Dist-County-Route: 05-SCR-01

Post Mile Limits: Tier I: PM R7.24/16.13 (KP R11.64/25.96); Tier II: PM 13.5/14.9

Project Type: Highway Widening

Project ID (or EA): 05000000230 (05-0C7300)

Program Identification: STIP

Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Central Coast (Region 3)

Is the Project required to consider Treatment BMPs? Yes ☒ No ☐

If yes, can Treatment BMPs be incorporated into the project? Yes ☒ No ☐

If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date: _____

Total Disturbed Soil Area: Tier I Project: 250 ac (101 ha) for HOV Lane Alternative and 101 ac (41 ha) for TSM Alternative; Tier II Project: 18.5 ac

Risk Level: 2 & 3

Estimated: Construction Start Date: Tier I Project: TBD; Tier II Project: March 2019

Construction Completion Date: Tier I Project: TBD; Tier II Project: May 2020

Notification of Construction (NOC) Date to be submitted: TBD (At least one month prior to the start of construction)

Erosivity Waiver	Yes ☐	Date: _____	No ☒
Notification of ADL reuse (if Yes, provide date)	Yes ☐	Date: _____	No ☒
Separate Dewatering Permit (if yes, permit number)	Yes ☐	Permit # _____	No ☒

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Analette Ochoa — 9/17/15

Analette Ochoa, P.E. Registered Project Engineer — Date

I have reviewed the storm water quality design issues and find this report to be complete, current and accurate:

Luis Duazo, Project Manager — 9/22/15 — Date

Chris Chalk, Designated Maintenance Representative — 9/29/15 — Date

Dennis Reeves, Designated Landscape Architect Representative — 9/29/15 — Date

[Stamp Required for PS&E only] For James Espinosa, Regional Design SW Coordinator or Designee — 9/29/2015 — Date

State Route 1 HOV Lane Widening Project (From Morrissey Boulevard to San Andreas Road) STORM WATER DATA REPORT

Errata

June 10, 2015

This Errata sheet revises the Storm Water Data Report as described below.

1. **Project Description.** The project description text provided in Section 1 of the report is hereby changed to replace the existing text of Section 1 with the following text.

   1. Project Description

   Purpose

   The purpose of the proposed Tier I project on Route 1 within the project limits is to achieve the following:

   - Reduce congestion.
   - Promote the use of alternative transportation modes as means to increase transportation system capacity.
   - Encourage carpooling and ridesharing.

   The purpose of the Tier II project is to:

   - Reduce congestion.
   - Improve safety.
   - Promote the use of alternative transportation modes as means to increase transportation system capacity.

   The main distinction between the Tier I and Tier II project purposes is the Tier II project also addresses a congestion-related safety need within its limits but will not promote carpooling in the Route 1 corridor.

   The Tier I and Tier II projects are intended to address specific deficiencies and needs on Route 1, as described in the following subsection.

   Need

   The Tier I and Tier II projects address the following needs resulting from deficiencies on Route 1 within the project limits:

   - Several bottlenecks along Route 1 in the southbound and northbound directions cause recurrent congestion during peak hours.
   - Travel time delays due to congestion are experienced by commuters, commerce, and emergency vehicles.
   - “Cut-through” traffic, or traffic on local streets, occurs and is increasing because drivers seek to avoid congestion on the highway.

- Limited opportunities exist for pedestrians and bicyclists to safely get across Route 1 within the project corridor.

Within the Tier I project limits, in addition to the common needs identified above there is a need to address the following corridor-wide deficiencies:

- Insufficient incentives to increase transit service in the Route 1 corridor because congestion threatens reliability and cost-effective transit service delivery.
- Inadequate facilities to support carpool and rideshare vehicles over single-occupant vehicles, reducing travel time savings and reliability.

The Tier II project, in addition to the common needs identified above, also addresses the following need:

- Improve operational safety to address accident rates in excess of the statewide average.

