucyclogobius newberryi	tidewater goby	FE	Coastal lagoons and creeks; found up to 3 miles upstream in slow-moving water.	Absent	**Does not occur.** Outside of range. Species not considered further.
Hypomesus transpacificus	delta smelt	FT	Brackish water. Found only in the Sacramento-San Joaquin Estuary, as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River. Downstream as far as San Pablo Bay.	Absent	**Does not occur.** Outside of range. Species not considered further.
Oncorhynchus mykiss	steelhead South/Central California Coast DPS	FT (CH) CSC	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. Spawns in winter/spring. This DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California.	Present	Does not occur in Action Area; no project impacts. Locations 4 and 5 parallel Bodfish Creek and/or contain its tributary, Blackhawk Creek, both of which lie within the Pajaro River watershed and are within the South/Central California DPS boundary and the designated critical habitat. During field surveys, individuals were observed in several locations below SR 152. Project excludes modifications to the only potentially passable stream or culvert (at Location 4); thus, no effect on species. Species not considered further.

Table 2.3-1: Federally Listed Species from the U.S. Fish and Wildlife Service Species List and the California Natural Diversity Database[1]

Scientific Name	Common Name	Federal Status State Status CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Potential Presence in the Study Area / Rationale
Oncorhynchus mykiss	steelhead Central California Coast DPS	FT (CH) -- National Marine Fisheries Service	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. Spawns in spring. This DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers.	Absent	**Does not occur.** Outside of range. Species not considered further.
Oncorhynchus mykiss irideus	steelhead Central Valley DPS	FT -- --	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. The DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries.	Absent	**Does not occur.** Outside of range. Species not considered further.

Table 2.3-1: Federally Listed Species from the U.S. Fish and Wildlife Service Species List and the California Natural Diversity Database[1]

Scientific Name	Common Name	Federal Status State Status CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Potential Presence in the Study Area / Rationale
AMPHIBIANS					
Ambystoma californiense	California tiger salamander	FT (CH) CSC --	A large terrestrial salamander that inhabits seasonal/semi-permanent water sources (3-4 months in duration) and adjacent upland habitat with small fossorial mammal activity in lowland grasslands, oak savannah and mixed woodlands. Range includes the Central Valley and Central Coast ranges from Colusa County south to San Luis Obispo and Kern counties from sea level to 3,460 feet in elevation with two disjunct populations within Sonoma County and Santa Barbara County. California tiger salamanders have been documented traveling distances up to 1 mile.	Present	**May occur.** Suitable breeding habitat has been identified within a 1.24-mile radius of Location 5, which is within potential migratory range. Occurrences reported within a 1.24-mile radius.
Rana draytonii	California red-legged frog	FT (CH) CSC --	A medium-sized frog that inhabits lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation up to 4,900 feet in elevation. Range extends from Redding to Baja California, Mexico. Breeding occurs between November and April in standing or slow moving water at least 2 ½ feet in depth with emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.) or overhanging willows (*Salix* spp.).	Present	**May occur.** Detected historically in 1939. Suitable breeding habitat has been identified within a 1-mile radius of Locations 1 through 5.
BIRDS					
Brachyramphus marmoratus marmoratus	marbled murrelet	FT (CH) SE --	A small coastal seabird that nests in coastal trees in large, mature/old-growth coniferous forests. Breeding begins in April. Tree nests require large-diameter limbs or other suitable platforms.	Absent	**Does not occur.** Field surveys for suitable habitat were negative. Suitable habitat is absent. Species not considered further.

Table 2.3-1: Federally Listed Species from the U.S. Fish and Wildlife Service Species List and the California Natural Diversity Database[1]

Scientific Name	Common Name	Federal Status State Status CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Potential Presence in the Study Area / Rationale
Falco peregrinus	American peregrine falcon	Delisted SE / FP --	Typically a year-round resident in California and most common along the coast. Nests on cliffs, but frequently uses manmade structures such as bridges and buildings. Nests are generally found close to water bodies with abundant avian prey. Breeding begins in March; single-brooded.	Absent	**Does not occur.** Suitable nesting habitat and large water bodies are absent. Species is uncommon, irregular breeder in Santa Clara County. Species not considered further.
Haliaeetus leucocephalus	bald eagle	Delisted SE / FP --	Winters at lakes, reservoirs, river systems and some rangelands and coastal wetlands. Nests in large conifers near aquatic sources. Breeding begins in May; single-brooded.	Present	**Does not occur.** Suitable nesting and foraging habitat within 5 miles. Rare to very rare vagrants and irregular breeders in Santa Clara County. No CNDDB occurrences nearby. Species not considered further.
Sternula antillarum browni	California least tern	FE SE / FP --	Migratory in California; breeding colonies are found in southern California along marine and estuarine shores, and in San Francisco Bay in abandoned salt ponds and along estuarine shores; feeds in nearby shallow, estuarine waters or lagoons where small fish are abundant. After breeding, family groups regularly occur at lacustrine waters near the coast of southern California. Prefers undisturbed nest sites on open, sandy or gravelly shores near shallow-water feeding areas in estuaries.	Absent	**Does not occur.** Suitable marine/estuarine habitat is absent. Species is rare to very rare in Santa Clara County. Species not considered further.
Vireo bellii pusillus	least Bell's vireo	FE SE --	Obligate riparian species during the breeding season preferring early successional habitat, typically inhabits structurally diverse woodlands along watercourses, including cottonwood-willow forests, oak woodlands, and mule fat scrub.	Absent	**Does not occur.** Suitable riparian habitat is absent. A vagrant species in Santa Clara County. Species not considered further.

MAMMALS					
Vulpes macrotis mutica	San Joaquin kit fox	FE ST --	Inhabits annual grasslands or grassy open stages with scattered shrubby vegetation, agricultural fields, valley oak woodlands, and alkali sink valley floor habitats with low vegetation; needs loose-textured sandy soils for burrowing, as well as a suitable prey base, typically in areas with significant California ground squirrel activity.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.

1 Database Queries for the Loma Prieta, Mount Madonna, Gilroy, Watsonville West, Watsonville East, and Chittendon USGS 7.5 minute Quads.

2 Status

CH	Critical Habitat	FT	Federal threatened
CNPS	California Native Plant Society	SE	State endangered
CSC	State species of concern	ST	State threatened
FE	Federal endangered	1B.1	Rare, threatened, or endangered in California and elsewhere; seriously endangered in California
FP	Fully protected (California)	1B.2	Rare, threatened, or endangered in California and elsewhere; fairly endangered in California

Note: A search of the Federal Endangered and Threatened Species That Occur In Or May Be Affected list was conducted and this table was updated on 10/20/10.

2.3.4.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 U.S.C., Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, are required to consult with the USFWS and the National Marine Fisheries Service (NOAA Fisheries) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of FESA defines take as activities that "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

2.3.4.2 Affected Environment

A Natural Environment Study was completed for this project on January 21, 2010. The Department initiates consultation with USFWS when a project has the potential to affect a federally listed species and/or destroy or adversely modify designated critical habitat. Formal consultation with the USFWS was initiated in June of 2009 with the submission of the Biological Assessment. A Biological Opinion 81420-2009-F-1058-2 was issued by the USFWS for the California red-legged frog and the California tiger salamander on July 14, 2010, and was accepted by the Department October 19, 2010.

The California red-legged frog (*Rana draytonii*), federally listed as threatened (USFWS 1999), is distributed throughout 26 counties in California, but is most abundant in the San Francisco Bay Area. A review of the CNDDB (CDFG 2009) and the Museum of Vertebrate Zoology (MVZ 2008) collections database showed that the project area occurs within the recognized range of the California red-legged frog. A total of four adult and juvenile California red-legged frog occurrences have been reported within 5 miles of the project area and one historical occurrence has been documented within the project limits at Location 1 (CDFG 2009; MVZ 2008).

The Bodfish and Uvas creek watersheds (and their component tributaries) are between known California red-legged frog occurrences, listed above. California red-legged frogs require slow-

moving water at least 2.5 ft deep with emergent vegetation for breeding (Hayes and Jennings 1988). Approximately 19 ponds, stockponds, reservoirs, and water bodies and an undetermined number of tributary creeks and streams were identified within a 1-mile radius of Locations 1 through 5. It is unknown whether these ponds specifically provide suitable breeding habitat as they were not investigated, however, it is possible that these watersheds could provide breeding, upland refugia, or oversummering habitat for the species, or act as migratory and dispersal corridors on a general population level.

Suitable California red-legged frog upland dispersal habitat includes the presence of some form of cover for the species as well as proximity to non-breeding aquatic habitat. The species may use small mammal burrows for cover in upland dispersal habitat. The proximity of non-breeding aquatic habitat is an important characteristic of upland habitat because 90% of the time non-migrating and non-breeding California red-legged frogs stay within 200 ft of aquatic habitat (Bulger et al. 2003). As a result, the habitats within the project limits, including redwood forest, coast live oak woodlands, coyote brush scrub, and purple needlegrass/native grasslands, may provide potential upland dispersal habitat.

Redwood forest habitat is present within the project limits in Locations 1 through 4. In addition, coast live oak woodlands, coyote brush scrub, and purple needlegrass/native grasslands are present within Location 4. Along Locations 1 through 4, SR 152 parallels Bodfish Creek and the unnamed tributary to Bodfish Creek within 200 ft of the edge of their riparian corridors, well within the USFWS' recognized upland habitat dispersal range. During the January 2008 California red-legged frog habitat assessment, little to no small mammal burrowing activity was observed in Locations 1 through 4. However, boulders, rocks, downed trees, and leaf litter in this habitat may provide upland shelter for this species. These four habitat types within the project limits may provide upland and dispersal habitat for the species.

Landscaped and agricultural lands are present within the project limits in Location 5. During the January 2008 California red-legged frog habitat assessment, moderate to high numbers of small mammal burrows, which could potentially be used by California red-legged frogs as refuge, were observed throughout Location 5. Location 5 is also near, within 500 ft of Bodfish Creek. Therefore, although slightly degraded by landscaping and agriculture, the habitat within Location 5 may provide upland and dispersal habitat for the species.

In summary, the following factors indicate a high potential for California red-legged frog to occur within the project area:

- Previously documented breeding habitat occurs within 1 mile of the project area
- Potential upland dispersal and aestivation habitat for the species is present offsite and within the project area
- The historical collection of a California red-legged frog in the vicinity of the unnamed tributary to Bodfish Creek near Location 1

The project area does not overlap designated or proposed revised critical habitat for California red-legged frog (USFWS 2006). The closest critical habitat unit is in Santa Cruz County 6.5 miles west of the project area.

California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*) is a large, terrestrial salamander with a black body and white to yellow spots and bars (Stebbins 2003). On August 4, 2004, the USFWS determined that the California tiger salamander was likely to become endangered within the foreseeable future throughout its range and listed the entire population of California tiger salamander as threatened (including the Santa Barbara and Sonoma county populations formerly listed as endangered) (USFWS 2004). On August 19, 2005, a court order vacated the downlisting of the Sonoma and Santa Barbara County Distinct Population Segments from endangered to threatened and reinstated their endangered status (USFWS 2005).

A review of the CNDDB (CDFG 2009) and the Museum of Vertebrate Zoology (MVZ 2008) collections database showed that the project area occurs within the recognized range of the California tiger salamander. A total of six adult and larval (breeding) California tiger salamander occurrences have been reported within 3.1 miles[3] of the project area; however, none of these occurrences have been reported within the boundaries or within 1.24 miles of the project area (the observed migratory range of the species from breeding locations).

California tiger salamanders require vernal pools, seasonal ponds, or semipermanent calm waters that pond for a minimum of 3 to 4 months for breeding. Approximately 15 ponds, stockponds, reservoirs, and water bodies have been identified within a 1.24-mile radius of Location 5. Although no aquatic habitat suitable for breeding California tiger salamander was observed within the project limits, two breeding locations, 1.3 miles from Location 5, were recorded in the CNDDB in 2005. This is just over the 1.24 mi migration distance that the species are known to travel. At least four ponds lie within 0.5 mile of the project area, and the uplands surrounding the project area possibly provide suitable upland, refugia, and aestivation habitat, or may act as migratory and dispersal corridors on a general population level.

Landscaped and agricultural lands are present within the project limits in Location 5. During the January 2008 California tiger salamander habitat assessment, a moderate to high number of ground squirrel and California meadow vole (*Microtus californicus*) burrows were noted at Location 5. These burrows are concentrated in isolated patches along the vegetated SR 152 shoulder and throughout the adjacent agricultural fields. Due to the proximity of the two CNDDB reported breeding locations, it is possible that these burrows could provide potential upland refugia and aestivation habitat for California tiger salamanders.

Redwood forest, coast live oak forest, coyote brush scrub, and purple needlegrass/native grasslands are present within the project limits along the roadside at Locations 1 to 4. During the January 2008 California tiger salamander habitat assessment, little to no small mammal burrowing activity was observed in these habitats at Locations 1 through 4, making it unlikely that suitable upland, aestivation, or dispersal habitat is available to California tiger salamanders at these locations.

In summary, the following factors indicate a high potential for California tiger salamander to occur within the project limits at Location 5:

[3] The distance recommended by the USFWS' *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* to look at the regional area (USFWS and CDFG 2003).

- Known breeding habitat within 1.3 miles of the project area
- The presence of potential dispersal, upland, and aestivation habitat

The project area does not overlap designated critical habitat for California tiger salamander (USFWS 2005). The closest critical habitat units are two units in Lion's Peak in Santa Clara County, both of which are between 2 and 3 miles to the northeast.

2.3.4.3 Environmental Consequences

California Red-Legged Frog

If California red-legged frogs are present in the project footprint during construction, potential take could occur in the form of capture, harm, harassment, injury, and mortality to adult California red-legged frog due to habitat loss and degradation, construction-related disturbance, or capture and relocation. The project will result in approximately 0.76 ac of temporary and 6.32 ac of permanent impacts to potential California red-legged frog dispersal and upland habitat provided by redwood forest, coast live oak forest, purple needle grass/native grassland, and landscaped and agricultural lands. Temporary effects include disturbance and vegetation trampling due to clearing and equipment access, and permanent effects include habitat loss due to roadway widening and soil nail wall construction.

However, even with the implementation of the avoidance and minimization measures recommended in this document, there would be loss of potentially suitable upland dispersal and aestivation habitat and some small chance of direct take. Therefore, as determined in the Hecker Pass Safety Improvement Project Biological Opinion 81420-2009-F-1058-2Assessment, project activities are likely to adversely affect, but not jeopardize the continued existence of California red-legged frog.

California Tiger Salamander

If California tiger salamanders are present in the project footprint during construction, potential take may occur in the form of capture, harm, harassment, injury, and mortality to adult California tiger salamanders. In addition, take may occur as a result of loss and degradation of potential upland, aestivation, and dispersal habitat; construction-related disturbance; or capture and relocation at Location 5. The project will result in approximately 0.67 acre of temporary and 2.30 acres of permanent impacts to potential California tiger salamander upland dispersal and aestivation habitat. Temporary effects include disturbance and vegetation trampling due to clearing and equipment access, and permanent effects include habitat loss due to roadway widening and soil nail wall construction.

Temporary and permanent impacts to coast live oak woodlands, coyote brush scrub, purple needle grass/native grasslands, and landscaped and agricultural lands at Location 5 will result from construction activities, staging, and access. All temporary impacts at Location 5 will be revegetated after the conclusion of the project construction activities.

The project will neither influence nor affect the potential for the California tiger salamander to cross SR 152. The project will create only very localized widening (up to 12 ft for short distances) at Location 5. No median concrete barrier will be installed. All existing culverts will remain in place and allow amphibian passage under the roadway.

However, even with the implementation of the avoidance and minimization measures recommended in this document, there will be loss of potential upland, aestivation, and dispersal habitat and a small chance of direct take. Therefore, as determined in the Hecker Pass Safety Improvement Project Biological Opinion 81420-2009-F-1058-2Assessment, project activities are likely to adversely affect, but not jeopardize the continued existence of the California tiger salamander.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

California Red-Legged Frog

Due to the proximity of California red-legged frogs in the vicinity of the project area and an historical record of California red-legged frog in the vicinity of Location 1 of the project, the Department will implement the following precautionary measures to avoid or minimize impacts to California red-legged frog:

1. Seasonal Avoidance: To the extent practicable, construction will not occur during the wet season, when California red-legged frogs are more likely to disperse through upland habitats. Work within all waters, wetlands, and the riparian corridor will be limited to the period from April 15 to October 15, with the exception of vegetation clearing. Vegetation clearing may be done outside of this period, if necessary, to avoid disturbance to nesting birds.

2. Preconstruction Surveys: A qualified biologist will conduct a California red-legged frog preconstruction survey of the work site 2 weeks before start-of-work activities begin, including vegetation clearing, grubbing, or other ground disturbance activities. If California red-legged frog adults, tadpoles, or eggs are found, the biologist will contact the USFWS and CDFG to determine whether relocating the species is appropriate. If the agencies approve of relocation, a USFWS-approved biologist will be allowed sufficient time to move the species from the work site before work activities begin. Only USFWS-approved biologists will participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.

3. Construction Area Delineation: Before any ground disturbance occurs on the project site, the boundaries of the project area will be clearly delineated with orange plastic high-visibility construction fencing (ESA fencing) or solid barriers to prevent workers or equipment from inadvertently straying from the project area.

4. Wildlife Exclusion Fencing: Exclusion fencing will be erected along each section of the project area before Project activities begin, including staging equipment and supplies. Fencing will be a minimum of 3 ft high and buried in the soil or form a tight seal with the pavement to prevent California red-legged frog from crawling under and entering the project area.

5. Procedure for California Red-Legged Frog Discovery Onsite: If a California red-legged frog, or any amphibian that construction personnel believe may be this species, is encountered during project construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:

- All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
- The resident engineer will be immediately notified.
- The resident engineer will notify the approved onsite biologist.
- In the case of a non-injurious encounter, the approved onsite biologist will transport the California red-legged frog immediately in a cool, moist container to a suitable location outside the project area (e.g., suitable habitat elsewhere in the Bodfish Creek watershed). This relocation site will be determined in advance by a qualified biologist in consultation with the USFWS and CDFG. The relocated individual(s) will be monitored until it is determined that the animal(s) are not imperiled by predators or other dangers.
- The approved onsite biologist will notify the USFWS within 24 hours after California red-legged frog(s) have been relocated.
- If a California red-legged frog has been killed or injured, the biologist will contact the USFWS and CDFG within 24 hours.

6. Entrapment Avoidance: To prevent inadvertent entrapment of California red-legged frog or other animals during construction, all excavated, steep-walled holes or trenches more than 2 ft deep will be covered with plywood or similar materials at the end of each working day, or the holes or trenches will contain one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If, at any time, a trapped California red-legged frog (or other wildlife) is discovered, USFWS and CDFG will be contacted.

7. Prohibition of Erosion Control Materials Potentially Harmful to California Red-Legged Frog: Plastic monofilament netting (erosion control matting) or similar material will not be used at the project site because California red-legged frog may become entangled and trapped in it. Tightly woven fiber netting or similar material will be used for erosion control or other purposes.

8. Prevention of Introduction of Amphibian Diseases: Biologists will take all precautions to prevent spread of amphibian diseases when handling the listed species. All equipment and clothing will be disinfected per protocol standards.

9. Regular Work Area Surveys: The biological monitor will conduct frequent surveys along the work area boundaries and will notify the USFWS-approved biologist if a California red-legged frog is found within the work area.

Because California red-legged frog could be present throughout the project limits, temporarily or permanently impacted habitat, excluding existing hardscape features such as the roadway or road shoulder, would be mitigated by habitat restoration/replacement. Approximately 6.32 acres of permanent uplandpermanent upland dispersal and aestivation habitat loss will be mitigated at a 3:1 ratio, resulting in 18.96 acres of mitigation for California red-legged frog upland dispersal and aestivation habitat. Temporary impacts will be mitigated at a 1.1:1 ratio, for a total of 0.84 acre. Of this, 0.76 acres will be onsite, in-kind restoration. Total mitigation (for both temporary and permanent loss) will be 19.80 acres.

California Tiger Salamander

Due to the potential for presence of California tiger salamander at Location 5, the, the following measures, in addition to the precautionary measures to avoid or minimize impacts to California red-legged frog,frog will be implemented to minimize impacts to California tiger salamander:

1. If California tiger salamander adults or juveniles are found, all work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease. The biological monitor will contact the USFWS and CDFG to determine whether relocating the species is appropriate. If the agencies approve of relocation, a USFWS-approved biologist will be allowed sufficient time to move the species from the work site before work activities begin. Only USFWS-approved biologists may participate in activities associated with the capture, handling, and monitoring of California tiger salamander.

2. Temporarily or permanently impacted habitat, excluding existing hardscape features such as the roadway or road shoulder, will be mitigated by habitat restoration/replacement. Approximately 2.3 acres of permanent upland dispersal and aestivation habitat loss will be mitigated at a 3:1 ratio resulting in 6.9 acres of mitigation for California tiger salamander upland dispersal and aestivation habitat. Temporary impacts of 0.67 acre will be mitigated at a 1.1:1 ratio, for a total of 0.74 acre. Of this, 0.67 acre will be restored onsite. Total mitigation (for both temporary and permanent loss) will be 7.64 acres.

2.3.5 Invasive Species

2.3.5.1 Regulatory Setting

On February 3, 1999, President Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

2.3.5.2 Affected Environment

The following sections are summarized from the Natural Environment Study (Caltrans 2009) approved on January 21, 2010.

The only invasive aquatic animal species observed in any of the aquatic features near the project area was the introduced crayfish, *Procambarus* spp., several individuals of which were observed in Bodfish Creek during the August 2008 site visit. Invasive plant species listed by the California Invasive Plant Council (Cal IPC) occur within the project area, especially in the California annual grassland series and more ruderal portions of the project area. Cal IPC defines high priority invasives as those species that “have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment” (Cal IPC 2006). High-priority invasive plant species that occur inside the

project area include: fennel (*Foeniculum vulgare*), foxtail chess (*Bromus madritens* ssp. *rubens*), Himalayan blackberry, and yellow star thistle (*Centaurea solstitialis*) (Cal IPC 2006). The Santa Clara Parks Department has identified broom, including French broom (*Genista monspessulana)* and Scotch broom *(Cytisus scoparius)* as also occurring within the project footprint of location 4.

2.3.5.3 Environmental Consequences

The SR 152 corridor provides opportunities for the movement of invasive species through the landscape. Invasive plant and animal species could be transported on vehicles and in the loads they carry. Weed seed could be introduced inadvertently on equipment used forconstructionfor construction.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

In compliance with the EO on Invasive Species (EO 13112), and subsequent guidance from the FHWA, the landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the present or proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity by means of displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describe when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA can be found in 40 CFR, Section 1508.7 of the CEQA Regulations.

2.4.2 Projects Considered for Cumulative Impacts

A survey was completed on CEQAnet, the online searchable environmental database of the State Clearinghouse, for any projects listed from 2005-present within the project limits. The

project limits were determined to be the same as the areas studied in the cumulative impact analysisanalysis, as the project impacts are limited to the immediate highway corridor. Outside this immediate corridor, visual and biological resources are dramatically different. In 2005, the Department approved an Initial Study with Negative Declaration (CEQA)/ Categorical Exclusion (NEPA) for the Uvas Creek Bridge Replacement project. The document's cumulative impact analysis included this project's limits. As no cumulative impacts were found in the 2005 document, it is assumed that the time frame for this project survey need only go back to 2005. No projects have occurred within the project limits within the last five years, and no projects within the reasonably foreseeable future were found in the survey.

2.4.3 Environmental Consequences

The following resource areas were determined to have no direct or indirect impacts, and were not discussed in Chapter 2 of this document: growth, coastal zone, wild and scenic rivers, timberland, community impacts, relocations and real property acquisitions, utilities/emergency services, hydrology and floodplain, traffic and transportation/pedestrian and bicycle facilities, paleontology, air quality, noise, and energy

Similarly, the following topics were discussed within Chapter 2, but as they have no potentially significant impact on a resource, they will not contribute to a cumulative impact: land use, farmlands, parks and recreational facilities, cultural resources, water quality and storm water runoff, geology/soils/seismic/topography, and hazardous waste/materials.

The remaining topics, visual resources and biological environment, are discussed below. Cumulative impacts associated with climate change are discussed in Section 3.5.

2.4.3.1 Visual Resources

Areas where development is permissible within the highway corridor are limited, but include areas of designated rural residential development adjacent to the highway in areas west of Watsonville Road. This area, a portion of Landscape Unit 2 (Gilroy/Santa Clara Valley) in this study, is already characterized by low-density development. In addition, areas adjacent to the highway within Hecker Pass itself, between Mt. Madonna County Park and the designated residential area, are designated to allow medium-scale agriculture, which in the study area consists primarily of grape growing. Within the project limits, as no projects are in construction, or planned for the reasonably foreseeable future, the project will not contribute to any cumulative visual impacts.

2.4.3.2 Biological Environment

Much of the area surrounding SR 152 is privately owned and used as agricultural land, owned by the Santa Clara County Parks and Recreation Department (Mt. Madonna County Park), or held by private timber interests. These lands are not slated for future change in zoning and no known development projects are currently expected on these private holdings. Within the project limits, as no projects are in construction, or planned for the reasonably foreseeable future, and as the Department will mitigate for any effects to the California red-legged frog and California tiger salamander as is required by the Biological Opinion issued by the USFWS, the project will not contribute to any cumulative biological impacts.

Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under CEQA

The proposed project is a joint project by the Department and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable federal laws for this project is being, or has been, carried out by the Department under its assumption of responsibility pursuant to 23 U.S.C. 327. The Department is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS), or some lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Department to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an Environmental Impact Report (EIR) must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. NEPA requires no types of actions parallel to the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.2 Less-than-Significant Effects of the Proposed Project

All environmental resource areas subject to analysis under CEQA other than visual/aesthetics would have less than significant effects. Refer to Chapter 2: Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures for a discussion of environmental effects of the proposed project. Visual/Aesthetic effects under CEQA are described in additional detail in the below section.

3.3 Significant Environmental Effects of the Proposed Project

This section focuses on significant impacts specific to CEQA. Significant environmental effects will occur to visual/aesthetic resources and threatened and endangered species within and adjacent to the project limits as a result of the proposed project. A detailed description of the impacts to these resources, and appropriate avoidance, minimization, and mitigation measures are provided in Sections 2.1.3 and 2.3.4 respectively.

Visual/Aesthetics. Appendix G of the CEQA guidelines defines four criteria to evaluate the significance of visual impacts. Of the four criteria, one would not have significant effects and two, discussed in the following questions and answers,answers can be reduced to less than significant levels with proposed mitigation.

Would the project substantially damage scenic resources, including but not limited to, tress, rock outcroppings, and historic buildings within a state scenic highway?

No specific outstanding scenic resources were identified within the project limits. The project has the potential to damage areas of mature forest within the proposed project right-of-way adjacent to the proposed retaining walls. However, with Mitigation Measures that limit tree removal and grubbing to within 5 ft of the proposed retaining walls, these impacts could be reduced to a minor, less-than-significant level. No other scenic resources were identified that could potentially be affected by the project action.

Would the project create a new source of substantial light and glare, which would adversely affect day or nighttime views in the project area?

Prominent concrete structures can, under certain conditions, be sources of annoying or even disabling reflected glare, particularly if bright in color or high in reflectivity. However with recommended mitigation measures, walls would be treated to have low reflectivity, dark, subdued colors, and light reflectivity values of under 45. With that measure, potential reflective glare from walls would be less than significant.

Similarly, with mitigation measures, potential glare from nighttime construction activities would be shielded and controlled, reducing those impacts to less-than-significant levels. No long-term project night lighting is proposed. No potential glare impacts from automobile headlights to off-road viewers as a result of project would occur.

Special-Status and Threatened and Endangered Species. Appendix G of the CEQA guidelines defines six criteria to evaluate the significance of impacts to biological resources. Of the six criteria, five would not have significant effects and one, discussed below, can be reduced to a less-than-significant level with proposed mitigation.

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Two species listed as threatened or endangered, the California red-legged frog and the California tiger salamander occur within the project limits. The project would temporarily and permanently impact potential habitat for both species. Several other species are listed as Species of Special Concern by the state. Impact avoidance, minimization, and mitigation measures would reduce impacts to these species to a less-than-significant level. Measures include pre-construction surveys, use of wildlife exclusion and environmentally sensitive area fencing, and restoration and replacement planting for impacted habitat. Replacement of habitat would be at a ratio of 3:1 for permanent impacts, and 1.1:1 for temporary impacts to threatened and endangered species habitat.

3.4 Unavoidable Significant Environmental Effects

One visual/aesthetic criteria under the CEQA guidelines would have significant environmental effects even with proposed avoidance, minimization, and mitigation measures, as described in the following question and answer.

Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

The introduction of the proposed retaining walls, with all recommended mitigation measures, would still have significant adverse impacts to the visual character and quality of the SR 152 scenic highway corridor. In all, up to approximately 0.75 mile (approximately 3,963 ft) of new retaining walls would be constructed in the corridor; approximately 1.6 miles of the highway overall would be affected by the project. If eligibility for State Scenic Highway status were to be affected by the project, this could be inconsistent with Policies R-PR(i) 21 and 22 of the Santa Clara County General Plan.

3.5 Climate Change

3.5.1 Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by EPA in December 2007. See California v. Environmental Protection Agency, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA will reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this

goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases. " Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., 549 U.S. 497 (2007). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009. [4]

According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be

[4] http://www.epa.gov/climatechange/endangerment.html

determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Shown below (Figure 3.5-1) is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

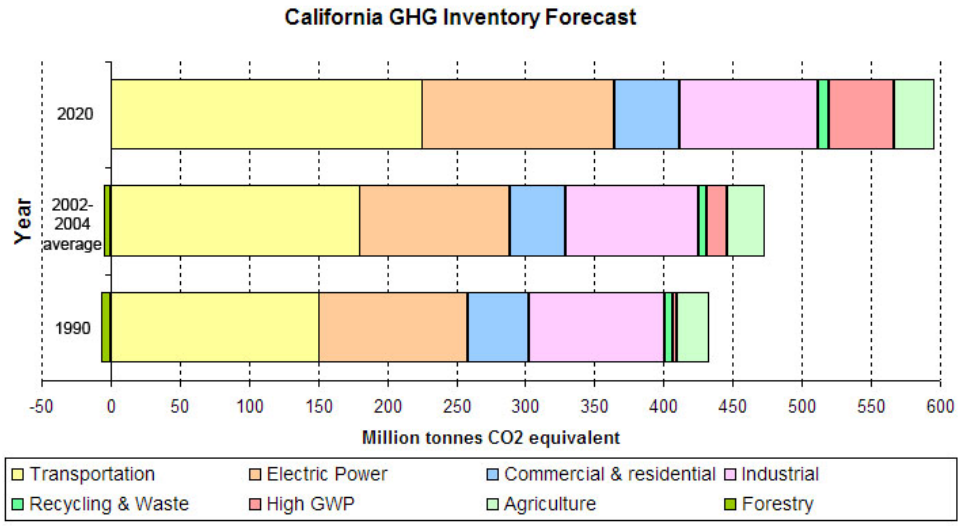

Figure 3.5-1. California Greenhouse Gas Inventory

Taken from : http://www.arb.ca.gov/cc/inventory/data/forecast.htm

The Department and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf

3.5.2 Project Analysis

This project involves safety improvements that would not modify the configuration of the roadway or result in changes that would be expected to increase traffic volumes or induce growth. Thus, the project has low to no potential for climate change impacts. Minor impacts resulting from unavoidable construction emissions would occur, as described below.

3.5.3 Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include

emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

CEQA Conclusion

While construction will result in a slight increase in GHG emissions during construction, it is anticipated that any increase in GHG emissions due to construction will be offset by the improvement in operational GHG emissions. While it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

3.5.4 AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade.[5] As shown on the figure below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

[5] Governor's Strategic Growth Plan, Fig. 1 (http://gov.ca.gov/pdf/gov/CSGP.pdf)

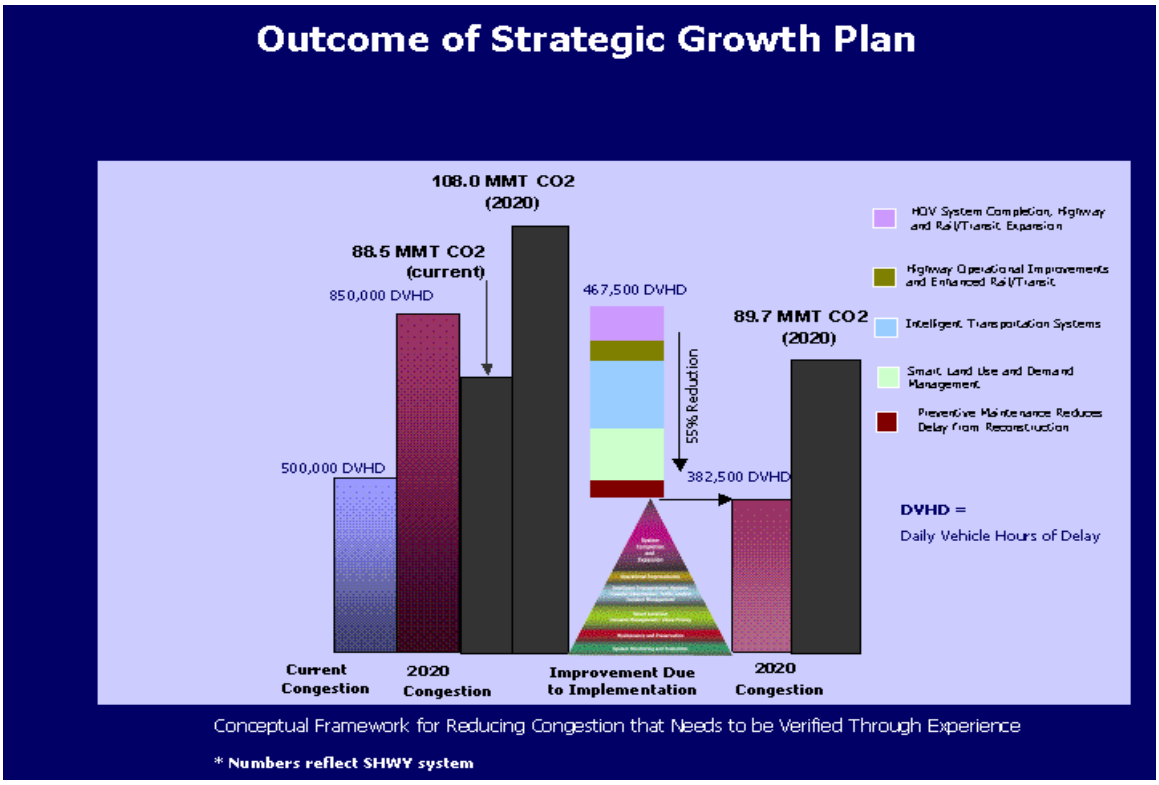

Figure 3.5-2. Outcome of Strategic Growth Plan

As part of the Climate Action Program at Caltrans (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 3.5-1 summarizes the Department and statewide efforts that the Department is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at the Department (December 2006); it is available at http://www.dot.ca.gov/docs/ClimateReport.pdf

Table 3.5-1: Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5% limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

To the extent that it is applicable or feasible for the project and through coordination with the project development team, the following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to ten minutes in each direction; in addition, the contractor must comply with local rules, ordinances, and regulations in regards to air quality restrictions.

3.5.5 Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08 which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency (now the Natural Resources Agency, (Resources Agency)), through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a *Sea Level Rise Assessment Report* by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- Relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- The range of uncertainty in selected sea level rise projections;

- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- A discussion of future research needs regarding sea level rise for California.

Furthermore Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.) This project is not mandated to consider sea level rise as the Notice of Preparation was submitted to the California State Clearinghouse on April 3, 2009.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted as part of Governor’s Schwarzenegger’s Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on *Sea Level Rise Assessment* which is due to be released by December 2010.

On August 3, 2009, Natural Resources Agency in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of discussion draft, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy is in direct response to Gov. Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource

Agency website on December 2, 2009; it can be viewed at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

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Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation, the level of analysis required, and to identify potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: project development team meetings and interagency coordination meetings. This chapter summarizes the results of the Department's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.1 Initial Project Development and Public Participation

On April 14, 2009, a public scoping meeting was held in Gilroy at the Gilroy Police Department Community Room. Over 250 notices of the scoping meeting were sent to a mailing list of officials and local residents. The meeting was advertised in two local newspapers (Gilroy Dispatch and Santa Cruz Sentinel), as well as on local radio and television. The style of meeting was "open house" and was staffed by representatives from Caltrans Project Management, Design/Engineering, Landscape Architecture, and Environmental Analysis. Large informational boards were produced and displayed at the meeting. These included an index map, details of the five separate locations, and typical cross-sections. Meeting attendees had the opportunity to browse displays and ask questions to Department staff. Attendees of the scoping meeting were also presented with a fact sheet detailing a general project description and schedule. Approximately 15 local residents attended the scoping meeting, 7 comment cards were received at the meeting, and one e-mail comment was received following the meeting.

4.2 Consultation and Coordination with Public Agencies

As part of the EIR process, a Notice of Preparation was prepared for this project and submitted to the Governor's Office of Planning and Research State Clearinghouse and Planning Unit, and to reviewing agencies for the project. Responses were received from the following agencies. The italicized statements after most of the following summary responses provide the Department's guidance and clarification on the concerns identified. All comments received regarding the DEIR/EA are discussed in section 4.3.

Public Agency Comments in Response to the Notice of Preparation/Scoping Meeting

Santa Clara Valley Transportation Authority

The Santa Clara Valley Transportation Authority requested that the Draft EIR/Environmental Assessment (EA) discuss any benefits or impacts the proposed project would have on cyclists, and should address the consistency of the proposed project with the 2008 Santa Clara Countywide Bicycle Plan.

Santa Clara County

The Santa Clara County Roads and Airports Department responded requesting that the Draft EIR/EA discuss any traffic impacts of the proposed project. *The proposed project is not*

anticipated to have any permanent impacts to traffic flow or patterns throughout the project corridor.

The Santa Clara County Parks and Recreation Department responded with the following comments:

- The Draft EIR/EA should discuss potential impacts to the Hecker Pass Connector Trails, Route C30 (Mis labeled by the County Parks in their first correspondence as the Bay Area Ridge Trail, and subsequently corrected in their comment letter addressed in section 4.3), designated as an on-street bicycle route within the roadway right-of-way along SR 152. *This project will not adversely impact bicycle facilities. After construction, bicyclists would have access to a wider roadway. SR 152 would remain functional during construction, bicyclists would be afforded the same accessibility to the roadway as motorized vehicles.*

- The Draft EIR/EA should discuss potential impacts to visual resources, parkland, water resources, cultural resources, and biological resources. *Discussion of impacts to environmental resources is in various sections in Chapter 2.*

- The Draft EIR/EA should identify potential impacts to visual resources and include mitigation to reduce the impacts to visual resources, specifically resulting from the construction of retaining walls. *Discussion of impacts to visual resources, and appropriate mitigation is discussed in Section 2.1.3.*

- The Draft EIR/EA should discuss potential impacts to trees and natural communities. *Impacts to trees and natural communities are discussed in Section 2.3.1.*

- The Draft EIR/EA should discuss the proposed drainage improvements and the impacts of these improvements related to special-status species. *Project impacts to special-status species are discussed in Sections 2.3.3 and 2.3.4.*

- Mitigation for importation of disease, fungi, and invasive species, should be addressed. *Mitigation measures to control the spread of invasive species are discussed in Section 2.3.5.*

- The Draft EIR/EA should indicate that Mt. Madonna is a migration corridor for migrating raptors and address impacts to these species. *Discussion of impacts to and mitigation for migrating raptors are discussed in Chapter 2.*

- The Draft EIR/EA should include a discussion on the Santa Clara Valley Habitat Conservation Plan that is currently under preparation, and how the proposed project may affect future habitat conservation areas. *Discussion of the proposed project in relation to the Santa Clara Valley Habitat Conservation plan is included in Section 2.1.1.2.*

- The Draft EIR/EA should include a discussion of potential impacts, including impacts from proposed culvert extensions, to creeks in the vicinity of the proposed project. *Water quality impacts and associated mitigation are discussed in Section 2.2.1.*

Stanislaus County

Stanislaus County responded stating that they reviewed the proposed project and have no comments.

Public Agency Consultation and Coordination

California Department of Fish and Game

- January 2008: A list of species of concern was obtained from the CDFG's California Natural Diversity Database to assist in the identification of sensitive plant and wildlife species that may occur in the project area.
- June 2008: The Department conducted a site visit with USFWS and CDFG to discuss the project and potential effects to federally and state listed species.
- June 2008: The Department requested that CDFG review the *Hecker Pass Safety Improvement Project: Marbled Murrelet Assessment.* CDFG concluded that the project area was not likely to support marbled murrelet and that future consultation with CDFG is not required.

U.S. Fish and Wildlife Service

- January 2008: A list of species of concern was obtained from the online database of the USFWS to assist in the identification of sensitive plant and wildlife species that may occur in the project area.
- June 2008: The Department conducted a site visit with USFWS and CDFG to discuss the project and potential effects to federally and state listed species.
- February 2009: A revised list of species of concern was obtained from the online database of the USFWS to assist in the identification of sensitive plant and wildlife species that may occur in the project area.
- June 2009: Biological Assessment was submitted to USFWS
- July 2010: Biological Opinion #81420-2009-F-1058-2 was received from the USFWS

United States Army Corps of Engineers

- August 2009: The Department submitted a copy of the Jurisdictional Wetland Delineation, with a request for concurrence from the Army Corps of Engineers.
- December 2009: The Department received concurrence on the Jurisdictional Wetland Delineation mapping.

USDA National Resource Conversation Service (NRCS)

- January 2010: The Department sent a letter, mapping, and copies of the Farmland Conversion Rating form AD 1006 with section 1 completed to the USDA National Resource Conservation Service.

- March 2010: The NRCS sent copies of form AD 1006 back to the Department with section two completed. The Department completed the rest of the form, finishing the consultation process.

County of Santa Clara Parks and Recreation Department

The Department and the Santa Clara County Department of Parks and Recreation held three coordination meetings in 2009 to discuss the proposed project and present information regarding Section 4(f) and the Department's proposal for a "de minimis" determination. The Department received written concurrence of the de minimis use of Mt. Madonna Park from the Santa Clara County Department of Parks and Recreation on August 20, 2010. A copy of this letter can be found in Appendix C.

4.3 Circulation, Review, and Comments on the Draft Environmental Document

Document Circulation and Review

The Draft EIR/EA wasill be releaseddistributed for public review on March 8, with the official comment period open until April 26, 2010. and comment, and Aa public meeting in the form of an open house waswill be held to receive comments, as oral testimony and in writing, on March 24, 2010 from 5:00 P.M. to 7:30 P.M. at the Gilroy High School Library.. Copies of this document, as well as of the technical studies we relied on in preparing it, are available for review at the Department of Transportation District 4 Office, 111 Grand Avenue, Oakland, CA, and the Gilroy Public Library, 7652 Monterey Street, Gilroy, CA. The document will also be posted online at the Department of Transportation District 4 web page: http://www.dot.ca.gov/dist4/envdocs.htm. A public hearing will be held on March 24, 2010, 5:00 P.M to 7:30 P.M., at the Gilroy High School Library, 750 West 10th Street, Gilroy, CA.

Notices regarding the availability of the DEIR/EA and the public meeting were published in the Santa Cruz Sentinel and the Gilroy Gazette on March 10th & March 17th, 2010. Comments may be submitted via postal mail to:

Jared Goldfine, Environmental Branch Chief
Department of Transportation, Environmental Planning
P.O. Box 23660 MS8B, Oakland, CA 94623

Comments may be submitted via email to jared_goldfine@dot.ca.gov.

After the comment review period ends, a Final EIR/EA will be prepared that will contain all comments received and the responses to those comments. If the Final EIR/EA is approved, a Notice of Determination and a Finding of No Significant Impact will be signed and included with the Final EIR/EA.A total of eight people attended the public meeting. The Department received one letter that was attached to a comment card from property owner’s adjacent to the project, and four hand written comment cards at the meeting. All comments received at the meeting were in written form, and can be found along with responses in the next section.

Comments and Responses

A copy of each comment received by the Department, followed by the Departments response can be found on the following pages. If multiple comments were received in a single submittal, each comment was segregated and addressed separately.

One letter (below), from Santa Clara County, had no comments.

231.06
2A2500

County of Santa Clara

Roads and Airports Department

101 Skyport Drive
San Jose, California 95110-1302
(408) 573-2400

April 2, 2010

Mr. Jared Goldfine
Senior Environmental Planner
Department of Transportation, Environmental Planning MS 8B
PO Box 23660
Oakland, CA 94623-0660

Subject: Notice of Availability for Draft EIR/EA and Announcement of Public Meeting for the State Route 152 Hecker Pass Safety Improvement Project in Santa Clara County

Your March 4, 2010 letter along with the attachments for the subject project have been reviewed. We have no comments.

Thank you for the opportunity to review and comment on the subject. If you have any questions, please contact me at 408-573-2464.

Sincerely,

Raluca Nitescu, PE
Project Engineer

Board of Supervisors: Donald F. Gage, George Shirakawa, Dave Cortese, Ken Yeager, Liz Kniss
County Executive: Jeffrey V. Smith

7-007

Comments 1A and 1B

QUESTIONS / COMMENTS

▸ **Project** STATE ROUTE 152 HECKER PASS SAFETY IMPROVEMENT PROJECT **Date** 3/24/2010 **Location** GHS. LIBRARY

Name *(Please Print)* Thomas Muniz **Phone/Fax**

Company

Address 422 Willy CT. *city* Gilroy *state* CA *zip code* 95020

• **Was this meeting helpful to you ?** YES

• **How can this kind of meeting be improved ?**

• **Other comments:** Please consider incorporation of 2 items:
(1) ADD 'SHARE THE ROAD' BICYCLIST SIGNAGE IN BOTH DIRECTIONS
(2) PROVIDE APPROPRIATE MPH FOR ACCOMODATION OF BICYCLISTS FOR BOTH DIRECTIONS

For additional comments use reverse side.

Caltrans

Comment 1A

Add “Share the road” bicyclist signage in both directions

Response 1A

The Department’s District 4 Bicycle Coordinator reviewed the project, and advises that “Share the Road” signage be installed as part of the project in advance of locations where road users are required to use the same space. Such locations include areas where the shoulder narrows, after a curve, or at critical locations where sight distance is an issue, and uphill locations where lower bicycle speeds are an issue. The Department will install signs where feasible within the spot locations being improved by the project.

Comment 1B

Provide appropriate MPH for accommodation [sic] of bicyclists for both directions.

Response 1B

The California Vehicle Code states that speed limits on state highways lower than 65 miles per hour be established in accordance with the engineering and traffic surveys conducted for the highway in question. The speed limits posted as a result of these surveys must facilitate the

orderly movement of traffic, be reasonable, and safe. The posted speed limits along route 152 conform with the speed limits determined by these surveys, and will remain the same.

Comments 2A and 2B

QUESTIONS / COMMENTS

• Project Hecker Pass Safety Improvement Project Date 3/24/10 Location Gilroy

Name (Please Print) CHARLES CRAIG Phone/Fax (408) 842-5969

Company —

Address 4605 MERITAGE CT city Gilroy state CA zip code 95020

• Was this meeting helpful to you? Yes

• How can this kind of meeting be improved? 1. Lower THE speed limit ON Hecker Pass FROM 55 to 45 mph. the WHOLE length OF THE ROAD.

• Other comments: INSTALL A LEFT TURN LANE FROM WEST BOUND Hecker PASS TO SAGUARO CT.

For additional comments use reverse side.

Caltrans

Comment 2A

Lower the speed limit on Hecker Pass from 55 to 45 mph the whole length of the road.

Response 2A

Please refer to response 1B.

Comment 2B

Install a left turn lane from westbound Hecker Pass to Saguaro Ct.

Response 2B

Mapping indicates that Saguaro Court is connected to Meritage Court, a private road that intersects Route 152 just west of Watsonville Road. The Department is unable to initiate projects that involve an intersection with a private road. However, the owner of a private road may initiate and develop a project (that will require a Caltrans encroachment permit) to construct improvements at this intersection. Such a proposal must satisfy all of the state's design and construction standards.

Comments 3A through 3D

QUESTIONS / COMMENTS

▸ **Project** St Route 152 Safety Imp **Date** 5-24-10 **Location**

Name *(Please Print)* Cheryl Behlmer **Phone/Fax** 408-842-9335

Company

Address 4390 Hecker Pass *city* *state* *zip code*

• **Was this meeting helpful to you ?** yes

• **How can this kind of meeting be improved ?**

• **Other comments:** see attached letter

For additional comments use reverse side.

Caltrans

Alternative -

Jared Goldfine
Department of Transportation, Environmental Planning MS 8B
PO Box 23660
Oakland CA 94623-0660

Re: Left turn lane at Watsonville road and Hecker Pass Rd. State Route 152

We live at 4390 Hecker Pass Road which is the residence immediately across the street from the Watsonville Road/Hecker Pass Road intersection.

We are not totally opposed to something that improves safety at the intersection stated above. However we do question the proposed solution. Here are some points that we would like to be considered:

1) Most of the accidents that I am aware of since we have lived at this residence (12 years) seem to have involved cars turning onto Hecker Pass Rd. from Watsonville Road. Not vice a versa. Any accident that was the result of someone waiting to turn onto Watsonville Road would be a "Rear end" accident. There have very few, if any "rear end" accidents on Hecker Pass at this intersection due to cars waiting to turn left, that I am aware of. Therefore, I am not convinced that adding a left turn lane improves safety.

2) Adding a left turn lane will increase the speed of traffic in this area. If cars no longer have to slow down and exercise caution due to someone making a turn, they will likely be going much faster in this area. Drivers already exceed the speed limit on the section of straight road between Hecker Pass Winery and Gilroy Gardens. We estimate that some drivers reach speeds of 70 miles per hour. Because of this, a left turn lane is going to make it much more dangerous for us to exit our driveway.
Alternative -
1) Has anyone considered lowering the speed limit to 45 along all of Hecker Pass Rd between Santa Teresa and the ascent up to Mount Madonna. In addition, add a **flashing caution light** at the intersection of Watsonville Road and Hecker Pass to warn drivers to slow down at this intersection. It would also warn drivers coming down Watsonville Road that they are approaching a stop sign and 3 way intersection. This would be an inexpensive alternative to widening the road and putting in a turn lane. If it proves to be unsuccessful after monitoring the results, then resort to the more costly approaches.

If for some reason, the above alternative does not make sense to the planners, here are a few additional points regarding the proposed left turn lane solution.

a) Watsonville Road is located on the north side of Hecker Pass Rd. Trees located on the south side of Hecker Pass road have no affect on visibility for anyone making turns at this intersection. Therefore, removing any trees on the south side of Hecker Pass road seems unnecessary. Since any obstructions to visibility logically have to exist on the north side of the road, that is where the focus of improvements should remain. There is absolutely nothing to be gained by removing trees and widening the road on the south side when the road in question (Watsonville Road) exists on the north side of Hecker Pass.

A response addressing these issues would be appreciated.

Sincerely

Eric D. Behlmer and Cheryl R. Behlmer
4390 Hecker Pass Road
Gilroy CA 95020

Comment 3A

Most of the accidents that I am aware of since we have lived at this residence (12 years) seem to have involved cars turning onto Hecker Pass Rd. from Watsonville Road. Not vise a versa. Any accident that was the result of someone waiting to turn onto Watsonville Road would be a "Rear end" accident. There have very few, if any "rear end" accidents on Hecker Pass at this intersection due to cars waiting to turn left, that I am aware of. Therefore I am not convinced that adding a left turn lane improves safety.

Response 3A

Construction of the left-turn lane at the Route 152/Watsonville Road intersection will help to prevent both accidents involving left-turning vehicles from eastbound Route 152 to northbound Watsonville Road as well as accidents involving left-turning vehicles from southbound Watsonville Road to eastbound Route 152. Not only could vehicles turning left from eastbound Route 152 be involved in are rear-end accidents, they could also be involved in: sideswipe accidents with eastbound Route 152 vehicles trying passing them on the shoulder, in broadside or head-on accidents with on-coming westbound Route 152 vehicles, and in broadside or head-on accidents with left-turning vehicles from southbound Watsonville Road. As the new left-turn lane and refuge area will provide vehicles a place to comfortably wait, these improvements should reduce the number accidents at this intersection.

Comment 3B

Adding a left turn lane will increase the speed of traffic in this area. If cars no longer have to slow down and exercise caution due to someone making turn, they will likely be going much faster in this area. Drivers already exceed the speed limit on the section of straight road between Hecker Pass Winery and Gilroy Gardens. We estimate that some drivers reach speeds of 70 miles per hour. Because of this, a left turn lane is going to make it much more dangerous for us to exit our driveway.

Response 3B

Construction of the left turn lane at the route 152/Watsonville Road intersection is intended to upgrade the current facility, so that it would be better able to assist out-of-control motorists from crossing the centerline of the highway, thus creating a safer facility. The speed of traffic along Route 152 will not be affected by this improvement, as the posted speed limits will remain as they are currently (please see response 1B for information). The California Highway Patrol (CHP) enforces speed limits along all State freeways and highways. Complaints regarding speeding in this area should be forwarded to the CHP office located at 740 Renz Lane, Gilroy, CA 95020-9584, or by phone at 408-848-2324.

Comment 3C

Alternative – 1) Has anyone considered lowering the speed limit to 45 along all of Hecker Pass Rd. between Santa Tersa and the ascent up to Mount Madonna. [sic] In addition, add a flashing caution light at the intersection of Watsonville Roade and Hecker Pass to warn drivers to slow down at this intersection. It would also warn drivers coming down Watsonville Road that they are approaching a stop sign and 3 way intersection. This would be an inexpensive alternative to

widening the road and putting in a turn lane. If it proves to be unsuccessful after monitoring the results, then resort to the more costly approaches.

Response 3C

Please see response 1B for the Departments response to speed limit concerns. As part of the project to be constructed at the intersection of Route 152 and Watsonville Road, all of the traffic control devices (such as striping, signage, etc.) required in accordance with our standards will be included. The Department appreciates your suggested alternative, but has determined that construction of the left hand turn lane will better meet the purpose of the project, to reduce cross centerline accidents and run off the road accidents along the highway corridor.

Comment 3D

If for some reason, the above alternative does not make sense to the planners, here are few additional points regarding the proposed left turn lane solution. A) Watsonville Road is located on the north side of Hecker Pass Rd. Trees located on the south side of Hecker Pass Road had no affect on visibility for anyone making turns at this intersection. Therefore, removing any trees on the south side of Hecker Pass road seems unnecessary. Since any obstructions to visibility logically have to exist on the north side of the road, that is where the focus of the improvements should remain. There is absolutely nothing to be gained by removing trees and widening the road on the south side when the road in question (Watsonville Road) exists on the north side of Hecker Pass.

Response 3D

Widening of the highway is proposed to take place on both the north and south side of the highway. The majority of the widening is planned to occur on the south side, to avoid impacting a possible hazardous waste area (an old gas station) and an underground utility.

Throughout the proposed project, the Department is making every effort possible to avoid affecting trees. Unfortunately, the trees you refer to are within the clear recovery zone, an area clear of fixed objects adjacent to the roadway to provide a recovery zone for vehicles that have left the traveled way. Along conventional highways, such as this portion of Route 152, a minimum clear recovery zone of 20 feet to the nearest traveled lane is required. To comply with this highway standard, trees on both the north and south side of the highway will be removed.

Comment 4

QUESTIONS / COMMENTS

• **Project** State 152 Hecker Pass Safety **Date** 03/24/10 **Location** Gilroy Ca.

Name (Please Print) Victoria V. Muñoz **Phone/Fax** (408) 840 6068

Company MS. Engineering in Construction Science

Address 1220 San Miguel **city** Gilroy **state** Ca **zip code** 95020

• **Was this meeting helpful to you?** More knowledging for me

• **How can this kind of meeting be improved?** More advertising for the people.

• **Other comments:** Thank you for the information to caltrans and staff and your presentation is perfect and excellent.

For additional comments use reverse side.

Caltrans

Comment 4A

How can this kind of meeting be improved? More advertising for the people.

Response 4A

The Department does its best to inform the public of the availability of the Draft EIR and of a public meeting, if one is being held, to the public, and is continuously working on improving this process. An announcement of both the availability of the Draft EIR and the open house were published in the Gilroy Dispatch and the Santa Cruz Sentinel on March 10, and March 17 of 2010.

Comment 5

QUESTIONS / COMMENTS

(Hecker Pass safety)

▸ **Project** Hwy 152 improvement **Date** 03/24/10 **Location** Gilroy

Name *(Please Print)* Charlotte Medina **Phone/Fax** (408) 903 7671

Company Gilroy High school student - senior

Address PO BOX 1012 *city* Gilroy *state* CA *zip code* 95021

• **Was this meeting helpful to you ?** Yes. I got well informed about what was the project about.

• **How can this kind of meeting be improved ?** Everything was okay. It was a nice visual presentation and the members were helpful :)

• **Other comments:**

For additional comments use reverse side.

Caltrans

Comment 5

Everything was okay. It was a nice visual presentation and the members were helpful ☺.

Response 5

The Department appreciates your attendance to the public meeting, and your participation in the environmental process.

Comment 6

"Andy Berna-Hicks"
<ABernahi@dtsc.ca.gov>
05/03/2010 02:19 PM

To <jared_goldfine@dot.ca.gov>
cc
Subject Hecker Pass Safety Improvement Project

Dear Mr. Goldfine,
Please accept the following comments regarding the Hecker Pass Safety Improvement Project.

Handling and placement of lead contaminated soils to be excavated and redeposited on-site must comply with the requirements of the Variance addressing management of lead impacted soils at CalTrans construction sites issued by Cal EPA, DTSC to CalTrans effective July 1, 2009. This document is available at the following website:
http://www.dot.ca.gov/hq/env/haz/pdfs/adl/h295.pdf

Note that the Variance does not apply to unpaved areas. Soils excavated and redeposited in unpaved areas must meet all current regulations regarding hazardous waste impacted soils.

Sorry for missing the deadline.

Sincerely,

Andrew Berna-Hicks
Project Manager
Brownfields and Environmental Restoration Program
Department of Toxic Substances Control
Berkeley Office
510-540-3956
abernahi@dtsc.ca.gov

Comment 6
Handling and placement of lead contaminated soils to be excavated and redeposited on-site must comply with the requirements of the Variance addressing management of lead impacted soils at CalTrans construction sites issued by Cal EPA, DTSC to CalTrans effective July 1, 2009. This document is available at the following website:
http://www.dot.ca.gov/hq/env/haz/pdfs/adl/h295.pdf

Note that the Variance does not apply to unpaved areas. Soils excavated and redeposited in unpaved areas must meet all current regulations regarding hazardous waste impacted soils.

Response 6

The Department will comply with all State and Federal laws and ordinances. If contaminated soil or groundwater is encountered during excavations, all activities involving the contaminated soil or groundwater will comply with regulatory agency requirements.

Comments 7A-7D

From: "john & patty cannon" [twoloosecannons@gmail.com]
Sent: 05/04/2010 10:10 PM MST
To: Jared Goldfine
Subject: Hecker Pass Safety Improvement Project Draft EIR

Hi Jared,

I am a resident at 1004 Hecker Pass Road, in Santa Cruz County, and have just finished reading the Draft EIR. For the record, I'm a Civil Engineer familiar with EIRs and roadway construction. The project EIR reads well and I enthusiastically support the project. Although I realize it is past the deadline for comment submission, I had three questions that perhaps you can help me understand better.

I did not see (or perhaps overlooked) the estimated construction duration for the project. The report suggests a 2010-2011 timeframe, but this looks like a two-year project to me. Can you give me a sense of the start date and construction duration? Also, do you have a sense of the construction hours that will affect commute traffic? I drive this road every day and it will obviously impact my commute in to San Jose.

Also, vehicle speed is a considerable contributor to the cross center divider accidents that occur along this section of the road. I know because I drive it every day, and although I've never witnessed an accident, I see the fresh skidmarks every Monday morning on my way in to work. Since the project contemplates straightening out a few S-curves and improving superelevation, can you share the Department's plans for the additional warning signage that may help slow motorists (not familiar with the road) so they do not swerve across the center divide?

And, how much of the new paving will be removed/replaced between the widening/retaining wall construction areas? The new pavement is a huge improvement over what existed two years ago, however considering the contemplated scope of the project, I would hope most the entire stretch would be repaved for smoothness and longevity. I realize it's not very green to remove and replace fresh paving, but I would be a little concerned about creating a patchwork quilt of uneven pavement surfaces.

Thanks for the opportunity to comment and I look forward to your response.

John Cannon
(408)221-1362

Comment 6A

I am a resident at 1004 Hecker Pass Road, in Santa Cruz County, and have just finished reading the Draft EIR. For the record, I'm a Civil Engineer familiar with EIRs and roadway construction. The project EIR reads well and I enthusiastically support the project. Although I realize it is past the deadline for comment submission, I had three questions that perhaps you can help me understand better.

Response 6A

The Department appreciates your interest in the project, and notes your support of the project.

Comment 6B

I did not see (or perhaps overlooked) the estimated construction duration for the project. The report suggests a 2010-2011 timeframe, but this looks like a two-year project to me. Can you

give me a sense of the start date and construction duration? Also, do you have a sense of the construction hours that will affect commute traffic? I drive this road every day and it will obviously impact my commute in to San Jose.

Response 6B

Construction of the project is currently planned to commence in late 2012 or early 2013, and will last approximately two years. A Transportation Management Plan will be put in place during the next phase of the project. As a general rule, the Department does its best to keep construction impacts to traffic at a minimum.

Comment 6C

Also, vehicle speed is a considerable contributor to the cross center divider accidents that occur along this section of the road. I know because I drive it every day, and although I've never witnessed an accident, I see the fresh skidmarks every Monday morning on my way in to work. Since the project contemplates straightening out a few S-curves and improving superelevation, can you share the Department's plans for the additional warning signage that may help slow motorists (not familiar with the road) so they do not swerve across the center divide?

Response 6C

The Department is not yet in the design phase of this project, and thus cannot denote exact locations where warning signs will be placed at this time. However, the installation of warning signs is a component of the improvements being constructed at each of the five spot locations. For more information regarding the limits of the spot improvements please see Figure 1.1-2, and section 1.3.1 of the document.

Comment 6D

And, how much of the new paving will be removed/replaced between the widening/retaining wall construction areas? The new pavement is a huge improvement over what existed two years ago, however considering the contemplated scope of the project, I would hope most the entire stretch would be repaved for smoothness and longevity. I realize it's not very green to remove and replace fresh paving, but I would be a little concerned about creating a patchwork quilt of uneven pavement surfaces.

Response 6D

Although the project limits extend to just over five miles in length, improvements, including repaving, are limited to the five spot locations referred to in response 6C. In the case that new pavement overlay was added in one of these spot locations, it will be scraped down to the structural segments of the roadway, and repaved as part of this project. This will be done to preserve the structural integrity of the road.

Comments 7A-7O

County of Santa Clara
Parks and Recreation Department

298 Garden Hill Drive
Los Gatos, California 95032-7669
(408) 355-2200 FAX 355-2290
Reservations (408) 355-2201
www.parkhere.org

May 11, 2010

Jared D. Goldfine, AICP
Environmental Branch Chief
California Department of Transportation, District 4
Environmental Planning
P.O. Box 23660
Oakland, CA 94623

SUBJECT: Draft Environmental Impact Report/Environmental Assessment for Hecker Pass Safety Improvement Project (February 2010)

Dear Mr. Goldfine,

The County of Santa Clara Parks and Recreation Department (County Parks) has received a copy of the Draft Environmental Impact Report/Environmental Assessment (DEIR/EA) for the proposed Hecker Pass Safety Improvement Project ("Project") (District 4-SCL-152, (PM 0.14/5.20) 2A2500) located along a portion of State Highway 152 (SR 152) that passes through Mount Madonna County Park in Gilroy.

County Parks has reviewed the Draft EIR/EA and submits the following comments for consideration. County Parks' comments are primarily focused on potential impacts related to land use policies, park natural resources, public access, recreation, and local and regional trails.

It is understood that project activities would occur at Location 4 (Postmile 2.5713.20) which is located along the southeastern border of Mount Madonna County Park within the vicinity of an existing staging area and parking lot, Sprig Recreation Area, and where adjoining trails provide recreational opportunities for the public.

Construction activities at Location 4 would involve construction of retaining walls necessitating the acquisition of approximate 0.55 acres of right-of-way at the southern boundary of the park abutting SR 152. Per Section 4(f) of the Department of Transportation Act of 1966, the acquisition of a public park or recreation area would be considered a "use" or impact of a section 4(f) resource. Because of the nature of this impact, which includes acquisition of a very small amount of parkland, Caltrans is proposing that this be considered a "de minimis" use of parkland and is seeking agreement from County Parks of a de minimis determination. The Director of County Parks determined that a "de minimis" determination may require consideration by the County of Santa Clara Board of Supervisors (Board). County Parks would welcome further

Board of Supervisors: Donald F. Gage, George Shirakawa, Dave Cortese, Ken Yeager, Liz Kniss
County Executive: Jeffrey V. Smith

discussions regarding the "de minimis" determination, and if necessary, staff would present a proposal for a "de minimis" determination to the Board at a regularly scheduled public meeting.

County Parks appreciates the collaborative and cooperative approach undertaken by Caltrans, and acknowledges that Caltrans staff has met with County Parks staff on several occasions including the three coordination meetings as mentioned on page 2-7 of the Draft EIR/EA. However, County Parks would like to clarify that while the "de minimis" determination was mentioned during these meetings, no substantial details were discussed regarding the findings of a "de minimis" determination. These coordination meetings focused on clarifications to the project description and engineering plan updates such as the location and heights of the proposed retaining walls.

Section 1.3.1.1, Build Alternative Location 4,
The Draft EIR/EA states *"Two T-intersections in this location on the northern side of the road provide access to the Sprig Lake parking lot and a horse trailhead and parking lot"*. The Draft EIR/EA should correctly list this area as the Sprig Recreation Area and provide additional information related to the existing park setting which includes a parking lot, equestrian staging area and access to park trails.

Santa Clara County Countywide Trails Master Plan Update
The Draft EIR/EA should acknowledge the land use policies and guidelines of the *Santa Clara County Countywide Trails Master Plan Update ("Countywide Trails Master Plan")*, which the County Board of Supervisors approved and adopted in November 1995 as part of the Parks and Recreation Element of the County of Santa Clara General Plan (1995-2010). Currently this adopted land use plan was not included in *section 2.1.1.2 Consistency with State Regional and Local Plans and Programs* of the DEIR.

County Parks, in partnership with other public agencies, is charged with furthering the implementation of the *Countywide Trails Master Plan*. The following Countywide Trails Master Plan routes are identified as future planned routes which are adjacent to or within the vicinity of the project area.

- ***Hecker Pass Connector Trails*** (Route C30) – designated as an on-street bicycle route within road right-of-way (ROW) for on-road cycling. This route is located along SR 152.
- ***Bay Area Ridge Trail: Santa Cruz Mountains*** (Route R5-A) – designated as a trail route within other public lands for hiking, cycling and equestrian use.
- ***Bay Area Ridge Trail: Mt Madonna-Coyote Lake*** (Route R5-E) - designated as a trail route within other public lands for hiking, cycling and equestrian use.

As clarification, the countywide trail route noted in April 28, 2009 County Parks' response letter on the Notice of Preparation (NOP) of the Draft EIR/EA incorrectly identified the trail route within the ROW as *Route R5-A, Bay Area Ridge Trail*, but the correct name for the trail route within the ROW is *Hecker Pass Connector Trails, Route C30*. County Parks agrees with the assessment on page 2-9 and 4-2 of the Draft EIR/EA that the project will have a future benefit to cyclists as a result of the proposed shoulder widening.

SANTA CLARA COUNTY PARKS

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The Bay Area Ridge Trail (Route R5) is a regionally significant trail route. Segments of this trail route, Route R5-A and Route R5-E, are located within Mount Madonna County Park and cross SR 152 in or adjacent to project area Location 4. Route R5-A is located north of Hwy 152 and is partially completed, leading to the Merry Go Round trail within the park and linking to other park trails. The segments of Route R5-A linking to Route R5-E and Route R5-E proposed south of SR 152 have not been developed.

In partnership with the Bay Area Ridge Trail Council, County Parks would plan and develop these future segments of the Bay Area Ridge Trail described above. Therefore, County Parks recommends an at-grade trail crossing and gathering location for trail users on both sides of SR 152 near and/or adjacent to Location 4 west of the entrance to Sprig Recreation Area per Caltrans specifications and all applicable State, Federal, and local standards. The at-grade trail crossing would require a safe crossing, gathering location on both sides of SR 152 and measures that meet State, Federal and local standards for safe crossing of the highway. County Parks staff will continue to work with Caltrans to identify an appropriate site for the gathering areas and identify a viable alignment for the trail connection within the park. Prior to Caltrans' completion of a Final EIR/EA, County Parks requests that Caltrans share draft language specifying a trail crossing/trail user gathering area for the Mitigation Monitoring and Reporting Plan with County Parks staff for review and comment.

Section 2.1.1.3 Parks and Recreational Facilities
The Draft EIR/EA states, "the park is under the jurisdiction of the Santa Clara County Parks and Recreation Department which administers the county's parks and recreation programs and operates and maintains 27 parks throughout the County." Please revise the statement with 28 parks that are managed by the County of Santa Clara Parks and Recreation Department.

Section 2.2 Physical Environment
There are existing landslide areas adjacent to the SR 152 and within the project area which were identified during coordination meetings and site visits with Caltrans. The Draft EIR/EA should include a discussion regarding these existing landslide areas and any underlying drainage issues and identify measures which could improve drainage and reduce soil instability.

Section 2.2.1.4 Avoidance, Minimization, and or Mitigation Measures
County Parks suggests that native plant species mixes be used with any seeding that may be used to cover disturbed soils. In order to achieve erosion control needs, native plant species mixes can be mixed with sterile seed mixes until native plants establish. County Parks requests that native plant seeds originate from the watershed and be species found within the project area.

A concern of County Parks is the importation of Sudden Oak Death (SOD) and other diseases and fungi. SOD is prevalent throughout the Santa Cruz Mountains; however, it has not appeared in Mount Madonna County Park. As part of our resource management goals, County Parks continues to focus on the prevention and the spread of SOD into the park. Therefore, County Parks requires that cleaning/decontamination of all equipment and vehicles be part of the protocols/specifications specified in the project's Best Management Practices.

Section 2.3 Biological Environment
The Draft EIR/EA (section 2.3.1.2) identifies vegetation communities including Oak and Redwood forest which would be temporarily or permanently impacted. The Draft EIR/EA

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should include a more comprehensive discussion of the vegetation communities, including the forest understory, which will be impacted by the project.

The avoidance and minimization efforts as described in section 2.3.1.3 are not adequate mitigations for the potential impacts to the vegetation communities. The Draft EIR/EA should clarify that native plant species will be planted and re-established in areas disturbed as a result of the project, including in the forest understory. County Parks would require that all plantings be of native species originating from the local watershed to maintain the genetic integrity of the natural communities within the park and project area.

Trees

Due to the uncertainty of the number, size and species of trees and their locations, County Parks is unable to comment on the project's potential impacts to trees. County Parks requests that the number, size and species of trees proposed for removal and those potentially significantly impacted by project activities be identified on a location map and included in the Draft EIR/EA. The Draft EIR/EA should also clarify if trees listed in Table 2.3-1 are only those which will be removed or includes those which may be significantly impacted such that they are not likely to survive after project completion.

County Parks requires that replacement trees be from the local watershed in order to maintain genetic integrity within the park. County Parks typically requires replacement mitigation ratios of 3:1 for native trees larger than 8" dbh or at a ratio acceptable to the California Department of Fish and Game. If non-native species are proposed for removal, County Parks recommends that they are mitigated at a 1:1 replacement ratio with a native species.

County Parks requests that mitigation sites be located within Mount Madonna County Park in a mutually agreed upon location within the park, and if not possible within the County Park, the mitigation site be negotiated at a location within the same watershed. The Draft EIR/EA does not include a mitigation monitoring and reporting plan, therefore, it is unclear as to what the success criteria are for mitigation and monitoring of the site. County Parks would not perform mitigation and mitigation monitoring; Caltrans would be fully responsible for these activities. The Mitigation Monitoring and Reporting Plan should include success criteria to meet Caltrans' success criteria goals and specify monitoring protocols.

The County of Santa Clara requires that the project comply with the County of Santa Clara Tree Preservation and Removal Ordinance (Ord. No. NS-1203-107, Division C16). The County of Santa Clara Tree Preservation and Removal Policy states that a protected tree consists of: 1) any tree present on property owned or leased by the county that is twelve (12) inches or more in diameter measured at four and one-half feet above the ground, or which exceeds twenty (20) feet in height; 2) any multi-trunk trees totaling 24 inches or more in diameter measured at four and one-half feet above the ground; and 3) any tree designated as heritage by the County Board of Supervisors.

Section 2.3.5 Invasive species

A concern of County Parks is the importation of invasive species, such as broom. Invasive plant species, including species of broom such as French and scotch broom, occur within, adjacent to and in the vicinity of the project sites. Broom has a long-lived seed source and because of the soil disturbance associated with the project, has the potential to regenerate and spread in the park.

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The Draft EIR/EA should identify broom as an invasive plant species occurring in the project area. The mitigations measures identified in section 2.3.5.4 are precautionary and, as such, do not address the removal of invasive plants from the project area or ensure that they do not spread to other areas outside of the project area. The Draft EIR/EA should discuss invasive plant species control and provide guidelines/protocols for their removal and ensure that they do not spread as a result of project activities.

County Parks appreciates the opportunity to comment on the Draft EIR/EA for the proposed Hecker Pass Safety Improvement Project. We look forward to receiving subsequent documents including the Draft Mitigation Monitoring and Reporting Plan and draft Final EIR/EA prior to the public release of the Final EIR/EA, and participating in future discussions as the project proceeds. If you have any questions regarding these comments, please feel free to contact me at (408) 355-2235 or by email at Antoinette.Romeo@prk.sccgov.org.

Sincerely,

Antoinette Romeo

Antoinette Romeo
Park Planner III

CC: Julie Mark, Acting Director
Jane Mark, Senior Planner
Tim Heffington, Senior Real Estate Agent
Don Rocha, Natural Resource Management Program Manager
Ian Champeny, Associate Real Estate Agent
Rob Eastwood, Senior Planner, County of Santa Clara, Department of Planning and Development Planning
Bern Smith, South Bay Director, Bay Area Ridge Trail Council

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County Executive: Jeffrey V. Smith

Comment 7A

Section 1.3.1.1, Build Alternative Location 4,

The Draft EIR/EA states "*Two T-intersections in this location on the northern side of the road provide access to the Sprig Lake parking lot and a horse trailhead and parking lot*". The Draft EIR/EA should correctly list this area as the Sprig Recreation Area and provide additional information related to the existing park setting which includes a parking lot, equestrian staging area and access to park trails.

Response 7A

The text in the section has been revised in response to your comments.

Comment 7B

Santa Clara County Countywide Trails Master Plan Update

The Draft EIR/EA should acknowledge the land use policies and guidelines of the Santa Clara County Countywide Trails Master Plan Update ("Countywide Trails Master Plan"), which the County Board of Supervisors approved and adopted in November 1995 as part of the Parks and Recreation Element of the County of Santa Clara General Plan (1995-2010). Currently this adopted land use plan was not included in section 2.1.1.2 Consistency with State and Regional and Local Plans and Programs of the DEIR.

Response 7B

The text in the section has been revised in response to your comments.

Comment 7C

As clarification, the countywide trail route noted in April 28, 2009 County Parks response letter on the Notice of Preparation (NOP) of the Draft EIR/EA incorrectly identified the trail route within the ROW as Route R5-A, Bay Area Ridge Trail, but the correct name for the trail route within the ROW is Hecker Pass Connector Trails, Route C30. County Parks agrees with the Assessment on page 2-9 and 4-2 of the Draft EIR/EA that the project will have a future benefit to cyclists as a result of the proposed shoulder widening.

Response 7C

The text in the section has been revised in response to your comments.

Comment 7D

In partnership with the Bay Area Ridge Trail Council, County Parks would plan and develop these future segments of the Bay Area Ridge Trail as described above. Therefore, County Parks recommends an at-grade trail crossing and gathering location for trail users on both sides of SR 152 near and/or adjacent to Location 4 west of the entrance to Sprig Recreation Area per Caltrans specifications and all applicable State, Federal, and local standards. The at-grade trail crossing would require a safe crossing, gathering location on both sides of SR 152 and measures that meet State, Federal and local standards for safe crossing of the highway. County Parks staff will continue to work with Caltrans to identify an appropriate site for gathering areas and

identify a viable alignment for the trail connection within the park. Prior to Caltrans' completion of a Final EIR/EA, County Parks requests that Caltrans share draft language specifying a trail crossing/trail user gathering area for the Mitigation Monitoring and Reporting Plan with County Parks staff for review and comment.

Response 7D

Creation of a trail user gathering location of the type referred to requires an Encroachment Permit from the Department. As the trail alignment is still in the planning phases by the County Parks, the Department cannot include specific language regarding a site at this time. The Department's Environmental and Engineering staff are committed to providing comprehensive technical assistance to County Parks during the (1) planning, (2) design, and (3) permit application process. It is expected that the active participation of the Department can facilitate the selection of a suitable gathering location. In addition, the Department can remain involved during the design phase to review plans as they are being developed, and facilitate obtaining the encroachment permit.

Comment 7E

Section 2.1.1.3 Parks and Recreational Facilities

The Draft EIR/EA states, "the park is under the jurisdiction of the Santa Clara County Parks and Recreation Department which administers the county's parks and recreation programs and operates and maintains 27 parks throughout the County." Please revise the statement with 28 parks that are managed by the County of Santa Clara Parks and Recreation Department.

Response 7E

The error regarding the number of parks managed by the County of Santa Clara Parks and Recreation Department has been corrected.

Comment 7F

Section 2.2 Physical Environment

There are existing landslide areas adjacent to the SR 152 and within the project area which were identified during coordination meetings and site visits with Caltrans. The Draft EIR/EA should include a discussion regarding these existing landslide areas and any underlying drainage issues and identify measures which could improve drainage and reduce soil instability.

Response 7F

Section 2.2.2 has been updated to include information regarding improvements to be made within landslide areas.

Comment 7G

Section 2.2.1.4 Avoidance, Minimization, and or Mitigation Measures

County Parks suggests that native plant species mixes be used with any seeding that may be used to cover disturbed soils. In order to achieve erosion control needs, native plant species mixes can

be mixed with sterile seed mixes until native plants establish. County Parks requests that native plant seeds originate from the watershed and be species found within the project area.

Response 7G

The Department will prepare a non standard specification instructing that any hydroseeding done for the project will use native plant species mixes.

Comment 7H

A concern of County Parks is the importation of Sudden Oak Death (SOD) and other diseases and fungi. SOD is prevalent throughout the Santa Cruz Mountains; however, it has not appeared in Mount Madonna County Park. As part of our resource management goals, County Parks continues to focus on the prevention and the spread of SOF into the park. Therefore, County Parks requires that cleaning/decontamination of all equipment and vehicles by part of the protocols/specifications specified in the project's Best Management Practices.

Response 7H

The Department will develop non standard specifications to ensure that cleaning and decontamination of all equipment and vehicles entering the project area will occur to prevent the introduction of SOD and other invasive species.

Comment 7I

Section 2.3 Biological Environment

The Draft EIR (section 2.3.1.2) identifies vegetation communities including Oak and Redwood forest which would be temporarily or permanently impacted. The Draft EIR/EA should include a more comprehensive discussion of the vegetation communities, including the forest understory, which will be impacted by the project.

Response 7I

Section 2.3.1.1 of the document discusses the vegetation communities, including the forest understory, that are located within the affected environment of the project.

Comment 7J

The avoidance and minimization efforts as described in section 2.3.1.3 are not adequate mitigations for the potential impacts to the vegetation communities. The Draft EIR/EA should clarify that native plant species will be planted and re-established in areas disturbed as a result of the project, including in the forest understory. County Parks would require that all plantings be of native species originating from the local watershed to maintain the genetic integrity of the natural communities within the park and project area.

Response 7J

The Department will include the establishment of a native forest undertory in locations where mitigation replanting occurs. The Department will replant using seed stock originating from the native species in the local watershed.

Comment 7K

Due to the uncertainty of the number, size and species of trees and their locations, County Parks is unable to comment on the project's potential impacts to trees. County Parks requests that the number, size and species of trees proposed for removal and those potentially significantly impacted by project activities be identified on a location map and included in the Draft EIR/EA. The Draft EIR/EA should also clarify if trees listed in Table 2.3-1 are only those which will be removed or includes those which may be significantly impacted such that they are not likely to survive after project completion.

Response 7K

Table 2.3-3 lists the number of trees (with a dbh of six inches or greater) by species that are located within the project footprint, as well as the trees that may be removed by the project at each location. To clarify, the trees listed as potentially impacted include all trees that may require removal, both through direct and indirect construction impacts, for the project. It is the Department's policy to avoid unnecessary removal of trees.

Comment 7L

County Parks requires that replacement trees be from the local watershed in order to maintain genetic integrity within the park. County parks typically requires replacement mitigation ratios of 3:1 for native trees larger than 8" dbh or at a ratio acceptable to the California Department of Fish and Game. If non-native species are proposed for removal, County Parks recommends that they are mitigated at a 1:1 replacement ration with a native species.

County Parks requires that mitigation sites be located within Mount Madonna County Park in a mutually agreed upon location within the park, and if not possible within the County Park, the mitigation site be negotiated at a location within the same watershed. The Draft EIR/EA does not include a mitigation monitoring and reporting plan, therefore, it is unclear as to what the success criteria are for mitigation and monitoring of the sire. County Parks would not perform mitigation and monitoring; Caltrans would be fully responsible for these actives. The Mitigation Monitoring and Reporting Plan should include success criteria to meet Caltrans' success criteria goals and specify monitoring protocols.

Response 7L

Section 2.3.1.3 has been revised to read: Replacement trees will be planted at a 3:1 for all native trees, and trees located within the riparian zone under California Department of Fish and Game regulatory jurisdiction with a dbh of 6 inches or greater. All other trees will be replaced at a 1:1 ratio.

The Department will work with County Parks to replant trees from native seed stock within a mutually agreed upon location(s) within the park. While a complete Mitigation Monitoring and Reporting Plan is not prepared by the Department until the design phase of the project begins, the Department's Avoidance, Minimization and Mitigation commitments can be found in Table S-1, which has been revised for the Final EIR/EA.

The Mitigation Monitoring and Reporting Plan will include information regarding the plant establishment period, success criteria, and reporting requirements.

Comment 7M

The County of Santa Clara requires that the project comply with the County of Santa Clara Tree Preservation and Removal Ordinance (Ord. No. NS-1203-107, Division C16). The County of Santa Clara Tree Preservation and Removal Policy states that a protected tree consists of: 1) and tree present on property owned or leased by the county that is twelve (12) inches or more in diameter measured at four and one-half feet above the ground, or which exceeds twenty (20) feet in height; 2) any multi-trunk trees totaling 24 inches or more in diameter measured at four and one-half feet above the ground; and 3) any tree designated as heritage by the County Board of Supervisors.

Response 7M

Replacement trees will be planted at a 3:1 ratio for all native trees, and trees located within the riparian zone under California Department of Fish and Game jurisdiction with a dbh of 6 inches or greater. All other trees will be replaced at a 1:1 ratio.

Comment 7N

Section 2.3.5 Invasive Species

The Draft EIR/EA should identify broom as an invasive plant species occurring in the project area. The mitigations measures identified in section 2.3.5.4 are precautionary and, as such, do not address the removal of invasive plants from the project area or ensure that they do not spread to other areas outside of the project area. The Draft EIR/EA should discuss invasive plant species control and provide guidelines/protocols for their removal and ensure that they do not spread as a result of project activities.

Response 7N

The Department has updated section 2.3.5.2 to include broom as an invasive species found at location 4. The Department will remove invasive species from plant mitigation sites at the time of planting and throughout the plant establishment and monitoring periods.

Chapter 5 List of Preparers

Caltrans
Office of Environmental Analysis
Melanie Brent
Jared Goldfine, AICP
Joe Robinson
Cristin Hallissy

Office of Landscape Architecture
Keith Suzuki
Brian Walker

Office of Natural Science and Permits
Katie Thoreson
Margaret Gabil

Office of Cultural Resources
Elizabeth Greene
Benjamin Harris
Frances Scheierenbeck

Office of Water Quality
Hardeep Tahkar
David Yam
Kamran Nakjihiri
Sara Dabilly
Laurie Smith
Amrinder Jhajj

Hazardous Waste
Ray Boyer

Air/Noise
Glenn Kinoshita

URS
Jeff Zimmerman
Bill Martin
Graham Craig
Matthew Bettleheim
David Halsing

William Kanemoto and Associates
William Kanemoto

Balfour Beatty
Doug Villars

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Chapter 6 Distribution List

The following agencies, organizations, and individuals received printed or electronic copies of this document. Agencies, organizations, and individuals on the project mailing list, which included over 250 addresses, were notified of the availability of this document and public meetings as described in Chapter 4.

Federal Agencies

National Marine Fisheries Service
Bay Area Office
777 Sonoma Avenue, Room 325
Santa Rosa, CA 94502

U.S. Army Corp of Engineers
Regulatory Branch
San Francisco District
Attention: CESPN-CO-R
1455 Market Street, 16th Floor
San Francisco, CA 94103

U.S. EPA Region 9
Regulatory Branch
75 Hawthorne Street
San Francisco, CA 94105

U.S. Department of Agriculture
Natural Resources Conservation Service
Farm Service Agency / Hollister Service Center
2337 Technology Pkwy, Suite A
Hollister, CA 95023

U.S. Fish and Wildlife Service
U.S. Department of Interior
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

Mr. Don Klima, Director
Office of Planning and Review Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, N.W.
Washington, DC 20004

* Agency received document through State Clearinghouse

State Agencies

Executive Director
Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

California Department of Conservation*
801 K Street, MS 24-01
Sacramento, CA 95814

California Department of Fish and Game*
Fisheries, Wildlife, and Environmental Programs
P.O. Box 47
Yountville, CA 94599

Office of Historic Preservation*
1416 Ninth Street, Room 1442
Sacramento, CA 95814

California Department of Parks and Recreation*
Resources Management Division
P.O. Box 942896
Sacramento, CA 94296

California Department of Water Resources*
Reclamation Board
1416 Ninth Street, Room 1601
Sacramento, CA 95814

California Department of Water Resources*
Environmental Services Office
3251 S Street, Room 111
Sacramento, CA 95816

California Highway Patrol*
Office of Special Projects
2555 1st Avenue
Sacramento, CA 95818
California Resources Agency*
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Integrated Waste Management Board
P.O. Box 4025
Sacramento, CA 95812

California State Water Resources Control Board*
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812

Native American Heritage Commission*
915 Capitol Mall, Room 364
Sacramento, CA 95814

Public Utilities Commission*
505 Van Ness Avenue
San Francisco, CA 94102

California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

California Transportation Commission 1120 "N" Street, Room 2221 (MS-52)
Sacramento, CA 95814

* Agency received document through State Clearinghouse

Farmland Mapping and Monitoring Program
Department of Conservation
801 K Street, MS 18-01
Sacramento, CA 95814

California Air Resources Board
PO Box 2815
Sacramento, CA 95812

Regional Agencies

Executive Officer William Norton
Bay Area Air Quality Management District*
939 Ellis Street
San Francisco, CA 94109

Executive Director, Steve Heminger
Metropolitan Transportation Commission
101 8th Street
Oakland, CA 94604

Executive Director, Henry Gardner
Association of Bay Area Governments
101 8th Street
Oakland, CA 94604

Mr. Beau Goldie, CEO
Santa Clara Valley Water District
Winfield Warehouse
5905 Winfield Blvd.
San Jose, CA 95123-2428

Michael Murdter, Department Director
County of Santa Clara Roads and Airports Department
101 Skyport Dr.
San Jose, CA 95110

Central Coast RWQCB
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Local Agencies

Planning Manager, David Bischoff
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Ms. Shawna Freels, City Clerk
City of Gilroy
7351 Rosanna Street
Gilroy, CA 95020

Mr. J. Edward Tewes, City Manager
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037

Mr. Darrell Wong, Senior Civil Engineer for
Land Development Engineering
Santa Clara County
70 West Hedding Street
7th Floor, East Wing
San Jose, CA 95110

Dana Peak
Department of Planning and Development
Santa Clara County
70 West Hedding Street
7th Floor, East Wing
San Jose, CA 95110

Mr. Art Henriques, Director of Planning &
Building Inspection Services
San Benito County
3224 Southside Road
Hollister, CA 95023-9174

Alameda County Clerk-Recorder's Office
1106 Madison Street
Oakland, CA 94607

County Clerk
County of San Mateo
555 County Center
Redwood City, CA 94063-1665

Santa Cruz County Clerk
701 Ocean St., Rm. 230
Santa Cruz, CA 95060

San Benito County Clerk
440 5th St.
Room 206 County Courthouse
Hollister, CA 95023-3843
Stanislaus County Clerk
1021 I Street, Suite 101
Modesto, California

Merced County Clerk
2222 M St.
Merced, CA 95340

San Joaquin County Clerk
44 N. San Joaquin Street
Suite 260
Stockton, CA 95202

Peggy Tomasso, Acting Community
Librarian
660 West Main Avenue
Morgan Hill, California, 95037

Lani D. Yoshimura, Community Librarian
Gilroy Library
7652 Monterey Street
Gilroy, CA 95020

San Benito County Library
470 5th st.
Hollister, CA 95023

Federal Elected Officials

Honorable Barbara Boxer
United States Senator
1700 Montgomery Street, Suite 240
San Francisco, CA 94111

Honorable Dianne Feinstein
United States Senator
One Post Street, Suite 2450
San Francisco, CA 94104

The Honorable Sam Farr
U.S. House of Representatives
District 17
100 West Alisal Street
Salinas, CA 93901

The Honorable Jerry McNerny
U.S. House of Representatives
District 11
5776 Stoneridge Mall Rd. #175
Pleasanton, CA 94588

State Elected Officials

The Honorable Elaine Alquist
California State Senate, District 13
7800 Arroyo Circle, Suite A
Gilroy, CA 95020

The Honorable Jeff Denham
California State Senate, District 12
369 Main Street, #208
Salinas, CA 93901

Assembly Member Anna M. Caballero
California State Assembly, District 28
100 West Alisal Street, Suite 134
Salinas, CA 93901

Local Elected Officials

Mr. Donald F. Gage
District One Supervisor
Santa Clara County
70 West Hedding Street
San Jose, CA 95110

The Honorable Al Pinheiro
Mayor, City of Gilroy
190 First St.
Gilroy, CA 95020
City of Gilroy City Council
7351 Rosanna St.
Gilroy, CA 95020

Mr. Steve Tate, Mayor
City of Morgan Hill
17555 Peak Avenue
Morgan Hill, CA 95037

Interested Parties

Sierra Club
Loma Prieta Chapter
3921 East Bayshore Road, Suite 204
Palo Alto, CA 94303

Gilroy Historical Society
PO box 1621
Gilroy, CA 95021-1621

Chapter 7 References

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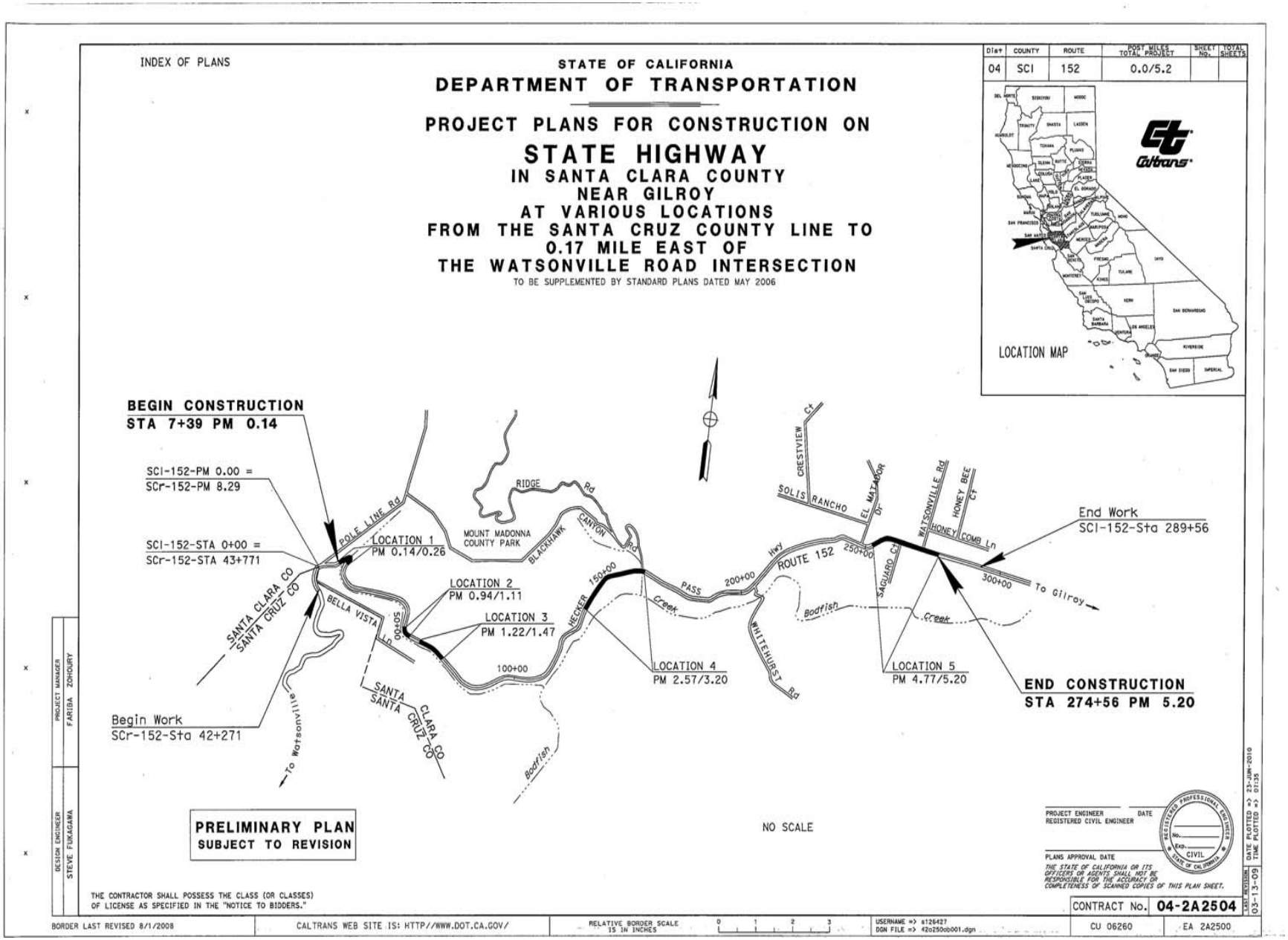
Appendix A Project Plans

Typical Cross Section sheets X-1 through X-6 illustrate the preliminary typical roadway cross section at each of the five project locations. Layout sheets L-1 through L-8 illustrate the preliminary project plans.