Project Alternatives

This section describes the proposed project improvements and the project alternatives developed to meet the purpose and need, while avoiding or minimizing environmental impacts. The alternatives are the Tier I Corridor HOV Lane Alternative, the Tier I Corridor Transportation System Management (TSM) Alternative, and the Tier II Auxiliary Lane Alternative.

The proposed Tier I and Tier II project locations are in Santa Cruz County, California, on Route 1. The Tier I eastern project limit is just south of the village of Aptos, approximately 0.4 mile south of the San Andreas-Larkin Valley Road interchange; the Tier I project then traverses the villages of Soquel, Live Oak and unincorporated Santa Cruz County. The western Tier I project limit is in the City of Santa Cruz, approximately 0.4 mile west of the Morrissey Boulevard interchange, for a total length of 8.9 miles. The Tier II project limits, which lie within the Tier I corridor, begin at 41st Avenue on the east and extend a distance of 1.4 miles westward to Soquel Avenue.

Within the Tier I and Tier II project limits, Route 1 is a four-lane divided freeway with 12-foot lanes. In the southbound direction the existing inside paved shoulder width varies from approximately 4 feet to 18 feet and in the northbound direction the existing inside paved shoulder width varies from 7 feet to 18 feet. In the southbound direction in the project corridor, the outside shoulder width varies from 8 feet to 12 feet. In the northbound direction in the project corridor, the outside shoulder width varies from 6 feet to 8 feet.

The purpose of the Tier I project is to reduce congestion, promote the use of alternative transportation modes as means to increase transportation system capacity, and encourage carpooling and ridesharing. The purpose of the Tier II project is to reduce congestion,

improve safety, and promote the use of alternative transportation modes as means to increase transportation system capacity.

Alternatives

This section describes the Tier I Corridor Alternatives and the Tier II Auxiliary Lane Alternative that were analyzed in this document. The Project Development Team studied various design alternatives and options. In an effort to reduce and avoid impacts, the Project Development Team also considered preliminary environmental information to better understand the impacts of those alternatives. The views of stakeholders were elicited through public information meetings and meetings with local agency staff and elected officials. From this preliminary analysis and public outreach, a longer list of alternatives and options was narrowed to include the alternatives described below.

The Tier I Corridor HOV Lane and TSM Alternatives were originally conceived as construction-level study alternatives, under the assumption that funding would be available in the near future. The Project Development Team recognized that funding sources to construct either of those alternatives would be limited in the short term and that implementation of the Tier I project would occur over a multi-year period. To make a decision on the types of transportation improvements that would occur within the corridor in the future, Tier I project implementation alternatives were identified. The team decided to study the HOV Lane and TSM Alternatives in a Tier I or Master Plan environmental document. The Tier I/II Draft Environmental Impact Report/Environmental Assessment (DEIR/EA) will allow for the identification of a preferred corridor alternative for the 8.9-mile-long project corridor and facilitate the programming of funds. At the same time, the team also recognized that there was sufficient funding to implement a construction-level Tier II project within the corridor that would have more immediate congestion-relief benefits. Accordingly, a Tier II Auxiliary Lane and Pedestrian/Bicycle Overcrossing Alternative is also defined and analyzed in the Tier I/II DEIR/EA.

The Tier I corridor analysis includes three alternatives: a Tier I Corridor HOV Lane Alternative, a Tier I Corridor TSM Alternative, and a Tier I No Build Alternative. As funding becomes available, the high-priority improvements in the corridor would become subsequent incremental (Tier II) construction-level projects and would be subject to separate environmental reviews.

The Tier II corridor analysis considers an Auxiliary Lane Alternative and Pedestrian/Bicycle Overcrossing, and a No Build Alternative. The Tier II project is located between 41st Avenue and Soquel Avenue/Drive. It is anticipated that construction of the Tier II project could begin in 2019.

Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives

The Tier I HOV Lane and TSM Alternatives share many features, such as: the addition of auxiliary lanes, new pedestrian/bicycle overcrossings over Route 1, and Transportation Operations System elements. These common design features are described below.

Auxiliary Lanes

Auxiliary lanes are designed to reduce conflicts between traffic entering and exiting the highway by connecting the on-ramp of one interchange to the off-ramp of the next; they are not designed to serve through traffic. Auxiliary lanes would be constructed to improve merging operations at the locations listed below:

- Freedom Boulevard and Rio Del Mar Boulevard – northbound and southbound
- Rio Del Mar Boulevard and State Park Drive – northbound and southbound
- State Park Drive and Park Avenue – both directions in the TSM Alternative; southbound only in the HOV Lane Alternative
- Park Avenue and Bay Avenue/Porter Street – northbound and southbound
- 41st Avenue and Soquel Avenue/Drive – northbound and southbound

New Pedestrian/Bicycle Overcrossings

Both Tier I alternatives would construct new pedestrian/bicycle overcrossings of Route 1 at the following locations:

- Mar Vista Drive – The crossing would start on the north side of Route 1 and parallel the highway eastward for approximately 600 feet, doubling back westward as it climbs before crossing the highway and McGregor Drive at a right angle and then descending by switchbacks to and along Mar Vista Drive for approximately 550 feet; the final design will be determined as part of the Tier II design/environmental analysis of this facility.
- Chanticleer Avenue – The crossing would start at the Chanticleer Avenue cul-de-sac on the north side of Route 1 and run parallel to the highway for approximately 400 feet to the west and then cross Route 1 and Soquel Avenue (frontage road) on a curved alignment, terminating just west of Chanticleer Avenue on the south side of the highway and Soquel Avenue (frontage road).
- Trevethan Avenue – The crossing would start on the north side of Route 1 at Trevethan Avenue and parallel the highway approximately 600 feet to the west before crossing on an angle and continuing along the banks of the western tributary to Arana Gulch to terminate close to Harbor High School; multiple configurations are possible, with the final design to be determined as part of the subsequent design/environmental analysis of this facility.

Other Common Features of the Tier I Corridor Alternatives

The Tier I Corridor Alternatives would include reconstruction of the Santa Cruz Branch Rail Line bridges over Route 1 and the State Park Drive, Capitola Avenue, 41st Avenue, and Soquel Avenue overcrossings. The Santa Cruz Branch Line railroad underpass structures are proposed to be modified or replaced to accommodate highway widening to match the ultimate six-through-lane concept, including shoulder and sidewalk facilities to accommodate pedestrians and bicycles. These modifications will lower the highway profile to provide standard clearances. In addition the Aptos Creek Bridge would be widened.

Both build alternatives would include Transportation Operations System elements such as changeable message signs, closed-circuit television, microwave detection systems, and vehicle detection systems. In addition, ramp metering and HOV on-ramp bypass lanes with highway patrol enforcement areas would be constructed on the Route 1 ramps within the Tier I project limits; however, only the HOV Lane Alternative would include HOV lanes on the mainline.

Table 1-4 summarizes the major features of the Tier I Corridor Alternatives.

Tier I Corridor HOV Lane Alternative

The Tier I Corridor HOV Lane Alternative includes the following main components, which are discussed in detail below and are shown in Figure 1-3 and in plan view in Appendix G of the EIR/EA:

- Highway mainline to include northbound and southbound HOV lanes throughout the project limits;
- Auxiliary lanes;
- Highway interchange reconfigurations and improvements such as ramp metering, on-ramp HOV bypass lanes and California Highway Patrol enforcement areas, and stormwater drainage/treatment facilities;
- Construction of three pedestrian/bicycle overcrossings;
- Reconstruction of two Santa Cruz Branch Rail Line overcrossings in Aptos;
- Widening of the Aptos Creek Bridge;
- Replacement of the Capitola Avenue overcrossing;
- Retaining walls;
- Soundwalls; and
- Traffic signal coordination and other transportation operation system improvements.