INDEX OF PLANS
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN SANTA CLARA COUNTY
NEAR GILROY
AT VARIOUS LOCATIONS
FROM THE SANTA CRUZ COUNTY LINE TO
0.17 MILE EAST OF
THE WATSONVILLE ROAD INTERSECTION
TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006
Dist 04
COUNTY SCI
ROUTE 152
POST MILES TOTAL PROJECT 0.0/5.2
SHEET NO.
TOTAL SHEETS
LOCATION MAP
BEGIN CONSTRUCTION
STA 7+39 PM 0.14
SCI-152-PM 0.00 =
SCr-152-PM 8.29
SCI-152-STA 0+00 =
SCr-152-STA 43+771
SANTA CLARA CO
SANTA CRUZ CO
Begin Work
SCr-152-Sta 42+271
To Watsonville
POLE LINE Rd
LOCATION 1
PM 0.14/0.26
MOUNT MADONNA
COUNTY PARK
RIDGE Rd
BLACKHAWK CANYON Rd
LOCATION 2
PM 0.94/1.11
LOCATION 3
PM 1.22/1.47
BELLA VISTA Ln
50+00
100+00
150+00
HECKER PASS
Creek
Bodfish
LOCATION 4
PM 2.57/3.20
200+00
Hwy
ROUTE 152
250+00
WHITEHURST Rd
SOLIS RANCHO
CRESTVIEW Ct
EL MATADOR Dr
SAGUARO Ct
WATSONVILLE Rd
HONEY BEE Ct
HONEY COMB Ln
300+00
To Gilroy
LOCATION 5
PM 4.77/5.20
End Work
SCI-152-Sta 289+56
END CONSTRUCTION
STA 274+56 PM 5.20
PRELIMINARY PLAN
SUBJECT TO REVISION
NO SCALE
PROJECT ENGINEER
REGISTERED CIVIL ENGINEER
DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
CONTRACT No. 04-2A2504
THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."
PROJECT MANAGER FARIBA ZOHOURY
DESIGN ENGINEER STEVE FUKAGAWA
BORDER LAST REVISED 8/1/2008
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EA 2A2500
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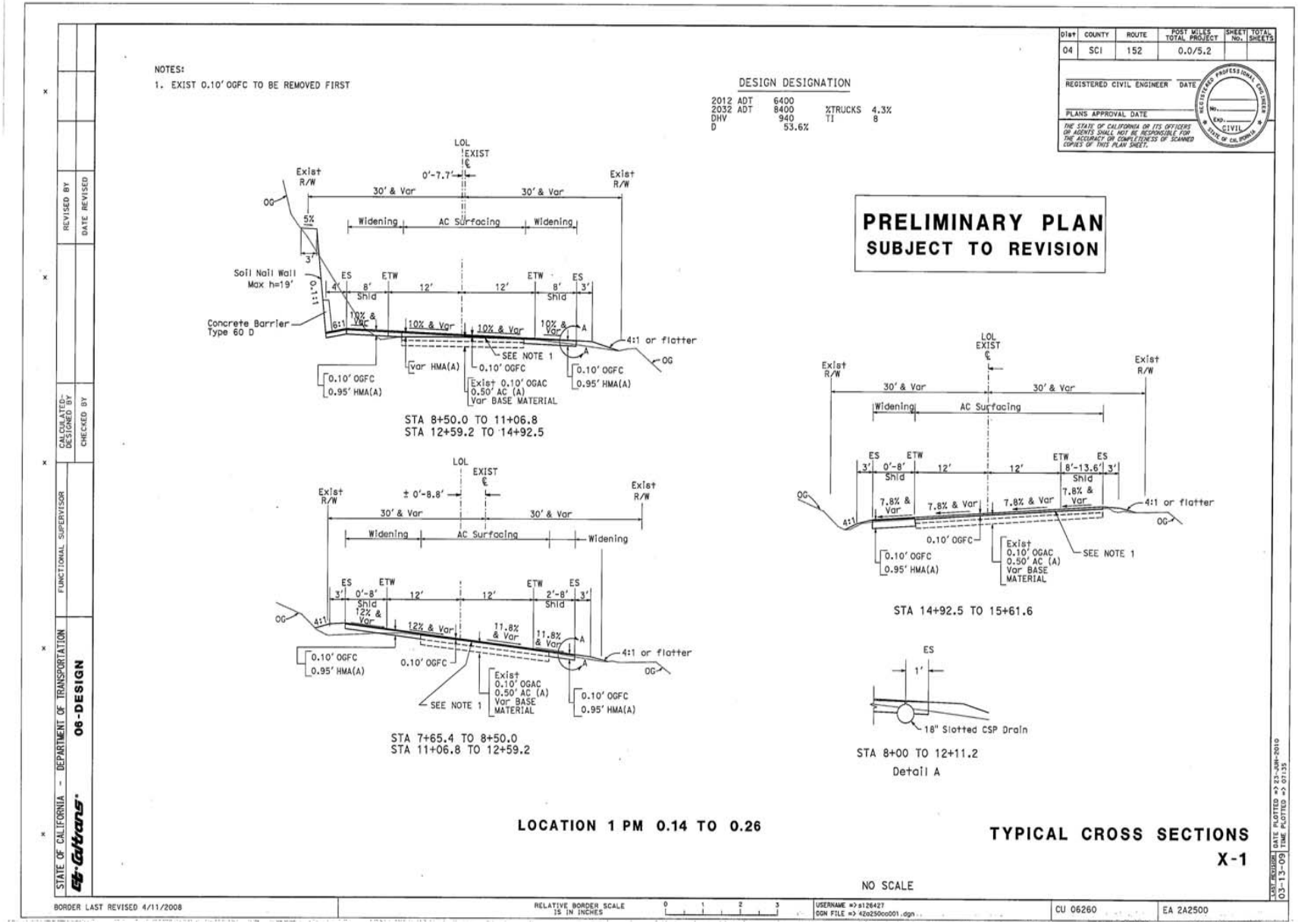
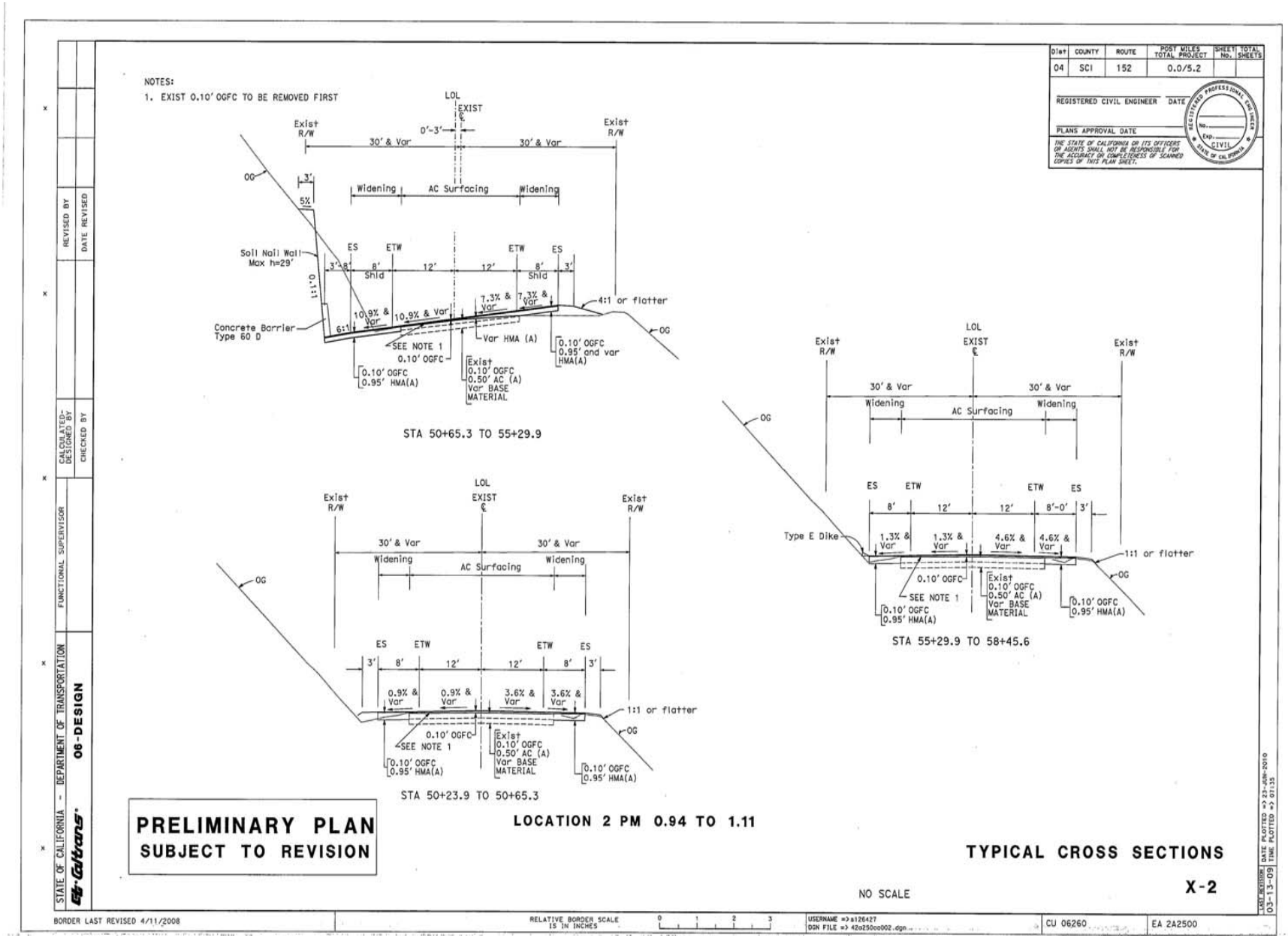
TIME PLOTTED => 07:35


NOTES:
1. EXIST 0.10' OGFC TO BE REMOVED FIRST
DESIGN DESIGNATION
2012 ADT 6400
2032 ADT 8400 %TRUCKS 4.3%
DHV 940 TI 8
D 53.6%
PRELIMINARY PLAN
SUBJECT TO REVISION
STA 8+50.0 TO 11+06.8
STA 12+59.2 TO 14+92.5
STA 7+65.4 TO 8+50.0
STA 11+06.8 TO 12+59.2
STA 14+92.5 TO 15+61.6
STA 8+00 TO 12+11.2
Detail A
18" Slotted CSP Drain
Soil Nail Wall Max h=19'
Concrete Barrier Type 60 D
0.10' OGFC
0.95' HMA(A)
Var HMA(A)
Exist 0.10' OGAC 0.50' AC (A) Var BASE MATERIAL
SEE NOTE 1
4:1 or flatter
LOCATION 1 PM 0.14 TO 0.26
TYPICAL CROSS SECTIONS
X-1
NO SCALE
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
06-DESIGN
BORDER LAST REVISED 4/11/2008
CU 06260
EA 2A2500


NOTES:
1. EXIST 0.10' OGFC TO BE REMOVED FIRST
LOL
EXIST ℄
Exist R/W
0'-3'
30' & Var
30' & Var
Widening
AC Surfacing
Widening
OG
3'
5%
Soil Nail Wall Max h=29'
0.1:1
ES
ETW
ETW
ES
3'
8'
8' Shld
12'
12'
8' Shld
3'
10.9% & Var
10.9% & Var
7.3% & Var
7.3% & Var
4:1 or flatter
Concrete Barrier Type 60 D
6:1
SEE NOTE 1
0.10' OGFC
Var HMA (A)
0.10' OGFC 0.95' and var HMA(A)
0.10' OGFC 0.95' HMA(A)
Exist 0.10' OGFC 0.50' AC (A) Var BASE MATERIAL
STA 50+65.3 TO 55+29.9
Type E Dike
8'
12'
12'
8'-0'
3'
1.3% & Var
1.3% & Var
4.6% & Var
4.6% & Var
1:1 or flatter
STA 55+29.9 TO 58+45.6
0.9% & Var
0.9% & Var
3.6% & Var
3.6% & Var
STA 50+23.9 TO 50+65.3
PRELIMINARY PLAN
SUBJECT TO REVISION
LOCATION 2 PM 0.94 TO 1.11
TYPICAL CROSS SECTIONS
X-2
NO SCALE
Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET No. TOTAL SHEETS
04 SCI 152 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
REVISED BY
DATE REVISED
CALCULATED-DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
LAST REVISION 03-13-09
DATE PLOTTED => 23-JAN-2010
TIME PLOTTED => 07:35
BORDER LAST REVISED 4/11/2008
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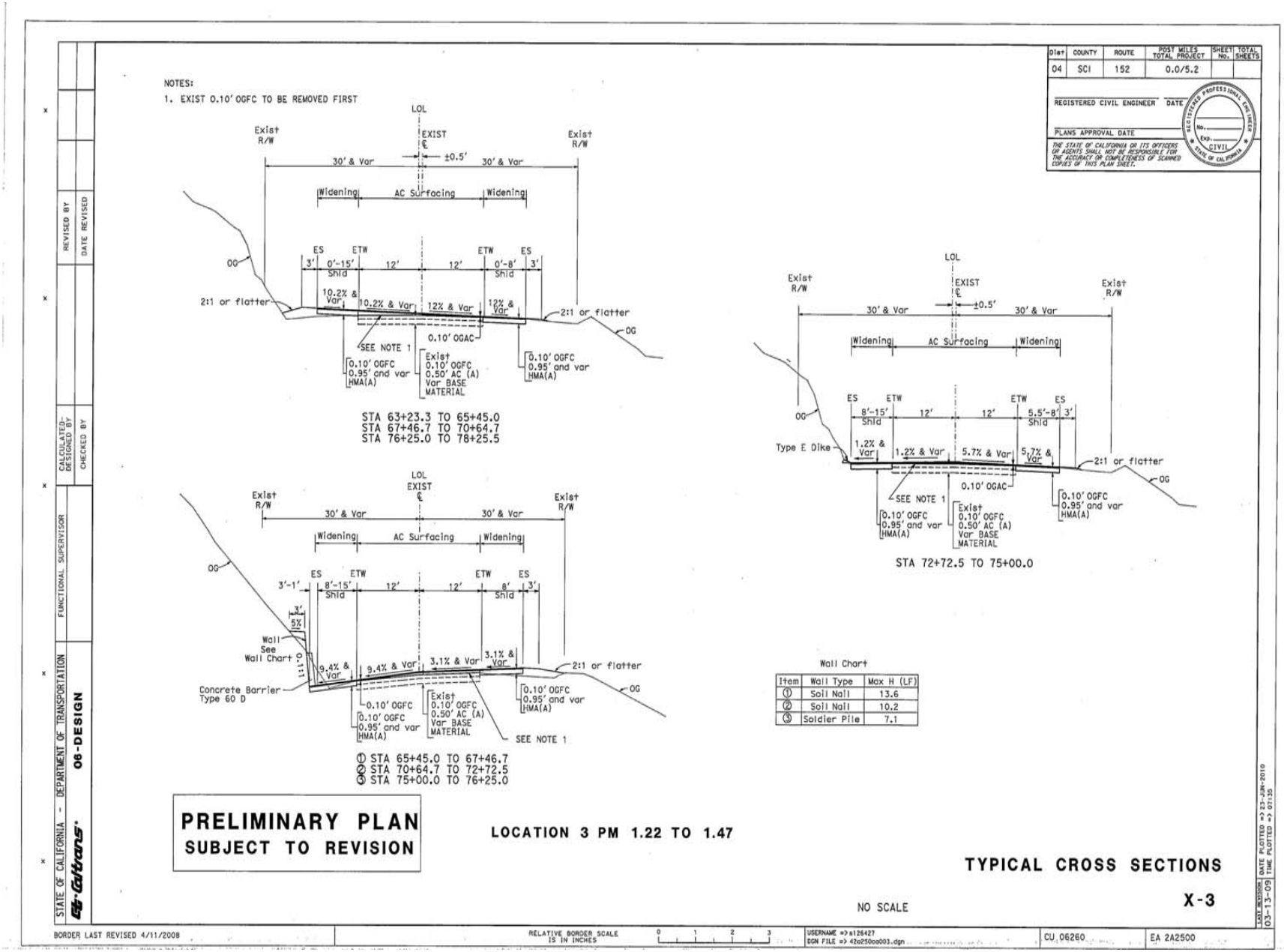
EA 2A2500


NOTES:
1. EXIST 0.10' OGFC TO BE REMOVED FIRST
LOL
EXIST ℄
Exist R/W
±0.5'
30' & Var
Widening
AC Surfacing
ES
ETW
3'
0'-15' Shld
12'
0'-8' Shld
10.2% & Var
12% & Var
2:1 or flatter
OG
0.10' OGAC
SEE NOTE 1
0.10' OGFC 0.95' and var HMA(A)
Exist 0.10' OGFC 0.50' AC (A) Var BASE MATERIAL
STA 63+23.3 TO 65+45.0
STA 67+46.7 TO 70+64.7
STA 76+25.0 TO 78+25.5
3'-1'
8'-15' Shld
8' Shld
Wall See Wall Chart
0.1:1
9.4% & Var
3.1% & Var
Concrete Barrier Type 60 D
① STA 65+45.0 TO 67+46.7
② STA 70+64.7 TO 72+72.5
③ STA 75+00.0 TO 76+25.0
8'-15' Shld
5.5'-8' Shld
1.2% & Var
5.7% & Var
Type E Dike
STA 72+72.5 TO 75+00.0
Wall Chart
Item | Wall Type | Max H (LF)
① | Soil Nail | 13.6
② | Soil Nail | 10.2
③ | Soldier Pile | 7.1
PRELIMINARY PLAN
SUBJECT TO REVISION
LOCATION 3 PM 1.22 TO 1.47
TYPICAL CROSS SECTIONS
X-3
NO SCALE
Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS
04 | SCI | 152 | 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
REVISED BY
DATE REVISED
CALCULATED-DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
BORDER LAST REVISED 4/11/2008
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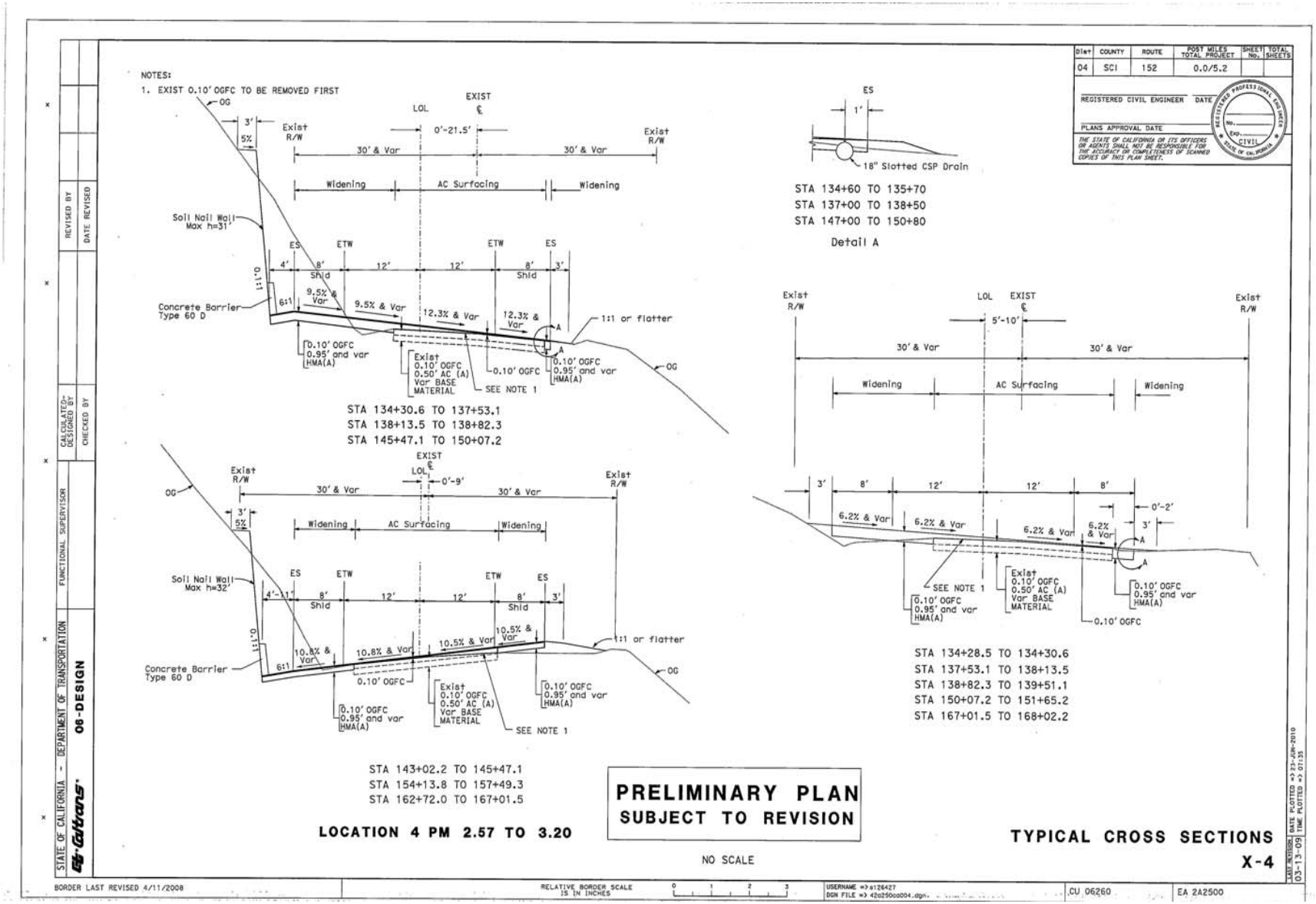
NOTES:
1. EXIST 0.10' OGFC TO BE REMOVED FIRST
STA 134+30.6 TO 137+53.1
STA 138+13.5 TO 138+82.3
STA 145+47.1 TO 150+07.2
STA 143+02.2 TO 145+47.1
STA 154+13.8 TO 157+49.3
STA 162+72.0 TO 167+01.5
LOCATION 4 PM 2.57 TO 3.20
STA 134+60 TO 135+70
STA 137+00 TO 138+50
STA 147+00 TO 150+80
Detail A
18" Slotted CSP Drain
STA 134+28.5 TO 134+30.6
STA 137+53.1 TO 138+13.5
STA 138+82.3 TO 139+51.1
STA 150+07.2 TO 151+65.2
STA 167+01.5 TO 168+02.2
PRELIMINARY PLAN
SUBJECT TO REVISION
NO SCALE
TYPICAL CROSS SECTIONS
X-4
Soil Nail Wall Max h=31'
Soil Nail Wall Max h=32'
Concrete Barrier Type 60 D
Widening
AC Surfacing
30' & Var
Exist R/W
LOL
EXIST ℄
ES
ETW
Shld
1:1 or flatter
0.10' OGFC 0.95' and var HMA(A)
Exist 0.10' OGFC 0.50' AC (A) Var BASE MATERIAL
SEE NOTE 1
OG
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
08-DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
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DATE REVISED
BORDER LAST REVISED 4/11/2008
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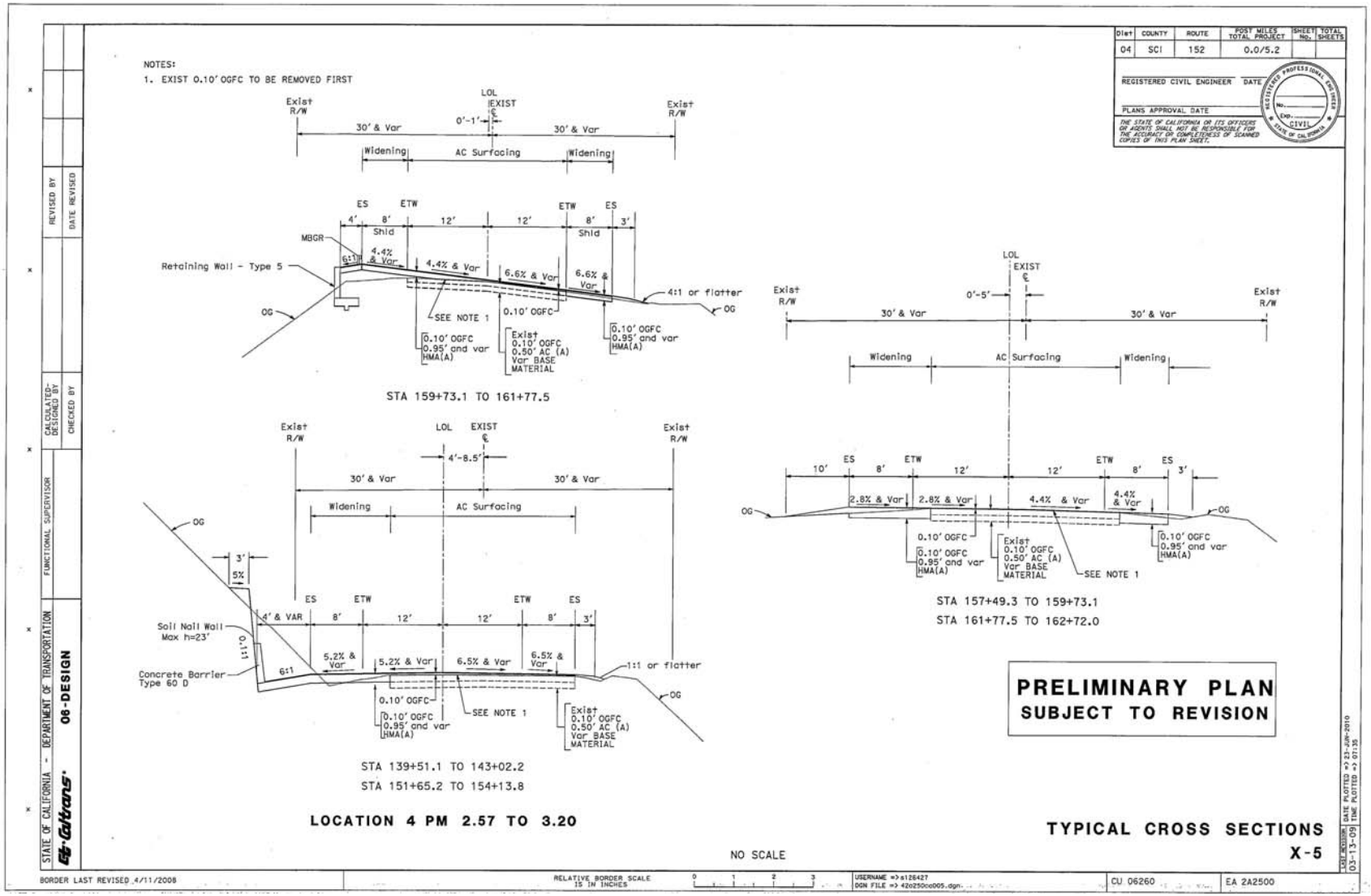
NOTES:
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Exist R/W
LOL
EXIST ℄
0'-1'
30' & Var
Widening
AC Surfacing
ES
ETW
4'
8'
Shld
12'
MBGR
Retaining Wall - Type 5
6:1
4.4% & Var
6.6% & Var
4:1 or flatter
OG
SEE NOTE 1
0.10' OGFC
0.10' OGFC 0.95' and var HMA(A)
Exist 0.10' OGFC 0.50' AC (A) Var BASE MATERIAL
STA 159+73.1 TO 161+77.5
4'-8.5'
3'
5%
Soil Nail Wall Max h=23'
0.1:1
Concrete Barrier Type 60 D
4' & VAR
5.2% & Var
6.5% & Var
1:1 or flatter
STA 139+51.1 TO 143+02.2
STA 151+65.2 TO 154+13.8
0'-5'
10'
2.8% & Var
STA 157+49.3 TO 159+73.1
STA 161+77.5 TO 162+72.0
PRELIMINARY PLAN
SUBJECT TO REVISION
LOCATION 4 PM 2.57 TO 3.20
TYPICAL CROSS SECTIONS
X-5
NO SCALE
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
08-DESIGN
Caltrans
REVISED BY
DATE REVISED
CALCULATED-DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR
Dist 04
COUNTY SCI
ROUTE 152
POST MILES TOTAL PROJECT 0.0/5.2
SHEET No.
TOTAL SHEETS
REGISTERED CIVIL ENGINEER
DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
BORDER LAST REVISED 4/11/2008
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REGISTERED CIVIL ENGINEER DATE

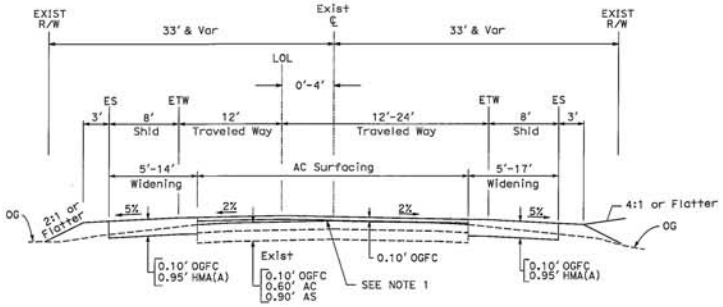
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

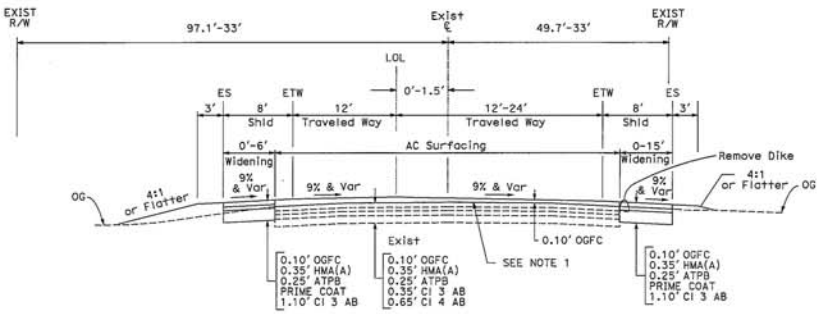
REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

NOTES:

1. EXIST OGFC TO BE REMOVED FIRST



Sta 260+82.7 to 274+20.5



Sta 253+24.1 to 260+82.7

PRELIMINARY PLAN
SUBJECT TO REVISION

LOCATION 5 PM 4.77 TO 5.20

NO SCALE

TYPICAL CROSS SECTIONS

X-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN

FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 03-13-09
DATE PLOTTED => 23-JAN-2010
TIME PLOTTED => 07:25

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EA 2A2500

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152	0.0/5.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

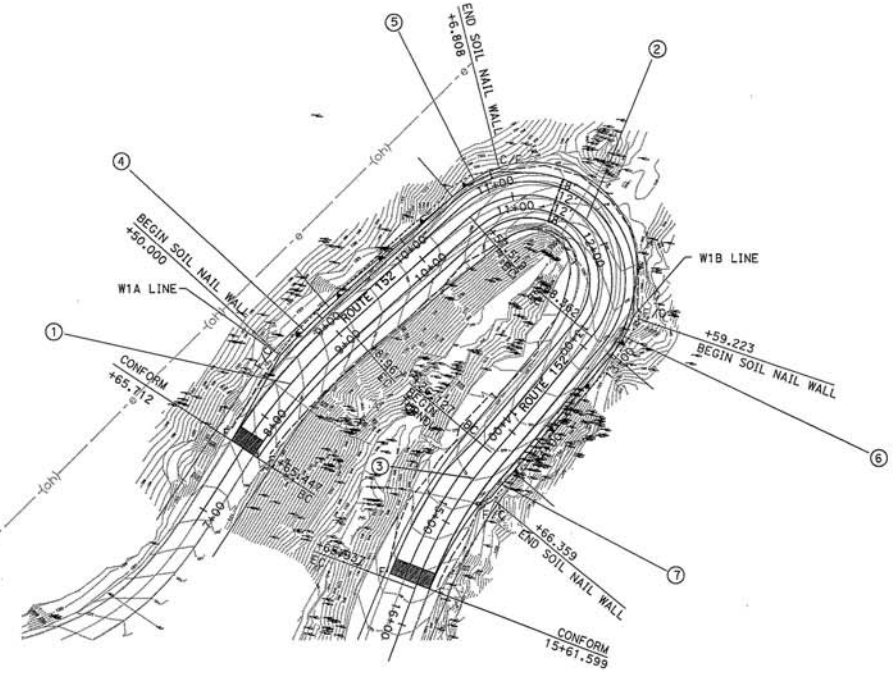
NOTES:

1. EXISTING CENTER YELLOW STRIPE WILL NOT MATCH DESIGN CENTERLINE.

LEGEND
----- CUT LINE
—·— FILL LINE

CURVE DATA

No.	R	Δ	T	L	N	E
1	525.00	15°39'47"	72.21	143.52	1823295.45	6207121.60
2	77.00	171°46'13"	1070.30	230.84	1823729.05	6206935.18
3	400.00	20°1'35"	70.63	139.81	1823316.14	6207210.87
4	549.00	6°26'3"	30.86	61.65	1823295.45	6207121.60
5	101.00	27°21'49"	24.59	48.24	1823729.05	6206935.18
6	101.00	21°40'55"	19.34	38.22	1823729.05	6206935.18
7	380.71	4°40'10"	15.52	31.03	1823295.68	6207198.84



PRELIMINARY PLAN
SUBJECT TO REVISION

LOCATION 1 PM 0.14 TO 0.26

SCALE 1"=50'

LAYOUT
L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06 - DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 03-13-09
DATE PLOTTED => 23-JUN-2010
TIME PLOTTED => 08:04

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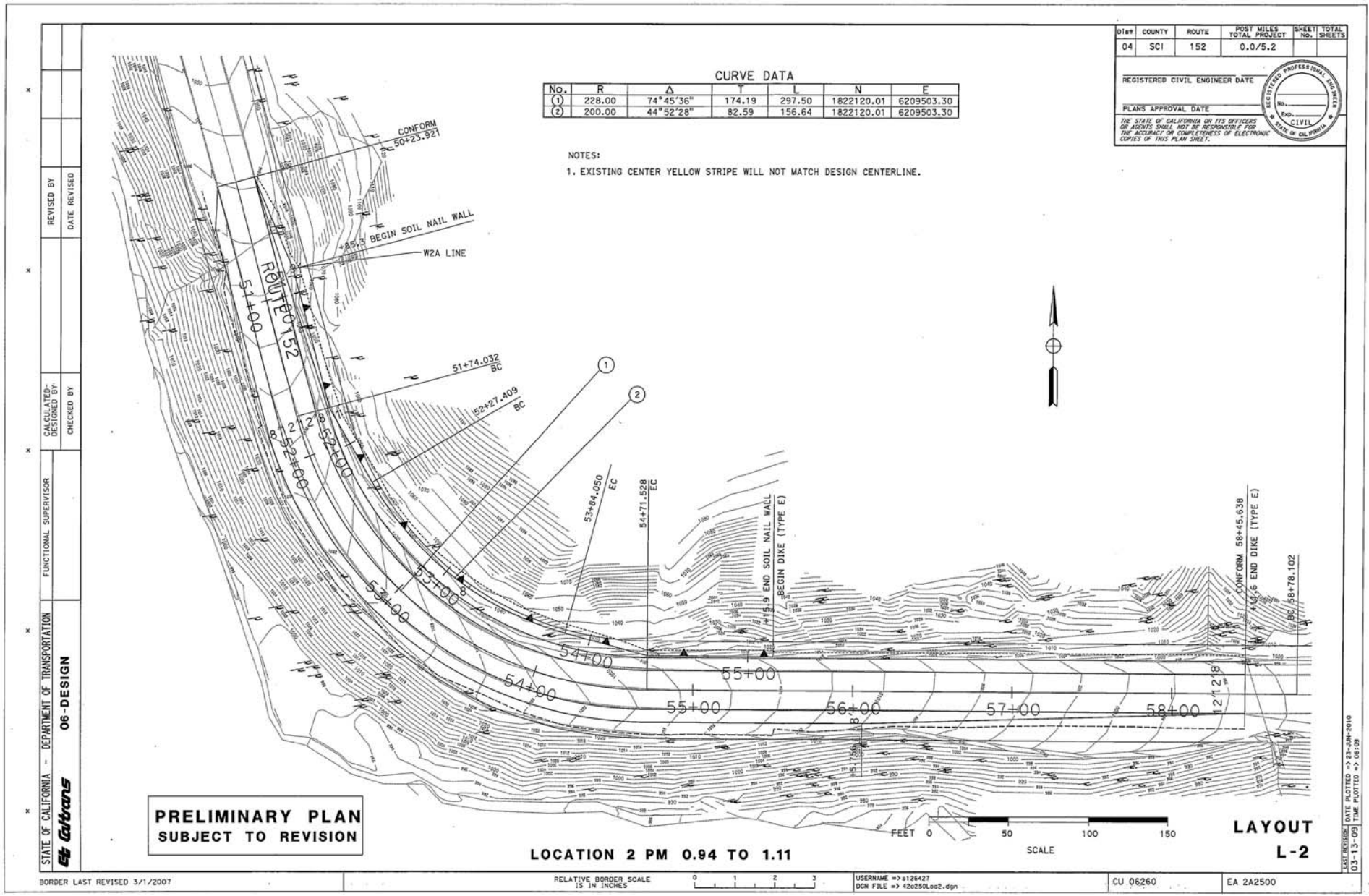
CU 06260
EA 2A2500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1. EXISTING CENTER YELLOW STRIPE WILL NOT MATCH DESIGN CENTERLINE.
Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET No. TOTAL SHEETS
04 SCI 152 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
CONFORM 50+23.921
BEGIN SOIL NAIL WALL
W2A LINE
ROUTE 152
51+00
51+74.032 BC
52+27.409 BC
52+00
53+00
53+84.050 EC
54+71.528 EC
END SOIL NAIL WALL
BEGIN DIKE (TYPE E)
54+00
55+00
56+00
57+00
58+00
CONFORM 58+45.638
END DIKE (TYPE E)
58+78.102 BC
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SUBJECT TO REVISION
LOCATION 2 PM 0.94 TO 1.11
FEET 0 50 100 150
SCALE
LAYOUT
L-2
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
LAST REVISION 03-13-09
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TIME PLOTTED => 08:09
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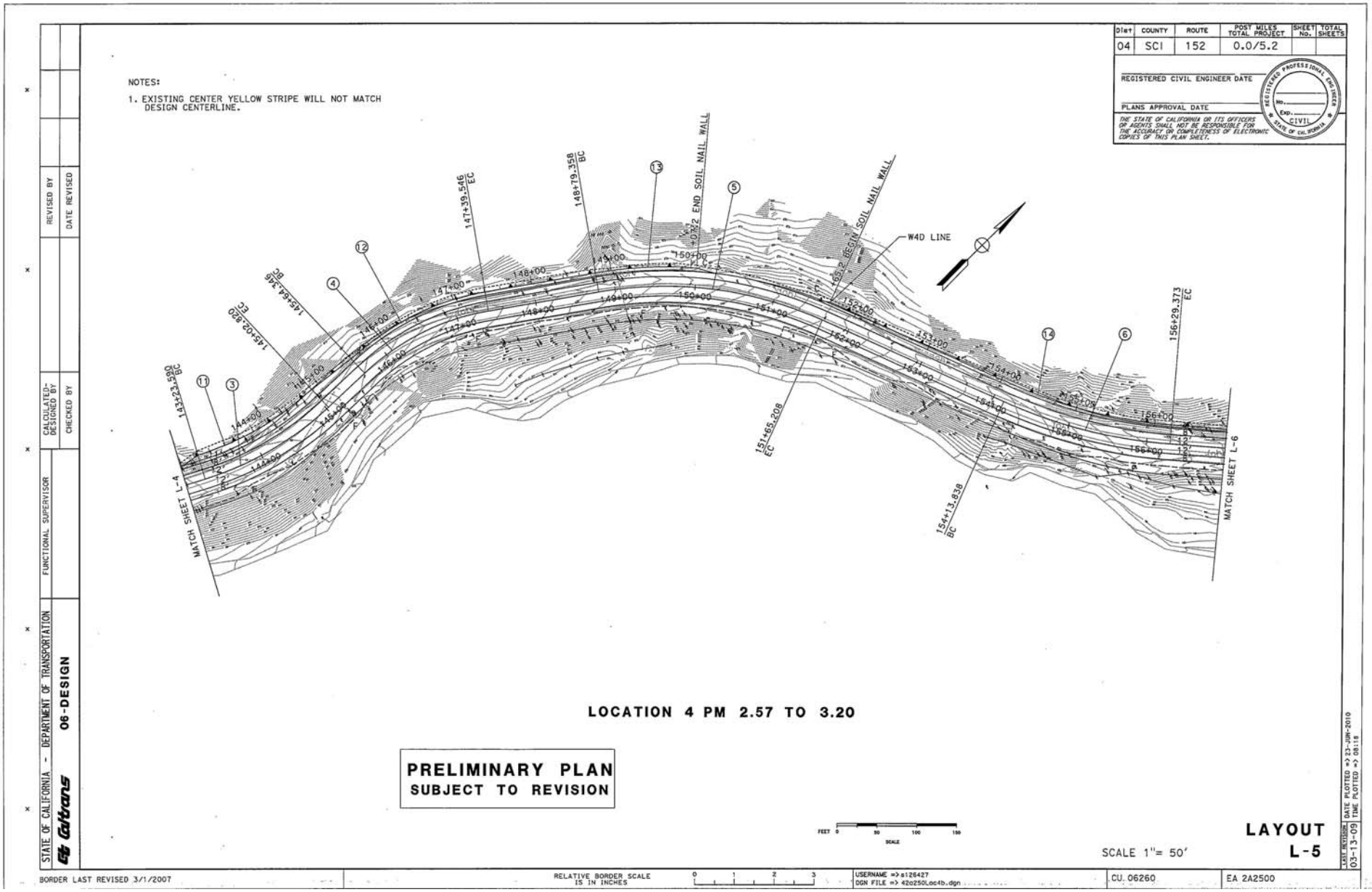
EA 2A2500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04 SCI 152 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
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REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
W4D LINE
MATCH SHEET L-4
MATCH SHEET L-6
LOCATION 4 PM 2.57 TO 3.20
PRELIMINARY PLAN
SUBJECT TO REVISION
SCALE 1"= 50'
LAYOUT
L-5
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN INCHES
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CU. 06260
EA 2A2500
LAST REVISION 03-13-09
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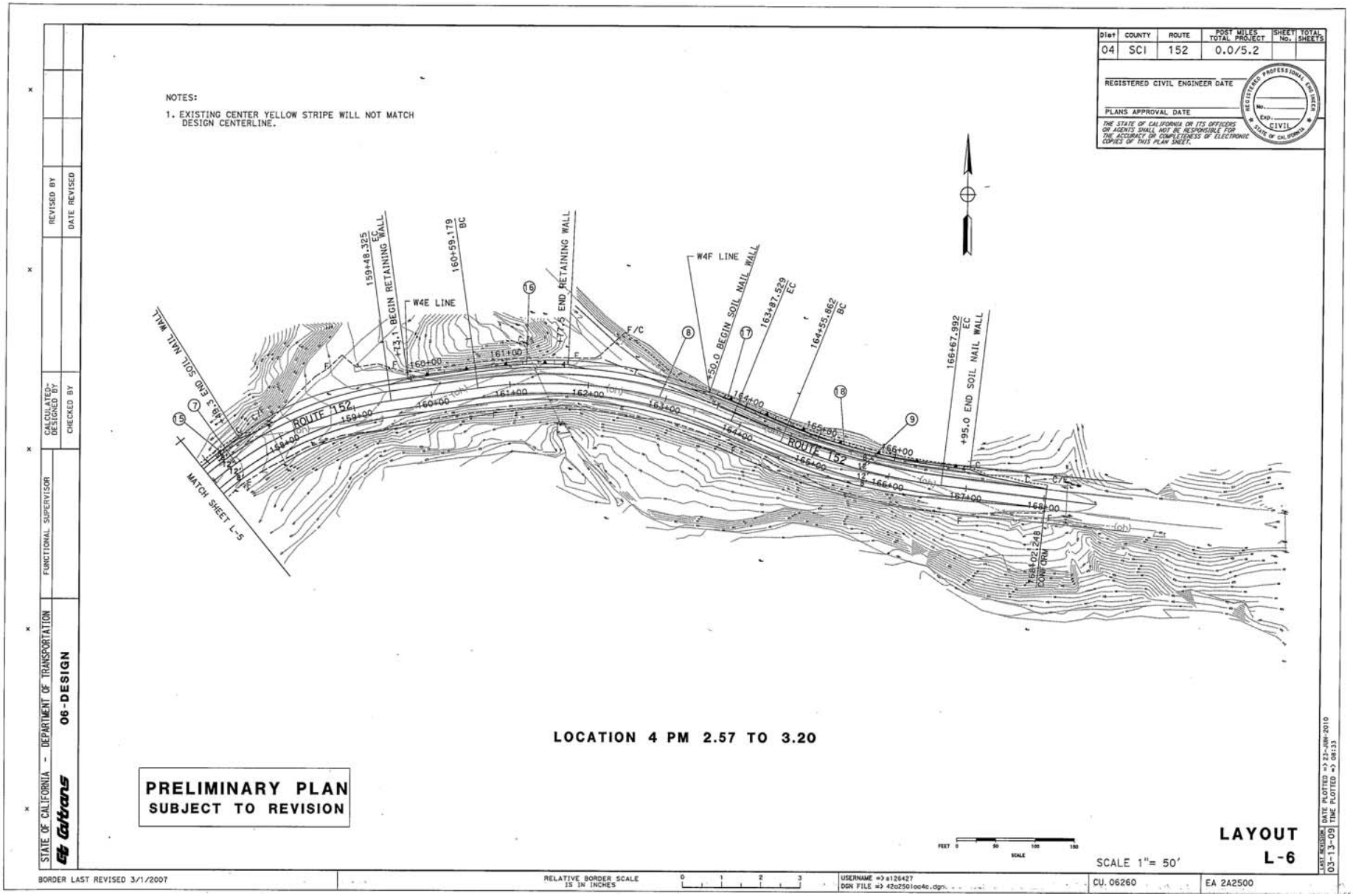
TIME PLOTTED => 08:18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Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET No. TOTAL SHEETS
04 SCI 152 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
CIVIL
STATE OF CALIFORNIA
159+49.325 EC
END RETAINING WALL
160+59.179 BC
BEGIN RETAINING WALL
W4E LINE
W4F LINE
BEGIN SOIL NAIL WALL
163+87.529 EC
164+55.862 BC
166+67.992 EC
END SOIL NAIL WALL
END SOIL NAIL WALL
ROUTE 152
MATCH SHEET L-5
LOCATION 4 PM 2.57 TO 3.20
PRELIMINARY PLAN
SUBJECT TO REVISION
LAYOUT
L-6
SCALE 1"= 50'
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN INCHES
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CU. 06260
EA 2A2500
LAST REVISION 03-13-09
DATE PLOTTED => 23-JUN-2010
TIME PLOTTED => 08:33

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCl	152	0.0/5.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

NOTE:

1. EXISTING CENTER YELLOW STRIPE WILL NOT MATCH DESIGN CENTERLINE.

CURVE DATA

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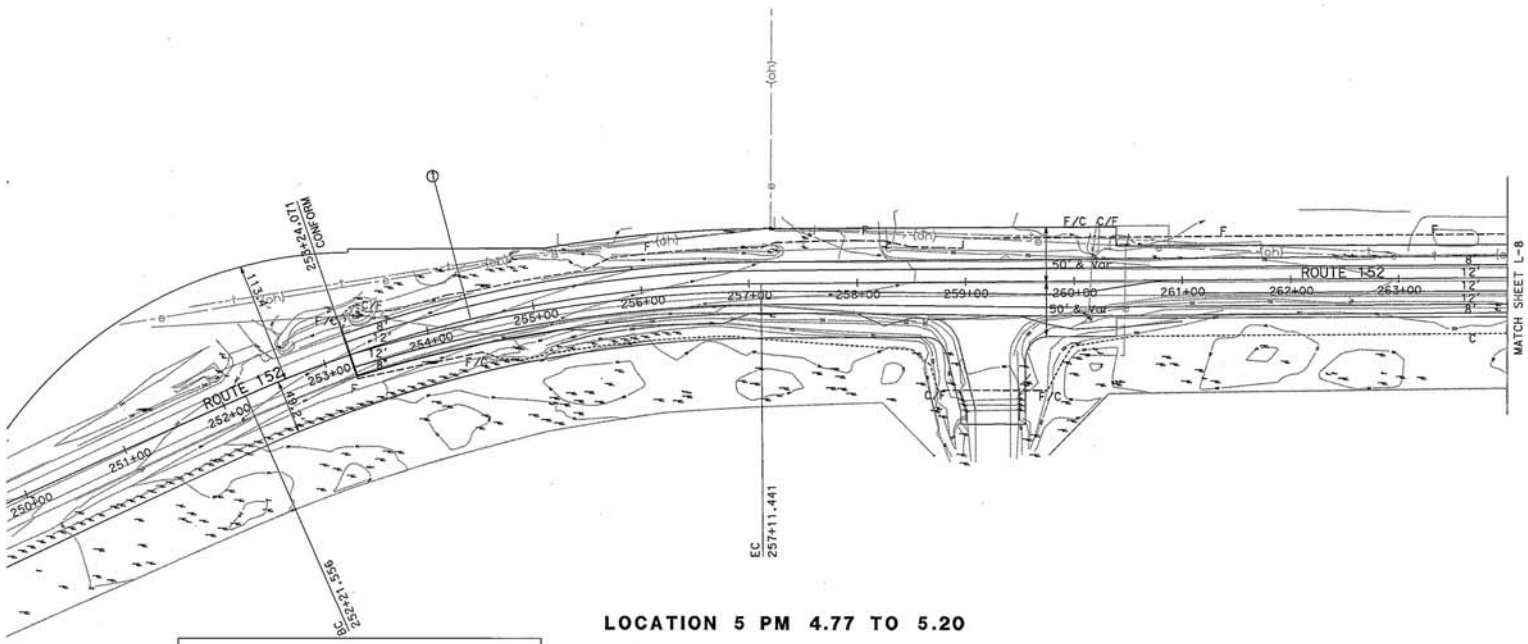

LOCATION 5 PM 4.77 TO 5.20

PRELIMINARY PLAN
SUBJECT TO REVISION

SCALE 1"= 50'

LAYOUT
L-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN

FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 03-13-09
DATE PLOTTED => 23-JUN-2010
TIME PLOTTED => 08:23

BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
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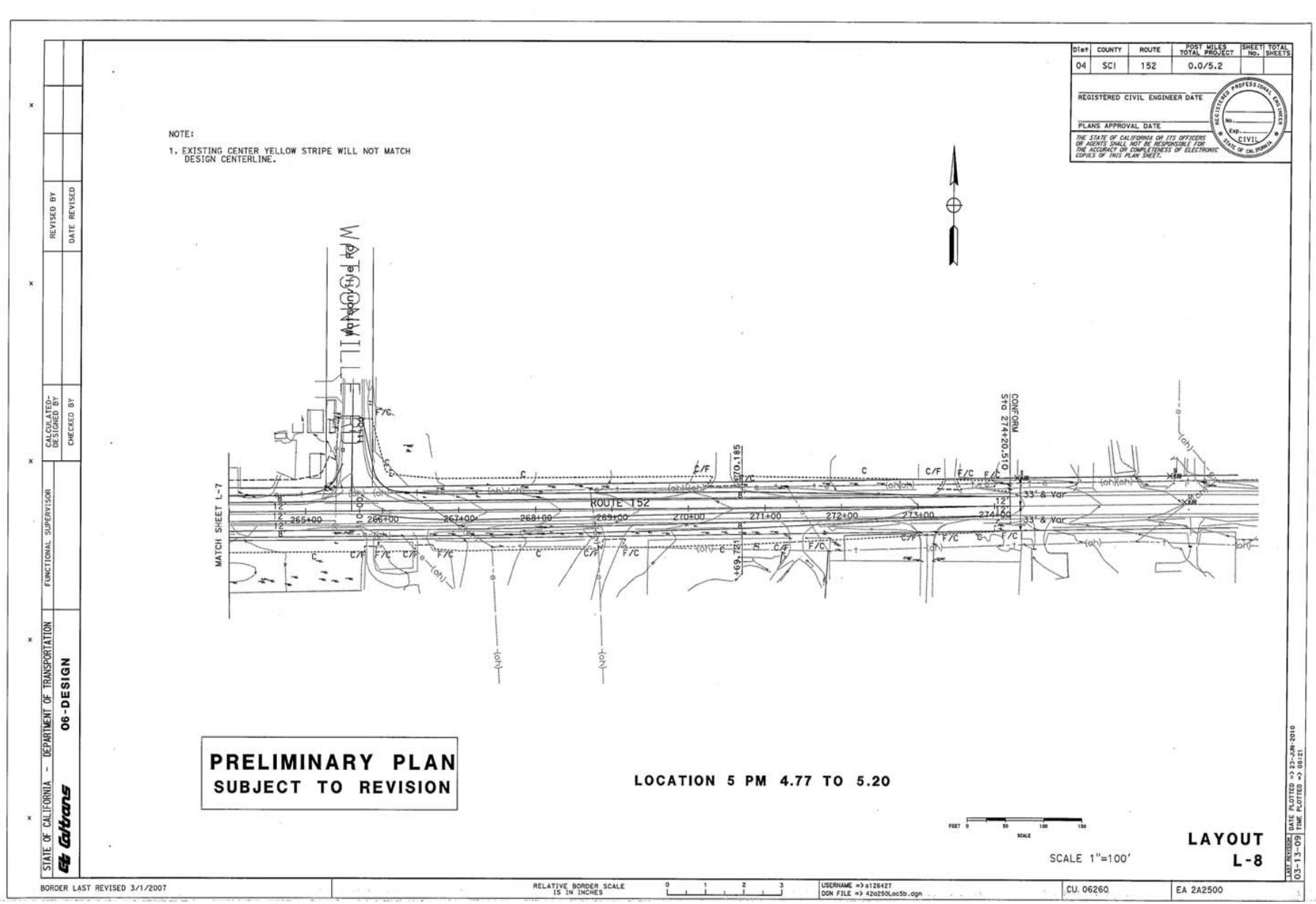
CU 06260
EA 2A2500


Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS
04 | SCl | 152 | 0.0/5.2
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA
NOTE:
1. EXISTING CENTER YELLOW STRIPE WILL NOT MATCH DESIGN CENTERLINE.
MATCH SHEET L-7
ROUTE 152
265+00
266+00
267+00
268+00
269+00
270+00
271+00
272+00
273+00
274+00
33' & Var
CONFORM STA 274+20.510
PRELIMINARY PLAN
SUBJECT TO REVISION
LOCATION 5 PM 4.77 TO 5.20
SCALE 1"=100'
LAYOUT
L-8
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
06-DESIGN
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
BORDER LAST REVISED 3/1/2007
RELATIVE BORDER SCALE IS IN INCHES
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LAST REVISION 03-13-09
DATE PLOTTED => 23-JAN-2010
TIME PLOTTED => 08:21

Appendix B CEQA Checklist

Supporting documentation of all CEQA checklist determinations is provided in Chapter 2 of this Environmental Impact Report/Environmental Assessment. Documentation of "No Impact" determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or compensation measures is under the appropriate topic headings in Chapter 2.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☒	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

IV. BIOLOGICAL RESOURCES: Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

V. CULTURAL RESOURCES: Would the project:

a) Cause a substantial adverse change in the significance of an historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

VI. GEOLOGY AND SOILS: Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

VII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

VIII. HYDROLOGY AND WATER QUALITY: Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or offsite?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

IX. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒

b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

X. MINERAL RESOURCES: Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

XI. NOISE: Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XII. POPULATION AND HOUSING: Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIII. PUBLIC SERVICES:

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☐	☒

XIV. RECREATION:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

XV. TRANSPORTATION/TRAFFIC: Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

XVI. UTILITIES AND SERVICE SYSTEMS: Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

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Appendix C Concurrrence Letter and Supplemental information of Section 4(f) and de minimis Impacts to Section 4(f) Resources

County of Santa Clara
Parks and Recreation Department

298 Garden Hill Drive
Los Gatos, California 95032-7669
(408) 355-2200 FAX 355-2290
Reservations (408) 355-2201
www.parkhere.org

August 20, 2010

Subject: Hecker Pass Safety Improvement Project

To: Jared Goldfine, Senior Branch Chief
Office of Environmental Analysis
Caltrans
P.O. Box 23660
Oakland, CA 94623

Dear Mr. Goldfine,

The County of Santa Clara Parks and Recreation Department (Department) reviewed the Draft Environmental Impact Report (DEIR) for the proposed road widening project on Highway 152 adjacent to Mount Madonna County Park. It is understood that the project will require that Caltrans use 0.55 acres of County parkland in order to construct retaining walls. Per section 4(f) of the Department of Transportation Act of 1966, Caltrans has determined that the use of this land is considered a de minimis impact to the park.

As previously stated, the County, in partnership with the Bay Area Ridge Trail Council, plans a future trail crossing across Highway 152 in the general vicinity of the proposed project. The Department has evaluated the proposed project and its effect on the County's resource and determined that, while the project will curtail the County's flexibility in establishing a future trail crossing, the project's effect on the County's park resource, as it is currently developed and configured, is likely de minimis, and staff will make that recommendation to the County of Santa Clara Board of Supervisors.

Please contact me at the above address if you have any questions.

Sincerely,

Julie Mark, Acting Director

C: Tim Heffington, Senior Real Estate Agent / Ian Champeny, Associate Real Estate Agent
Katherine Harasz, Deputy County Counsel
James O'Connor, Deputy Director

Section 4(f), of the US Department of Transportation Act of 1966, states that the Federal Highway Administration "…may approve a transportation program or project…requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if…there is no prudent and feasible alternative to using that land; and…the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." (49 U.S.C. 303[c])

A "use" of a Section 4(f) resource, as defined in "Title 23, Code of Federal Regulations, Part 771.135(p)," occurs: 1) when land is permanently incorporated into a transportation facility; 2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes; or 3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a Section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

a) the projected noise level increase, attributable to the project, substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f);

b) the proximity of the project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of such an effect would be the location of a transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a park or historic site which derives its value in substantial part due to its setting; and/or

c) the project results in a restriction on access, which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

The Federal Highway Administration (FHWA) issued guidance on December 13, 2005, for determining de minimis impacts on Section 4(f) resources. This guidance came from an amendment of existing Section 4(f) legislation through adoption of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)2 to simplify the processing and approval of projects that have only de minimis impacts on lands protected by Section 4(f). This is the first substantive revision of Section 4(f) legislation since passage of the U.S. Department of Transportation Act of 1966. This revision of Section 4(f) legislation provides that once FHWA determines that a transportation use of Section 4(f) property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a de minimis impact on that property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete. In other words, although some impacts may be unavoidable (and would be minimized or mitigated), avoidance alternatives would not need to be developed if a de minimis impact determination is made.

De minimis impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not adversely affect the activities, features, and attributes of

the 4(f) resource. The official(s) with jurisdiction over the property must provide written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under 4(f), and the public must be afforded the opportunity to review and comment on the effects of the project on the identified 4(f) resource(s).

De minimis impacts on historic sites are defined as the determination of either "no adverse effect" or "no historic properties impacted" in compliance with Section 106 regulations, including SHPO's written concurrence and ACHP's written concurrence, when applicable. When a Programmatic Agreement is in place for Section 106, the Department must inform the SHPO in writing that a non-response for the purposes of a "no adverse affect" or a "no historic properties affected" determination will be treated as the written concurrence for the *de minimis* determination; to streamline the process this may be combined with the Section 106 PA notification letter to SHPO regarding the finding of effect.

The Rofinella Winery, discussed in Section 2.1.5.3 of this document, is not eligible for inclusion in the National Register of Historic Places. As such, it it not subject to Section 106 regulations, and no concurrence of “no adverse effect” or “no historic properties affected” would be secured from SHPO or ACHP. In instances where a historic site is not eligible for inclusion in the National Register of Historic Places, but is determined by the Department as assigned by FHWA to be a Section 4(f) resource, the determination of a *de minimis* impact to a Section 4(f) resource would be made by the Department.

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Appendix D Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
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Flex your power!
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August 25, 2009

TITLE VI
POLICY STATEMENT

The California State Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

RANDELL H. IWASAKI
Director

"Caltrans improves mobility across California"

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Appendix E Glossary of Acronyms and Technical Terms

AB	California State Assembly Bill
ACOE	U.S. Army Corps of Engineers
ADL	aerially deposited lead
APE	area of potential effect
BMP	best management practice
BT&H	Business, Transportation, and Housing
CAA	Clean Air Act, as amended in 1990
CalEPA	California Environmental Protection Agency
Cal IPC	California Invasive Plant Council
CARB	California Air Resources Board
CCA	cross-centerline accident
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (aka “Superfund”)
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CO_2	carbon dioxide
CRZ	Clear Recovery Zone
dbh	diameter at breast height
Department	California Department of Transportation
EA	environmental assessment
EIR	environmental impact report
EIS	environmental impact statement
EO	Executive Order
EPA	Environmental Protection Agency

ESA	environmentally sensitive area
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
ft	foot/feet
GHG	greenhouse gas
HCP/NCCP	Habitat Conservation Plan/Natural Communities Conservation Plan
HFC-23	fluoroform
HFC-134a	s, s, s, 2 –tetrafluoroethane
HFC-152a	difluoroethane
HSA	hydrologic sub-area(s)
in	inch(es)
IPCC	Intergovernmental Panel on Climate Change
ISA	Initial Site Assessment
MBTA	Migratory Bird Treaty Act
MCE	maximum credible earthquake
MLD	most likely descendent
mpg	miles per gallon
Mt.	Mount
MTC	Metropolitan Transportation Commission
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OWTS	onsite treatment system(s)

PM	post mile
PRC	Public Resources Code
project	proposed federal action
RCRA	Resource Conservation and Recovery Act of 1976
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
SR	State Route
Sta	station
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resource Control Board
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TSM	Transportation System Management
U.S.	United States
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service

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Appendix F Minimization and/or Mitigation Summary

This appendix summarizes the minimization and/or mitigation measures discussed in Chapter 2.

Visual Resources

Locations 1, 2, and 3

To address the potential impacts of tree removal at these locations, the following tree replacement and revegetation measures are recommended:

- Minimizing existing tree and forest removal to the greatest possible extent. The limit of work shall be kept to the minimum possible footprint, not to exceed 5 feet (ft) from the edge of the retaining wall. Priority shall be placed on preserving existing trees nearest the wall, in order to preserve views of the forest edge from the road to the greatest extent feasible.
- Tree replacement planting shall be implemented if appropriate to mitigate for major loss of tree canopy, as determined by the project landscape architect.

To address the potential impacts of visual intrusion from the new retaining walls, the following mitigation measures are recommended:

- Minimizing overall wall height to the greatest extent feasible.
- Using context-sensitive wall texture and color treatment, in consultation with local agencies, to reduce visual contrast and enhance compatibility of visual character to the greatest extent feasible.
- Staining of bottom, safety-barrier portion of walls to reduce overall color contrast and visual intrusion.
- If feasible, walls shall be gutterless and without chain-link safety fence in order to reduce visual contrast.
- Wherever feasible and consistent with safety, the use of crash cushions at retaining walls shall be avoided to reduce the visual contrast with the natural environment.

Location 4

All avoidance, minimization, and mitigation measures that apply to Locations 1, 2, and 3 also apply to Location 4. In addition to those measures, the following measures also apply to Location 4:

- To minimize the long-term visual effect of tree removal for Wall 4E as seen from both inside and outside of the park, tree replacement and other supplemental native vegetation planting will be implemented where feasible adjacent to Wall 4E.
- To minimize the contrast in visual character and decline in visual quality as a result of Wall 4E as seen by park visitors, Mitigation Measures VM-2 shall be applied to Wall 4E, including context-sensitive wall color and texture treatment. Color shall be dark to minimize contrast and reflectivity; texture treatment such as stacked stone, carved rock or other similar treatment shall be used to articulate the wall surface and provide a more naturalistic, context-compatible visual character.

Location 5

- Minimization of existing tree removal to the greatest possible extent. The limit of work shall be kept to the minimum possible footprint.
- Where feasible, tree replacement planting shall be implemented to replace the lost tree screening and 'allee' pattern at the roadside.

Light and Glare

- Construction activities shall limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Construction impacts

- Unsightly material and equipment storage and staging shall not be visible within the foreground of the highway corridor to the extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and to nearby sensitive off-road receptors.
- Construction, staging, and storage areas shall be screened by visually opaque screening wherever they will be exposed to public view for extended periods of time.
- Construction activities shall be phased to minimize the duration of disturbance to the shortest feasible time.
- All areas disturbed by construction, staging, and storage shall be revegetated.
- Construction activities adjacent to residences shall limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Cultural Resources

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the Department District 4 Environmental Branch Office of Cultural Resources Studies so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.
- During coordination with Native American groups, a Native American cultural resources monitor was requested. The Department will determine if a Native American cultural resources monitor is required during the design phase of the project based on specific construction activities that are anticipated.

Water Quality and Storm Water Runoff

Section 401 of the Clean Water Act

- Section 401 certification will be required for this project. Early discussion will be initiated regarding the handling and disposal of water during the design phase. The groundwater will be tested for potential contamination as a part of the Hazardous Waste Site Investigation. Proper handling and disposal of the groundwater will be based on the levels of contaminants reported in the Site Investigation Report.

Section 402 of the Clean Water Act

- According to Caltrans NPDES permit and the Construction General Permit, BMPs will be incorporated to reduce the discharge of pollutants during construction as well as permanently to the Maximum Extent Practicable (MEP). These BMPs fall into three categories, Temporary Construction Site BMPs, Permanent Design Pollution Prevention BMPs, and Permanent Treatment BMPs.

Construction Site BMPs

- Construction Site BMPs are implemented during construction activities to reduce pollutants in storm water discharges throughout construction. Temporary silt fence, concrete washout, stockpile cover, stabilized construction entrance/exit and temporary soil stabilizers are some of the temporary erosion and water pollution control measures that may be used in combination to prevent and minimize soil erosion and sediment discharges during construction. Given that the anticipated soil disturbance will be greater than 0.4 hectare (1 acre), a Storm Water Pollution Prevention Plan (SWPPP) will be developed during construction. This dynamic document addresses the deployment of various erosion and water pollution control measures that are required commensurate to changing construction activities.

Permanent Design Pollution Prevention BMPs

- Design Pollution Prevention BMPs are permanent measures to improve storm water quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Erosion control measures will be provided on all disturbed areas to the extent feasible. These measures will use a combination of source and sediment control measures to prevent and minimize erosion from soil disturbed areas. Source controls can use erosion control netting in combination with hydroseeding.

- The biodegradable netting is effective in providing good initial mechanical protection while seed applied during the hydroseeding operation germinates and establishes itself. Other forms of source control such as tacked straw may also be used when applicable. Sediment controls such as biodegradable fiber rolls can be used to retain sediments and to help control runoff from disturbed slope areas. These measures will be investigated during the design phase.

- Outlet protection and velocity dissipation devices placed at the downstream end of culverts and channels are also Design Pollution Prevention BMPs that reduce runoff velocity and control erosion and scour. The need of these devices for this project will also be further investigated during the design phase.

- Generally, as velocities and volume of flow increases, so could the sediment loading. Effects to downstream flow will be further investigated during the design phase and the use of appropriate Design Pollution Prevention BMPs to address this concern will be considered.

Permanent Treatment BMPs

- This project will be required to incorporate treatment BMPs. Treatment BMPs are permanent devices and facilities treating storm water runoff. The Department-approved Treatment BMPs are: biofiltration swales, infiltration basins, detention basins, traction sand traps, dry weather flow diversions, media filters, gross solids removal devices (GSRDs), multi-chamber treatment trains, and wet basins.

Geology/Soils/Seismic/Topography

- The field exploration and investigation of this project will include borings. Laboratory tests may include corrosion, moisture content, density, plasticity index, graduation, consolidation, and triaxial tests. Vertical and horizontal borings will be advanced at all sites where fill or walls are proposed. Horizontal borings are recommended at all soil nail wall locations to determine whether the contractor will have to case the holes for the soil nails.

- The soil nail walls and retaining wall at Location 4 may require a fault study, which will likely include trenching to verify the exact location of the Sargent and Castro Faults that cross the project area limit. The strike of the fault is a design parameter for soil nail wall design. These studies will help ensure that the proposed retaining walls will be appropriately designed for the site conditions, pursuant to the requirements of latest uniform Building Code.

- Mitigation for the potential reactivation of the landslides and rock fall sites referred to in Table 2.2-1 may include avoidance, different wall type, installation of rock nets and minimizing cut slopes to a maximum of 2:1.

Hazardous Waste/Materials

- Additional review of the data analyzed in the ISA will be performed before ground-disturbing activities begin, to ensure that the potential hazardous materials site will not have an adverse impact on the proposed project.

- There is a potential for residual ADL in the surface soil. Testing for ADL will be performed during the final design stage. If ADL is found, special handling of the contaminated soil will be required and will include implementing a health and safety plan. If construction encounters soil contamination, all activities involving contaminated soil or groundwater will be planned to comply with regulatory agency requirements.

- Existing yellow roadway striping that will be impacted will be tested for lead-based paint. If present, lead-based paint will be handled and disposed of to comply with regulatory agency requirements.

Natural Communities

- General avoidance and minimization efforts will be incorporated into the design and implemented to reduce potential impacts to natural communities and plant and animal species. These measures will include minimizing the project footprint, providing environmental education for the construction crew, delineating the work area and all environmentally sensitive areas with fencing, requiring that an onsite biological monitor be present during activities that may impact sensitive biological resources. No compensatory mitigation is required for impacts to the communities.

- Replacement trees will be planted at a ratio of 3:1 for all native trees, and trees located within the riparian zone within California Department of Fish and Game jurisdiction with a dbh of 6 inches or greater. All other trees will be replaced at a 1:1 ratio. Trees will be planted onsite in the project area to the extent possible, after the completion of roadway construction. Offsite planting areas will be sought only if onsite mitigation is not possible.

- The Department will limit construction activities to the smallest area possible to complete the work in an effort to minimize impacts to the existing riverine habitat in Bodfish Creek. A Department biologist will clearly delineate this limited construction area for incorporation in the project plans and specifications. The Department will use environmentally sensitive area (ESA) fencing to delineate protected areas and to confine workers and equipment to the designated construction areas. The ESA fencing will preclude access to the stream channel and riparian habitat along Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek, except as necessary for construction access.

- Potential instream impacts to Bodfish Creek, the unnamed tributary to Bodfish Creek, and Blackhawk Creek aquatic resources and fisheries will be minimized by adhering to State Standard Specifications for avoidance of water pollution (Section 7-1.01g) and by implementing best management practices (BMPs). These measures include detailed recommendations for keeping heavy machinery out of the water, limiting the amount of material (excavated or construction materials) that enter the streams, and maintaining flows at all times. The State Standard Specifications require the contractor to prepare a plan to control water pollution during construction.

- All temporary impacts will be restored to pre-construction conditions. Compensatory mitigation for permanent impacts to waters of the U.S. will not likely be required by the Corps of Engineers; however, mitigation may be required by the RWQCB for waters of the State.

Animal Species

- A qualified biologist will survey the work site in the vicinity of Location 4, no more than 48 hours before start-of-work activities begin, for signs of western pond turtles and/or western pond turtle nesting activity (i.e., recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Preconstruction surveys to detect western pond turtles will focus on suitable aerial and aquatic basking habitat such as logs, branches, rootwads, and rip-rap, as well as the shoreline and adjacent warm, shallow waters where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Preconstruction surveys to detect western pond turtle nesting activity will be concentrated within approximately 1,300 ft of suitable aquatic habitat and will focus on areas along south- or west-facing slopes with bare hard-packed clay or silt soils or a sparse vegetation of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist will contact CDFG to determine whether relocation and/or exclusion buffers are appropriate. If CDFG approves of moving the animal, the biologist shall be allowed sufficient time to move the western pond turtle(s) from the work site before work activities begin.

- Preconstruction bird surveys will be conducted by a qualified biologist no more than 2 weeks before construction begins for activities occurring during the breeding season (February 1 to

August 31) or during the wintering period (September 1 to January 31) for sensitive wintering species.

- If active nests of special-status bird species are found in the vicinity of the limits of grading or construction work, within 100 ft of passerine nests or within 300 ft of raptor nests, a non-disturbance buffer will be established at a distance sufficient to minimize nest/roost disturbance based on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential disturbance. Buffer size will be determined in cooperation with CDFG and USFWS.

- If rescheduling work around active nests/roosts of special-status bird species is infeasible, a qualified biologist will monitor nests for signs of disturbance. If it is determined that project activities are resulting in nest/roost disturbance, work will cease immediately, and the CDFG and the USFWS will be contacted for guidance.

- Within 30 days before construction begins, burrowing owl preconstruction surveys will be conducted at Location 5 of the project area by a qualified biologist in accordance with CDFG's Staff Report on Burrowing Owl Mitigation (CDFG 1995) and the California Burrowing Owl Consortium's Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1993). Preconstruction surveys, consisting of winter season surveys (between December 1 and January 31) and nesting season surveys (between April 15 and July 15), will be conducted for Location 5 of the project area and within a 500 ft buffer where possible to identify and map active burrowing owl burrows. Surveys will consist of walking transects of no more than 100 ft apart.

- Occupied burrows will not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFG verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

- If burrowing owls are detected in the project footprint or within 500 ft of the project footprint, a non-disturbance buffer will be established within a 160-ft radius surrounding occupied burrows during the nonbreeding season (September 1 through January 31) or within a 250-ft radius surrounding occupied burrows during the breeding season of February 1 through August 31.

- If avoidance is not feasible and owls must be moved away from the disturbance area, one of the two following passive relocation techniques will be used rather than trapping. At least 1 full week will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

  Passive Relocation – With One-Way Doors. Owls will be excluded from burrows in the immediate impact zone and within a 160-ft buffer zone by installing one-way doors in burrow entrances to allow the birds to leave the burrow, but not return. One-way doors (e.g., modified dryer vents) will be left in place 48 hours to ensure owls have left the burrow before excavation. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily for 1 week to confirm owl use of burrows before excavating burrows in the immediate

impact zone. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

Passive Relocation – Without One-Way Doors. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows may then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

- Several months in advance of construction activities, surveys will be conducted in all forested areas in the project footprint to locate active woodrat nests.
- If active woodrat stick nests are found within the project footprint area at the time of construction, relocation measures, developed in conjunction with CDFG, will be implemented to ensure that the project footprint is clear of woodrat nests before construction begins.

Threatened and Endangered Species

California Red-Legged Frog

- Seasonal Avoidance: To the extent practicable, construction will not occur during the wet season, when California red-legged frogs are more likely to disperse through upland habitats. Work within all waters, wetlands, and the riparian corridor will be limited to the period from April 15 to October 15, with the exception of vegetation clearing. Vegetation clearing may be done outside of this period, if necessary, to avoid disturbance to nesting birds.
- Preconstruction Surveys: A qualified biologist will conduct a California red-legged frog preconstruction survey of the work site 2 weeks before start-of-work activities begin, including vegetation clearing, grubbing, or other ground disturbance activities. If California red-legged frog adults, tadpoles, or eggs are found, the biologist will contact the USFWS and CDFG to determine whether relocating the species is appropriate. If the agencies approve of relocation, a USFWS-approved biologist will be allowed sufficient time to move the species from the work site before work activities begin. Only USFWS-approved biologists will participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.
- Construction Area Delineation: Before any ground disturbance occurs on the project site, the boundaries of the project area will be clearly delineated with orange plastic high-visibility construction fencing (ESA fencing) or solid barriers to prevent workers or equipment from inadvertently straying from the project area.
- Wildlife Exclusion Fencing: Exclusion fencing will be erected along each section of the project area before project activities begin, including staging equipment and supplies. Fencing will be a minimum of 3 ft high and buried in the soil or form a tight seal with the pavement to prevent California red-legged frog from crawling under and entering the project area.

- Procedure for California Red-Legged Frog Discovery Onsite: If a California red-legged frog, or any amphibian that construction personnel believe may be this species, is encountered during project construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:
  - All work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease.
  - The resident engineer will be immediately notified.
  - The resident engineer will notify the approved onsite biologist.
  - In case a non-injurious encounter occurs, the approved onsite biologist will transport the California red-legged frog immediately in a cool, moist container to a suitable location outside the project area (e.g., suitable habitat elsewhere in the Bodfish Creek watershed). This relocation site will be determined in advance by a qualified biologist in consultation with the USFWS and CDFG. The relocated individual(s) will be monitored until it is determined that the animal(s) are not imperiled by predators or other dangers.
  - The approved onsite biologist will notify the USFWS within 24 hours after California red-legged frog(s) have been relocated.
  - If a California red-legged frog has been killed or injured, the biologist will contact the USFWS and CDFG within 24 hours.
- Entrapment Avoidance: To prevent inadvertent entrapment of California red-legged frog or other animals during construction, all excavated, steep-walled holes or trenches more than 2 ft deep will be covered with plywood or similar materials at the end of each working day, or the holes or trenches will contain one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If, at any time, a trapped California red-legged frog (or other wildlife) is discovered, USFWS and CDFG will be contacted.
- Prohibition of Erosion Control Materials Potentially Harmful to California Red-Legged Frog: Plastic monofilament netting (erosion control matting) or similar material will not be used at the project site because California red-legged frog may become entangled and trapped in it. Tightly woven fiber netting or similar material will be used for erosion control or other purposes.
- Prevention of Introduction of Amphibian Diseases: Biologists will take all precautions to prevent spread of amphibian diseases when handling the listed species. All equipment and clothing will be disinfected per protocol standards.
- Regular Work Area Surveys: The biological monitor will conduct frequent surveys along the work area boundaries and will notify the USFWS-approved biologist if a California red-legged frog is found within the work area.
- Because California red-legged frog could be present throughout the project limits, temporarily or permanently impacted habitat, excluding existing hardscape features such as the roadway or road shoulder, will be mitigated by habitat restoration/replacement. Approximately 6.32 acres of permanent upland dispersal and aestivation habitat loss will be

mitigated at a 3:1 ratio resulting in 18.96 acres of mitigation for California red-legged frog upland dispersal and aestivation habitat. Temporary impacts will be mitigated at a 1.1:1 ratio, for a total of 0.84 acre. Of this, 0.76 acre will be onsite, in-kind restoration. Total mitigation (for both temporary and permanent loss) will be 19.80 acres.

California Tiger Salamander

- If California tiger salamander adults or juveniles are found, all work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease. The biological monitor will contact the USFWS and CDFG to determine whether relocating the species is appropriate. If the agencies approve of relocation, a USFWS-approved biologist will be allowed sufficient time to move the species from the work site before work activities begin. Only USFWS-approved biologists may participate in activities associated with the capture, handling, and monitoring of California tiger salamander.

- Temporarily or permanently impacted habitat, excluding existing hardscape features such as the roadway or road shoulder, will be mitigated by habitat restoration/replacement. Approximately 2.3 acres of permanent upland dispersal and aestivation habitat loss will be mitigated at a 3:1 ratio, resulting in 6.9 acres of mitigation for California tiger salamander upland dispersal and aestivation habitat. Temporary impacts of 0.67 acre will be mitigated at a 1.1:1 ratio, for a total of 0.74 acre. Of this, 0.67 acre will be restored onsite. Total mitigation (for both temporary and permanent loss) will be 7.64 acres.

Invasive Species

In compliance with the Executive Order on Invasive Species, E.O. 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

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Appendix G List of Technical Studies

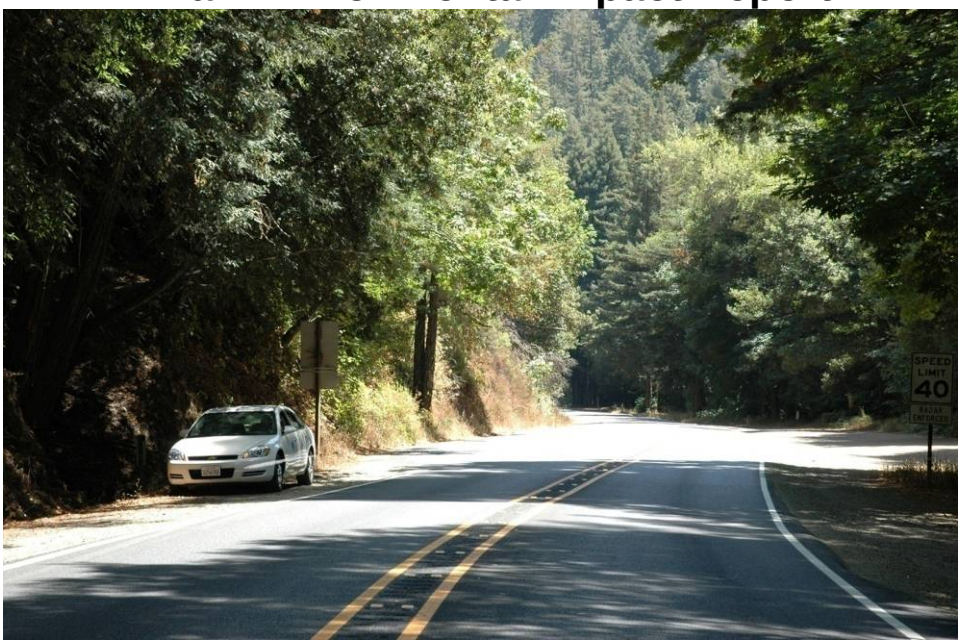
The following technical studies were prepared to support this environmental document:

- Archaeological Survey Report, April 2009
- Biological Assessment, June 2009
- Historic Property Survey Report, May 2009
- Storm Water Data Report, February 2009
- Natural Environment Study, January 2010
- Visual Impact Assessment, September 2009
- Water Quality Report, August 2008
- Preliminary Geotechnical Report
- Initial Site Assessment, August 2009

Hecker Pass Safety Improvement Project

SANTA CLARA COUNTY, CALIFORNIA
DISTRICT 4 – SCL – 152, (PM 0.14/5.20)
EA 2A2500/EFIS 0400000813

Addendum to the
Final Environmental Impact Report



Prepared by the
State of California Department of Transportation

March 2013

04-SCL-152-PM 0.14/5.2
SCH#2009042029
EA 2A2500/EFIS 0400000813

Construct safety improvements along State Route 152, from the Santa Cruz County line, to just west of the Gilroy city limits (post mile 0.14 to post mile 5.20).

ADDENDUM TO THE FINAL ENVIRONMENTAL IMPACT REPORT

Submitted Pursuant to: (State) Division 13, California Public Resources Code

THE STATE OF CALIFORNIA
Department of Transportation

04-26-2013
Date of Approval

Stefan Galvez-Abadia
Chief, Office of Environmental Analysis
California Department of Transportation
CEQA Lead Agency

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1. EXECUTIVE SUMMARY **1**

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1. EXECUTIVE SUMMARY

The California Department of Transportation (Caltrans) is proposing to enhance safety at five locations within the section of State Route (SR) 152 in Santa Clara County from just east of Pole Line Road to Watsonville Road. See Figures 1 and 2 for maps of the project vicinity and location. Improvements include widening existing lanes and shoulders, improving curves, and adding a left-turn lane from eastbound SR 152 to Watsonville Road. In addition, retaining walls would be constructed at four of the locations to minimize right-of-way requirements and thereby limit impacts to the surrounding environment.

Detailed information about this safety project was provided in the Draft Environmental Impact Report (EIR)/Environmental Assessment, which was circulated to the public from March 10, 2010 to April 26, 2010. A Final EIR/Finding of No Significant Impact (FONSI) was completed in November 2010. The EIR was prepared to comply with the California Environmental Quality Act (CEQA) and the EA and FONSI were prepared to comply with the National Environmental Policy Act (NEPA).

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, a “lower level” document is often prepared for NEPA. One of the most commonly seen joint document types is an EIR/EA. Because of changes to the project, additional documentation was needed to maintain the validity of the EA, but a new or higher level document was not required. Therefore, a reevaluation was prepared separately to comply with NEPA. As part of this process, a Section 4(f) De Minimis Finding for impacts to Mount Madonna County Park was circulated to the public and the Santa Clara County Parks and Recreation Department concurred by letter with the finding. The Section 4(f) De Minimis Finding, which includes the concurrence letter, is available at www.dot.ca.gov/dist4/envdocs.htm.

This document is an addendum to the Final Environmental Impact Report (FEIR) and was prepared by Caltrans to comply with CEQA. Additional environmental studies were conducted for this addendum because of changes to the project description.

This addendum is necessary to update the project description, effects of the project and avoidance, minimization and mitigation measures. An addendum is being prepared instead of a supplemental or subsequent EIR because no new or substantially more severe significant effects will result from the modified project design, as explained below and in Section 4. While the project design has been modified since the FEIR was completed, it has not changed enough to warrant a revised Project Report.

The proposed project changes would represent a minor change in potential visual effects at Locations 1, 2, 3, and 4 (see Figure 2) based on changes to the overall dimensions of proposed retaining walls, addition of end treatments to retaining walls, and increased right-of-way acquisitions and tree removal. Because overall wall length at Location 3 would be substantially shorter than previously proposed, impacts at Location 3 would be reduced to less-than-significant. Impacts at Locations 1, 2, and 4 would remain significant even with proposed avoidance, minimization and mitigation measures. Adverse visual effects of tree removal and increased right-of-way acquisitions would increase at Location 5 (see Figure 2). However, the

proposed changes would not alter the overall impact conclusion of the original State Route 152 Safety Improvement Project's Visual Impact Assessment for this location, which identified significant impacts that could not be avoided, minimized, or mitigated below a level of significance.

Changes to the project will also affect biological resources and a historic property found to be eligible under Criteria 1 of the California Register of Historic Resources on the local level. The revised cultural impacts are described in Section 4.4. In 2009, Caltrans determined a "finding of no impact" for the historic property. Based on design changes, the new determination is that the project will have a "less than significant" impact on the historic property. The finding for all other cultural resources remains "no impact" under CEQA.

The significance determinations for biological impacts remain the same as those reported in the CEQA Checklist section of the 2010 FEIR/EA. Please see Section 4.5 for a description of the revised impacts and avoidance, minimization and mitigation measures for biological resources.

Other resources affected by changes to the project are Parks and Recreational Facilities, Farmland and Paleontology. The total area of impacts on Mount Madonna County Park has increased from .55 acres to 2.6 acres. Additional mitigation measures are discussed in Section 4.1. The amount of farmland being acquired has increased slightly and is discussed in Section 4.2. Paleontology is discussed in Section 4.6. In the CEQA Checklist of the 2010 FEIR/EA, impacts to paleontological resources were marked as "no impact." A recent Paleontological Identification Report (PIR), however, indicates that paleontological resources may be present in the project area. Based on the PIR, a new determination has been made that if paleontological resources are uncovered, the impacts would be "less than significant with mitigation."

This addendum describes the revised impacts and mitigation measures, where applicable, for visual/aesthetic resources, parks and recreational facilities, farmland, and cultural, biological and paleontology resources. All other impacts and avoidance, minimization and mitigation measures are disclosed in the FEIR/EA. Based on this addendum, only one item has changed on the CEQA Checklist in Appendix B of the FEIR/EA. As stated above, Section V (a), concerning impacts to historical resources, has changed from "no impact" to "less than significant impact." See Section 4.4 for an analysis of this change. The FEIR/EA is available online at www.dot.ca.gov/dist4/envdocs.htm.

2. PROJECT PURPOSE AND NEED

The purpose and need of the project, provided in Section 1.2 of the FEIR/EA, is included below to help the reader review this addendum.

2.1 PROJECT PURPOSE

The purpose of the project is to reduce the number of cross-centerline and run-off-the-road accidents along this SR 152 corridor.

2.2 PROJECT NEED

Within the project limits, SR 152 is a two-lane undivided conventional east-west highway, located within a rural setting of Santa Clara County. The existing highway consists of two 12-

foot-wide opposing traffic lanes with outside paved shoulders that vary from less than 1 foot to more than 8 feet in width.

Roadway Deficiencies

SR 152 within the project limits is in a heavily forested area of rural Santa Clara County. The existing alignment has sharp turns, narrow shoulders in many locations, and steep embankments and vegetation adjacent to the shoulders of the roadway. Truck-trailers over 45 feet long have been banned from SR 152 between Watsonville and Gilroy since 1986, based on, among other factors, the limited roadway width, winding alignment of the highway, and the number of truck-involved accidents[1]. Adding to the available pullout areas would increase refuge opportunities for disabled vehicles. The inability of emergency response vehicles to use shoulders and bypass stalled traffic to reach disabled vehicles delays their response time.

Improving safety along the present location of the highway cannot be accomplished without removal of vegetation, additional side-slope grading, and construction of retaining walls and other slope stability measures.

A "clear recovery zone" would be added depending on the conditions along each of the five identified sections of SR 152 within the project limits. The clear recovery zone is provided as a recovery area when errant vehicles leave the traveled way, offering the motorist the opportunity to regain control. A typical clear recovery zone, 20 feet wide on a conventional highway, is an area cleared of fixed objects adjacent to the roadway including trees, utility poles, and signs.

State Route 152/Watsonville Intersection at Location 5

There is no left-turn lane pocket at the SR 152/Watsonville Road intersection, so eastbound vehicles back up in the highway lane if a car is waiting to make a left turn onto northbound Watsonville Road. Vehicles wanting to make a left turn can increase the potential for conflicts that may result in cross-centerline accidents.

Traffic and Accident Data

A number of accidents on this segment of the highway have involved vehicles that cross the roadway centerline. Caltrans developed a list in 2004 of candidate major collision-reduction projects to the Headquarters of Traffic Safety program coordinator based on results from the Two- and Three-Lane Safety Monitoring program. Because a high number of cross-centerline accidents occurred within this portion of SR 152 during the study period, the Project was submitted and the District's recommendation was approved by District Headquarters on June 21, 2004.

The average annual daily traffic along this segment of SR 152 as of 2008 is 5,900 vehicles, and is expected to increase to 9,500 vehicles in 20 years, by 2028. An 8-year study period between October 1, 2000, and September 30, 2008, generated detailed information about the number, type, frequency, and causes of accidents along this section of SR 152. The average number of accidents along the study corridor was 1.91 per million vehicles, which was higher than the statewide average of 1.49 per million vehicles.

The study found that 29 of the 176 accidents involved vehicles that crossed the centerline. Constructing the improvements proposed as part of this project would create an upgraded

[1] Department of Transportation, special truck restriction history (http://www.dot.ca.gov/hq/traffops/trucks/routes/restrict-hist-152.htm)

roadway that would be better able to assist out-of-control motorists from crossing the centerline and would reduce cross-centerline accidents.

3. PROJECT DESCRIPTION

There have been changes to the project description since the FEIR/EA was completed in 2010. The information below describes the project and points out where changes have been made. Maps showing details for each location are also included in Appendix A. Following the FEIR/EA, Caltrans selected the Build Alternative as the Preferred Alternative. The discussion in this document is consistent with that decision.

The project is located on a section of State Route (SR) 152 that crosses the Santa Cruz Mountain Range in western Santa Clara County, which is known as Hecker Pass. It links Watsonville and SR 1 to the west with Gilroy and SR 101 to the east. See Figure 1. The proposed project would improve safety and prevent cross-centerline accidents by making the following improvements at five separate locations (See Figure 2) between postmile 0.1 and postmile 5.2:

- Improving and widening existing lanes and adding 8-foot shoulders.
- Overlaying and replacing part of the existing pavement to improve the roadway's superelevation. Superelevation is the banking or tilt of the roadway along a curve so motorists can safely maneuver the curve at reasonable speeds.
- Removing fixed objects such as poles and trees near the roadway to both improve visibility and create a "clear recovery zone" that allows drivers who go off the shoulder enough space to recover control of the car.
- Installing 10 retaining walls to prevent hillsides from slipping (Locations 1 – 4)
- Installing a left-hand turn lane from eastbound SR 152 to Watsonville Road (Location 5)
- Modifying and replacing existing drainage structures and systems
- Installing permanent warning signs.