The Tier I Corridor HOV Lane Alternative would expand the existing four-lane highway to a six through-lane facility by adding HOV lanes in both the northbound and southbound directions. HOV lanes would be constructed entirely within the existing median where possible. In those areas where the median is not wide enough to accommodate additional

lanes, widening would occur outside of the existing freeway footprint. The southernmost 1.5 miles of the freeway can accommodate an HOV lane inside the existing median. From approximately Freedom Boulevard to Soquel Drive, the existing median is not wide enough to accommodate an HOV lane, so the space needed for the additional lanes would be achieved through a combination of median conversion within existing right-of-way and acquisition of property adjacent to the freeway. Plan drawings depicting the Tier I Corridor HOV Lane Alternative are presented in Appendix G of the EIR/EA, Figures HOV-1 through HOV-20.

Table 1-4: Major Project Features
Tier I Project Alternatives

Project Features	HOV Lane Alternative	TSM Alternative	No Build Alternative
Highway Mainline Changes			
HOV lanes	X		
Lower highway profile at Santa Cruz Branch Line bridge crossings[1]	X	X	
Auxiliary Lane Improvements			
Northbound and southbound between Freedom Boulevard and Rio Del Mar Boulevard	X	X	
Northbound and southbound between Rio Del Mar Boulevard and State Park Drive	X	X	
Northbound between State Park Drive and Park Avenue		X	
Southbound between State Park Drive and Park Avenue	X	X	
Northbound and southbound between Park Avenue and Bay Avenue/Porter Street	X	X	
Northbound and southbound from 41st Avenue to Soquel Avenue/Drive	X	X	
Highway Interchange Improvements			
Reconfigure all nine interchanges within project limits	X		
Reconstruct State Park Drive, 41st Avenue, and Soquel overcrossings		X	
Ramp metering	X	X	
On-ramp HOV bypass lanes	X	X	
On-ramp California Highway Patrol enforcement areas	X	X	
Stormwater drainage and treatment facilities	X	X	
New Pedestrian/Bicycle Overcrossings			
Mar Vista Drive Crossing	X	X	
Chanticleer Avenue Crossing	X	X	
Trevethan Avenue Crossing	X	X	
Santa Cruz Branch Line Bridges Replacement	X	X	
Aptos Creek Bridge Widening	X	X	
Capitola Avenue Overcrossing Replacement	X	X	
Retaining Walls	X	X	
Soundwalls	X	X	
Traffic Signal Coordination	X	X	X
Transportation Operations System	X	X	X
Transit-Supportive Improvements	X		
1 Existing highway profile does not meet vertical clearance standards for railroad bridge crossings.			