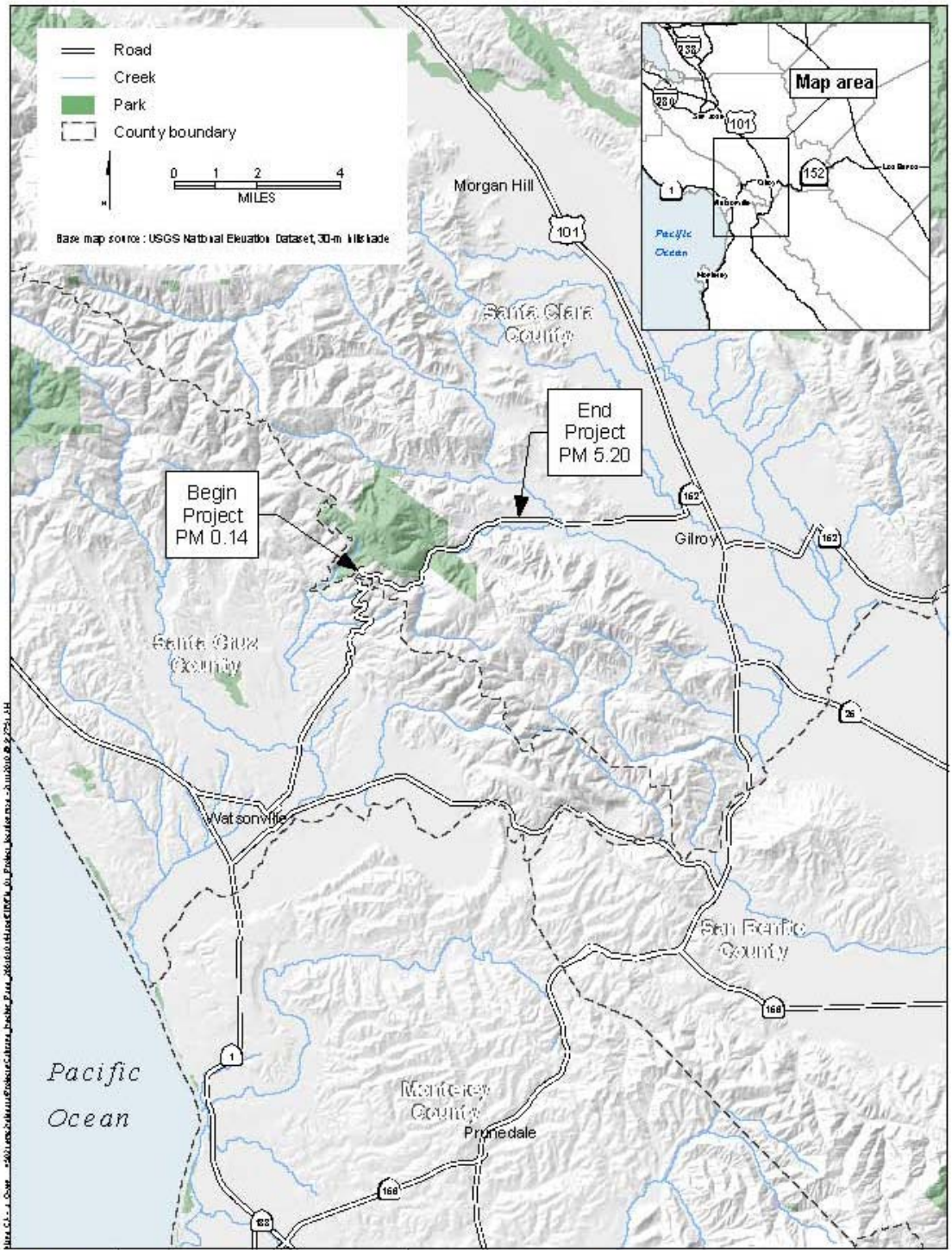

Figure 1: Project Vicinity Map

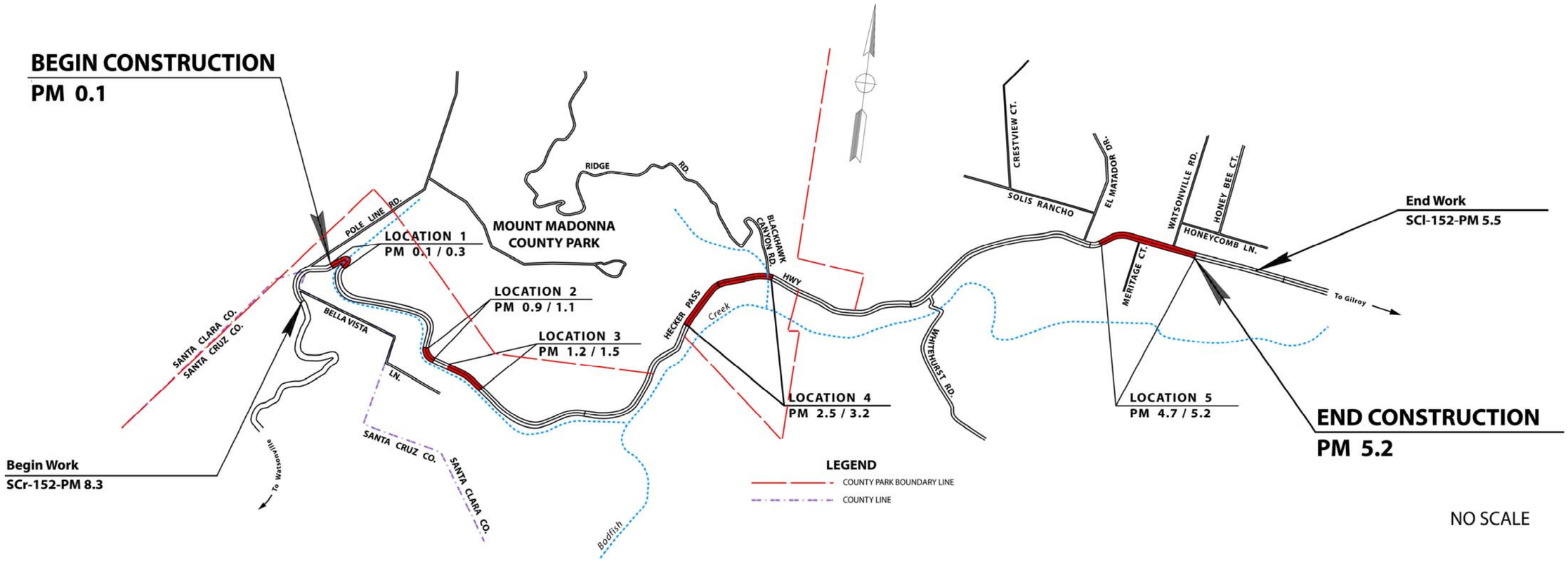

Figure 2: Project Location Map

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3.1 COMMON DESIGN CHANGES AT ALL LOCATIONS

Common design changes for all of the locations include the following:

- End treatments have been added to retaining walls to prevent drivers from crashing into the wall. The end treatments will be stained to blend into the natural appearance of the walls. (Locations 1 – 4)
- Black vinyl cable railing has been added at the top of retaining walls. (Locations 1 – 4)
- Additional drainage elements have been added as described under the description for each location below.

3.2 UNIQUE DESIGN CHANGES AT EACH LOCATION

Design changes specific to each location are described in the following sections. Please note that wall heights and lengths are approximate. Right-of-way measurements include permanent acquisitions as well as temporary construction easements at Locations 1, 3 and 5, underground easements for soil nails at Locations 1 through 4 and public utility easements at Location 5.

3.2.1 LOCATION 1 – Project Description and Changes

Location 1 extends from postmile 0.1 to postmile 0.3. The existing roadway configuration at Location 1 includes two 12-foot travel lanes with shoulders varying between 0 and 10 feet. This location also includes three existing culverts: two 18-inch corrugated metal pipes and one 42-inch reinforced concrete pipe. Project changes made at Location 1 since the 2010 FEIR/EA are listed below.

- The two proposed soil nail retaining walls (vertical masonry slab walls attached into the hillside by soil nails) in the westbound direction have changed in size. The maximum height of the first retaining wall was reduced from 17.2 feet to 13.4 feet. The length will be reduced from 256.8 feet to 220 feet, not including the end treatment. The maximum height of the second retaining wall will be reduced from 19.2 feet to 14.7 feet. The length will be increased from 207.1 feet to 221 feet, not including the end treatment.
- The amount of right of way needed has increased to approximately 0.5 acre, which will be acquired from both sides of the road. The original description called for acquiring 0.12 acre on the westbound side of the roadway only.
- Install new culverts and inlets along the retaining walls. Add rock slope protection at the outlets of two culverts to slow down the rate of drainage and prevent erosion. On the eastbound side, add a grated line drain and bioswale (vegetated channel) to filter storm water runoff. Modify the existing culverts that cross SR 152 to accommodate the widened roadway.

3.2.2 LOCATION 2 – Project Description and Changes

Location 2 extends from postmile 0.9 to postmile 1.1. The existing infrastructure at this location includes two 12-foot travel lanes with no road shoulders. Location 2 also includes one existing 18-inch corrugated metal pipe culvert and one existing 24-inch corrugated metal pipe culvert. Project changes made at Location 2 since the 2010 FEIR/EA are listed below.

- The proposed soil nail retaining wall on the westbound side has changed in size. The approximate maximum height of this wall has been increased from 29 feet to 32.6 feet. The

approximate length has been increased from 430.6 feet to 566 feet, not including the end treatment.

- The amount of right of way needed has changed to approximately 0.9 acre, which will be acquired from both sides of the road. The original description called for acquiring approximately 0.05 acre on the northern side of the roadway only.
- Add additional culverts and drainage inlets along the retaining wall on the westbound side. The existing culvert that crosses SR 152 will be extended by 5 feet to accommodate the widened roadway. The headwall to the east of the retaining wall will be removed and replaced with a 36-inch grated inlet to catch gully runoff.

3.2.3 LOCATION 3 – Project Description and Changes

Location 3 extends from postmile 1.2 to postmile 1.5. The existing infrastructure at Location 3 includes two 12-foot travel lanes with no road shoulders and one 15-foot-wide turnout on the westbound side of the road. This location also includes three existing culverts; a 30-inch, 36-inch, and 18-inch corrugated metal pipe culvert. Project changes made at Location 3 since the 2010 FEIR/EA are listed below.

- The design has changed to construct only one soil nail retaining wall on the westbound side with a maximum height of 14.1 feet. Not including end treatments, the length of this wall will be 272 feet long. Originally, the design at this location called for two soil nail walls. The first wall would have been 11.2 feet high and 167.9 feet long. The second wall would have been 10.2 feet high and 207.8 feet long. A 125-foot-long soldier pile retaining wall on the westbound side has also been removed from the project design.
- Widen the existing roadway to provide 8- to 12-foot-wide shoulders. The original design called for no shoulders to 12-foot-wide shoulders.
- The amount of right of way needed has increased to approximately 1 acre, which will be acquired from both sides of the road. The original description called for acquiring 0.07 acre on the westbound side of the roadway.
- Grade the private driveways to conform to the new alignment of the roadway.
- Remove the existing concrete barrier on the eastbound side.
- Extend the existing culvert that crosses SR 152 west of the retaining wall and replace the inlet. Add an additional culvert and drainage inlets along the retaining wall. Remove the headwall east of the retaining wall and replace it with a grated steel pipe inlet. Extend the existing culvert that crosses SR 152 at the headwall to accommodate the widened road. Modify the cross culvert at the east end of Location 3 to match the roadway and replace the inlet.

3.2.4 LOCATION 4 – Project Description and Changes

Location 4 extends from postmile 2.6 to postmile 3.2. The existing infrastructure at Location 4 includes two 12-foot travel lanes with no road shoulder. Two T-intersections in this location on the northern side of the road provide access to the Sprig Recreation Area of Mount Madonna County Park. This location also includes seven existing culverts; one 21-inch smooth interior plastic pipe/corrugated metal pipe, two 18-inch corrugated metal pipes, three 24-inch corrugated metal pipes, and one 6-foot- by 8-foot-high reinforced concrete box culvert.

- The five proposed soil nail retaining walls on the westbound side have changed in size and one Type 5 retaining wall has been added on the eastbound side. Please see Table 3-1.
- Widen the existing roadway to provide 8-foot-wide shoulders, rather than 15-foot-wide shoulders previously reported in the 2010 FEIR/EA.
- Acquire a total of approximately 4 acres of right-of-way from both sides of the roadway, which includes 2.6 acres of park land and 1.3 acres of underground easements for soil nails. The original description called for acquiring 0.55 acre on the westbound side of the roadway only.
- Extend 7 existing culverts that cross SR 152, replace inlets and add additional inlets to accommodate the widened road and retaining walls. Add new culverts and inlets along the 5 soil nail retaining walls. Remove the headwall at the existing culvert east of the Sprig Recreation Area parking lot and replace it with a grated steel pipe inlet. Remove 2 feet of the culvert that crosses the eastern entrance into the park and replace it with a flared end section.

Table 3-1: Location 4 Retaining Walls

Original Retaining Wall Name	New Retaining Wall Name	Original Maximum Height (feet)*	New Maximum Height (feet)*	Original Length (feet)*	New Length (feet)*
4A	RW 7	31.2	31.8	292.5	315
4B	RW 8	14.2	10.5	57.3	70
4C	RW 9	32.2	30.4	1056.1	1,037
4D	RW 10	23.2	19.3	584.1	568
4E	Removed	5	Removed	205	Removed
4F	RW 11	12	10.6	345	380
Added	RW 166	Added	8	Added	170

*Approximate

3.2.5 LOCATION 5 – Project Description and Changes

Location 5 extends from postmile 4.8 to postmile 5.2. The existing infrastructure at Location 5 includes 12-foot travel lanes and shoulders varying from 2 feet to 8 feet. There is a T intersection on the northern side where Watsonville Road intersects with SR 152, as well as nine commercial and residential driveways in this location. This location also includes three existing culverts; one 32-inch corrugated metal pipe, one 12-inch corrugated metal pipe (driveway) and one 42 x 29-inch corrugated metal pipe arch. Project changes made at Location 5 since the 2010 FEIR/EA are listed below.

- Change the length of a new left-hand turn lane from eastbound SR 152 to Watsonville Road from 550 feet to 275 feet long.
- Add a refuge area at the Watsonville Road intersection for motorists turning left onto eastbound SR 152 from Watsonville Road.
- The amount of right of way needed has increased to approximately 2 acres, which will be acquired from both sides of the road. The acquisition includes underground easements for soil nails, temporary construction easements and public utility easements. The original description called for acquiring 1.20 acres on the westbound side of the roadway only. The

increase includes acquisition of a business on the northwest corner of SR 152 and Watsonville Road.

- Modify the culverts under driveways to accommodate changes to the road. Extend the culvert that crosses Meritage Court to match the gutter flow on both sides. Extend the culvert that crosses SR 152 just east of Meritage Court and add rock slope protection at both ends. On the south side of SR 152, extend the existing side ditch with a trapezoidal side ditch with 4:1 slopes. In other areas, where the road is crowned to drain water, add a v-ditch on both sides of SR 152. Infiltration filters will be constructed in the gutter on both sides of the roadway to control heavy rainfall and treat storm water runoff.

4. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES AND AVOIDANCE, MINIMIZATION AND/OR MITIGATION MEASURES

This section corresponds to Chapter 2 in the FEIR/EA. The resources discussed here are included because they are affected by changes made to the project since the FEIR/EA was completed. The project's effects on other resources and the cumulative impacts discussed in the FEIR/EA have not changed. The analysis in the FEIR/EA remains valid. Please refer to Chapter 2 of the FEIR/EA for a description of regulatory settings for each resource discussed below.

4.1 PARKS AND RECREATIONAL FACILITIES

Please refer to Section 2.1.1.3 in the FEIR/EA for the original analysis. Because of changes to the project, a new Section 4(f) De Minimis Finding was also prepared to comply with NEPA. It is available at www.dot.ca.gov/dist4/envdocs.htm.

4.1.1 Affected Environment

Mount Madonna County Park (Park) is located adjacent to much of the northern side of the project area (see Location 4 map in Appendix A), and portions of the southern side of the project area. This park consists of 3,688 acres dominated by redwood forest characteristic of the Santa Cruz Mountain range. The park is under the jurisdiction of the Santa Clara County Parks and Recreation Department (County Parks), which administers the County's parks and recreation programs and operates and maintains 28 parks throughout the county.

Land from the Park would only be acquired for the project at Location 4. While County Parks owns the land on both sides of the highway at Location 4, the Park is only open to the public on the north side of SR 152.

Proposed construction activities at Location 4 include the construction of five soil nail retaining walls on westbound SR 152, which have changed in size, and the addition of one Type 5 retaining wall (L-shaped wall to support the roadway) on the eastbound side of SR 152. Please see Table 3-1 for a description of changes in the wall sizes.

4.1.2 Environmental Consequences

The amount of acquisition of park land has changed from 0.55 acre on the north side only to 2.6 acres of park land, taken as strips of land along both sides of the highway. In addition, 1.3 acres of underground easement for soil nails would be acquired. Approximately 344 trees will be

affected by the project on the westbound side of SR 152 and 80 trees on the eastbound, creek side of the park. Please see Table 4-7 for more details.

While parkland would be acquired, no park facilities or amenities would be taken by the project. Public use, access and enjoyment of the park would not be impaired by project activities.

4.1.3 Avoidance, Minimization, and/or Mitigation Measures

In addition to the visual measures described in Section 4.3.3, during coordination with the County Parks, the following measures were agreed upon to compensate for impacts to vegetation on the north side of SR 152 at Location 4:

- At Location 4, Caltrans will replace native trees at a ratio of 3 native trees planted for each removed tree that is 4 inches or greater in diameter at breast height. Caltrans will replace any non-native trees at a ratio of 1 native tree planted for each removed non-native tree that is 4 inches or greater in diameter at breast height.
- Caltrans will plant and re-establish native plant species in areas disturbed as a result of the project, including the forest understory and shrubs.
- Caltrans will fund, implement and monitor for a three- to five-year plant establishment period, or as determined by the California Department of Fish and Wildlife (CDFW), compensation for permanent impacts on the north side of SR 152 in the area of the Park open to the public.
- Caltrans will prepare a Mitigation, Monitoring and Reporting Plan (MMRP) that will include, at a minimum, success criteria to meet all goals and monitoring protocols specified by regulatory agencies and Caltrans relating to impacted species and habitat. Prior to preparing the MMRP, if the County agrees to a site on park land, Caltrans will consult with County Parks on an appropriate planting site and the plant palette and will provide County Parks with the final MMRP for their information prior to implementation.
- Caltrans will use best efforts to ensure that all plantings will be of native species locally collected or purchased from the local watershed and found within the immediate project site, if available, to maintain the genetic integrity of the natural communities within the park and project area and to prevent the importation of diseases and fungi. Mixes will be approximately 65 pounds/acre mixture rate (or agreed upon by the County). In addition, the contractor will be asked to save duff from the project area to reuse on the planting site if there is no concern that the duff may carry Sudden Oak Death.
- Caltrans will use best efforts to ensure that planting sites are located within the same watershed where trees and plant species were impacted or removed.
- Caltrans will implement Best Management Practices (BMPs) to prevent the spread of Sudden Oak Death as required by applicable state and federal laws.
- Caltrans will implement BMPs to prevent the spread of invasive plant species in the Park. The BMPs will comply with the Executive Order on Invasive Species, E.O. 13112, and subsequent guidance from the Federal Highway Administration, as well as the Streambed Alteration Agreement with the CDFW.
- The project work and activities will be carried out and comply with the Streambed Alteration Agreement from the CDFW, the Biological Opinion from the U.S. Fish and Wildlife Service and the Section 404 Permit from the U.S. Army Corps of Engineers. Caltrans will provide County Parks with the final permits showing the avoidance, minimization and mitigation

measures agreed upon to protect habitat, threatened and endangered species, special-status animal species, wetlands and other waters of the U.S. and migratory birds within the Park.

4.2 FARMLANDS

Please refer to Section 2.1.2 in the FEIR/EA for the previous analysis and information on the laws and regulations that affect farmlands, as well as a description of the different types of farmland.

4.2.1 Affected Environment

Location 5 is the only portion of the project with farmland. Caltrans submitted a Farmland Conversion Impact Rating form to the National Resource Conservation Service (NRCS). The original consultation process with the NRCS was completed on March 9, 2010. It concluded that farmland required for the project was negligible, with a total score of 91 out of a possible 260, and that no mitigation was required. Consultation was reinitiated with the NRCS in 2012 and it was completed on June 21, 2012. With a score of 124 out of a possible 260, the farmland required for the project is still considered negligible.

As described in the FEIR/EA, only one parcel with a Williamson Act contract is located within the project area at Location 5. However, this parcel is also under non-renewal for the Williamson Act and will be completely out of the program by 2015.

4.2.2 Environmental Consequences

The amount of farmland being acquired for the project at Location 5 has changed from 1.20 acres to 1.22 acres. This land will be incorporated into the transportation facility and will no longer be used for agricultural production. This acquisition represents a narrow strip of farmland along the highway frontage and would not result in impacts that would preclude agricultural production on the remainder of the parcel or prevent access to the parcel.

The amount of Williamson Act land being acquired has been reduced from 4,445 square feet to 4,247 square feet or .1 acre.

4.2.3 Avoidance, Minimization, and/or Mitigation Measures

None required.

4.3 VISUAL/AESTHETICS

In 2009, the State Route 152 Safety Improvement Project Visual Impact Assessment (VIA) was approved. Because of changes to the project design, a Supplemental VIA was prepared in 2012 and approved in January 2013. The same methods were used in both the original and Supplemental VIA to assess visual changes. Information in this section is summarized from this supplemental assessment.

4.3.1 Affected Environment

The project is situated in Hecker Pass, an east-west oriented canyon paralleling the stream course of Bodfish Creek, in the southernmost portion of the Santa Cruz Mountain Range. The project area consists of two distinct landscape units: the Santa Cruz Mountains/Hecker Pass (containing

Locations 1, 2, 3 and 4) and the Santa Clara Valley (containing Location 5). Each landscape unit has a characteristic visual character, quality, and visual sensitivity.

Santa Cruz Mountains/Hecker Pass Landscape Unit
The Santa Cruz Mountains/Hecker Pass landscape unit extends from the western project limit to roughly 0.5 mile east of Blackhawk Canyon where Bodfish Creek diverges south from the highway and includes Locations 1, 2, 3 and 4. Along SR 152, this landscape unit is scenically highly intact with little evidence of disturbance and steep slopes containing native mixed evergreen woodland, particularly tall redwoods. The tall forest trees visually enclose the roadway and are the only visual image type seen by motorists on the roadway. Fleeting views of Bodfish Creek, which is parallel to, and south of the highway, are visible at various locations. The visual character, visual quality, and viewer conditions of the SR 152 corridor are similar throughout Locations 1, 2, 3, and 4.

The Santa Cruz Mountains/Hecker Pass landscape unit is sparsely developed. Viewers in this area consist primarily of motorists on SR 152. Principal off-road, non-motorist, viewers in proximity to the project include residents on Bella Vista Lane above and south of Location 1 at the western end of the project corridor, visitors to Mt. Madonna County Park at the main entrance near Location 1, and park visitors at the secondary entrance at Location 4.

Overall, the visual quality of this landscape unit is considered to be high. Viewer sensitivity from the roadway is considered to be high due to the recreational and scenery-focused orientation of most motorists on this section of SR 152. Viewer sensitivity toward the roadway is considered to be low due to the lack of viewer exposure to the roadway.

Santa Clara Valley Landscape Unit
The Santa Clara Valley landscape unit only includes Location 5. Although some surrounding land use in this landscape unit includes residential buildings, they are well screened from the roadway behind walls and landscaping. The overall visual scene is dominated by wooded riparian corridors of Bodfish Creek and its tributaries; undeveloped, wooded slopes of the Santa Cruz Mountain foothills at foreground and middle-ground distance; and the historical agricultural character of several surrounding wineries and associated vineyards. Walnut trees line both sides of SR 152 east of its intersection with Watsonville Road.

Location 5 is in a low-density, rural residential neighborhood and is thus visible to adjacent homes. Existing views to and from the road are generally well-screened by community walls, extensive tree screening, and other landscaping.

Overall, the visual quality of this landscape unit is considered to be moderately high. Viewer sensitivity from the roadway is also considered to be moderately high; this landscape unit is less recreation and scenery oriented than within the Santa Cruz Mountains/Hecker Pass landscape unit. Viewer sensitivity toward the project area by non-motorists is considered to be moderately high due to the moderate to high level of viewer exposure to the roadway.

4.3.2 Environmental Consequences
Visual quality is characterized and evaluated in terms of the descriptors *vividness*, *intactness*, and *unity*. Vividness refers to the striking and distinctive quality that makes a landscape powerful and

memorable; intactness is the visual integrity of the landscape and its freedom from encroaching elements; unity is the visual coherence and compositional harmony of a landscape. Visual impacts are identified as a combination of the degree of project-related change to visual character and quality (*the visual resource*), and *viewer response* or overall sensitivity and exposure to visual change.

Visually significant features of the proposed project would include the retaining walls and associated features. The proposed roadway widening would have minor visual effects, as discussed by location below.

Please note that wall heights and lengths are approximate, and that final heights and lengths will be determined during final design. Minor revisions in both final wall height and length are not anticipated to result in significant differences in the final overall visual impact determination.

4.3.2.1 Location 1

Before and after visual simulations of the proposed upslope Retaining Wall (RW) 1 at Location 1 are shown in Figures 3, 4 and 5 below. Figure 3 shows the existing condition. Figure 4 shows the simulated condition immediately following construction. Figure 5 shows the simulated condition 10 to 15 years following construction, with anticipated re-vegetation along the top of the wall. Simulations for subsequent locations show the condition 10 to 15 years following construction.

Views from the Road

Changes to the project at Location 1 are summarized in the following table:

Table 4-1: Location 1 Visual Changes to Retaining Walls

Original Retaining Wall Name	New Retaining Wall Name	ORIGINAL Maximum Height (feet)	NEW Maximum Height (feet)	ORIGINAL Length (feet)	NEW Length (feet)
1A	RW 1	17.2	13.4	256.8	220
1B	RW 2	19.2	14.7	207.1	221

As suggested by the table and shown in the simulations, anticipated project impacts under the proposed modified project are substantially the same as described in the original FEIR/EA. Overall wall length and wall heights at Location 1 would decrease slightly from the original proposal. As under the original project, impacts from the roadway with the proposed modifications would include strong contrast with the existing landscape character and a strong decline in vividness, intactness, and unity due to the highly prominent visual intrusion of the new retaining walls and accompanying vegetation removal. Approximately 0.5 acre of additional right-of-way on both sides of the roadway would be acquired under the modified project. The original description called for acquiring approximately 0.12 acre on the northern side of the roadway only. Roadway widening and wall construction could require removal or possible root damage of approximately 67 mature trees, including bay laurel, maple, and redwood trees. The resulting loss of tree canopy from the additional acquisition would proportionately increase the amount of tree and vegetation loss at the roadside.

Figure 3: Existing westbound view facing location of proposed RW 1 at Location 1

Figure 4: Simulated westbound view showing proposed RW 1 at Location 1 immediately following construction

Figure 5: Simulated westbound view showing proposed RW 1 at Location 1 10-15 years after construction

This would represent a moderate decline in vividness in this road segment, whose visual character would nevertheless remain dominated by remaining forest canopy and views of wooded hillsides. In the previous design, yellow plastic crash cushions were proposed at the ends of walls. The modified upslope retaining walls at all locations, including Location 1, now incorporate end treatments to prevent auto collisions with the walls. The end treatment would consist of driving the wall and associated concrete safety barrier (at the bottom of all upslope walls) into the hillside. The walls' staining and aesthetic treatment would blend the wall into the hillside and reduce the artificial character. The concrete safety barrier would be colored the predominant color of the wall to further reduce glare, contrast and the possibility of graffiti, in addition to decreasing visual impacts. Nevertheless, moderately strong declines in both intactness and unity would result from the prominent concrete walls and barriers along the roadway shoulder.

In the context of high viewer sensitivity and high visual exposure throughout Landscape Unit 1, this would, overall, represent a high level of adverse change and a substantial adverse impact. The retaining walls would incorporate context-sensitive color and texture treatment to reduce potential impacts. A sculpted rock wall texture treatment is depicted in the visual simulations; however the final selection of texture will be made in consultation with local agencies. Whatever the selected texture, the intent of the treatment is to reduce overall wall contrast, incompatibility of character, and resulting decline in visual quality to the extent feasible.

Non-motorist views toward the project area

Effects on views to the project from off-road viewpoints would not change as a result of the project modifications. Despite the proximity of several homes on nearby Bella Vista Lane in the area south of Location 1, no views of the proposed project area from these off-site locations are

evident due to dense intervening forest. Potential impacts to these viewers would thus be negligible.

Similarly, views from Pole Line Road, representing the main visitor entrance into Mt. Madonna County Park, would be entirely blocked by intervening forest and terrain. Park visitors would have views of the project area, but only as motorists passing by Location 1. Once on Pole Line Road, or elsewhere within the park, the proposed project area would not be visible. Potential impacts to visitors within the park would thus be negligible.

4.3.2.2 Location 2

Before and after visual simulations of proposed upslope Retaining Wall (RW) 3 at Location 2 are shown in Figures 6 and 7.

Proposed changes to the project at Location 2 are summarized in the following table:

Table 4-2: Location 2 Visual Changes to Retaining Walls

Original Retaining Wall Name	New Retaining Wall Name	ORIGINAL Maximum Height (feet)	NEW Maximum Height (feet)	ORIGINAL Length (feet)	NEW Length (feet)
2A	RW 3	29	32.6	430.6	566

<u>Views from the Road</u>

As suggested by the table and shown in the simulations, anticipated project impacts under the proposed modified project are similar to those described in the original VIA, but increased in both maximum height and overall length. Maximum height would increase from 29 feet originally, to 32.6 feet. Overall wall length would increase from 430.6 feet to 566 feet. While these changes would represent a moderate increase in both prominence and duration of view of the new wall, impacts were previously identified as substantially adverse, and this conclusion would also apply to the modified wall. As under the original project, anticipated project impacts from the roadway would include strong contrast with the existing landscape character, resulting in a moderate decline in vividness, and strong declines in intactness and unity due to highly prominent visual intrusion of the new retaining wall, and accompanying vegetation removal. Approximately 0.9 acre of additional right-of-way on both sides of the roadway will be acquired, with associated tree and vegetation removal. The original description called for acquiring approximately 0.05 acre on the northern side of the roadway only. Roadway widening and wall construction could require removal or possible root damage of approximately 71 mature trees, including bay laurel, maple, oak, redwood and toyon trees. As at Location 1, the modified retaining walls would incorporate end treatments to prevent auto collisions with the walls. These would be stained to blend into the texture treatment of the adjoining walls. No crash cushions were proposed at this location under the original project. The staining of end treatments would minimize their artificial character.

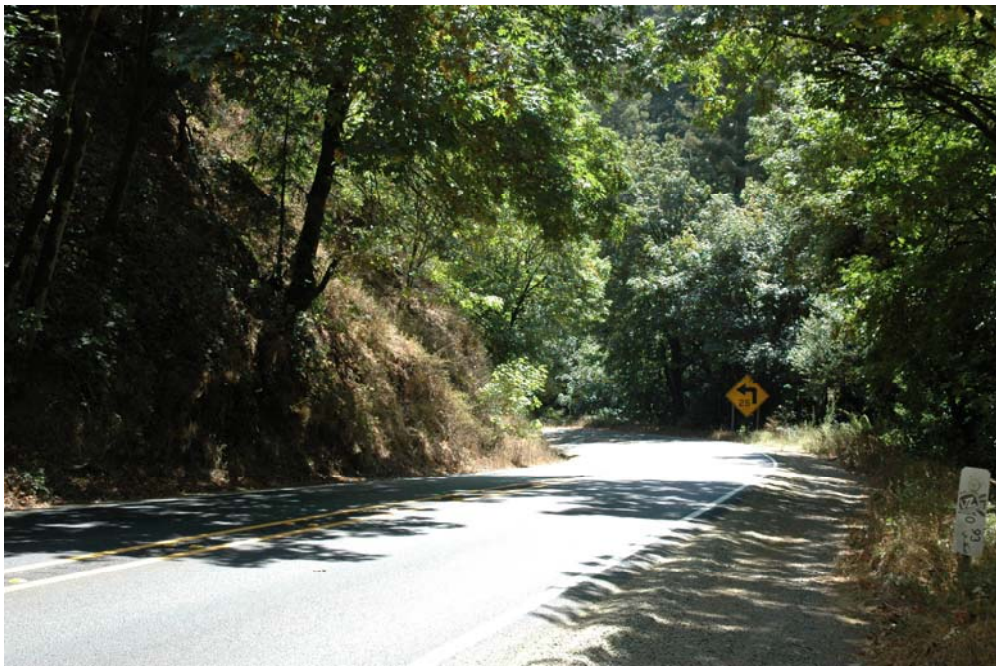

Figure 6: Existing eastbound view facing location of proposed RW 3 at Location 2

Figure 7: Simulated eastbound view showing proposed RW 3 at Location 2 10-15 years after construction

The retaining walls would incorporate context-sensitive color and texture treatment to reduce potential impacts. A sculpted rock wall texture treatment is depicted in the visual simulations; however, the final selection of texture will be made in consultation with local agencies. Nevertheless, the overall decline in visual quality and in this road segment would remain strong. Concrete safety-shape barriers in front of retaining walls will be colored to blend in with the walls. The coloring would reduce glare and reduce the likelihood of graffiti.

In the context of high viewer sensitivity and high visual exposure, this would represent a high level of adverse change and a substantial adverse impact.

Non-motorist views toward the project area

Effects on views to the project from off-road viewpoints would not change as a result of the project modifications. Viewers in proximity to Location 2 include one or more properties on Bella Vista Road and Sanders Road overlooking the highway from the southwest at distances of under one-quarter-mile. However, as discussed for Location 1, views from all of the properties in this area would be largely or completely screened by dense intervening forest. Actual exposure to the proposed project area from these properties is thus negligible. Similarly, Location 2 would not be visible from within Mt. Madonna County Park. Adverse impacts on off-site views to the road are thus not anticipated at Location 2.

4.3.2.3 Location 3

Before and after visual simulations of the proposed upslope Retaining Wall (RW) 4 at Location 3 are shown in Figures 8 and 9 below. Proposed changes to the project at Location 3 are summarized in the following table:

Table 4-3: Location 3 Visual Changes to Retaining Walls

Original Retaining Wall Name	New Retaining Wall Name	ORIGINAL Maximum Height (feet)	NEW Maximum Height (feet)	ORIGINAL Length (feet)	NEW Length (feet)
3A	RW 4	11.2	14.1	167.9	272
3B	Combined with RW 4	10.2	Combined with RW 4	207.8	Combined with RW 4
3C	RW 6	5.2	Removed	125	Removed

Views from the Road

As suggested by the table, anticipated project impacts from the roadway would decrease substantially at Location 3. Where formerly three walls with an overall length of 500.7 feet were proposed, under the modified project these would be replaced by a single 272-foot-long wall. Maximum wall height would increase slightly, from 11.2 feet to 14 feet. This increase in height would be relatively subtle. In contrast, the wall length and duration of visual exposure for motorists would decrease substantially.

Although the proposed RW 4 would have strong contrast with the existing landscape character, the shorter height when compared to Location 2, and the reduced overall length compared to both Locations 1 and 2 would result in a moderate decline in vividness due to tree removal, and moderate declines in intactness and unity due to moderate and brief visual intrusion of the new retaining walls. Concrete safety-shape barriers in front of retaining walls will be colored to blend in with the walls. The coloring would reduce glare and reduce the likelihood of

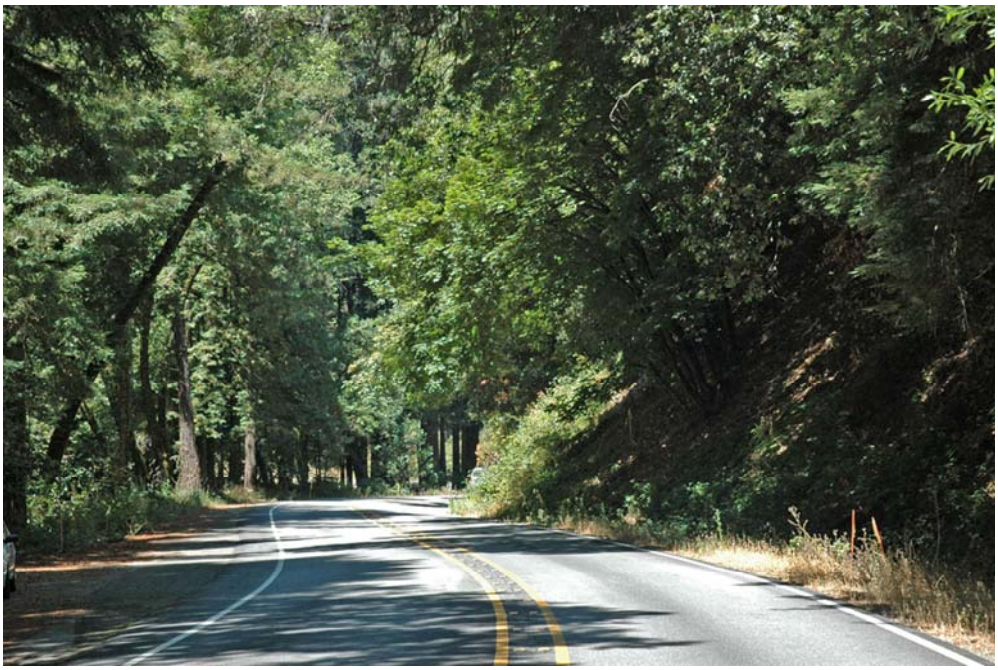

Figure 8: Existing westbound view facing location of proposed RW 4 at Location 3

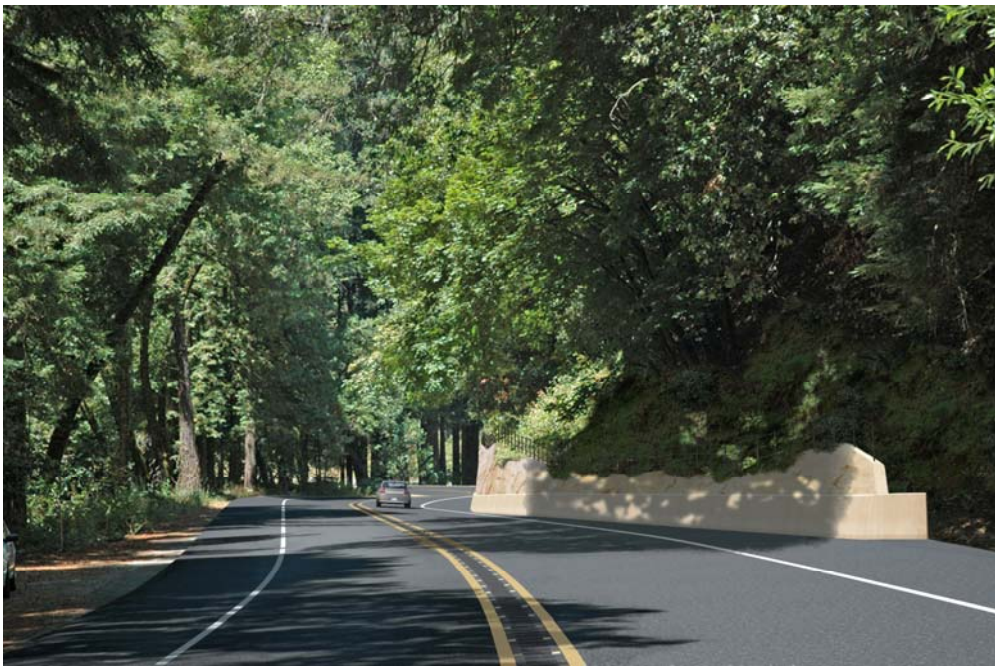

Figure 9: Simulated westbound view showing proposed RW 4 at Location 3 10-15 years after construction

graffiti. Roadway realignment and wall construction could require removal or possible root damage of approximately 65 mature trees, including bay laurel, maple, oak, redwood and toyon trees. Approximately 1 acre of additional right-of-way on both sides of the roadway would be acquired. The original description called for acquiring approximately 0.07 acre on the northern side of the roadway only. The visual setting would, however, remain dominated by existing tree canopies near the shoulders, as well as in the mid-ground distance, where attractive views of forested hillsides divert eastbound motorists' attention from the immediate highway shoulder. The retaining walls would incorporate context-sensitive color and texture treatment to reduce potential impacts. Overall, the decline in visual quality and in this road segment would be moderate.

As in the previous locations in the Santa Cruz Mountains, viewer sensitivity is high. However, visual exposure would be moderate due to the shorter duration of exposure compared to other locations, and overall viewer response would be moderately high. By itself, the impacts of this wall are considered adverse, but moderate and less than significant.

Non-motorist views toward the project area

Location 3, which is immediately east of Location 2, is within foreground distance of the same residences on Bella Vista Lane and Sanders Road discussed above under Location 2. The same conditions apply as well: the project would be largely or completely screened by existing forest from these properties. Visual exposure to project features at Location 3 is thus negligible. Location 3 is not visible from within Mt. Madonna County Park. Adverse impacts on off-site views to the road are thus not anticipated at Location 3.

The private driveways at Location 3 would be graded to conform to the new alignment of the roadway. With completion of construction, the resulting visual changes would be negligible.

4.3.2.4 Location 4

Before and after visual simulations of the proposed upslope Retaining Wall (RW) 9 at Location 4 are shown in Figures 10 and 11 (eastbound); and 12 and 13 (westbound). A simulation of proposed upslope RW 10 (westbound) is shown in Figures 14 and 15.

Proposed changes to the project at Location 4 are summarized in the following table:

Table 4-4: Location 4 Visual Changes to Retaining Walls

Original Retaining Wall Name	New Retaining Wall Name	ORIGINAL Maximum Height (feet)	NEW Maximum Height (feet)	ORIGINAL Length (feet)	NEW Length (feet)
4A	**RW 7**	31.2	31.8	292.5	315
4B	**RW 8**	14.2	10.5	57.3	70
4C	**RW 9**	32.2	30.4	1056.1	1037
4D	**RW 10**	23.2	19.3	584.1	568
4E	(No name) (downslope)	5	Removed	205	Removed
4F	**RW 11**	12	10.6	345	380
NA	**RW 166** (Downslope)	NA	8	NA	170

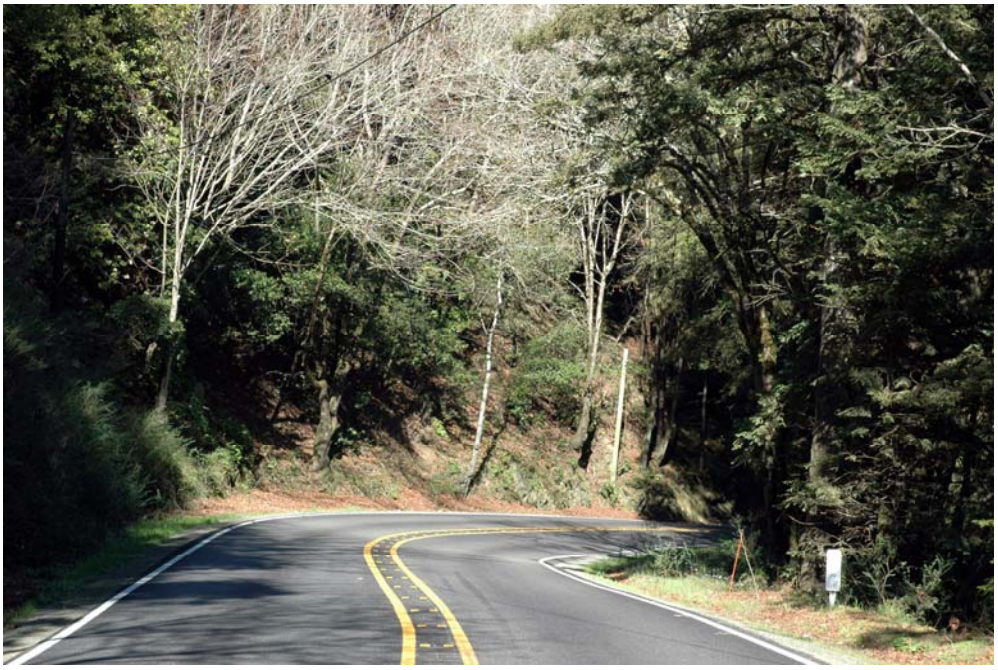

Figure 10: Existing eastbound view facing location of proposed RW 9 at Location 4

Figure 11: Simulated eastbound view showing proposed RW 9 at Location 4 10-15 years after construction

Figure 12: Existing westbound view facing location of proposed RW 9 at Location 4

Figure 13: Simulated westbound view showing proposed RW 9 at Location 4, 10-15 years after construction

Figure 14: Existing westbound view facing location of proposed RW 10 at Location 4

Figure 15: Simulated westbound view showing proposed RW 10 at Location 4, 10-15 years after construction

Views from the Road

As suggested by the table, the difference between the original project description and the proposed modifications to walls at Location 4 are minor and would be visually insignificant. The overall affected road segment is approximately 0.63 mile (3,326 feet), and the combined wall length is 0.45 mile (2,370 feet). As under the original project, anticipated project impacts at Location 4 would include strong contrast with the existing landscape character, resulting in a moderate decline in vividness due to tree removal, and strong declines in intactness and unity due to highly prominent visual intrusion of the new retaining walls. The retaining walls would incorporate context-sensitive color and texture treatment to reduce potential impacts. Similarly, concrete safety-shape barriers in front of retaining walls would be colored to blend in with the walls. The coloring would reduce glare and reduce the likelihood of graffiti. Nevertheless, the overall decline in visual quality in this road segment would remain high.

In addition to the upslope walls described above, a newly proposed downslope retaining wall (RW No. 166) would be located directly across the road from upslope RW 11. A concrete safety shape barrier would be located at road level atop the new RW 166, with the ends of the barrier protected by 75 feet of metal beam guard rail (MBGR) at each end. The barriers would be colored to blend with other retaining walls, reducing glare, contrast, and susceptibility to graffiti. MBGR would be treated to develop an oxidized reddish-brown finish, blending with the setting and minimizing contrast and glare. The visual effect of the new wall would be limited to this visible length of safety barrier at the shoulder, and would be minor.

The primary visual difference between the original project and modified project would be in the amount of tree and vegetation removal that would occur. Roadway realignment and wall construction could require removal or possible root damage of approximately 112 mature trees, including bay laurel, maple, madrone, oak, redwood and toyon trees. Approximately 4 acres of additional right-of-way on both sides of the roadway would be acquired under the modified project. The original description called for acquiring approximately 0.55 acre on the northern side of the roadway only. An estimated 424 trees would be removed within the proposed new project right-of-way. This tree removal, however, would be limited to the area within 5 feet of the top of the retaining walls. Beyond that distance, dense existing forest canopy would remain.

As under the original project description, overall decline in visual quality at Location 4 would be high. In the context of high viewer sensitivity and high visual exposure, this would represent a high level of adverse change and a substantial adverse impact.

Non-motorist views toward the project area

Views to the road within this road segment are very limited. Potential views from within Mt. Madonna County Park and the vicinity of the park entrance to proposed upslope walls are almost entirely blocked by intervening topography. Despite anticipated tree removal at the roadside within the project right-of-way, visual effects to users within the park would be negligible. A previously proposed downslope retaining wall (4E) near the park entrance at Sprig Recreation Area has been eliminated from the project. At the Mt. Madonna County Park entrance, trees along the highway would be removed; however, large trees and other vegetation on the park (north) side of the creek would remain, maintaining screening. In the context of high viewer sensitivity, these minor declines in visual quality as seen from within the park would not be substantial.

The principal visual impact of the proposed project to park visitors at this location would thus be experienced by motorists approaching the park entrance in views from the road, as described above. Outside of the views of park visitors within the Sprig Recreation Area parking lot, no other off-road viewers are present in the viewshed of Location 4, either within or outside of Mt. Madonna County Park.

4.3.2.5 Location 5

Figure 16 depicts existing conditions and features to be removed under the proposed action at Location 5. A before and after visual simulation of proposed actions at Location 5 are shown in Figures 17 and 18 below.

Views from the Road

The principal project actions at Location 5 include minor roadway widening, addition of a turn lane at the intersection of Watsonville Road, creation of standard 8-foot shoulders, along with related asphalt dikes and other drainage features.

However, the principal visual effect at this location would be the removal or root damage of roughly 223 trees within the proposed right-of-way. Approximately 2 acres of right-of-way on both sides of the roadway would be acquired. The original description called for acquiring approximately 1.20 acres on the northern side of the roadway only. The increase includes acquisition of a business on the northwest corner of SR 152 and Watsonville Road, depicted in Figure 16. As shown in Figure 16, a large number of mature trees line the highway in this segment, particularly in the large (approximately 80 feet wide) landscaped setback area south of the highway and east of Watsonville Boulevard, contributing substantial vividness to this length of the highway. However, the project right-of-way in this section would extend 35 feet or less from the edge of shoulder, leaving virtually all of the large-scale existing trees in the setback area intact. Only those trees located very close to the existing shoulder would be removed. These include about 20 mature walnut trees at the highway shoulder in the southeastern quadrant of the intersection of SR 152 and Watsonville Road at the Roffinella/Thomas Kruse Winery, and up to 10 similar walnut trees in the northeastern quadrant of the intersection, identified for removal under the original project proposal. The two groups of trees form a remnant of an allee (double row of trees) lining the highway east of the intersection with Watsonville Road. In addition, a large number of young, smaller trees, mostly comprising more recently planted hedgerows at the edge of the roadway, would be removed for road widening at the Fortino and Hecker Pass Winery frontages, and at the road shoulder in the landscaped setback area southwest of Watsonville Boulevard. Up to three rows of vines at the Roffinella Winery may be removed to widen the roadway. This small loss of vines would likely be unnoticed by motorists.

From the perspective of motorists, this removal of smaller stature trees at the roadside would represent a moderate decline in vividness, but would not substantially alter the overall visual quality of the viewshed in this location, which would remain intact, rural in character, and moderately high in visual quality. For motorists, open views of the surrounding rural setting and views of wooded mountains in the background provide the focus of attention and retain a high level of visual quality. In addition, the large trees dominating the landscaped setback southwest of Watsonville Road would remain, retaining their role as vivid defining features of the immediate foreground in this segment. From the perspective of motorists, this minor decline in visual quality from roadside tree removal would be an adverse, but not substantial impact.

Allee of walnut trees to be removed, Roffinella Winery, looking west.

Roadside hedgerows to be removed, Fortino Winery looking west.

Landscaped setback area southwest of Watsonville Boulevard intersection, looking west. The large trees depicted would be unaffected by proposed widening.

Building to be removed at intersection of Watsonville Boulevard, looking east.

Figure 16: Existing views of Location 5

Figure 17: Existing westbound view facing Roffinella Winery at Location 5

Figure 18: Simulated westbound view facing Roffinella Winery at Location 5

Widening at Location 5 would also require removal of one existing building, depicted in Figure 16. This small commercial building lacks special architectural or historic distinction, and its removal would not represent an adverse visual impact.

Non-motorist views toward the project area

From the perspective of adjoining properties, including the Roffinella, Fortino and Hecker Pass Wineries and nearby residences, the loss of roadside trees would be a much more pronounced effect. The trees to be removed at the highway shoulder primarily comprise hedgerow plantings whose main purpose is evidently to provide screening and isolation from the highway for the affected properties. All three wineries are visitor destinations for which scenic quality is of importance, and one, the Roffinella/Thomas Kruse Winery, was found to be eligible for the California Register of Historical Resources on the local level and is a designated Santa Clara County landmark. Therefore, viewer sensitivity and overall viewer response at Location 5 is considered high. Although the majority of nearby residences, located southwest of the Watsonville Boulevard intersection, are well-isolated from the roadway by a community wall, substantial setback area, and landscaping, residences adjoining the highway near the project's southeastern terminus are not so isolated and would be more directly exposed to the proposed tree removals on their properties. These residences would also have high viewer sensitivity, exposure and response.

The proposed removal of the 223 trees in Location 5 would thus have a strong adverse effect on visual quality of the affected properties, exposing them directly to the highway with a corresponding decline in vividness, intactness and unity of their visual setting. In the context of their high viewer sensitivity and response, this strong decline in visual quality would represent an adverse impact. However, the proposed changes to the project would not alter the overall impact conclusion of the original VIA for this location, which identified significant impacts that could not be avoided, minimized, or mitigated below a level of significance.

Light and Glare

No substantial long-term light or glare impacts would occur as a result of the proposed project. Construction at night could result in glare impacts that interfere with safe navigation by motorists. Walls would be treated to have low reflectivity and subdued earth-tone colors.

Construction Impacts

Construction staging within the highway corridor would be visible from the highway and would cause temporary impacts due to the presence of materials and equipment. Construction activities would have temporary impacts that would be visible to motorists, such as placement of safety barriers and signs, vegetation removal, slope grading, and temporary soil and rock exposure. In the worst case, such impacts would have the potential to be substantially adverse.

4.3.3 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures are described by project location below:

Locations 1, 2, 3 and 4

To address the potential impacts of tree removal at these locations, the following tree replacement and revegetation measures would be implemented:

- Minimizing existing tree and vegetation removal to the greatest possible extent. The limit of work will be kept to the minimum possible footprint, not to exceed 5 feet from the edge of the retaining wall. Priority will be placed on preserving existing trees nearest the wall, in order to preserve views of the forest edge from the road to the greatest extent feasible.

- Tree replacement planting will be implemented if appropriate to mitigate for major loss of tree canopy, as determined by the project landscape architect.

To address the potential impacts of visual intrusion from the new retaining walls, the following mitigation measures would be implemented:

- Minimizing overall wall height to the greatest extent feasible.

- Using context-sensitive wall texture and color treatment, in consultation with local agencies to reduce visual contrast and enhance compatibility of visual character to the greatest extent feasible.

- Staining of the concrete safety-barrier attached to retaining walls to reduce overall color contrast and visual intrusion.

- If feasible, walls will be gutterless in order to reduce visual contrast and mass.

- Wherever feasible and consistent with safety, the use of plastic collapsible crash cushions at retaining walls will be avoided to reduce the visual contrast with the natural environment.

Location 5

- Replacement of existing tree screening to be removed at Location 5 has been determined to be infeasible within Caltrans right-of-way. Therefore, property owners will be compensated for the loss of trees.

Light and Glare

- Construction activities will limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Construction impacts

- Unsightly material and equipment storage and staging will be screened to the extent feasible to minimize visibility from the roadway and nearby sensitive off-road receptors, such as homes or vineyards.

- Construction activities will be phased to minimize the duration of disturbance to the shortest feasible time.

- All vegetated areas disturbed by construction, staging, and storage will be treated with appropriate erosion control measures and revegetated.

4.4 CULTURAL RESOURCES

4.4.1 Affected Environment

In September 2012, an Addendum was approved to the 2009 Historic Property Survey Report and Archaeological Survey Report. The Addendum addresses changes in project elements and the project footprint. The archaeological and architectural Areas of Potential Effect (APE) were also expanded to account for the larger footprint, as well as construction staging and traffic handling.

Archaeological Resources

The 2009 archival and archaeological field investigation did not identify any recorded or unrecorded archaeological resources. Because the previous records searches covered the expanded APE, no new records searches were undertaken. However, all the additions to the APE were investigated in the field.

During field investigations, one archaeological resource, an historic-era logging site, was identified in the expanded APE. This resource is located outside of the construction footprint, but within the boundaries of an area that will temporarily be used to control traffic during construction.

Proposed ground-disturbing activities will primarily occur within previously disturbed soil or fill, or within terrain that would have severely limited prehistoric or historic land use. There is a low potential for encountering buried archaeological resources.

Historic Properties

In 2009, one historic resource, the Thomas Kruise (Rofinella) Winery at 4390 Hecker Pass Road, was identified as a designated Santa Clara County Landmark. This property was found to be eligible under Criteria 1 of the California Register of Historical Resources on the local level for its representation of an early winery developed by Italian immigrants. It is, therefore, considered an historic property for the purpose of compliance with CEQA. In 2009, Caltrans determined a "finding of no impact" to the property.

4.4.2 Environmental Consequences

Archaeological Resources

The project will have no impact on the historic-era logging site because it will be protected by the avoidance measure described under Avoidance, Minimization and Mitigation Measures in Section 4.4.3 below.

Historic Properties

The Rofinella Winery was reassessed for potential impacts in the 2012 Addendum to the Historic Property Survey Report. Based on the addendum, Caltrans has determined a "finding of no substantial adverse change." The project will acquire some of the property's highway frontage, which will involve removing up to three rows of grape vines out of the existing 37 rows or 8 percent of the vines. A total of 4,087 square feet will be acquired for the project, which is 3.75% of the existing 2.5-acre property. Removal of the vines will not alter the historical resource such

that the significance of the resource will be impaired according to CEQA guidelines. Measures are described below to protect the remaining vines from any potential damage.

4.4.3 Avoidance, Minimization, and/or Mitigation Measures

The first two measures below have been added since the FEIR/EA:

- Before the start of work, the Project Archaeologist will set up the Environmentally Sensitive Area (ESA) to protect the archaeological resource. No project-related activities may occur within the ESA.
- Before the start of work, the Project Architectural Historian will delineate the ESA location for the historic winery. The ESA will be located on the proposed new right-of-way line between the rows of vineyards that will be removed and those that are remaining. No project actives may occur on the side of the ESA within the remaining vines.
- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities will cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission, who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resources Studies so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

4.5 BIOLOGICAL RESOURCES

The following sections are summarized from the Supplemental Natural Environment Study (Caltrans 2013) approved on March 27, 2013 and the Natural Environment Study (Caltrans 2009), approved on January 21, 2010. The temporary and permanent impacts to biological resources reported below have been revised since the 2010 FEIR/EA.

4.5.1 NATURAL COMMUNITIES

Habitat areas that have been designated as critical habitat under the federal Endangered Species Act are discussed in Section 4.5.4, Threatened and Endangered Species. Wetlands and other waters are discussed in Section 4.5.2.

4.5.1.1 Affected Environment

Section 2.3.1 of the FEIR/EA describes the natural communities in the project area.

Trees

In the FEIR, 148 trees were reported in the project footprint with a diameter at breast height (dbh) in excess of six inches. Since then, the California Department of Fish and Wildlife (CDFW), formerly known as the California Department of Fish and Game, requires that trees with a dbh of four inches or greater be counted. The smaller diameter and two years of growth, along with an increase in the construction area, contributed to a higher tree count in 2012. There are now 850 trees that will either be removed or that could be affected by root damage. A list of tree species at each location is provided in Table 4-6.

4.5.1.2 Environmental Consequences

Vegetation Communities

Table 4-5 lists the revised potential temporary and permanent impacts to vegetation communities resulting from roadway construction. Temporary impacts to habitat are those that can be restored and revegetated after construction is completed. Permanent impacts to habitat include those areas lost due to circumstances such as the increased paved surface that will remain after construction is complete. Species- or habitat-specific measures are discussed in the sections that follow.

Table 4-5: Areas of Temporary & Permanent Impacts to Vegetation Communities in the Project Footprint

Vegetation Community	Project Area Location [Impacts Acreage]					Total Area Acres
	1	2	3	4	5	
Temporary Impacts						
Coastal Live Oak Forest	–	–	–	.51	–	.51
Coyote Brush Scrub	–	–	.08		–	.08
Purple Needlegrass/Native Grassland	–	–	–	.02	–	.02
Redwood Forest	.40	.49	1.11	2.73	–	4.73
Landscaped/Agricultural Lands	–	–	–	–	2.07	2.07
Developed	–	–	–	–	.18	.18
Roadway/Paved/Shoulder	.01	.07	.02	.19	.13	.42
Total Temporary Impacts						**8.01**
Permanent Impacts						
Coastal Live Oak Forest	–	–	–	.55	–	.55
Coyote Brush Scrub	–	–	.03	–	–	.03
Purple Needlegrass/Native Grassland	–	–	–	.02	–	.02
Redwood Forest	.42	.34	.63	1.33	–	2.72
Landscaped/Agricultural Lands	–	–	–	–	2.25	2.25
Developed	–	–	–	–	.18	.18
Roadway/Paved/Shoulder	.09	.29	.32	.39	.11	1.19
Total Permanent Impacts						**6.94**
					Total Impact	**14.95**

Trees

Biological surveys indicate that approximately 850 trees could be affected by the project, as shown in Table 4-6 below. This is a conservative estimate, taking into account not just trees that

Table 4-6: Estimated Number of Affected Trees by Species

Tree Species	Total Affected Trees By Location									Total Affected Trees within the Project Footprint	
	1 (Riparian)	1 (Non-riparian)	2 (Riparian)	2 (Non-riparian)	3 (Riparian)	3 (Non-riparian)	4 (Riparian)	4 (Non-riparian)	5*		
Bay Laurel	3	2	0	4	5	0	9	24	0		47
Cedar									1		1
Madrone	0	0	0	0	0	0	0	3	0		3
Maple	1	12	35	18	7	8	31	65	0		177
Oak	0	0	0	8	2	1	14	104	167		296
Olive	0	0	0	0	0	0	0	0	4		4
Pine	0	0	0	0	0	0	0	0	2		2
Redwood	5	44	0	4	19	19	26	63	11		191
Toyon	0	0	0	1	0	4	0	6	0		11
Walnut (English)	0	0	0	0	0	0	0	0	32		32
Unknown Ornamental	0	0	0	1	0	0	0	79	6		86
Total Affected Trees per Location	9	58	35	36	33	32	80	344	223	Total Affected Trees within the Project Footprint	850

***There is no riparian habitat at Location 5.**

are proposed for removal, but also those trees that may not survive because of root damage. Wherever possible, trees will be trimmed rather than removed.

Additionally, in 2009, all impacted trees with a diameter at breast height (DBH) of 6 inches or greater were counted. For 2012, the requirement from CDFW is that all impacted trees with a 4-inch dbh or greater be counted for mitigation. Vegetation removal quantities between the original project and the revised project are thus not directly comparable.

The trees shown in the riparian columns in Table 4-6 fall under the jurisdiction of CDFW. Of the approximately 850 trees, an estimated total of 157 trees are in riparian areas at Locations 1 through 4.

4.5.1.3 Avoidance, Minimization and/or Mitigation Measures

Vegetation Communities
General avoidance and minimization efforts were incorporated into the design to reduce potential impacts to natural communities and plant and animal species. These measures include minimizing the project footprint, providing environmental education for the construction crew, and delineating the work area and all environmentally sensitive areas with fencing. These require that an onsite biological monitor be present during activities that may impact sensitive biological resources.

Trees & Riparian Habitat

- Caltrans proposes to mitigate for permanent losses of riparian redwood forest habitat at a 3:1 ratio through a conservation easement. Caltrans anticipates there to be approximately 3.37 acres of permanent impacts to riparian redwood habitat resulting in an easement of about 10 acres.
- Native trees outside of the riparian area with a dbh of four inches or greater will be replaced at a ratio of 3:1. All non-native trees with a dbh of four inches or greater not located in riparian habitat will be replaced at a 1:1 ratio.
- To the extent practicable, the root masses of removed trees and shrubs will be left in place. Disturbance or removal of vegetation will not exceed the minimum necessary to complete construction.
- All slopes or unpaved areas affected by the proposed project will be reseeded with native grasses and shrubs to stabilize the slopes and bare ground against erosion. Following construction, native plant species will be installed at the disturbed area(s).

4.5.2 WETLANDS AND OTHER WATERS

The 2009 Natural Environment Study described water features that were delineated in February 2008. The numbers, types, and locations of these water features (including culverts, other waters, and wetlands) was verified by the USACE in November 2009. A Jurisdictional Wetland Delineation for this project was approved by the U.S. Army Corps of Engineers (USACE) on December 28, 2009. In November 2012, USACE requested changes to the verified delineation maps, which are included in the Supplemental Natural Environment Study.

4.5.2.1 Affected Environment

The wetland delineation for the project identified 25 other water features within the project footprint that have the potential to be impacted. These features include potentially jurisdictional other waters of the U.S. (OWUS) and other waters that are potentially non-jurisdictional (OWUSNJ). These non-jurisdictional waters of the U.S. are considered waters of the State of California. No wetlands were identified within the project footprint. The project footprint contains 15 OWUS features and 10 OWUSNJ features that have the potential to be temporarily or permanently impacted by the proposed project.

The wetland delineation for the project identified 22 culverts in the project footprint. Each of these culverts is associated with an "other water" feature that conveys water in a channel. Sixteen of the 22 culverts identified during the delineation are scheduled for some type of repair, modification, extension or replacement under the proposed project. Eleven of the potentially impacted culverts were determined to convey OWUS and are therefore jurisdictional for the USACE, while the remaining five potentially impacted culverts were determined to be non-jurisdictional. These five non-jurisdictional culverts are considered waters of the State of California. The remaining six culverts in the project footprint are not expected to be impacted by the project, because they are all located under the existing roadway of SR 152.

4.5.2.2 Environmental Consequences

Construction activities will result in permanent impacts to approximately 4,576 square feet (0.11 acre) of other waters, including: 3,843 square feet (0.09 acre) of OWUS, and 733 square feet (0.02 acre) of waters of the State.

Construction activities will result in temporary impacts to approximately 3,194 square feet (0.07 acre) of other waters, including 2,525 square feet (0.058 acre) of OWUS and 669 square feet (0.015 acre) of waters of the State. Repairs to culverts within the project footprint will result in temporary impacts to approximately 264 square feet (0.006 acre) of culverted waters of the U.S.

To the extent practicable, all temporary impacts will be restored to preconstruction condition. No wetlands will be impacted.

4.5.2.3 Avoidance, Minimization and/or Mitigation Measures

In addition to the measures below, the measures to protect steelhead described in Section 4.5.4.3 will also protect Other Waters.

- Caltrans will limit construction activities to the smallest area possible to complete the work in an effort to minimize impacts to the existing riverine habitat in Bodfish Creek. A Caltrans-approved biologist will clearly delineate this limited construction area for incorporation in the project plans and specifications. The perimeter of the work site will be adequately fenced using high visibility Environmentally Sensitive Area (ESA) fencing to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by ESA fencing.
- Caltrans will use erosion control measures throughout all phases of operation where sediment runoff from exposed slopes threatens to enter waterways. At no time will silt-laden runoff be allowed to enter the stream or directed to where it may enter the stream. Erosion control installations will be monitored for effectiveness and repaired or replaced as recommended by

a Water Quality Monitor. As needed to prevent erosion, Caltrans will use soil stabilizers such as hydroseeding, netting, erosion control mats, mulch, fiber rolls, silt fences, check dams and devices to slow the velocity of runoff. Materials containing monofilament or plastic will not be used. The contractor will stabilize and equip construction site entrances and exits with tire washing capability. No discharge of pollutants from vehicle and equipment cleaning is allowed in any storm drains or water courses.

- Concrete will be excluded from surface water for a period of 30 days after it is poured/ sprayed. During that time the concrete will be kept moist, and runoff from the concrete will not be allowed to enter any water body. Commercial sealants may be applied to the concrete surface where difficulty in excluding flow for a long period may occur. If sealant is used, water will be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it will be prevented from flowing towards surface water. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.
- Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the creek channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek will be positioned over drip pans. Any equipment or vehicles driven and/or operated above or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.
- Refueling, cleaning or maintenance of mobile construction equipment and vehicles will not occur within 50 feet of any water body, or anywhere that spilled fuel could drain to a water body. Refueling of stationary equipment requiring breakdown and setup to move will remain in place. All equipment will be refueled with appropriate drip pans, absorbent pads, and water quality Best Management Practices. Equipment and vehicles operating in the project area will be checked and maintained daily to prevent leaks of fuels, lubricants, or other liquids.
- Construction access, staging, storage, and parking areas will be located within the project right of way outside of any designated ESA or outside of the right of way in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
- Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, covering temporary access road entrances and exits with rock (rocking), and covering temporary stockpiles when weather conditions require. A speed limit of 15 miles per hour in unpaved areas of the project footprint will be enforced to reduce dust and excessive soil disturbance.

4.5.3 ANIMAL SPECIES

4.5.3.1 Affected Environment

The following special-status animal species that are not listed as threatened or endangered were determined to have some potential to occur within the project area: foothill yellow-legged frog

(*Rana boylii*), western pond turtle (*Emys* (=*Clemmys*) *marmorata*), white-tailed kite (*Elanus leucurus*), burrowing owl (*Athene cunicularia*), and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectans*).

In addition to the white-tailed kite and burrowing owl, eight other special-status migratory bird species were identified as having some potential to nest, forage, roost, or winter within or near the project area. These species include five raptors (birds of prey): Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), golden eagle (*Aquila chrysaetos*), long-eared owl (*Asio otus*), and merlin (*Falco columbarius*). There are also three passerine species (perching birds) — yellow warbler (*Dendroica petechia brewsteri*), loggerhead shrike (*Lanius ludovicianus*), and purple martin (*Progne subis*) — that have the potential to occur within or near the project area. These species and their habitats are described in Section 2.3.3.2 of the FEIR/EA.

4.5.3.2 Environmental Consequences

Possible impacts to the foothill yellow-legged frog, western pond turtle, San Francisco dusky-footed woodrat, burrowing owl, and migratory birds other than the white-tail kite have not changed from those reported in the FEIR/EA. Changes in impacts to the white-tailed kite are described below.

White-tailed Kite
The ornamental and native trees at Location 5 could potentially act as suitable nesting habitat for white-tailed kites and the project may result in impacts to the species at this location. White-tailed kite will not be affected at Locations 1-4, because the denser redwood and coast live oak forests in these areas do not provide appropriate breeding habitat for the species. Potential impacts at Location 5 include nest disturbance or abandonment during incubation, nestling, or fledging stages; temporary shifts in foraging patterns or territories; noise or light pollution; and winter roost abandonment (if this species were to nest near this location at the time of construction). The project will affect an estimated 850 trees, 223 of which are within the project footprint at Location 5. Although no permanent impacts to white-tailed kite are anticipated, temporary impacts can be avoided and/or minimized by implementing the minimization measures described in Section 4.5.3.3 below.

4.5.3.3 Avoidance, Minimization and/or Mitigation Measures
Some of the measures below have been revised since the FEIR/EA.

Foothill Yellow-legged Frog
The measures described in Section 4.5.4.3 to avoid and minimize impacts to the California red-legged frog will also avoid and minimize impacts to the foothill yellow-legged frog.

Western Pond Turtle
The measures to avoid or minimize impacts to California red-legged frog (Section 4.5.4.3) together with the following measures will avoid or minimize impacts to western pond turtle:

- A biologist approved by CDFW will survey the work site in the vicinity of Location 4 no more than 48 hours before the start of work activities for signs of the western pond turtle, western pond turtle nesting activity (recently excavated nests, nest plugs) or nest depredation

(partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Pre-construction surveys to detect western pond turtles will focus on potentially suitable aerial and aquatic basking habitat (logs, branches, rootwads, riprap), and the shoreline and adjacent warm, shallow waters, where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Pre-construction surveys to detect western pond turtles and their nesting activity will be concentrated within a radius to be agreed upon with CDFW of suitable aquatic habitat and will focus on areas along south- or west-facing slopes with bare, hard-packed clay or silt soils or sparse vegetation consisting of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist will contact CDFW to determine whether relocation and/or exclusion buffers are appropriate. If CDFW approves of moving the animal, a qualified biologist will be allowed sufficient time to move the western pond turtle from the work site before construction activities begin.

White-tail Kite and Other Migratory Birds

To ensure compliance with the Migratory Bird Treaty Act (16 U.S.C. 703-712) and California Fish and Game Code (§§3503, 3511, and 3513), and minimize impacts to the white-tailed kite and other migratory birds, the following species-specific avoidance and minimization measures will be implemented:

- If project activities will occur between February 15 and September 1, a qualified biologist approved by CDFW will conduct pre-construction surveys for nesting birds no more than one week before construction. Surveys will consist of multiple days of observations. If nesting birds are found, a 50-foot buffer will be established around the nest for non-raptors and a 300-foot-radius buffer will be established for raptors, such as hawks, owls, and eagles. The area will be avoided. A buffer of less than 300 feet, but no less than 100 feet, may be used if a qualified biologist, experienced in raptor behavior, is assigned to monitor the behavior of any raptor nesting within 300 feet of project activities. The qualified biologist will have authority, through the Resident Engineer, to order the cessation of all project activities within 300 feet of any raptor nest if the birds exhibit abnormal nesting behavior, which may cause reproductive failure (nest abandonment and loss of eggs and/or young). Abnormal nesting behaviors that may cause reproductive harm include, but are not limited to: defensive flights/vocalizations directed towards project personnel, standing up from a brooding position, and flying away from the nest. Project activities within 300 feet of the nest will not resume until the qualified biologist has consulted with CDFW and both the qualified biologist and CDFW confirm that the bird's behavior has normalized or the young have left the nest.

Burrowing Owl

In addition to the measures above for migratory birds, the following precautionary measures will be taken to avoid or minimize impacts to the burrowing owl at Location 5, where ground squirrel and vole burrows provide potential nesting and foraging habitat:

1. Within 30 days before construction begins, burrowing owl preconstruction surveys will be conducted at Location 5 of the project area by a qualified biologist in accordance with CDFW's Staff Report on Burrowing Owl Mitigation and the California Burrowing Owl Consortium's Burrowing Owl Survey Protocol and Mitigation Guidelines. Preconstruction surveys, consisting of winter season surveys (between December 1 and January 31) and nesting season surveys (between April 15 and July 15), will be conducted for Location 5 of

the project area and within a 500-foot buffer where possible, to identify and map active burrowing owl burrows. Surveys will consist of walking transects of no more than 100 feet apart.

2. Occupied burrows will not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFW verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

3. If burrowing owls are detected in the project footprint or within 500 feet of the project footprint, a non-disturbance buffer will be established within a 160-foot radius surrounding occupied burrows during the non-breeding season (September 1 through January 31) or within a 250-foot radius surrounding occupied burrows during the breeding season of February 1 through August 31.

4. If avoidance is not feasible and owls must be moved away from the disturbance area, one of the two following passive relocation techniques will be used rather than trapping. At least one full week will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

   Passive Relocation – With One-Way Doors. Owls will be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors around burrow entrances to allow the birds to leave the burrow, but not return. One-way doors (e.g., modified dryer vents) will be left in place 48 hours to ensure owls have left the burrow before excavation. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily for 1 week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside.

   Passive Relocation – Without One-Way Doors. Two natural or artificial burrows will be provided for each burrow in the affected project area. The project area will be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows may then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

San Francisco Dusky-Footed Woodrat

Potential presence of the San Francisco dusky-footed woodrat can be avoided by taking the following avoidance and minimization measures:

1. Prior to the start of construction, a biologist will conduct a survey of the project area and a surrounding 30-foot buffer to determine the location of existing woodrat dens. Survey data will be recorded and mapped in relation to the construction footprint.

2. A 30-foot buffer will be established around dens that can be avoided. All vegetation in the buffer area will be retained and nests will not be disturbed.

3. If active woodrat stick nests are found within the project footprint area at the time of construction, and cannot be avoided, trapping and relocation measures, developed in conjunction with CDFW and described in the Streambed Alteration Agreement, will be implemented to ensure that the project footprint is clear of woodrat nests before construction. The trapping will occur outside of the breeding period, between September and December, and will not be conducted during heavy rains or full moons. Trapping must be done by a qualified biologist with a current CDFW permit to trap.

4.5.4 THREATENED AND ENDANGERED SPECIES

Caltrans consulted with CDFW concerning the California tiger salamander, which was recently listed as threatened by CDFW. Caltrans also initiates consultation with USFWS when a project has the potential to affect a federally listed species and/or affect or adversely modify federally-designated critical habitat. Formal consultation with USFWS was first initiated in June of 2009 with the submission of a biological assessment. Biological Opinion 81420-2009-F-1058-2 was issued by the USFWS for the California red-legged frog and the California tiger salamander on July 14, 2010, and was accepted by Caltrans on October 19, 2010. As a result of changes to the project, an amended Biological Opinion, 81420-2009-F-1058-R001, was issued by USFWS on May 29, 2012. The National Marine Fisheries Service (NMFS), which regulates potential impacts to endangered anadromous fish and their critical habitat, was consulted about the project's potential affect on steelhead.

4.5.4.1 Affected Environment

Three species listed as threatened or endangered are known to occur within the project limits. These species include the California red-legged frog (*Rana draytonii*), the California tiger salamander (*Ambystoma californiense*) and the South Central California Coast steelhead (SCCC steelhead) (*Oncorhynchus mykiss*). The California red-legged frog is federally listed as threatened and is a California species of special concern. The California tiger salamander (CTS) is federally listed as threatened and has also recently been state listed as threatened by CDFW.

A description of the California red-legged frog and its habitat is described in the FEIR/EA. Because California tiger salamander recently became a state-listed species, Caltrans biologists did further analysis on habitat connectivity in the project area, which is summarized below. Steelhead information has also been added below, based on biological studies for the Supplemental Natural Environment Study (NES). The South Central California Coast (SCCC) steelhead ESU was federally listed as threatened in 1997, and the National Marine Fisheries Service (NMFS) affirmed the listing of the distinct population segment of SCCC steelhead in 2006. SCCC steelhead is also a California species of special concern.

California Tiger Salamander

A current review of the California Natural Diversity Database (CDFG 2012) showed that no new occurrences of CTS have been recorded since the 2009 NES was developed. Only Location 5 has suitable habitat for CTS. Since the 2009 NES, Caltrans has conducted further analyses using available literature, aerial imagery and a Geographic Information System (GIS) to examine CTS habitat fragmentation, connectivity and potential impediments to dispersal surrounding Location 5 with an emphasis on land between Location 5 and the nearest known CTS locations 1.3 miles to the northeast. Using these analyses with the most conservative assumptions, and further

consultation with CDFW, Caltrans has concluded the area surrounding the project site is inaccessible to CTS; therefore it is unlikely that CTS occupies Location 5 of the project area.

The ponds with recorded CTS are located within undeveloped and sparsely wooded grasslands. Grasslands surrounding these CTS ponds likely provide upland dispersal habitat given the life cycle history of CTS. Between these CTS ponds and Location 5 of the proposed project the landscape includes: (1) low-density rural residential development; (2) two relatively large ponds that appear to be perennial; (3) perennially flowing Uvas Creek; (4) a large nursery operation; (5) interspersed grassland; (6) vineyards; and (7) roads such as Watsonville Road. Based on the Federal Register and the scientific literature, the following fragment CTS habitat or are considered potential barriers to the dispersal of CTS: low-density residential development, predators, structures, intensive agriculture inactive burrows, and roads.

Low-density residential development contributes to habitat loss, fragmentation and degradation (USFWS 2005b). Structures prevent salamanders from reaching their breeding sites because their migratory corridors are disrupted (USFWS 2005b). Low-density housing areas occur adjacent to the grasslands inhabited by CTS and occur intermittently between Uvas Creek and the project location. Low-density development may contribute to higher desiccation risks associated with traversing paved areas, traffic related mortality, and predation by pets (Halupka 2012).

Based on aerial imagery dating back to 1993, the two large ponds adjacent to the residential development and grasslands appear to contain water year-round. Due to their perennial nature, these two ponds may have the capacity to support predatory fish and bullfrogs (USFWS 2005b). Thus, these two large ponds may not support CTS breeding habitat.

Uvas Creek, which flows perennially, lies southwest of the large ponds. This reach of Uvas Creek flows southeast crossing Watsonville Rd. approximately 0.99 miles north of Location 5. Approximately 2.12 river miles downstream of Watsonville Rd., Uvas Creek crosses SR 152 approximately 1.08 miles to the east of Location 5. Construction of the Uvas Dam in 1957 led to gradual yet substantial changes to the creek and the associated riparian area (Casagrande 2010). Flows within this reach now persist through the summer and fall. Dam releases between winter storms produce flows up to 160 cubic feet per second (cfs). Flow regulation has reduced the frequency and magnitude of storm-related channel scour events and has facilitated changes in riparian vegetation.

Riparian saplings of willow and alder species have proliferated where interspersed sycamores had previously persisted. Increased tree density has subsequently led to higher canopy densities, which may impede CTS dispersal (USFWS 2004). Casagrande (2010) observed that pools are the most prevalent aquatic habitat type at the Watsonville Rd. crossing yet, it also contained a greater abundance of fast water habitats (riffle, run, head of pools) relative to downstream reaches.

Drainage pipes have been observed along this reach discharging highly turbid waters and steelhead densities were reportedly lower at this reach relative to other species indicating that any potentially toxic effects of these discharges may impact different species disproportionately (Casagrande 2010). Agricultural contaminants may reduce the long-term viability of CTS and

toxicants do not need to be present in lethal concentration to be harmful (USFWS 2004). In addition, Uvas Creek contains populations of exotic predatory fish including sunfish (Lepomis spp.), carp (Cyprinus carpio), and mosquito fish (Gambusia affinis) (URS 2013). Raccoons (Procyon lotor), bullfrogs (Rana catesbeiana) and crayfish (Procambarus spp.) have also been observed in Uvas Creek (URS 2013). All of these characteristics of Uvas Creek create a potential barrier to dispersal of CTS.

Because Uvas Creek is perennially flowing it is unlikely CTS breeding habitat (USFWS 2005). Off-channel pools, formed by temporary high water filling floodplain depressions, offer potential CTS breeding habitat. However, due to the prevalence of predatory species in Uvas Creek, successful colonization of these ponds may be precluded (URS 2013). The potential for seasonal flooding in Uvas Creek poses the risk of flushing egg masses, larvae and metamorphs from off-channel pools (URS 2013).

The 2009 NES noted that the extent and frequency of potential agricultural and viticultural land management practices like harvesting, pesticide and fertilizer applications, or rodent/pest control, are unknown. Generally, viticultural practices include pruning the vines between January and March, and harvesting the grape crop between September and November, both of which are performed either by machine or by hand. Vineyards are typically planted with a cover crop of native grasses in between the vine rows, and the fields are drip irrigated throughout the growing season until as late as September. Pesticides use is typically limited to elemental sulfur, which is applied as a wetable powder, and although herbicides may be used in new fields, their application tapers off as a vineyard matures. These practices may vary between the types of grape being grown, and also depend on whether the grapes are grown organically. Where ground squirrels and gophers inhabit or become pests in vineyards, a pest control program may be in place. Pest control practices may inadvertently negatively affect CTS since inactive burrow systems become unsuitable over time and usually collapse within 18 months following cessation of burrowing mammal use (USFWS 2005b).

Other agricultural/commercial practices include a large open air nursery operation. This facility covers an area of approximately 115 acres. Approximately 0.88 miles of the facility parallels Uvas Creek. Specific activities at this site are unknown; however, substantial numbers of relatively large planter boxes are prevalent according to available aerial imagery. The number and density of structures at this facility may result in barriers to CTS dispersal. USFWS (2005b) notes that structures prevent salamanders from reaching their breeding sites because their migratory corridors are disrupted.

Roads may fragment CTS habitat and impede CTS movement along migratory corridors and lead to increased road crossing mortality during migration events (USFWS 2005b).
While an individual barrier to dispersal is to some degree porous and does not represent an absolute barrier to CTS dispersal, the number of barriers to dispersal from known CTS occurrences or breeding ponds make it unlikely that CTS can disperse into the project site.

The GIS analysis of habitat connectivity further demonstrates the probability of CTS dispersing into the project site is low given that connectivity from proximal ponds to the project site is poor. All variable inputs into the GIS analysis and model assumptions were conservative. To conduct

the GIS analysis, all potential breeding ponds were digitized from an aerial imagery layer, the adjacency and connectivity between ponds was determined, and potential barriers that can disrupt the connectivity were identified.

The analysis demonstrated that the area surrounding the project site is inaccessible to CTS, therefore it is unlikely that CTS occupy Location 5 of the project area. All ponds within 0.7 miles of the project site occur in a fragmented landscape and are isolated from each other and from the project site. The viewshed analysis also indicated that the project site falls within an inaccessible area.

Although there is a possibility that CTS could be present at Location 5, it is beyond the known maximum CTS dispersal distance from the nearest recorded CTS occurrences. The effect of the potential CTS dispersal barriers and habitat fragmentation makes the ruderal, agricultural and landscaped areas within Location 5 unlikely to be inhabited by CTS. In addition, Caltrans avoidance and minimization measures may further diminish the possibility that CTS may be disperse into the project site at Location 5 from known occurrences or breeding ponds.

Through consultation with USFWS, Caltrans determined that suitable habitat for CTS is only present at Location 5 of the project. Location 5 was deemed to have suitable habitat because of the presence of agricultural and landscaped lands with small mammal burrows that could provide suitable dispersal and aestivation habitat to the CTS. In consultation with CDFW, CDFW staff noted that CTS was unlikely to occur within the project footprint.

Steelhead

Between 1997 and 2000, 10 evolutionary significant units (ESUs) of West Coast steelhead were federally listed as either endangered or threatened by the National Marine Fisheries Service (NMFS). The South Central California Coast (SCCC) steelhead ESU was listed as threatened in 1997, and NMFS affirmed the listing of the distinct population segment of SCCC steelhead in 2006. SCCC steelhead is also a California species of special concern. The SCCC distinct population segment of steelhead includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California (NMFS 2006).

Portions of Bodfish Creek and Blackhawk Canyon Creek, within and near the project area, have been designated as SCCC steelhead critical habitat. Critical habitat along Bodfish Creek stretches from Location 5 upstream through Location 4. The portion of Bodfish Creek that parallels Locations 1, 2, and 3 of the project has not been designated as critical habitat because these locations are above a hydraulic drop (small waterfall) that is just upstream of Location 4. The waterfall is a result of large boulders in the stream, and this is considered a barrier to steelhead movement. This project does not occur in or near Essential Fish Habitat as classified by the Magnuson Act.

Hecker Pass parallels and is adjacent to Bodfish Creek at Location 4, and a survey conducted on August 1, 2008, found steelhead in Bodfish Creek along the entire stretch of Location 4. Numerous juvenile SCCC steelhead were observed within Bodfish Creek in the vicinity of Location 4 of the project. Locations 1, 2, and 3 parallel Bodfish Creek upstream of this barrier, but steelhead have not been observed in the creek adjacent to these locations of the project.

Steelhead have been observed in Bodfish Creek near Location 5; however, Location 5 runs through a residential area and work will not be occurring within or near the riparian corridor of Bodfish Creek itself at Location 5.

4.5.4.2 Environmental Consequences

California Red-Legged Frog

If California red-legged frogs are present within the project footprint during construction, potential take could occur in the form of capture, harm, harassment, injury, and mortality as a result of habitat loss and degradation, construction-related disturbance, or capture and relocation. Temporary effects include disturbance and vegetation trampling due to clearing and equipment access, and permanent effects include habitat loss resulting from roadway widening and soil nail wall construction.

The project will result in approximately 7.32 acres of temporary and 5.53 acres of permanent impacts to potential California red-legged frog dispersal and upland habitat including redwood forest, coyote brush scrub, coast live oak forest, purple needle grass/native grassland, and landscaped and agricultural lands.

The project will not impact the potential for the frog to cross SR 152. The project will create only very localized widening (up to 12 feet for short distances) in Locations 1 through 5. No median concrete barrier will be installed. All existing culverts will remain in place and allow amphibian passage under the roadway. However, even with the implementation of the avoidance and minimization measures recommended in this document, there would be loss of potentially suitable upland dispersal and aestivation habitat and some small chance of direct take.

California Tiger Salamander

Caltrans biologists consulted with CDFW and USFWS concerning possible take of California tiger salamander, because the species is both state and federally listed. USFWS determined that if California tiger salamander (CTS) is found in the project footprint during construction, take may occur. However, in consultation with CDFW, CDFW staff noted that CTS was unlikely to occur within the project footprint.

In the unlikely event that CTS are present in the project footprint during construction, “take” may occur in the form of capture, harm, harassment, injury, and mortality to adult CTS. According to the federal Endangered Species Act (FESA), “take” is defined as a means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

Meanwhile, Section 2080 of the Fish and Game Code prohibits “take” of any state-listed endangered or threatened species. Pursuant to Section 86 of the Fish and Game Code, “take” is defined as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” The California Endangered Species Act (CESA) definition of take does not include habitat

loss. While similar, FESA has a lower threshold for take than CESA, because it deems harassment as a form of take, while CESA does not. In the unlikely event that a CTS is encountered on the project site at Location 5, Caltrans will not handle, capture, or relocate the individual. Instead the CTS will be allowed to leave on its own volition, and construction activities will not resume within 50 feet of the individual until the CTS vacates the project site. A biological monitor will be present on site to monitor the behavior of the CTS individual for signs of stress.

The project will result in approximately 2.07 acres of temporary and 2.25 acres of permanent impacts to potential California tiger salamander upland dispersal and aestivation and dispersal habitat in landscaped and agricultural lands as Location 5. Temporary impacts in Location 5 will result from construction activities, staging, and access. All temporary impacts at Location 5 will be revegetated after the conclusion of construction activities.

The project will neither influence nor affect the potential for the California tiger salamander to cross SR 152. The project will create only very localized widening (up to 12 feet for short distances) at Location 5. No median concrete barrier will be installed. All existing culverts will remain in place and allow amphibian passage under the roadway.

Even with the implementation of the avoidance and minimization measures recommended in this document, though, there will be loss of potential upland, aestivation, and dispersal habitat.

Steelhead

Critical habitat only runs adjacent to Location 4 of the project. Work at Location 5 will occur well outside the riparian corridor, and Locations 1, 2, and 3 are not adjacent to designated critical habitat.

Because of the variation within all steelhead life stages, steelhead may be present in Bodfish Creek any time of the year. Caltrans does not anticipate steelhead to be impacted at Locations 1, 2, and 3, because steelhead are not known to occur in this area of the project. However, steelhead may be present at Location 4. A survey conducted in 2008 for Caltrans found numerous juvenile steelhead in Bodfish Creek near Location 4. Work in the riparian corridor will be limited to the dry season (June 15 to October 15), and adult steelhead are not anticipated to be migrating during this period, though juveniles may be present.

Although individual steelhead have the potential to be impacted by the Hecker Pass project, the direct take of steelhead individuals is not anticipated because of the planned avoidance and minimization measures that will be implemented as described in the following section.

The proposed project will occur above the ordinary high water mark (OHWM) that defines the lateral extent of SCCC steelhead critical habitat. However, within the 2005 critical habitat rule for steelhead, NMFS noted that federal agencies must be aware of activities outside the OHWM, because upslope work can adversely affect instream habitat quality.

While Caltrans will not be working directly within critical habitat, project construction activities could affect critical habitat through the loss of riparian trees. Tree removal in and near the riparian corridor could adversely affect steelhead critical habitat through the loss of fallen leaves

and other organic material, an increase in sediment deposition that could smother spawning locations and eggs, and a reduction in shade that could result in increased water temperatures. Although upstream tree removal from Locations 1, 2, and 3 could have an indirect effect on downstream critical habitat, the number of riparian trees to be removed from these areas is very small compared to what is present in the surrounding forest canopy. Therefore, the reduction in leaf material input to areas downstream from these trees is likely immeasurable. Increases in runoff from new paved surface are expected to be minor, because most of the runoff flowing through the project's draining systems is from un-paved, upland areas. Downstream effects on Location 5 as a result of upstream project activities will also likely be negligible since residential properties are between the project area and Bodfish Creek. Because of Best Management Practices to control erosion and sediment, Caltrans anticipates that only negligible amounts of sediment will enter Bodfish Creek at all project locations.

Most of the work within or near the riparian corridor within critical habitat will occur at Location 4. Construction work at this location has the highest potential to affect steelhead critical habitat. Approximately 80 trees on the south side of SR 152 at this location are slated for removal. However, the area is densely forested and even without these 80 trees, there will be abundant tree cover along this stretch of Bodfish Creek. Caltrans does not anticipate there to be a measurable impact on instream water temperature or shade at this location from planned tree removal.

In summary, the number of trees to be removed from the riparian habitat along Bodfish Creek is small compared to the number of trees that will remain after the project, and erosion control measures should prevent sediment from entering the creek to the point that it would diminish migration, rearing, or spawning habitat quality. Caltrans obtained a concurrence letter from NMFS on March 13, 2013 that the proposed project "may affect, but is not likely to adversely affect," SCCC steelhead or its critical habitat.

4.5.4.3 Avoidance, Minimization and/or Mitigation Measures

California Red-Legged Frog

Because California red-legged frogs could be present throughout the project limits, temporary and permanent impacts to habitat, which does not include existing hardscape features such as the roadway or road shoulder, would be mitigated by habitat restoration/replacement.

Approximately 5.53 acres of permanent upland dispersal and aestivation habitat loss will be mitigated at a 3:1 ratio, resulting in 16.59 acres of mitigation for California red-legged frog upland dispersal and aestivation habitat. Temporary impacts of 7.32 acres will be mitigated at a 1.1:1 ratio, for a total of 8.06 acres. Caltrans may provide approximately 7.32 acres onsite and 0.732-acre offsite. Mitigation for impacts to CRLF habitat would total approximately 24.64 acres.

In addition to the above habitat restoration/replacement, the following measures to avoid and minimize impacts to the California red-legged frog (CRLF) will be implemented:

1. Seasonal Avoidance: Construction actions will be scheduled to minimize effects on listed species and habitats. Except for limited vegetation clearing (necessary to minimize effects to nesting birds), work will be conducted from April 15 through October 15, to avoid the rainy season. Work within the riparian area will be conducted from June 15 to October 15.

2. Environmental Awareness Training: Before any construction activities, a qualified biologist will conduct an education program for all construction personnel. At a minimum, the training will include a description of CRLF, CTS, and other listed species; migratory birds and their habitats; the occurrence of these species within the action area; an explanation of the status of these species and protection under FESA, CESA, and the Migratory Bird Treaty Act (MBTA); the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating they attended the program and understand all the avoidance and minimization measures and implications of all applicable environmental laws.

3. Pre-construction Surveys: Pre-construction surveys will be conducted by a USFWS-approved biologist immediately prior to the initiation of any ground-disturbing activities within or adjacent to suitable CRLF or CTS habitat. These surveys will comprise walking transects while conducting visual encounter surveys within areas that will be subject to staging, vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. All fossorial mammal burrows will be inspected for signs of CRLF or CTS usage to the maximum extent practicable. If it is determined that a burrow may be occupied by a CRLF, the burrow will be excavated by hand, if possible, and the individual(s) relocated or allowed to leave on its own volition. CRLF will be relocated in accordance with the observation and handling protocol promulgated by USFWS.

4. Environmentally Sensitive Area Fencing (ESA): Prior to the start of construction, ESAs will be clearly delineated using high-visibility orange fencing. The ESA fencing will remain in place throughout the duration of the project, while construction activities are ongoing and will prevent the encroachment of construction equipment and personnel from entering sensitive habitat areas. The final project plans will depict all locations where ESA fencing will be installed and how it will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. In addition, hydrological features (e.g., topographic depressions, drainage ditches, culverts, etc.) outside of the project footprint will not be manipulated (e.g., re-routed, dredged, filled, graded, etc.).

5. Wildlife Exclusion Fencing: Before the start of construction, Wildlife Exclusion Fencing (WEF) will be installed along the project footprint in all areas where CRLF could potentially enter the project site. The final project plans will show where and how the WEF will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of the project, while construction activities are ongoing, and will be regularly inspected and fully maintained. Upon project completion the WEF will be completely removed and the areas returned to their original condition or better.

6. Procedure for California Red-Legged Frog Discovery Onsite: If a California red-legged frog, or any amphibian that construction personnel believe may be this species, is encountered

during project construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:

- All work within 50 feet of the animal will immediately cease and the resident engineer and USFWS-approved biologist will be notified. Based on the professional judgment of the biologist, if project activities can be conducted without harming or injuring the animal(s), it may be left at the location of discovery and monitored by the USFWS-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of the animal without a biological monitor present. If the biologist determines that construction cannot proceed with CRLF present in the work area, then construction will not resume until the CRLF leaves the work area or can be relocated.
- Should relocation of CRFL be necessary, the following steps will be followed:
    - Prior to handling and relocation, the USFWS-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (Service 2005a). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle amphibians after working in other aquatic habitats.
    - CRLF will be captured by hand, dip net or other USFWS-approved methods and will be transported by hand, dip net or temporary holding container, and released as soon as practicable within the same day of capture. Handling of CRLF will be minimized to the maximum extent practicable. Holding containers and dip nets will be thoroughly cleaned and disinfected prior to transporting to the action area and rinsed with freshwater onsite immediately prior to use unless doing so would result in the injury or death of the animal(s) as a result of a time delay.
    - CRLF will be relocated to the nearest suitable habitat outside of the area where actions would not result in harm or harassment and released on the same side of SR 152 where it was discovered. The individual(s) will be released within suitable habitat in the Caltrans right of way or another property acceptable to the property owner, and USFWS will be notified. If suitable habitat cannot be identified, USFWS will be contacted to determine an acceptable alternative. Transporting CRLF to a location other than the location described herein will require written authorization of the USFWS.

7. Entrapment Avoidance: To prevent the inadvertent entrapment of California red-legged frog or other animals during construction, all excavated, steep-walled holes or trenches more than one-foot deep will be covered with plywood or similar materials at the end of each working day, or the holes or trenches will contain one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. All pipes, culverts or similar structures stored in the action area overnight will be inspected before they are moved, capped or buried. If at any time a listed species is discovered, the resident engineer and a USFWS-approved biologist will be immediately informed. The USFWS-approved biologist will determine if relocating the species is necessary and will work with USFWS and CDFW before handling or relocating unless otherwise authorized.

8. Prohibition of Erosion Control Materials Potentially Harmful to CRLF or CTS: To prevent CRLF and CTS from becoming entangled, trapped or injured, erosion control materials that use plastic or synthetic mono-filament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include fibers such as jute or twine, or tackified hydroseeding compounds.

9. Biological Monitors: A USFWS-approved biologist will be present onsite to monitor for CRLF and CTS. Through communication with the resident engineer or their designee, the biologist may stop work if deemed necessary for any reason to protect listed species and will advise the resident engineer or designee on how to proceed accordingly. The biologist will be present during all construction activities where a listed species could occur. The biologist will conduct clearance surveys at the beginning of each day within or adjacent to suitable CRLF and CTS habitat and regularly throughout the workday when construction is occurring within or adjacent to suitable CRLF and CTS habitat.

10. Minimize Nighttime Work: To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active species.

11. Vegetation Removal: Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants to resprout after construction. A USFWS-approved biologist will be present during all vegetation clearing and grubbing activities to monitor for the presence of CRLF and CTS in the project footprint. If at any point CRLF, CTS, or other listed species are discovered during these activities, various measures discussed elsewhere in this section will be taken to avoid and minimize the harm and harassment of these species. All clearing and grubbing of woody vegetation will occur by hand or using light construction equipment, such as backhoes and excavators. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses and environmental clearances for properly disposing of such materials.

12. Construction Site Restrictions: In addition to restrictions already listed or listed under steelhead measures below, no pets will be allowed in the project area and no firearms will be allowed except for authorized law enforcement or security personnel.

California Tiger Salamander

The proposed project will permanently impact approximately 2.25 acres potential CTS habitat. Caltrans has agreed with USFWS to mitigate this impact at a 3:1 ratio, which will result in approximately 6.75 acres of mitigation for CTS habitat. The proposed project will also temporarily impact approximately 2.07 acres of potential CTS habitat that will be mitigated in-kind at a restoration ratio of 1.1:1. This will result in approximately 2.28 acres of restored upland dispersal and aestivation habitat, of which 2.07 acres will be provided onsite and 0.207-acre offsite. Therefore, mitigation for CTS will total approximately 9.02 acres of upland dispersal and aestivation habitat.

In addition to the above habitat restoration/replacement and some of measures to avoid or minimize impacts to CRLF described in Section 4.5.4.3 above, the following measures will be implemented to minimize impacts to CTS:

1. Discovery of CTS: If CTS are found, all work within 50 feet of the animal will immediately cease and the resident engineer and USFWS-approved biologist will be notified. Based on the professional judgment of the biologist, if project activities can be conducted without harming or injuring the animal(s), it may be left at the location of discovery and monitored by the USFWS-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of the animal without a biological monitor present. If the biologist determines that construction cannot proceed with CTS present in the work area, then construction will not resume until the CTS leaves the work area. Caltrans does not have state authorization to take or handle CTS. In the unlikely event CTS should enter the work site, construction will not resume until the CTS leaves the work area on its own volition.

2. Wildlife Exclusion Fencing: At Location 5, WEF will be installed during the CTS breeding season, typically from November through April, based on habitat suitability, so the likelihood of the species occupying the work site at the beginning of construction is greatly reduced. Because no CTS breeding habitat is present within Location 5, Caltrans does not anticipate CTS to be present during the breeding season when WEF at Location 5 would be installed. In cooperation with USFWS and CDFW, the location of the fencing will be determined by the resident engineer and agency-approved biologist. The final project plans will show where and how the WEF will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of the project, while construction activities are ongoing, and will be regularly inspected and fully maintained. Upon project completion the WEF will be completely removed and the areas returned to their original condition or better.

Steelhead

The project excludes modifications to the only culvert that would be potentially passable to steelhead (at Location 4), which is the Blackhawk Canyon Creek culvert that conveys water under SR 152. The other culverts to be modified at Locations 1, 2, 3, and 4 occur at ephemeral tributaries to Bodfish Creek, and work within these areas will occur during the dry season

Other specific measures to avoid and minimize impacts to steelhead are summarized below:

1. Work within the riparian corridor will be restricted to June 15 to October 15, which is during the dry season. Restricting work to the dry season will minimize the chances work will be conducted during rain events that could result in sediment inputs to Bodfish Creek and its tributaries.

2. Before any ground disturbance occurs on the project site, the boundaries of the project area will be clearly delineated with orange plastic, high-visibility construction fencing (i.e., ESA fencing) or solid barriers to prevent workers or equipment from inadvertently straying from the project area. The contractor will do this in consultation with a Caltrans-approved biologist.

3. Silt fencing or other erosion control measures will be installed to prevent sediment and pollutant discharges to State and Federal waters.

4. Temporary erosion control measures will be implemented on all disturbed areas. Coir rolls or straw wattles will be installed along or at the base of slopes during construction to capture sediment.

5. Permanent erosion control measures will be implemented upon completion of construction. All disturbed areas will be re-vegetated with appropriate native, non-invasive species or non-persistent hybrids that will serve to stabilize site conditions.

6. A Storm Water Pollution Prevention Plan and erosion-control best management practices will be implemented to minimize water pollution during project construction.

7. All material stockpiling and staging areas will be within the project right of way in non-sensitive areas or at designated disturbed/developed areas outside of design construction zones.

8. All ground-disturbing activities will be restricted to the dry season (April 15 to October 15).

9. To avoid attracting predators of protected species, all food-related trash items such as wrappers, cans, bottles, and food scraps will be enclosed in sealed trash containers and removed at the end of each working day from the site.

10. Maintenance and refueling areas for equipment will be kept a minimum of 50 feet from from water courses.

11. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

12. No contact will be allowed between any live stream and uncured concrete.

13. Groundwater that comes in contact with wet concrete, such as within bridge footing excavations (if necessary), will not be allowed to enter any creek or wetlands, but will be isolated for proper disposal or treatment.

14. Heavy equipment will not be operated in the active flow channel of any creek.

15. Complete diversion or damming of surface flows will not be allowed.

16. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved as well as improved roads.

17. The limits of the construction area will be clearly marked. Before commencing construction activities, the contractor will define construction vehicle parking areas and all access.

18. To the maximum extent practicable, any borrow material will be certified non-toxic and weed free.

19. All construction-related materials will be removed after construction activities are completed. The temporary construction easements and staging areas will be cleaned up, re-contoured to original grade, and re-vegetated with appropriate native species, as necessary.

20. Permanent erosion control, including soil stabilization measures such as hydroseeding and coir netting, will be applied to all temporarily affected project areas to minimize erosion after construction.

21. Caltrans will not work when 0.25 inch or more of precipitation is forecasted to occur. Seventy-two hour weather forecasts from the National Weather Service will be consulted.

22. Following any precipitation event, work will not begin again until runoff ceases and there is a 30% or lesser chance of precipitation for the following 24-hour period.

23. No activity of the project will begin unless its associated erosion control measures can be completed prior to the onset of precipitation. After any storm event, the contractor will inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sediment problems and take corrective action as needed.

24. All temporarily impacted waters will be graded and restored to their pre-project conditions. Permanent impacts, in the form of new or modified culverts and roadside ditches, would be constructed so as to closely resemble or improve on the pre-project conditions, wherever possible.

25. The slurry that is produced by the use of water during drilling will be fully contained and disposed of at an approved facility and will not be allowed to enter any drainage systems or waterways.

4.6 PALEONTOLOGICAL RESOURCES

4.6.1 Regulatory Setting

The following state laws pertain to paleontological resources. No local regulations pertaining to paleontological resources were identified.

<u>California Environmental Quality Act</u>
The California Environmental Quality Act (CEQA) requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or a unique geological feature (CEQA Guidelines, Appendix G (V)c). If an impact is significant, the CEQA Guidelines require “feasible measures which could minimize significant adverse impacts.”

Public Resources Code Section 5097.5

California Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

Caltrans Guidelines

Caltrans uses a three-part scale for assessing the sensitivity or potential for a particular rock unit to contain paleontological resources (Caltrans, 2007). In most cases, decisions about how to manage paleontological resources must be based on this potential because the actual situation cannot be known until construction excavation for the project is underway:

High Potential. Geologic units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant non-renewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits, gravels deposits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: (1) abundant vertebrate fossils; (2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than recent, including *Neotoma* (sp.) middens; or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

Low Potential. This category includes sedimentary rock units that: 1) are potentially fossiliferous, but have not yielded significant fossils in the past; 2) have not yet yielded fossils, but possess a potential for containing fossil remains; or 3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a qualified Principal Paleontologist must evaluate the resource. If the resource is determined to be significant, monitoring and mitigation is required.

No Potential. Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing

significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern and no further action taken.

4.6.2 Affected Environment

Caltrans performed a paleontological reconnaissance of the project site on April 12, 2013 to observe existing geologic and paleontological conditions at the site. The reconnaissance found that the geologic map for the area is consistent with the observed geologic conditions. No fossils were observed during either the site visit or earlier geotechnical drilling.

The area of the proposed project is contained within two separate U.S. Geological Survey (USGS) 7.5' quadrangles: Watsonville East and Mt. Madonna. Geologic mapping of these quadrangle maps can be found from two separate USGS sources: Preliminary Geologic Description of the San Jose 30x60 Minute Quadrangle, California, OFR 98-795, Wentworth, et al (1997); and Geology of the Southernmost Part of Santa Clara County, California, Derived from the Digital Database, OFR 97-710, Graymer (1997). Geologic units within the project area are assigned different names on each map. For this analysis, terminology and unit descriptions from Wentworth, et al (1997) are used. The geologic units found at each location are discussed below.

Locations 1, 2, and 3: Soil nail walls proposed at these locations will expose sandstone and mudstone of Loma Chiquita Ridge. The Eocence age ascribed to this unit comes from foraminifers as well as rare molluscan fossils. Foraminifers are marine protozoans with calcareous shells full of tiny holes through which slender filaments project. Within the project area, the unit is thick to thinly bedded, locally pebbly sandstone interbedded with carbonaceous mudstone.

Location 4: Five walls are proposed at Location 4, near the entrance of the Sprig Recreational Area. The three western-most proposed walls at Location 4 will expose sandstone and mudstone of Loma Chiquita Ridge, as described above. The third wall, from west to east, will expose Mount Chual mudstone and sandstone. Wentworth, et al, describe this unit as a mottled red to olive green mudstone containing foraminifers with a bioclastic (forms from pieces of animal shells) sandy basal section. The bioclastic debris includes shallow marine macrofossils as well as large Discocyclinnid foraminifers. The eastern most wall at Location 4 will expose Lower Cretaceous basaltic volcanic rocks comprised of pillowed basalt flows and flow breccias (rock composed of angular fragments of older rocks melded together).

Location 5: No walls are proposed along this stretch of roadway; however, cuts are proposed to accommodate widening. These cuts will be made in alluvial fan deposits of Upper Pleistocene age. This unit contains tan reddish brown cobbly gravel with a clayey and sandy matrix.

4.6.3 Environmental Consequences

As stated above, five main geologic units will be excavated within the project limits. The paleontological sensitivity, per Caltrans guidelines, of each unit is described below:

Sandstone and Mudstone of Loma Chiquita Ridge (Tls): This unit has yielded micro and macrofossils in the past, however, the latter being rare. Because this unit has contained fossils in the past, it is classified as having a High Potential.

Mount Chual Mudstone and Sandstone (Tcm): This unit has produced marine macro and microfossils in the past. Due to the recovery of past fossils, this unit is classified as having High Potential.

Basaltic Volcanic Rocks of the Permanente terrane (fpv): Part of the Cretaceous Franciscan Complex, this unit is igneous in origin and described by Wentworth, *et al,* as likely an obducted ocean plateau or seamount (ocean floor rock). Due to its igneous origin, this unit is considered as having No Potential to produce fossils.

Pleistocene Alluvial Fans (Qpf): Pleistocene units are known to contain vertebrate fossils throughout the Bay Area. While cuts may be of minimal volume, this unit is considered to have a High Potential to produce significant fossils.

Construction activities can impact paleontologically-sensitive geologic units when vehicles or other work equipment impact previously-undisturbed sediments by excavating, grading, or crushing bedrock exposed in or underlying a project. This can result in impacts to fossils by destroying them or otherwise altering them in such a way that their scientific value is lost.

As noted above, only the basaltic volcanic rocks of the Permanente terrane have no potential for producing fossils. Ground disturbance of these units will include the excavation for the soil nail walls and potentially some small cut slopes. Since these activities will occur in a unit with no potential for significant paleontological resources, they are not expected to affect sensitive paleontological resources.

All other sedimentary units are classified as having a high potential for significant paleontological resources within the unit. Ground disturbance of these units will include soil nail wall excavation and cut slopes. Since these activities will occur in a unit with high potential for significant paleontological resources, they have the potential to affect sensitive paleontological resources.

4.6.4 Avoidance, Minimization, and/or Mitigation Measures

A combined Paleontological Evaluation Report (PER)/Paleontologic Mitigation Plan (PMP) will be prepared for the project before construction begins. If necessary, other mitigation measures may include:

- Monitoring construction and halting work to recover important fossils; and
- Cleaning, identification, and cataloging of fossil specimens collected for curation and research purposes.

5. CONTRIBUTORS

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6. TECHNICAL STUDIES

Supplemental Visual Impact Assessment (January 2013)

Addendum to the 2009 Historic Property Survey Report (September 2012)

Addendum to the 2009 Archaeological Survey Report (September 2012)

Supplemental Natural Environment Survey (March 2013)

7. REFERENCES

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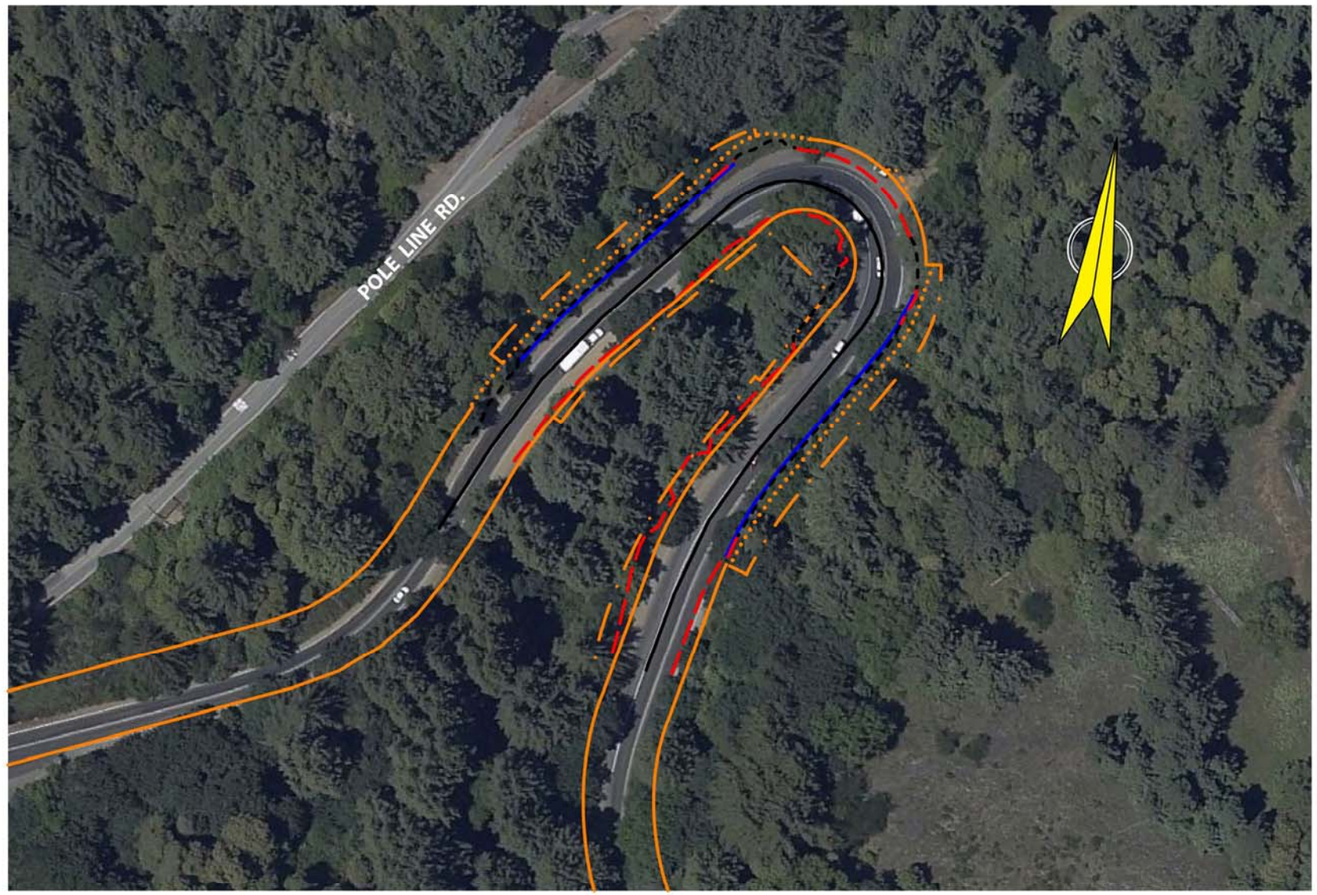
Appendix A: Location Maps



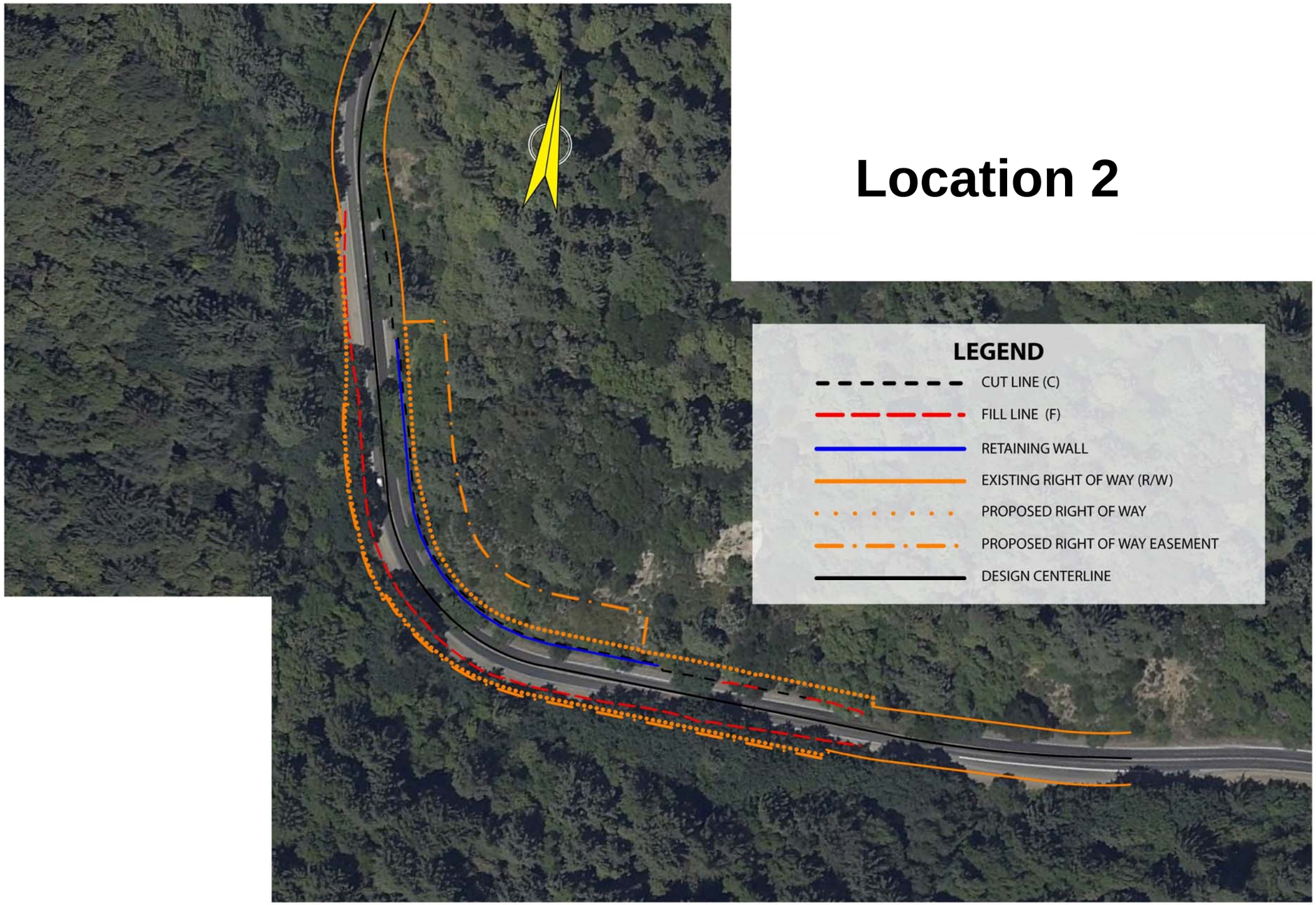
Location 1

LEGEND

- CUT LINE (C)
- FILL LINE (F)
- RETAINING WALL
- EXISTING RIGHT OF WAY (R/W)
- PROPOSED RIGHT OF WAY
- PROPOSED RIGHT OF WAY EASEMENT
- DESIGN CENTERLINE

Not to scale

Location 2



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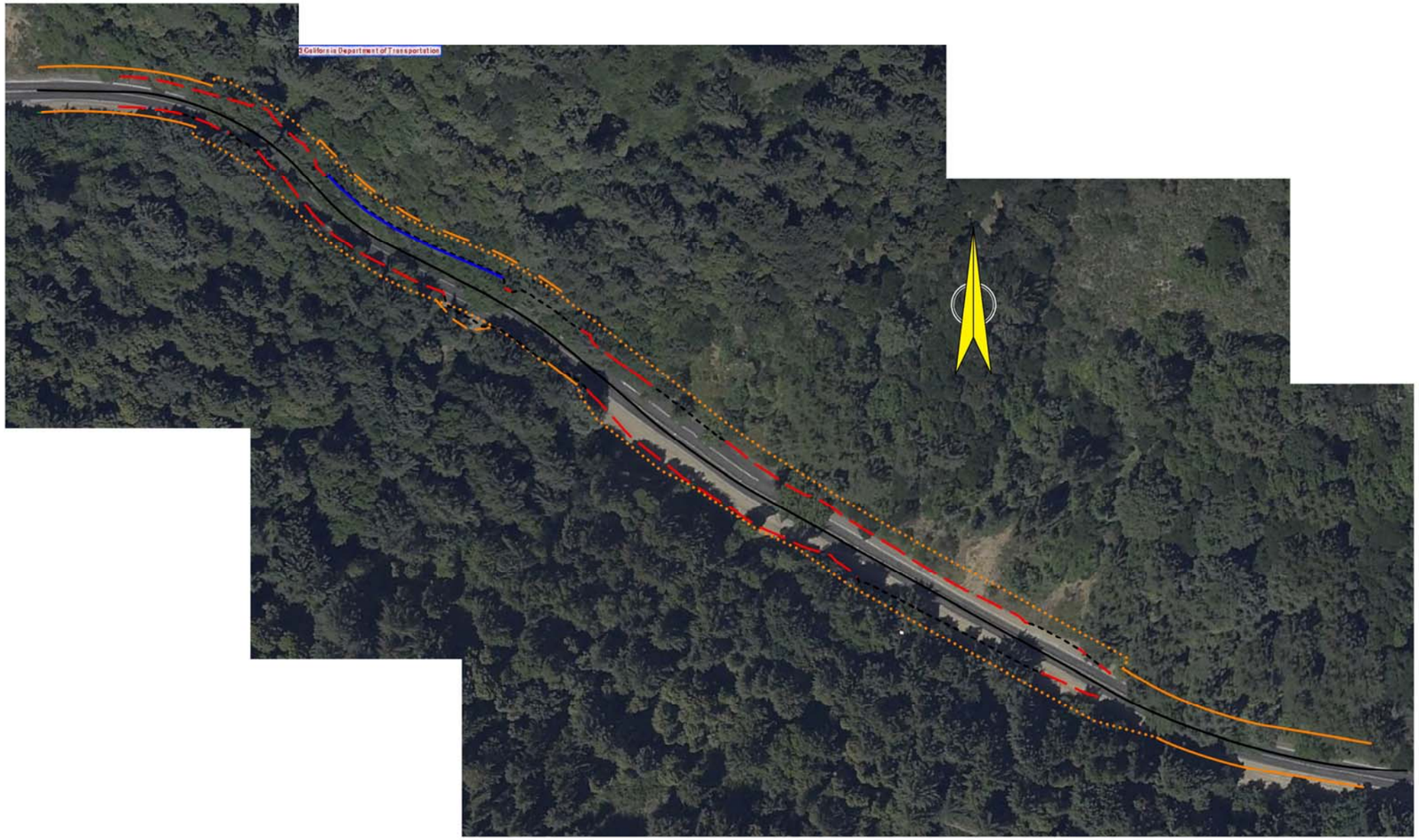
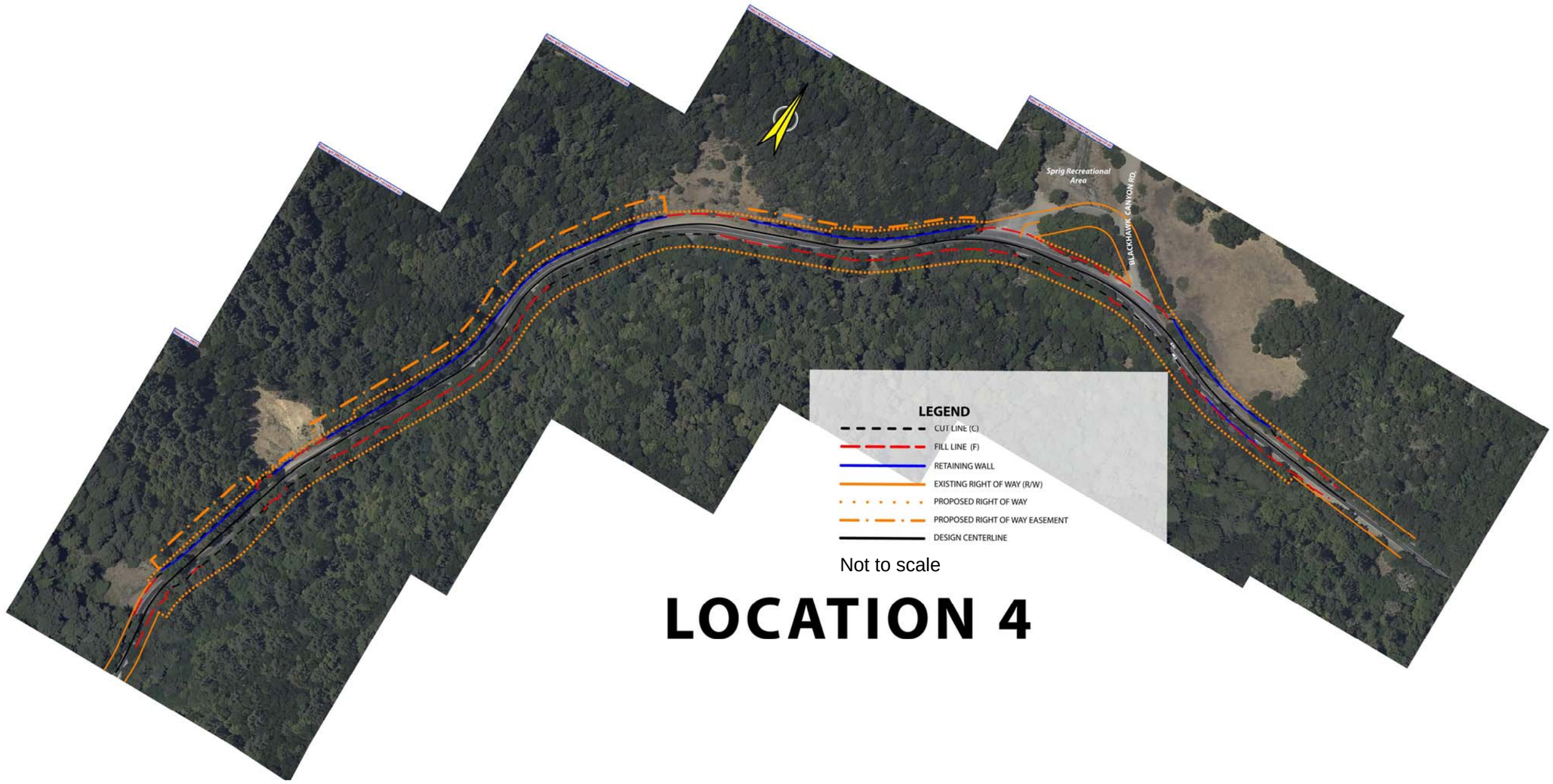


LEGEND

- CUT LINE (C)
- FILL LINE (F)
- RETAINING WALL
- EXISTING RIGHT OF WAY (R/W)
- PROPOSED RIGHT OF WAY
- PROPOSED RIGHT OF WAY EASEMENT
- PROPOSED PERMIT TO ENTER & CONSTRUCT
- DESIGN CENTERLINE

Not to scale

Location 3



Not to scale

LOCATION 4

Not to scale

Location 5

Appendix B: USFWS List of Special-Status Animal Species

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Federal and State-Listed Species					
Plants					
Ceanothus ferrisae	coyote ceanothus	FE -- CNPS 1B.1	Chaparral, coastal scrub, and valley and foothill grassland/serpentinite; known from five occurrences in the Mt. Hamilton Range; Elevation range: 394-1,509 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not discussed further.
Chorizanthe pungens var. *pungens*	Monterey spineflower	FT -- CNPS 1B.2	Chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland/sandy; Elevation range: 10-1,476 feet.	Present	**Does not occur.** Suitable habitat is present within or in the vicinity of the BSA, but field surveys of the project limits were negative. Species not considered further.
Chorizanthe robusta var. *robusta*	robust spineflower	FE -- CNPS 1B.1	Chaparral (maritime), cismontane woodlands (openings), coastal dunes, and coastal scrub/sandy or gravelly; Elevation range: 10-984 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not discussed further.
Cordylanthus rigidus ssp. *littoralis*	seaside bird's-beak	-- SE CNPS 1B.1	Closed-cone coniferous forest, chaparral (maritime), cismontane woodland, coastal dunes, coastal scrub/sandy, often-disturbed sites; Elevation range: 0-14,265 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not discussed further.
Dudleya setchellii	Santa Clara Valley dudleya	FE -- CNPS 1B.1	Cismontane woodland, valley and foothill grasslands/serpentinite, rocky; Elevation range: 196-1,492 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not discussed further.
Holocarpha macradenia	Santa Cruz tarplant	FT (CH) SE CNPS 1B.1	Coastal prairie, coastal scrub; Elevation range: 32-721 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not discussed further.
Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewelflower	FE -- CNPS 1B.1	Valley and foothill grassland (serpentinite); Elevation range: 147-2,624 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Trifolium amoenum	two-fork clover	FE -- CNPS 1B.1	Coastal bluff scrub, valley, and foothill grassland (sometimes serpentinite); Elevation range: 16-1,361 feet.	Present	**Does not occur.** Suitable grassland habitat is present at Location 4, but field surveys of the project limits were negative. Species not considered further.
Invertebrates					
Euphydryas editha bayensis	bay checkerspot butterfly	FT (CH) -- --	A California endemic butterfly restricted to native grasslands on rock outcrops in serpentine soil. Host plant is the dwarf plantain (*Plantago erecta*). *Orthocarpus densiflorus* and *O. purpurascens* are secondary host plants. Restricted to San	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
			Francisco, Alameda, Contra Costa, San Mateo, and Santa Clara Counties.		
Fish					
Eucyclogobius newberryi	tidewater goby	FE -- --	Coastal lagoons and creeks; found up to 3 miles upstream in slow-moving water.	Absent	**Does not occur.** Outside of range. Species not considered further.
Hypomesus transpacificus	delta smelt	FT SE --	Brackish water. Found only in the Sacramento-San Joaquin Estuary, as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River. Downstream as far as San Pablo Bay.	Absent	**Does not occur.** Outside of range. Species not considered further.
Oncorhynchus mykiss	steelhead South/Central California Coast DPS	FT (CH) CSC --	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. Spawns in winter/spring. This DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California.	Present	**May Occur.** Locations 4 and 5 parallel Bodfish Creek and/or its tributary, Blackhawk Creek, both of which lie within the Pajaro River watershed and are within the South/Central California DPS boundary and the designated critical habitat. During field surveys, individuals were observed in several locations below State Route 152. Project excludes modifications to the only potentially passable culvert (at Location 4). Species not in Project limits; but species critical habitat is near enough to warrant consideration.
Oncorhynchus mykiss	steelhead Central California Coast DPS	FT (CH) -- --	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. Spawns in spring. This DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers.	Absent	**Does not occur.** Outside of range. Species not considered further.
Oncorhynchus mykiss irideus	steelhead Central Valley DPS	FT -- --	Anadromous. Inhabits cold headwaters, creeks, and small to large rivers and lakes with swift, shallow water and clean, loose gravel for spawning. Requires large pools during summer months. The DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers	Absent	**Does not occur.** Outside of range. Species not considered further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
			in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries.		
Amphibians					
Ambystoma californiense	California tiger salamander	FT (CH) ST --	A large terrestrial salamander that inhabits seasonal/semi-permanent water sources (3-4 months in duration) and adjacent upland habitat with small fossorial mammal activity in lowland grasslands, oak savannah and mixed woodlands. Range includes the Central Valley and Central Coast ranges from Colusa County south to San Luis Obispo and Kern counties from sea level to 3,460 feet in elevation with two disjunct populations within Sonoma County and Santa Barbara County. California tiger salamanders have been documented traveling distances up to 1 mile.	Present	**May occur.** Ponds exist within a 1.24-mile radius of Location 5, the potential migratory range of the species. These ponds were not assessed and it is unknown whether these ponds provide suitable breeding habitat, with the exception of two ponds at breeding occurrences reported in 2005 by the CNDDB.
Rana draytonii	California red-legged frog	FT (CH) CSC --	A medium-sized frog that inhabits lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation up to 4,900 feet in elevation. Range extends from Redding to Baja California, Mexico. Breeding occurs between November and April in standing or slow moving water at least 2 ½ feet in depth with emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.) or overhanging willows (*Salix* spp.).	Present	**May occur.** Detected historically in 1939. Ponds and streams exist within a 1-mile radius of Locations 1 through 5, the lower limit of the potential migratory range of the species. These ponds and streams were not assessed and it is unknown whether these ponds provide suitable breeding habitat, with the exception of two locations reported in 1998 and 2004 by the CNDDB.
Birds					
Brachyramphus marmoratus marmoratus	marbled murrelet	FT (CH) SE --	A small coastal seabird that nests in coastal trees in large, mature/old-growth coniferous forests. Breeding begins in April. Tree nests require large-diameter limbs or other suitable platforms.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Falco peregrinus	American peregrine falcon	FE SR --	Typically a year-round resident in California and most common along the coast. Nests on cliffs, but frequently uses manmade structures such as bridges and buildings. Nests are generally found close to water bodies with abundant avian prey. Breeding begins in March; single-brooded.	Absent	**Does not occur.** Suitable nesting habitat and large water bodies are absent. Species is uncommon, irregular breeder in Santa Clara County. Species not considered further.
Haliaeetus leucocephalus	bald eagle	Delisted SE	Winters at lakes, reservoirs, river systems and some rangelands and coastal wetlands. Nests in	Absent	**Does not occur.** Suitable nesting and foraging habitat within 5 miles. Rare to very rare vagrants

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
		--	large conifers near aquatic sources. Breeding begins in May; single-brooded.		and irregular breeders in Santa Clara County. No CNDDB occurrences nearby. Species not considered further.
Riparia riparia	bank swallow	-- ST --	Nests in colonies in vertical banks with friable soils. Breeds from April to August. Most of California's nesting colonies occur along the upper Sacramento River. Breeding begins in April; double-brooded.	Absent	**Does not occur.** Suitable vertical bank nesting habitat is absent. Species is very rare/casual in Santa Clara County. Species not considered further.
Sternula antillarum browni	California least tern	FE SE / FP --	Migratory in California; breeding colonies are found in southern California along marine and estuarine shores, and in San Francisco Bay in abandoned salt ponds and along estuarine shores; feeds in nearby shallow, estuarine waters or lagoons where small fish are abundant. After breeding, family groups regularly occur at lacustrine waters near the coast of southern California. Prefers undisturbed nest sites on open, sandy or gravelly shores near shallow-water feeding areas in estuaries.	Absent	**Does not occur.** Suitable marine/estuarine habitat is absent. Species is rare to very rare in Santa Clara County. Species not considered further.
Vireo bellii pusillus	least Bell's vireo	FE SE --	Obligate riparian species during the breeding season preferring early successional habitat, typically inhabits structurally diverse woodlands along watercourses, including cottonwood-willow forests, oak woodlands, and mule fat scrub.	Absent	**Does not occur.** Suitable riparian habitat is absent. A vagrant species in Santa Clara County. Species not considered further.
Mammals					
Vulpes macrotis mutica	San Joaquin kit fox	FE ST --	Inhabits annual grasslands or grassy open stages with scattered shrubby vegetation, agricultural fields, valley oak woodlands, and alkali sink valley floor habitats with low vegetation; needs loose-textured sandy soils for burrowing, as well as a suitable prey base, typically in areas with significant California ground squirrel activity.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Special-Status and Locally Rare Species					
Plants					
Arctostaphylos andersonii	Santa Cruz Mountains manzanita	-- -- CNPS 1B.2	Broadleafed upland forest, chaparral, and north coast coniferous forest/openings, edges, redwood forests; Elevation range: 197-2,395 feet.	Present	**Does not occur.** Suitable habitat is present only near Location 5, but no records of occurrences exist, and field surveys were negative. Species not considered further.
Arctostaphylos hookeri ssp. *hookeri*	Hooker's manzanita	-- -- CNPS 1B.2	Closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub/sandy, sandy shale, sandstone outcrops; Elevation range: 279- 1,758 feet.	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Arctostaphylos pajaroensis	Pajaro manzanita	-- -- CNPS 1B.1	Chaparral (sandy); Elevation range: 98-2,495 feet	Absent	**Does not occur.** Suitable habitat is absent. Species not considered further.
Arctostaphylos regismontana	Kings mountain manzanita	-- -- CNPS 1B.2	Broadleaf upland forest, chaparral, north coast coniferous forest/granitic or sandstone; Elevation range: 1,000-2,395 feet.	Present	**Does not occur.** Elevation constraints limit suitable habitat. Past occurrences in vicinity along SR 152, but field surveys were negative. Species not considered further.
Balsamorhiza macrolepis var. *macrolepis*	big-scale balsamroot	-- -- CNPS 1B.2	Cismontane woodland, valley and foothill grassland/sometimes serpentinite; Elevation range: 295-4,593 feet.	Present	**Does not occur.** Suitable woodland habitat is present, but field surveys were negative. Species not considered further.
Castilleja rubicundula ssp. *rubicundula*	pink cream sacs	-- -- CNPS 1B.2	Chaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland (serpentinite); Elevation range: 66-2,953 feet.	Present	**Does not occur.** Suitable woodland habitat is present, but field surveys were negative. Species not considered further.
Calyptridium parryi var. *hesseae*	Santa Cruz Mountain pussypaws	-- -- CNPS 1B.1	Chaparral, cismontane woodland; Elevation range: 1,000–3,658 feet.	Present	**Does not occur.** Suitable woodland habitat is present, but field surveys were negative. Species not considered further.
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	-- -- CNPS 1B.2	Valley and foothill grassland (alkaline); Elevation range: 3-755 feet.	Present	**Does not occur.** Suitable grassland habitat is present within or in the vicinity of Locations 4 and 5, but field surveys were negative. Species not considered further.
Clarkia concinna ssp. *automixa*	Santa Clara red ribbons	-- -- CNPS 4.3	Chaparral, cismontane woodland; Elevation range: 295-4,921 feet.	Present	**Does not occur.** Suitable woodland habitat is present, but field surveys were negative. Species not considered further.
Ericameria fasciculata	Eastwood's goldenbush	-- -- CNPS 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub/sandy, openings; Elevation range: 98-902 feet.	Absent	**Does not occur.** No suitable coniferous habitat is present. Species not discussed further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Eriogonum nortonii	Pinnacles buckwheat	-- -- CNPS 1B.3	Chaparral, valley and foothill grassland/sandy, often on recent burns; Elevation range: 984-3,198 feet.	Present	**Does not occur.** Suitable grassland habitat is present, but field surveys were negative. Species not considered further.
Erysimum ammophilum	sand-loving wallflower	-- -- CNPS 1B.2	Chaparral (maritime), coastal dunes, coastal scrub/sandy, openings; Elevation range: 0-197 feet.	Absent	**Does not occur.** No suitable chaparral/dune habitat is present. Species not considered further.
Fritillaria liliacea	fragrant fritillary	-- -- CNPS 1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley, and foothill grassland/often serpentinite; Elevation range: 10-1,345 feet.	Present	**Does not occur.** Suitable woodland/grassland habitat is present, but field surveys were negative. Species not considered further.
Hoita strobilina	Loma Prieta hoita	-- -- CNPS 1B.1	Chaparral, cismontane woodland, riparian woodland/usually serpentinite, mesic; Elevation range: 98-2,821 feet.	Present	**Does not occur.** Suitable woodland habitat, but no suitable serpentinite grassland habitat, is present, and field surveys were negative. Species not considered further.
Horkelia cuneata ssp. *sericea*	Kellogg's horkelia	-- -- CNPS 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub/sandy or gravelly, openings; Elevation range: 33-656 feet.	Absent	**Does not occur.** No suitable coniferous habitat is present. Species not considered further.
Legenere limosa	legenere	-- -- CNPS 1B.1	Vernal pools; Elevation range: 3-2,887 feet.	Absent	**Does not occur**. No suitable vernal pool habitat is present. Species not considered further.
Lessingia micradenia var. *glabrata*	smooth lessingia	-- -- CNPS 1B.2	Chaparral, cismontane woodland/serpentinite, serpentinite grasslands, often roadsides; Elevation range: 394-1,378 feet.	Present	**Does not occur.** Some suitable woodland or serpentinite grassland habitat is present, but field surveys were negative. Species not considered further.
Malacothamnus arcuatus	arcuate bush-mallow	-- -- CNPS 1B.2	Chaparral, cismontane woodland; Elevation range: 49-1,165 feet.	Absent	**Does not occur.** No suitable cismontane habitat or chaparral habitat is present. Species not considered further.
Malacothamnus hallii	Hall's bush-mallow	-- -- CNPS 1B.2	Chaparral, coastal scrub, sometimes serpentinite; Elevation range: 33-2,493 feet.	Absent	**Does not occur.** No suitable chaparral/coastal scrub habitat is present. Species not considered further.
Monardella villosa ssp. *globosa*	robust monardella	-- -- CNPS 1B.2	Broadleafed upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, valley and foothill grassland; Elevation range: 328-3,001 feet.	Present	**Does not occur.** Suitable forest/woodland/grassland habitat is present, but field surveys were negative. Species not considered further.
Monolopia gracilens	Woodland wooly threads	-- -- CNPS 1B.2	Chaparral, valley and foothill grasslands (serpentine), cismontane woodland, broadleafed upland forests, north coast coniferous forests.	Absent	**Does not occur.** No suitable woodland or grassland serpentine habitat is present, and field surveys were negative. Species not considered further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Pedicularis dudleyi	Dudley's lousewort	-- SR CNPS 1B.2	Chaparral (maritime), cismontane woodland, north coast coniferous forest, valley, and foothill grassland, redwood forests; Elevation range: 197-2,952 feet.	Present	**Does not occur.** Suitable forest/woodland/grassland habitat is present, but field surveys were negative. Species not considered further.
Penstemon rattanii var. *kleei*	Santa Cruz Mountains beardtongue	-- -- CNPS 1B.2	Chaparral, lower montane coniferous forest, north coast coniferous forest; Elevation range: 1,312-3,608 feet.	Present	**Does not occur.** Suitable coniferous forest habitat is present and occurrences have been reported in the vicinity of Pole Line Road; however, field surveys were negative. Species not discussed further.
Plagiobothrys chorisianus var. *chorisianus*	Choris' popcorn-flower	-- -- CNPS 1B.2	Chaparral, coastal prairie, coastal scrub/mesic; Elevation range: 49-525 feet.	Absent	**Does not occur**. No suitable chaparral/coastal scrub habitat is present. Species not considered further.
Rosa pinetorum	pine rose	-- -- CNPS 1B.2	Closed-cone coniferous forest; Elevation range: 7-984 feet.	Absent	**Does not occur.** No suitable coniferous habitat is present within the species' elevation range. Species not considered further.
Streptanthus albidus ssp. *peramoenus*	most beautiful jewel-flower	-- -- CNPS 1B.2	Chaparral, cismontane woodland, valley and foothill grassland/serpentinite, serpentinite outcrops, road cuts; Elevation range: 308-13,280 feet.	Absent	**Does not occur.** No suitable woodland serpentinite or grassland habitat is present, and field surveys were negative. Species not considered further.
Trifolium buckwestiorum	Santa Cruz clover	-- -- CNPS 1B.1	Broadleafed upland forest, cismontane woodland, coastal prairie/gravelly, margins; Elevation range: 344-2,001 feet.	Present	**Does not occur.** Suitable woodland and forest habitat is present, however field surveys were negative. Species not considered further.
Trifolium depauperatum var. *hydrophilum*	saline clover	-- -- CNPS 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools; Elevation range: 0-984 feet.	Absent	**Does not occur.** No suitable grassland habitat is present, and field surveys were negative. Species not discussed further.
Amphibians					
Rana boylii	foothill yellow-legged frog	-- CSC --	Frog restricted to partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Cobble-sized substrate required for egg-laying.	Present	**May occur.** Three foothill yellow-legged frogs were collected within or adjacent to Location 1 in 1939 along a tributary to Bodfish Creek. Suitable rocky stream habitat is present within the BSA, but no records or observations have been made since the 1939 record.
Reptiles					
Anniella pulchra nigra	black legless lizard	-- CSC --	Fossorial lizard restricted to sand dunes and sandy soils in the Monterey Bay and Morro Bay regions. Optimal habitat includes moist, sandy soils and dune areas dominated by bush lupine and mock heather.	Absent	**Does not occur.** No suitable sandy soils/dune habitat is present. Species not considered further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Emys (=Clemmys) marmorata	western pond turtle	-- CSC --	A moderate-sized freshwater turtle that inhabits permanent or nearly permanent bodies of water and low-gradient, slow- moving streams below 6,000-foot elevation. Range extends throughout California's streams and creeks. Frequently seen basking on logs, shorelines, or beneath algal mats at the water's surface where refugia habitat (deep waters, undercut banks, woody debris) are present.	Present	**May occur.** Two western pond turtles were observed in 2000 next to Location 4 in Sprig Lake Pond, an impoundment along Blackhawk Creek, a tributary to Bodfish Creek.
Birds					
Accipiter cooperii	Cooper's hawk	-- CSC --	Inhabits dense stands of oak woodlands, riparian deciduous forests, or other forest habitats often near water and suburban areas. Hunts in broken woodlands and along forest edges. Breeding begins in April; single-brooded.	Present	**May occur.** Species is fairly common and a regular breeder in Santa Clara County. The oak woodlands and riparian corridors present provide suitable habitat for Cooper's hawk.
Accipiter striatus	sharp-shinned hawk	-- CSC --	Inhabits north-facing slopes in conifers, including ponderosa pine, black oak, and Jeffrey pines, preferably in riparian areas. Forages primarily for small birds along woodland edges and openings, hedgerows, brushy pastures, and shorelines. Breeding begins in April; single-brooded.	Present	**May occur.** Species is fairly common to rare and a regular breeder in Santa Clara County. The conifer forest and riparian corridors present provide suitable habitat for sharp-shinned hawk.
Agelaius tricolor	tricolored blackbird	-- CSC --	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Nest in emergent vegetation within aquatic and riparian habitats. Breeding begins in March; double-brooded.	Absent	**Does not occur.** Species is uncommon in Santa Clara County. No suitable emergent vegetation habitat is present. Species not discussed further.
Aquila chrysaetos	golden eagle	-- CSC / FP --	A large diurnal raptor that nests on cliffs and in large trees in open areas. Forages in open terrain including grasslands, deserts, savannahs and early successional stages of forest and shrub habitats. A year-round resident in the greater Bay Area. Breeding begins in February to late May; single-brooded.	Present	**May occur**. Species is fairly common and a regular breeder in Santa Clara County. Suitable nesting habitat is limited within the BSA.
Asio otus	long-eared owl	-- CSC --	Inhabits riparian bottomlands grown to tall willows and cottonwoods and belts of live oak paralleling stream courses. Requires adjacent open land with an abundance of mice and old crow, hawk, or magpie nests as breeding sites.	Present	**May occur.** Species is very rare or casual and an irregular breeder in Santa Clara County. Marginal oak/riparian habitat near stream courses is present.
Athene cunicularia	burrowing owl	-- CSC --	Valley bottoms and foothills with low vegetation and fossorial mammal activity. Breeding begins in March; single-brooded.	Present	**May occur.** Species is uncommon and a regular breeder in Santa Clara County. Marginal open/grassland habitat is present.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Circus cyaneus	northern harrier	-- CSC --	Inhabits both freshwater and saltwater marshes and adjacent upland grasslands. Nests on the ground in tall grasses in grasslands and meadows. Breeding begins in March; single-brooded.	Absent	**Does not occur.** Species is fairly common to uncommon and a regular breeder in Santa Clara County. No suitable freshwater/saltwater marsh habitat is present Species not discussed further.
Dendroica petechia brewsteri	yellow warbler	-- CSC --	Nests in dense, shrubby thickets dominated by willows along water courses. Nests built in a branch fork in shrubs and small trees. Breeding begins in mid-April to mid-June; sometimes double-brooded.	Present	**May occur.** Species is common to very rare/casual and a regular breeder in Santa Clara County. Suitable riparian corridor habitat is present.
Elanus leucurus	white-tailed kite	-- FP --	Inhabits grasslands, agriculture fields, oak woodlands, savannah, and riparian habitats in rural and urban areas. Feeds primarily on California voles. Year-round resident of Central and Coastal California. Breeding begins in February; sometimes double-brooded.	Present	**May occur.** Species is fairly common and a regular breeder in Santa Clara County. Marginal nesting habitat is present in the ornamental trees, agricultural fields, and rural/urban areas along Location 5.
Falco columbarius	merlin	-- CSC --	Winters throughout California, breeds in northern states, Canada, and Alaska. Wintering habitat included open forests, grasslands, agricultural fields, mud flats, and urban areas. Feeds primarily on small birds. Breeding begins in May; single-brooded.	Present	**May occur.** According to the Santa Clara County Bird Checklist, merlins are uncommon to rare in Santa Clara County. Marginal wintering habitat is present.
Falco mexicanus	prairie falcon	-- CSC --	Nests on cliffs and at times in old raven or eagle stick nests on cliff, bluff, or rock outcrop. Inhabits perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub communities. Breeding begins in April; single-brooded.	Absent	**Does not occur.** Species is uncommon to rare and an irregular breeder in Santa Clara County. No suitable cliff or rock outcrop nesting sites are present. Species not discussed further.
Lanius ludovicianus	loggerhead shrike	-- CSC --	Inhabits a variety of habitats from open grasslands and scrub to woodlands and riparian areas. Year-round resident of California. Breeding begins in February; double- to triple-brooded.	Present	**May occur.** Species is fairly common to uncommon and a regular breeder in Santa Clara County. Suitable oak woodland habitat is present.
Pandion haliaetus	osprey	-- CSC --	Inhabits rivers, lakes, and coastal habitats. Nests in tall trees near water bodies with sufficient prey. Range is almost cosmopolitan throughout California. Breeding begins in March; single-brooded.	Absent	**Does not occur.** Species is uncommon to rare in Santa Clara County. No suitable large water bodies are present. Species not discussed further.

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
Progne subis	purple martin	-- CSC --	Nests in tall, old trees near a body of water in open forests, woodlands, and riparian habitats. Forages in valley foothills, meadows, grasslands, montane hardwood, riparian habitats, closed-cone pine-cypress, ponderosa pine, Douglas fir, and redwood forests. Breeding begins in March; primarily single-brooded.	Present	**May occur.** Species is very rare/casual and a regular breeder in Santa Clara County. Suitable woodland and riparian corridor habitat is present..
Mammals					
Antrozous pallidus	pallid bat	-- CSC --	Inhabits rocky terrain in open areas in lowlands, foothills, and mountainous areas near water throughout California below 6,300 feet. Roosts in caves, rock crevices, mines, hollow trees, buildings and bridges in arid regions in low numbers (<200). Active from March-November; migrates in some areas, but may hibernate locally.	Present	**May occur.** Suitable habitat is present; however, while this species has been known to roost in coastal and coniferous forests, it does show a preference for more xeric habitats. Pallid bat has been reported east of the project limits at Uvas Creek and in downtown Gilroy.
Corynorhinus (=Plecotus) townsendii townsendii	Townsend's western big-eared bat	-- CSC --	An obligate cave rooster and moth specialist. Also inhabits caves and mines, and may also use bridges, buildings, rock crevices, and tree hollows in coastal lowlands, cultivated valleys and nearby hills characterized by mixed vegetation throughout California below 10,000 feet. Exhibits high site fidelity and is highly sensitive to disturbance. Forages along edge habitats near water; may travel long distances during foraging bouts.	Absent	**Does not occur.** Species has a strong preference for roosting in caves or mines, which are not found in the immediate area. Species may forage in coastal forests around the BSA but would not occur in the project footprint. Species not considered further.
Eumops perotis californicus	western mastiff bat	-- CSC --	Primarily a cliff-roosting species. Inhabits a variety of vegetation communities near suitable cliff roosting habitat throughout central and southern California below 10,000 feet. Often forages high above the ground and over great distances. Highly sensitive to human disturbance.	Absent	**Does not occur.** No suitable roosting habitat such as significant rock features is present. Species not discussed further.
Lasiurus blossevillii	western red bat	-- CSC --	Primarily a riparian obligate species that is ubiquitous throughout most of California except the northern Great Basin region. Roosts individually in foliage within trees along riparian areas, orchards and suburban areas. Favors cottonwoods, willows, sycamores, and walnut trees. Feeds primarily on moths, but will eat a variety of other insects.	Present	**May occur.** Suitable riparian habitat is present and sufficient roost sites are available. Species is associated with streams and riparian areas and roosts in tree foliage.
Lasiurus cinereus	hoary bat	-- CSC	Ubiquitous throughout California. A solitary foliage rooster that prefers evergreens, but will	Present	**May occur**. Suitable coniferous and deciduous tree foliage-roosting habitat is present. Species is

Scientific Name	Common Name	Federal, State, and CNPS Status[2]	Supporting Habitat / Flowering Period	Habitat Present/ Absent	Species Presence in the Project limits / Rationale
		--	use deciduous trees particularly in edge habitat. May forage in small to large groups. Feeds primarily on moths, but will eat a variety of other insects. Migrates great distances.		widespread and shows a close association with forested habitats throughout the west. Hoary bat has been reported east of the project limits in downtown Gilroy.
Neotoma fuscipes annectans	San Francisco dusky-footed woodrat	-- CSC --	Prefers forest habitats with moderate to dense understory and moderate canopy cover, often chaparral and redwood habitats. Constructs stick nests at ground-level or elevated in trees.	Present	**Does occur.** A single San Francisco dusky-footed woodrat stick nest was observed in the vicinity of Location 1 along a tributary to Bodfish Creek. Suitable redwood forest habitat is present.
Taxidea taxus	American badger	-- CSC --	Inhabits open areas with friable soils within woodlands, grasslands, savannah, and desert habitats. A fossorial mammal that preys predominately on ground squirrels and pocket gophers.	Absent	**Does not occur.** No suitable grassland habitat is present. No large mammal burrows were observed during site reconnaissance visit. Species not discussed further.

1 Database Queries were performed December 20, 2012, for the following USGS 7.5 minute quadrangles: Loma Prieta, Mount Madonna, Gilroy, Watsonville West, Watsonville East, and Chittendon.

2 **Status**

CH	Critical Habitat	FT	Federal threatened
CNPS	California Native Plant Society	SC	State candidate
CSC	California species of special concern	SE	State endangered
FC	Federal candidate	ST	State threatened
FE	Federal endangered	SR	State rare
FP	(California) fully protected species	1B.1	Rare, threatened, or endangered in California and elsewhere; seriously endangered in California
		1B.2	Rare, threatened, or endangered in California and elsewhere; fairly endangered in California

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 130422010726

Database Last Updated: September 18, 2011

Report Date: April 22, 2013

Quad Lists

Quads Containing Listed, Proposed or Candidate Species:

CHITTENDEN (386A)
WATSONVILLE EAST (386B)
MT. SIZER (406A)
MORGAN HILL (406B)
MT. MADONNA (406C)
GILROY (406D)
SANTA TERESA HILLS (407A)
LOMA PRIETA (407D)

Listed Species

Invertebrates

- Euphydryas editha bayensis
  - bay checkerspot butterfly (T)
  - Critical habitat, bay checkerspot butterfly (X)

Fish

- Eucyclogobius newberryi
  - tidewater goby (E)

- Hypomesus transpacificus
  - delta smelt (T)

- Oncorhynchus mykiss
  - Central California Coastal steelhead (T) (NMFS)
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central California coastal steelhead (X) (NMFS)
  - South Central California steelhead (T) (NMFS)

- Oncorhynchus tshawytscha

    - Central Valley spring-run chinook salmon (T) (NMFS)
    - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Ambystoma californiense
    - California tiger salamander, central population (T)
    - Critical habitat, CA tiger salamander, central population (X)

- Rana draytonii
    - California red-legged frog (T)
    - Critical habitat, California red-legged frog (X)

Birds

- Brachyramphus marmoratus
    - marbled murrelet (T)

- Sternula antillarum (=Sterna, =albifrons) browni
    - California least tern (E)

- Vireo bellii pusillus
    - Least Bell's vireo (E)

Mammals

- Vulpes macrotis mutica
    - San Joaquin kit fox (E)

Plants

- Castilleja affinis ssp. neglecta
    - Tiburon paintbrush (E)

- Ceanothus ferrisae
    - Coyote ceanothus (E)

- Dudleya setchellii
    - Santa Clara Valley dudleya (E)

- Holocarpha macradenia
    - Critical habitat, Santa Cruz tarplant (X)
    - Santa Cruz tarplant (T)

- Streptanthus albidus ssp. albidus
    - Metcalf Canyon jewelflower (E)
    -

Quads Containing Listed, Proposed or Candidate Species:

WATSONVILLE WEST (387A)

Database last updated: September 18, 2011

Report Date: April 22, 2013

Listed Species

Fish

- Eucyclogobius newberryi
  - critical habitat, tidewater goby (X)

- Oncorhynchus kisutch
  - coho salmon - central CA coast (E) (NMFS)

- Oncorhynchus mykiss
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central California coastal steelhead (X) (NMFS)

Amphibians

- Ambystoma californiense
  - California tiger salamander, central population (T)

- Rana draytonii
  - California red-legged frog (T)
  - Critical habitat, California red-legged frog (X)

Birds

- Brachyramphus marmoratus
  - marbled murrelet (T)

- Charadrius alexandrinus nivosus
  - Critical habitat, western snowy plover (X)

- Sternula antillarum (=Sterna, =albifrons) browni
  - California least tern (E)

Mammals

- Vulpes macrotis mutica
  - San Joaquin kit fox (E)

Plants

- Chorizanthe robusta var. robusta
  - robust spineflower (E)
- Holocarpha macradenia
  - Critical habitat, Santa Cruz tarplant (X)
  - Santa Cruz tarplant (T)

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Appendix C: Summary of Avoidance, Minimization and/or Mitigation Measures

This appendix summarizes all of the avoidance, minimization and/or mitigation measures for the project, including the measures discussed in Section 4 of this document and measures from Chapter 2 in the FEIR/EA that have not changed.

PARKS AND RECREATIONAL FACILITIES

- At Location 4, Caltrans will replace native trees at a ratio of 3 native trees planted for each removed tree that is 4 inches or greater in diameter at breast height. Caltrans will replace any non-native trees at a ratio of 1 native tree planted for each removed non-native tree that is 4 inches or greater in diameter at breast height.
- Caltrans will plant and re-establish native plant species in areas disturbed as a result of the project, including the forest understory and shrubs.
- Caltrans will fund, implement and monitor for a three- to five-year plant establishment period, or as determined by the California Department of Fish and Wildlife (CDFW), compensation for permanent impacts on the north side of SR 152 in the area of the Park open to the public.
- Caltrans will prepare a Mitigation, Monitoring and Reporting Plan (MMRP) that will include, at a minimum, success criteria to meet all goals and monitoring protocols specified by regulatory agencies and Caltrans relating to impacted species and habitat. Prior to preparing the MMRP, if the County agrees to a site on park land, Caltrans will consult with County Parks on an appropriate planting site and the plant palette and will provide County Parks with the final MMRP for their information prior to implementation.
- Caltrans will use best efforts to ensure that all plantings will be of native species locally collected or purchased from the local watershed and found within the immediate project site, if available, to maintain the genetic integrity of the natural communities within the Park and project area and to prevent the importation of diseases and fungi. Mixes will be approximately 65 pounds/acre mixture rate (or agreed upon by the County). In addition, the contractor will be asked to save duff from the project area to reuse on the planting site if there is no concern that the duff may carry Sudden Oak Death.
- Caltrans will use best efforts to ensure that planting sites are located within the same watershed where trees and plant species were impacted or removed.
- Caltrans will implement Best Management Practices (BMPs) to prevent the spread of Sudden Oak Death as required by applicable state and federal laws.
- Caltrans will implement BMPs to prevent the spread of invasive plant species in the Park. The BMPs will comply with the Executive Order on Invasive Species, E.O. 13112, and subsequent guidance from the Federal Highway Administration, as well as the Streambed Alteration Agreement with the CDFW.
- The project work and activities will be carried out and comply with the Streambed Alteration Agreement from the CDFW, the Biological Opinion from the U.S. Fish and Wildlife Service and the Section 404 Permit from the U.S. Army Corps of Engineers. Caltrans will provide County Parks with the final permits showing the avoidance, minimization and mitigation measures agreed upon to protect habitat, threatened and endangered species, special-status animal species, wetlands and other waters of the U.S. and migratory birds within the Park.

VISUAL RESOURCES

Locations 1, 2, 3 and 4

To address the potential impacts of tree removal at these locations, the following tree replacement and revegetation measures would be implemented:

- Minimizing existing tree and vegetation removal to the greatest possible extent. The limit of work will be kept to the minimum possible footprint, not to exceed 5 feet from the edge of the retaining wall. Priority will be placed on preserving existing trees nearest the wall, in order to preserve views of the forest edge from the road to the greatest extent feasible.
- Tree replacement planting will be implemented if appropriate to mitigate for major loss of tree canopy, as determined by the project landscape architect.

To address the potential impacts of visual intrusion from the new retaining walls, the following mitigation measures would be implemented:

- Minimizing overall wall height to the greatest extent feasible.
- Using context-sensitive wall texture and color treatment, in consultation with local agencies to reduce visual contrast and enhance compatibility of visual character to the greatest extent feasible.
- Staining of the concrete safety-barrier attached to retaining walls to reduce overall color contrast and visual intrusion.
- If feasible, walls will be gutterless in order to reduce visual contrast and mass.
- Wherever feasible and consistent with safety, the use of plastic collapsible crash cushions at retaining walls will be avoided to reduce the visual contrast with the natural environment.

Location 5

- Unsightly material and equipment storage and staging will be screened to the extent feasible to minimize visibility from the roadway and nearby sensitive off-road receptors, such as homes or vineyards.

Light and Glare

- Construction activities will limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Construction impacts

- Unsightly material and equipment storage and staging will be screened to the extent feasible to minimize visibility from the roadway and nearby sensitive off-road receptors, such as homes or vineyards.
- Construction activities will be phased to minimize the duration of disturbance to the shortest feasible time.
- All vegetated areas disturbed by construction, staging, and storage will be treated with appropriate erosion control measures and revegetated.

CULTURAL RESOURCES

- Before the start of work, the Project Archaeologist will set up the Environmentally Sensitive Area (ESA) to protect the archaeological resource. No project-related activities may occur within the ESA.

- Before the start of work, the Project Architectural Historian will delineate the ESA location for the historic winery. The ESA will be located on the proposed new right-of-way line between the rows of vineyards that will be removed and those that are remaining. No project actives may occur on the other side of the ESA within the remaining vines.
- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities will cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC, who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 4 Office of Cultural Resources Studies so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

WATER QUALITY AND STORM WATER RUNOFF

Section 401 of the Clean Water Act

- Section 401 certification will be required for this project. Early discussion will be initiated regarding the handling and disposal of water during the design phase. The groundwater will be tested for potential contamination as a part of the Hazardous Waste Site Investigation. Proper handling and disposal of the groundwater will be based on the levels of contaminants reported in the Site Investigation Report.

Section 402 of the Clean Water Act

- According to Caltrans NPDES permit and the Construction General Permit, Best Management Practices (BMPs) will be incorporated to reduce the discharge of pollutants during construction as well as permanently to the Maximum Extent Practicable (MEP). These BMPs fall into three categories, Temporary Construction Site BMPs, Permanent Design Pollution Prevention BMPs, and Permanent Treatment BMPs.

Construction Site BMPs

- Construction Site BMPs are implemented during construction activities to reduce pollutants in storm water discharges throughout construction. Temporary silt fence, concrete washout, stockpile cover, stabilized construction entrance/exit and temporary soil stabilizers are some of the temporary erosion and water pollution control measures that may be used in combination to prevent and minimize soil erosion and sediment discharges during construction. Given that the anticipated soil disturbance will be greater than 0.4 hectare (1 acre), a Storm Water Pollution Prevention Plan (SWPPP) will be developed during construction. This dynamic document addresses the deployment of various erosion and water pollution control measures that are required commensurate to changing construction activities.

Permanent Design Pollution Prevention BMPs

- Design Pollution Prevention BMPs are permanent measures to improve storm water quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Erosion control measures will be provided on all disturbed areas to the extent feasible. These

measures will use a combination of source and sediment control measures to prevent and minimize erosion from soil disturbed areas. Source controls can use erosion control netting in combination with hydroseeding.

- The biodegradable netting is effective in providing good initial mechanical protection while seed applied during the hydroseeding operation germinates and establishes itself. Other forms of source control such as tacked straw may also be used when applicable. Sediment controls such as biodegradable fiber rolls can be used to retain sediments and to help control runoff from disturbed slope areas. These measures will be investigated during the design phase.
- Outlet protection and velocity dissipation devices placed at the downstream end of culverts and channels are also Design Pollution Prevention BMPs that reduce runoff velocity and control erosion and scour. The need of these devices for this project will also be further investigated during the design phase.
- Generally, as velocities and volume of flow increases, so could the sediment loading. Effects to downstream flow will be further investigated during the design phase and the use of appropriate Design Pollution Prevention BMPs to address this concern will be considered.

Permanent Treatment BMPs

- This project will be required to incorporate treatment BMPs. Treatment BMPs are permanent devices and facilities treating storm water runoff. Caltrans-approved Treatment BMPs are: biofiltration swales, infiltration basins, detention basins, traction sand traps, dry weather flow diversions, media filters, gross solids removal devices (GSRDs), multi-chamber treatment trains, and wet basins.

GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

- The field exploration and investigation of this project will include borings. Laboratory tests may include corrosion, moisture content, density, plasticity index, graduation, consolidation, and triaxial tests. Vertical and horizontal borings will be advanced at all sites where fill or walls are proposed. Horizontal borings are recommended at all soil nail wall locations to determine whether the contractor will have to case the holes for the soil nails.

- The soil nail walls and retaining wall at Location 4 may require a fault study, which will likely include trenching to verify the exact location of the Sargent and Castro Faults that cross the project area limit. The strike of the fault is a design parameter for soil nail wall design. These studies will help ensure that the proposed retaining walls will be appropriately designed for the site conditions, pursuant to the requirements of latest uniform Building Code.
- Measures for the potential reactivation of the landslides and rock fall sites referred to in Table 2.2-1 in the FEIR/EA may include avoidance, different wall type, installation of rock nets and minimizing cut slopes to a maximum of 2:1.

HAZARDOUS WASTE/MATERIALS

- Additional review of the data analyzed in the ISA will be performed before ground-disturbing activities begin, to ensure that the potential hazardous materials site will not have an adverse impact on the proposed project.
- There is a potential for residual ADL in the surface soil. Testing for ADL will be performed during the final design stage. If ADL is found, special handling of the contaminated soil will be required and will include implementing a health and safety plan. If construction

encounters soil contamination, all activities involving contaminated soil or groundwater will be planned to comply with regulatory agency requirements.

- Existing yellow roadway striping that will be impacted will be tested for lead-based paint. If present, lead-based paint will be handled and disposed of to comply with regulatory agency requirements.
- Wood removed from roadside sign and metal beam guard railing is treated wood waste (TWW). Contractor must follow standard special provisions for handling, storing and disposing of TWW and provide training to personnel who handle TWW.

NATURAL COMMUNITIES

Vegetation Communities

General avoidance and minimization efforts will be incorporated into the design and implemented to reduce potential impacts to natural communities and plant and animal species. These measures will include minimizing the project footprint, providing environmental education for the construction crew, and delineating the work area and all environmentally sensitive areas with fencing. These require that an onsite biological monitor be present during activities that may impact sensitive biological resources.

Trees & Riparian Habitat

- Per the Draft Streambed Alteration Agreement from CDFW, Caltrans will compensate for permanent losses of riparian redwood forest habitat at a 3:1 ratio through a conservation easement. Caltrans anticipates there to be approximately 3.37 acres of permanent impacts to riparian habitat resulting in an easement of about 10 acres.
- Native trees outside of the riparian area with a dbh of four inches or greater will be replaced at a ratio of 3:1. All non-native trees with a dbh of four inches or greater not located in riparian habitat will be replaced at a 1:1 ratio.
- To the extent practicable, the root masses of removed trees and shrubs will be left in place. Disturbance or removal of vegetation will not exceed the minimum necessary to complete construction.
- All slopes or unpaved areas affected by the proposed project will be reseeded with native grasses and shrubs to stabilize the slopes and bare ground against erosion. Following construction, native plant species will be installed at the disturbed area(s).

WETLANDS AND OTHER WATERS

- Caltrans will limit construction activities to the smallest area possible to complete the work in an effort to minimize impacts to the existing riverine habitat in Bodfish Creek. A Caltrans-approved biologist will clearly delineate this limited construction area for incorporation in the project plans and specifications. The perimeter of the work site will be adequately fenced using high visibility Environmentally Sensitive Area (ESA) fencing to prevent damage to adjacent riparian habitat. No construction activities, within the riparian zone, will be allowed within the habitat protected by ESA fencing.

- Caltrans will use erosion control measures throughout all phases of operation where sediment runoff from exposed slopes threatens to enter waterways. At no time will silt-laden runoff be allowed to enter the stream or directed to where it may enter the stream. Erosion control installations will be monitored for effectiveness and repaired or replaced as recommended by

a Water Quality Monitor. As needed to prevent erosion Caltrans will use soil stabilizers such as hydroseeding, netting, erosion control mats, mulch, fiber rolls, silt fences, check dams and devices to slow the velocity of runoff. Materials containing monofilament or plastic will not be used. The contractor will stabilize and equip construction site entrances and exits with tire washing capability. No discharge of pollutants from vehicle and equipment cleaning is allowed in any storm drains or water courses.

- Concrete will be excluded from surface water for a period of 30 days after it is poured/ sprayed. During that time the concrete will be kept moist, and runoff from the concrete will not be allowed to enter any water body. Commercial sealants may be applied to the concrete surface where difficulty in excluding flow for a long period may occur. If sealant is used, water will be excluded from the site until the sealant is cured. If groundwater comes into contact with fresh concrete, it will be prevented from flowing towards surface water. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.
- Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the creek channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek will be positioned over drip pans. Any equipment or vehicles driven and/or operated above or adjacent to the stream must be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.
- Refueling, cleaning or maintenance of mobile construction equipment and vehicles will not occur within 50 feet of any water body, or anywhere that spilled fuel could drain to a water body. Refueling of stationary equipment requiring breakdown and setup to move will remain in place. All equipment will be refueled with appropriate drip pans, absorbent pads, and water quality Best Management Practices. Equipment and vehicles operating in the project area will be checked and maintained daily to prevent leaks of fuels, lubricants, or other liquids.
- Construction access, staging, storage, and parking areas will be located within the project right of way outside of any designated ESA or outside of the right of way in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
- Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, covering temporary access road entrances and exits with rock (rocking), and covering temporary stockpiles when weather conditions require. A speed limit of 15 miles per hour in unpaved areas of the project footprint will be enforced to reduce dust and excessive soil disturbance.

ANIMAL SPECIES

Western Pond Turtle

The measures to avoid or minimize impacts to California red-legged frog (Section 4.4.4.3) together with the following measures will avoid or minimize impacts to western pond turtle:

- A biologist approved by CDFW will survey the work site in the vicinity of Location 4 no more than 48 hours before the start of work activities for signs of the western pond turtle, western pond turtle nesting activity (recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Pre-construction surveys to detect western pond turtles will focus on potentially suitable aerial and aquatic basking habitat (logs, branches, rootwads, riprap), and the shoreline and adjacent warm, shallow waters, where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Pre-construction surveys to detect western pond turtles and their nesting activity will be concentrated within a radius to be agreed upon with CDFW of suitable aquatic habitat and will focus on areas along south- or west-facing slopes with bare, hard-packed clay or silt soils or sparse vegetation consisting of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist will contact CDFW to determine whether relocation and/or exclusion buffers are appropriate. If CDFW approves of moving the animal, a qualified biologist will be allowed sufficient time to move the western pond turtle from the work site before construction activities begin.

White-tail Kite and Other Migratory Birds

To ensure compliance with the Migratory Bird Treaty Act (16 U.S.C. 703-712) and California Fish and Game Code (§§3503, 3511, and 3513), and minimize impacts to the white-tailed kite and other migratory birds, the following species-specific avoidance and minimization measures will be implemented:

- If project activities will occur between February 15 and September 1, a qualified biologist approved by CDFW will conduct pre-construction surveys for nesting birds no more than one week before construction. Surveys will consist of multiple days of observations. If nesting birds are found, a 50-foot buffer will be established around the nest for non-raptors and a 300-foot-radius buffer will be established for raptors, such as hawks, owls, and eagles. The area will be avoided. A buffer of less than 300 feet, but no less than 100 feet, may be used if a qualified biologist, experienced in raptor behavior, is assigned to monitor the behavior of any raptor nesting within 300 feet of project activities. The qualified biologist will have authority, through the Resident Engineer, to order the cessation of all project activities within 300 feet of any raptor nest if the birds exhibit abnormal nesting behavior, which may cause reproductive failure (nest abandonment and loss of eggs and/or young). Abnormal nesting behaviors that may cause reproductive harm include, but are not limited to: defensive flights/vocalizations directed towards project personnel, standing up from a brooding position, and flying away from the nest. Project activities within 300 feet of the nest will not resume until the qualified biologist has consulted with CDFW and both the qualified biologist and CDFW confirm that the bird's behavior has normalized or the young have left the nest.

Burrowing Owl

In addition to the measures above for migratory birds, the following precautionary measures will be taken to avoid or minimize impacts to the burrowing owl:

1. Within 30 days before construction begins, burrowing owl pre-construction surveys will be conducted at Location 5 of the project area by a qualified biologist in accordance with CDFW's Staff Report on Burrowing Owl Mitigation and the California Burrowing Owl Consortium's Burrowing Owl Survey Protocol and Mitigation Guidelines. Preconstruction

surveys, consisting of winter season surveys (between December 1 and January 31) and nesting season surveys (between April 15 and July 15), will be conducted for Location 5 of the project area and within a 500-foot buffer where possible, to identify and map active burrowing owl burrows. Surveys will consist of walking transects of no more than 100 feet apart.

2. Occupied burrows will not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFW verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
3. If burrowing owls are detected in the project footprint or within 500 feet of the project footprint, a non-disturbance buffer will be established within a 160-foot radius surrounding occupied burrows during the non-breeding season (September 1 through January 31) or within a 250-foot radius surrounding occupied burrows during the breeding season of February 1 through August 31.

4. If avoidance is not feasible and owls must be moved away from the disturbance area, one of the two following passive relocation techniques will be used rather than trapping. At least one full week will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

   Passive Relocation – With One-Way Doors. Owls will be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors around burrow entrances to allow the birds to leave the burrow, but not return. One-way doors (e.g., modified dryer vents) will be left in place 48 hours to ensure owls have left the burrow before excavation. Two natural or artificial burrows will be provided for each burrow in the project area that will be affected. The project area will be monitored daily for one week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside.

   Passive Relocation – Without One-Way Doors. Two natural or artificial burrows will be provided for each burrow in the affected project area. The project area will be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows may then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

San Francisco Dusky-Footed Woodrat

Potential presence of the San Francisco dusky-footed woodrat can be avoided by taking the following avoidance and minimization measures:

1. Prior to the start of construction, a biologist will conduct a survey of the project area and a surrounding 30-foot buffer to determine the location of existing woodrat dens. Survey data will be recorded and mapped in relation to the construction footprint.
2. A 30-foot buffer will be established around dens that can be avoided. All vegetation in the buffer area will be retained and nests will not be disturbed.

3. If active woodrat stick nests are found within the project footprint area at the time of construction, and cannot be avoided, trapping and relocation measures, developed in conjunction with CDFW and described in the Streambed Alteration Agreement, will be implemented to ensure that the project footprint is clear of woodrat nests before construction. The trapping will occur outside of the breeding period, between September and December, and will not be conducted during heavy rains or full moons. Trapping must be done by a qualified biologist with a current CDFW permit to trap.

THREATENED AND ENDANGERED SPECIES

California Red-Legged Frog

Approximately 5.53 acres of permanent upland dispersal and aestivation habitat loss will be mitigated at a 3:1 ratio, resulting in 16.59 acres of mitigation for California red-legged frog upland dispersal and aestivation habitat. Temporary impacts of 7.32 acres will be mitigated at a 1.1:1 ratio, for a total of 8.06 acres. Caltrans may provide approximately 7.32 acres onsite and 0.732-acre offsite. Mitigation for impacts to CRLF habitat would total approximately 24.64 acres.

In addition to the above habitat restoration/replacement, the following measures to avoid and minimize impacts to the California red-legged frog (CRLF) will be implemented:

1. Seasonal Avoidance: Construction actions will be scheduled to minimize effects on listed species and habitats. Except for limited vegetation clearing (necessary to minimize effects to nesting birds), work will be conducted from April 15 through October 15, to avoid the rainy season.

2. Environmental Awareness Training: Before any construction activities, a qualified biologist will conduct an education program for all construction personnel. At a minimum, the training will include a description of CRLF, CTS, and other listed species; migratory birds and their habitats; the occurrence of these species within the action area; an explanation of the status of these species and protection under FESA, CESA, and the Migratory Bird Treaty Act (MBTA); the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating they attended the program and understand all the avoidance and minimization measures and implications of all applicable environmental laws.

3. Pre-construction Surveys: Pre-construction surveys will be conducted by a USFWS-approved biologist immediately prior to the initiation of any ground disturbing activities within or adjacent to suitable CRLF or CTS habitat. These surveys will comprise walking transects while conducting visual encounter surveys within areas that will be subject to staging, vegetation clearing, grubbing, grading, cut and fill, or other ground disturbing activities. All fossorial mammal burrows will be inspected for signs of CRLF or CTS usage to the maximum extent practicable. If it is determined that a burrow may be occupied by a CRLF, the burrow will be excavated by hand, if possible, and the individual(s) relocated or allowed to leave on its own volition. CRLF will be relocated in accordance with the observation and handling protocol promulgated by USFWS.

4. Environmentally Sensitive Area Fencing (ESA): Prior to the start of construction, ESAs -- defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high-visibility orange fencing. Construction work areas include the active construction site and all areas providing support for the project including areas used for vehicle parking, equipment and material storage and staging, access roads, etc. The ESA fencing will remain in place throughout the duration of the project, while construction activities are ongoing and will prevent the encroachment of construction equipment and personnel from entering sensitive habitat areas. The final project plans will depict all locations where ESA fencing will be installed and how it will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. In addition, hydrological features (e.g., topographic depressions, drainage ditches, culverts, etc.) outside of the project footprint will not be manipulated (e.g., re-routed, dredged, filled, graded, etc.).

5. Wildlife Exclusion Fencing: Before the start of construction, Wildlife Exclusion Fencing (WEF) will be installed along the project footprint in all areas where CRLF could potentially enter the project site. The final project plans will show where and how the WEF will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of the project, while construction activities are ongoing, and will be regularly inspected and fully maintained. Upon project completion the WEF will be completely removed and the areas returned to their original condition or better.

6. Procedure for California Red-Legged Frog Discovery Onsite: If a California red-legged frog, or any amphibian that construction personnel believe may be this species, is encountered during project construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:

   - All work within 50 feet of the animal will immediately cease and the resident engineer and USFWS-approved biologist will be notified. Based on the professional judgment of the biologist, if project activities can be conducted without harming or injuring the animal(s), it may be left at the location of discovery and monitored by the USFWS-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of the animal without a biological monitor present. If the biologist determines that construction cannot proceed with CRLF present in the work area, then construction will not resume until the CRLF leaves the work area or can be relocated.
   - Should relocation of CRFL be necessary, the following steps will be followed:
     - Prior to handling and relocation, the USFWS-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (Service 2005a). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle amphibians after working in other aquatic habitats.

- CRLF will be captured by hand, dip net or other USFWS-approved methods and will be transported by hand, dip net or temporary holding container, and released as soon as practicable within the same day of capture. Handling of CRLF will be minimized to the maximum extent practicable. Holding containers and dip nets will be thoroughly cleaned and disinfected prior to transporting to the action area and rinsed with freshwater onsite immediately prior to use unless doing so would result in the injury or death of the animal(s) as a result of a time delay.
- CRLF will be relocated to the nearest suitable habitat outside of the area where actions would not result in harm or harassment and released on the same side of SR 152 where it was discovered. The individual(s) will be released within suitable habitat in the Caltrans right of way or another property acceptable to the property owner, and USFWS will be notified. If suitable habitat cannot be identified, USFWS will be contacted to determine an acceptable alternative. Transporting CRLF to a location other than the location described herein will require written authorization of the USFWS.

7. Entrapment Avoidance: To prevent the inadvertent entrapment of California red-legged frog or other animals during construction, all excavated, steep-walled holes or trenches more than one-foot deep will be covered with plywood or similar materials at the end of each working day, or the holes or trenches will contain one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. All pipes, culverts or similar structures stored in the action area overnight will be inspected before they are moved, capped or buried. If at any time a listed species is discovered, the resident engineer and a USFWS-approved biologist will be immediately informed. The USFWS-approved biologist will determine if relocating the species is necessary and will work with USFWS and CDFW before handling or relocating unless otherwise authorized.

8. Prohibition of Erosion Control Materials Potentially Harmful to CRLF or CTS: To prevent CRLF and CTS from becoming entangled, trapped or injured, erosion control materials that use plastic or synthetic mono-filament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include fibers such as jute or twine, or tackified hydroseeding compounds.

9. Biological Monitors: A USFWS-approved biologist will be present onsite to monitor for CRLF and CTS. Through communication with the resident engineer or their designee, the biologist may stop work if deemed necessary for any reason to protect listed species and will advise the resident engineer or designee on how to proceed accordingly. The biologist will be present during all construction activities where a listed species could occur. The biologist will conduct clearance surveys at the beginning of each day within or adjacent to suitable CRLF and CTS habitat and regularly throughout the workday when construction is occurring within or adjacent to suitable CRLF and CTS habitat.

10. Minimize Nighttime Work: To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active species.

11. Vegetation Removal: Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants to resprout after construction. A USFWS-approved biologist will be present during all vegetation clearing and grubbing activities to monitor for the presence of CRLF and CTS in the project footprint. If at any point CRLF, CTS, or other listed species are discovered during these activities, various measures discussed elsewhere in this section will be taken to avoid and minimize the harm and harassment of these species. All clearing and grubbing of woody vegetation will occur by hand or using light construction equipment, such as backhoes and excavators. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses and environmental clearances for properly disposing of such materials.

12. Construction Site Restrictions: In addition to restrictions already listed or listed under steelhead measures below, no pets will be allowed in the project area and no firearms will be allowed except for authorized law enforcement or security personnel.

California Tiger Salamander

The proposed project will permanently impact approximately 2.25 acres potential CTS habitat. Caltrans has agreed with USFWS to mitigate this impact at a 3:1 ratio, which will result in approximately 6.75 acres of mitigation for CTS habitat. The proposed project will also temporarily impact approximately 2.07 acres of potential CTS habitat that will be mitigated in-kind at a restoration ratio of 1.1:1. This will result in approximately 2.28 acres of restored upland dispersal and aestivation habitat, of which 2.07 acres will be provided onsite and 0.207-acre offsite. Therefore, mitigation for CTS will total approximately 9.02 acres of upland dispersal and aestivation habitat.

In addition to the above habitat restoration/replacement and some of measures to avoid or minimize impacts to CRLF described in Section 4.5.4.3 above, the following measures will be implemented to minimize impacts to CTS:

1. Discovery of CTS: If CTS are found, all work within 50 feet of the animal will immediately cease and the resident engineer and USFWS-approved biologist will be notified. Based on the professional judgment of the biologist, if project activities can be conducted without harming or injuring the animal(s), it may be left at the location of discovery and monitored by the USFWS-approved biologist. All project personnel will be notified of the finding and at no time will work occur within 50 feet of the animal without a biological monitor present. If the biologist determines that construction cannot proceed with CTS present in the work area, then construction will not resume until the CTS leaves the work area. Caltrans does not have state authorization to take or handle CTS. In the unlikely event CTS should enter the work site, construction will not resume until the CTS leaves the work area on its own volition.

2. Wildlife Exclusion Fencing: At Location 5, WEF will be installed during the CTS breeding season, typically from November through April, based on habitat suitability, so the likelihood of the species occupying the work site at the beginning of construction is greatly reduced. Because no CTS breeding habitat is present within Location 5, Caltrans does not anticipate CTS to be present during the breeding season when WEF at Location 5 would be installed. In

cooperation with USFWS and CDFW, the location of the fencing will be determined by the resident engineer and agency-approved biologist. The final project plans will show where and how the WEF will be installed. The special provisions in the bid solicitation package will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of the project, while construction activities are ongoing, and will be regularly inspected and fully maintained. Upon project completion the WEF will be completely removed and the areas returned to their original condition or better.

Steelhead

1. Work within the riparian corridor will be restricted to June 15 to October 15, which is during the dry season. Restricting work to the dry season will minimize the chances work will be conducted during rain events that could result in sediment inputs to Bodfish Creek and its tributaries.

2. Before any ground disturbance occurs on the project site, the boundaries of the project area will be clearly delineated with orange plastic, high-visibility construction fencing (i.e., ESA fencing) or solid barriers to prevent workers or equipment from inadvertently straying from the project area. The contractor will do this in consultation with a Caltrans-approved biologist.

3. Silt fencing or other erosion control measures will be installed to prevent sediment and pollutant discharges to State and Federal waters.

4. Temporary erosion control measures will be implemented on all disturbed areas. Coir rolls or straw wattles will be installed along or at the base of slopes during construction to capture sediment.

5. Permanent erosion control measures will be implemented upon completion of construction. All disturbed areas will be re-vegetated with appropriate native, non-invasive species or non-persistent hybrids that will serve to stabilize site conditions.

6. A Storm Water Pollution Prevention Plan and erosion-control best management practices will be implemented to minimize water pollution during project construction.

7. All material stockpiling and staging areas will be within the project right of way in non-sensitive areas or at designated disturbed/developed areas outside of design construction zones.
8. All ground-disturbing activities will be restricted to the dry season (April 15 to October 15).

9. To avoid attracting predators of protected species, all food-related trash items such as wrappers, cans, bottles, and food scraps will be enclosed in sealed trash containers and removed at the end of each working day from the site.

10. Maintenance and refueling areas for equipment will be kept a minimum of 50 feet from water courses.

11. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

12. No contact will be allowed between any live stream and uncured concrete.

13. Groundwater that comes in contact with wet concrete, such as within bridge footing excavations (if necessary), will not be allowed to enter any creek or wetlands, but will be isolated for proper disposal or treatment.

14. Heavy equipment will not be operated in the active flow channel of any creek.

15. Complete diversion or damming of surface flows will not be allowed.

16. Construction crews will be informed during the education program meeting that, to the extent possible, travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved as well as improved roads.

17. The limits of the construction area will be clearly marked. Before commencing construction activities, the contractor will define construction vehicle parking areas and all access.

18. To the maximum extent practicable, any borrow material will be certified non-toxic and weed free.

19. All construction-related materials will be removed after construction activities are completed. The temporary construction easements and staging areas will be cleaned up, re-contoured to original grade, and re-vegetated with appropriate native species, as necessary.

20. Permanent erosion control, including soil stabilization measures such as hydroseeding and coir netting, will be applied to all temporarily affected project areas to minimize erosion after construction.

21. Caltrans will not work when 0.25 inch or more of precipitation is forecasted to occur. Seventy-two hour weather forecasts from the National Weather Service will be consulted.

22. Following any precipitation event, work will not begin again until runoff ceases and there is a 30% or lesser chance of precipitation for the following 24-hour period.

23. No activity of the project will begin unless its associated erosion control measures can be completed prior to the onset of precipitation. After any storm event, the contractor will inspect all sites currently under construction and all sites scheduled to begin construction within the next 72 hours for erosion and sediment problems and take corrective action as needed.

24. All temporarily impacted waters will be graded and restored to their pre-project conditions. Permanent impacts, in the form of new or modified culverts and roadside ditches, would be

constructed so as to closely resemble or improve on the pre-project conditions, wherever possible.

25. The slurry that is produced by the use of water during drilling will be fully contained and disposed of at an approved facility and will not be allowed to enter any drainage systems or waterways.

INVASIVE SPECIES

- In compliance with the Executive Order on Invasive Species, E.O. 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.
- In the event that high or medium priority noxious weeds, as defined by the California Department of Food and Agriculture or the California Invasive Plant Council, are disturbed or removed during construction related activities, the contractor will contain the plant material associated with these noxious weeds and dispose of it in a matter that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area should be covered to the extent practicable with heavy black plastic solarization material until the end of the project.
- Caltrans will implement Best Management Practices (BMPs) to prevent the spread of Sudden Oak Death (SOD) as required by applicable state and federal laws. Before removing trees or vegetation from the job site within a SOD infected county, obtain a wood transportation permit from the County Agricultural Commissioner, and submit a copy to the resident engineer. Provide a copy of the permit to all employees, subcontractors, and other private or public parties who remove trees, wood or vegetation from the project site.
- Clean equipment used to clear, grub, or chip removed vegetation as follows:

  A. Clean hand equipment with a solution of 9 parts water to 1 part bleach and rinse; or clean with soap and water, rinse, spray with disinfectant and wipe dry; or steam clean with a soap solution and rinse with clear water.
  B. Power wash trucks and large equipment to remove mud or soil accumulation.
  C. Clean workers boots of mud prior to leaving the work area.

PALEONTOLOGICAL RESOURCES

A combined Paleontological Evaluation Report (PER)/Paleontologic Mitigation Plan will be prepared (PMP) for the project before construction begins. If necessary, other mitigation measures may include:

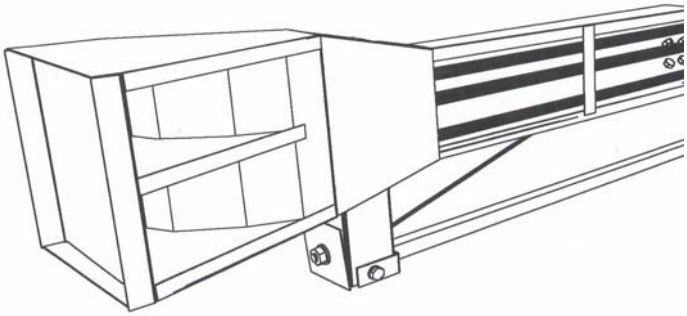
- Monitoring construction and halting work to recover important fossils; and
- Cleaning, identification, and cataloging of fossil specimens collected for curation and research purposes.

Steel Post

SKT Tangent Terminal

Installation Instructions for

Steel Post Options



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General Information
For All SKT Steel Posts Designs

The SKT was crash tested to meet the requirements of NCHRP Report 350 Test Level 3 (100 km/hr) and Test Level 2 (70 km/hr). Refer to specific State DOT standards and specifications for allowable design alternatives. It is the responsibility of the installer to utilize a design approved by the State DOT and to follow all required State procedures in installing the SKT.

This SKT Installation Manual is divided into 4 sections

- General Information for all **SKT** Steel Posts Designs.
- **SKT** Design Options – This area describes the many different post options (steel and wood posts) to choose from for the SKT. (page4)
- Installing the **SKT** – This section gives a step-by-step procedure on the proper installation of the SKT system. (page 16) Refer to Figures 1 – 13 for details.
- Inspection Checklist for **SKT** Steel Post System – Use this checklist to inspect new installations or recently maintained/repaired installations. (page 21)

The Following Steel Post Options are Accepted for use with the SKT:

- All Bolted Hinged Posts (foundation tubes are not required).
- All Plug Welded Posts (foundation tubes are required at posts #1 & #2).
- Bolted Hinged Posts #1 & #2 and Plug Welded Posts #3 and beyond.
- Bolted Hinged Posts #1 & #2 and Wood CRT Posts #3 and beyond.

The Following Installation Lengths are Accepted for use with the SKT:

The Test Level 3 (100 km/hr design speed) **SKT** system is 50'-0" long.

The Test Level 2 (70 km/hr design speed) **SKT** system is 25'-0" long. This has the same components as the 50'-0" long system with the last 25'-0" eliminated.

The Test Level 3 **SKT-LITE** option may be installed 37'-6" long. This has the same components as the 50'-0" long system with the last 12'-6" eliminated. Check the State standard sheets or contract plans to see if this option is approved in your State.

General Information (continued)

The **SKT** breakaway steel posts are applicable for Test Level 3 (50'-0" long system) and Test Level 2 (25'-0" long system) design speeds. See **Figure 1** for a layout of the **SKT** steel post system.