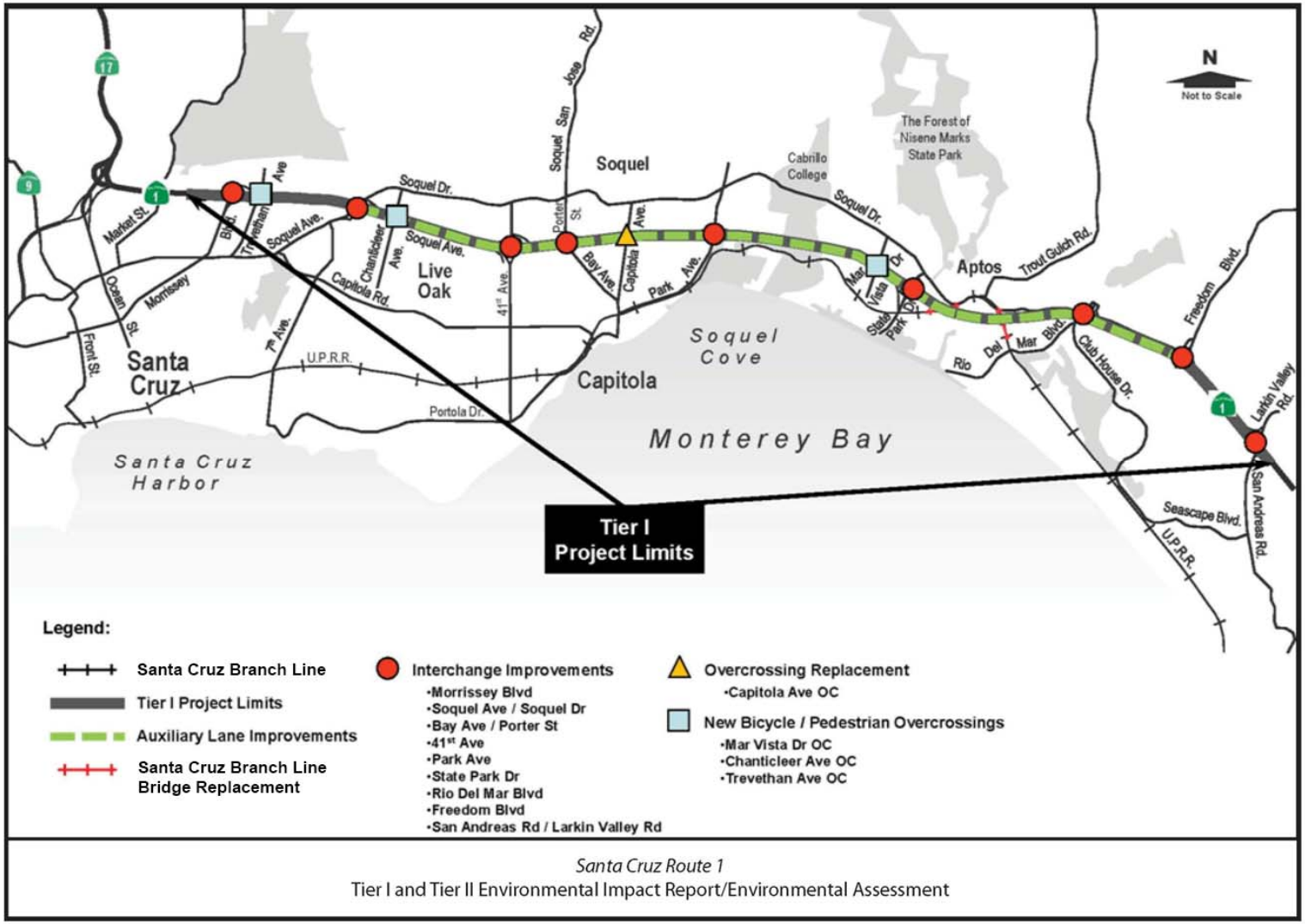


Figure 1-3: Tier I Corridor HOV Lane Alternative – Project Features

The Tier I Corridor HOV Lane Alternative would expand the existing four-lane highway to a six through-lane facility by adding HOV lanes in both the northbound and southbound directions. HOV lanes would be constructed entirely within the existing median where possible. In those areas where the median is not wide enough to accommodate additional lanes, widening would occur outside of the existing freeway footprint. The southernmost 1.5 miles of the freeway can accommodate an HOV lane inside the existing median. From approximately Freedom Boulevard to Soquel Drive, the existing median is not wide enough to accommodate an HOV lane, so the space needed for the additional lanes would be achieved through a combination of median conversion within existing right-of-way and acquisition of property adjacent to the freeway. Plan drawings depicting the Tier I Corridor HOV Lane Alternative are presented in Appendix G of the EIR/EA, Figures HOV-1 through HOV-20.