Shown below is a comparison of the wood post and steel post **SKT** systems.

The following items remain **"unchanged"** from the **"wood"** post systems to **"steel"** post systems:

- Impact head
- All W-beam rail sections
- Cable anchor bracket
- Foundation tubes (only required with the Plug Welded Posts)
- Ground strut (same for Plug Welded Posts / different for Hinged Bolted Posts
- Cable assembly
- Bearing plate
- Most of the hardware

The following **"items vary"** between the **"wood"** post systems to **"steel"** post systems:

- The ***end posts*** are steel rather than wood.
- The breakaway ***line posts*** are steel rather than wood.
- For the Bolted Hinged Post design, a different ***ground strut*** is used.
- The steel post systems do not use a ***pipe sleeve*** at post #1.
- The steel post systems use a ***routed wood block*** or recycled block of similar design.
- The steel post systems use a standard 1 1/4" long splice bolt for the ***post bolt at post #2*** instead of a 10" long post bolt.
- The steel post systems use 10" long ***line post bolts*** instead of 18" long.
- The steel post systems use 1/4" hex bolts for the ***impact head attachment*** not 3/8" lag screws. (The **SKT** impact head is designed to bolt to a steel post or a wood post. See **Figure 11**.)
- The Plug Welded systems ***strut channel bolts*** are 3/4" at the tube connection not 5/8" bolts.
- The Bolted Hinged posts use a single high strength ***post hinge bolt*** at the post connection. At post #1, the bolt is 5/8" x 9". At the remaining posts, a 3/4" x 8 ½" bolt is used.
- The steel post systems bearing plate uses a ***retainer/tie*** to prevent rotation.

Design Options

The length of the Test Level 3 **SKT** system is 50'-0" long or the system may also be installed 37'-6" long for the **SKT-LITE** option. Check State or local agency standards or contract plans for allowable options.

There are many different options available for the SKT support posts.
Available designs are shown in **Table 1**.

SKT Post Design Options	Number of ***Wood*** BCT Posts	Number of ***Wood*** CRT Posts	Number of ***Foundation Tubes***	Number of **Bolted Hinged Steel** Posts	Number of **Plug Weld Steel** Posts
All Breakaway **Wood** Posts	2, 4 or 8	6, 4 or 0	2, 4 or 8	-0-	-0-
All Hinged **Steel** Posts	-0-	-0-	-0-	6 medium 2 long	-0-
All Plug Weld **Steel** Posts	-0-	-0-	2	-0-	2 short 6 medium
Hinged & Plug Weld **Steel** Posts	-0-	-0-	-0-	2 long	6 medium
Hinged **Steel** & **Wood** Posts	-0-	6	-0-	2 long	-0-

Table 1. SKT Post Design Options (50'-0" long system)
(Refer to Wood Post SKT Manual for additional information on the Wood Post SKT System)

Post Lengths & Descriptions: (Reference to the approximate length of posts shown below is for the purpose of identifying a general length relative to the other posts. It is not an exact length.)

BCT **Wood** Posts are approx. 3.5 feet long and inserted in a steel foundation tube.

CRT **Wood** Posts are 6 feet long.

Long Hinged **Steel** Posts are approx 8.5 feet long and must be bolted together in the field.

Medium Hinged **Steel** Posts are 6 feet long and must be bolted together in the field.

Medium Plug Weld **Steel** Posts are 6 feet long and shipped as a welded assembly.

Short Plug Weld **Steel** Posts are approx 3.5 feet long and inserted in a foundation tube. They are shipped as a welded assembly.

Steel Foundation Tubes at post locations #1 & #2 may be either 6 feet long (no soil plate) or 4.5 feet or 5 feet long (with a soil plate).

NOTE: All Bolted Hinged **Steel** Posts must have the lower section installed before bolting the top section. The lower section of the Bolted Hinged steel posts should not be driven with the upper post attached.

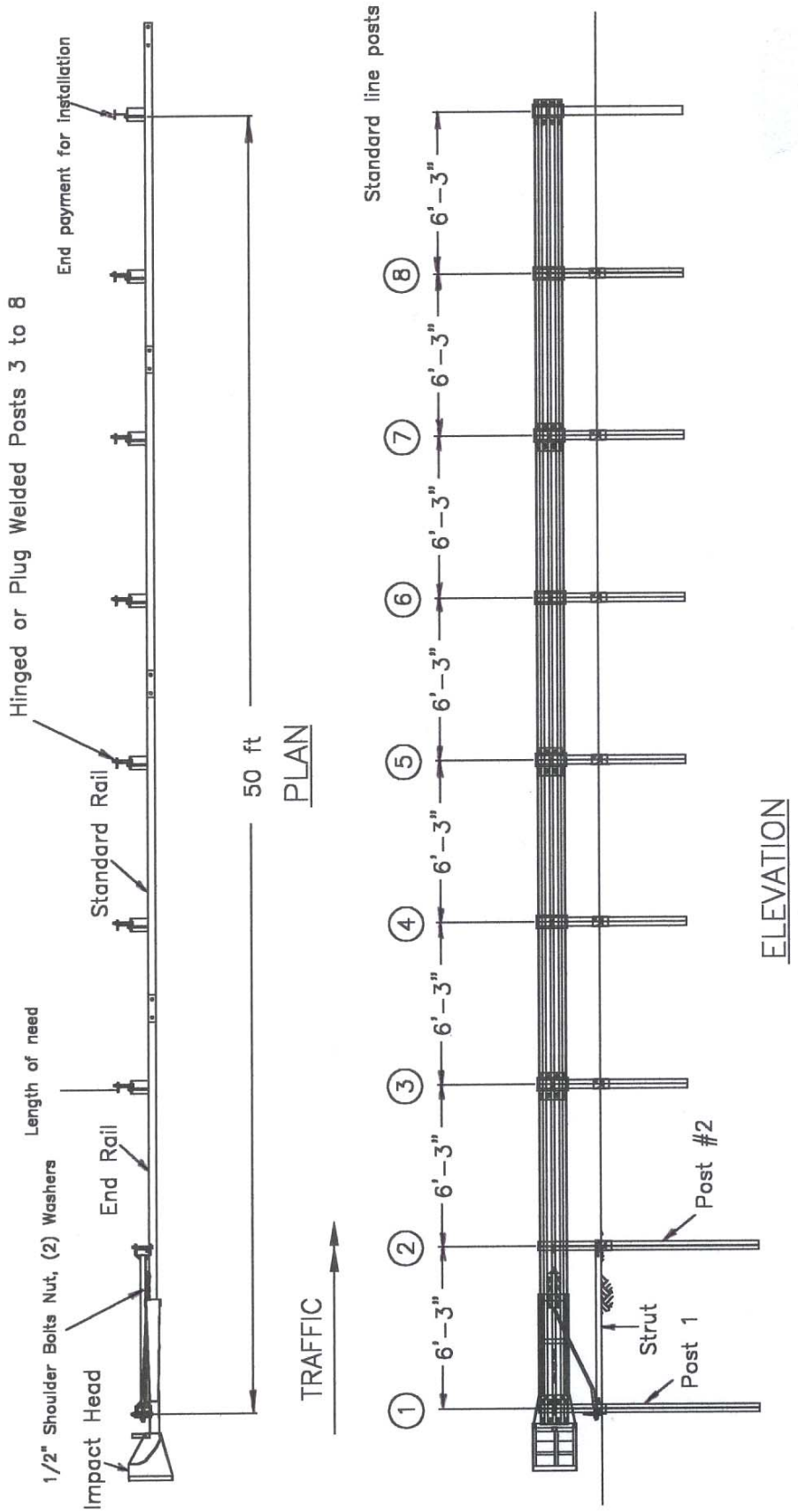


Figure 1. Plan and Elevation View of Steel Post SKT System

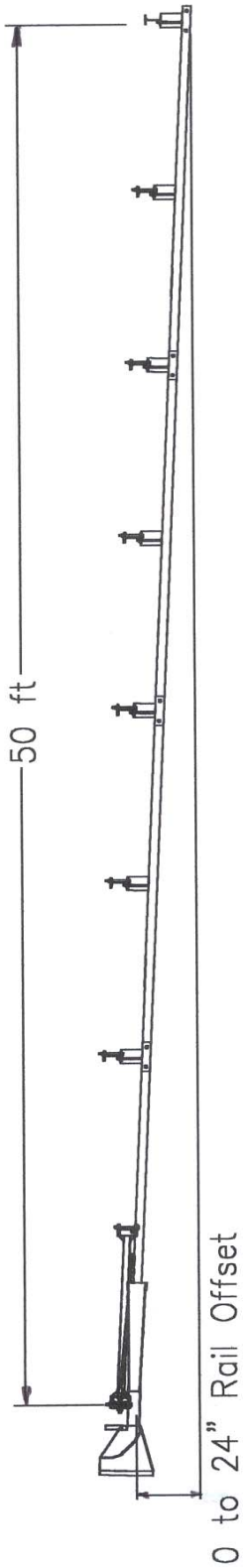


Figure 2. SKT Optional Flared Installation

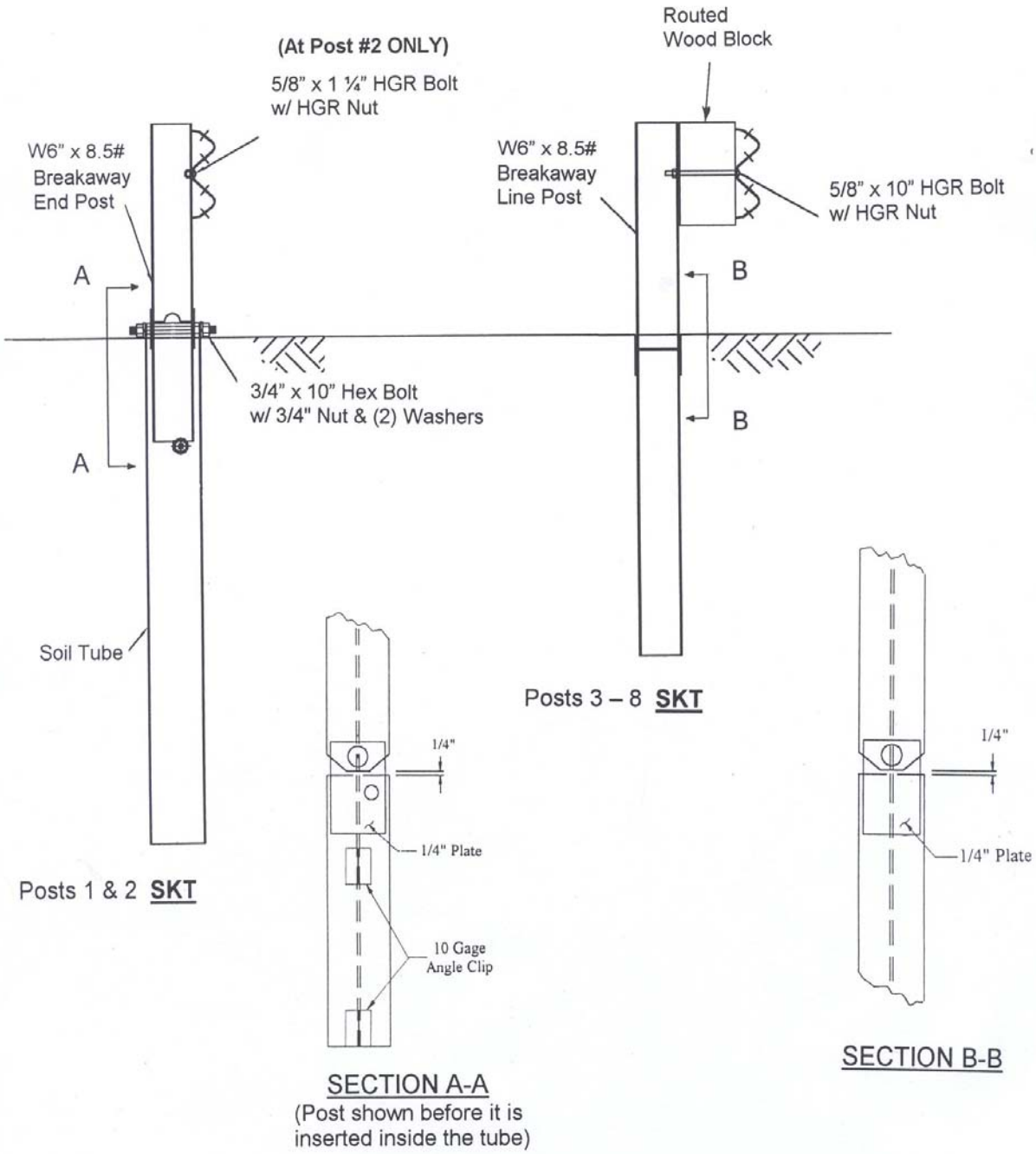


Figure 3. Section View of <u>Plug Welded</u> Steel End Posts and Line Posts

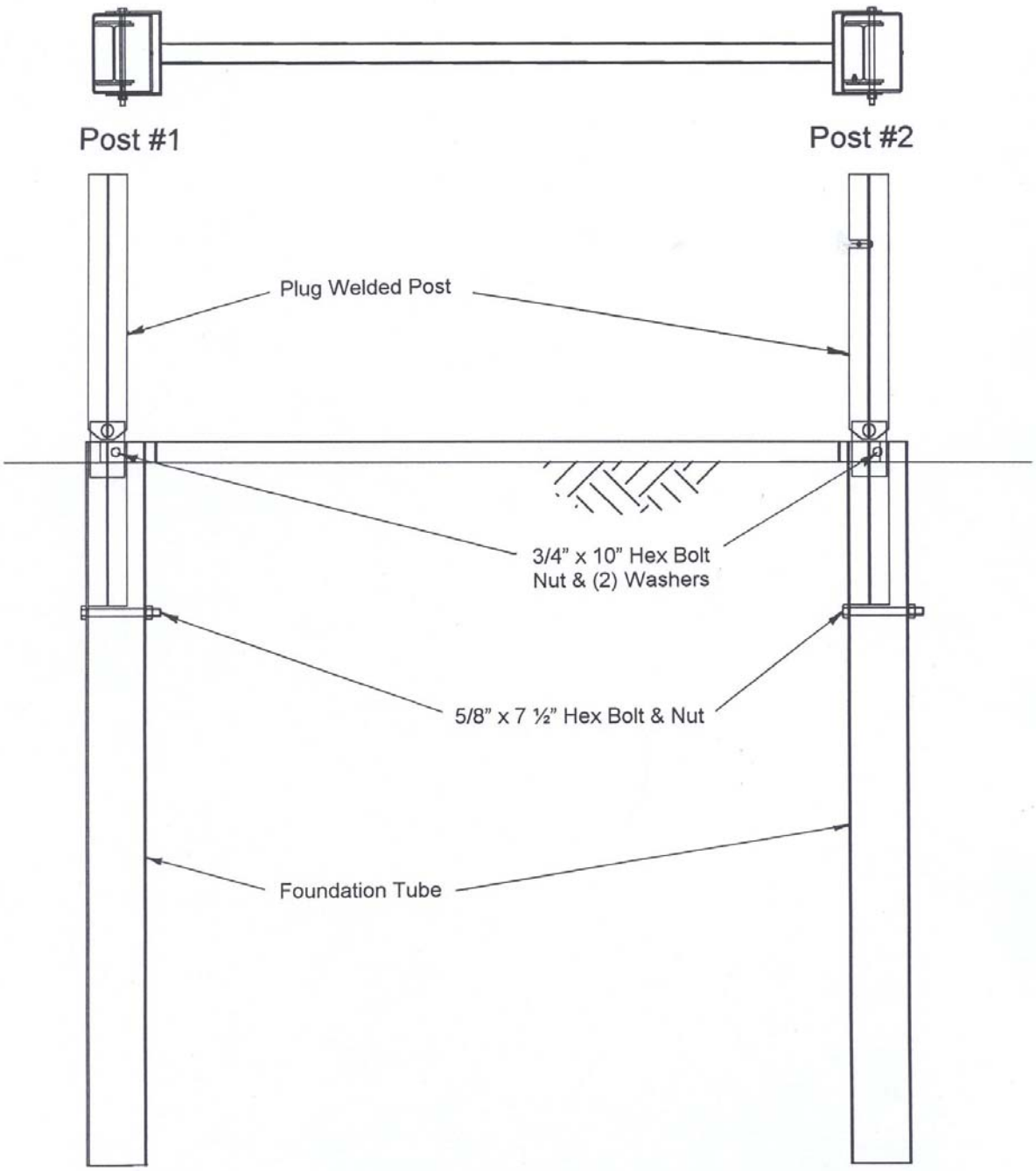


Figure 4. SKT Ground Strut Anchorage for <u>Plug Welded</u> Steel Post

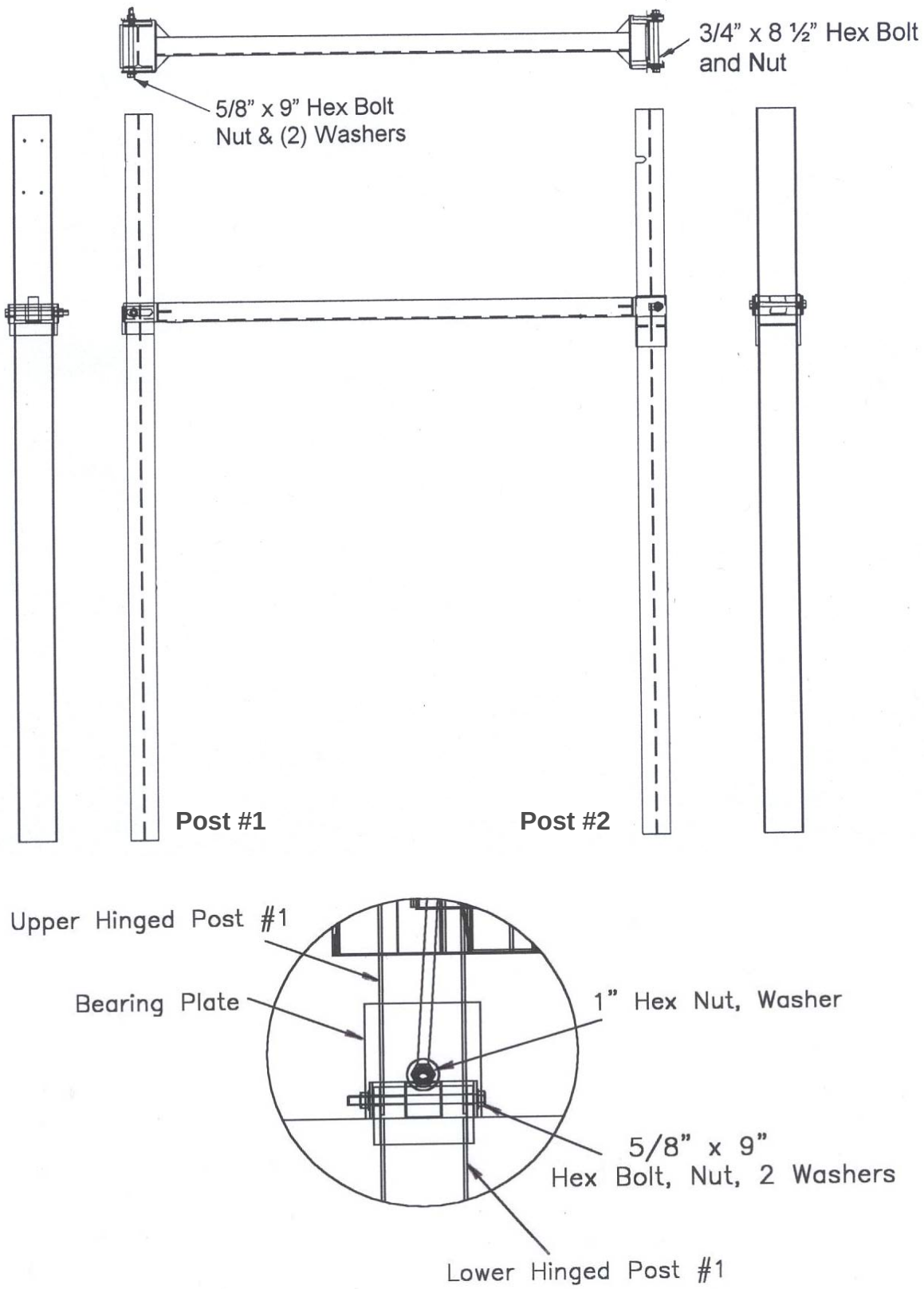
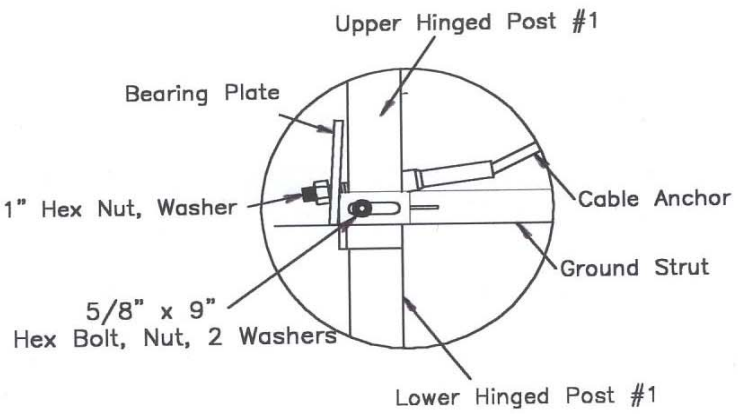
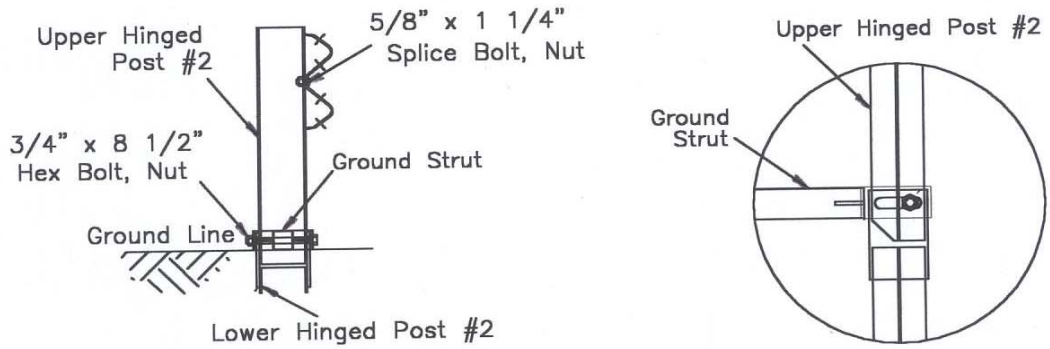


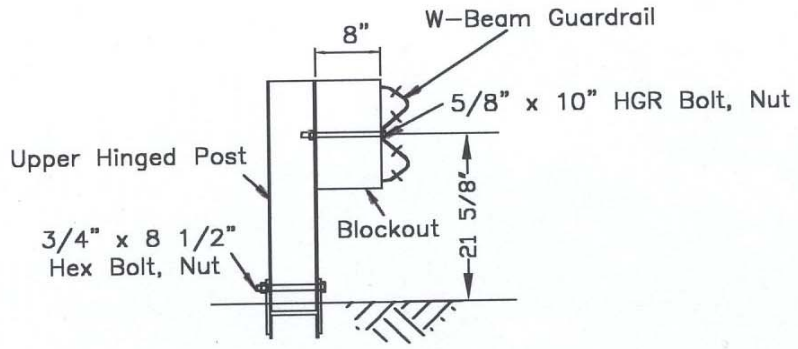
Figure 5. SKT Ground Strut Anchorage for <u>Bolted Hinged</u> Steel Post



Hinged Steel Post #1 Side View
(Note that retainer/tie to keep bearing plate from rotating is not shown)



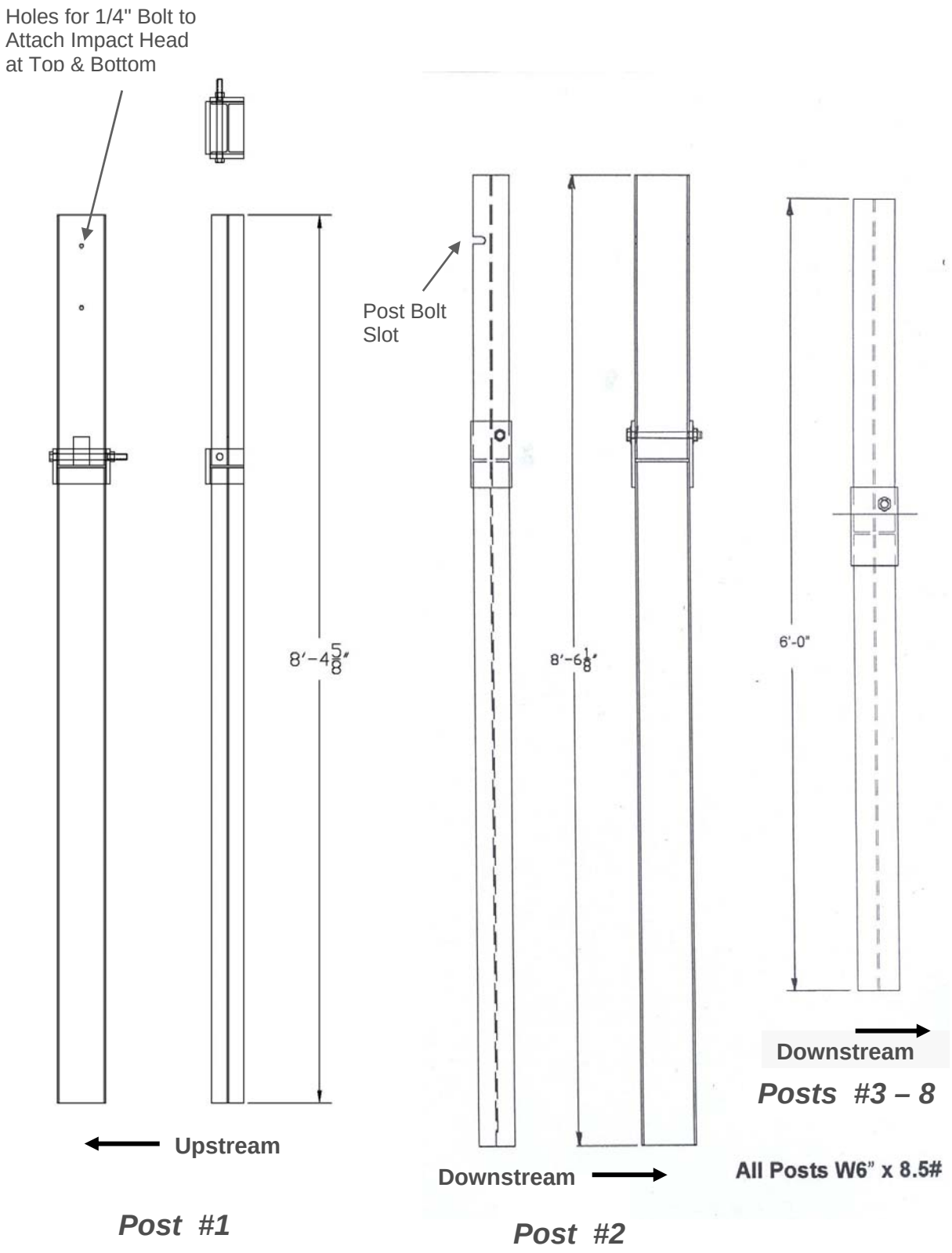
Hinged Steel Post #2



Hinged Steel Posts #3 to #8

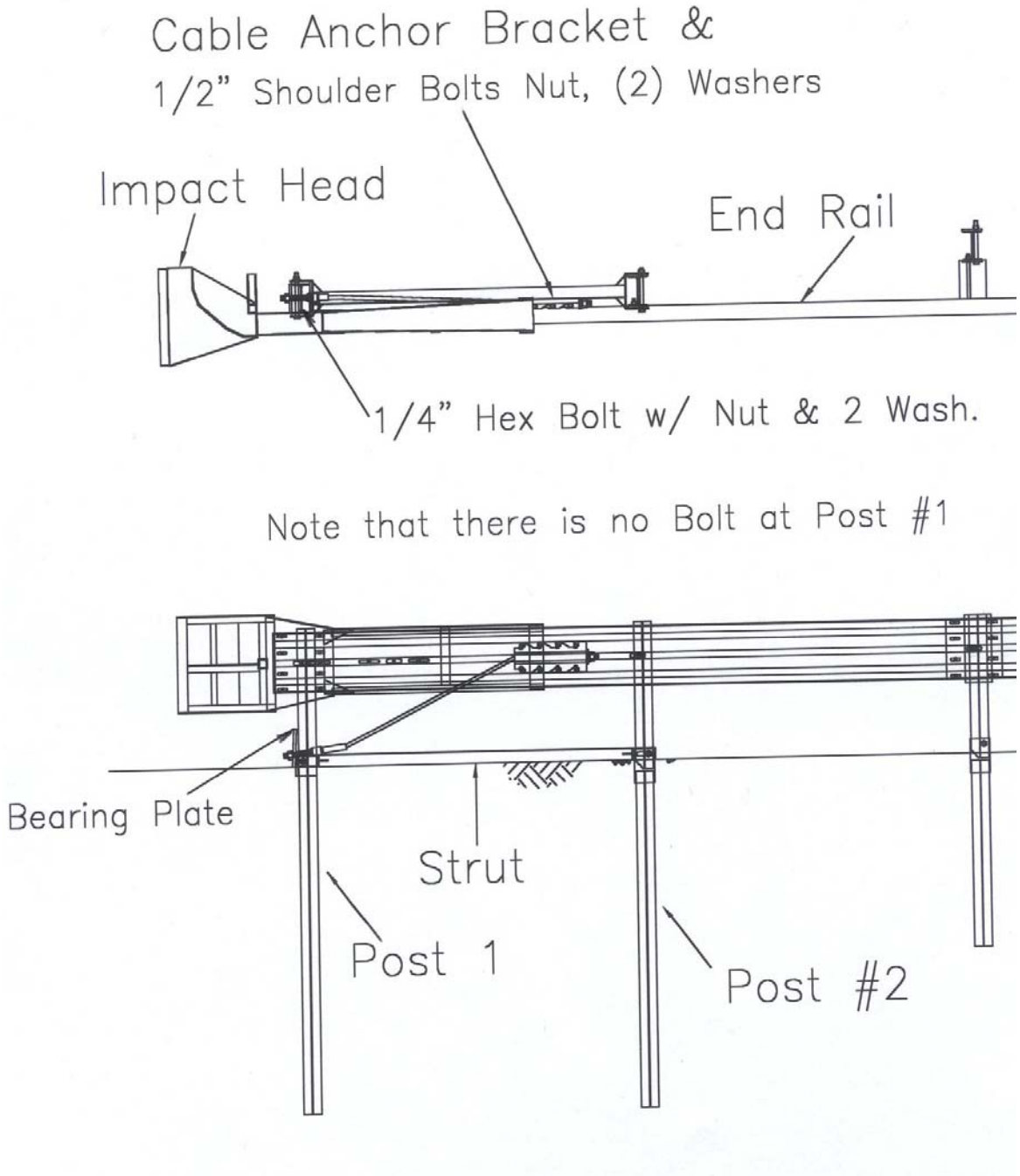
NOTE: Be sure the 5/8" x 9" hex bolt at Hinged Post #1 is on the upstream side of the post.
Be sure the 3/4" x 8 ½" hex bolt at Hinged Posts 2-8 is on the downstream side of the post.

Figure 6. Section Views of Bolted Hinged Steel End Posts and Line Posts



NOTE: Be sure the 5/8" x 9" hex bolt at Hinged Post #1 is on the upstream side of the post.
Be sure the 3/4" x 8 ½" hex bolt at Hinged Posts 2-8 is on the downstream side of the post.

Figure 7. Detail of Bolted Hinged Steel End Posts and Line Posts



NOTE: The impact head is attached to post #1. The W-Beam rail section is not attached to post #1.

Figure 8. SKT Above-Ground Details at Post Locations 1 and 2.

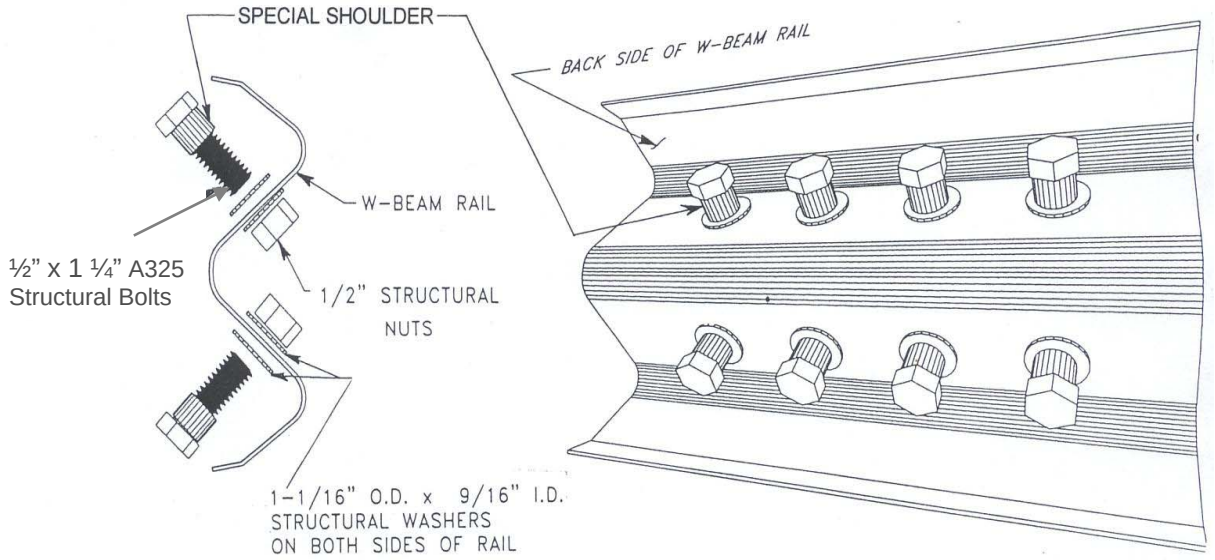
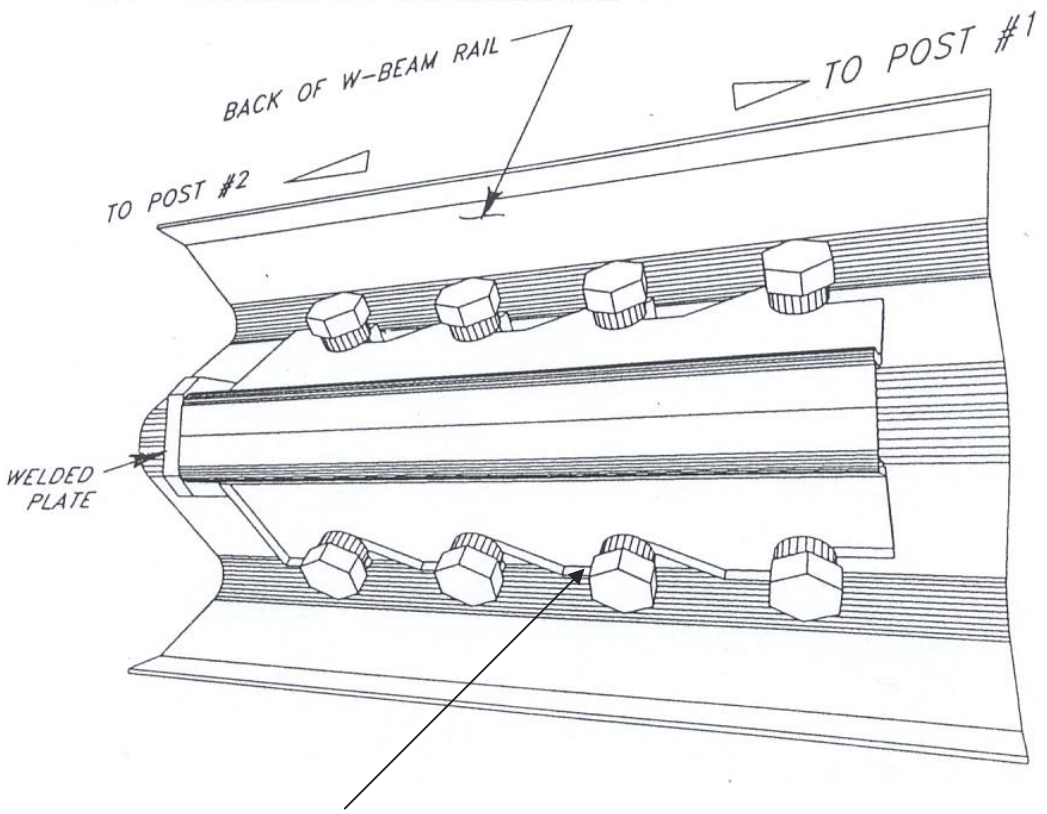


Figure 9. Installation of Cable Anchor Bracket Shoulder Bolts.



It is important that the anchor bracket be fully seated on the shoulder portion of the cable anchor bolts

Figure 10. Installation of Cable Anchor Bracket.

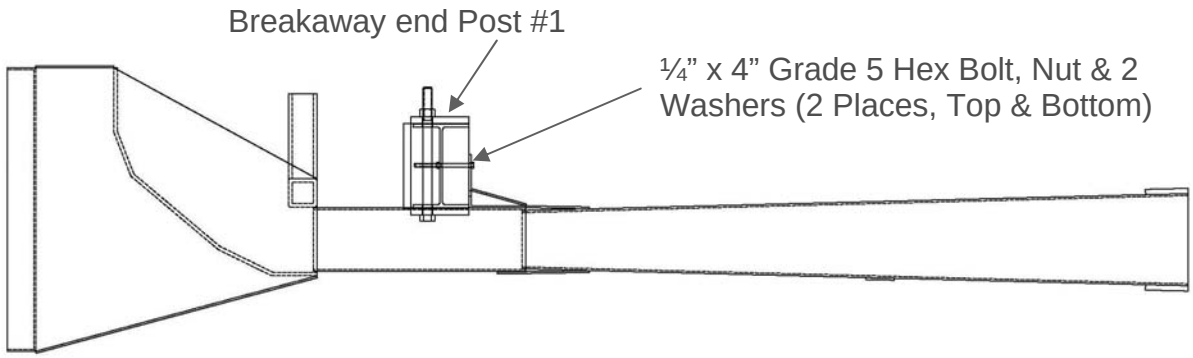
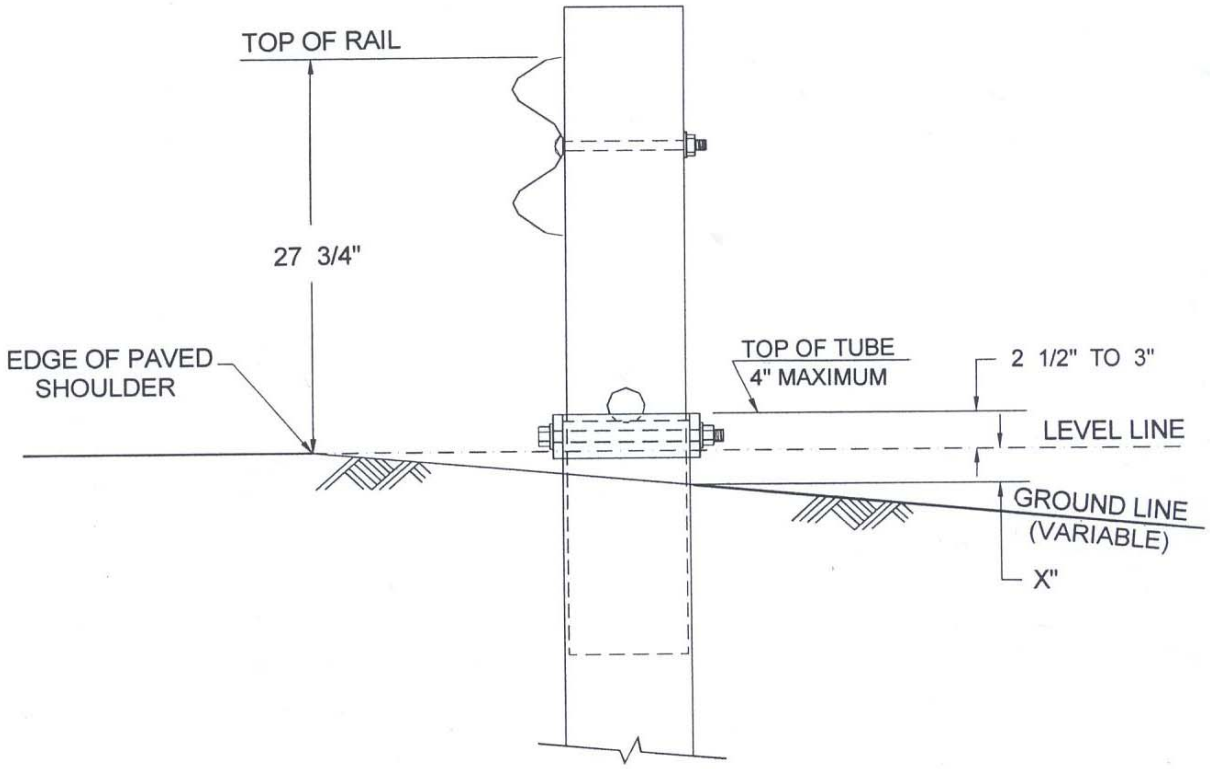
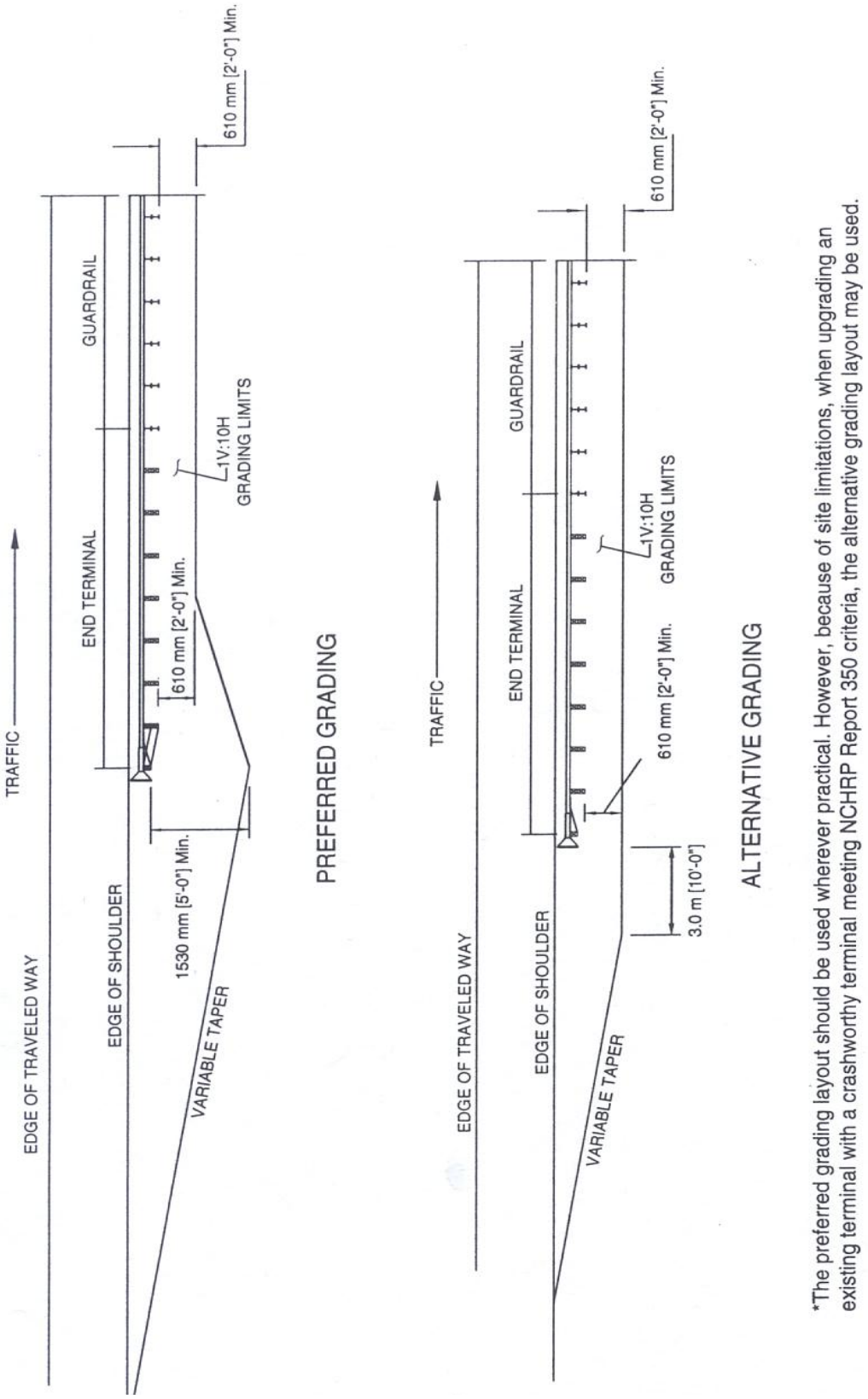


Figure 11. SKT Impact Head Connection to Steel Post



(Wood Post #2 Shown / Steel Post Requirements Similar)

Figure 12. Proper Placement of Foundation Tubes



*The preferred grading layout should be used wherever practical. However, because of site limitations, when upgrading an existing terminal with a crashworthy terminal meeting NCHRP Report 350 criteria, the alternative grading layout may be used.

(Reference AASHTO Roadside Design Guide)

Figure 13. Grading Recommendations for SKT

Installing the SKT

Materials

The length of the **SKT** is 50'-0" long for a Test Level 3 system or the system may also be installed 37'-6" long for the **SKT-LITE** option. A Test Level 2 **SKT** system is 25'-0" long. Refer to contract plans.

Site Preparation

When the guardrail is installed parallel to the edge of the shoulder, a 50:1 (or less) flare away from the roadway is recommended so the impact head will not encroach on the shoulder thereby reducing the potential for nuisance impacts. The flare is not required and may be decreased or eliminated. See **Figure 2**. Minor site grading may be necessary for installations placed beyond the edge of the shoulder to prevent the foundation tubes or the lower section of the breakaway Steel Posts from extending more than 4″ above the ground. See **Figures 12 & 13**.

Tools Required

The tools required for installation of the SKT system are the same as those used to install standard highway guardrails (H.G.R.), including sockets & wrenches, a drill, and other equipment such as augers, tampers, and post pounders commonly used in driving guardrail posts.

Installation Procedures

Begin installation at the downstream end of the SKT (post location 9) to ensure that the terminal matches up with the standard downstream section of guardrail. The major steps in the installation of the SKT are as follows:

- Install steel line posts #3 through #8. The Plug Welded Posts are shop welded and arrive as a single post. (See **Figure 3**). The Hinged Bolted Posts have a top and bottom half that are bolted together in the field. (See **Figure 7**).
- Install steel end posts #1 and #2 with groundline strut. The Plug Welded Posts are inserted in a steel foundation tube. (See **Figure 4**). These posts are shop welded and arrive as a single post. (See **Figure 3**). The Hinged Bolted Posts do not use a foundation tube. (See **Figure 5**). These posts have a top and bottom half that are bolted together in the field. (See **Figure 7**).
- Install guardrail. All posts are spaced at 6'-3". (See **Figure 1**).
- Install cable anchor bracket. (See **Figures 9 & 10**).
- Install the SKT impact head. (See **Figure 11**).
- Install cable assembly.

NOTE: For *Plug Welded Steel Post* and *Wood Post* SKT options, foundation tubes must be used at Posts #1 and #2. Those tubes may be either 6'-0" long split tubes without soil plates, 6'-0" long solid tubes without soil plates, 5'-0" long tubes with soil plates, or 4'-6" long tubes with soil plates. The *Hinged Steel Post* option does not use foundation tubes. See **Table 1** for the allowable steel post and wood post options at Posts # 3 through 8.

Installing Steel Posts 3 Through 8

For the *Hinged Steel Post* option, all bolted posts must have the lower section installed before bolting the top section. The lower section of the Bolted Hinged steel posts should not be driven with the upper post attached. Bolt upper and lower posts together with a ¾" x 8 ½" hex bolt and nut.

Be sure when the *Hinged Steel Posts* #3 through #8 are installed, the hinge bolt is on the downstream side of the post (opposite the impact head). See **Figures 6 & 7**.

For the *Plug Welded Steel Post* option, most times posts 3 through 8 will be 6 feet long and are shipped as a welded assembly. They can be driven just the same as a standard guardrail post.

For the *Plug Welded Steel Post* (or *Wood Post*) SKT options, 2, 4 or 8 foundation tube options are allowable. However, most times only 2 tubes are used (at post #1 & #2) for the Plug Welded Steel Post option. Do not over tighten the bolt at the top of the tube as it may cause the tube to deform.

For stiff soils, drill a pilot hole and force the post to the appropriate depth by impact or vibratory means with an approved driving head. The post may also be installed by augering and backfilling if the contractor so prefers. The initial hole must be large enough to allow adequate room for proper compaction of the soil during backfill. *Care must be taken to carefully compact the backfill to prevent settlement or lateral displacement of the post.* If rock is encountered during driving or excavation, refer to appropriate State specifications for how to proceed. Guidelines will vary from State to State.

NOTE: All of the W-Beam railing within the SKT terminal must be straight. Curving this rail is not permitted.

Installing Steel End Posts 1 and 2 with Groundline Strut

Steel posts 1 & 2 may be installed with either a *Hinged Steel Post* or *Plug Welded Steel Post* option. **Figure 8** shows the above ground details. A ground strut is required for both options but note that different struts are used in order to accommodate the 6" Hinged Post as opposed to the 8"wide foundation tube. **Figures 4 & 5** show the ground strut sections.

For the *Hinged Steel Post* option, all bolted posts must have the lower section installed before bolting the top section. The lower section of the Bolted Hinged steel posts should not be driven with the upper post attached.

Bolt upper and lower Post #2 together with a ¾" x 8 ½" hex bolt and nut. Bolt upper and lower Post #1 together with a 5/8" x 9" hex bolt, nut and (2) washers.

For *Hinged Steel Post #2*, be sure when the lower segment of the post is installed, the hinge bolt is on the downstream side of the post (opposite the impact head). See **Figures 6 & 7**.

The upper Steel Post #2 has an open-ended slot for post bolt #2. Be sure the slot is on the upstream side of the post (toward the impact head). See **Figure 7**.

For *Hinged Steel Post #1*, be sure when the post is installed, the hinge bolt is on the upstream side of the post (toward the impact head). See **Figures 6 & 7**.

For the *Plug Welded Steel Post* (or *Wood Post*) SKT options, foundation tubes are required at post #1 & #2 locations. **Figure 12** illustrates the proper placement of the foundation tubes. The top of the foundation tubes should not project more than 4″ above the ground line when measured along a 5' cord, in compliance with AASHTO specifications. Site grading may be required if the top of the foundation tubes or the lower section of the breakaway Steel Posts project more than 4″ above the ground line. The finished guardrail height should be approximately 27 ¾" above the edge of the shoulder.

Based on a level line from the edge of the paved shoulder, the top of the foundation tube should normally be 2-1/2" to 3" above the level line. The placement of the foundation tube should be an appropriate depth below the level line in order to maintain the 27-3/4" guardrail height from the edge of the shoulder.

If the slope drops off some distance (*X*") from the edge of the shoulder to the tube location, as shown in **Figure 12**, the depth of the foundation tube should be reduced by *X*" in order to maintain the proper guardrail height. The top of the foundation tube will project (*X*" + 2-1/2") to (*X*" + 3") above the ground. In order not to exceed the AASHTO 4" maximum projection above the ground, site grading will be necessary to assure that the "*X* " dimension is not more than 1-1/2" to 1" respectively.

Installing Guardrail

Attach the standard W-beam guardrail sections, 12'-6" or 25'-0" long, beginning at post 9. Attach the W-beam guardrail end section to span from post 1 to 3 for the 12'-6" rail, or from post 1 to 5 for the 25'-0" rail. The rail is to be spliced with 5/8″ x 1-1/4″ H.G.R. bolts and 5/8″ H.G.R. nuts.

For ease of installation, we recommended to have the eight 1/2" cable anchor bracket shoulder bolts and the cable anchor bracket attached to the W-beam guardrail end section prior to attaching the guardrail to the posts. See Section on "Installing Cable Anchor Bracket" for details and **Figures 9 & 10**.

The rails are to be attached to posts and blockouts at post locations 3 through 8 with 5/8″ x 10" H.G.R. bolts and nuts. There is no blockout on posts 1 and 2. The rail is attached to post 2 with a 5/8″ x 1 ¼" H.G.R. bolt and nut.

NOTE: A post bolt is not used at post #1.

It is recommended that the post bolt be placed through the rail at post location #5 where the rail splice occurs as that's how the system was crash tested. However, the system will still function properly if the post bolt is not attached to the rail.

Installing Cable Anchor Bracket

For ease of installation, it is recommended to have the eight 1/2" cable anchor bracket shoulder bolts and the cable anchor bracket attached to the W-beam guardrail end section prior to attaching the guardrail to the posts. If this procedure is not followed, Post #2 may interfere with attaching the bracket.

The eight 1/2" cable anchor bracket shoulder bolts are attached to the W-beam guardrail end section with two 1-1/16" OD x 9/16" ID structural washers, one on each side of the guardrail, and a 1/2" structural nut. The shoulders of the bolts should be on the backside of the guardrail, away from traffic, as shown in **Figure 9**.

For ease of installation, attach the cable anchor bracket shoulder bolts to the rail "finger tight" only. Then align the slots on the cable anchor bracket with the shoulder bolts and tap the cable anchor bracket onto the shoulder portion of the bolts using a hammer. Tighten the bolts with a wrench when the bracket is in place. The welded plate on the cable anchor bracket should be toward Post #2, as shown in **Figure 10**. Be sure the bracket is fully seated on the shoulder portion of the bolts.

Installing the SKT Impact Head

The eight cable anchor bracket shoulder bolts and the cable anchor bracket should be attached to the W-beam guardrail end section prior to attaching the SKT impact head to the first post with ¼" x 4" Grade 5 hex bolts.

Place the SKT impact head with the guide chute over the end of the W-beam guardrail. The impact head should be positioned so that the protruding tube is on the backside of the guardrail, away from traffic as shown in **Figure 8**. Slide the impact head forward until the post angle attachments on the impact head are aligned with the holes in the web of the first post as shown in **Figure 11**. Attach the impact head to the first post with two ¼" x 4" hex bolts, nut and (2) washers, one each for the top and bottom post angle attachments.

NOTE: It is recommended that the face of the impact head be delineated with an object marker that meets State specifications for better night visibility. However, the impact face object marker may not be included as part of the shipped materials for the SKT unless specifically requested in the contract plans.

Installing Cable Assembly

Place the cable assembly through the cable anchor bracket and through the base of post 1. Place the bearing plate at the base of post 1 with the 5″ dimension up and 3″ dimension down. See **Figures 5 & 6**. Secure the bearing plate with a retainer/tie to prevent the plate from rotating. Secure both ends of the cable assembly with a 1″ hex nut and washer. While tightening the cable, use a hammer to tap the cable anchor bracket from the downstream end to ensure that it is securely interlocked with the shoulder bolts. Restrain the cable at the end being tightened with vice grips or channel lock pliers to avoid twisting the cable.

Upon completion of the installation, the cable should be taut and the cable anchor bracket should be fully seated on the shoulder portion of the cable anchor bolts.

NOTE: ***It is very important that the cable anchor bracket be fully seated on the shoulder portion of the cable anchor bolts as shown in Figure 10.***

Steel Post SKT Inspection Checklist

State: _____ Date: _____

Project #: _____ Location: _____

- ☐ The rail height is in accordance with the contract plans. This is approximately 27 ¾" above the edge of the shoulder or the finished grade.
- ☐ The rail in the terminal is not curved and is not attached to the post at post location #1.
- ☐ The end rail panel has special slots and all rails are lapped in the proper direction.
- ☐ The ¾" x 8 ½" Hinge Bolt at posts #2 to #8 is on the downstream side of the post.
- ☐ The 5/8" x 9" Hinge Bolt at post location #1 is on the upstream side of the post.
- ☐ If the posts are Plug Welded, the splice plates are secure and the weld has not failed.
- ☐ At post #2, the open-ended slot for the post bolt is on the upstream side of the post.
- ☐ The guide chute of the impact head is parallel to the top of the rail and the impact head does not encroach on the shoulder (a maximum 25:1 taper is permitted to eliminate the potential for encroachment).
- ☐ The two ¼" x 4" hex bolts holding the impact head to post 1 are secured.
- ☐ The 8" x 8" bearing plate at post 1 is correctly positioned with the 5" dimension up & the 3" dimension down. The anchor cable is taut and correctly installed as shown in Figure 8. A retainer/tie has been placed over the bearing plate to prevent rotation.
- ☐ The cable anchor bracket shoulder bolts are properly attached to the W-beam guardrail and the cable anchor bracket is fully seated on the shoulder portion of the bolts.
- ☐ If the posts were augered, be sure the backfill material around the posts is compacted.
- ☐ No washers are used on the face of the rail except at the cable anchor bracket bolts.
- ☐ If used, the foundation tubes do not protrude more than 4″ above the ground line (measured by the AASHTO 5’ cord method). Site grading may be necessary to meet this requirement.
- ☐ The finished SKT installation is in accordance with all specific State DOT guidelines.

Additional notes:

_____

_____

Inspection performed by:_____

NOTES

NOTES

Installation Instructions

Wood and Steel Post Options

ET-PLUS™

Guardrail End Treatment

Revised October 2009

TRINITY
HIGHWAY PRODUCTS

HIGHWAY SAFETY SOLUTIONS TODAY

ET-PLUS™ Systems

Guardrail End Treatment

Instructional Manual

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, Texas 75207

⚠	**IMPORTANT:** These instructions are to be used only in conjunction with the installation of the ET-PLUS™ systems. These instructions are for standard installations specified by the appropriate state/specifying agency. In the event the specified systems installation requires or involves special circumstances, contact the appropriate state/specifying agency before proceeding. Trinity Highway Products, LLC. representative is available for consultation, if required.

This Manual must be available to the workers at all times. For additional copies, contact Trinity Highway Products, LLC. at 800-527-6050.

All information, illustrations, and specifications in this Manual are based on the latest ET-PLUS™ systems information available at the time of printing. We reserve the right to make changes at any time.

CUSTOMER SERVICE CONTACTS

Trinity Highway Products, LLC. is committed to the highest level of customer service. Feedback regarding the ET-PLUS™ systems, their installation procedures, supporting documentation, and performance is always welcome. Our goal is to enhance highway safety through innovation. Additional information for materials and product specifications can be obtained by calling the telephone numbers or writing to the email address below:

TRINITY HIGHWAY PRODUCTS, LLC:	
Telephone:	800-644-7976 (U.S. Calls) +1-214-589-8140 (International)
E-mail:	productinfo@trin.net
REGIONAL TELEPHONE CONTACTS:	
Dallas, Texas	800-527-6050
Centerville, Utah	800-772-7976
Elizabethtown, Kentucky	800-282-7668
Girard, Ohio	800-321-2755
Orangeburg, South Carolina	800-835-9307
International	+1-214-589-8140

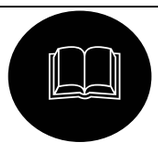
SUGGESTED SAFETY RULES FOR INSTALLATION - MAINTENANCE - REPAIR

*** IMPORTANT SAFETY INSTRUCTIONS ***

Always keep this Manual in a location where it is easily accessed by persons who install, maintain, or repair the ET-PLUS™ systems.

SAFETY SYMBOLS

Below are the safety symbols that may appear on the ET-PLUS™ systems or in the documentation. Read the entire Manual for suggested safety, assembly, installation, maintenance, repair, and service information.

SYMBOL	MEANING
	▪ **SAFETY ALERT SYMBOL** Indicates Danger, Warning, or Caution. Failure to read and follow the Danger, Warning, and Safety or Caution indicators could result in serious injury or death to the workers and/or bystanders.
	▪ **WARNING – READ MANUAL** Read the Manual(s) and follow all warnings and safety instructions. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders.

WARNINGS AND CAUTIONS

Read all warnings, cautions, and instructions before installing/ maintaining/repairing the ET-PLUS™ systems.

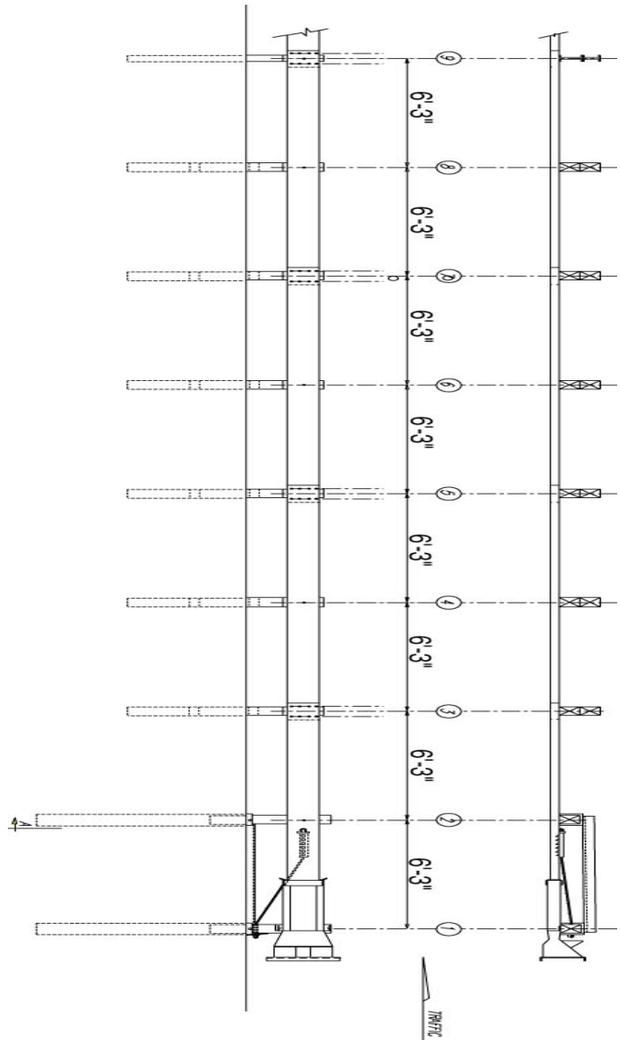
	IMPORTANT: READ SAFETY INSTRUCTIONS THOROUGHLY AND FOLLOW THE SAFE OPERATION PRACTICES WHILE INSTALLING THE ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders.
	WARNING: Read the instructions carefully. Be familiar with the complete instructions for the ET-PLUS™ systems before installing, maintaining, or repairing the ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that the necessary traffic control is setup and any debris that has encroached onto the traveled way or shoulder has been removed, before beginning installation or repairs. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Be sure adequate time is available for complete installation, before beginning the installation process. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT perform installation, maintenance, or repair of the ET-PLUS™ systems when tired, ill, or under the influence of alcohol, drugs, or medication. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do not install, maintain, or repair the ET-PLUS™ systems, until you have read this Manual thoroughly. Please call Trinity Highway Products, LLC. at 800-527-7976, if you do not understand the installation instructions. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.
	WARNING: Do NOT modify the ET-PLUS™ systems in any way. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT perform installation, maintenance, or repair, if the ET-PLUS™ systems site, shoulder, or traveled area is covered or encroached by road debris. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Safety measures, incorporating traffic control devices, must be used to protect all personnel, while at the installation, maintenance, or repair site. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders. Trinity Highway Products offers an economical and effective truck mounted attenuator, the MPS-350, for the protection of workers in work zones. For more information on the MPS-350, call 800-644-7976 or visit the Trinity Highway Products website at www.highwayguardrail.com.
	WARNING: Ensure that the entire work zone site is visible at all times. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders.
	WARNING: Use caution when working near public roads. Be mindful of vehicles in motion nearby. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders.
	WARNING: Ensure that all Guardrail products and delineation used meet all federal, state/specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.

	WARNING: Ensure that your installation, repair, and maintenance meet all appropriate Manual on Uniform Traffic Control Devices (MUTCD) and local standards. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that the Guardrail you install is terminated, as dictated by the state/specifying agency, pursuant to FHWA acceptance. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT install SYTP™ at **location 1**. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT install 6'0" CRT post at location 1. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT bolt the rail panel to the post at **location 1** in any of the ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Do NOT bolt the rail to the HBA™ post at **location 2**. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that there is proper site grading for tube and post placement, as dictated by the state/specifying agency, pursuant to FHWA acceptance. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that all of the ET-PLUS™ systems Warnings, Cautions, and Important statements within the ET-PLUS™ systems Manual are completely followed. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Always use safety precautions when performing installation, maintenance, repair, mixing chemicals, and/or moving heavy equipment. Wear steel toe shoes, gloves, safety goggles, and back protection. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders.
	WARNING: Ensure all wood blocks or composite blocks used with steel posts are routered. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Ensure that this installation conforms with the guidance provided by the AASHTO Roadside Design Guide, including, but not limited to, those regarding placement on curbs. Failure to follow this warning could result in serious injury or death in the event of a collision.
	WARNING: Any grout, backfill, or other materials (such as concrete, asphalt, or soil) must be low enough so as not to obstruct, constrain, or otherwise engage the bearing plate. Failure to eliminate the interaction of soil or materials with the bearing plate will hinder the performance of the ET-PLUS™ systems and could result in serious injury or death in the event of a collision.
	CAUTION: Ensure before installing, maintaining, or repairing the ET-PLUS™ systems that no parts are frayed, damaged, or broken. Failure to follow this warning could result in serious injury to the workers and/or bystanders.

KNOW YOUR ET-PLUS™ SYSTEMS

ET- PLUS™ (TL-3)
50' (15.24 m) SYSTEM

For specific installation, maintenance, or repair details,
refer to the state/specifying agency's standard drawing(s).

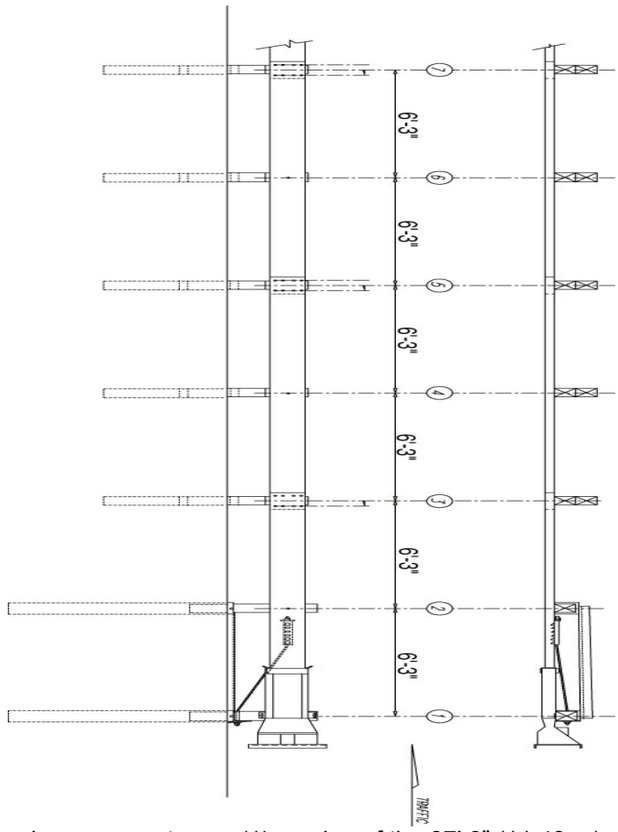


(This drawing represents one (1) version of the 50' (15.24 m) systems)

Alternates for Foundation Tubes
At post **locations 1 and 2,** the alternates to long foundation tube without soil plate are: • Hinged Breakaway™ ("HBA™") post • Short tube with soil plate • HBA™ post **at location 1**, Steel Yielding Terminal Post™ ("SYTP™") at **location 2** • Long foundation at **location 1**, SYTP™ at **location 2** • Short foundation with soil plate at **location 1**, SYTP™ at **location 2**
The alternate to two (2) 12' 6" (3.81 m) long rail elements is one (1) 25' 0" (7.62 m) long rail element.
For post **locations 3 through 8** (50' (15.24 m) system), alternates are: • All short tubes without soil plates and breakaway wood posts • All HBA™ posts • All CRT posts • All SYTP™ • Any combination of above options, as accepted by the FHWA and dictated by the state/specifying agency

ET-PLUS™ (TL-3)
37’ 6" (11.43 m) SYSTEM

For specific installation, maintenance, or repair details,
refer to the state/specifying agency’s standard drawing(s).

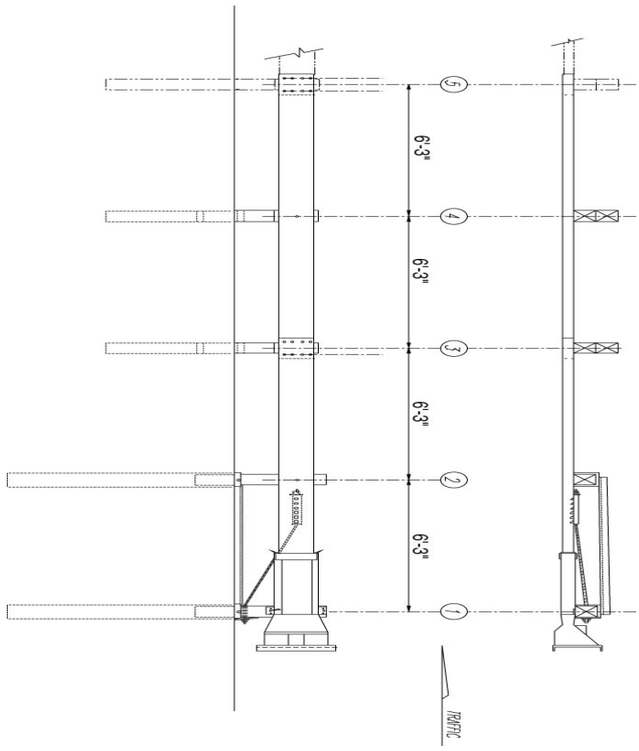


(This drawing represents one (1) version of the 37' 6” (11.43 m) systems)

Alternates for Foundation Tubes and Posts
At post **locations 1 and 2,** the alternates to long foundation tube without soil plate are: • HBA™ post • HBA™ post at **location 1** and SYTP™ at **location 2** • Long foundation tube or short tube with soil plate **at location 1** and SYTP™ at **location 2**
For post **locations 3 through 7** (37’ 6” (11.43 m) system), alternates are: • All short tubes without soil plates and breakaway wood posts • All HBA™ posts (HBA™ post required at **location 8**) • All CRT posts • All SYTP™ (SYTP™ required for **location 8**) • Any combination of above options, as accepted by the FHWA and dictated by the state/specifying agency

ET-PLUS™ (TL-2)
25' (7.62 m) SYSTEM

For specific installation, maintenance, or repair details,
refer to the state/specifying agency's standard drawing(s).



(This drawing represents one (1) version of the 25' (7.62 m) systems)

Alternates for Foundation Tubes, Rail Panels, and Posts
At post **locations 1 and 2,** the alternates to long foundation tube without soil plate are: • HBA™ post • HBA™ post at **location 1** and SYTP™ at **location 2** • Long foundation tube or short tube with soil plate at **location 1** and SYTP™ at **location 2**
The alternate to two (2) 12' 6" (3.81 m) long rail elements is one (1) 25' 0" (7.62 m) long rail element.
For post **locations 3 through 4** (25' (7.62 m) system), alternates are: • Short steel foundation tubes without soil plates and breakaway wood posts or SYTP™ in tubes • All HBA™ posts • All CRT posts • All SYTP™

BILL OF MATERIAL ENGLISH (METRIC)

WARNING: Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.

ET-PLUS™ SYSTEMS

(For specific materials and quantities, see state/specifying agency's option(s))

PN	Description
9G	12/12.5'/6' 3"/S (2.67/3.81/1.905/S) (Guardrail)
32G	12/12.5"/6' 3"/S (2.67/3.81/1.905/S) ANC (Guardrail)
60G	12/25'/6' 3"/S (2.67/7.62/1.905/S) (Guardrail)
62G	12/25'/6' 3"/S (2.67/7.62/1.905/S) ANC (Guardrail)
704A	Cable Anchor Bracket
705G	Pipe Sleeve - 2" STD Pipe x $5^1/_2$" (50 STD Pipe x 150 Pipe)
740G*	6" x 8" x 4' 6" x $^3/_{16}$ (152 x 203 x 1375 x 4.8) Tube Sleeve
749G	6" x 8" x 6' 0" x $^3/_{16}$ (152 x 203 x 1830 x 4.8 Tube Sleeve (Alternate to using 740G and 766G)
766G*	18" x 24" x $^1/_4$" (460 x 610 x 16) Soil Plate
782G	8" x 8" x $^5/_8$" (200 x 200 x 16) Bearing Plate
995A	ET-PLUS™ Extruder (Head)
3000G	Cable (Assembly) $^3/_4$" x 6' 6" (19 x 1981)
3300G	$^5/_8$" (16) Round Washer
3340G	$^5/_8$" (16) HGR Nut
3360G	$^5/_8$" DIA. X $1^1/_4$" (16 DIA. x 35) Splice Bolt (HGR)
3478G	$^5/_8$" DIA. x $7^1/_2$" (16 DIA. x 190) Hex Head Bolt
3497G	$^5/_8$" DIA. x $9^1/_2$" (16 DIA. x 240) Hex Head Bolt
3500G	$^5/_8$" DIA. x 10" (16 DIA. x 255) HGR Post Bolt
3580G	$^5/_8$" DIA. x 18" (16 DIA. x 460) HGR Post Bolt
3701G	$^3/_4$" (19) Washer
3704G	$^3/_4$" (19) HEX Nut
3717G	$^3/_4$ " x $2^1/_2$" (19 x 75) Hex Head Bolt (High Strength)
3718G	$^3/_4$" x 3" (19 x 75) Hex Head Bolt (High Strength)
3900G	1" (25) Round Washer
3910G	1" (25) Hex Nut
4063B	Wood Post 6" x 8" x 6' 0" (150 x 200 x 1830) CRT
4075B	Wood Block 6" x 8" x 14" (150 x 200 x 360) DR
4076B	Wood Block - 6" x 8" x 14" (150 x 200 x 360) DR
4147B	Wood Post - $5^1/_2$" x $7^1/_2$" x 3' 9" (140 x 190 x 1145)
4254G	$^3/_8$" (10) Round Washer
4255G	$^3/_8$" (10) Fender Washer $1^1/_2$" OD (38)
4258G	$^3/_8$" (10) Lockwasher
4261G	$^3/_8$" DIA. X $1^1/_2$" (10 x 38) Hex Head Bolt
4228B	$^3/_8$" x 4" (10 x 100) Lag Screw
4388G	$^7/_{16}$" (11) Hex Nut
4389G	$^7/_{16}$" (11) Round Washer
4390G	$^7/_{16}$" DIA. x $1^1/_2$" (11 x 38) GR. 5 Hex Head Bolt
4393G	$^7/_{16}$" (11) Lockwasher
5148G	$^3/_4$" DIA. X $9^1/_2$" (19 DIA. x 240) Hex Head Bolt (High Strength)
4699G	$^3/_4$" (19) Lockwasher

PN	Description
6321G	$^3/_8$" x 2' (10 x 50) Hex Head Bolt (High Strength)
6405G	$^3/_8$" (10) Hex Nut
6907B	Polymer Block 4" x 7$^1/_2$" x 14" (100 x 187 x 350) [King Block]
14329G#	3' 6$^5/_8$" SYTP Stub
14578G#	6' Steel Yielding Terminal Post (SYTP)
33871A#	ET HBA Post #1 Top
33873A#	ET HBA Post #1 and #2 Bottom
33874A#	ET HBA Post #3 - #8 Bottom
33877A#	ET HBA Post #2 - #8 Top
9852A#	Strut (and Yoke Assembly)
33875G#	6' 6" (1980) Angle Strut ET HBA
33795G#	6' 6" (1980) Angle Strut
33730G#	6' 7$^1/_2$" (1980) Angle Strut
33847G#	6' 9$^1/_8$" Angle Strut

* Option to the 6'0" Post Sleeve Tube

Review the state/specifying agency's standard drawings of these systems, for details that are specific to the project or site locations.

Delineation Options

PN	Description
6206B	Right Side 13" x 27 $^1/_2$" (325 x 700) Reflective Sheeting
6207B	Left Side 13" x 27 $^1/_2$" (325 x 700) Reflective Sheeting
6668B	Either Side 12" x 12" (305 x 305) Reflective Sheeting (Typically 2 required)

INSTALLING THE ET-PLUS™ SYSTEMS

Use Trinity Highway Products' drawings for the ET-PLUS™ systems with these instructions. Review the state/specifying agency's standard drawings of this system. Details will be specific to the project or site locations.

!	**WARNING:** Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.
!	**WARNING:** Ensure that there is proper site grading for tube and post placement, as dictated by the state/specifying agency, pursuant to FHWA acceptance. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Do NOT install 6'0" CRT post at location 1. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Do NOT install SYTP™ at **location 1**. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Ensure that all Guardrail products and delineation used meet all federal, state/specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.

MATERIALS

As packaged, the ET-PLUS™ systems include all materials needed for a complete installation. This will include either a 50' (15.24 m) system, 37' 6" (11.43 m) system, or 25' (7.62 m) system pay limit, unless otherwise specified in the contract plans. Note that concrete footings or foundations are not required.

TOOLS REQUIRED

The following list shows recommended tools for installation of the ET-PLUS™ systems:

- $^{9}/_{16}$" (14 mm) Socket or Wrench
- $^{15}/_{16}$" (24 mm) Socket or Wrench
- $1^{1}/_{4}$" (32 mm) Socket or Wrench
- $1^{1}/_{2}$" (38 mm) Socket or Wrench
- Augers
- Post Pounders (commonly used in driving posts)
- Locking Pliers
- Tape Measure

The following list shows recommended tools for the repair of the ET-PLUS™ systems. However, since repair is directed by the state/specifying agency, they may have more specific guidelines.

- Acetylene torch to cut off extruded rail
- Heavy-duty chain to remove the ET-PLUS™ Extruder (Head)
- Locking Pliers or channel lock pliers
- Sledge hammer
- Post removal tool and other normal guardrail tools
- Eye bolts connected to heavy duty chain (to remove the posts from tubes)
- Vehicle to pull the Extruder from the damaged rail

SITE PREPARATION

When the Guardrail is installed in-line with edge of the shoulder (without any offset), a 25:1 or flatter straight flare over the length of the systems can be used to position the ET-PLUS™ Extruder (Head) further away from the edge of the shoulder. Minor site grading may be necessary for installations beyond the edge of the shoulder, for the proper placement of the steel tubes and the CRT posts. Use the state/specifying agency's standard specifications and drawings for the site grading. Trinity does not direct grading. Complete all grading before the start of the installation of the ET-PLUS™ systems. See INSTALLATION OF THE ET-PLUS™ SYSTEMS ON A CURVE section for the layout of the ET-PLUS™ systems on a curve.

⚠	**WARNING:** Ensure that there is proper site grading for tube and post placement, as dictated by the state/specifying agency, pursuant to FHWA acceptance. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLATION

⚠	**WARNING:** Ensure that this installation conforms with the guidance provided by the AASHTO Roadside Design Guide, including, but not limited to, those regarding placement on curbs. Failure to follow this warning could result in serious injury or death in the event of a collision.

For installation of the ET-PLUS™ systems, see POST INSTALLATION section. If the systems are installed on a curve, see INSTALLATION OF THE ET-PLUS™ SYSTEMS ON A CURVE. When installing the ET-PLUS™ systems outside or inside the curve, the ET must be straight over the length of the systems. If there are special field conditions encountered when installing the ET-PLUS™ systems, contact the state/specifying agency's engineer. Trinity Highway Products LLC., at 1-800-644-7976, is available to assist the state/specifying agency, if needed.

POST INSTALLED IN RIGID MATERIAL

Provide the proper leave out (specified area of open space in the pavement) around a post when installing the post in any thickness of concrete or asphalt. **The top surfaces of any grout or other backfill placed in the rigid material "leave out" MUST be low enough so that it does not engage the anchor cable bearing plate at Post 1 or otherwise obstruct/constrain the $^{3}/_{8}$" shear bolts or the ¾" hinge bolts of the HBA Post.**

For "leave-out" information, please consult the applicable state/specifying agency. Additional source of "leave-out" information/details can be found in the U.S. Department of Transportation, Federal Highway Administration, Memorandum B64-B, dated 3-10-04. Trinity can provide this FHWA memo upon request.

⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt.

INSTALLATION OF THE ET-PLUS™ SYSTEMS ON A CURVE

When the ET-PLUS™ systems are installed on a curve, use the following layouts. All offsets are measured to the face of the rail. Under no circumstances shall the guardrail within the ET-PLUS™ pay limit be curved.

- **Outside the curve:** With the line guardrail installed parallel to the curve, the terminal end is offset from the curve a distance equal to the line guardrail offset plus the value in Table 1. (See state/specifying agency drawings for details.)
- **Inside the curve (radius Greater than 1000 feet):** With the line guardrail installed parallel to the curve, the terminal end is offset from the curve a distance equal to the line guardrail offset plus the value in Table 1. (See state/specifying agency drawings for details.)
- **Inside the curve (radius 1000 feet or Less):** With the line guardrail installed parallel to the curve, the terminal end is offset from the

curve a distance equal to the line guardrail offset plus 1 foot maximum in Table 1. (See state/specifying agency drawings for details.)

ET™ Length	Outside the Curve Max Offset	Inside the Curve With a Radius Greater Than 1000 Feet Max Offset	Inside the Curve With a Radius 1000 Feet or Less Max Offset
50 Feet	2 Feet	2 Feet	1 Foot
37 Feet 6 Inches	1.5 Feet	1.5 Feet	1 Foot
25 Feet	1 Foot	1 Foot	1 Foot

Table 1

POST INSTALLATION

Complete the following steps when installing wood CRT posts, foundation tubes with wood posts, HBA™ posts, and SYTP™. When installing posts in rigid pavement, see the POST INSTALLED IN RIGID MATERIAL section.

⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING THE WOOD CRT POSTS

Complete the following steps to install the wood CRT posts:

Step	Actions
1.	Install the wood posts (PN-4063B) at locations required for the systems, spaced at 6' 3" (1270 mm) apart. Select Option A or Option B to install the CRT posts.

Option A	Drive posts into the ground.
Option B	1. Drill 12” (300 mm) maximum diameter pilot holes approximately 44" (1120 mm) deep. 2. Insert the 6' 0" (1830 mm) wood posts into these holes. 3. Backfill the holes with compactable materials in 6" (150 mm) lifts and compact with pneumatic equipment to optimum compaction.

Note: In either option within Step 1, the bottom of the upper $3^1/_2$" (90 mm) hole in the post is approximately at the finished grade.

⚠	**WARNING:** Do NOT install 6’0” CRT post at location 1. Failure to follow this warning could result in serious injury or death in the event of a collision.
⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

PLACING FOUNDATION TUBES FOR WOOD OR SYT™ POSTS

Complete the following steps to install foundation tubes and Wood or SYT™ posts:

<table>
<tr><th>Step</th><th>Actions</th></tr>
<tr><td>1.</td><td>Select Option A or Option B for this tube installation.
<table>
<tr><td>Option A</td><td>1. For 6' 0" (1830 mm) Tube without Soil Plate
1. Install the foundation tube (PN-749G), per Step 2 below.</td></tr>
<tr><td></td><td>2. For 4’ 6” (1375 mm) Tube without Soil Plate (locations 3 through 8, locations 3 through 7, or locations 3 through 4)
1. Install the soil tube (PN-740G), per Step 2 below.</td></tr>
<tr><td>Option B</td><td>1. For 4' 6" (1375 mm) Tube with Soil Plate (locations 1 & 2)
1. Assemble the soil tubes and soil plates.
2. Bolt the soil plate (PN-766G) to the foundation tube (PN-740G) with two $^{5}/_{8}$" x $7^{1}/_{2}$" (16 mm x 190 mm) Hex Head Bolts (PN-3478G) and $^{5}/_{8}$" (16 mm) HGR Nuts (PN-3340G) (no washers).
3. Install the foundation tube (PN-766G) with soil plate, per Step 2 below.</td></tr>
<tr><td></td><td>2. For 4’ 6” (1375 mm) Tube without Soil Plate (locations 3 through 8, locations 3 through 7, or locations 3 through 4)
1. Install the soil tube (PN-740G), per Step 2 below.</td></tr>
</table>
Note: Do not over tighten the nuts and deform the tubes, this will complicate post replacement.
<table>
<tr><td>⚠</td><td>WARNING: Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.</td></tr>
</table></td></tr>
<tr><td>2.</td><td>Install the foundation tubes at locations 1 and 2. Use the strut as a guide for the spacing of the tubes. If the soil plate is utilized, position it on the downstream side of the post (away from the impact head).
Note: Do not drive tubes with the wood post inserted, this will complicate post replacement.</td></tr>
</table>

INSTALLATION OPTIONS FOR FOUNDATION TUBES FOR WOOD OR SYT™ POSTS

Complete the following steps to install foundation tubes and Wood or SYT™ posts:

FOR PERMEABLE SOIL

Step	Actions
1.	If the soil is permeable (water will drain from the tubes), drive the tubes (with an appropriate driving head) to the optimum height, where the top of the tube is $2^{5}/_{8}$” (67 mm) above the finished grade. **Note:** Take extra care to prevent settlement or lateral displacement of the tubes, to ensure the posts attach to the Guardrail, correctly.
2.	Ensure that the finished Guardrail height will be approximately $27^{3}/_{4}$" (706 mm) above the finished grade, or as the state/ specifying agency plans indicate.
3.	Ensure that the tubes do not project more than 4" (100 mm) above the finished grade.

⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

FOR NON-PERMEABLE SOIL

<table>
<tr><th>Step</th><th>Actions</th></tr>
<tr><td>1.</td><td>Select Option A, Option B, or Option C below, if soil is non-permeable.
<table>
<tr><td>Option A</td><td>For 6’ Tube Only
1. Drill a 12” (300 mm) maximum diameter pilot hole approximately 75” (1905 mm) deep.
2. Insert the tube into the hole to the optimum depth, where the top of the tube is $2^5/_8$” (67 mm) above the finished grade.</td></tr>
<tr><td></td><td>For 4’ 6” Tube with Soil Plate
1. Drill a 12” (300 mm) maximum diameter pilot hole approximately 57” (1450 mm) deep.
2. Insert the soil plate/tube assembly into the hole by impact or vibratory means with an appropriate driving head.
3. Insert the tube to the optimum depth of where the top of the tube is $2^5/_8$" (67 mm) of the above the finished grade.</td></tr>
<tr><td></td><td>For 4’ 6” Tube without Soil Plate
1. Drill a 12” (300 mm) maximum diameter pilot hole approximately 57” (1450 mm) deep.
2. Insert the tube into the hole to the optimum depth, where the top of the tube is $2^5/_8$” (67 mm) above the finished grade.</td></tr>
<tr><td>Option B</td><td>For 4’ 6” Tube with Soil Plate
Cut slots for the soil plates out by hand or by using a rock bar and then follow all of the steps of Option A for 4’ 6” tube with soil plate, above.</td></tr>
<tr><td>Option C</td><td>For 4’ 6” Tube with Soil Plate
Drill three adjacent 12” (300 mm) maximum diameter holes or one 24” (610 mm) maximum diameter hole to accommodate the soil plate/tube assembly and then follow all of the steps of Option A for 4’ 6” tube with soil plate, above.</td></tr>
</table>
Note: Take extra care to prevent settlement or lateral displacement of the tubes, to ensure the posts attach to the Guardrail, correctly.
<table>
<tr><td>⚠</td><td>WARNING: Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.</td></tr>
</table></td></tr>
<tr><td>2.</td><td>Backfill the hole with compactable materials in 6" (150 mm) lifts and compact with pneumatic equipment to optimum compaction.</td></tr>
<tr><td>3.</td><td>Ensure that the finished Guardrail height will be approximately $27^3/_4$" (706 mm) above the finished grade, or as the state/specifying agency plans indicate.</td></tr>
<tr><td>4.</td><td>Ensure that the tubes do not project more than 4" (100 mm) above the finished grade.</td></tr>
</table>

INSTALLING HBA™ BOTTOM POSTS

Complete the following steps to install HBA™ Bottom Posts:

Step	Actions
1.	Arrange the posts so that the large hole ($^{13}/_{16}$" [21 mm]) is placed downstream (away from the impact end of the systems).
2.	Adjust the offset to **Post 2,** if the ET-PLUS™ Extruder (Head) causes a gap between the rail panel and **Post 2**. **Note:** The rail panel must be within $^{1}/_{2}$" (13 mm) of **Post 2**.
3.	Select Option A or Option B for this installation. **Option A** 1. Drive the HBA™ Bottom Posts (PN-33873A, PN-33874A) with an approved driving head to the appropriate depths. The appropriate depth will be approximately 72" (1830 mm) for post PN-33873A, at **Posts 1 and 2** and 44" (1120 mm) for post PN-33874A, at **Posts 3 through 8**, **Posts 3 through 7**, or **Posts 3 through 4**. **Option B** **For HBA™ Bottom Posts** (PN-33873A) at **Posts 1 and 2** 1. Drill a 12" (300 mm) maximum diameter pilot hole approximately 72" (1830 mm) deep. **For HBA™ Bottom Posts** (PN-33874A) at **Posts 3 through 8**, **Posts 3 through 7**, or **Posts 3 through 4** 1. Drill a 12" (300 mm) maximum diameter pilot hole approximately 44" (1120 mm) deep. 2. Insert the posts to the appropriate depth by impact or vibratory means with an appropriate driving head. 3. Backfill the hole with compactable materials in 6" (150 mm) lifts and compact with pneumatic equipment to optimum compaction. **Note:** In either option, the optimum depth will have the $^{13}/_{16}$" (21 mm) hole in the post plates (ears) even with the finished grade. **WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING FOUNDATION TUBES, HBA™ POSTS, OR SYTP™ WHEN ENCOUNTERING ROCK

Complete the following steps to install foundation tubes, HBA™ posts or SYTP™ when encountering rock:

Step	Actions
1.	Select Option A or Option B below when encountering rock, unless there is a more restrictive state/specifying agency specification. **Option A** **If rock is encountered with depth of 20" (510 mm) or less** 1. Drill a 12" - 16" (300 mm - 400 mm) diameter hole into the rock. 2. Drill the hole 2" (50 mm) deeper than the required embedment depth. 3. Place granular material or small pieces of the drilled rock in the bottom 2" (50 mm) of the hole for drainage. Continues on next page.

	4. Install the tube/post into the hole. Backfill the hole with compactable materials in 6" (150 mm) lifts and compact with pneumatic equipment to optimum compaction. **Note:** If compactable, the material removed from the hole may be used for the backfill.
Option B	**If rock is encountered with depth greater than 20" (510 mm)** 1. Drill a 12" - 16" (300 mm - 400 mm) diameter hole 22" (560 mm) deep into the rock. 2. Cut off the embedded portion of the tube/post so the Guardrail will be installed at the proper mounting height. 3. Place granular material or small pieces of the drilled rock in the bottom 2" (50 mm) of the hole for drainage. 4. Install the tube/post in the hole. Backfill the hole with compactable materials in 6" (150 mm) lifts and compact with pneumatic equipment to optimum compaction. **Note:** If compactable, the material removed from the hole may be used for the backfill.

⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING WOOD POSTS IN TUBES

Complete the following steps to install wood posts in tubes:

Step	Actions
1.	Insert Pipe Sleeve (PN-705G) in post (PN-4147B) and install the wood post in the steel tube at **location 1**.
2.	Install wood post(s) (PN-4147B) in tubes at locations required for the systems, as dictated by the state/specifying agency.
3.	Insert a $^{5}/_{8}$" x $9^{1}/_{2}$" (16 mm x 240 mm) Hex Head Bolt (PN-3497G) through the foundation tube and the wood post at all **locations EXCEPT locations 1 and 2**. **Note:** The bolt must be installed from the embankment side, to aid in possible post replacement.
4.	Place a $^{5}/_{8}$" (16 mm) HGR Nut (PN-3340G) on the end of the inserted bolt.
5.	Tighten the nuts to a snug position. **Note:** Do not over tighten the bolts and deform the tubes, this will complicate post replacement.

⚠	**WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING HBA™ TOP POSTS

Complete the following steps to install the HBA™ Top Posts, after the Bottom Posts have been installed:

AT POST 1

Step	Actions
1.	Install the Top Post (PN-33871A) at **Post 1**, by aligning the holes of the post plates (ears) on the Top and Bottom Posts. **Note:** The Top Post's post plates (ears) can be installed on either side of the Bottom Post's post plates (ears).
2.	Insert a $^{3}/_{8}$" (10 mm) diameter x 2" (50 mm) Hex Head High Strength Bolt (PN-6321G) through the $^{7}/_{16}$" (11 mm) holes of the

	post plates (ears) on the Top and Bottom Posts.
3.	Place a $^{3}/_{8}$" (10 mm) Washer (PN-4252G) and a $^{3}/_{8}$" (10 mm) Lockwasher (PN-4258G) under a $^{3}/_{8}$" (10 mm) Hex Nut (PN-6405G) on the inserted bolts to secure. **Note:** The bolts can be installed so the nuts are on the inside or outside of the post plates (ears).
4.	Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.
5.	Insert a $^{3}/_{4}$" (19 mm) diameter x $2^{1}/_{2}$" (63 mm) Hex Head High Strength Bolt (PN-5148G) in the $^{13}/_{16}$" (21 mm) hole of the HBA™ **Post 1** post plates on the side opposite the strut. Do not install the $^{3}/_{4}$" (19 mm) bolt on the strut side of **Post 1**, until the strut is ready to be installed. **Note:** The bolts can be installed so the nuts are on the inside or outside of the post plates (ears).
6.	Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) and a $^{3}/_{4}$" (19 mm) Lockwasher (PN-4699G) under a $^{3}/_{4}$" (19 mm) Hex Nut on the inserted bolt to secure.
7.	Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.

AT POST 2

Step	Actions
1.	Install the Top Post (PN-33877A) at **Post 2**, by aligning the holes of the post plates (ears) on the Top and Bottom Posts.
2.	Insert a $^{3}/_{8}$" (10 mm) diameter x 2" (50 mm) Hex Head High Strength Bolt (PN-6321G) in the $^{7}/_{16}$" (11 mm) holes. **Note:** For the bolt opposite the strut, install it so the nut is on either side of the post plates (ears). For the $^{3}/_{8}$" (10 mm) bolt that is on the side of the strut, install the bolt through the post plates (ears) with the bolt head on the same side as the strut.
3.	Place a $^{3}/_{8}$" (10 mm) Washer (PN-4251G) and a $^{3}/_{8}$" (10 mm) Lockwasher (PN-4258G) under a $^{3}/_{8}$" (10 mm) Hex Nut (PN-6405G) on the inserted bolts to secure.
4.	Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.
5.	Insert a $^{3}/_{4}$" (19 mm) diameter x 2 ½" (63 mm) Hex Head High Strength Bolt (PN-5148G) through the $^{13}/_{16}$" (21 mm) hole of the HBA™ **Post 2** post plates on the side opposite the strut. Do not install the $^{3}/_{4}$" (19 mm) bolt on the strut side of **Post 2**, until the strut is ready to be installed. **Note:** The bolts can be installed so the nuts are on the inside or outside of the post plates (ears).
6.	Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) and a $^{3}/_{4}$" (19 mm) Lockwasher (PN-4699G) under a $^{3}/_{4}$" (19 mm) Hex Nut on the inserted bolt to secure.
7.	Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.

AT POSTS 3 THROUGH 8, POSTS 3 THROUGH 7, OR POSTS 3 AND 4

Step	Actions
1.	Arrange the Top Posts (PN-33877A), for **Posts 3 through 8**, **Posts 3 through 7**, or for **Posts 3 through 4**, by aligning the holes of the post plates (ears) on the HBA™ Top and Bottom Posts, if used.
2.	Insert a $^{3}/_{8}$" (10 mm) diameter x 2" (50 mm) Hex Head Bolt (PN-6321G) through in the $^{7}/_{16}$" (11 mm) holes of the post plates (ears).
3.	Place a $^{3}/_{8}$" (10 mm) washer (PN-4254G) and a $^{3}/_{8}$" (10 mm) Lockwasher (PN-4258G) under a $^{3}/_{8}$" (10 mm) Hex Nut (PN-6405G) on the inserted $^{3}/_{8}$" diameter Hex Head Bolt.
4.	Insert a $^{3}/_{4}$" (19 mm) diameter x $2^{1}/_{2}$" (63 mm) Hex Head High Strength Bolt (PN-6321G) through the $^{13}/_{16}$" (21 mm) holes. **Note:** The bolts can be installed so the nuts are on either side of the post plates (ears).

5.	Place a $^3/_4$" (19 mm) Washer (PN-4252G) and a $^3/_4$" (19 mm) Lockwasher (PN-4258G) under $^3/_4$" (19 mm) Hex Nut on the inserted $^3/_4$" (19 mm) diameter Hex Head High Strength Bolt to secure.
6.	Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.

INSTALLING THE SYTP™

The SYTP™ can be driven or installed in a tube. For SYTP™ installation in a tube, see the INSTALLING THE SYTP™ IN TUBES section. The SYTP™ can be installed at all locations **EXCEPT** at **location 1**.

Complete the following step to install the SYTP™:

WARNING: Do NOT install SYTP™ at **location 1**. Failure to follow this warning could result in serious injury or death in the event of a collision.

DRIVING THE 6' SYTP™

Step	Actions
1.	Drive all the 6'0" SYTP™ (PN-14578) to the optimum depth, where the centers of the four (4) yielding holes through the flange are at the ground line. **WARNING:** Do NOT install SYTP™ at **location 1**. Failure to follow this warning could result in serious injury or death in the event of a collision. **WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING THE SYTP™ IN TUBES

Step	Actions
1.	Install the 3' $6^5/_8$" SYTP(s) ™ (PN-14329) in tubes**,** as dictated by the state/specifying agency. **WARNING:** Do NOT install SYTP™ at **location 1**. Failure to follow this warning could result in serious injury or death in the event of a collision. **WARNING:** Ensure that the proper Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt. Failure to follow this warning could result in serious injury or death in the event of a collision.
2.	Follow the instructions in the INSTALLING THE STRUT section, Step 5.
3.	Except at **Posts 1 and 2**, install the SYTP™ in a tube at locations required for the systems with the four (4) yielding holes (through the flange) at the top of the tube.
4.	From the embankment side of the tube, insert a $^5/_8$" x $9^1/_2$" (16 mm x 240 mm) Hex Head Bolt (PN-3497G) through the tube, the Spacer (PN-4161), and the SYTP™.
5.	Place a $^5/_8$" (16 mm) HGR Nut (PN-3340G) on the inserted bolt, to secure the SYTP™ to the tube. **Note:** Do not over tighten the nut and deform the tube, this will complicate post replacement.

INSTALLING THE STRUT

Complete the following steps when installing the strut:

Note: For All strut installations, the installer must provide a shallow valley/trough for installation of the strut, since a portion of the angle strut will be below grade.

INSTALLING THE STRUT WITH HBA™ POSTS/SYTP™

Complete the following steps to install the strut with HBA™ posts/SYTP™:

Step	Actions
1.	Place the Angle Strut (PN-33875G for HBA™, or PN-33795G for HBA™/SYTP™) on the **outside flanges** of the HBA™ posts or the SYTP™ at **locations 1 and 2**. (Use PN-33875G with the HBA™ posts or the HBA™ post/SYTP™ in a tube. Use PN-33795G with the HBA™ post/SYTP™.) **Note:** The strut can be placed with one of the legs flat on the ground or with the leg edge on the ground. The strut may be installed either on the traffic side or the field side of the posts.
2.	Install a $^{3}/_{4}$" (19 mm) diameter x 2 $^{1}/_{2}$" (63 mm) Hex Head High Strength Bolt (PN-3717G) in the $^{13}/_{16}$" (21 mm) hole of the HBA™ **Post 1** post plates. Place the bolt through the top and Bottom Post's post plates and through the strut.
3.	Place a $^{3}/_{4}$" (19 mm) Washer (PN-3700G) and a $^{3}/_{4}$" (19 mm) Lockwasher under a $^{3}/_{4}$" (19 mm) Hex Nut on the end of the bolt to secure.
4.	Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.)
5.	Select Option A, Option B, or Option C below, for installing the strut on **post 2**: **Option A** — **For HBA™ post at location 2** 1. Insert a $^{3}/_{4}$" (19 mm) diameter x 3" (75 mm) Hex Head High Strength Bolt (PN-3718G) through the strut, two or three ¾" (19 mm) Washers (PN-3701G), and the $^{13}/_{16}$" (21 mm) holes of the HBA™ post plates of **Post 2**. (The two or three washers allow the strut to pass over the $^{3}/_{8}$" (10 mm) bolt head.) 2. Place a $^{3}/_{4}$" (19 mm) washer and a $^{3}/_{4}$" (19 mm) Lockwasher (PN-4699G) under a $^{3}/_{4}$" (19 mm) Hex Nut (PN-3704G) on the inserted bolt. 3. Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly. **Option B** — **For 6' SYTP™ only at location 2** 1. Place a $^{7}/_{16}$" (11 mm) Round Washer (PN-4389G) on the two (2) $^{7}/_{16}$" (11 mm) diameter x 1$^{1}/_{2}$" (38 mm) Hex Head High Strength Bolts (PN-4390G). 2. Place the bolts in the two slotted holes of the strut and the yielding diameter holes of the SYTP™. 3. Place a Lockwasher (PN-4699G) under a $^{7}/_{16}$" Hex Nut (PN-3704G) on the ends of the inserted bolts. 4. Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.) **Option C** — **For 3' 6$^{5}/_{8}$" SYTP™ in tube at location 2** 1. Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) on diameter x 9$^{1}/_{2}$" (240 mm) Hex Head High Strength Bolt (PN-3718G). 2. From the embankment side, insert the bolt through the strut, foundation tube, Spacer (PN-4161), and the SYTP™. 3. Place a washer under a nut on the end of the inserted bolt. 4. Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.) **Note:** Do not over tighten the bolts and deform the tubes, this will complicate post replacement.

INSTALLING THE STRUT WITH WOOD CRT POST IN TUBE AT POST 1 AND SYTP™/ SYTP™ IN TUBE AT POST 2

Complete the following steps to install the strut with wood post in soil tube at **Post 1** and SYTP™/ SYTP™ in tube at **Post 2**:

AT POST 1

Step	Actions
1.	Place the angle strut (PN-33795G) on the embankment side of the SYTP™. (The strut can be placed with one of the legs flat on the ground or with the leg edge on the ground.)
2.	Place a $^{7}/_{16}$" (11 mm) Round Washer (PN-4389G) on the two (2) $^{7}/_{16}$" (11 mm) diameter x $1^{1}/_{2}$" (38 mm) Hex Head High Strength Bolts (PN-4390G).
3.	Insert the two bolts through the two slotted holes of the strut and the yielding diameter holes of the SYTP™, at **Post 2**.
4.	Place a $^{7}/_{16}$" (11 mm) Lockwasher (PN-4393G) under a $^{7}/_{16}$" (11 mm) Hex Nut (PN-4388G) on the ends of the inserted bolts.
5.	Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.)

FOR ANGLE STRUT WITH 6' SYTP™ ONLY AT POST 2

Step	Actions
1.	Place the angle strut (PN-33795G) on the embankment side of the SYTP™. (The strut can be placed with one of the legs flat on the ground or with the leg edge on the ground.)
2.	Place a $^{7}/_{16}$" (11 mm) Round Washer (PN-4389G) on the two (2) $^{7}/_{16}$" (11 mm) diameter x $1^{1}/_{2}$" (38 mm) Hex Head High Strength Bolts (PN-4390G).
3.	Insert the two bolts through the two slotted holes of the strut and the yielding diameter holes of the SYTP™, at **Post 2**.
4.	Place a $^{7}/_{16}$" (11 mm) Lockwasher (PN-4393G) under a $^{7}/_{16}$" (11 mm) Hex Nut (PN-4388G) on the ends of the inserted bolts.
5.	Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.)

FOR ANGLE STRUT WITH SYTP™ IN TUBE AT POST 2

Step	Actions
1.	Place the angle strut (PN-33795G) on the embankment side of the tube. (The strut can be placed with one of the legs flat on the ground or with the leg edge on the ground.)
2.	Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) on a $^{3}/_{4}$" (19 mm) diameter x $9^{1}/_{2}$" (240 mm) Hex Head High Strength Bolt (PN-4699G).
3.	From the embankment side, insert the bolt through the strut, foundation tube, Spacer (PN-4161), and the SYTP™ at **Post 2**.
4.	Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) under a $^{3}/_{4}$" (19 mm) Hex Nut on the end of the inserted bolt.
5.	Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.) **Note:** Do not over tighten the bolts and deform the tubes, this will complicate possible post replacement.

INSTALLING THE STRUT WITH WOOD POSTS IN SOIL TUBE

Complete the following steps to install the strut with wood posts in soil tubes:

Step	Actions
1.	Select the Option A or Option B for installing the strut with wood posts in soil tubes: **Option A** — **For angle strut** 1. Place the angle strut (PN-33875G) on the embankment side of the foundation tubes. 2. Place a $^{3}/_{4}$" (19 mm) Washer (PN-3701G) on a $^{3}/_{4}$" (19 mm) diameter x $9^{1}/_{2}$" (240 mm) Hex Head High Strength Bolt (PN-5148G).

	3. From the embankment side, insert the bolt through the strut, the foundation tube, and the wood post. 4. Place a second washer under a $^{3}/_{4}$" (19 mm) Hex Nut (PN-3704G) on the end of the inserted bolt. 5. Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.)
Option B	**For channel ground strut** 1. Place the slotted yokes of the ground strut (PN-9852A) over the foundation tubes, at the base of **Posts 1 and 2**. 2. Place a $^{5}/_{8}$" (16 mm) Round Washer (PN-3300G) on a $^{5}/_{8}$" (16 mm) diameter x $9^{1}/_{2}$" (240 mm) Hex Head Bolt (PN-3497G). 3. From the embankment side, insert the bolt through the strut, foundation tube, and the wood post. 4. Place a second washer under a $^{5}/_{8}$" (16 mm) HGR Hex Nut on the end of the inserted bolt. 5. Tighten the nuts to a snug position. (The designer does not recommend a torque requirement.)

Note: Do not over tighten the bolts and deform the tubes, this will complicate possible post replacement.

INSTALLING OFFSET BLOCKS AND RAIL PANELS

The ET-PLUS™ systems use 25' 0" (7.62 m) rail panels (PN-60G and/or PN-62G) or 12' 6" (3.81 m) rail panels (PN-9G and/or PN-32G). The state/specifying agency standards must be reviewed for what systems to use.

WARNING: Do NOT bolt the rail panel to the post at **location 1** in any of the ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death in the event of a collision.

WARNING: Do NOT bolt the rail to the HBA™ post at **location 2**. Failure to follow this warning could result in serious injury or death in the event of a collision.

SPLICING THE RAIL PANELS

Complete the following steps to splice the rail panels:

Step	Actions
1.	Lap the terminal rail in the direction of traffic, unless the state/specifying agency's policy dictates otherwise.
2.	Splice the rail panels together with eight (8) $^{5}/_{8}$" x $1^{1}/_{4}$" (16 mm x 32 mm), HGR Splice Bolts (PN-3360G), and $^{5}/_{8}$" (16 mm) HGR Hex Nuts.
3.	Tighten the bolts. (There is no torque requirement.)

INSTALLING THE OFFSET BLOCK AND RAIL PANEL TO WOOD POSTS (POSTS 3 THROUGH 7 OR 8)

Complete the following steps to attach the offset blocks and rail panels to the wood post:

Step	Actions
1.	At locations with wood posts and wood blocks, insert a $^5/_8$" (16 mm) diameter x 18" (460 mm) HGR Post Bolt (PN-3580G) through the rail panel, offset block (PN-4075B), and the post. **Note:** Offset blocks are **NOT** used at **post locations 1 and 2**, but are used at all other locations. **WARNING:** Do NOT bolt the rail panel to the post at **location 1** in any of the ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death in the event of a collision.
2.	Place a $^5/_8$" (16 mm) Round Washer (PN-3300G) under a $^5/_8$" (16 mm) HGR Nut (PN-3340G).
3.	Tighten the bolts. (There is no torque requirement for these bolts.)
4.	Secure the offset block by toe nailing the block to the post or the post to the block, with two (2) 16d hot-dipped galvanized nails approximately 3" (75 mm) from the top of the post or block, one on each side, to prevent it from rotating.

INSTALLING THE OFFSET BLOCK AND RAIL PANEL TO HBA™ POSTS OR SYTP™ (POSTS 3 THROUGH 7 OR 8)

Complete the following steps to attach the offset blocks and rail panels to the HBA™ post or SYTP™:

Step	Actions
1.	At locations with HBA Posts or SYTP™ with wood blocks, insert a $^5/_8$" (16 mm) diameter x 10" (255 mm) HGR Post Bolt (PN-3500G) through the rail panel, Routered Wood (PN-4076B) or Composite Blockout, and the HBA™ post or SYTP™. **Note:** Offset blocks are **NOT** used at **post locations 1 and 2** For SYTP™ stubs, there are two (2) sets of holes in the SYTP™ for attaching the rail. Use the holes in the SYTP™ stub that will place the rail at the correct height. **WARNING:** Do NOT bolt the rail panel to the post at **location 1** in any of the ET-PLUS™ systems. Failure to follow this warning could result in serious injury or death in the event of a collision. **WARNING:** Ensure all wood blocks or composite blocks used with steel posts are routered. Failure to follow this warning could result in serious injury or death in the event of a collision.
2.	Place a $^5/_8$" (16 mm) Round Washer (PN-3300G) under a $^5/_8$" (16 mm) HGR Nut (PN-3340G) on the inserted bolt.
3.	Tighten the bolts. (There is no torque requirement for these bolts.)

INSTALLING THE RAIL PANEL TO THE POST WITHOUT OFFSET BLOCK AT POST 2

Complete the following steps to attach the rail panel to the post without offset block at **Post 2**:

Step	Actions
1.	Select the Option A, Option B, or Option C to install the rail panel without offset block at **Post 2**: **Option A For Wood Post** 1. Insert a $^5/_8$" (16 mm) diameter x 10" (255 mm) HGR Post Bolt (PN-3500G) through the rail and the wood post at **location 2**. 2. Place a $^5/_8$" (16 mm) Round Washer (PN-3300G) under a $^5/_8$" (16 mm) HGR Nut (PN-3340G) on the inserted bolt. Tighten the bolts. (There is no torque requirement for these bolts.) **Option B For SYTP™** 1. Insert a $^5/_8$" (16 mm) diameter x $1^1/_4$" (31 mm) HGR Blot (PN-3360G) through the rail panel and the hole in the SYTP™. **Note:** For SYTP stubs, use the hole in the SYTP™ that will place the rail at the correct height. (If there are two (2) sets of holes in the SYTP™ stub for attaching the rail.) 2. Place a $^5/_8$" (16 mm) Round Washer (PN-3300G) under a $^5/_8$" (16 mm) HGR Nut (PN- 3340G) on the inserted bolt. **Option C For HBA™ Post** 1. Do NOT bolt the rail panel to the HBA™ post at **location 2**. **WARNING:** Do NOT bolt the rail to the HBA™ post at **location 2**. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLING THE CABLE ANCHOR ASSEMBLY

The Cable Anchor Bracket (PN-704A) is secured to the rail panel, by inserting the square protruding hooks/lugs on the bracket into the square slots in the rail panel. The Cable Anchor Bracket is locked into place, by pulling the bracket towards the impact end of the unit, making sure the hooks/lugs are well seated into the square holes.

Complete the following steps to install the cable anchor assembly:

Step	Actions
1.	Slide one end of the cable (PN-3000G) into the Cable Anchor Bracket and the other end through **Post 1**.
2.	Place a 1" (25 mm) Washer (PN-3900G) and 1" (25 mm) Hex Nut (PN-3910G) on the end of the cable that extends through the Cable Anchor Bracket. Turn the nut, until at least 2 threads are completely through the nut.
3.	Place the Bearing Plate (PN-782G) on the impact side of **Post 1** where the cable extends through the post. **The cable bearing plate MUST BE oriented with the "long" dimension turned up. The hole in the bearing plate is off center (in the vertical direction), 5" (125 mm) from one edge and 3" (75 mm) from the opposite edge.**
4.	If applying the Bearing Plate (PN-782G) to a wood post at **Post 1**, drive two nails along the top edge of the Bearing Plate and bend over to prevent the Bearing Plate from rotating. **WARNING:** Any grout, backfill, or other materials (such as concrete, asphalt, or soil) must be low enough so as not to obstruct, constrain, or otherwise engage the bearing plate. Failure to eliminate the interaction of soil or materials with the bearing plate will hinder the performance of the ET-PLUS™ systems and could result in serious injury or death in the event of a collision.
5.	Place a 1" (25 mm) washer under a nut on the end of the cable extending through **Post 1**.
6.	Restrain the cable with locking pliers at the end being tightened, to avoid twisting the cable.
7.	Tighten the Hex Nuts on the cable ends, until the cable is taut.

	The cable is considered taut, when it does not deflect more than 1 inch when pressure is applied by hand in an up or down direction.
8.	**The shank portion of the anchor cable MUST BE positioned so it bears on the bottom edge of the web of the HBA post. The shank portion of the anchor cable must also be centered horizontally so that the bearing plate bears uniformly on both flanges of Post 1.**

INSTALLING THE ET-PLUS™ EXTRUDER (HEAD)

Complete the following steps to install the ET-PLUS™ Extruder (Head):

Step	Actions
1.	Place the ET-PLUS™ Extruder (Head (PN-995A)) over the end of the rail panel as the final piece to attach to the assembly. **Note:** The ET-PLUS™ Extruder (Head) can be used on the left or right hand shoulder.
2.	Push the ET-PLUS™ Extruder (Head) as far as it will go on the rail panel, making sure the rail is in the channel chute.
3.	Install the ET-PLUS™ Extruder channel chute approximately parallel to the ground. The attachment brackets have 3 holes in each bracket to provide tolerance in the installation.
4.	Select the Option A or Option B for the ET-PLUS™ Extruder (Head) installation:

Option A	**For Wood post** 1. Place the ET-PLUS™ Extruder (Head) against the wood post, at **location 1**. 2. Choose the hole in the bracket that is closest to the center of the post. 3. Drill a $^1/_4$" (6 mm) pilot hole to avoid breaking the lag screw during installation. 4. Screw one (1) $^3/_8$" (10 mm) diameter x 4" (100 mm) Lag Screw (PN-4228B) in the top and bottom bracket. The lag screw must be screwed into the post to prevent it from pulling out or cracking the post.
Option B	**For HBA™ post** 1. Place the ET-PLUS™ Extruder (Head) against the HBA™ post, at **location 1**. 2. Place a $^3/_8$" (10 mm) Round Washer (PN-4254G) on a $^3/_8$" (10 mm) diameter x $1^1/_2$" (38 mm) Hex Head Bolt (PN-4261G). 3. Insert the bolt through the flange of the ET-PLUS™ Extruder (Head) and the flange of HBA™ post. 4. Place a $^3/_8$" (10 mm) Fender Washer (PN-4255G) under a $^3/_8$" (10 mm) Nut (PN-6405G) on the end of the inserted bolt. 5. Tighten the nuts to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.

DELINEATION OPTION FOR THE ET-PLUS™

Install high intensity reflective sheeting (PN-6206B [Right Side] or PN-6207B [Left Side]) on the front face of the ET-PLUS™ Extruder (Head), per the state/specifying agency's MUTCD for options or proper delineation. Alternate reflective sheeting is PN-6668B. The alternate reflective sheeting requires two pieces and must be rotated for proper delineation.

Note: The reflective sheeting is an option to the ET-PLUS™ and needs to be ordered separate from the ET-PLUS™ package.

WARNING: Ensure that your installation, repair, and maintenance meet all appropriate Manual on Uniform Traffic Control Devices (MUTCD) and local standards. Failure to follow this warning could result in serious injury or death in the event of a collision.

INSTALLATION CHECKLIST

STATE: _____PROJECT: _____

DATE: _____LOCATION: _____

- ❑ The Leaveout (specified area of open space in the pavement) around the posts is reserved and filled with state/specifying agency approved backfill material that will not prevent movement, for any posts installed in rigid pavement such as any thickness of concrete or asphalt.
- ❑ The finished Guardrail height is approximately 27$^{3}/_{4}$" above the finished grade, or as the state/specifying agency plans indicate.
- ❑ Any site grading needed was completed, before the start of the installation of the ET-PLUS™ systems.
- ❑ The steel tubes or post plates (ears) to the HBA™ Bottom Posts do not protrude more than 4" (100 mm) above the finished grade measured by the American Association of State Highway and Transportation Officials ("AASHTO") 5' (1.5 m) cord method. Site grading may be necessary to meet this requirement.
- ❑ The $^{3}/_{4}$" bolts connecting the tops of the HBA™ Bottom Posts to the bottoms of the HBA™ Top Posts are tightened to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.
- ❑ The ⅜" bolts connecting the tops of the HBA™ Bottom Posts to the bottoms of the HBA™ Top Posts are tightened to a snug position. The designer does not recommend a torque requirement for the HBA field assembly.
- ❑ The bolts at the top of the steel tubes are not over tightened. The walls of the steel tubes are not collapsed.
- ❑ If an angle strut was utilized, the bolts connecting the angle strut are HIGH STRENGTH.
- ❑ The ET-PLUS™ Extruder (Head) is pushed as far as it will go on the rail panel, ensuring the panels fully engage with the channel chute.
- ❑ The two bolts holding the ET-PLUS™ Extruder (Head) to **Post 1** are snug and the Extruder channel chute is approximately parallel to the finished grade.
- ❑ The Cable Anchor Bracket is locked into place, by pulling the bracket towards the impact end of the unit, making sure the hooks/lugs are well seated into the square holes.
- ❑ The shank portion of the anchor cable **MUST BE** positioned vertically, up flush against the bottom web of the top section of the HBA post. The shank portion of the cable **MUST** also be centered horizontally so that the bearing plate bears uniformly on both flanges of **Post 1**.
- ❑ Any grout, backfill, or other materials (such as concrete, asphalt, or soil) must be low enough so as not to obstruct, constrain, or otherwise engage the bearing plate.
- ❑ The Hex Nuts on the cable ends are tighten, until the cable is taut. The cable is considered taut, when it does not deflect more than 1 inch when pressure is applied by hand in an up or down direction.
- ❑ The Bearing Plate (PN-782G) is placed on the impact side of **Post 1** where the cable extends through the post. The cable bearing plate **MUST BE** oriented with the "long" dimension turned up. The hole in the bearing plate is off center (in the vertical direction), 5" (125 mm) from one edge and 3" (75 mm) from the opposite edge.
- ❑ The top surfaces of any grout or other backfill placed in the mowstrip "leave out" must be low enough so that it does not engage the bearing plate or otherwise obstruct/constrain the 3/8" shear bolts or the 3/4" hinge bolts of the HBA Post
- ❑ Any wood offset blocks used have been toe nailed to the wood posts.
- ❑ If backfilled, the backfill material around the posts is properly compacted.
- ❑ Each HBA™ post has two bolts on either side of the post with the larger bolt downstream of the smaller bolt (away from the impact head).
- ❑ The SYTP™ holes are at the finished grade.
- ❑ The CRT post has two 3$^{1}/_{2}$" (90 mm) breakaway holes (checked prior to installation). They are located parallel to the roadway with the top hole located approximately at the finished grade.
- ❑ The tube bolts are installed with the nuts on the pavement side of the tube for ease of future removal.
- ❑ The rail panels are lapped correctly and not attached to the posts at locations identified for the system installed.
- ❑ The reflective sheeting is correctly positioned on the Extruder face.
- ❑ Ensure that this installation conforms with the guidance provided by the AASHTO Roadside Design Guide, including, but not limited to, those regarding placement on curbs.

MAINTENANCE AND REPAIR INSTRUCTIONS

*** IMPORTANT MAINTENANCE AND REPAIR INSTRUCTIONS ***

Always keep the Manual in a location where it is easily accessed by persons who install, maintain, or repair the ET-PLUS™ systems. If you have any questions concerning the information in this Manual or about the ET-Plus™ systems, contact the state/specifying agency, then Trinity Highway Products, LLC. at 800-527-6050.

!	**WARNING:** Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.
!	**WARNING:** Ensure that the necessary traffic control is setup and any debris that has encroached onto the traveled way or shoulder has been removed, before beginning installation or repairs. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Safety measures, incorporating traffic control devices, must be used to protect all personnel while at the installation, maintenance, or repair site. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders. Trinity Highway Products offers an economical and effective truck mounted attenuator, the MPS-350, for the protection of workers in work zones. For more information on the MPS-350, call 800-644-7976 or visit the Trinity Highway Products website at www.highwayguardrail.com.
!	**WARNING:** Do NOT perform installation, maintenance, or repair if the ET-PLUS™ systems site, shoulder, or traveled area are covered or encroached by road debris. Failure to follow this warning could result in serious injury or death in the event of a collision.
!	**WARNING:** Ensure that all Guardrail products and delineation used meet all federal, state/specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.

MAINTENANCE

Complete the following steps, periodically, to check the safety of the system:

Step	Actions
1.	Ensure the nuts have not been removed from the cable. Replace nuts, if needed. ! **WARNING:** Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.
2.	**Ensure the end fitting on the anchor cable MUST BE positioned vertically, up flush against the bottom web of the top section of the post. The end fitting of the cable MUST be centered horizontally so that the bearing plate bears uniformly on both flanges of Post 1.**
3.	Ensure the cable is taut. The cable is considered taut, when it does not deflect more than 1 inch when pressure is applied by hand in an up or down direction. Tighten, if needed.
4.	**Ensure the bearing plate has not rotated.** **Note: The cable bearing plate MUST BE oriented with the "long" dimension turned up. The hole in the bearing plate is**

	off center (in the vertical direction), 5" (125 mm) from one edge and 3" (75 mm) from the opposite edge.
5.	Ensure wood blocks are in place and in good condition, as defined by the state/specifying agency.
6.	Ensure the blockouts have not rotated. Correct the blockout position and reinstall the 16d hot-dipped galvanized nails, if needed.

REPAIR

Complete the following steps to repair the ET-PLUS™ systems:

Step	Actions
1.	Setup necessary traffic control at the accident site and then, remove any debris that has encroached onto the traveled way or shoulder. **WARNING:** Ensure that the necessary traffic control is setup and any debris that has encroached onto the traveled way or shoulder has been removed, before beginning installation or repairs. Failure to follow this warning could result in serious injury or death in the event of a collision. **WARNING:** Safety measures, incorporating traffic control devices, must be used to protect all personnel while at the installation, maintenance, or repair site. Failure to follow this warning could result in serious injury or death to the workers and/or bystanders. Trinity Highway Products offers an economical and effective truck mounted attenuator, the MPS-350, for the protection of workers in work zones. For more information on the MPS-350, call 800-644-7976 or visit the Trinity Highway Products website at www.highwayguardrail.com.
2.	Take inventory of the damaged systems and determine what parts are reusable, as defined by the state/specifying agency and what parts need to be replaced.
3.	Check the ET-PLUS™ Extruder (Head) for damage. (It is normally reusable.)
4.	Check the anchor cable and Cable Anchor Bracket for damage. (The Bearing Plate, nuts, washers, and Cable Anchor Bracket are rarely damaged.)
5.	Obtain the Trinity Highway Products' parts that need to be replaced from Trinity Highway Products, LLC. (See TOOLS REQUIRED section for list of recommended tools for the repair of the ET-PLUS™ systems.) **WARNING:** Use only Trinity Highway Products' parts on the ET-PLUS™ systems for installation, maintenance, or repair. The installation or co-mingling of unauthorized parts is strictly prohibited. Failure to follow this warning could result in serious injury or death in the event of a vehicle impact with a system that has not been accepted by the Federal Highway Administration ("FHWA"). The ET-PLUS™ systems and its component parts have been accepted for state use by FHWA. However, a co-mingled system has not been accepted.
6.	Return to the repair site with the replacement parts and tools needed.
7.	Cut off the **extruded** rail near the ET-PLUS™ Extruder (Head). Do not cut the ET-PLUS™ Extruder (Head) from the non-extruded rail.
8.	Secure a chain to the ET-PLUS™ Extruder (Head).
9.	Attach the chain to a truck frame while the other end of the rail is still connected to the downstream posts (away from the impact head) to provide anchorage.
10.	Pull the ET-PLUS™ Extruder (Head) off the rail.
11.	Remove any damaged rail.
12.	Remove the broken posts from the steel tubes.
13.	Remove all damaged CRT, SYTP™, or HBA™ posts. Undamaged HBA™ posts can be reset.
14.	Remove and discard any rubber bumpers or construction legs

	encountered on damaged systems.
15.	Reconstruct the systems following the installation instructions, after the site has been cleared of damaged debris. **WARNING:** Do NOT perform installation, maintenance, or repair if the ET-PLUS™ systems site, shoulder, or traveled area are covered or encroached by road debris. Failure to follow this warning could result in serious injury or death in the event of a collision.
16.	Install proper delineation for the repaired systems in accordance with the state/specifying agency's MUTCD. **WARNING:** Ensure that all Guardrail products and delineation used meet all federal, state/specifying agency, and local specifications. Failure to follow this warning could result in serious injury or death in the event of a collision.

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Installation and Maintenance Manual

X-Tension™ Guardrail End Terminal

Step by Step Instructions for the ***Tangent, Flared*** and ***Median*** Applications

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X-Tension Introduction

Introduction

The X-Tension Guardrail End Terminal has been designed and tested to meet the evaluation criteria of NCHRP 350 Test Level 3.

The system has been tested to the guidelines in NCHRP 350 for a non-gating, re-directive guardrail end treatment. When correctly installed and maintained, the system is capable of stopping, containing, or re-directing an errant vehicle in a safe manner under NCHRP 350 impact conditions.

The X-Tension Guardrail End Terminal is the world's first fully re-directive, non-gating guardrail terminal end. The unique X-Tension technology is a tension based solution rather than compression based. It offers exceptional vehicle control and energy absorbing capabilities in head on impacts, where the energy is absorbed with resistance at the impact head rather than being transferred down the rail as occurs with other systems. Even head on, high angle (15° during testing) impacts on the nose resulted in the vehicle being redirected and controlled.

System Overview

The X-Tension Guardrail End Terminal is designed and constructed to provide acceptable structural adequacy, minimal occupant risk and safe trajectory as set forth in NCHRP 350 for guardrail terminal ends.

When impacted head on with an 820 – 2000kg (1800 – 4400lb) vehicle at speeds of up to 100kph (62 mph), the impacting vehicle is brought to a controlled stop or allowed to penetrate to the back side, depending on the impact conditions.

Before Installation

Placement and use of the X-Tension Guardrail End Terminal should be done in accordance with the guidelines and recommendations set forth in the "AASHTO Roadside Design Guide", FHWA memoranda and other state and local standards.

Depending on the application and circumstances at the site, installation and assembly of a Test Level 3 system should take a two person crew less than two hours.

The X-Tension Guardrail End Terminal is a highly engineered safety device made up of a relatively small number of parts. Before starting installation ensure that one is familiar with the make up of the system.

Limitations and Warnings

The X-Tension Guardrail End Terminal has been rigorously tested and evaluated per the recommendations in the NCHRP 350 guidelines for terminals and crash cushions. The impact conditions recommended in NCHRP 350 are intended to address typical in–service collisions.

When properly installed and maintained, the system is capable of containing and re-directing impacting vehicles in a predictable and safe manner under the NCHRP 350 impact conditions.

Vehicle impacts that vary from the NCHRP 350 impact conditions described for guardrail end terminals may result in significantly different results than those experienced in testing. Vehicle impact characteristics different than or in excess of those encountered in NCHRP 350 testing may result in system performance that may not meet the NCHRP 350 evaluation criteria.

Safety Statements

General Safety
All required traffic safety precautions should be complied with. All workers should wear required safety clothing (high visibility vests, steel capped footwear, gloves, hard hats, safety glasses etc.)

All underground services must be located before installation of any posts.

Only Authorized trained personnel should operate any machinery. Where overhead machinery is used, care must be taken to avoid any overhead hazards.

Gloves should be worn at all times. Particular care should be taken to avoid galvanizing spikes.

X-Tension Safety Statements
All installers must be well clear of post driving machinery when in use.

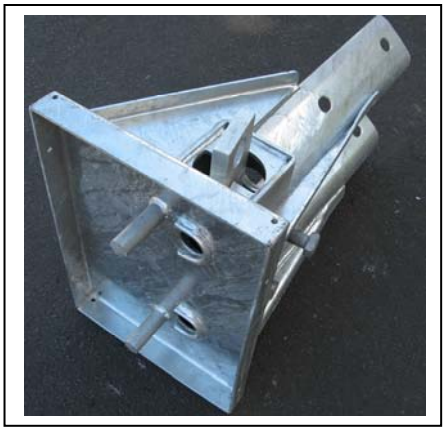
Avoid placing hands or fingers in and around moving parts when components are being lifted and manoeuvred into place. (i.e. around splice holes, etc.) permeable

The cables should be fitted by one person only. Other workers should stand clear to avoid being caught in moving cables.

Securely fasten the impact head and rail before turning the friction plate.

The friction plate should be turned manually with a crow bar and extension handle. Do not attempt to turn it with the assistance of machinery. Ensure crow bar is securely held while the 4 locking bolts are tightened.

X-Tension Parts Identification



Impact Head
(1 Required)
B061072

Friction Plate
(1 Required)
B061058

Soil Anchor
(1 Required)
B061104

Slider Bracket + Angle Bar
(1 Required Roadside – 2 Median)
B061079

Cable Bracket
(1 Required)
B061083

Cable Assembly
(2 Required)
B061109

Slider Panel
(1 Required Roadside – 2 Median)
B061088

Post 1 - Top
(1 Required)
B061099

Ground Strut
(1 Required)
B061094

X-Tension Parts Identification (Continued)

Post # 2 (1 Req.)
Roadside can be CRT Timber
B061100

Standard Steel Line Post (3-6)
(CRT Timber Posts allowed roadside)
4002338

Post #1 Bottom
(1 Required)
B061098

Standard Highway Rail 12'-6"
(3 Required Roadside – 5 Median)
4002018

Median Radius Rail 1 (12'-6")
(1 Required – Shop Curved)
B070233

Median Secondary Head
(1 Required)
B070219

Shear Bolts
(8 Required Roadside - 16 Median)
K080123

Blockout (Plastic or Timber)
(5 Required Roadside – 10 Median)
4001339

Hardware Set
(Roadside)
K070202 & K070204

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X-Tension – Preparation for all Applications

Preparation

Before installing an X -Tension, ensure that all materials required for an 11.4 m (38 ft) system are on site and have been identified. See bill of materials for the particular application and parts identification sheet.

Ensure that the area where the X-Tension is to be installed is flat enough so that the soil anchor will not protrude more than 100mm (4 in) from ground level, when measured with a straight line over a 1.5m (5 ft) cord. Minor site grading may be required.

Soil Conditions

The X-Tension has been designed to be installed in median or edge of road locations and in soil that meets or exceeds the AASHTO "standard soil" specification. If rock or saturated soil is encountered during post installation, refer to appropriate State specifications. Guidelines will vary from State to State.

Tools Required

The same tools required to install standard highway guardrail will also install an X-Tension. ***Specifically:*** Sockets (commonly used in Guardrail), Drill, Wrenches, Large Crow Bar, String line, Level, Augers, Tampers and Post Pounders commonly used in driving posts.

Before Starting

For all applications, begin the installation from the downstream end of the terminal at the point where it joins the standard guardrail (post 7).

For the tangent and flared applications, the X-Tension connects directly to standard steel post or timber post strong post W – beam highway guardrail, SGR04a-b.

The median application X-Tension connects directly to standard steel post or timber post strong post W-beam median barrier SGM04a-b

Follow step by step instructions for the appropriate application.

Important Note about posts and blockouts:

Tangent & Flared Systems:

Post 1 steel – Post 2 either CRT timber or crimped steel
Post 3-6 either CRT timber or standard steel I beam posts

Median system:

Posts 1 & 2 are always crimped steel.
Posts 3 – 6 are standard steel I beam posts

Blockouts may be either composite or timber.

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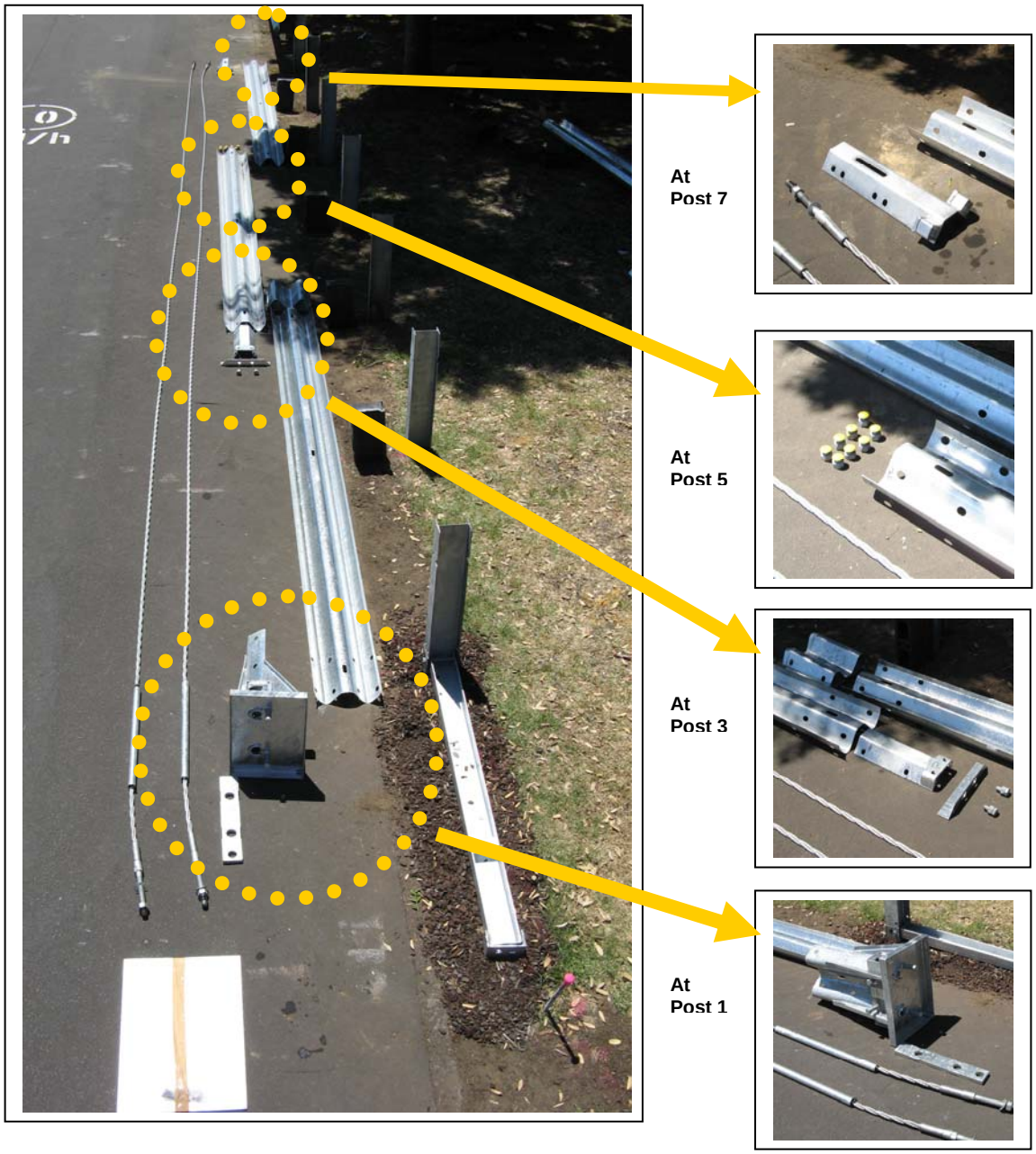
X-Tension - Tangent Installation Instructions

Step 1 - Set Out

The tangent terminal is essentially an 11.4m (38 ft) continuation of the standard guardrail run.

Pull a string line out with the desired offset (0 -450mm : 0-1.5 ft) over the length of the system, in a straight flare (Figure 1). **The system should not be installed on parabolic curve**. The string line should be set to follow the roadside edge of the posts.

All the posts except post #1 have a blockout so take care to place the roadside face of post #1 200mm (8 in) towards the roadway to compensate for the lack of blockout.



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Step 2 – Installing Posts 6- 2

Install posts 6 to 2 at standard highway rail spacing (1905mm: 6 ft 3 in), to the correct height. **All posts should be the same height from ground level throughout the entire system.**

Posts #6 to #3 are either standard "I" beam posts **OR** timber CRT posts. Post 2 is either the Special "I" beam post or a timber CRT (see parts identification photo).

Posts may be directly driven, or in stiff soils a 150mm (6 in) diameter hole drilled, and the post then driven into the hole. The post may also be placed in an oversized augured hole but care must be taken to ensure the backfill is properly compacted.

Hint: Offset Post 3 back from the string line 40-50mm (up to 2 in) to make it easier to push rail 1 and Slider Panel over rail 2.

When driving steel posts, ensure that a driving cap with timber or plastic insert is used to prevent damage to the galvanizing on the top of the posts.

Ensure that Post 2 has the post bolt **holes** on the side nearest the rail (**notches** go to the backside as shown and are only used on the median application (Figure 2).

Bolt the blockout to the post at post 3, prior to attaching to the rail (Figure 3).

Figure 1. Pull a string line with the desired offset.

Figure 2. Notches go to the backside.

Figure 3. Bolt the blockout prior to attaching the rail.

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X-Tension - Tangent Installation Instructions

Step 3 – Post 1, Ground Strut and Soil Anchor

Place the roadside face of post 1 bottom anchor, 200mm (8 in) towards the roadway to compensate for the lack of blockout (Figure 4). Post 1 bottom, the Ground Strut and the Soil Anchor are then placed parallel to the string line at this roadside offset position.

Drive or place the bottom of post 1 in the augured hole so that no more than 75mm (3 in) [100mm (4 in max)] protrudes above ground level (Figure 5). Use the Ground Strut as a template to place the Soil Anchor in the correct place. The Soil Anchor can then be driven into place or placed in an augured hole and backfilled. The Ground Strut should be level **or** lower at the anchor end than at the post 1 bottom end.

Place post 1 top in the post 1 bottom anchor ensuring that the post bolt notches are at the top and facing the Soil Anchor (Figure 6). Use M16 x 200mm (5/8 in x 8 in) hex head bolt with nut and washers. **Do not over tighten bolt.**

Figure 4. Measure 8 in. towards roadway.

Figure 5. Drive post 1 into augured hole.

Figure 6. Post 1 top in post bottom.

Step 4 – Hang Rail 3 and Cable Anchor Bracket

Rail 3 is installed like standard guardrail with post 6 at the center of the rail and blockouts between the rail and post. Place the Cable Anchor Bracket on the back of the rail at the joint between rail 3 and rail 4 (post 7).

The two “boxes” on the cable bracket should be on the impact head side of the splice joint. Attach rails to post with post bolt and splice rail 3 to rail 4 with 8 standard splice bolts (Figure 7).

Figure 7. Splice rail 3 to rail 4 with 8 standard splice bolts.

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X-Tension - Tangent Installation Instructions

Step 5 – Hang Rail 2 and Shear Bolts

Before installing rail 2, double check that the blockout is already bolted to post 3.

Bolt rail 2 to the post and blockouts at posts 4 and 5 with the appropriate post bolt (Figure 8). **DO NOT BOLT THE RAIL TO POST 3.**

Splice rail 2 to rail 3 with **the 8 special shear bolts (yellow) supplied (Figure 9)**. **Put the washer and nut on inside of rail.**
IMPORTANT NOTE: DO NOT USE STANDARD SPLICE BOLTS AT POST 5 SPLICE. DO NOT USE AN AIR-IMPACT WRENCH TO TIGHTEN SHEAR BOLTS. SHEAR BOLTS WILL BREAK IF OVER-TIGHTEND.

Figure 8. Bolt rail 2 to post and blockouts.

Figure 9. Splice rail 2 to rail 3 with 8 special shear bolts.

Step 6 – Attach Slider Bracket to Rail 2

Bolt the Slider Bracket to the end of rail 2 at post 3 (Figure 10). Use 4 standard splice bolts. The angle bar end should be closest to the Impact Head end. **Remove the angle bar and 2 x M20 x 25mm (3/4 in x 1 in) bolts (Figure 11).**

Figure 10. Bolt Slider Bracket to end of rail 2 at post 3.

Figure 11. Remove angle bar bolts.

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X-Tension - Tangent Installation Instructions

Step 7 – Assemble Slider Panel onto Rail 1

Start by sitting rail 1 on a blockout or post so that it is raised off the ground as shown (Figure 12). Slide the Slider Panel onto the downstream end of rail at post 3 location (Figure 13) and bolt into place using 4 standard splice bolts, pushing the bolt through from the inside of the slider to the outside so that the **nut is on the traffic face.**
The curved and reinforced (post breaker) end of Slider Panel sits at the rail end.
Use guardrail pin bar or crow bar to assist with lining up splice holes.

Figure 12. Sit rail 1 so it is raised off the ground.

Figure 13. Slide the Slider Panel onto downstream end.

Step 8 – Hang Rail 1

Lift rail 1 with Slider Panel attached and push the slider end over rail 2 (Figure 14). Overlap the rails as per a standard splice joint overlap.

Bolt rail 1 and blockout to post 2 using a standard post bolt that is supplied (Figure 15).

Re-attach the angle bar to the slider bracket on the backside of the rail (Figure 16).

Figure 14. Push Slider Panel over rail 2.

Figure 15. Bolt rail 1 and blockout to post 2.

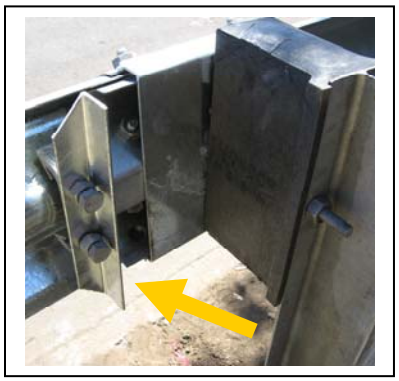

Figure 16. Reattach the angle bar.

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Step 9 – Attach Impact Head

Place Impact Head on upstream end of rail 1 and attach using 8 standard splice bolts with nuts on traffic face (Figure 17). **Hint**: Place bottom two bolts first then use guardrail pin bar to lever head up snug onto rail.

Bolt head and rail 1 to post 1 using the supplied M16 x 50mm (5/8 in x 2 in) guardrail post bolt. Use a 50mm x 50mm (2 in x 2 in) washer under the nut on the inside of post 1 (Figure 18).

Figure 17. Attach Impact Head to rail 1.

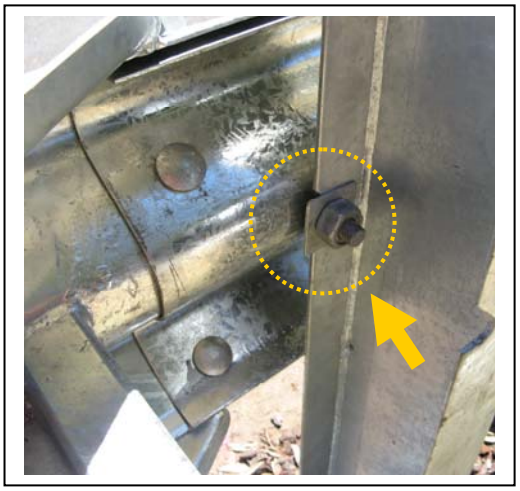

Figure 18. Bolt head and rail 1 to post 1 with washer.

Step 10 – Place the Cables

Push the cables under the steel strap on the Ground Strut (Figure 19) and forward through the holes at the top of the anchor. Lay the cables out parallel to the guardrail, downstream from the anchor.
Ensure that bottom cable (closest to road) has half the thread protruding through the anchor, as shown. Ensure the top cable has the nut wound on a least two turns past the end of the thread (Figure 20).

Figure 19. Push cables under steel strap on Ground Strut.

Figure 20. Thread the nuts as shown.

Step 11 – Installing the Cables

Install the Friction Plate in the top of the Impact Head, adjustment hole up. Take the cable closest to the road, pick up the downstream cable fitting and walk to the head, passing the cable through the bottom hole, through the Friction Plate (Figure 21) and out the backside of the Impact Head.

Now thread the cable down the backside of the rail following the bottom trough of the W-beam and attach to the bottom "box" on the Cable Bracket at post 7. Repeat this process with the other cable but push it through the top hole and thread it along the top trough of the W-beam.

Place the nuts and washer on the cables at the Cable Bracket end but only run them a few turns (Figure 22).

Do not tighten cables at this stage (or the Friction Plate will not turn)

Figure 21. Pass the cable through the bottom hole.

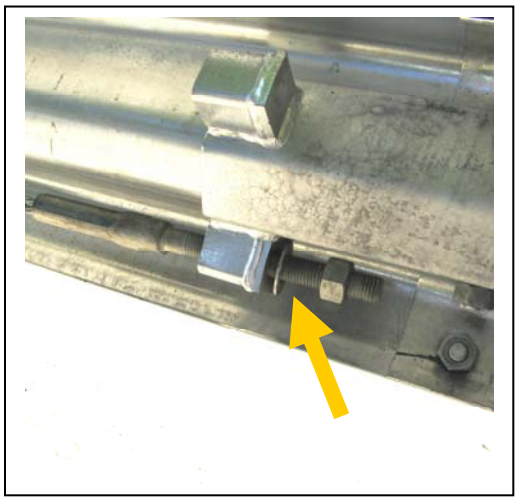

Figure 22. Do not tighten nuts at this time.

Step 12 – Turning the Friction Plate

Put a crow bar through the hole at the top of the friction plate (Figure 23) and turn it to the final position. Using a socket, tighten the 4 - M20 x 75mm (3/4 in x 3 in) bolts on the side of the impact head to lock the bar in the turned position (Figure 24).

Figure 23. Use crow bar to turn Friction Plate.

Figure 24. Use socket to lock bar in the turned position.

Step 13 – Tightening the Cables

Only tighten the cables using the nuts at the Cable Bracket end (post 7) (Figure 25). **Do not tighten the cable nuts at front of the Ground Anchor.**

Tighten the cables until they are taut, i.e. they rest in the backside of the W-beam and do not visibly sag between posts (Figure 26). There is no torque requirement for the cables.

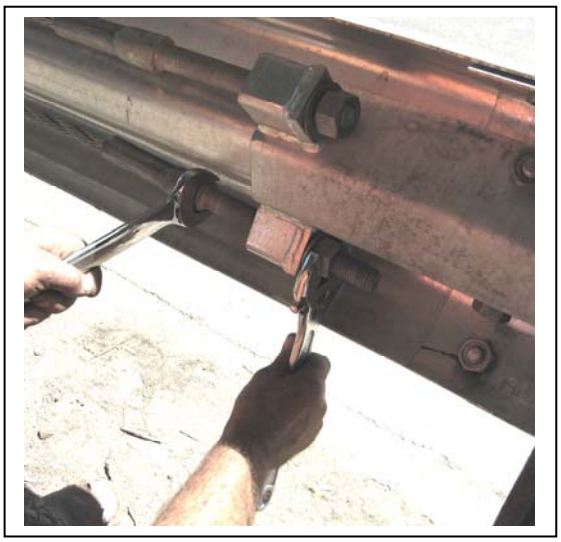

Figure 25. Tighten cables at Cable Bracket end (post 7).

Figure 26. Tighten cables until they are taut.

Step 14 – Attach Nosing

Push nosing into place on the front of the impact head. Attach using the supplied nylon push rivets (Figure 27).

Delineation to be attached to nosing, as per the Local Authorities requirements.

Figure 27. Attach nose using nylon push rivets.

X-Tension - Flared Installation Instructions

This section deals with installation of a Flared X-Tension system in a roadside guardrail terminal end application.

Apart from the initial set out, the flared X-Tension and installation procedure is identical to the Tangent system, the only difference being the amount of offset used.

Site preparation

The Flared terminal may be installed either parallel to the edge of the roadway (tangent) or with the impact head end of the rail offset by up to 1.2m (4 ft) away from the road (Figure 28) in a straight flare, over the length of the system. **The system should not be installed on parabolic curve.**

Ensure that the area where the X-Tension is to be installed is flat enough so that the anchor will not protrude more than 75 mm (3 in) [100 mm (4 in) max] above ground level, when measured with a straight line over a 1.5m (5 ft) cord. Minor site grading may be required.

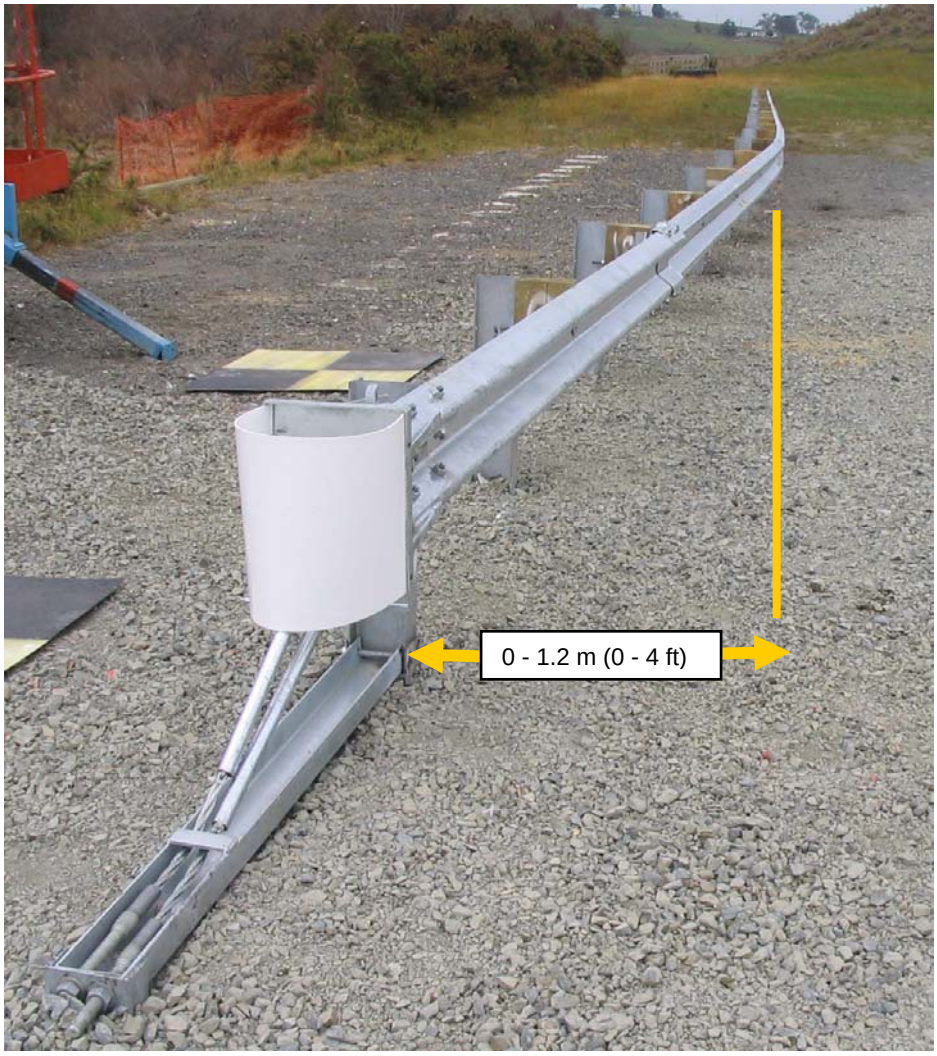

Figure 28. Maximum offset is 1.2 m (4 ft).

X-Tension - Flared Installation Instructions

Step 1 - Set Out

Pull a string line out with the desired offset (0 -1.2m; 0-4 ft)
Note that the flare is a straight flare, over the length of the system (11.4m; 38 ft)

The string line should be set to follow the roadside edge of the posts (Figure 29).

All the posts except post 1 have a blockout so take care to place the roadside face of post 1 200mm (8 in) towards the roadway (Figure 30).

Post 1 bottom, the Ground Strut and the Soil Anchor are then placed parallel to the string line on the roadside of it (Figure 31).

Figure 29. Pull string line to follow roadside edge of posts.

Figure 30. Place roadside face of post 1 towards roadway.

Figure 31. Place Ground Strut parallel to string line.

Now follow steps 2 – 14 in the Tangent installation instructions.
Note: The "kink" in the line of rail between rail 3 and rail 4 (at post #7) is formed by simply pushing the rails around to follow the flared line of posts. This is not factory bent.

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X-Tension - Median Installation Instructions

This section deals with installation of a Median X-Tension system as a Median guardrail terminal end application.

Site preparation

The Median X-Tension system is installed parallel to the standard median barrier, therefore no offset is used (Figure 32).

Ensure that the area where the X-Tension is to be installed is flat enough so that the soil anchor will not protrude more than 100mm (4 in) [preferred 75 mm 3 in)] from ground level when measured with a straight line over a 1.5m (5 ft) cord. Minor site grading may be required.

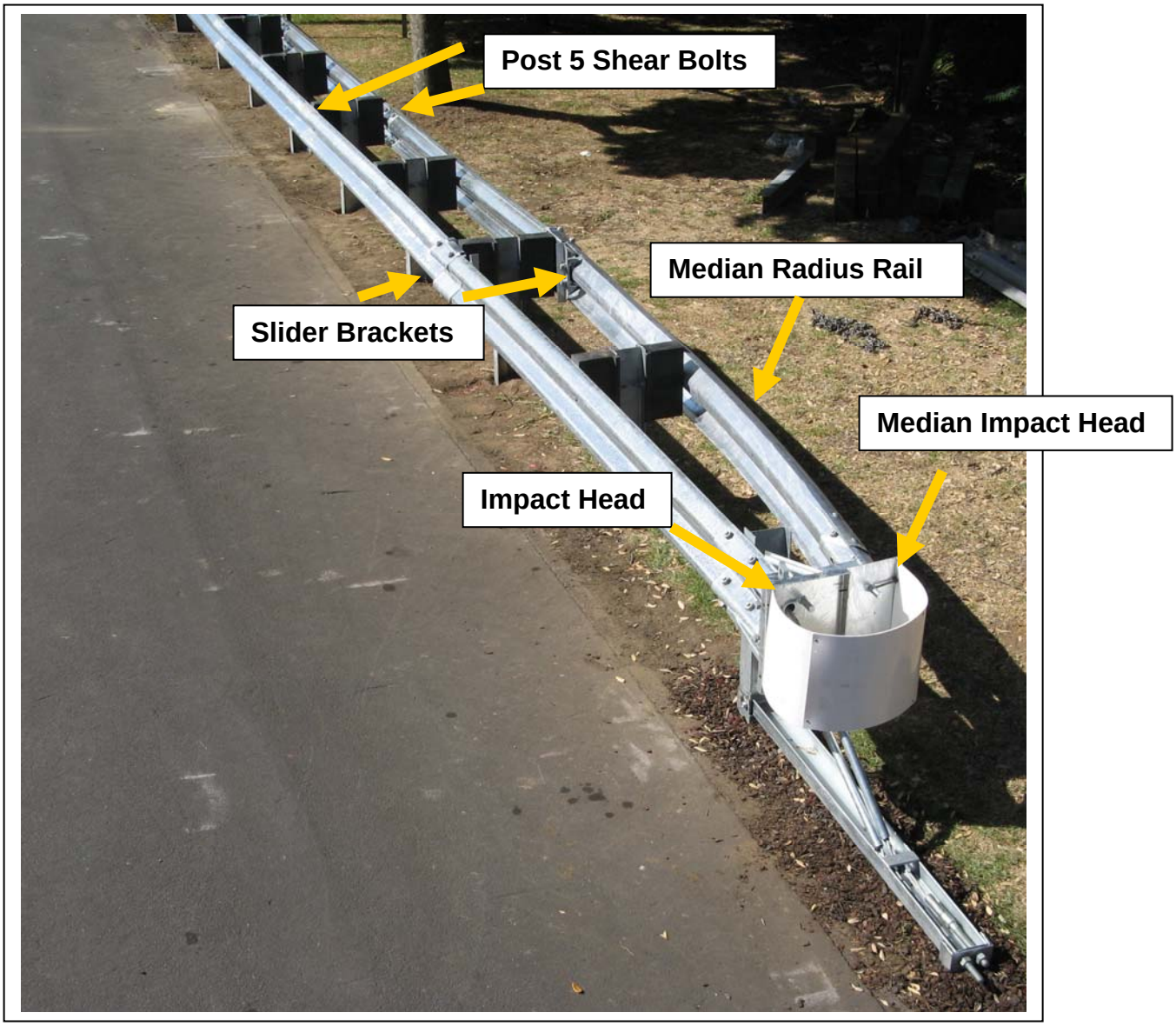

Figure 32. X-Tension median installation.

X-Tension - Median Installation Instructions

Step 1 - Set Out

The Median X -Tension is essentially one Tangent X-Tension installed parallel to one side of the median barrier (Figure 33), with a small number of additional components and rail attached parallel with the other side of the barrier (Figure 34).

Determine which side of the barrier will have the Tangent X-Tension portion of the Median X-Tension installed parallel to it. (Usually the heaviest traffic volume side)

Pull a string line out the length of the system, parallel with the median barrier posts.
The string line should be set to follow the side of the posts, on the side that it is desired to install the tangent X-Tension.

Figure 33. Essentially a tangent system installed parallel to median barrier.

Figure 34. Small number of additional components.

Step 2 – Installing Tangent X-Tension Portion

Follow steps 2 – 13 in the Tangent installation instructions, with the following exceptions.

(1) DO NOT set post 3 back 30-50mm (1 -2 in) as per the instructions in Step 2 of the Tangent installation instructions. For the Median application, Post 3 remains parallel with the other line posts.
(2) As noted on page #7, Post 2 must be steel crimped and Post 3-6 are always standard steel I-beam posts.
Now follow the <u>remaining steps</u> 3 to 8 to complete the backside of the median terminal.

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Step 3 – Attach Secondary Impact Head

Fit secondary head to main head by pushing sideways onto the main head as shown below (Figure 35), until the holes in the gussets line up. Fix into place with either the 25mm (1 in) pin and pin lynch, or 2 M24 x 50mm (1 in X 2 in) bolts as shown (Figure 36).

Figure 35. Fit secondary head to main head.

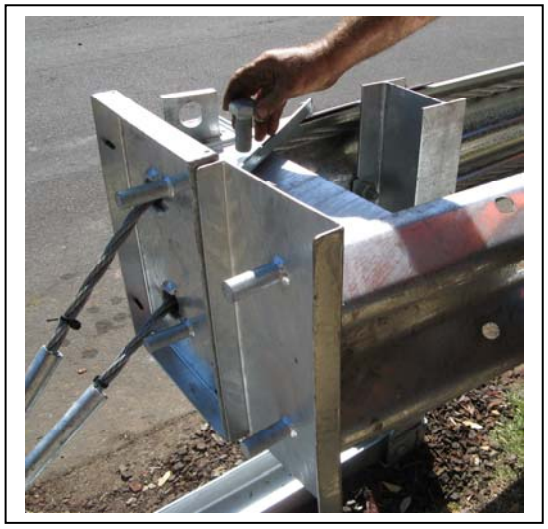


Figure 36. Fix secondary head into place.

Step 4 – Attach Backside Rail #3 and Rail #2

Rails 3 and 2 are installed like standard guardrail with blockouts between the rail and post (Figure 37). Attach rails to post 2, 4, 5 and 6 with blockouts and post bolts supplied (do not bolt the rail to post 3) and splice rail 3 to rail 4 with 8 standard splice bolts. At post 7 lap rail in the direction of traffic as per standard median barrier.

Ensure that rail 2 is spliced to rail 3 using the special shear bolts (yellow head) supplied. DO NOT use standard splice bolts at this joint (Figure 38). Be sure rail 2 is lapped outside rail 3 in both directions. ***DO NOT USE AN AIR-IMPACT WRENCH TO TIGHTEN SHEAR BOLTS. SHEAR BOLTS WILL BREAK IF OVER-TIGHTEND.***

Figure 37. Rails installed with blockouts.

Figure 38. Splice rail 2 to rail 3 with 8 special shear bolts.

X-Tension - Median Installation Instructions

Step 5 – Attach Slider Bracket to Backside Rail 2

Bolt the Slider Bracket to the upstream end of rail 2 (at post 3) using 4 standard splice bolts (Figure 39). The angle bar end should be closest to the Impact Head end (Figure 40).
Remove the angle bar and 2 M20 X 25mm (3/4 in x 1 in) bolts.

Figure 39. Bolt Slider Bracket to upstream end of rail 2.

Figure 40. Angle bar end should be closest to Impact Head.

Step 6 – Assemble Slider Panel onto Backside Rail 1

Raise the straight end of the curved backside rail 1 and fit the Slider Panel onto the downstream (straight) end of rail (Figure 41) and bolt into place using 4 standard splice bolts, pushing the bolt through from the inside of the slider to the outside so the **nut is on the traffic face (Figure 42).**

The curved and reinforced (post breaker) end of Slider Panel sits at the rail end.
Use guardrail pin bar or crow bar to assist with lining up splice holes.

Figure 41. Fit the Slider Panel onto the straight end of rail.

Figure 42. Push bolt from inside (nut on traffic face).

Step 7 – Hang Curved Backside Rail #1

Lift rail 1 with Slider Panel attached and push the slider end over rail 2.

Bolt rail 1 and blockout to post 2 using supplied standard post bolt and 50x50mm (2 in x 2 in) washer on inside of post bolt notch on the backside of post 2 (Figure 43).

Re-attach the angle bar to the Slider Bracket (Figure 44) on the backside of the rail (at post 3).

Figure 43. Bolt rail 1 and blockout to post 2 using the square washer.

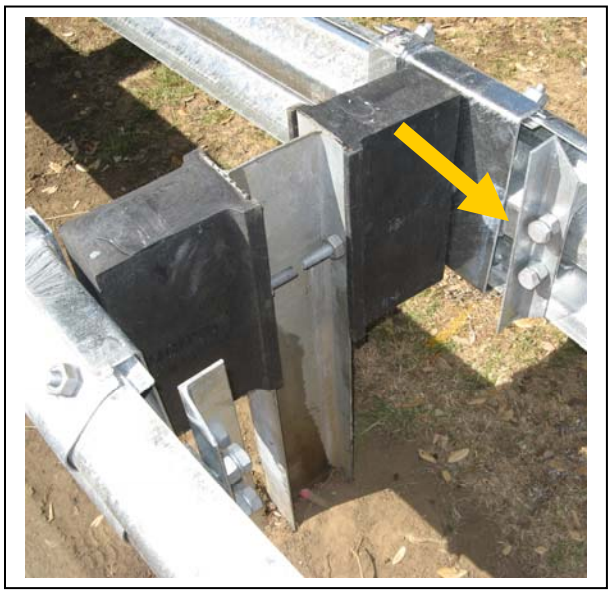


Figure 44. Re-attach the angle bar to the Slider Bracket.

Splice the rail to the secondary impact head using 8 standard splice bolts (Figure 45, 46)**.**

Figure 45. Splice the rail to secondary impact head.

Figure 46. Use 8 standard splice bolts.

Step 8 – Attach Nosing

Push nosing into place on the front of the impact head. Attach using the supplied nylon push rivets (Figure 47).

Delineation to be attached to nosing, as per Local Authorities requirements.

Figure 47. Attach nosing using nylon push rivets.

Optional Nose Cover – Install High Visibility Nose Cover

Attach the High Visibility Nose Cover to the Impact Head using the supplied hardware. The nose cover is attached using (4) bolts, two on each side of the Impact Head and a wire tether.

To attach the wire tether, pass the tether through the Nose Cover and the Friction Plate (Figure 48).

Figure 48. Tether Installation

Figure 49. Nose Cover Installed

INSTALLATION CHECKLIST FOR X-Tension Systems

Location			
Installed By		***Date***	
Inspected By		***Date***	

X-Tension Tangent and Flared Systems [System Length 11.4m (38ft)]	***Y/N***	***NA***
• Rail is bolted at all posts <u>except</u> post **3.** • Post 1, post bolt notches face impact head. Bolted to ground strut. • Post 3 to 6 standard steel posts (or timber CRT posts). • Friction plate is turned fully and bolted in place. • Nuts are fitted on traffic face of rail at impact head. • Nosing is fitted to impact head.		
• Ground Strut lays flush with ground. Front of ground strut should be level or lower at the anchor end than at the post end. • Ground anchor does not protrude more than 100mm (4 in) [preferred 75mm (3 in)] above the ground. • The entire Terminal End (11.4m; 38 ft) is installed straight with flare as per design (offset between 0 to 1.2m) (0 to 4 ft).		
• Slider Panel is connected to end of first rail. All 4 holes bolted with **nuts on traffic face**. • Slider Bracket affixed to back of rail 2, with 4 bolts and **nuts on backside of rail**. • **Angle bar is fitted closest to impact head end.** Bolts MUST be wrenched tight.		
• Guardrail for terminal end (i.e. 3 lengths) is 2.7mm (12 gauge) highway rail.		
• **Yellow Shear Bolts correctly installed at post 5** (washer only between nut & rail).		
• **Cables** should be "taut", not visibly sagging between posts.		
X-Tension Median Application only - as above plus: • Yellow Shear Bolts are correctly installed at post 5. • Slider Panel is bolted to end of first rail. All 4 holes bolted with **nuts on traffic face**. • Slider Bracket affixed to back of rail 2, with 4 bolts and **nuts on backside of rail.** • **Angle bar is fitted closest to impact head end.** Bolts MUST be wrenched tight. • Post bolt at post 2 is in notched post flange and fixed with 50mm x 50mm (2 in x 2 in) washer and nut. • Secondary Impact Head is connected to main impact head. • Additional Guardrails are 2.7mm (12 gauge) highway rail.		

X-Tension Maintenance (Traffic Face Impacts)

Types of repair are divided into two categories:
Traffic Face Impacts and Head on Impacts (Next Page)

Traffic Face Impacts

Key Repair Steps:

1. Remove cables
2. Remove damaged rail
3. Remove components from rails
4. Remove damaged posts
5. Assess damage
6. Reassemble

Step 1: Remove Cables

Undo nuts at downstream cable bracket (post 7). Take out the bolts on the side of the impact head that hold the friction plate in place and rotate the locking bar backwards.
Pull one cable at a time from the front side of the impact head and completely remove them. Rotating the cables as you pull them will help. Undo nuts at ground anchor end and remove cables.

Step 2: Remove Rails

Unbolt the splice bolts first. Then unbolt the post bolts and lower rails to ground.

Step 3: Remove X-Tension Components

All the X-Tension components are attached to the rails with standard splice bolts. Unbolt and remove the components.

Step 4: Remove Posts

Undo the bolt at the bottom of Post 1 and pull out post. For all other damaged line posts, attach a chain to the top half of the post and pull out of the ground with either a crane truck or digger. Note it is sometimes possible to remove steel posts by hand.

Step 5: Assess the Damage

Any part that cannot be reused must be replaced with a new part. Always replace the yellow shear bolts. Cables can be reused.
Generally, all the specialized components of the system such as the head and brackets should be undamaged.

Step 6: Reassemble

Reassemble as per system installation instructions.

X-Tension Maintenance (Head on Impacts)

Head on Impacts

Key Repair Steps:

1. Remove the cables
2. Pull the rails back
3. Remove components from rails
4. Remove damaged posts
5. Assess damage
6. Reassemble

Step 1: Remove Cables

After a head on impact the cables may appear to be slack but may in fact still retain some tension from the impact. Care must be taken when removing the cables. DO NOT UNDO THE CABLES FROM THE GROUND ANCHOR END FIRST, ALWAYS UNDO THE CABLES FROM THE CABLE BRACKET (post 7) FIRST.

Undo nuts at downstream cable bracket (post 7). Take out the bolts on the side of the impact head that hold the friction plate in place and turn the friction plate back. Pull one cable at a time from the front side of the impact head and completely remove them. Rotating the cables as you pull them will help. Undo nuts at ground anchor end last and remove cables.

Step 2: Pull Rails Back Out

Attach a chain or two ton strap to the front of the impact head and pull upstream to its' original position with a light truck or utility vehicle. The components are easier to unbolt when the rails are separated.

Step 3: Remove X-Tension Components

All components are attached to the rails with standard splice bolts. Unbolt and remove parts.

Step 4: Remove Posts

Undo the bolt at the bottom of Post 1 and pull out post. For all other damaged line posts, attach a chain to the top half of the post and pull out of the ground with either a crane truck or digger. Note it is sometimes possible to remove steel posts by hand.

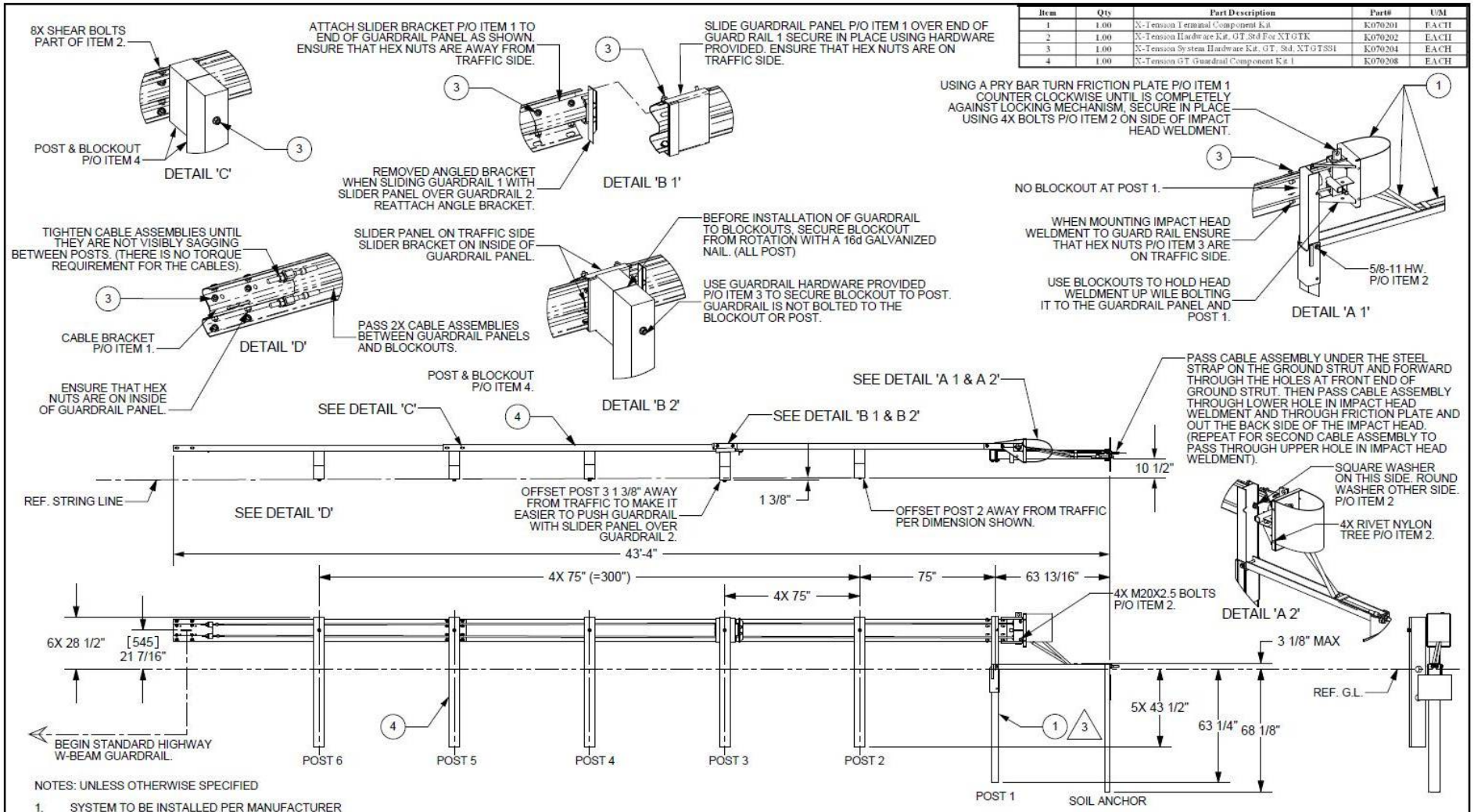
Step 5: Assess The Damage

Any part that cannot be reused must be replaced with a new part. In minor impacts (rails telescoped less than 3 meters (10 feet) the cables can be reused by turning them end for end. If additional damage has occurred, replace the cables. Generally, all the specialized components of the system such as the head and brackets should be undamaged.

Step 6: Reassemble

Reassemble as per system installation instructions.

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT Std For XTGTK	K070202	EACH
3	1.00	X-Tension System Hardware Kit, GT, Std, XTGTSS1	K070204	EACH
4	1.00	X-Tension GT Guardrail Component Kit 1	K070208	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

1. SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
3. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN# 942	8/31/07	AEM			
A	SEE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT.
DRAWN BY	08/03/07	AEM
APPR'D BY		

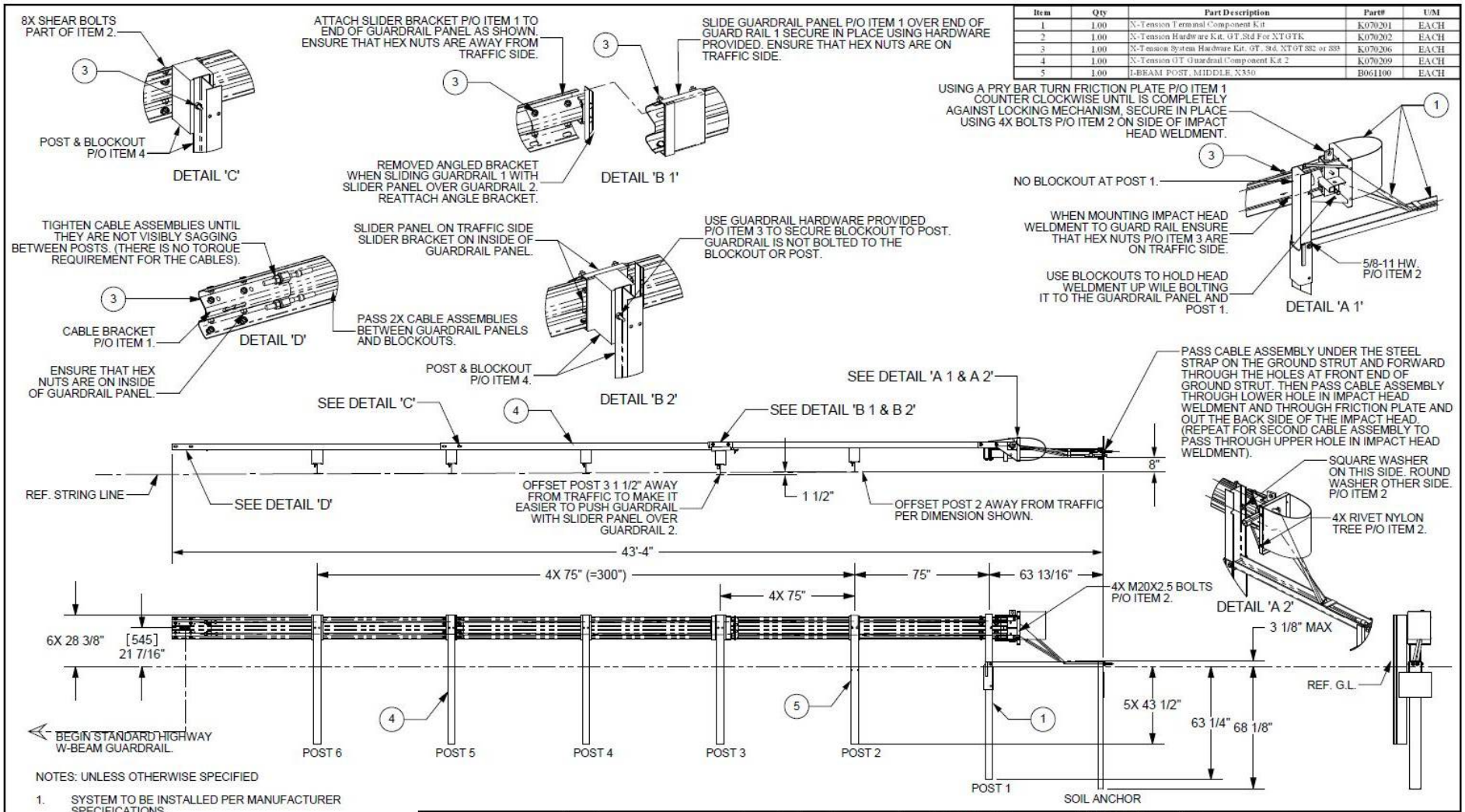
TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
CRT TIMBER POST TO TIMBER BLOCKOUT

Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSS1	B

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT,Std For XTGTK	K070202	EACH
3	1.00	X-Tension System Hardware Kit, GT, Std, XTGTSS2 or SS3	K070206	EACH
4	1.00	X-Tension GT Guardrail Component Kit 2	K070209	EACH
5	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

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2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
3. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN# 942	8/31/07	AEM			
A	SE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT.
DRAWN BY	08/03/07	AEM
APPR'D BY		

Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
STEEL POST WITH WOOD BLOCKOUT

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSS2	B

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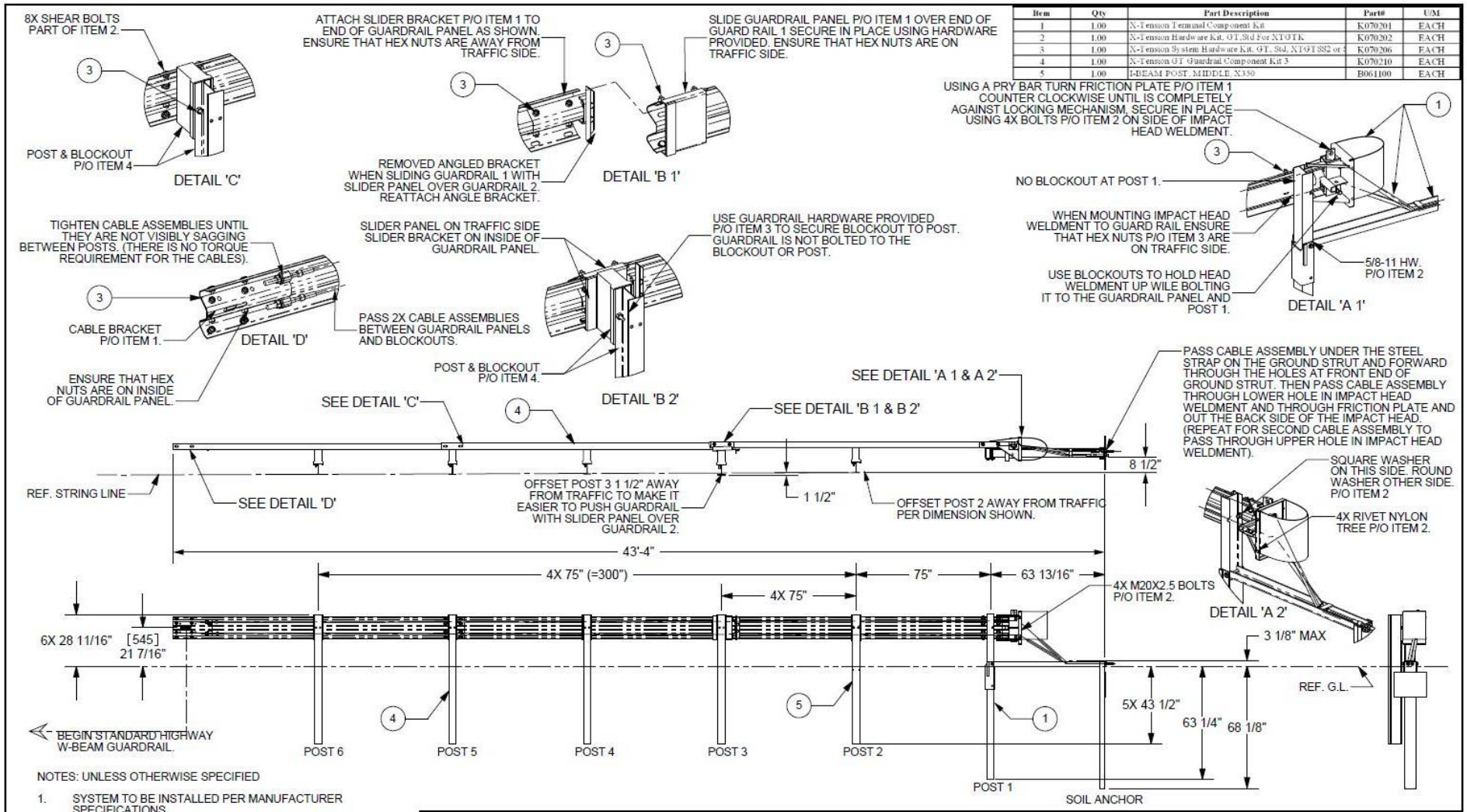
Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Std For XTGTK	K070202	EACH
3	1.00	X-Tension System Hardware Kit, GT, Std, XTGTSS2 or 3	K070206	EACH
4	1.00	X-Tension GT Guardrail Component Kit 3	K070210	EACH
5	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

1. SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
3. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN# 942	8/31/07	AEM			
A	SEE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT.
DRAWN BY	08/06/07	AEM
APPR'D BY		

TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
STEEL POST WITH COMPOSITE BLOCKOUT

Standard Tolerance

Angular	±	1/2°
Fractional	±	1/16"
Dec .XXX=	±	.010
Dec .XX=	±	.030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSS3	B

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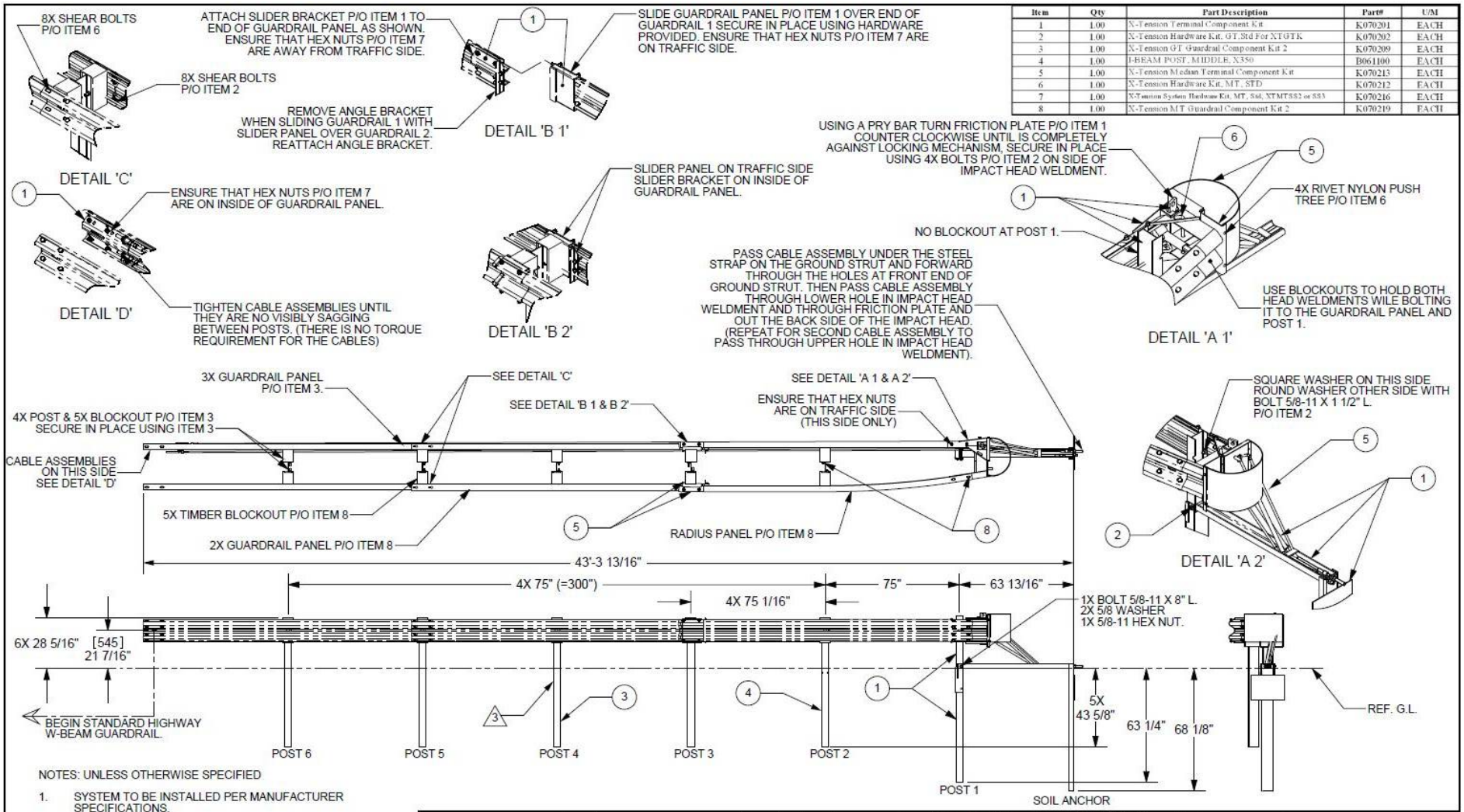
Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT,Std For XTGTK	K070202	EACH
3	1.00	X-Tension GT Guardrail Component Kit 2	K070209	EACH
4	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH
5	1.00	X-Tension Median Terminal Component Kit	K070213	EACH
6	1.00	X-Tension Hardware Kit, MT, STD	K070212	EACH
7	1.00	X-Tension System Hardware Kit, MT, Std, XTMTSS2 or SS3	K070216	EACH
8	1.00	X-Tension MT Guardrail Component Kit 2	K070219	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

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2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
3. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
A	SEE ER# 541	10/03/07	AEM			

SCALE: 1:50

	DATE	INIT
DRAWN BY:	10/01/07	AEM
APPR'D BY:		

TITLE: SYSTEM, X-TENSION MEDIAN GUARDRAIL TERMINAL, US, STEEL-WOOD

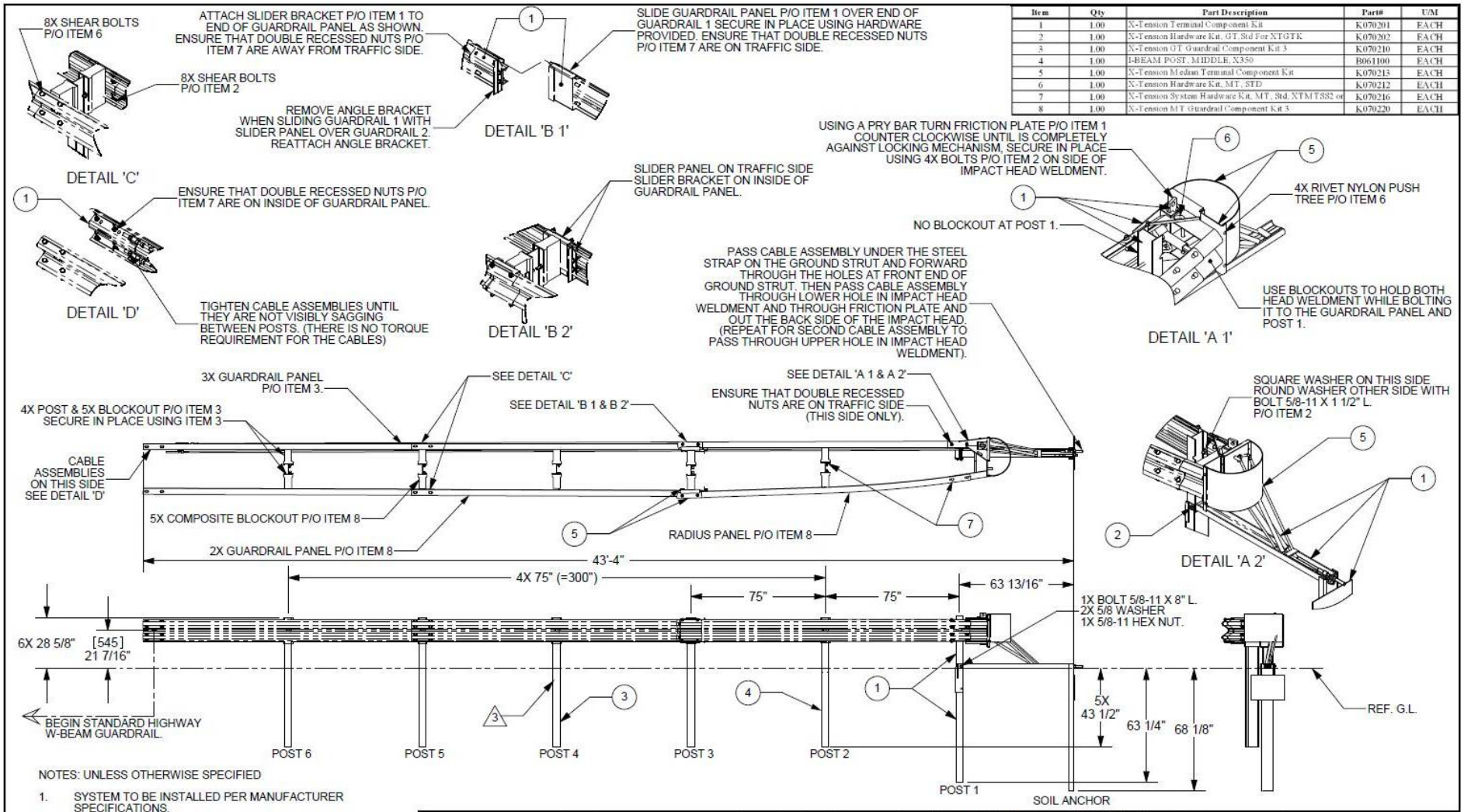
Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTMTSS2	A

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Std For XTGTK	K070202	EACH
3	1.00	X-Tension GT Guardrail Component Kit 3	K070210	EACH
4	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH
5	1.00	X-Tension Median Terminal Component Kit	K070213	EACH
6	1.00	X-Tension Hardware Kit, MT, STD	K070212	EACH
7	1.00	X-Tension System Hardware Kit, MT, Std. XTMTSS2 or	K070216	EACH
8	1.00	X-Tension MT Guardrail Component Kit 3	K070220	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

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2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN # 1344	05/04/09	JR			
A	SEE ER# 541	10/03/07	AEM			

SCALE: 1:50

	DATE	INIT
DRAWN BY:	10/01/07	AEM
APPR'D BY:		

TITLE: SYSTEM, X-TENSION MEDIAN GUARDRAIL TERMINAL, US, STEEL-COMP.