A mandatory standard median width (22 feet) set by Caltrans in its Highway Design Manual is proposed through most of the project corridor, north of Freedom Boulevard. The mandatory standard median width comprises two 10-foot-wide inside shoulders and a 2-foot-wide barrier. Where meeting the mandatory median width standard would result in acquiring property on the non-highway side of existing frontage roads, inside shoulder widths of 5 feet are proposed to reduce property requirements and impacts. Five feet is a nonstandard inside shoulder width for a Caltrans facility. This exception to shoulder-width design standards has received conceptual review in meetings between Caltrans and the project sponsor. All projects requiring design exceptions must ultimately be approved by Caltrans.

The Tier I Corridor HOV Lane Alternative would modify or reconstruct all nine interchanges within the project corridor to improve merging operations and ramp geometry by increasing the length of lanes for acceleration and deceleration, adding HOV bypass lanes and mixed-flow lanes to on-ramps, and improving sight distances. The Bay Avenue/Porter Street and 41st Avenue interchanges would be modified to operate as one interchange with frontage roads connecting the two interchanges. Where feasible, design deficiencies on existing ramps would be corrected to meet current design standards. Ramp metering and HOV bypass lanes would be provided on all Route 1 on-ramps. This alternative would include auxiliary lanes between all interchange ramps (with the exception of a northbound auxiliary lane between State Park Drive and Park Avenue) and Transportation Operations System elements, such as changeable message signs, microwave detection systems, and vehicle detection systems. Bridge structures and the Capitola Avenue overcrossing would be modified or replaced to accommodate the HOV lanes. New and widened highway crossing structures would include shoulder and sidewalk facilities to accommodate pedestrians and bicycles. The HOV Lane Alternative would include three new pedestrian/bicycle overcrossings of Route 1. The two existing Santa Cruz Branch Line structures over Route 1 in Aptos would be replaced with longer bridges at the same elevation, and the highway profile

would be lowered to achieve standard vertical clearance under the bridges to make room for the HOV and auxiliary lanes. In addition, this design configuration would reduce environmental impacts. The existing Route 1 bridge over Aptos Creek would be widened on the outside to accommodate the HOV lanes in each direction. The existing Capitola Avenue overcrossing would be replaced with a longer structure.

Retaining walls would be constructed to minimize property acquisitions and reduce environmental impacts. At locations where frontage roads are adjacent to Route 1, concrete barriers would be constructed to separate the highway and frontage road.

Changes to Highway Mainline with the Tier I Corridor HOV Lane Alternative

- Route 1 would be expanded to allow for two standard-width (12-foot) mixed-flow lanes, one standard-width (12-foot) HOV lane, and standard-width outside (10-foot) shoulders in each direction.
- The proposed lanes would be constructed within the existing 45-foot median. In locations where the existing median width is less than 45 feet, widening would occur both in the median and at the outside, generally within the existing Route 1 right-of-way.
- Where auxiliary lanes are proposed, widening by approximately 12 feet outside of the existing highway footprint would occur.
- A mandatory standard median width of 22 feet is proposed through most of the corridor.
- The highway centerline would be shifted northward in the vicinity of the Santa Cruz Branch Line crossings in Aptos to reduce impacts to wetlands. The bridge over Aptos Creek would be widened to allow for four new lanes: two HOV, two auxiliary, and pedestrian/bicycle facilities.
- Route 1 would be lowered to obtain vertical clearance at the Santa Cruz Branch Line crossings in Aptos (see Appendix G of the EIR/EA, Figures HOV-14 and HOV-15). A mandatory standard median width of 22 feet is proposed to minimize impact to the railroad bridge.
- At three locations, median and inside shoulder widths would be nonstandard to reduce impacts to adjacent streets. The three locations are: McGregor Drive, Cabrillo College Drive, and Kennedy Drive. At these three constrained locations, the inside shoulder in the constrained direction would be a nonstandard 5 feet, and the median would be a nonstandard 17 feet.

Auxiliary Lane Improvements with the Tier I Corridor HOV Lane Alternative

The auxiliary lane improvements are discussed above in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section.