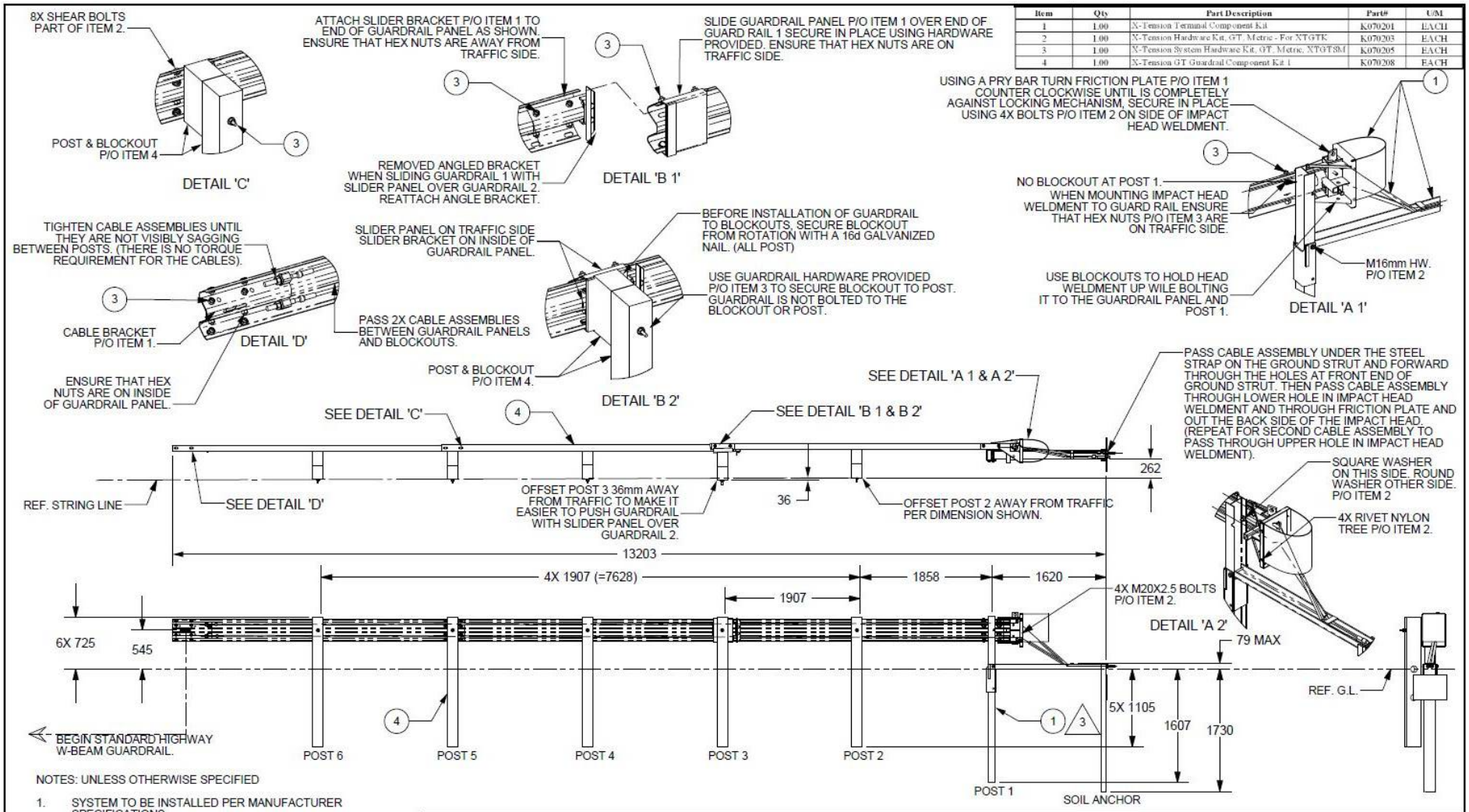
Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTMTSS3	B

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Metric - For XTGTK	K070203	EACH
3	1.00	X-Tension System Hardware Kit, GT, Metric, XTGTSM	K070205	EACH
4	1.00	X-Tension GT Guardrail Component Kit 1	K070208	EACH



NOTES: UNLESS OTHERWISE SPECIFIED

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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN# 942	8/31/07	AEM			
A	SEE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT
DRAWN BY:	08/06/07	AEM
APPR'D BY:		

TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
CRT TIMBER POST TO TIMBER BLOCKOUT
METRIC

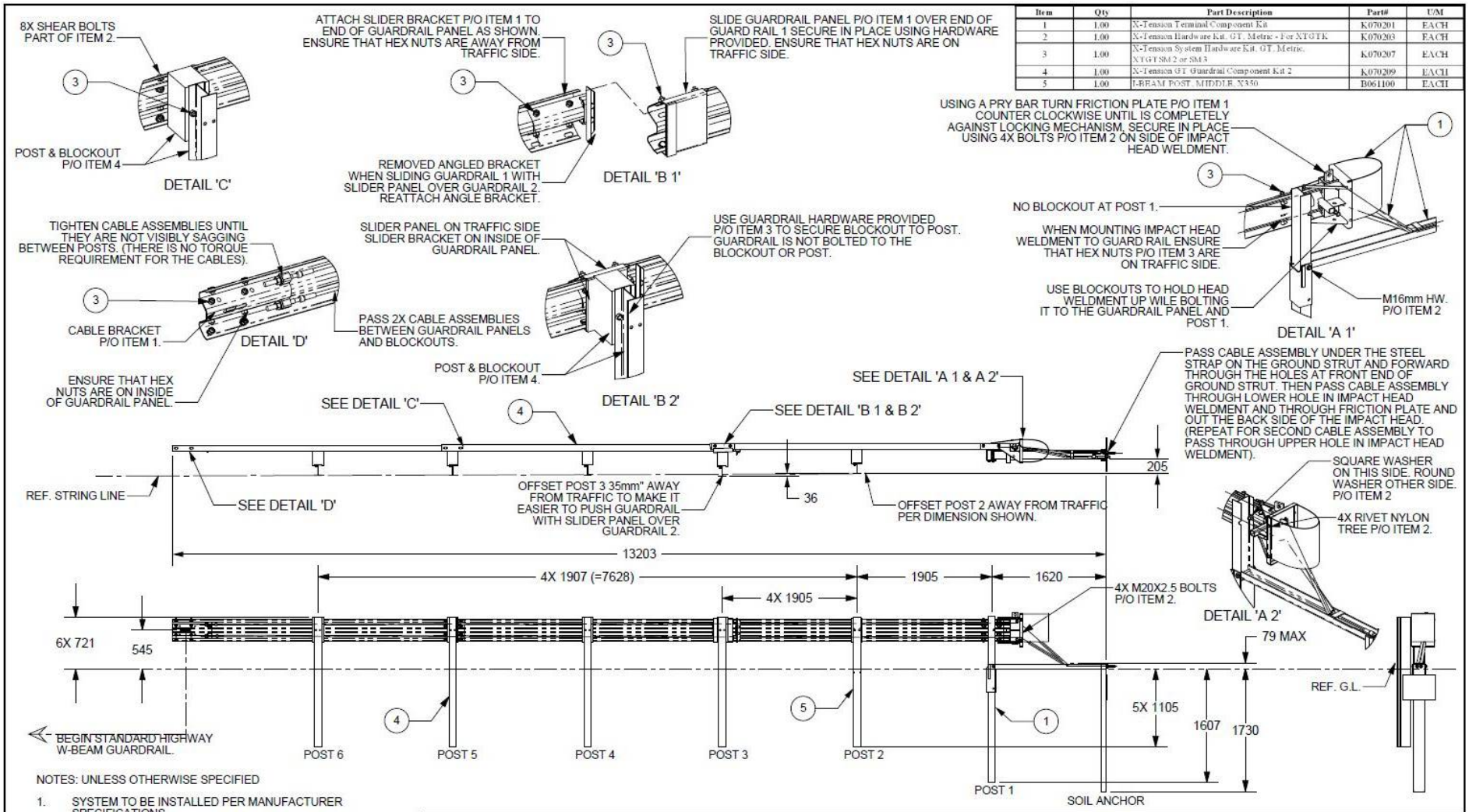
Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSM1	B

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Metric - For XTGTK	K070203	EACH
3	1.00	X-Tension System Hardware Kit, GT, Metric, XTGTSM 2 or SM 3	K070207	EACH
4	1.00	X-Tension GT Guardrail Component Kit 2	K070209	EACH
5	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH



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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
B	SEE ECN# 942	8/31/07	AEM			
A	SEE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT
DRAWN BY:	08/06/07	AEM
APPR'D BY:		

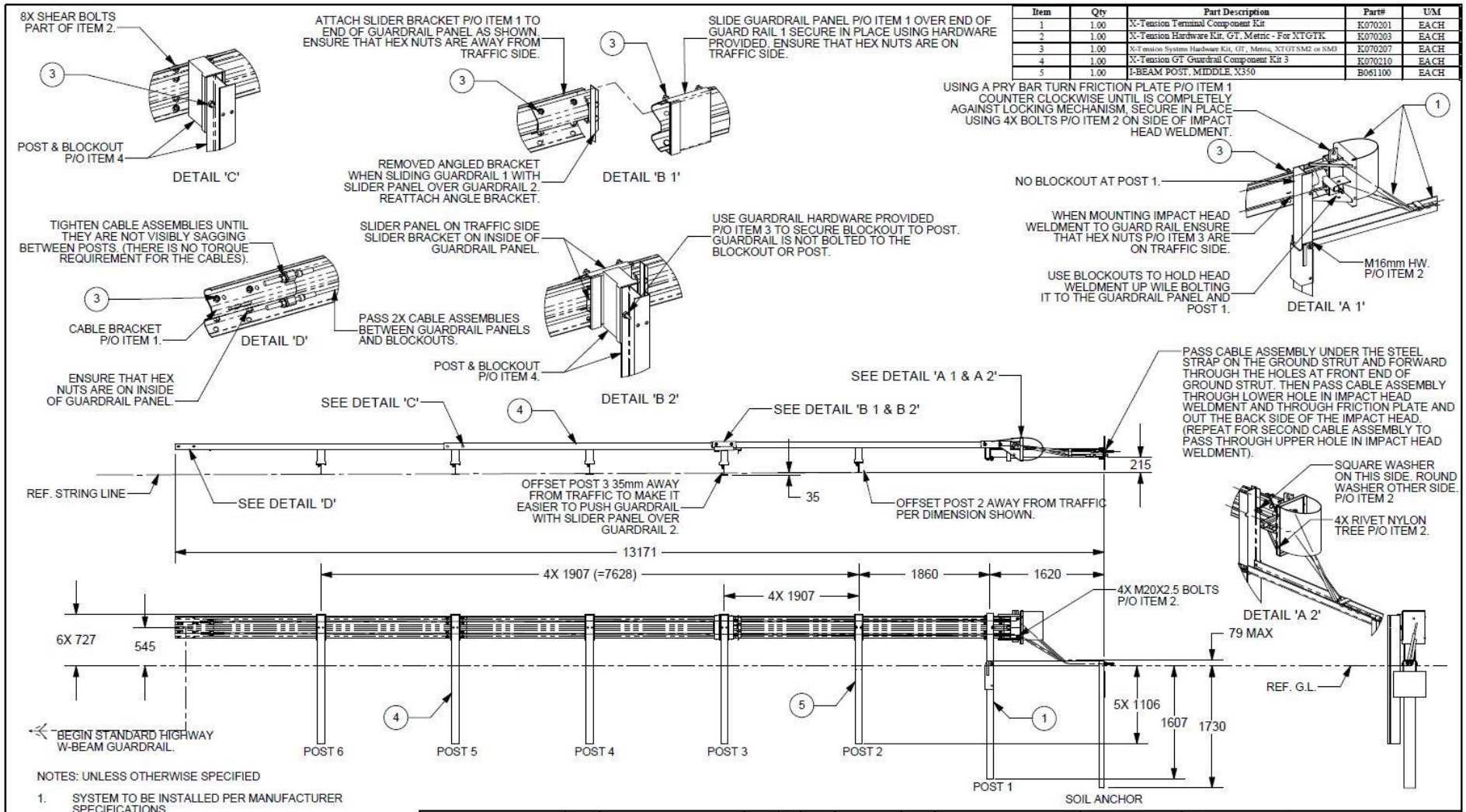
TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
STEEL POST WITH WOOD BLOCKOUT
METRIC

Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSM2	B

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Metric - For XTGTK	K070203	EACH
3	1.00	X-Tension System Hardware Kit, GT, Metric, XTGTSM2 or SM3	K070207	EACH
4	1.00	X-Tension GT Guardrail Component Kit 3	K070210	EACH
5	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH



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B	SEE ECN# 942	8/31/07	AEM			
A	SEE ER# 531	8/08/07	AEM			

SCALE: 1:50

	DATE	INIT.
DRAWN BY:	08/06/07	AEM
APPR'D BY:		

TITLE:
X-TENSION GUARDRAIL TERMINAL SYSTEM
STEEL POST WITH COMPOSITE BLOCKOUT
METRIC

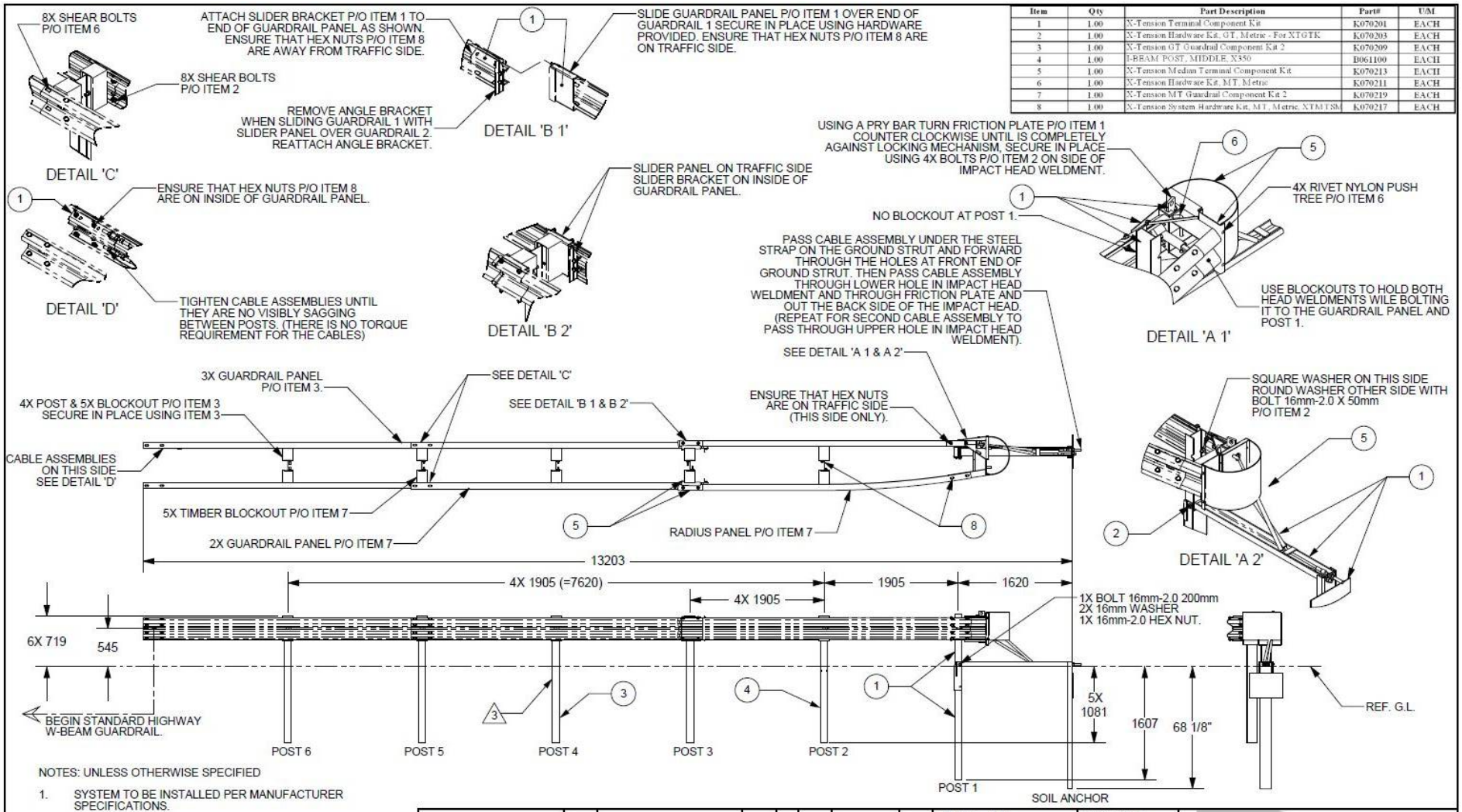
Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTGTSM3	B

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Metric - For XTGTK	K070203	EACH
3	1.00	X-Tension GT Guardrail Component Kit 2	K070209	EACH
4	1.00	I-BEAM POST, MIDDLE, X350	D061100	EACH
5	1.00	X-Tension Median Terminal Component Kit	K070213	EACH
6	1.00	X-Tension Hardware Kit, MT, Metric	K070211	EACH
7	1.00	X-Tension MT Guardrail Component Kit 2	K070219	EACH
8	1.00	X-Tension System Hardware Kit, MT, Metric, XTMTSM	K070217	EACH



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REV.	CHANGES	DATE	BY	REQ'D	NEXT ASSY.	ITEM
A	SEE ER# 541	10/03/07	AEM			

SCALE: 1:50

	DATE	INIT.
DRAWN BY	9/28/07	AEM
APPR'D BY		

Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

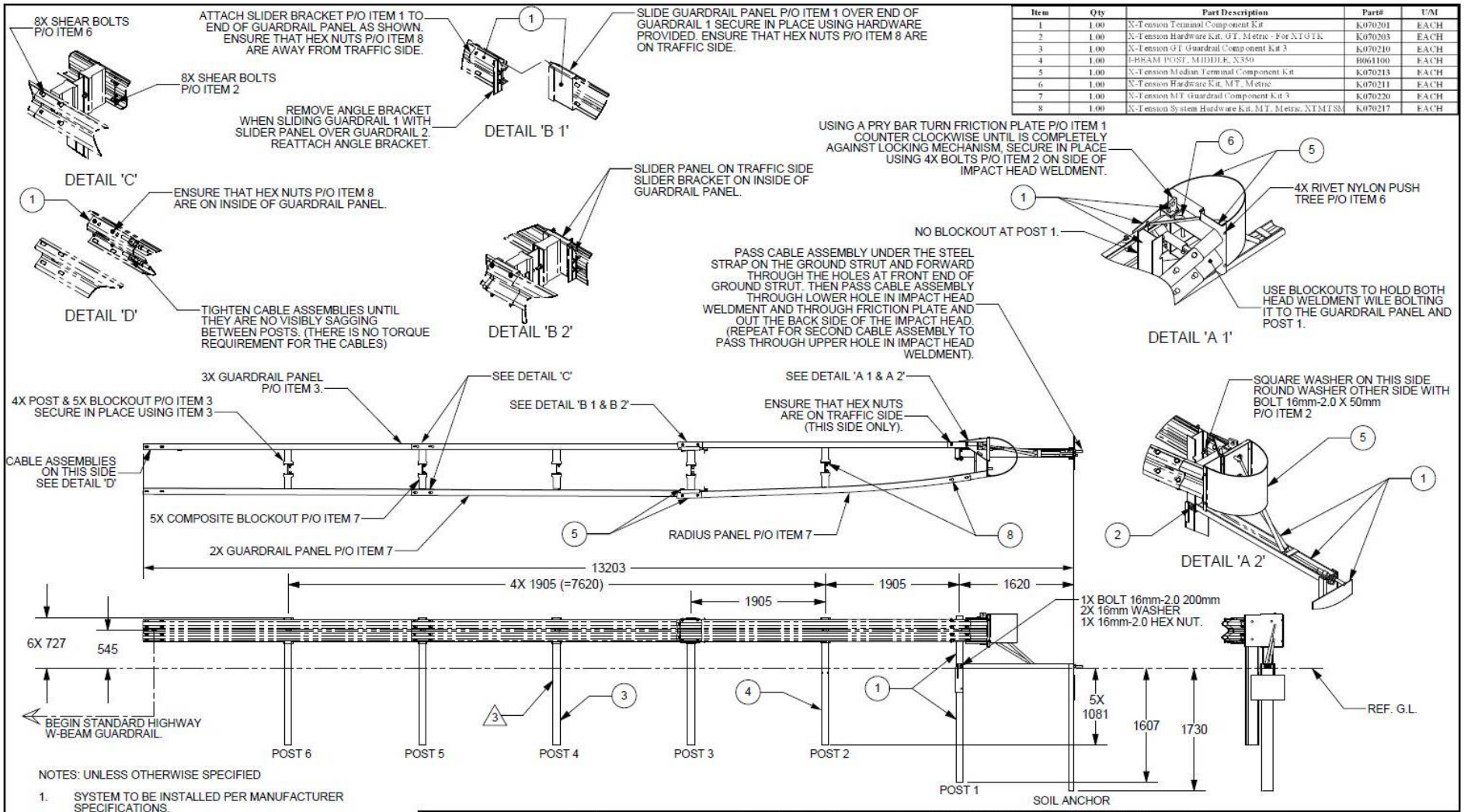
TITLE:
SYSTEM, X-TENSION MEDIAN GUARDRAIL TERMINAL, METRIC, STEEL-WOOD

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTMTSM2	A

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

Item	Qty	Part Description	Part#	U/M
1	1.00	X-Tension Terminal Component Kit	K070201	EACH
2	1.00	X-Tension Hardware Kit, GT, Metric - For XTGTK	K070203	EACH
3	1.00	X-Tension GT Guardrail Component Kit 3	K070210	EACH
4	1.00	I-BEAM POST, MIDDLE, X350	B061100	EACH
5	1.00	X-Tension Median Terminal Component Kit	K070213	EACH
6	1.00	X-Tension Hardware Kit, MT, Metric	K070211	EACH
7	1.00	X-Tension MT Guardrail Component Kit 3	K070220	EACH
8	1.00	X-Tension System Hardware Kit, MT, Metric, XTMTSM	K070217	EACH



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A	SEE ER# 541	10/03/07	AEM			

SCALE: 1:50

	DATE	INIT
DRAWN BY:	9/28/07	AEM
APPR'D BY:		

TITLE: SYSTEM, X-TENSION MEDIAN GUARDRAIL TERMINAL, METRIC, STEEL-COMP.

Standard Tolerance
Angular ± 1/2°
Fractional ± 1/16"
Dec .XXX= ± .010
Dec .XX= ± .030

BARRIER SYSTEMS INC
180 RIVER RD, RIO VISTA, CA 94571
TEL: 707-374-6800 FAX: 707-374-6801

SHEET	DRAWING NUMBER	REV
1 OF 1	XTMTSM3	A

BARRIER SYSTEMS
A LINDSAY TRANSPORTATION SOLUTIONS COMPANY

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. BRIAN MORI
Senior Bridge Engineer
Office of Bridge Design - West

Date: March 6, 2012

Attention: S. Hegazi

File: 04-SCL-152 PM 0.0/5.5
04-2A2501
Efis: 04 0000 0813-1
Soil Nail Walls

From: A. KADDOURA/ M. ZABOLZADEH
Associate Materials & Research Engineers
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

H. Nikoui
HOOSHMAND NIKOUI
Chief, Branch A
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Foundation Report (FR) for the Nine Proposed Soil Nail Walls

1. INTRODUCTION

This is a revised report as per our discussions with Structures Design to use soil nail bar #9 in lieu of bar #10 used in our FR dated October 20, 2011. This FR supersedes all our previous submittals and our Foundation Report dated October 20, 2011 for the above referenced project.

This memorandum provides our foundation recommendation for the proposed retaining walls in the above referenced project. These retaining walls are proposed to be nine soil nail walls. There is another proposed Caltrans Standard Type 5 retaining wall (RW #166) and is covered under a separate report.

This project is located on Route 152 (Hecker Pass), near the City of Gilroy in Santa Clara County at various locations between 0.17 miles, east of Watsonville Road intersection and the Santa Cruz County line. This section of Route 152 is a narrow 2-lane highway in steep mountainous terrain, connecting the towns of Watsonville and Gilroy. The project area is undeveloped and vegetation consists of typical coastal redwood forest. Bodfish Creek flows adjacent to the alignment throughout the project limits.

This section of Route 152 is a narrow 2-lane highway in steep mountainous terrain, with 22 ft traveled way and no paved shoulders. To accommodate the safety improvements along Route 152, the project was divided into five locations. There are no walls proposed for Location 5.

- Location 1: PM 0.0 to PM 0.26
- Location 2: PM 0.95 to PM 1.11

- Location 3: PM 1.22 to PM 1.47
- Location 4: PM 2.57 to PM 3.20
- Location 5: PM 4.77 to PM 5.20

The improvements include widening of the existing shoulders, constructing 9 soil nail walls, constructing one Caltrans Type 5 Standard retaining wall, overlay existing pavement, removing trees, install warning signs, and constructing a left turn lane on eastbound Route 152 at Watsonville Road.

The proposed widening of Route 152 is being accommodated by cutting into the adjacent hills (with some minor fill at an existing box culvert); we have considered different types of retaining wall alternatives such as Caltrans Standard Type 1 and Type 7 Retaining Walls, and Soil Nail Walls. However, for this project, because of the geology of the adjacent hills, long and continuous cut slope above the proposed wall, and most importantly for seismic reasoning and ease of construction, we believe Soil Nail Wall would be the most feasible and economical alternative. Therefore, we recommend constructing Soil Nail Walls along the face of the proposed cuts. Also, in order to contain the fill for the proposed widening and minimize R/W take, a Caltrans Standard Type 5 is deemed to be the best alternative.

The following Table 1 lists wall names, types, locations, heights, lengths and boring information:

Table 1

Wall No.	*Location*	*Boring Name*	*LOL Sta limits/ Boring Location*	*Boring Depth (ft.)*	*Boring Elev. (ft.)*	*Wall/ (Boring Type)*	*Max. Wall Height (ft)*	*Length of Wall (ft)*
1	1		Sta. 8+40 to 10+60			Soil Nail	15.40	220
		R-10-001	***40' LT. 9+75***	40	1300	(Horizontal)		
2	1		Sta. 12+86 to15+07			Soil Nail	17.0	221
		R-10-002	***41' LT. 13+50***	40	1282	(Horizontal)		
3	2		Sta. 49+04 to 55+60			Soil Nail	34.6	656
		R-10-003	***25' LT. 52+00***	50	1039	(Horizontal)		
		R-10-004	***20' LT. 54+00***	50	1026.5	(Horizontal)		
4	3		Sta. 65+61 to 68+38			Soil Nail	19	277
		R-10-005	***21' LT. 66+50***	40	954	(Horizontal)		
7	4		Sta. 134+40 to 137+55			Soil Nail	36.7	315
		R-10-008	***7' LT. 135+70***	65	623	(Horizontal)		
8	4		Sta. 138+12 to 138+82			Soil Nail	12.5	70
		R-10-009	***22' LT. 138+50***	50	609.5	(Horizontal)		
9	4		Sta. 139+78 to 150+15			Soil Nail	32.4	1037
		R-10-010	***20' LT. 142+00***	75	590	(Horizontal)		
		R-10-011	***23' LT. 145+00***	75	573	(Horizontal)		
		R-10-012	***19' LT. 148+00***	75	558	(Horizontal)		
10	4		Sta. 152+29 to 157+97			Soil Nail	24.2	568
		R-09-013	***20' LT. 153+50***	55	526	(Horizontal)		
		R-09-014	***15' LT. 156+00***	45	514	(Horizontal)		
11	4		Sta. 163+20 to 167+0.0			Soil Nail	15.5	380
		R-09-016	***22' LT. 163+75***	48	495.5	(Horizontal)		
		R-09-017	***28' LT. 165+50***	34	496.5	(Horizontal)		
166*	**4**		**Sta. 165+20 to 166+90**			**Type 5***	**5**	**170**
		A-10-101	***16' LT. 160+00***	**30**	**494.7**	**VERTICAL**		

*** This wall will be addressed in a separate Report to District 06 Design**

2. SCOPE OF WORK

The scope of our foundation investigation included:

- Field mapping, reviewing existing reports and information available on site, geology, seismicity and subsurface soil/rock conditions.

- Subsurface investigation using exploratory boring and a laboratory-testing program.

3. REGIONAL AND SITE GEOLOGIC SETTING

The project area lies in the southern portion of Santa Clara County. This area constitutes the Central California Coast Range. The area includes five fault-bounded structural blocks, each containing a distinct stratigraphic assemblage, and Santa Clara Valley which contains a large Quaternary alluvial complex overlaying and obscuring bedrock relationships (Graymer, 1997).

Northeast of the San Andreas Fault, the Mesozoic composite basement is broken into the subsidiary Sierra Azul and New Almaden blocks along a complex fault boundary consisting of locally merged segments of Sargent, Berrocal, Sierra Azul, and Aldercroft Faults.

The western side of the project area lies within the Sierra Azule block. The Sierra Azule block composed of a west- facing, tightly folded and overturned section of Cretaceous and Tertiary strata, unconformably overlain by relatively gently folded Pliocene strata. It is bounded on the west by the San Andreas Fault zone and on the east by Sergent Fault zone. The strata are disrupted by a west-vergent reverse fault separating Eocene and Miocene strata, probably related to tight folding within the block (Graymer, 1997).

The eastern side of the project area is located in the New Almaden block. The structurally lowest exposed rocks of the Almaden block consist of a composite Mesozoic basement of rocks of the Coast Range ophiolite and Franciscan Complex. The eroded Franciscan and ophiolitic rocks were unconformably overlain by early Eocene Marine strata and, later, by Miocene marine strata (McLaughlin et al, 2001). Since the middle Pleistocene, Miocene and younger strata of the New Almaden block locally have been tilted, overturned, compressed into open to tightly appressed folds, and repeated along northeast-vergent reverse faults of the Sargent, Berrocal, and Shannon Fault zones (McLaughlin et al, 2001).

According to the geologic maps and the borings drilled for the proposed retaining walls numbers 1, 2, 3 and 4 are located in Sierra Azula block and underlain by two different rock units:

Siliceous shale and sandstone of Mount Pajaro (Oligocene and/or Miocene) – interbedded white weathering, dark brown, hard laminated, siliceous mudstone, dark brown laminated chert; dark brown micaceous siltstone; white weathering, brown, fine-grained, quartz-mica sandstone, and clean, white, quartz sandstone. Chert was observed only near the top of the unit just south of Hecker Pass.

Sandstone of Mount Madonna (Eocene) – Interbedded massive, white, fine to coarse-grained, quartz-mica, quartz-feldspar, and quartz sandstone; distinctly bedded, brown, fine- to coarse-grained, carbonaceous, mica-lithic and lithic wacke; distinctly bedded, brown mudstone and siltstone; and brown weathering, dark gray shale.

Where as retaining walls numbers 7, 8, 9, 10, 11, and 166 are mostly located in Sierra Azula block and the southern end of the new Almaden block and underlain by the following rock units:
Volcanic rocks (Lower Cretaceous) – Pillowed basalt flows, flow breccias, and andesitic tuff.

Sandstone and mudstone – thick-to thin bedded, locally pebbly, quartzo-feldspathic and arkosic sandstone and interbedded micaceous carbonaceous mudstone.

Mottled mudstone and sandstone of Mount Chaul (lower Eocene) – Maroon-red to olive green, mottled foraminiferal mudston. Locally containing glauconitic, bioclastic conglomerate and lithic sandstone at the base. Basal bioclastic strata include detriutus eroded from the Franciscan Complex and the Coast Range ophiolite. The mottled mudstone is overlain by quartzo-feldspathic sandstone and interbedded carbonaceous green to brown mudstone.

Alluvial fan deposits (Pleistocene) – Unconsolidated boulders, sand, silt and soil, deposited in older alluvial fans. Includes deposits of older Pleistocene alluvial fans incised by younger Pleistocene and Holocene alluvial deposits. Units includes channel and overbank deposits of major Pleistocene fluvial systems.

Refer to the attached Geologic Map and the Log of Test Borings for Details.

4. FAULT AND SEISMIC DATA

The project area occupies an area of extremely high seismicity, even for the Bay area. The Sargent and Castro Faults are active faults and both cross the project area. The San Andreas Fault is an active fault located in the proximity of the project (Refer to the Attached Exhibit). The Sargent and Castro Faults are part of the San Andreas Fault system and have produced major earthquakes in historic time. The San Andreas Fault system is a complex belt of major fault zones extending roughly northwestward from northern Mexico through western California. Each of these faults has produced major earthquakes in historic time (documented since 1836).

Following is Table 2 listing the distance from the project to nearby active faults, the Maximum Magnitude of these faults, estimated Deterministic Peak Bed Rock Acceleration (PBA), and probabilistic USGS 5% in 50 years hazard anticipated within the project's five locations using the Caltrans ARS online (shake) program (see attached):

Table 2

Fault	*Site to source Distance (mi)*	*Maximum Magnitude (Mmax)*	*Peak Bed Rock Acceleration (PBA)*	*USGS 5% in 50 years probability Exceedance*
Loc.1 @PM 0.2				
San Andreas	1.10	7.9	0.525	0.695
Sargent (NW)	0.85	6.8	0.522	
Loc.2 @PM 1.03				
San Andreas	1.35	7.9	0.513	0.686
Sargent (NW)	0.70	6.8	0.537	
Loc.3 @PM 1.35				
San Andreas	1.45	7.9	0.507	0.681
Sargent (NW)	0.70	6.8	0.537	
Loc.4 @PM 3.2				
San Andreas	2.90	7.9	0.442	
Sargent (NW)	0.00	6.8	0.681	0.642

It should be noted that the Castro Fault PBA and Probabilistic USG 5% values are not listed, because Shake program does not include shorter faults since they do not produce ground motion over the minimum spectrum. The Castro Fault is considered part of the Sargent Fault in the CGS database and by itself less than 10 km long (late-Quaternary and younger sections - meaning Caltrans "active") (Martha Merriam – personal contact). Refer to the attached Regional Fault Map for Details.

5. FOUNDATION SOIL/ROCK AND GROUNDWATER

The Office of Geotechnical Design – West, a Division of Engineering Services, investigated the subsurface conditions (December 2009, January and February 2010) at the site using Christensen CS 2000 track drill rig.

The foundation investigation for the proposed nine soil nail walls consisted of drilling fourteen sub horizontal borings (R-10-001 through R-10-005, R-10-008 through R-0914, R-09-16 and R-09-17). Refer to Table 1 above for boring locations in reference to their corresponding wall numbers and other pertinent information. The subsurface soils/rocks for the proposed soil nail wall may be described as sedimentary rocks (sandstone and mudstone). The bedrock is very soft

to hard, decomposed to fresh, and intensely to very intensely fractured. Local clayey filled shears are common. Recovery and RQD values were very low to moderate. The boring was inclined upward slightly (<5°) for groundwater control, however groundwater was not measured due to rotary wash method of drilling.

Refer to the LOTB for complete soil/rock description.
LOTB sheets will be furnished to you upon completion.

6. RECOMMENDATIONS

Refer to Table 1 above for approximate wall limits, lengths, and maximum heights.

6.1 Soil Nail Walls

A. Design Criteria for Soil Nail Walls

In this project, the design for the proposed soil nail walls is performed using the recently improved Caltrans' Computer Program "SNAILZWIN", Version 5.1. The rock/soil parameters used in this program were selected based on the horizontal borings (See LOTB sheets for details) drilled within the proposed wall limits, and field observations.

The following limiting criteria are used in the design of the soil nail retaining Walls:

- The minimum factor of safety with seismic loading (pseudo-static): $FOS_{dynamic}$ = 1.0; a horizontal pseudo-static coefficient of 0.2 g was used to simulate seismic loading conditions.

- The maximum spacing of the nails (S_v x S_h):
  S_v is the vertical spacing of the nails
  $S_{v,MAX}$ = 5 ft.
  S_h is the horizontal spacing of the nails
  $S_{h,MAX}$ = 5 ft.

- The inclination angle (θ) of all the nails to the horizontal = 15 degrees

- The average soil/rock design parameters used for design of all soil nail walls (based on the LOTB sheet) were:

Friction Angle (ϕ)	= 32 degrees
Cohesion (c)	= 700 psf
Unit Weight (γ)	= 125 pcf

- Soil nail profiles lines shall be parallel to the top of the wall except the bottom most line, which shall be parallel to the bottom of the wall.

- Minimum and maximum vertical distances from the bottom of the wall to the bottom level of the soil nail assembly (SB) shall be 2 ft and 3 ft, respectively, except where shown on the plans.

- Soil nails shall be of ASTM Designation: A615, Grade 60, fs= 60,000psi. ***Refer to Table 3 for bar sizes and other design parameters.***

- Design pullout resistance between grout and drilled hole = 2.0 kips per linear foot of bonded length for all soil nail walls.

- Punching shear capacity = 45 kips for all soil nail walls.

- The maximum tensile strength (kips/level) for each wall is shown on Table 3.

Table 3

Wall No.	*Friction Angle (deg.)*	*Cohesion (psf)*	*E.Q Factor*	*F.Y Steel (ksi)*	*Punching Shear (kips)*	*Bar No. (Diam.-inch)*	*DESIGN Pullout Resist. (kips/ft)*	*Maximum Tensile Force $T_{max.}$ (kips/level)*
1	32	700	0.3	60	45	7 (0.875")	2.0	41.2
2	32	700	0.3	60	45	8 (1.000")	2.0	36.4
3	32	700	0.3	60	45	7 (0.875"), 8 (1.000"), & 9 (1.128")	2.0	33.0
4	32	700	0.3	60	45	7 (0.875")	2.0	42.0
7	32	700	0.3	60	45	7 (0.875"), 8 (1.000"), & 9 (1.128")	2.0	37.0
8	32	700	0.3	60	45	7 (0.875")	2.0	27.2
9	32	700	0.3	60	45	7 (0.875"), 8 (1.000"), & 9 (1.128")	2.0	42.0
10	32	700	0.3	60	45	7 (0.875") and 8 (1.000")	2.0	27.0
11	32	700	0.3	60	45	7 (0.875")	2.0	29.2

- The design vertical distance between the bottom of the wall and the finished grade of the proposed roadway elevation is = 2 ft, except where shown on the plans.

- Vertical distance between top of wall (cut line as shown on the plans) and the top most row of soil nails ST = 2 ft.

- Minimum and maximum spacing, both horizontal and vertical, of soil nail assembly = 1.5 and 5 ft, respectively.

- Minimum and maximum distances between the beginning/end of wall and the first/last soil nail = 1.5 ft and 2.5 ft, respectively.

- The designed lengths (embedment depth) of the soil nails will be shown on the proposed Soil Nail Retaining Wall Plans. See attached Wall elevation views for nail schedules and embedment depths.

B. Field Testing

Field verification of the design pullout resistance values used in the design ensures that the nail design loads can be carried without excessive movements and with an acceptable factor of safety for the service life of the wall. Verification testing and proof testing shall be conducted in order to verify the design pullout resistance and to ensure consistency of the quality of drilling, installation and grouting technique.

Verification testing and stability testing for each "wall zone" shall be conducted prior to the installation of production soil nails in accordance to the special provisions at locations recommended by the Engineer. It is recommended that locations for these tests be shown in the Contractor's working drawing submittal for approval. The wall zones shall be defined as follows:

Soil Nail Wall #1

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	8+40	10+60	1310 ft	1300 ft
2	8+40	10+60	1300 ft	1287 ft

Soil Nail Wall #2

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	12+86	15+07	1295 ft	1280 ft
2	12+86	15+07	1280 ft	1263 ft

Soil Nail Wall #3

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	49+04	50+70	1056 ft	1040 ft
2	50+70	52+00	1072 ft	1050 ft
3	50+70	52+00	1050 ft	1030 ft
4	52+00	54+00	1050 ft	1035 ft
5	52+00	54+00	1035 ft	1015 ft
6	54+00	55+60	1033 ft	1011 ft

Soil Nail Wall #4

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	65+61	68+38	965 ft	940 ft

Soil Nail Wall #7

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	134+40	136+00	648 ft	630 ft
2	134+40	136+00	630 ft	615 ft
3	136+00	137+55	648 ft	628 ft
4	136+00	137+55	628 ft	608 ft

Soil Nail Wall #8

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	138+12	138+82	616 ft	602 ft

Soil Nail Wall #9

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	139+70	143+00	608 ft	575 ft
2	143+00	145+63	602 ft	584 ft
3	143+00	145+63	584 ft	564 ft
4	145+89	149+02	586 ft	568 ft
5	145+89	149+02	568 ft	548 ft
6	149+13	150+15	563 ft	545 ft

Soil Nail Wall #10

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	152+29	155+20	546 ft	528 ft
2	152+29	155+20	528 ft	510 ft
2	155+20	157+97	527 ft	508 ft

Soil Nail Wall #11

Zone	Begin Stationing	End Stationing	Upper Elev.	Lower Elev.
1	163+20	165+00	501 ft	489 ft
2	165+00	165+00	501 ft	490 ft

Proof test on at least eight (8) sacrificial test nails shall be performed for every one hundred production soil nails. The locations of such proof test locations of pullout tests are shown on the plans. An additional two (2) sacrificial test nails for every one hundred production soil nails may be necessary during construction for further quality assurance. Locations of both the proof testing and verification testing shall be chosen in such a manner that the entire limits of the wall is covered, particularly where significant changes in the ground condition and soil/rock characteristics are expected. The pullout test procedure described in the standard special provisions shall be followed. If the test nails fail to meet the requirements stated in the special provisions, the OGDW shall be contacted immediately for assessment of the failure and modification of the wall design, if necessary.

C. Wall Drainage System

Although groundwater was not encountered during drilling operations (based on the boring logs), still, to protect against any possible hydrostatic pore pressure build up behind the wall and to direct the surface runoff away from the wall, we recommend constructing a proper internal and external drainage systems. For these drainage systems, we recommend the following:

i. Internal Drainage System

- Place 1 ft wide prefabricated geotextile drain strips (placed with the geotextile side against the ground) vertically on 5 ft centers prior to applying shotcrete. The geotextile drain strips shall start from the bottom of the proposed gutter and end at the bottom PVC pipe weep hole as shown on the attached Exhibit A.

- Install PVC pipe (2 inches to 3 inches in diameters) weep holes through the shotcrete face at the center and base of the prefabricated geotextile drainage strips.

ii. External Drainage System

- A concrete cap is needed at the top of the wall from the beginning of the wall to the end of the wall for sheet flow of the surface water away from the wall.
- A Drainage Inlet (DI) may be needed at the beginning and end of the wall to collect the surface runoff.
- The District Hydraulics Branch should be contacted for specific drainage recommendations.

D. Wall Facing System

The design of the wall facing system is the responsibility of the Office of Structures Design (DSD) and Landscape Architecture Branch.

7. CONSTRUCTION CONSIDERATIONS

Due to the sandy nature of the soils, caving of the nail holes is anticipated and the use of casing may be required.

8. CORROSION

Corrosion studies are conducted in accordance with the requirements of California Test Method No. 643.

The Department considers the site to be corrosive to foundation elements if one or more of the following conditions exist for the representative soil and/or water samples taken at the site:

The following table provides our corrosion test summary:

Boring	*SIC Number*	*Sample Depth*	*Resistivity (Ohm-Cm)*	*pH*	*Chloride Content (ppm)*	*Sulfate Content (ppm)*
R-10-002	c634948	15'-30'	1391	6.7	N/A	N/A
R-10-004	c634944	15'-25'	4930	7.0	N/A	N/A
R-10-008	c634945	15'-35'	1170	7.5	N/A	N/A
R-09-013	c634947	19'-29'	4247	7.1	N/A	N/A
R-09-014	c634946	20'-30'	2514	6.8	N/A	N/A

Note: *Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.*

Based on the laboratory test results on the soil samples, the site appears to be non-corrosive

Corrosion mitigation measures should be designed using these test results according to the guidelines provided in the Structure Reference Specification 19-660 (19NAIL).

9. DISCLAIMER

The recommendations contained in this report are based on specific project information regarding structure type, location, and design loads that have been provided by the Office of West. If any conceptual changes are made during final project design, the Office of Geotechnical Design-West, Branch A should review those changes to determine if these foundation recommendations are still applicable.

* * * * * *

Any questions regarding the above recommendations should be directed to the attention of Ali Kaddoura/Mohammad Zabolzadeh at 510-286-4676/4831 or Hooshmand Nikoui at 510-286-4811, at the Office of Geotechnical Design-West, Branch A.

Attachments:

c: TPokrywka, HNikoui, MZabolzadeh, AKaddoura - (GS west), Mark Willian (GS Corporate), RE_pending_File (Structure Construction), John Stayton (DES OE), Brian Kearney (District ME), Fariba Zohoury (District 4 PM), Hydraulics (District 4), MHunt (Environmental Planning), Steve Fukagawa PE (District 6 PE), Getachew Eshete (District 6 Senior).

Attachments

Kaddoura-Zabolzadeh/mm/2A2501-Soil Nail Walls Revised Final FR-March 2012

REGISTERED PROFESSIONAL ENGINEER
ALI K. KADDOURA
No. C55710
Exp. 12-31-12
CIVIL
STATE OF CALIFORNIA

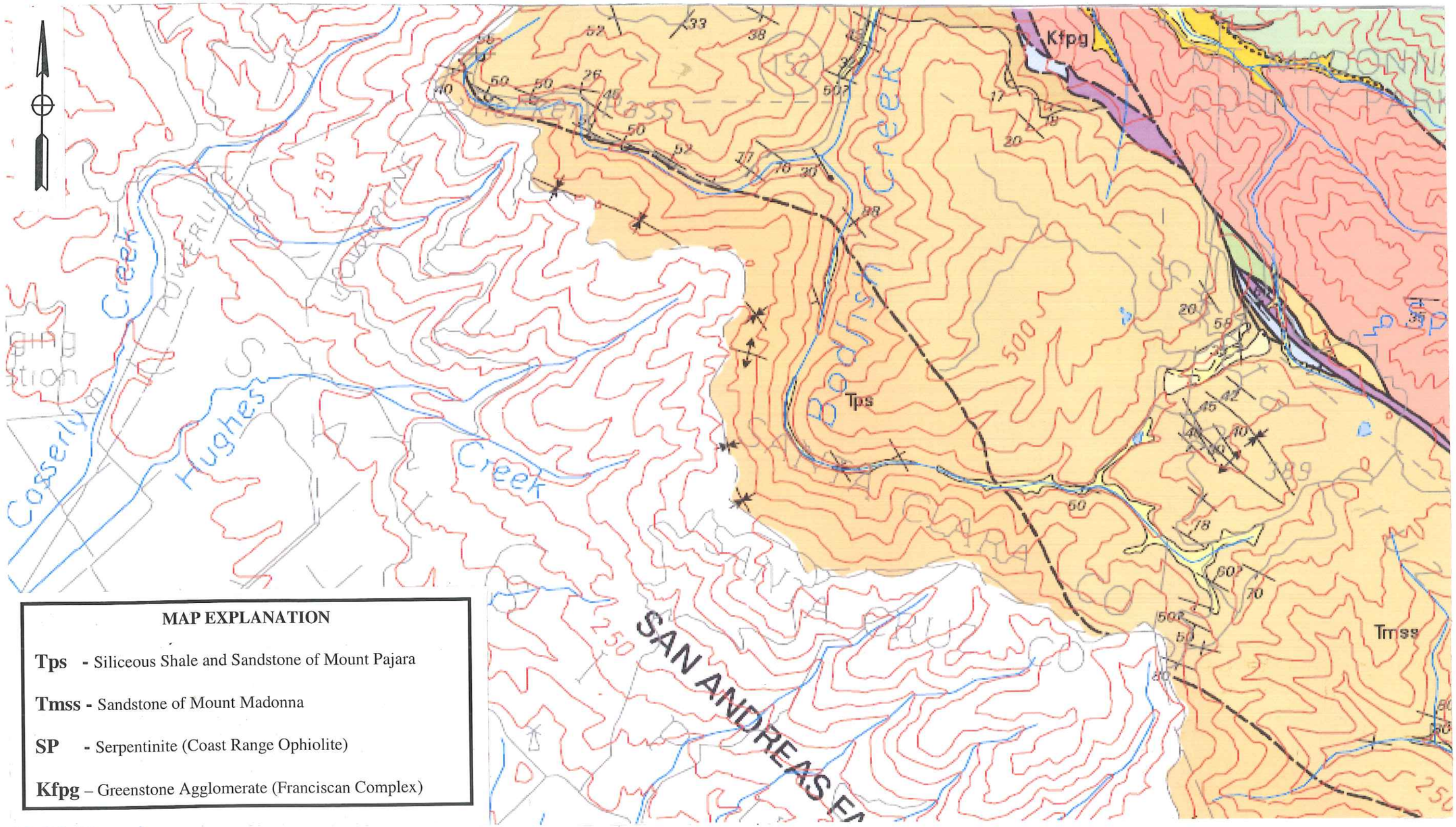
Caltrans

Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - West
Branch B

HECKER PASS ROAD

04-SCI-152 PM 0.0/5.2
EA No. 2A2500 Jan. 2009

LOCATION MAP



MAP EXPLANATION

Tps - Siliceous Shale and Sandstone of Mount Pajara

Tmss - Sandstone of Mount Madonna

SP - Serpentinite (Coast Range Ophiolite)

Kfpg – Greenstone Agglomerate (Franciscan Complex)

Scale
1: 38,400

Reference: R.W. Graymer, USGS, OF 97-710

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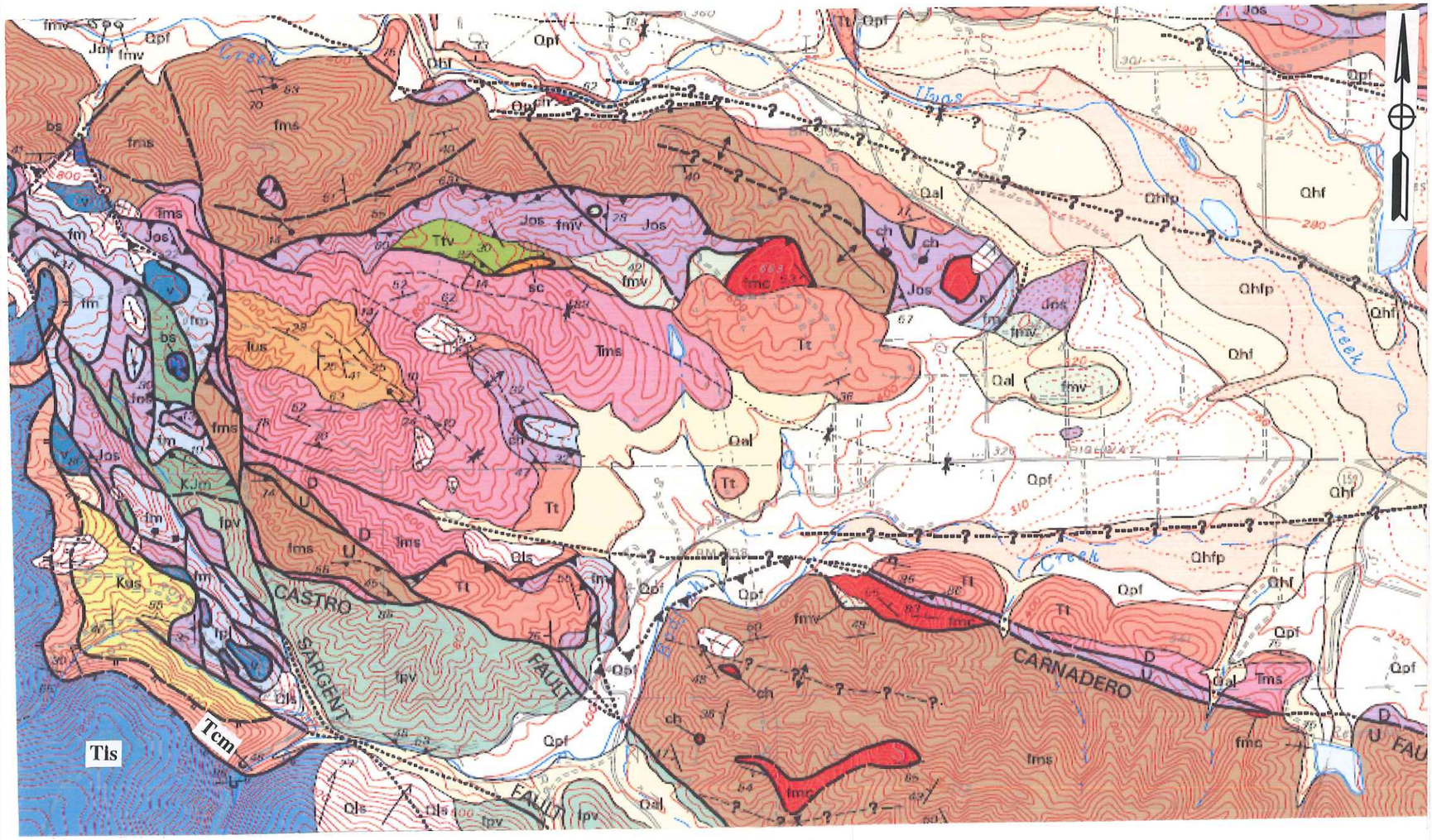
Office on Geotechnical Design - West
Branch B

HECKER PASS ROAD	
04-SCI-152	PM 0.0/5.2
EA No. 2A2500	Jan. 2009
Fig. 3A - GEOLOGY MAP	



Scale 1: 24,000

MAP EXPLANATION

QaI - Alluvium, undivided (Holocene and Pleistocene)

Qis - Landslide deposits, undivided (Holocene and Pleistocene)

Qhf - Alluvial fan deposits (Holocene)

Qhfp- Floodplain deposits (Holocene)

Qpf - Alluvial fan deposits (Pleistocene)

Tms - Monterey shale (middle and lower Miocene)

Tt - Temblor sandstone (middle Miocene to Oligocene)

Ttv - Volcanic and intrusive rocks (middle Miocene)

Jos - Serpentinized ultramafic rocks (Jurassic)

Fm - Melange of centeral belt (Upper Cretaceous)

bs - Blueshist blooks

ch - Chert blocks

fpv - Volcanic rocks (lower Cretaceous)

fms - Sandstone (Upper and/or lower Cretaceous)

fmc - Radiolarian chert (lower Cretaceous Jurassic)

Tls - Sandstone and mudstone

Tcm - Mottled mudstone and sandstone of Mount Chual (lower Eocene)

Reference: U.S. Geological Survey, 2001, Micellaneous Field Studies Map MF-2373

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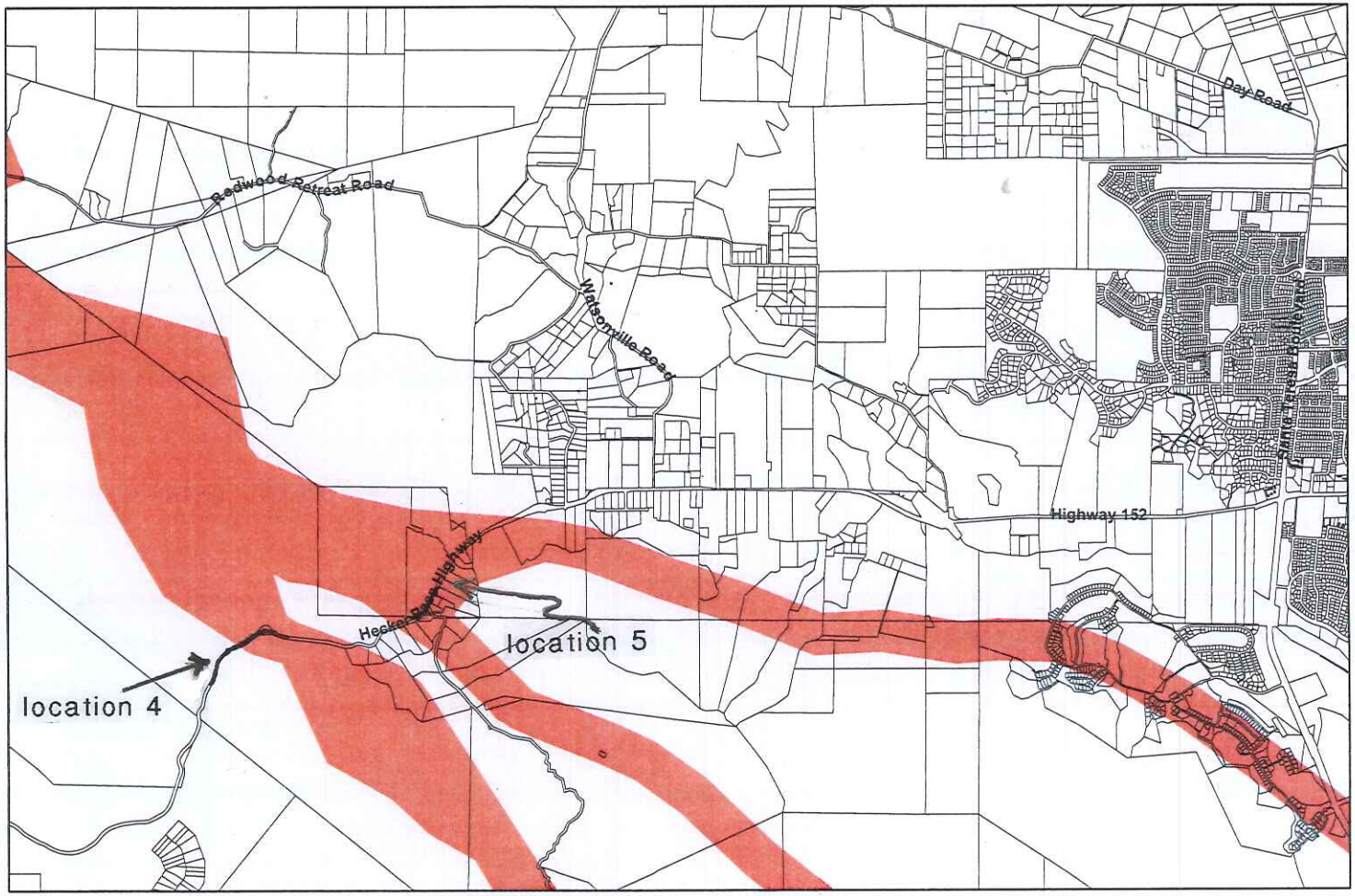
Branch B

HECKER PASS ROAD	
04-SCI-152	PM 0.0/5.2
EA No. 2A2500	Jan. 2009
B - GEOLOGY MAP	



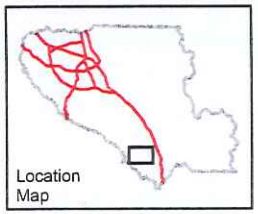
THE COUNTY OF SANTA CLARA

Santa Clara County Geologic Hazard Zones

- Fault Rupture Hazard Zones
- Parcels
- County Boundary

0 3,000 6,000
Feet

1 inch equals 3,000 feet
1:36,000



Version Info:
Zones: February 26, 2002
Parcels: January 2002

These maps are subject to revision. Please check the Planning Office website for the most current version.
The zones shown on this map indicate areas within which the County Geologist may require site specific geologic reports prior to approval of development applications.
Local determination services companies should be contacted to resolve the status of parcels that appear to be located at or near zone boundaries.

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Division of Engineering Services
Geotechnical Services
Office of Geotechnical Design - West
Branch B

HECKER PASS ROAD
04-SCI-152 PM 0.0/5.2
EA No. 2A2500 Jan. 2009
Fault Rupture Map

Scale 1:75,000

Reference: Thomas H., Rogers and John W. William, 1974, CDMG, Special Report 107

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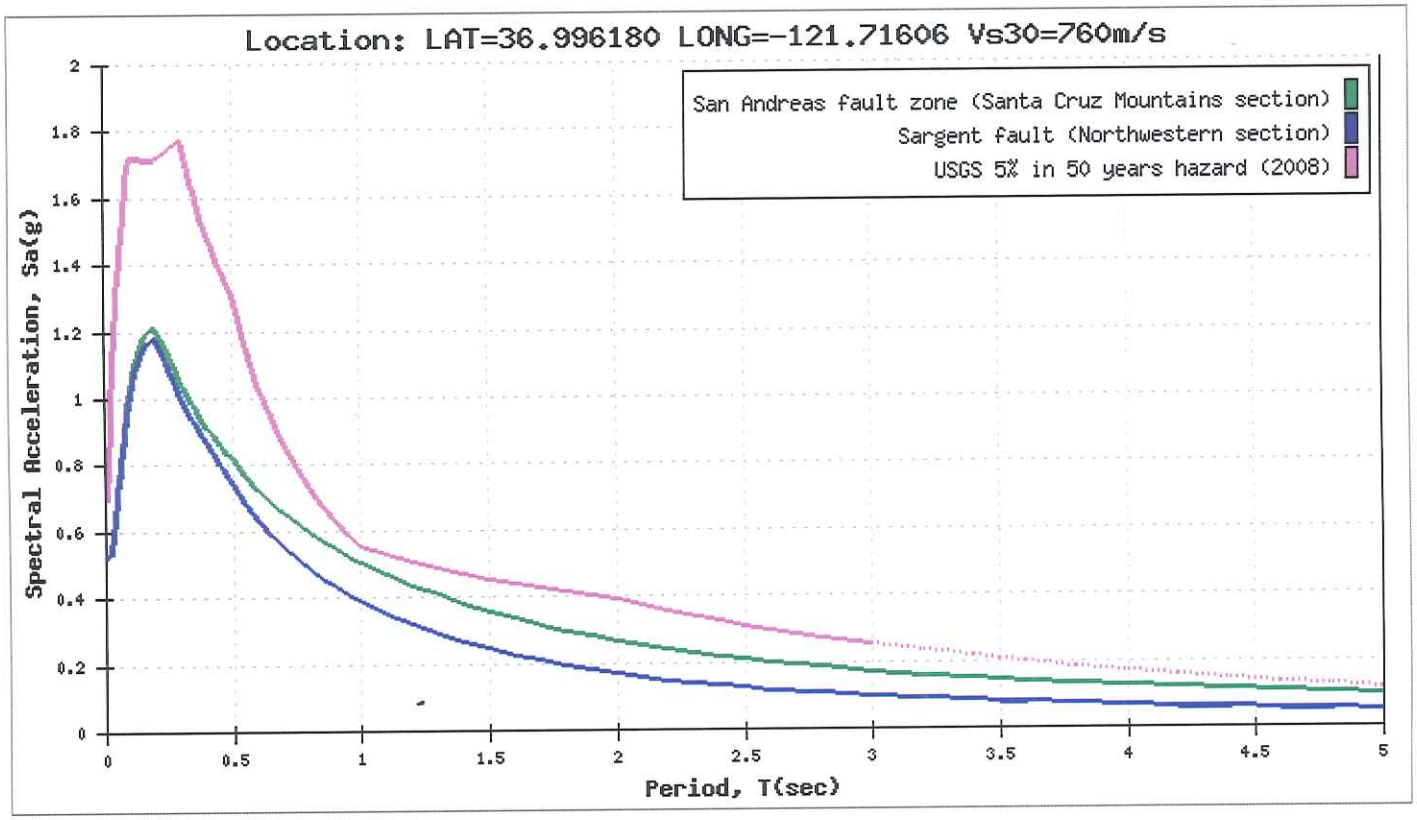
Geotechnical Services
Office on Geotechnical Design - West
Branch B

HECKER PASS ROAD	
04-SCI-152	PM 0.0/5.2
EA No. 2A2500	Jan. 2009
B - FAULT MAP	

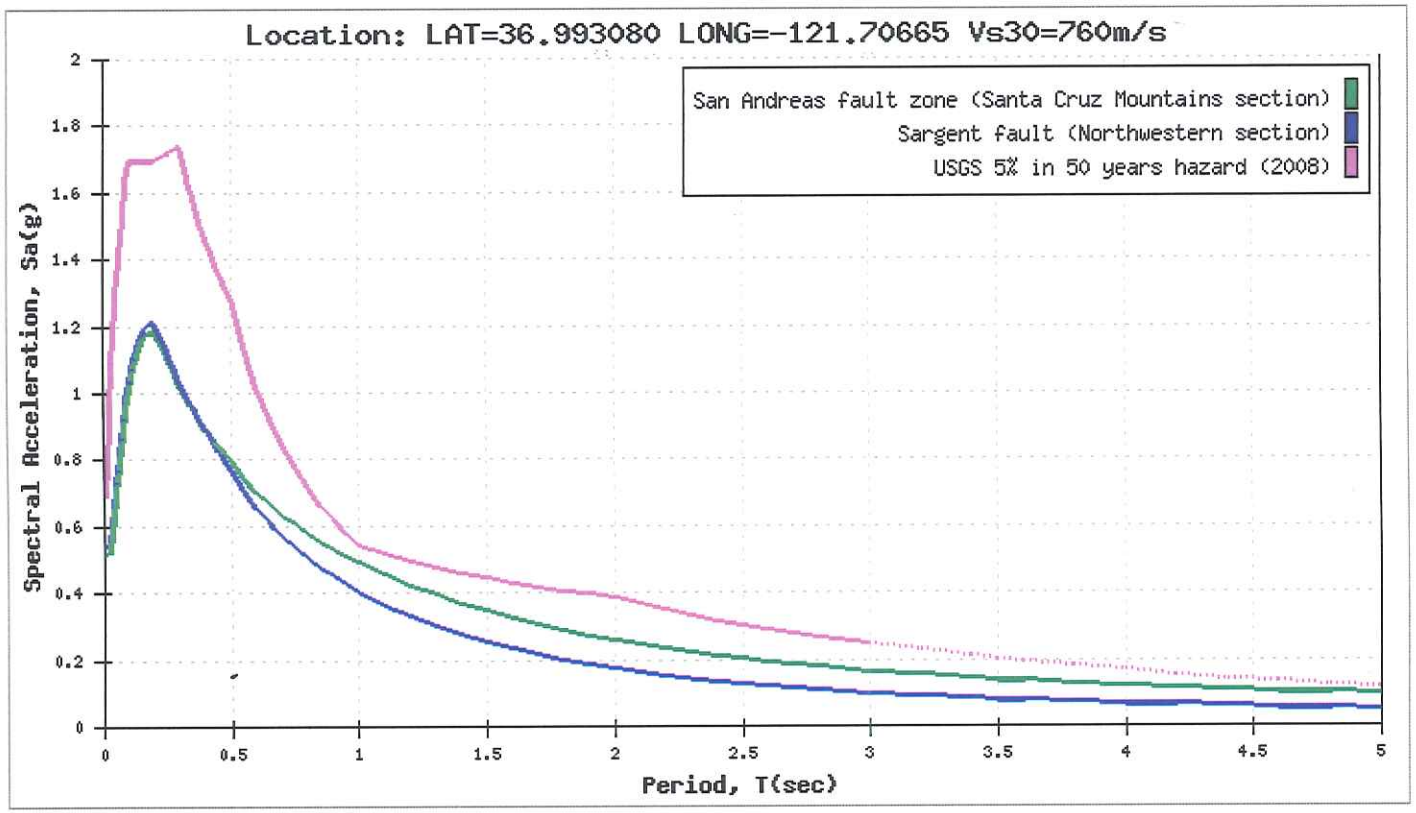
Location 1 from PM 0.0 to PM 0.26

CALCULATED SPECTRA



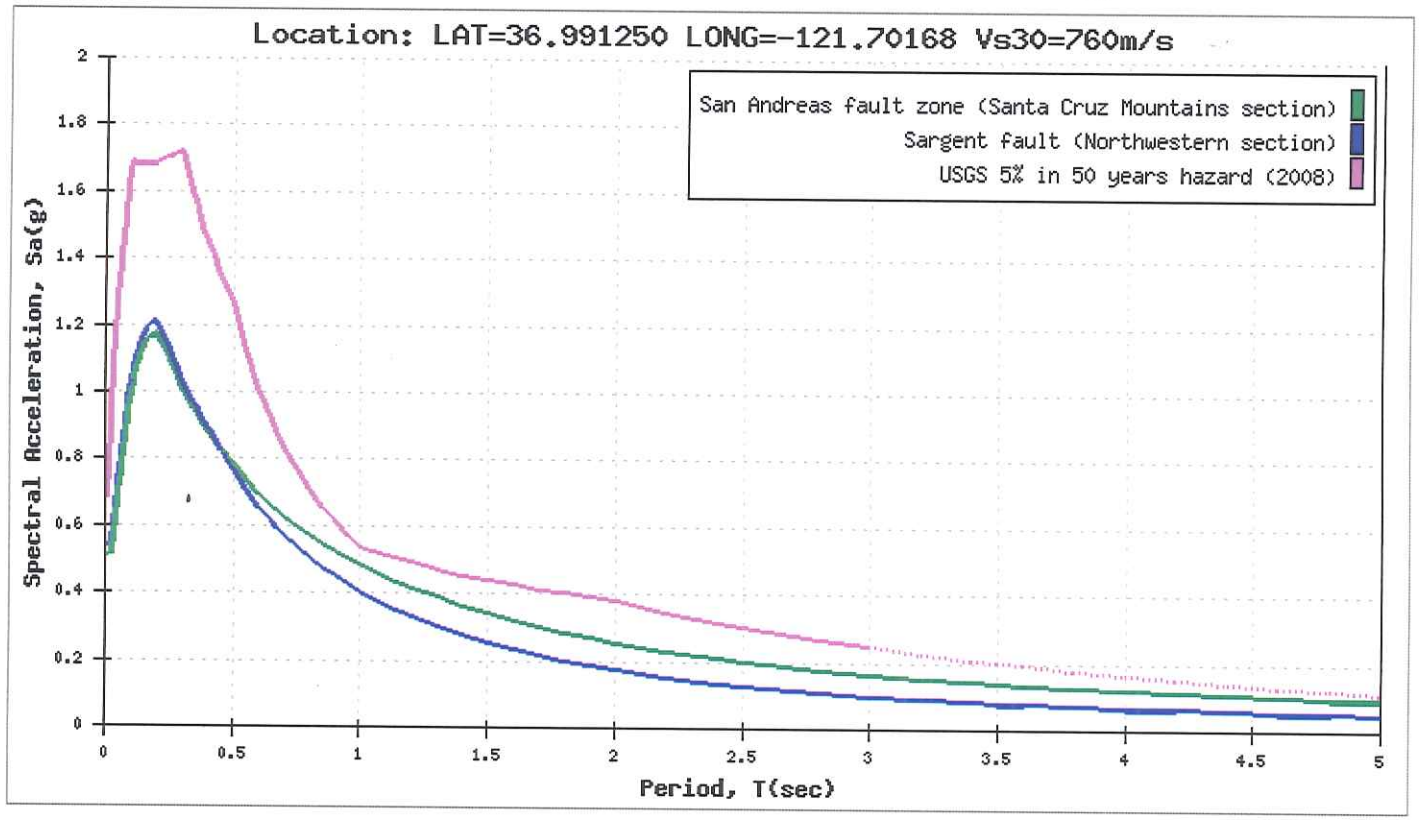
Location 2 from PM 0.95 to PM 1.11

CALCULATED SPECTRA



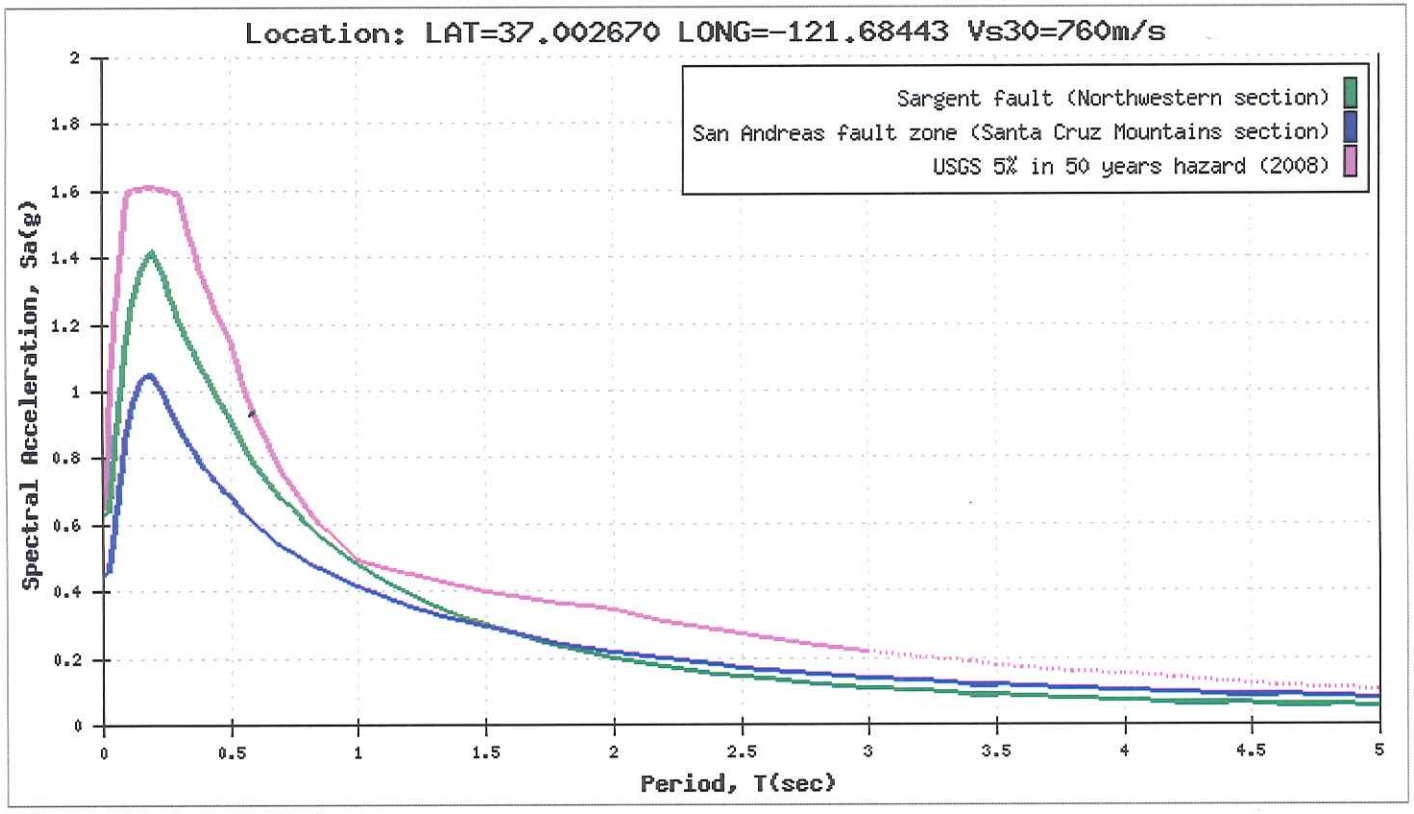
Location 3 from PM 1.22 to PM 1.47

CALCULATED SPECTRA



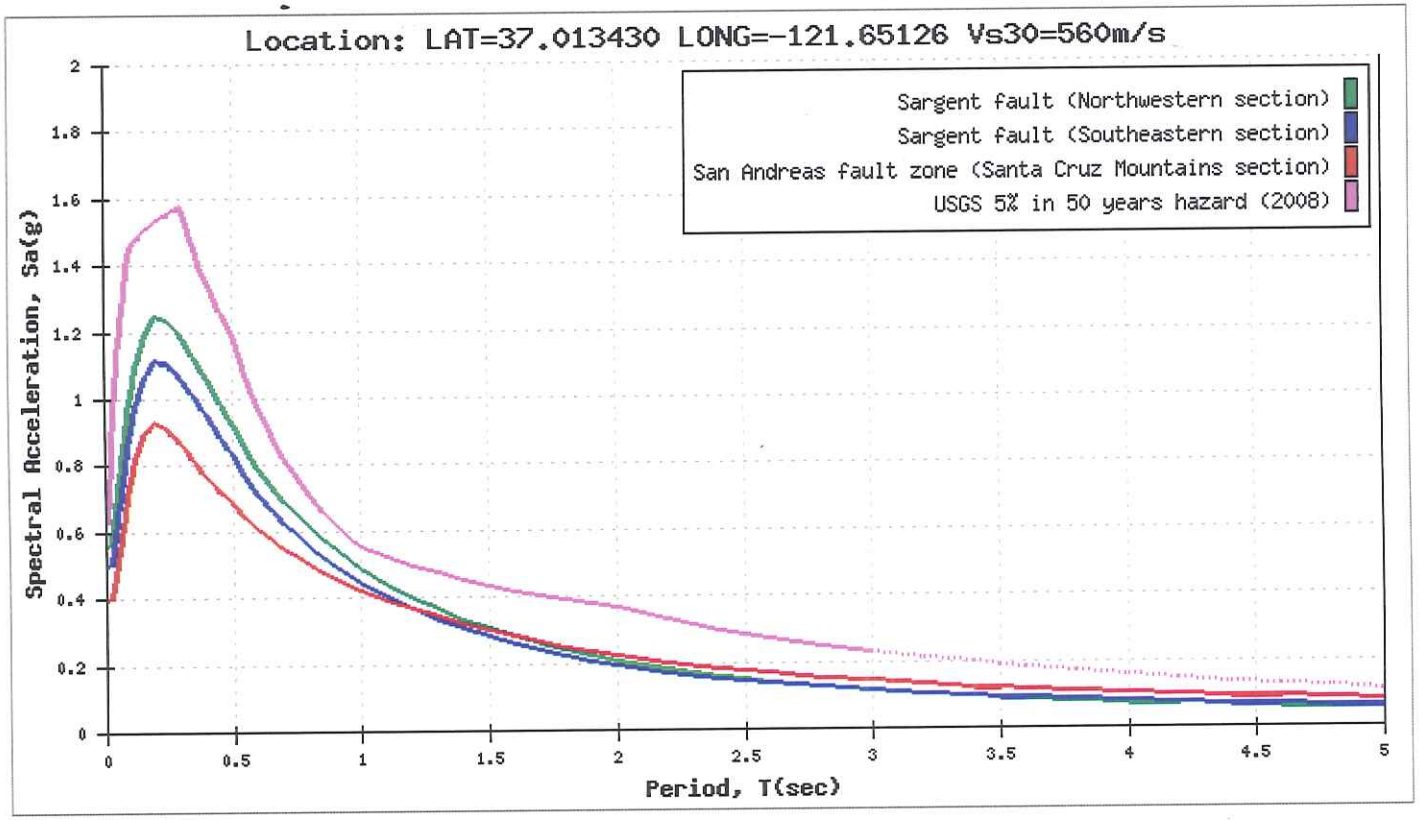
Location 4 from PM 2.57 to PM 3.20

CALCULATED SPECTRA

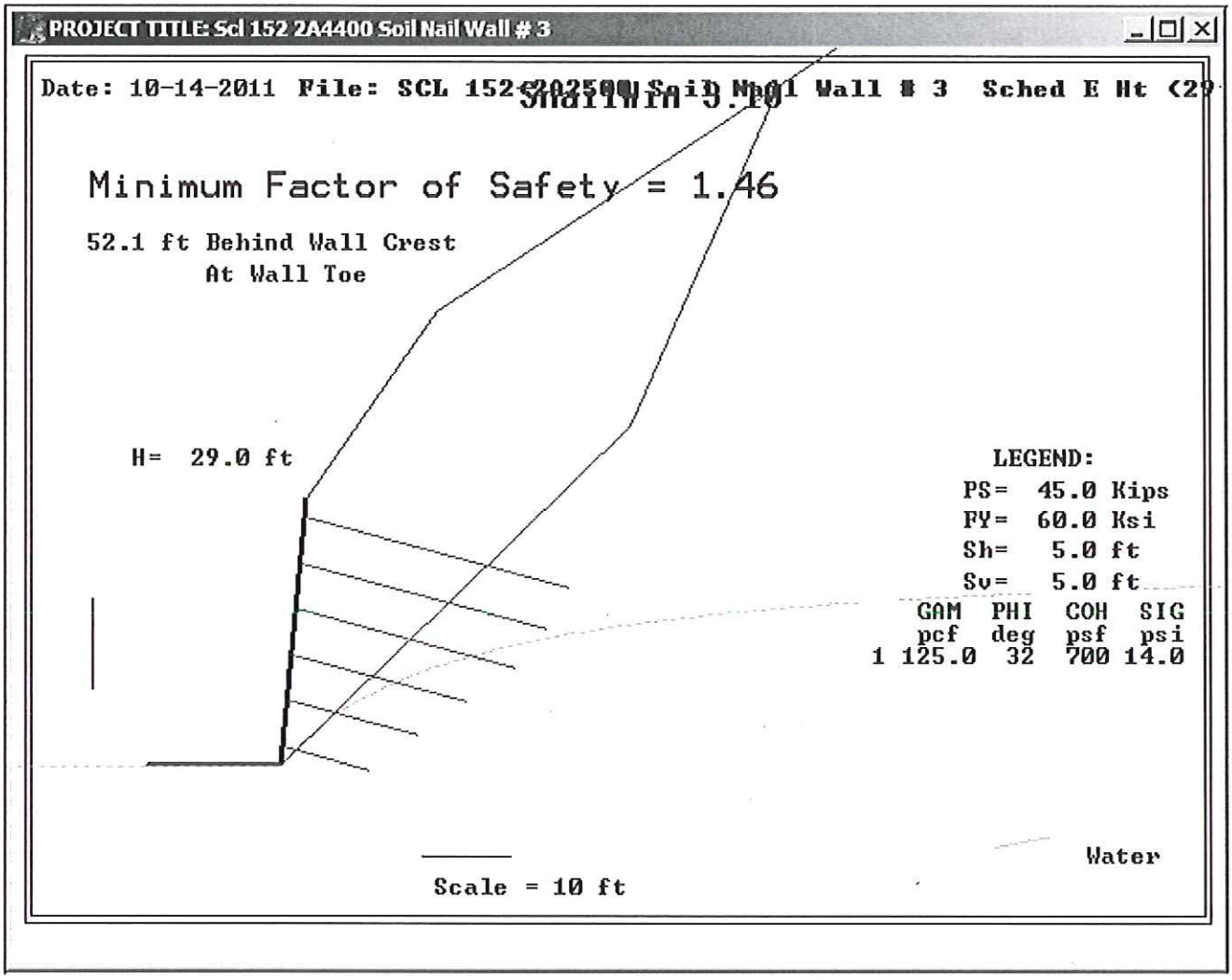


Location 5 from PM 4.77 to PM 5.20

CALCULATED SPECTRA



PROJECT TITLE: Scl 152 2A4400 Soil Nail Wall # 3



File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

```
*************************************************
*    CALIFORNIA DEPARTMENT OF TRANSPORTATION    *
*          ENGINEERING SERVICE CENTER           *
*     DIVISION OF MATERIALS AND FOUNDATIONS     *
*   Office of Roadway Geotechnical Engineering  *
*    Date: 10-14-2011          Time: 09:38:07   *
*************************************************
```

Project Identification - Scl 152 2A4400 Soil Nail Wall # 3

--------- WALL GEOMETRY ---------

Vertical Wall Height	=	29.0 ft	
Wall Batter	=	5.7 degree	
		Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	=	55.0	25.0
Second Slope from 1st slope.	=	33.0	200.0
Third Slope from 2nd slope.	=	0.0	0.0
Fourth Slope from 3rd slope.	=	0.0	0.0
Fifth Slope from 3rd slope.	=	0.0	0.0
Sixth Slope from 3rd slope.	=	0.0	0.0
Seventh Slope Angle.	=	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

There is NO SURCHARGE imposed on the system.

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	125.0	32.0	700.0	14.0	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

--------- WATER SURFACE ---------

The Water Table is defined by three coordinate points.

X(1)-Coordinate = 0.00 ft Y(1)-Coordinate = 0.00 ft
X(2)-Coordinate = 7.00 ft Y(2)-Coordinate = 6.00 ft
X(3)-Coordinate = 120.00 ft Y(3)-Coordinate = 20.00 ft

--------- SEARCH LIMIT ---------

The Search Limit is from 0.0 to 55.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels = 6
Horizontal Spacing = 5.0 ft
Yield Stress of Reinforcement = 60.0 ksi
Diameter of Grouted Hole = 6.0 in
Punching Shear = 45.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	30.0	15.0	2.0	1.27	1.00
2	28.0	15.0	5.0	1.27	1.00
3	25.0	15.0	5.0	1.27	1.00
4	20.0	15.0	5.0	1.27	1.00
5	15.0	15.0	5.0	1.27	1.00
6	10.0	15.0	5.0	1.27	1.00

File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	3.699	8.1	60.9	16.7	89.9	21.9

Reinf. Stress at Level 1 = 13.392 Ksi (Punching Shear controls..)
2 = 13.740 ksi (Punching Shear controls..)
3 = 12.411 Ksi (Pullout controls...)
4 = 10.182 Ksi (Pullout controls...)
5 = 8.192 Ksi (Pullout controls...)
6 = 6.202 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 2	3.019	13.3	43.3	12.8	83.5	35.3

Reinf. Stress at Level 1 = 17.606 Ksi (Pullout controls...)
2 = 16.008 Ksi (Pullout controls...)
3 = 13.582 Ksi (Pullout controls...)
4 = 9.499 Ksi (Pullout controls...)
5 = 7.927 Ksi (Pullout controls...)
6 = 6.997 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 3	2.774	18.5	34.2	9.0	76.2	46.6

Reinf. Stress at Level 1 = 18.189 Ksi (Pullout controls...)
2 = 17.024 Ksi (Pullout controls...)
3 = 14.958 Ksi (Pullout controls...)
4 = 11.089 Ksi (Pullout controls...)
5 = 7.220 Ksi (Pullout controls...)
6 = 7.176 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 4	2.275	23.7	37.0	17.8	77.5	44.0

Reinf. Stress at Level 1 = 16.702 Ksi (Pullout controls...)
2 = 15.156 Ksi (Pullout controls...)
3 = 12.510 Ksi (Pullout controls...)
4 = 9.625 Ksi (Pullout controls...)
5 = 9.277 Ksi (Pullout controls...)
6 = 8.929 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 5	1.975	28.9	33.3	20.8	75.8	47.1

Reinf. Stress at Level 1 = 15.123 Ksi (Pullout controls...)
2 = 13.534 Ksi (Pullout controls...)
3 = 10.679 Ksi (Pullout controls...)
4 = 9.438 Ksi (Pullout controls...)
5 = 9.725 Ksi (Pullout controls...)
6 = 10.013 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 6	1.770	34.2	35.3	20.9	70.6	51.3

Reinf. Stress at Level 1 = 16.131 Ksi (Pullout controls...)
2 = 14.997 Ksi (Pullout controls...)
3 = 12.451 Ksi (Pullout controls...)
4 = 11.544 Ksi (Pullout controls...)
5 = 11.443 Ksi (Pullout controls...)
6 = 11.342 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 7					
1.591	39.4	49.2	42.2	69.7	34.0

Reinf. Stress at Level 1 = 19.913 Ksi (Pullout controls...)
2 = 21.813 Ksi (Pullout controls...)
3 = 22.142 Ksi (Pullout controls...)
4 = 19.328 Ksi (Pullout controls...)
5 = 16.513 Ksi (Pullout controls...)
6 = 13.699 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 8					
1.533	44.6	47.1	45.9	68.3	36.2

Reinf. Stress at Level 1 = 18.682 Ksi (Pullout controls...)
2 = 21.021 Ksi (Pullout controls...)
3 = 21.729 Ksi (Pullout controls...)
4 = 19.175 Ksi (Pullout controls...)
5 = 16.621 Ksi (Pullout controls...)
6 = 14.067 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 9					
1.491	49.8	45.4	49.6	67.1	38.3

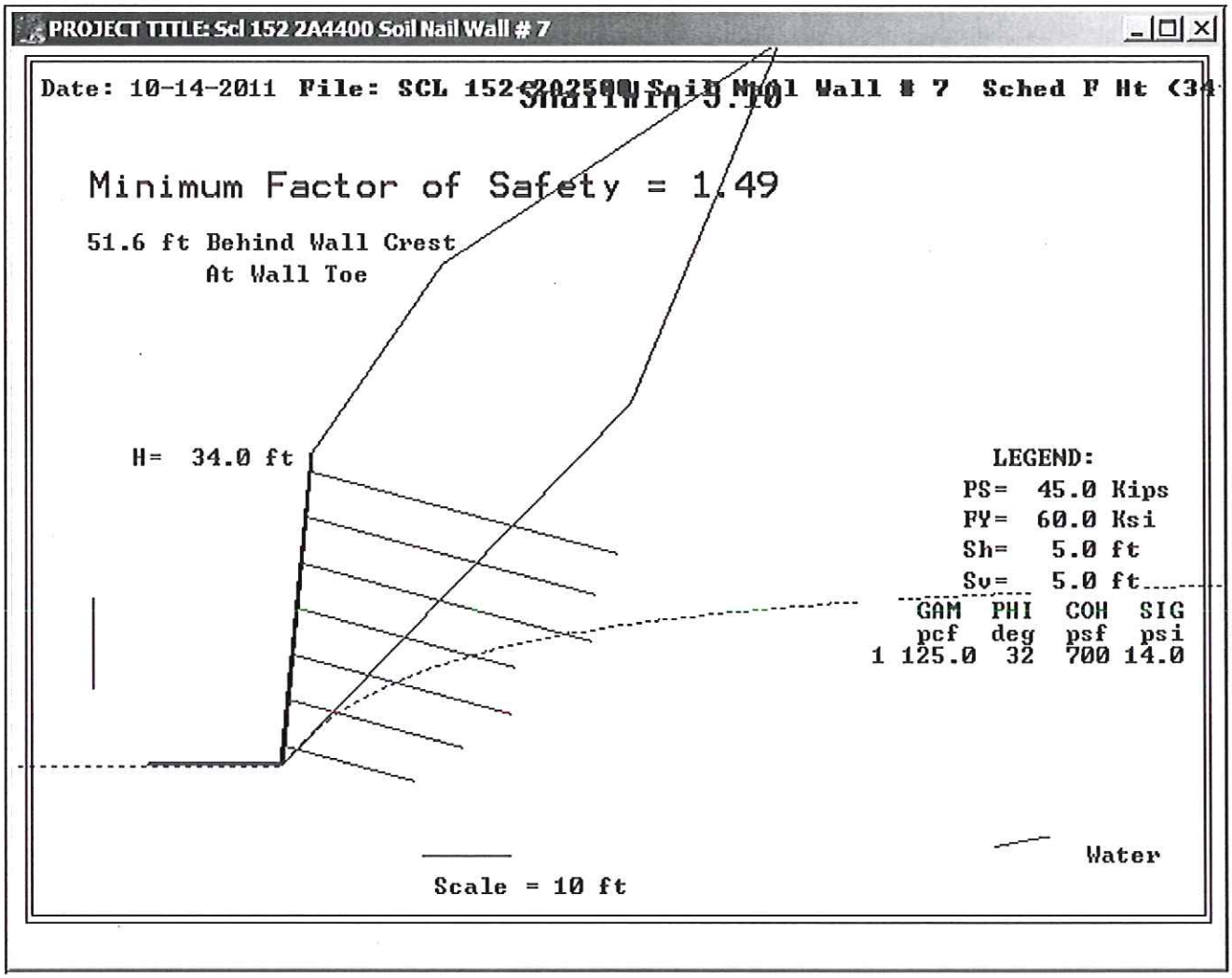
Reinf. Stress at Level 1 = 17.417 Ksi (Pullout controls...)
2 = 20.153 Ksi (Pullout controls...)
3 = 21.213 Ksi (Pullout controls...)
4 = 18.919 Ksi (Pullout controls...)
5 = 16.625 Ksi (Pullout controls...)
6 = 14.332 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 3 Sched E Ht (29')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE10					
1.460	55.0	43.9	53.4	66.0	40.5

Reinf. Stress at Level 1 = 16.159 Ksi (Pullout controls...)
2 = 19.254 Ksi (Pullout controls...)
3 = 20.637 Ksi (Pullout controls...)
4 = 18.595 Ksi (Pullout controls...)
5 = 16.554 Ksi (Pullout controls...)
6 = 14.513 Ksi (Pullout controls...)

```
*******************************************************************
*                 For Factor of Safety = 1.0                      *
*          Maximum Average Reinforcement Working Force:           *
*                      0.000 Kips/level                           *
*******************************************************************
```


PROJECT TITLE: Scl 152 2A4400 Soil Nail Wall # 7
Date: 10-14-2011 File: SCL 152 2A4400 Soil Nail Wall # 7 Sched F Ht (34
SnailWin 5.10
Minimum Factor of Safety = 1.49
51.6 ft Behind Wall Crest
At Wall Toe
H= 34.0 ft
LEGEND:
PS= 45.0 Kips
FY= 60.0 Ksi
Sh= 5.0 ft
Sv= 5.0 ft
GAM PHI COH SIG
pcf deg psf psi
1 125.0 32 700 14.0
Water
Scale = 10 ft

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

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**************************************************
*    CALIFORNIA DEPARTMENT OF TRANSPORTATION     *
*          ENGINEERING SERVICE CENTER            *
*     DIVISION OF MATERIALS AND FOUNDATIONS      *
*   Office of Roadway Geotechnical Engineering   *
*    Date: 10-14-2011          Time: 09:39:26    *
**************************************************
```

Project Identification - Scl 152 2A4400 Soil Nail Wall # 7

--------- WALL GEOMETRY ---------

Vertical Wall Height	=	34.0 ft	
Wall Batter	=	5.7 degree	
		Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	=	55.0	25.0
Second Slope from 1st slope.	=	33.0	200.0
Third Slope from 2nd slope.	=	0.0	0.0
Fourth Slope from 3rd slope.	=	0.0	0.0
Fifth Slope from 3rd slope.	=	0.0	0.0
Sixth Slope from 3rd slope.	=	0.0	0.0
Seventh Slope Angle.	=	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

There is NO SURCHARGE imposed on the system.

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	125.0	32.0	700.0	14.0	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

--------- WATER SURFACE ---------

The Water Table is defined by three coordinate points.

X(1)-Coordinate = 0.00 ft Y(1)-Coordinate = 0.00 ft
X(2)-Coordinate = 7.00 ft Y(2)-Coordinate = 6.00 ft
X(3)-Coordinate = 120.00 ft Y(3)-Coordinate = 20.00 ft

--------- SEARCH LIMIT ---------

The Search Limit is from 0.0 to 55.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels = 7
Horizontal Spacing = 5.0 ft
Yield Stress of Reinforcement = 60.0 ksi
Diameter of Grouted Hole = 6.0 in
Punching Shear = 45.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	35.0	15.0	2.0	1.27	1.00
2	33.0	15.0	5.0	1.27	1.00
3	33.0	15.0	5.0	1.27	1.00
4	25.0	15.0	5.0	1.27	1.00
5	25.0	15.0	5.0	1.27	1.00
6	20.0	15.0	5.0	1.27	1.00
7	15.0	15.0	5.0	1.27	1.00

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	3.916	8.6	0.0	3.4	82.9	41.7

Reinf. Stress at Level 1 = 11.756 Ksi (Punching Shear controls..)
2 = 11.678 ksi (Punching Shear controls..)
3 = 11.601 ksi (Punching Shear controls..)
4 = 11.523 ksi (Punching Shear controls..)
5 = 11.446 ksi (Punching Shear controls..)
6 = 10.470 Ksi (Pullout controls...)
7 = 7.356 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 2	3.318	13.7	30.6	9.6	82.9	44.2

Reinf. Stress at Level 1 = 17.067 Ksi (Punching Shear controls..)
2 = 16.971 ksi (Punching Shear controls..)
3 = 16.876 ksi (Punching Shear controls..)
4 = 12.761 Ksi (Pullout controls...)
5 = 12.857 Ksi (Pullout controls...)
6 = 9.185 Ksi (Pullout controls...)
7 = 9.595 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 3	3.003	18.9	47.7	22.4	84.4	38.8

Reinf. Stress at Level 1 = 17.870 Ksi (Pullout controls...)
2 = 16.196 Ksi (Pullout controls...)
3 = 16.187 Ksi (Pullout controls...)
4 = 11.253 Ksi (Pullout controls...)
5 = 14.064 Ksi (Pullout controls...)
6 = 12.713 Ksi (Pullout controls...)
7 = 11.362 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 4					
2.521	24.0	46.2	24.3	80.0	41.6

Reinf. Stress at Level 1 = 18.851 Ksi (Pullout controls...)
2 = 17.241 Ksi (Pullout controls...)
3 = 17.614 Ksi (Pullout controls...)
4 = 12.875 Ksi (Pullout controls...)
5 = 16.378 Ksi (Pullout controls...)
6 = 14.924 Ksi (Pullout controls...)
7 = 13.470 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 5					
2.037	29.2	64.8	68.5	89.9	0.0

Reinf. Stress at Level 1 = 29.449 Ksi (Yield Stress controls.)
2 = 28.753 ksi (Punching Shear controls..)
3 = 26.658 ksi (Punching Shear controls..)
4 = 23.548 Ksi (Pullout controls...)
5 = 22.466 ksi (Punching Shear controls..)
6 = 20.370 ksi (Punching Shear controls..)
7 = 17.566 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 6					
1.720	34.4	43.5	28.4	73.3	47.7

Reinf. Stress at Level 1 = 21.408 Ksi (Pullout controls...)
2 = 19.900 Ksi (Pullout controls...)
3 = 23.355 Ksi (Pullout controls...)
4 = 17.321 Ksi (Pullout controls...)
5 = 22.911 Ksi (Pullout controls...)
6 = 21.236 Ksi (Pullout controls...)
7 = 19.561 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 7					
1.646	39.5	51.1	44.1	70.9	36.3

Reinf. Stress at Level 1 = 23.934 Ksi (Pullout controls...)
2 = 25.463 Ksi (Pullout controls...)
3 = 30.031 Ksi (Pullout controls...)
4 = 22.446 Ksi (Pullout controls...)
5 = 27.014 Ksi (Pullout controls...)
6 = 23.986 Ksi (Pullout controls...)
7 = 20.959 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 8					
1.558	44.7	44.0	31.1	66.1	55.1

Reinf. Stress at Level 1 = 20.877 Ksi (Pullout controls...)
2 = 20.218 Ksi (Pullout controls...)
3 = 26.197 Ksi (Pullout controls...)
4 = 19.441 Ksi (Pullout controls...)
5 = 25.518 Ksi (Pullout controls...)
6 = 23.575 Ksi (Pullout controls...)
7 = 21.631 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 9					
1.529	49.8	47.2	51.3	68.3	40.5

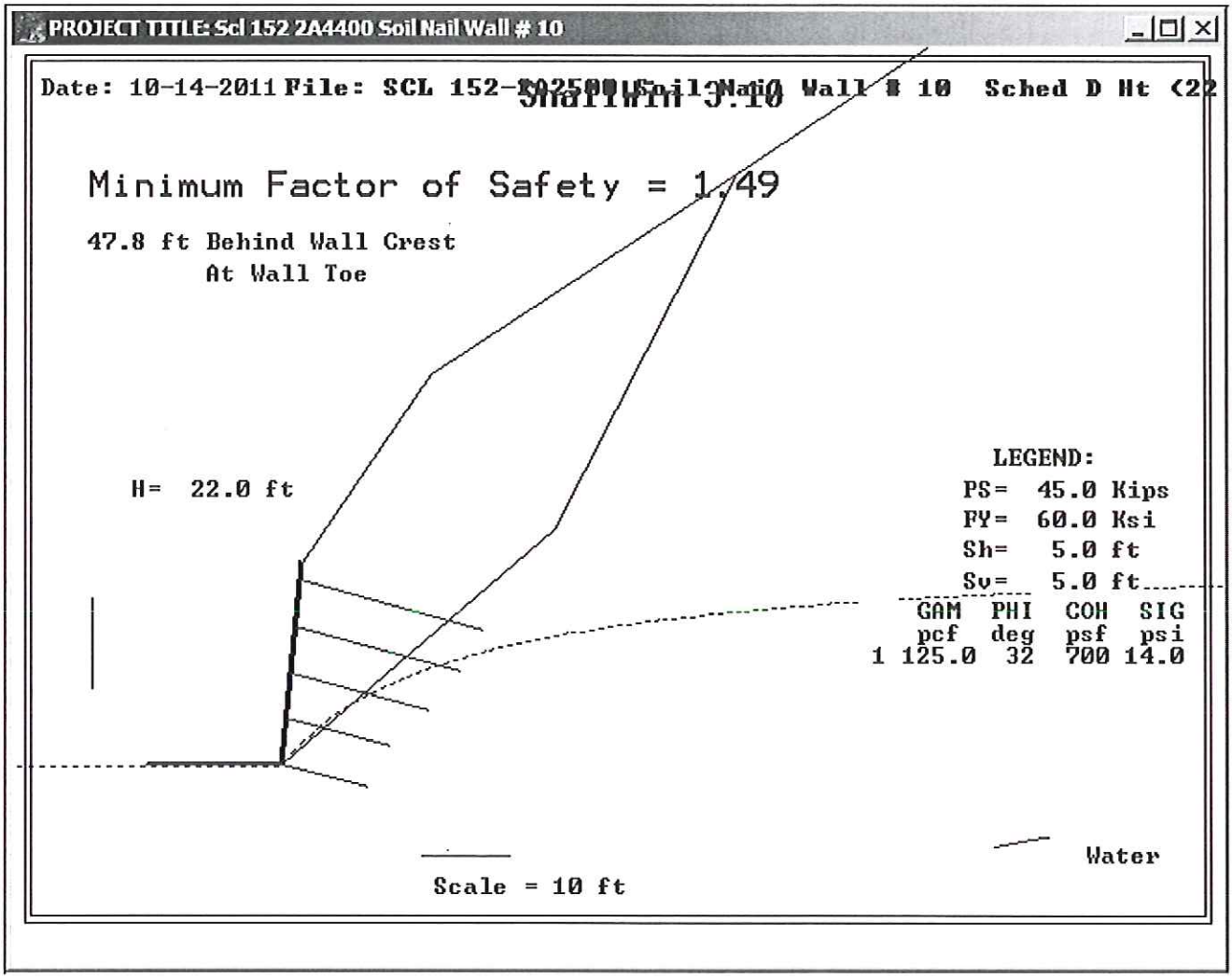
Reinf. Stress at Level 1 = 21.362 Ksi (Pullout controls...)
2 = 23.696 Ksi (Pullout controls...)
3 = 29.300 Ksi (Pullout controls...)
4 = 21.824 Ksi (Pullout controls...)
5 = 27.428 Ksi (Pullout controls...)
6 = 24.856 Ksi (Pullout controls...)
7 = 22.285 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 7 Sched F Ht (34')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE10					
1.490	55.0	45.6	55.0	67.2	42.7

Reinf. Stress at Level 1 = 20.020 Ksi (Pullout controls...)
2 = 22.711 Ksi (Pullout controls...)
3 = 28.757 Ksi (Pullout controls...)
4 = 21.382 Ksi (Pullout controls...)
5 = 27.429 Ksi (Pullout controls...)
6 = 25.087 Ksi (Pullout controls...)
7 = 22.745 Ksi (Pullout controls...)

```
*******************************************************************
*                 For Factor of Safety = 1.0                      *
*          Maximum Average Reinforcement Working Force:           *
*                      0.000 Kips/level                           *
*******************************************************************
```


PROJECT TITLE: Scl 152 2A4400 Soil Nail Wall # 10
Date: 10-14-2011 File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht <22
Shallwin 3.10
Minimum Factor of Safety = 1.49
47.8 ft Behind Wall Crest
At Wall Toe
H= 22.0 ft
LEGEND:
PS= 45.0 Kips
FY= 60.0 Ksi
Sh= 5.0 ft
Sv= 5.0 ft
GAM PHI COH SIG
pcf deg psf psi
1 125.0 32 700 14.0
Water
Scale = 10 ft

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

```
**************************************************
*    CALIFORNIA DEPARTMENT OF TRANSPORTATION     *
*          ENGINEERING SERVICE CENTER            *
*     DIVISION OF MATERIALS AND FOUNDATIONS      *
*   Office of Roadway Geotechnical Engineering   *
*    Date: 10-14-2011          Time: 09:40:25    *
**************************************************
```

Project Identification - Scl 152 2A4400 Soil Nail Wall # 10

--------- WALL GEOMETRY ---------

Vertical Wall Height	=	22.0 ft	
Wall Batter	=	5.7 degree	
		Angle (Deg)	Length (Feet)
First Slope from Wallcrest.	=	55.0	25.0
Second Slope from 1st slope.	=	33.0	200.0
Third Slope from 2nd slope.	=	0.0	0.0
Fourth Slope from 3rd slope.	=	0.0	0.0
Fifth Slope from 3rd slope.	=	0.0	0.0
Sixth Slope from 3rd slope.	=	0.0	0.0
Seventh Slope Angle.	=	0.0	

--------- SLOPE BELOW THE WALL ---------

There is NO SLOPE BELOW THE TOE of the wall

--------- SURCHARGE ---------

There is NO SURCHARGE imposed on the system.

--------- OPTION #1 ---------

Ultimate Punching shear, Bond & Yield Stress are used.

--------- SOIL PARAMETERS ---------

Soil Layer	Unit Weight (Pcf)	Friction Angle (Degree)	Cohesion Intercept (Psf)	Bond* Stress (Psi)	Coordinates of Boundary XS1 (ft)	YS1 (ft)	XS2 (ft)	YS2 (ft)
1	125.0	32.0	700.0	14.0	0.0	0.0	0.0	0.0

* Ultimate bond Stress values also depend on BSF (Bond Stress Factor.)

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

--------- WATER SURFACE ---------

The Water Table is defined by three coordinate points.

X(1)-Coordinate = 0.00 ft Y(1)-Coordinate = 0.00 ft
X(2)-Coordinate = 7.00 ft Y(2)-Coordinate = 6.00 ft
X(3)-Coordinate = 120.00 ft Y(3)-Coordinate = 20.00 ft

--------- SEARCH LIMIT ---------

The Search Limit is from 0.0 to 50.0 ft

You have chosen NOT TO LIMIT the search of failure planes to specific nodes.

--------- REINFORCEMENT PARAMETERS ---------

Number of Reinforcement Levels	=	5
Horizontal Spacing	=	5.0 ft
Yield Stress of Reinforcement	=	60.0 ksi
Diameter of Grouted Hole	=	6.0 in
Punching Shear	=	45.0 kips

---------- (Varying Reinforcement Parameters) ---------

Level	Length (ft)	Inclination (degrees)	Vertical Spacing (ft)	Bar Diameter (in)	Bond Stress Factor
1	21.0	15.0	2.0	1.00	1.00
2	19.0	15.0	5.0	1.00	1.00
3	16.0	15.0	5.0	1.00	1.00
4	12.0	15.0	5.0	1.00	1.00
5	10.0	15.0	5.0	1.00	1.00

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
Toe	3.742	7.0	39.6	4.5	82.3	26.2

Reinf. Stress at Level 1 = 16.034 Ksi (Yield Stress controls.)
2 = 16.034 Ksi (Yield Stress controls.)
3 = 13.528 Ksi (Pullout controls...)
4 = 9.405 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 2	2.951	11.8	40.9	10.9	83.0	28.7

Reinf. Stress at Level 1 = 17.978 Ksi (Pullout controls...)
2 = 15.409 Ksi (Pullout controls...)
3 = 11.473 Ksi (Pullout controls...)
4 = 10.700 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 3	2.748	16.5	36.3	14.4	81.7	34.3

Reinf. Stress at Level 1 = 14.354 Ksi (Pullout controls...)
2 = 11.757 Ksi (Pullout controls...)
3 = 9.426 Ksi (Pullout controls...)
4 = 10.582 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 4					
2.180	21.3	35.5	15.7	76.8	37.5

Reinf. Stress at Level 1 = 14.808 Ksi (Pullout controls...)
2 = 12.316 Ksi (Pullout controls...)
3 = 11.460 Ksi (Pullout controls...)
4 = 13.130 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 5					
1.884	26.1	36.7	16.3	71.5	41.1

Reinf. Stress at Level 1 = 15.482 Ksi (Pullout controls...)
2 = 13.592 Ksi (Pullout controls...)
3 = 14.024 Ksi (Pullout controls...)
4 = 15.572 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 6					
1.722	30.9	33.9	18.6	69.6	44.2

Reinf. Stress at Level 1 = 11.624 Ksi (Pullout controls...)
2 = 9.948 Ksi (Pullout controls...)
3 = 13.374 Ksi (Pullout controls...)
4 = 16.053 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 7	1.616	35.7	37.6	18.0	64.0	48.9

Reinf. Stress at Level 1 = 14.326 Ksi (Pullout controls...)
2 = 13.761 Ksi (Pullout controls...)
3 = 16.940 Ksi (Pullout controls...)
4 = 18.450 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 8	1.555	40.4	45.7	40.5	67.3	31.4

Reinf. Stress at Level 1 = 17.160 Ksi (Pullout controls...)
2 = 21.297 Ksi (Pullout controls...)
3 = 22.842 Ksi (Pullout controls...)
4 = 21.793 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE 9	1.518	45.2	44.0	44.0	66.1	33.4

Reinf. Stress at Level 1 = 15.483 Ksi (Pullout controls...)
2 = 20.247 Ksi (Pullout controls...)
3 = 22.355 Ksi (Pullout controls...)
4 = 21.805 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

File: SCL 152-2A2500 Soil Nail Wall # 10 Sched D Ht (22')

	MINIMUM SAFETY FACTOR	DISTANCE BEHIND WALL TOE (ft)	LOWER FAILURE PLANE ANGLE (deg)	LOWER FAILURE PLANE LENGTH (ft)	UPPER FAILURE PLANE ANGLE (deg)	UPPER FAILURE PLANE LENGTH (ft)
NODE10	1.492	50.0	40.6	39.5	62.6	43.4

Reinf. Stress at Level 1 = 11.230 Ksi (Pullout controls...)
2 = 17.208 Ksi (Pullout controls...)
3 = 20.483 Ksi (Pullout controls...)
4 = 21.055 Ksi (Pullout controls...)
5 = 0.000 Ksi (Pullout controls...)

```
*****************************************************************
*                For Factor of Safety = 1.0                     *
*         Maximum Average Reinforcement Working Force:          *
*                     0.000 Kips/level                          *
*****************************************************************
```

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

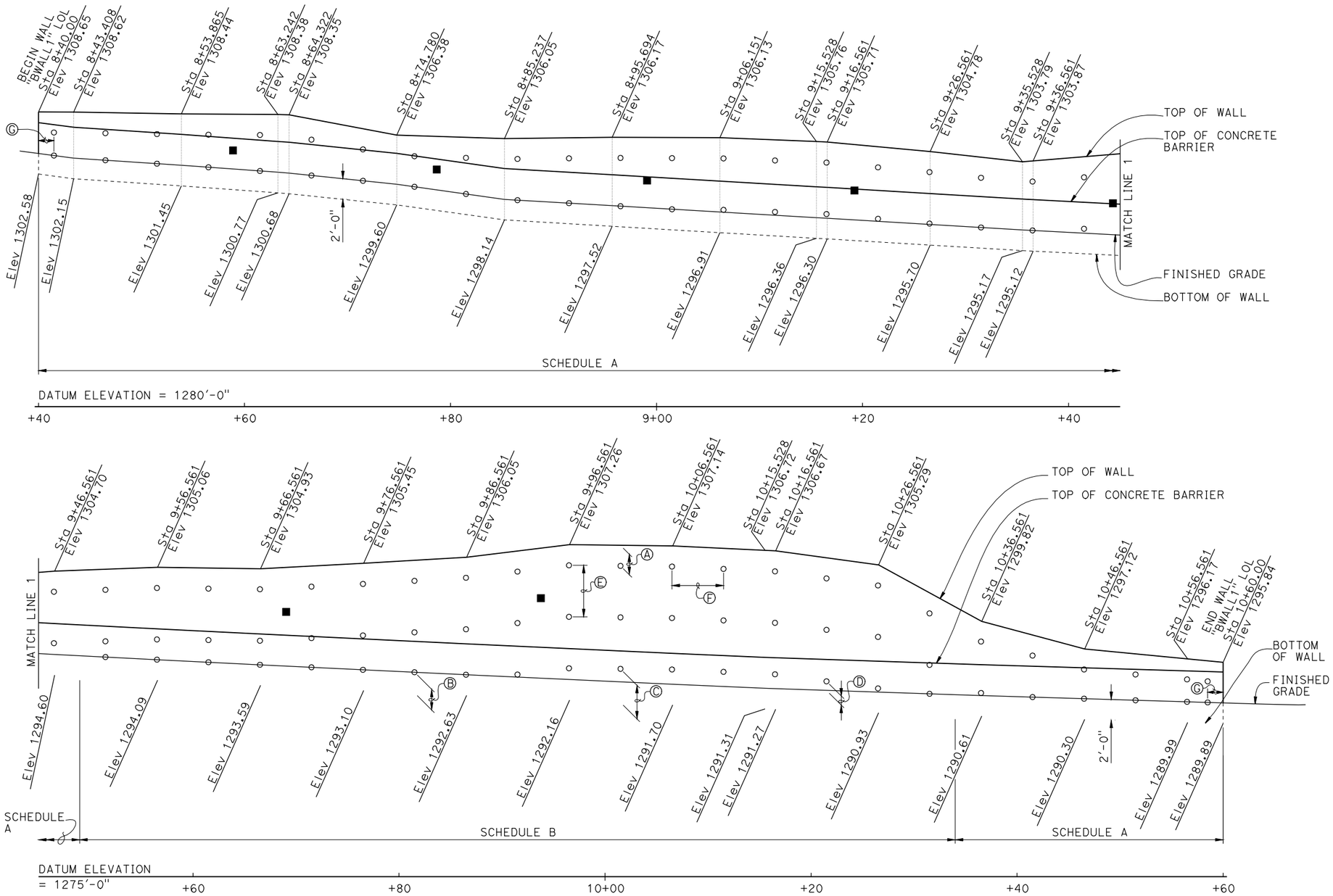
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	15	12	10



DEVELOPED ELEVATION

3/16" = 1'-0"

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2'-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2'-0", SB1 (Max) < 3'-6".

Ⓒ SB_2 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB2 (Max) < 3'-6"

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1'-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1'-6", SV (Max) = 5'-0".

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1'-6", SH (Max) = 5'-0".

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1'-6", SS (Max) = 2'-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 1

STRUCTURE ELEVATION

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 06-06-11 02-28-12 02-09-12 SHEET 4 OF X

FILE => 37-retw01-f-strucelv.dgn

USERNAME => s134055 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 10:09

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

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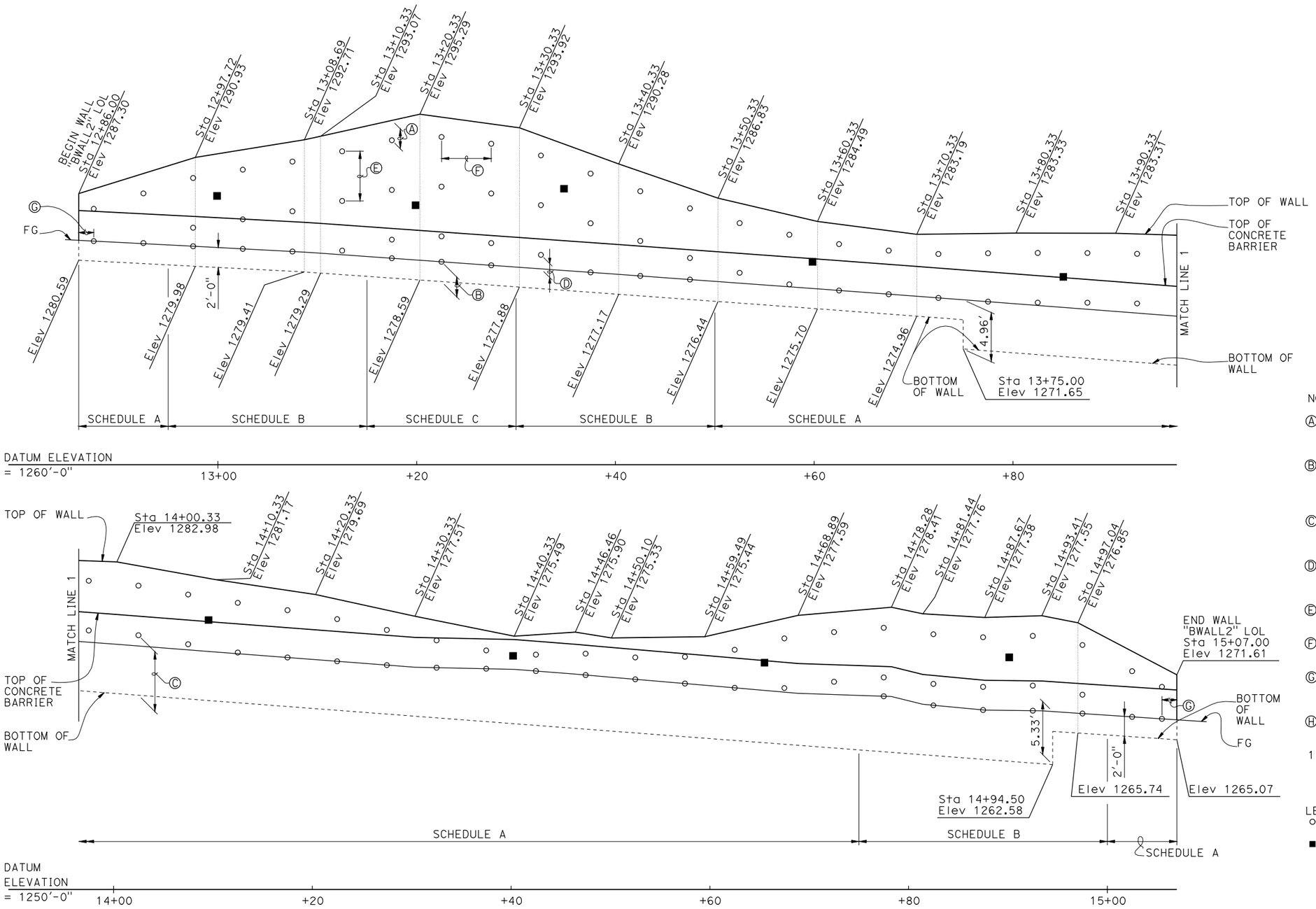

DEVELOPED ELEVATION

3/16" = 1'-0"

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	15	12	10

SCHEDULE C	BAR SIZE: #7			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (FT)	17	15	12	10

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2'-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2'-0", SB1 (Max) < 3'-6".

Ⓒ SB_2 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB2 (Min) > 3'-0", SB2 (Max) = 6'-8".

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1'-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1'-6", SV (Max) = 5'-0".

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1'-6", SH (Max) = 5'-0".

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1'-6", SS (Max) = 2'-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 2

STRUCTURE ELEVATION

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 05-26-11 02-28-12 02-29-12

SHEET 4 OF X

FILE => 37-retw2-f-strucelv.dgn

USERNAME => s134055 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 11:11

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

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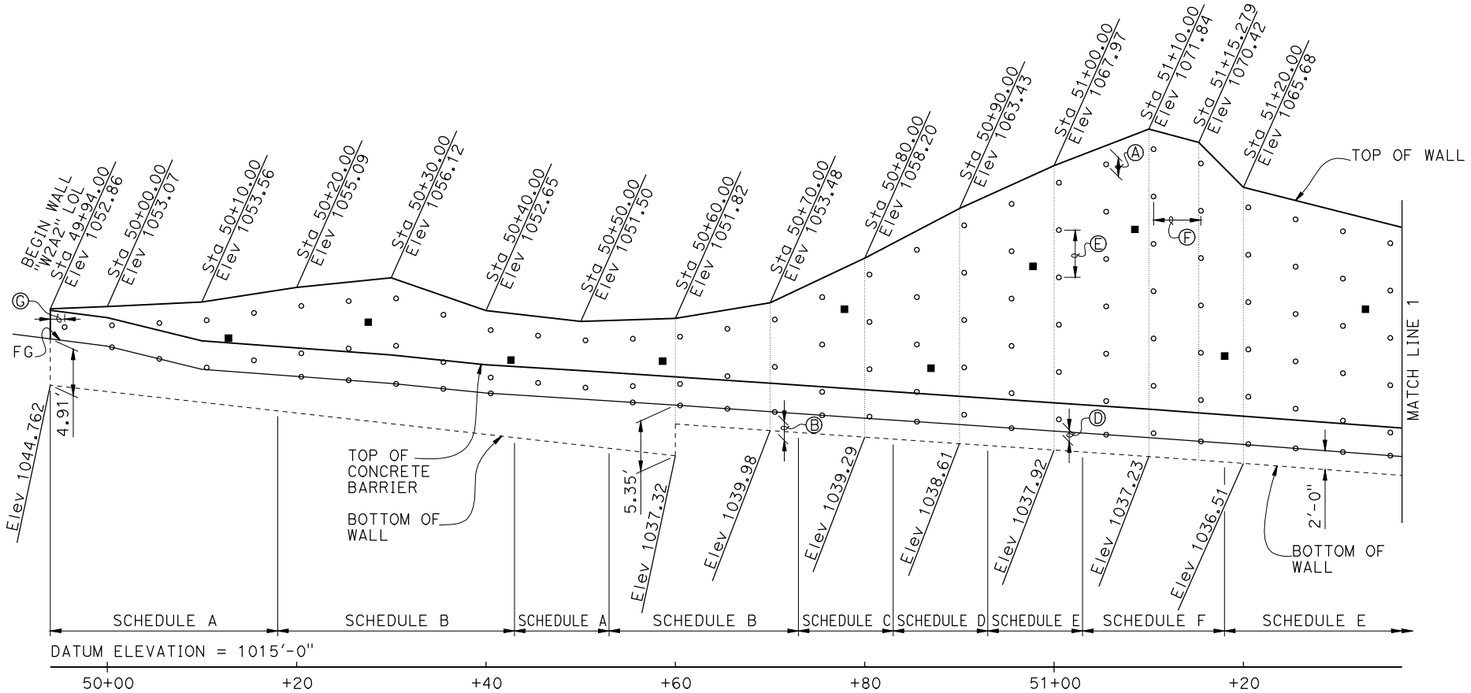

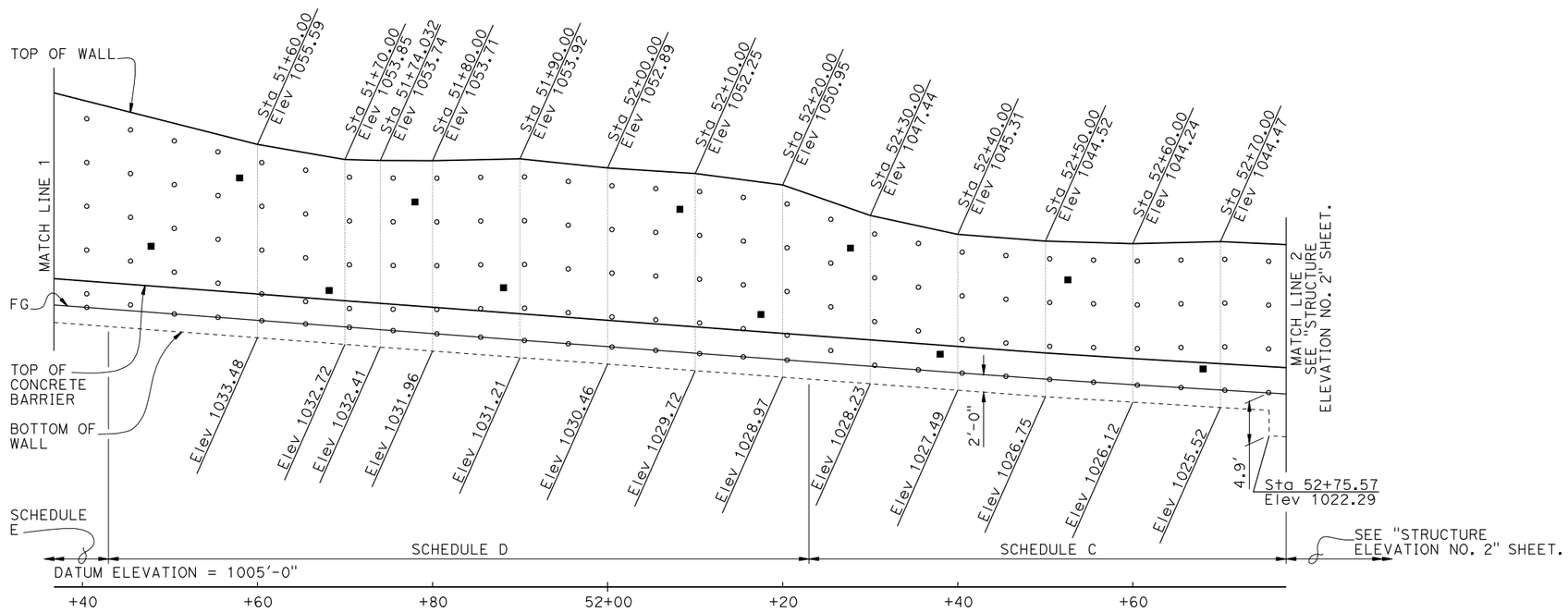

DEVELOPED ELEVATION

1/8" = 1'-0"

SCHEDULE D	BAR SIZE: #8				
NO. OF SOIL NAIL ROWS	5				
ROW NO. TOP TO BOTTOM	1	2	3	4	5
EMBEDMENT LENGTH (FT)	24	19	15	12	10

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE E	BAR SIZE: #9					
NO. OF SOIL NAIL ROWS	6					
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6
EMBEDMENT LENGTH (FT)	30	30	25	20	15	10

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	15	12	10

SCHEDULE F	BAR SIZE: #9						
NO. OF SOIL NAIL ROWS	7						
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6	7
EMBEDMENT LENGTH (FT)	37	33	30	25	20	15	10

SCHEDULE C	BAR SIZE: #7			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (FT)	17	15	12	10

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2'-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2'-0", SB1 (Max) < 3'-6".

Ⓒ SB_2 = Vertical distance from finished grade to bottom level of the soil nail assemblies, SB2 = 1'-6"

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1'-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1'-6", SV (Max) = 5'-0".

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1'-6", SH (Max) = 5'-0".

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1'-6", SS (Max) = 2'-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

DESIGN	BY S. Hegazi	CHECKED R. Amir	
DETAILS	BY T. Kusumi	CHECKED S. Hegazi / R. Amir	
QUANTITIES	BY R. Amir	CHECKED S. Hegazi	

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 3

STRUCTURE ELEVATION NO. 1

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 07-06-11 02-28-12 03-02-12

SHEET 4 OF X

FILE => 37-retw3-f-structelv01.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:33

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

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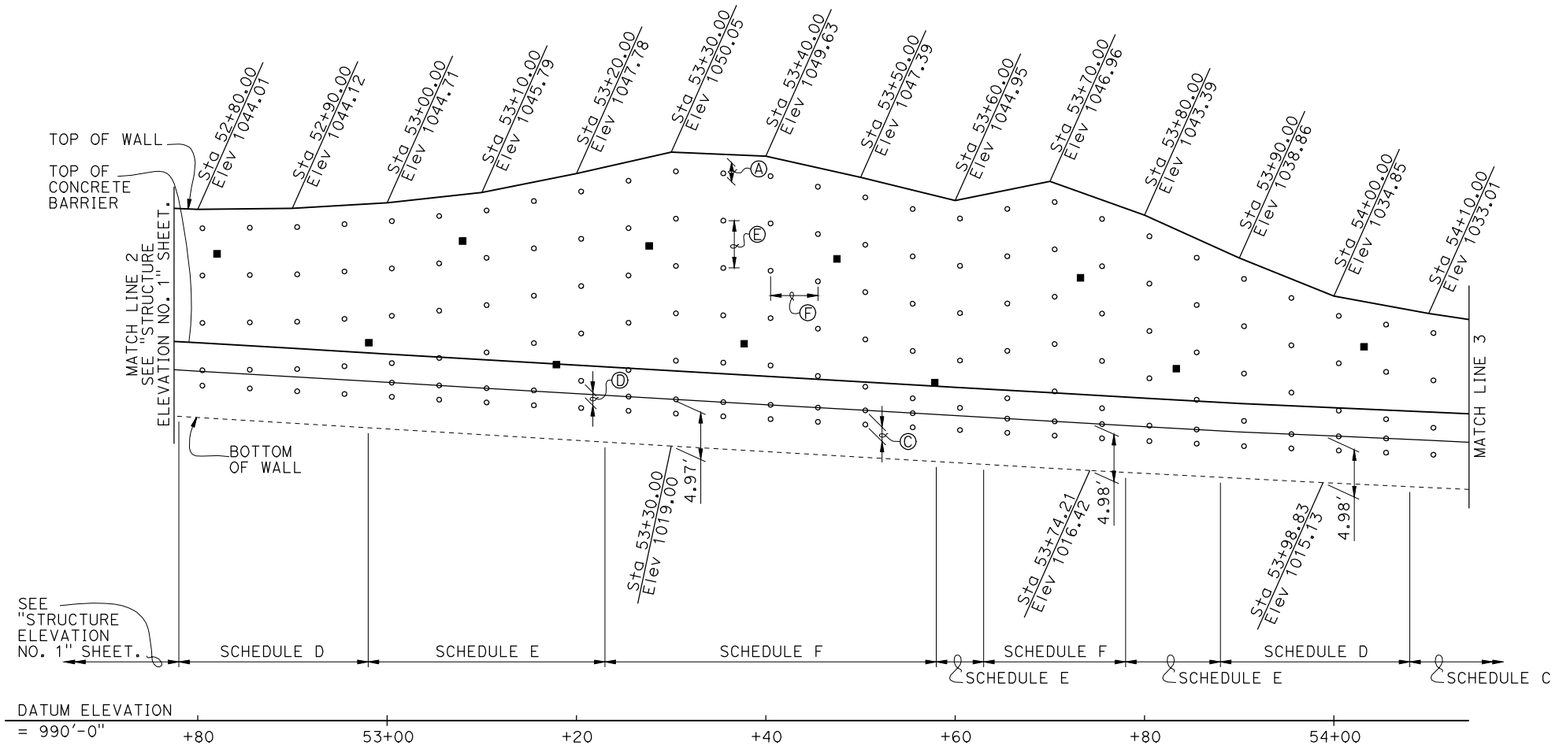

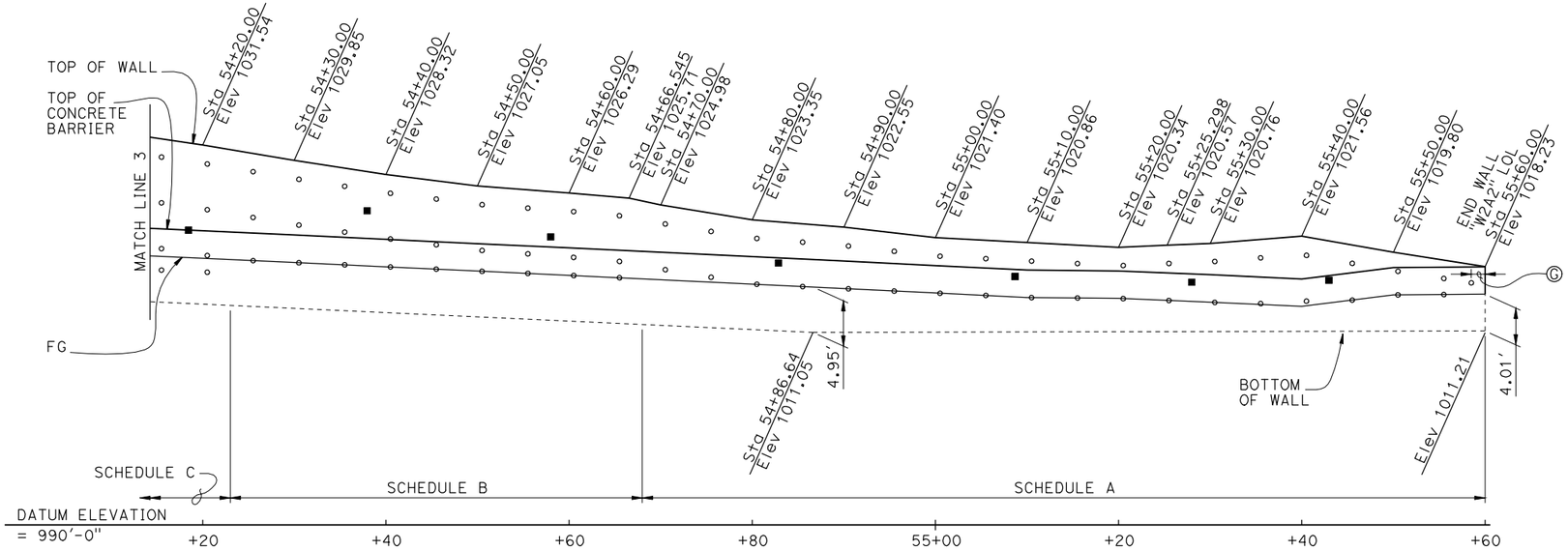

DEVELOPED ELEVATION

1/8" = 1'-0"

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	S. Hegazi / R. Amir
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 3

STRUCTURE ELEVATION NO. 2

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 07-01-11 02-02-12 12-05-11

SHEET 5 OF X

FILE => 37-retw3-f-strucelv02.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:33

SCHEDULE A	BAR SIZE #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (ft)	10	10

SCHEDULE B	BAR SIZE #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (ft)	15	12	10

SCHEDULE C	BAR SIZE #7			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (ft)	17	15	12	10

SCHEDULE D	BAR SIZE #7				
NO. OF SOIL NAIL ROWS	5				
ROW NO. TOP TO BOTTOM	1	2	3	4	5
EMBEDMENT LENGTH (ft)	17	15	12	10	10

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 09-30-2013 CIVIL STATE OF CALIFORNIA

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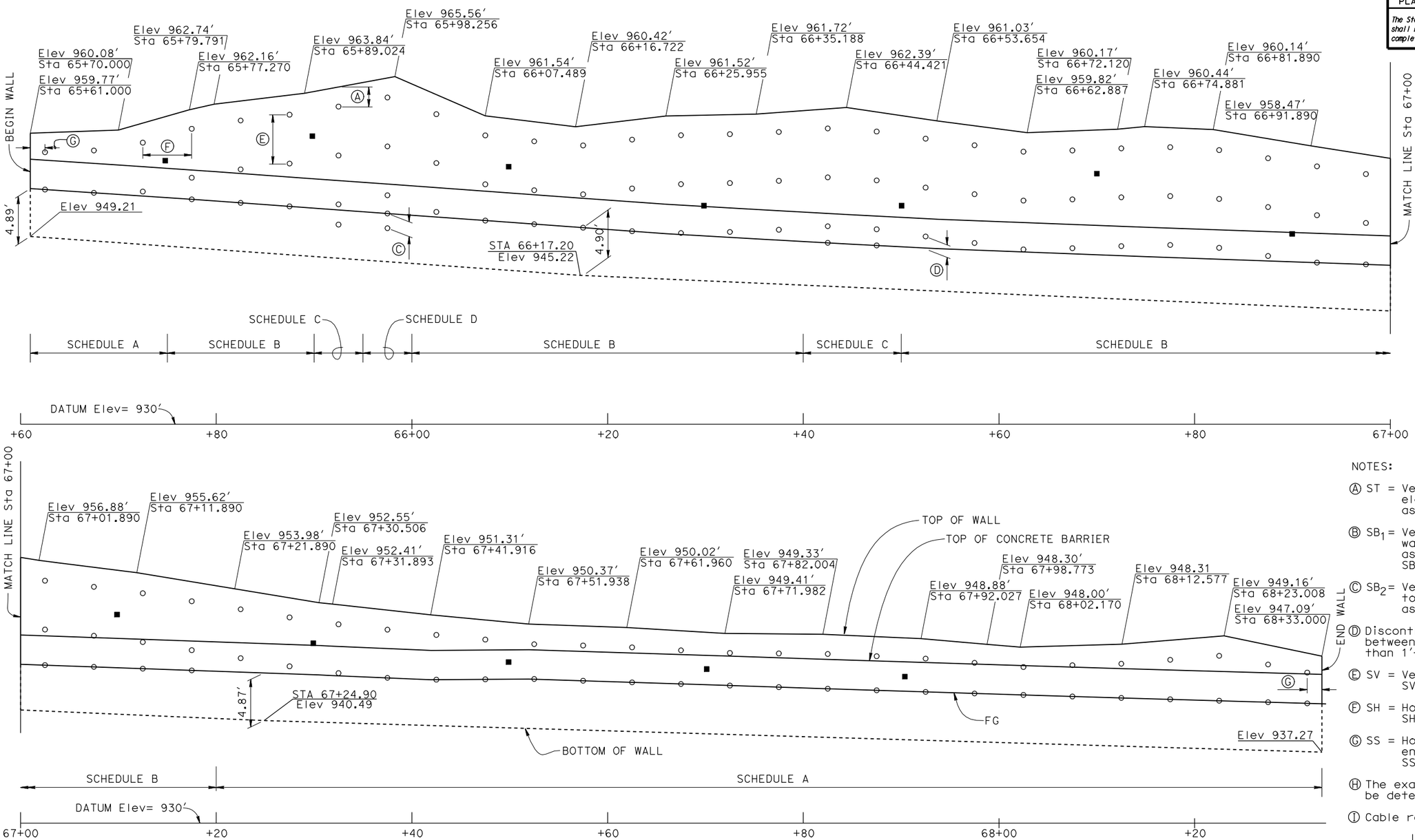

DEVELOPED ELEVATION

3/16"=1

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2′-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2′-0", SB1 (Max) = 3′-0".

Ⓒ SB_2 = Vertical distance from finished grade to bottom level of the soil nail assemblies, SB2 (Max) = 1′-6".

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1′-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1′-6", SV (Max) = 5′-0".

Ⓕ SH = Horizontal spacing of soil nail assemblies SH (Min) = 1′-6", SH (Max) = 5′-0".

Ⓖ SS = Horizontal distance between the begin / end wall and first/last soil nail assembly SS (Min) = 1′-6", SS (Max) = 2′-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

Ⓘ Cable railing posts are not shown for clarity.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

DESIGN	BY Sameh Hegazi	CHECKED Rangina Amir	
DETAILS	BY Antonio Carreon	CHECKED S Hegazi/R Amir	
QUANTITIES	BY Rangina Amir	CHECKED Sameh Hegazi	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 8

BRIDGE NO. X
POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 4
STRUCTURE ELEVATION

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 01-31-12 02-06-12 02-29-12

SHEET 4 OF X

FILE => 37-heckers4-c-se.dgn

USERNAME => s133975 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 08:54

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

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SCHEDULE D	BAR SIZE: #8				
NO. OF SOIL NAIL ROWS	5				
ROW NO. TOP TO BOTTOM	1	2	3	4	5
EMBEDMENT LENGTH (FT)	24	19	15	12	10

SCHEDULE E	BAR SIZE: #9					
NO. OF SOIL NAIL ROWS	6					
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6
EMBEDMENT LENGTH (FT)	30	30	25	20	15	10

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE F	BAR SIZE: #9						
NO. OF SOIL NAIL ROWS	7						
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6	7
EMBEDMENT LENGTH (FT)	37	33	33	25	25	20	15

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	15	12	10

SCHEDULE G	BAR SIZE: #9							
NO. OF SOIL NAIL ROWS	8							
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6	7	8
EMBEDMENT LENGTH (FT)	37	33	33	25	25	20	15	10

SCHEDULE C	BAR SIZE: #7			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (FT)	17	15	12	10

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2'-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2'-0", SB1 (Max) = 3'-6".

Ⓒ SB_2 = Vertical distance from finished grade to bottom level of the soil nail assemblies, SB2 (Max) = 1'-6".

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1'-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1'-6", SV (Max) = 5'-0".

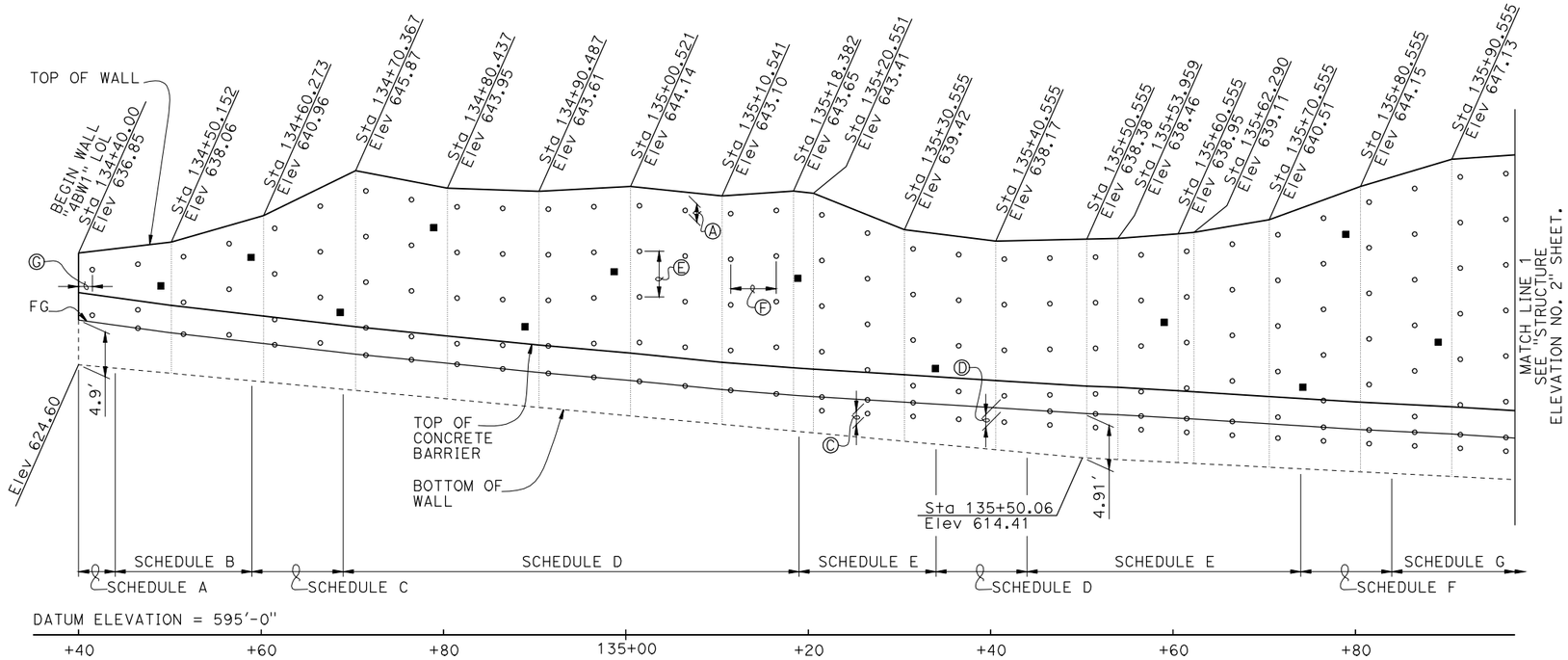
Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1'-6", SH (Max) = 5'-0".

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1'-6", SS (Max) = 2'-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails



DEVELOPED ELEVATION

1/8" = 1'-0"

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 8

BRIDGE NO. X
POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 7
STRUCTURE ELEVATION NO. 1

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 07-06-11 03-02-12 02-21-12

SHEET 4 OF X

FILE => 37-retw7-f-strucelv01.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:23

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Sameh Hegazi
No. C64899
Exp. 06-30-2013
CIVIL
STATE OF CALIFORNIA

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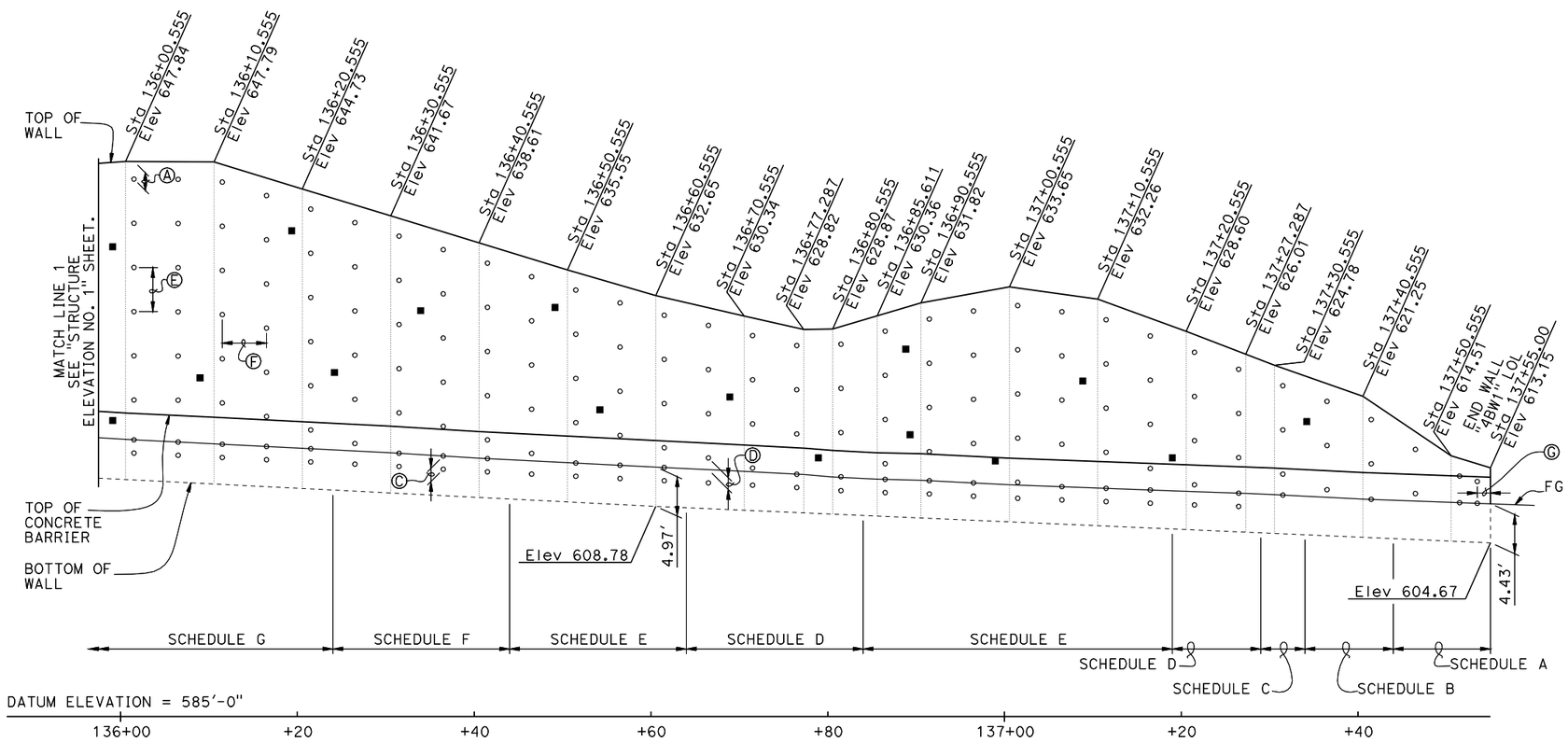


DEVELOPED ELEVATION

1/8" = 1'-0"

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

DESIGN	BY S. Hegazi	CHECKED R. Amir	
DETAILS	BY T. Kusumi	CHECKED R. Amir / S. Hegazi	
QUANTITIES	BY R. Amir	CHECKED S. Hegazi	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 8

BRIDGE NO. X
POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 7
STRUCTURE ELEVATION NO. 2

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 07-06-11 09-18-11 02-02-12

SHEET 5 OF X

FILE => 37-retw7-f-structelv02.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:23

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 09-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

LEGEND:

○ Indicates approximate location of soil nail assemblies.

■ Indicates approximate location of proof test nails

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2′-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB (min) = 2′-0" SB (max) = 3′-0"

Ⓒ SB_2 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB_2 (Min)> 3′-6"

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1′-6"

Ⓔ SV = Vertical spacing of soil nail assemblies SV (min) = 1′-6" SV (max) = 5′-0"

Ⓕ SH = Horizontal spacing of soil nail assemblies SH (min) = 1′-6" SH (max) = 5′-0"

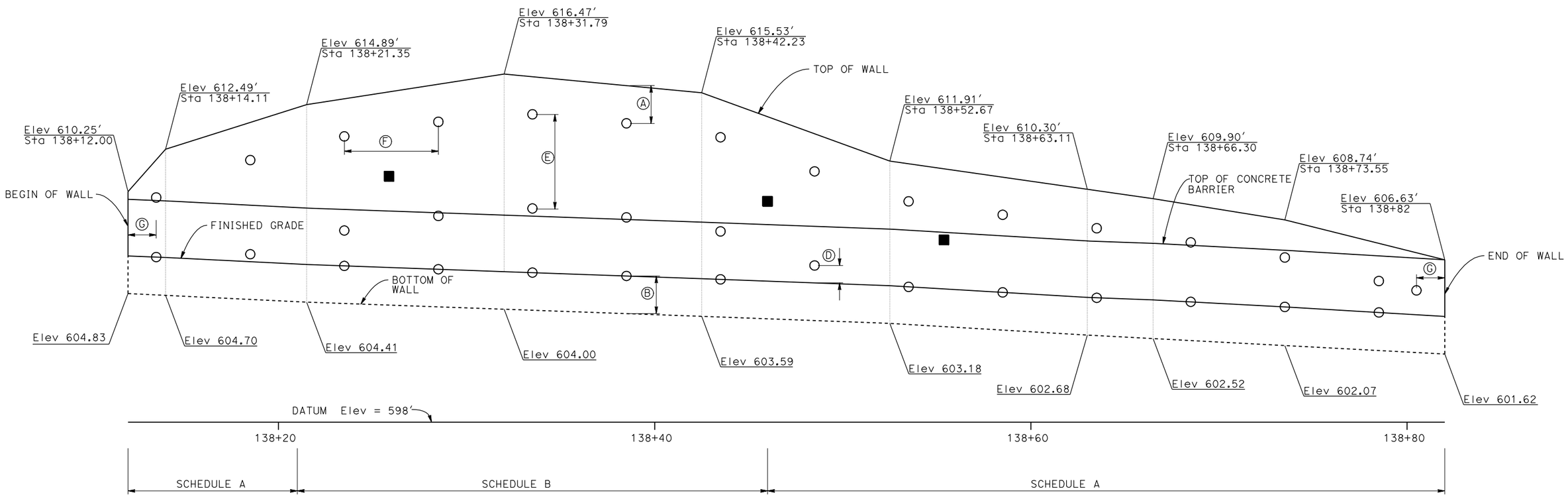
Ⓖ SS = Horizontal distance between the begining / end of wall and first / last soil nail assemblies, SS (min) = 1′-6" SS (max) = 2′-6"

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

Ⓘ Cable railing posts are not shown for clarity.

NAIL SCHEDULE "A"	BAR SIZE #7	
No. OF NAIL ROWS	2	
ROW No.TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (ft)	10	10

NAIL SCHEDULE "B"	BAR SIZE #7		
No. OF NAIL ROWS	3		
ROW No.TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (ft)	12	10	10



DEVELOPED ELEVATION

3/8" = 1′

DESIGN	BY Sameh Hegazi	CHECKED Rangina Amir	
DETAILS	BY Antonio Carreon	CHECKED S Hegazi/R Amir	
QUANTITIES	BY Rangina Amir	CHECKED Sameh Hegazi	

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO.8

STRUCTURE ELEVATION

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593

PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 02-08-12 02-29-12 01-31-12

SHEET 4 OF X

FILE => 37-heckers8-d-se.dgn

USERNAME => s133975 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 08:59

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

SCHEDULE D	BAR SIZE: #8				
NO. OF SOIL NAIL ROWS	5				
ROW NO. TOP TO BOTTOM	1	2	3	4	5
EMBEDMENT LENGTH (FT)	24	24	19	15	10

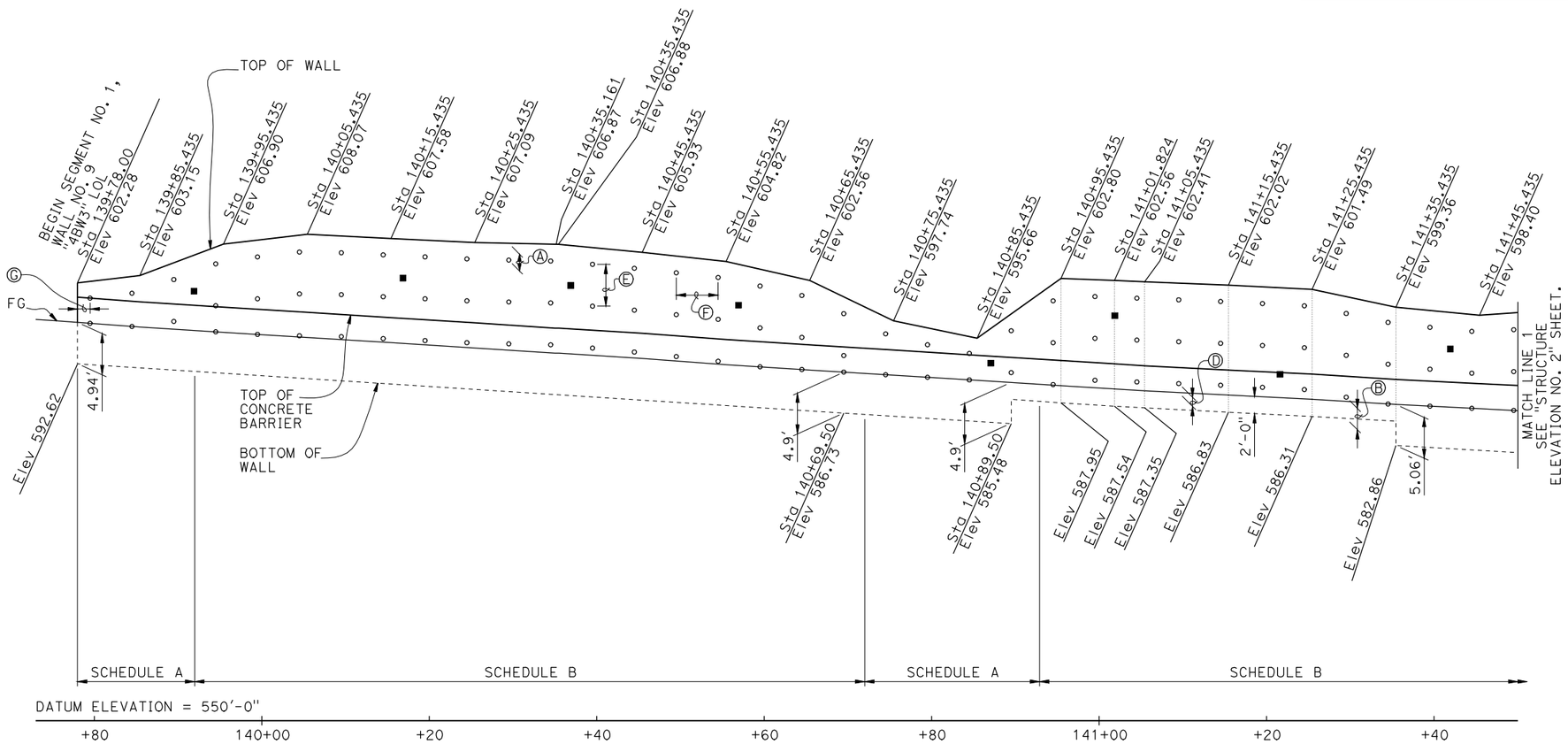
SCHEDULE E	BAR SIZE: #9					
NO. OF SOIL NAIL ROWS	6					
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6
EMBEDMENT LENGTH (FT)	30	30	30	25	20	15

SCHEDULE F	BAR SIZE: #9						
NO. OF SOIL NAIL ROWS	7						
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6	7
EMBEDMENT LENGTH (FT)	37	33	33	25	25	20	15

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	15	12	10

SCHEDULE C	BAR SIZE: #8			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (FT)	19	15	12	10



DEVELOPED ELEVATION

1/8" = 1'-0"

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2'-0"

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2'-0", SB1 (Max) < 3'-6".

Ⓒ SB_2 = Vertical distance from finish grade to bottom level of the soil nail assemblies, SB2 (Min) = 1'-6".

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1'-6".

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1'-6", SV (Max) = 5'-0".

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1'-6", SH (Max) = 5'-0".

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1'-6", SS (Max) = 2'-6".

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 9

STRUCTURE ELEVATION NO. 1

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 10-14-11 02-27-12 03-02-12

SHEET 5 OF X

FILE => 37-retw9-f-structelv01.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:42

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

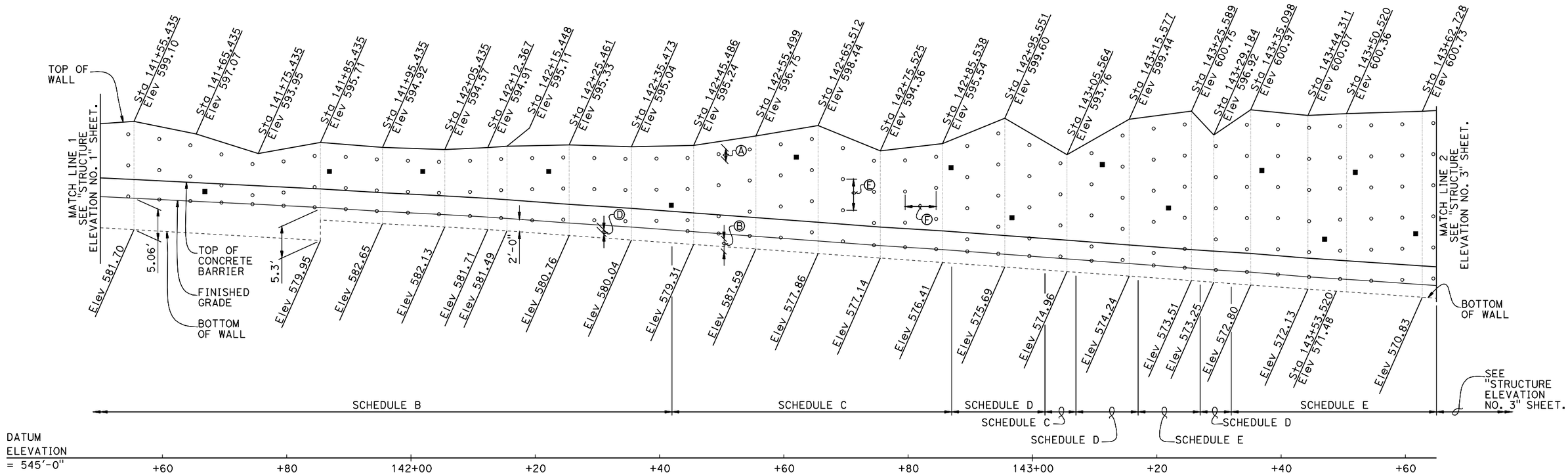
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails



DEVELOPED ELEVATION

1/8" = 1'-0"

DESIGN	BY S. Hegazi	CHECKED R. Amir	
DETAILS	BY T. Kusumi	CHECKED R. Amir / S. Hegazi	
QUANTITIES	BY R. Amir	CHECKED S. Hegazi	

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 9

STRUCTURE ELEVATION NO. 2

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593

PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 10-14-11 11-23-11 02-02-12

SHEET 6 OF X

FILE => 37-retw9-f-structelv02.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:43

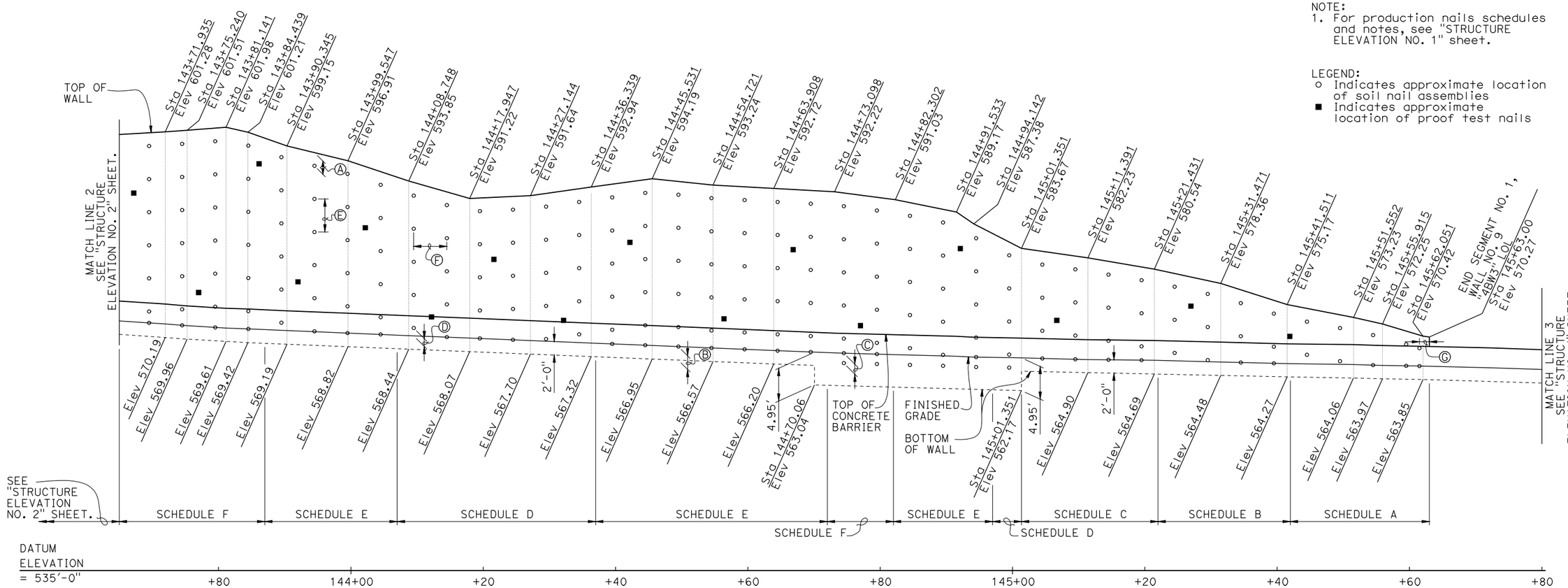
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



DEVELOPED ELEVATION

1/8" = 1'-0"

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 9

STRUCTURE ELEVATION NO. 3

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 10-14-11 11-23-11

SHEET 7 OF X

FILE => 37-retw9-f-structelv03.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:43

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

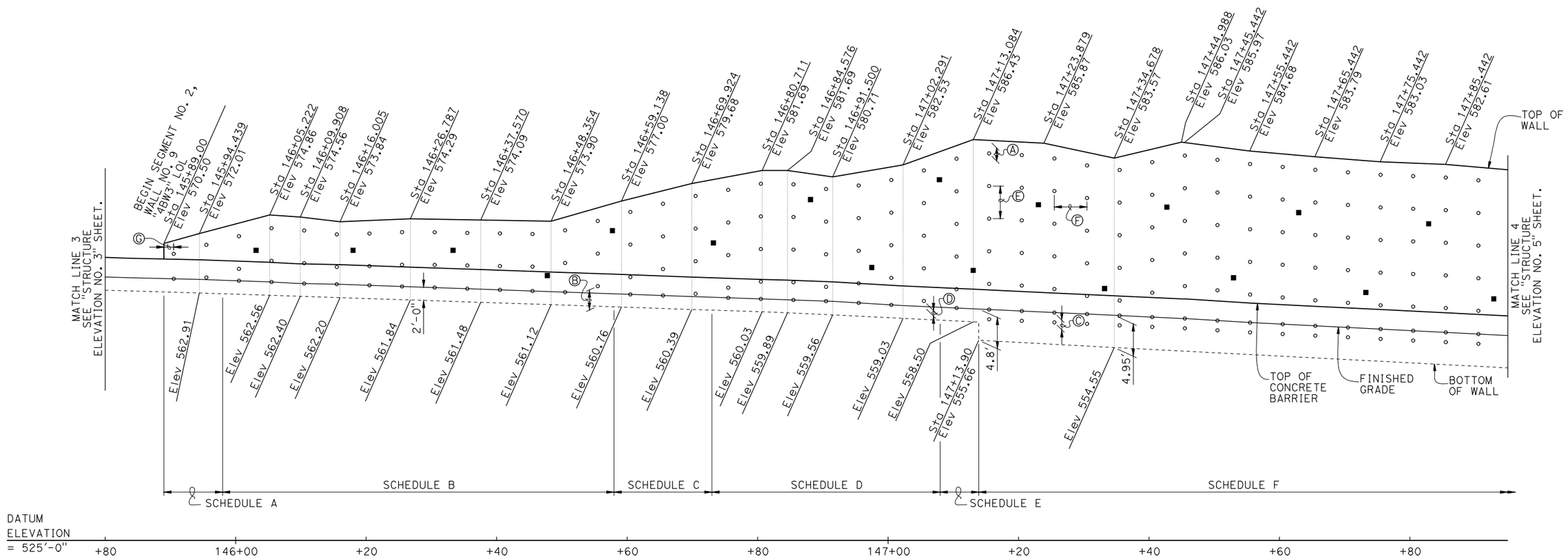
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails



DEVELOPED ELEVATION

1/8" = 1'-0"

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 8

BRIDGE NO. X
POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 9
STRUCTURE ELEVATION NO. 4

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 10-14-11 11-23-11 02-02-12

SHEET 8 OF X

FILE => 37-retw9-f-strucelv04.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:43

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

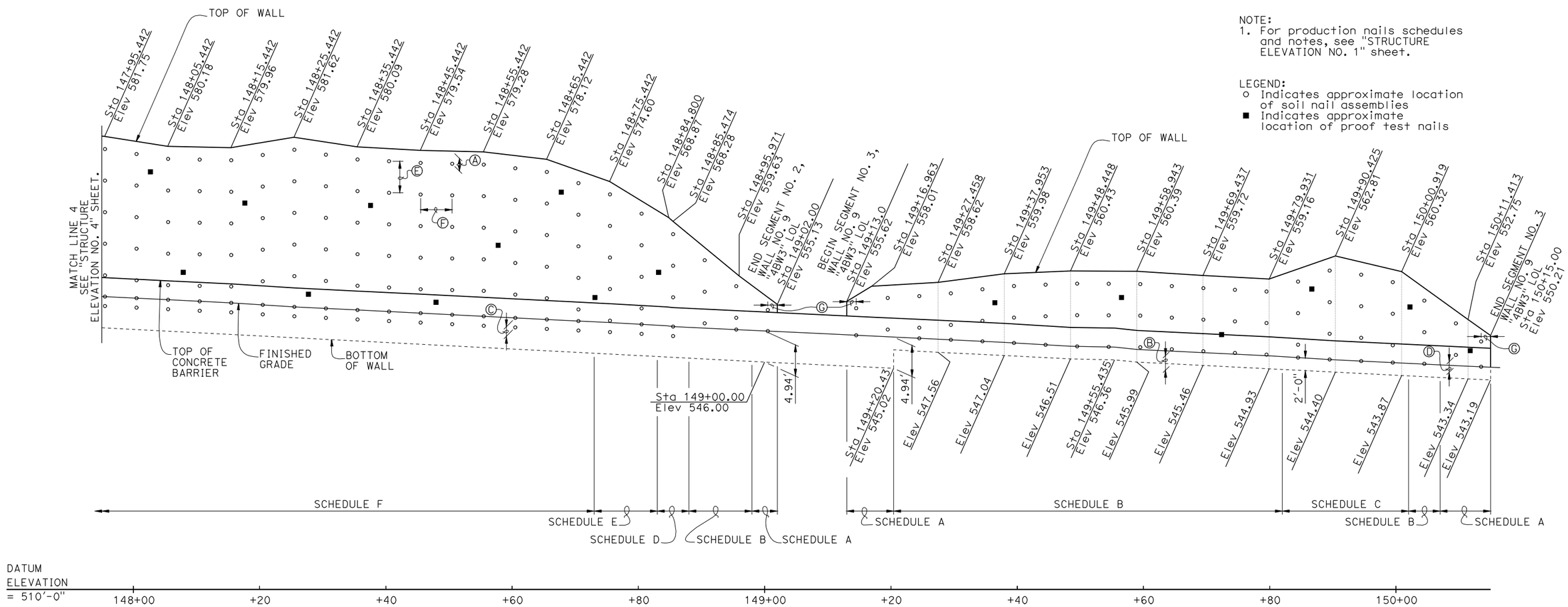
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails



DEVELOPED ELEVATION

1/8" = 1'-0"

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 9

STRUCTURE ELEVATION NO. 5

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 10-14-11 11-23-11 02-02-12

SHEET 9 OF X

FILE => 37-retw9-f-structelv05.dgn

USERNAME => s134055 DATE PLOTTED => 02-MAR-2012 TIME PLOTTED => 10:43

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2′-0″

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2′-0″, SB1 (Max) < 3′-6″.

Ⓒ SB_2 = Vertical distance from finished grade to bottom level of the soil nail assemblies, SB2 = 1′-6″.

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1′-6″.

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1′-6″, SV (Max) = 5′-0″.

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1′-6″, SH (Max) = 5′-0″.

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1′-6″, SS (Max) = 2′-6″.

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

1. Cable railing posts are not shown for clarity.

LEGEND:
- ○ Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

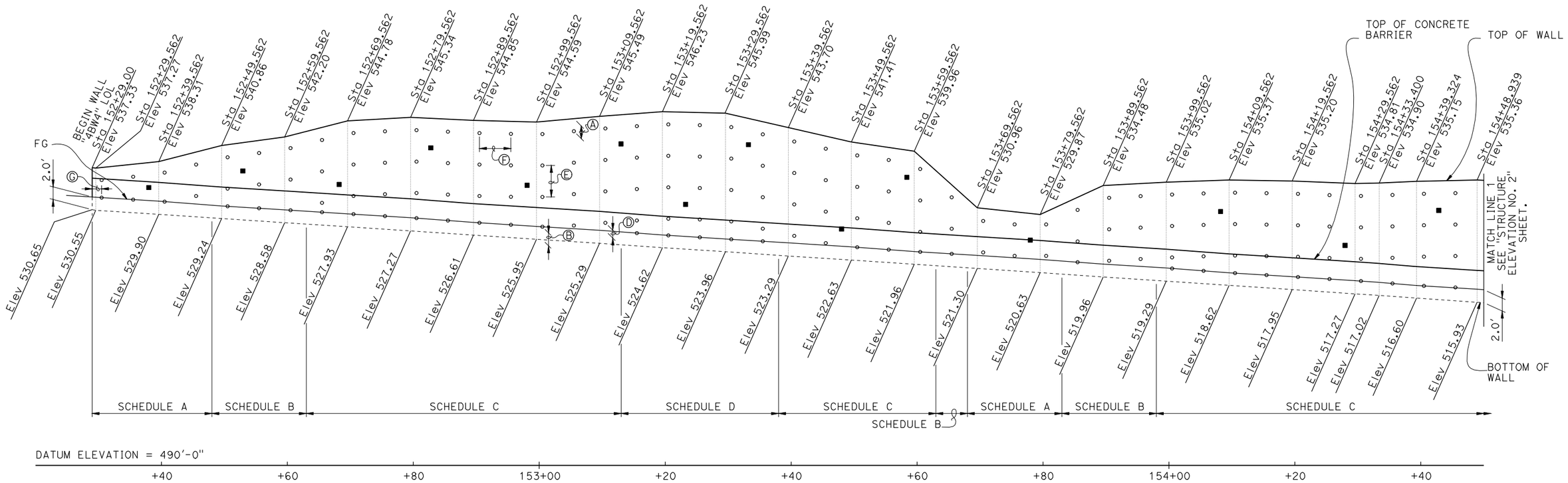
SCHEDULE D	BAR SIZE: #8				
NO. OF SOIL NAIL ROWS	5				
ROW NO. TOP TO BOTTOM	1	2	3	4	5
EMBEDMENT LENGTH (FT)	24	19	19	12	10

SCHEDULE A	BAR SIZE: #7	
NO. OF SOIL NAIL ROWS	2	
ROW NO. TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (FT)	10	10

SCHEDULE E	BAR SIZE: #8					
NO. OF SOIL NAIL ROWS	6					
ROW NO. TOP TO BOTTOM	1	2	3	4	5	6
EMBEDMENT LENGTH (FT)	24	19	19	12	10	10

SCHEDULE B	BAR SIZE: #7		
NO. OF SOIL NAIL ROWS	3		
ROW NO. TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (FT)	12	10	10

SCHEDULE C	BAR SIZE: #8			
NO. OF SOIL NAIL ROWS	4			
ROW NO. TOP TO BOTTOM	1	2	3	4
EMBEDMENT LENGTH (FT)	19	15	12	10



DEVELOPED ELEVATION

1/8″ = 1′-0″

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 10

STRUCTURE ELEVATION NO. 1

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 09-01-11 02-27-12 02-09-12

SHEET 4 OF X

FILE => 37-retw10-f-strucelv01.dgn

USERNAME => s134055 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 15:00

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 06-30-2013 CIVIL STATE OF CALIFORNIA

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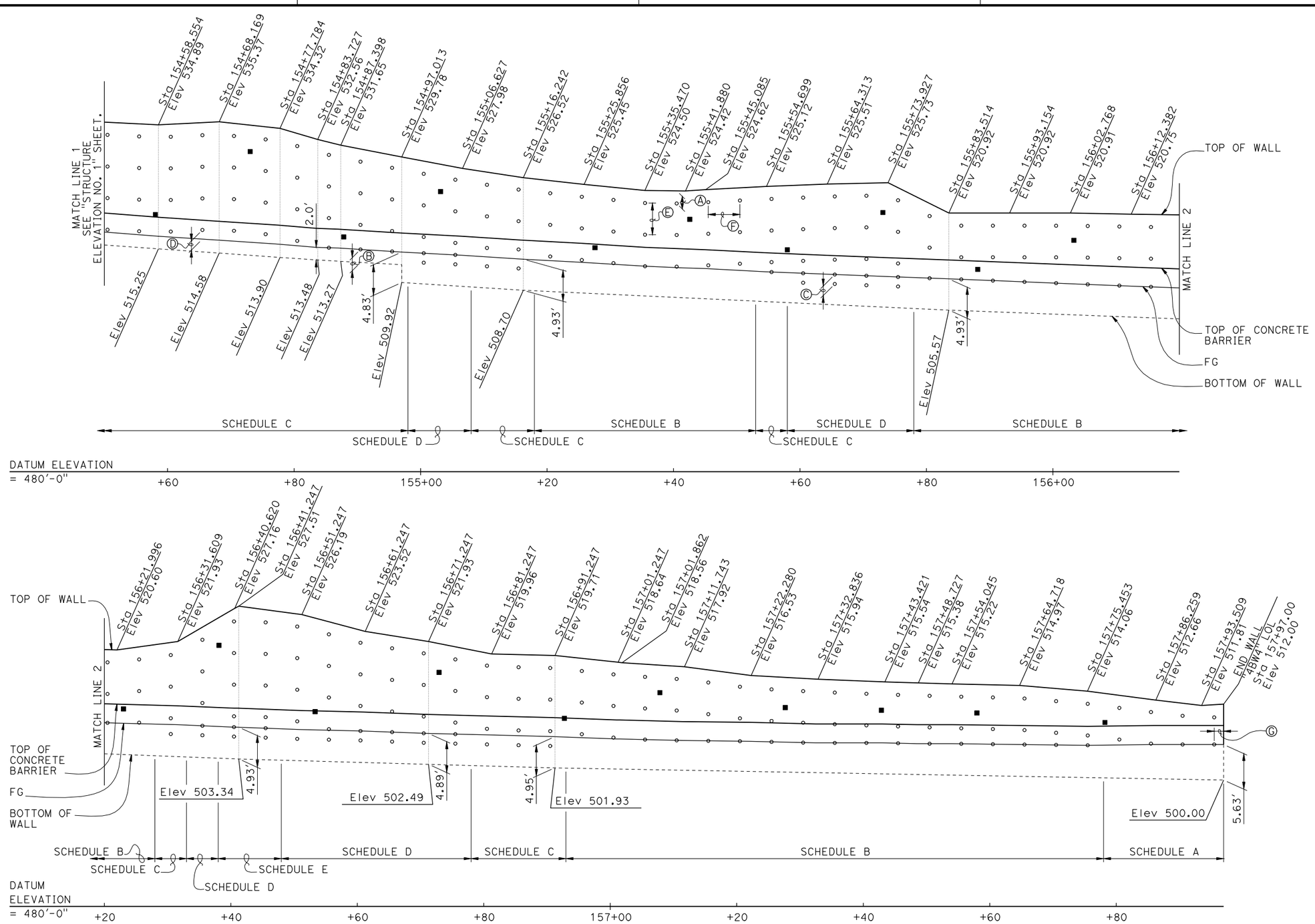


DEVELOPED ELEVATION

1/8" = 1'-0"

NOTE:
1. For production nails schedules and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

LEGEND:
- o Indicates approximate location of soil nail assemblies
- ■ Indicates approximate location of proof test nails

FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT DISTRICT OFFICE.

	BY	CHECKED
DESIGN	S. Hegazi	R. Amir
DETAILS	T. Kusumi	R. Amir / S. Hegazi
QUANTITIES	R. Amir	S. Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 10

STRUCTURE ELEVATION NO. 2

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593
PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 09-01-11 11-28-11 02-02-12

SHEET 5 OF X

FILE => 37-retw10-f-strucelv02.dgn

USERNAME => s134055 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 15:00

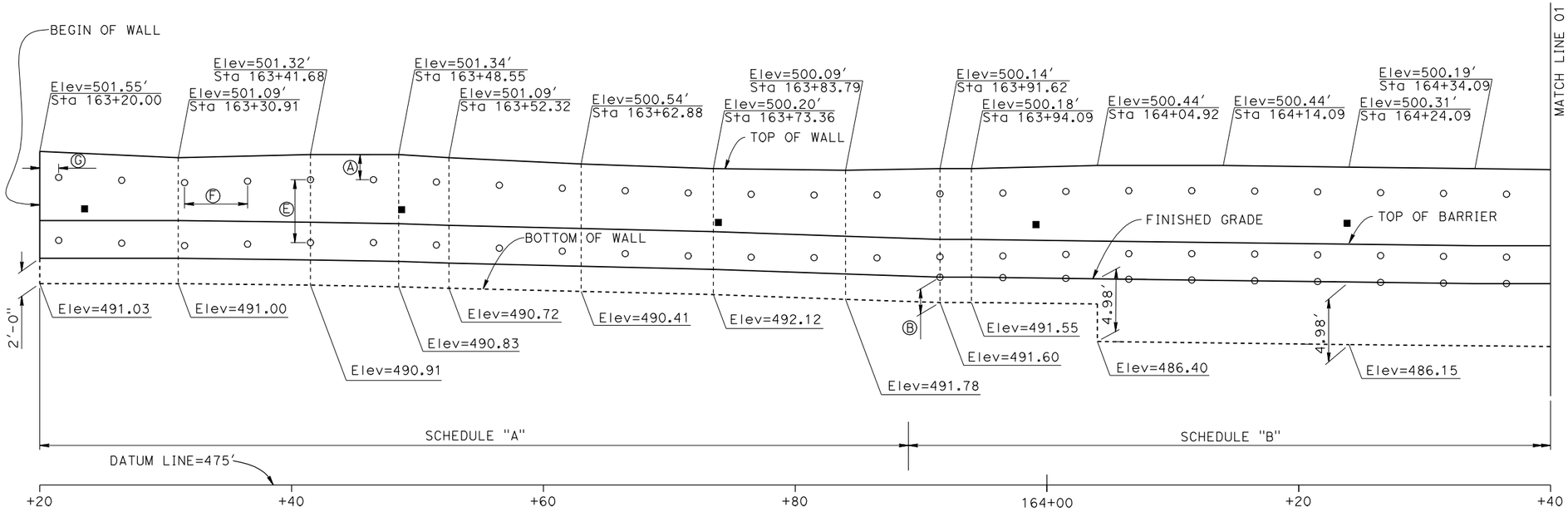
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

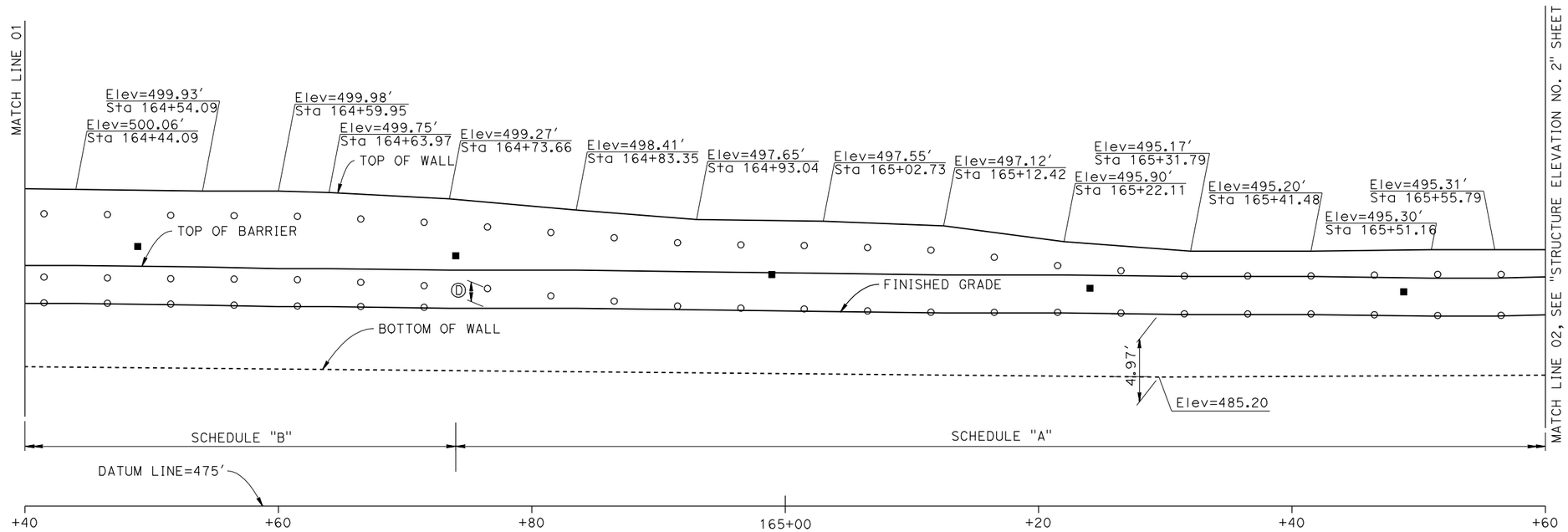
REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 09-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



NAIL SCHEDULE "A"	BAR SIZE #7	
No. OF NAIL ROWS	2	
ROW No.TOP TO BOTTOM	1	2
EMBEDMENT LENGTH (ft)	10	10

NAIL SCHEDULE "B"	BAR SIZE #7		
No. OF NAIL ROWS	3		
ROW No.TOP TO BOTTOM	1	2	3
EMBEDMENT LENGTH (ft)	12	10	10



MATCH LINE 02, SEE "STRUCTURE ELEVATION NO. 2" SHEET

NOTES:

Ⓐ ST = Vertical distance from top of wall elevation to top level of soil nail assemblies, ST = 2′-0″

Ⓑ SB_1 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB1 (Min) = 2′-0″, SB1 (Max) < 3′-0″.

Ⓒ SB_2 = Vertical distance from bottom of wall to bottom level of the soil nail assemblies, SB2 (Min) > 3′-0″, SB2 (Max) = 6′-8″.

Ⓓ Discontinue row when vertical distance between soil nail assemblies are less than 1′-6″.

Ⓔ SV = Vertical spacing of soil nail assemblies, SV (Min) = 1′-6″, SV (Max) = 5′-0″.

Ⓕ SH = Horizontal spacing of soil nail assemblies, SH (Min) = 1′-6″, SH (Max) = 5′-0″.

Ⓖ SS = Horizontal distance between the begin/end wall and first/last soil nail assembly, SS (Min) = 1′-6″, SS (Max) = 2′-6″.

Ⓗ The exact location of the test soil nails to be determined by the Engineer.

Ⓘ Cable railing posts are not shown for clarity

LEGEND:
○ Indicates approximate location of soil nail assemblies
■ Indicates approximate location of proof test nails

DEVELOPED ELEVATION

1″ = 5′

	BY	CHECKED
DESIGN	Sameh Hegazi	Rangina Amir
DETAILS	Antonio Carreon	S Hegazi/R Amir
QUANTITIES	Rangina Amir	Sameh Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 11

STRUCTURE ELEVATION NO. 1

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593

PROJECT NUMBER & PHASE: 0400000813-1 CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 02-29-12 01-31-12 02-29-12

SHEET 4 OF X

FILE => 37-hecker11-d-se01.dgn

USERNAME => s133975 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 09:05

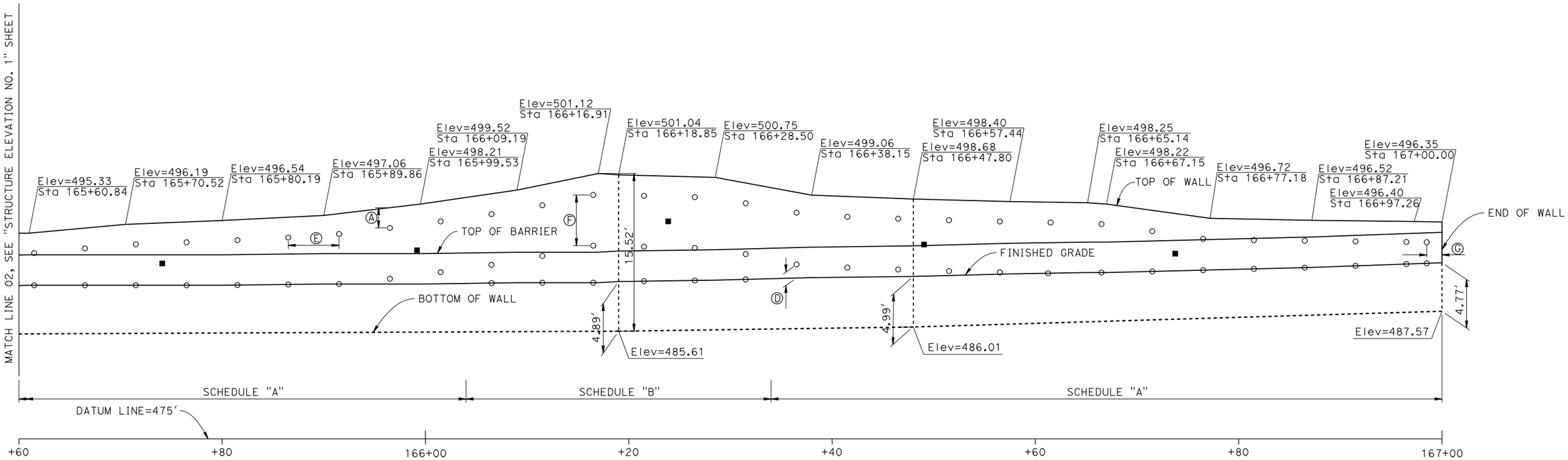
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCI	152			

REGISTERED CIVIL ENGINEER X DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Sameh Hegazi No. C64899 Exp. 09-30-2013 CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



DEVELOPED ELEVATION

1" = 5'

LEGEND:

- o Indicates approximate location of soil nail assemblies.
- ■ Indicates approximate location of proof test nails

NOTE:

1. For production nails schedule and notes, see "STRUCTURE ELEVATION NO. 1" sheet.

	BY	CHECKED
DESIGN	Sameh Hegazi	Rangina Amir
DETAILS	Antonio Carreon	S Hegazi/R Amir
QUANTITIES	Rangina Amir	Sameh Hegazi

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 8

BRIDGE NO. X

POST MILE 0.0/5.2

HECKER PASS SOIL NAIL WALL NO. 11

STRUCTURE ELEVATION NO. 2

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3593

PROJECT NUMBER & PHASE: 0400000813-1

CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 08-01-11 12-01-11 02-29-12

SHEET 5 OF X

FILE => 37-hecker11-d-se02.dgn

USERNAME => s133975 DATE PLOTTED => 01-MAR-2012 TIME PLOTTED => 09:05