Interchange Improvements with the Tier I Corridor HOV Lane Alternative

All nine interchanges within the project corridor would be modified under the Tier I Corridor HOV Lane Alternative, including overcrossing and undercrossing widening or replacement. These modifications would improve merging operations and ramp geometrics, and accessibility and safety for pedestrians and bicyclists. Major interchange improvements would include the following:

- Reconfiguration of intersections, including replacement or widening of highway overcrossings and undercrossings.
- Intersections of freeway ramps with local roads would be modified to shorten the pedestrian and bike crossing distances. Additionally, free right turns would be eliminated where feasible and traffic signals installed to improve traffic flow and slow vehicle traffic speeds through the bike and pedestrian crossing areas.
- Local roadways would be widened at the interchanges to accommodate the anticipated travel demand.
- Drainage and stormwater runoff treatment facilities would be provided.

Interchange improvements and design reconfigurations proposed for each interchange are listed in Table 1-5.

Table 1-5: Interchange Improvements and Reconfigurations
Tier I Corridor HOV Lane Alternative

Route 1 Interchange Location	Project Plan Sheet No.[1]	Tier I Corridor HOV Lane Alternative Features
San Andreas/ Larkin Valley Roads Interchange	HOV-20	The existing northbound cloverleaf off-ramp free right-turn onto Larkin Valley Road would be eliminated in favor of a signalized 90-degree intersection.
		A signalized intersection would be provided at the San Andreas Road ramps and the free right-turns would be eliminated.
		The existing on-ramps would be widened to accommodate HOV bypass lanes.
		The southbound Route 1 bridge over San Andreas/Larkin Valley Road would be widened into the median to accommodate the HOV lanes.
		San Andreas/Larkin Valley Roads would be widened within the Tier I project limits to add turn lanes.
		New sidewalks would be added along San Andreas/Larkin Valley Roads within the Tier I project limits.
Freedom Boulevard Interchange	HOV-18	The existing ramp termini at Freedom Boulevard would be modified to provide less-skewed intersections with Freedom Boulevard. These intersections would be signalized, and free right-turns would be eliminated.
		The southbound off-ramp would be widened to two exit lanes.
		The existing on-ramps would be widened to accommodate HOV bypass lanes.
		Freedom Boulevard would be widened within the Tier I project limits to add turn lanes.
		The Freedom Boulevard/Bonita Drive intersection would be enlarged to add turn lanes and achieve acceptable level of service.

Table 1-5: Interchange Improvements and Reconfigurations
Tier I Corridor HOV Lane Alternative

Route 1 Interchange Location	Project Plan Sheet No.[1]	Tier I Corridor HOV Lane Alternative Features
		The Freedom Boulevard bridge would be replaced with a wider structure that would accommodate a new turn lane on Freedom Boulevard and the new HOV lanes on Route 1.
		New sidewalks would be added along Freedom Boulevard within the Tier I project limits.
Rio Del Mar Boulevard Interchange	HOV-16	The northbound on-ramp would be realigned to form the north leg of a four-way intersection with Rio Del Mar Boulevard and the northbound off-ramp. This intersection would be signalized, and free right turns would be eliminated
		The northbound off-ramp would be widened to two exit lanes.
		The southbound ramps would be widened, the intersection with Rio Del Mar Boulevard signalized, and free right-turns eliminated.
		The existing on-ramps would be widened to accommodate HOV bypass lanes.
		Soquel Drive would be shifted northward to accommodate the roadway widening along the northbound off-ramp.
		Rio Del Mar Boulevard would be widened within the Tier I project limits to add turn lanes and a through lane in each direction.
		The Rio Del Mar Boulevard bridge over Route 1 would be replaced with a longer, wider bridge to accommodate a new turn lane and a through lane in each direction on Rio Del Mar Boulevard and the new HOV lanes on Route 1.
		Sidewalk would be added along eastbound Rio Del Mar Boulevard within the Tier I project limits; the sidewalk on westbound Rio Del Mar Boulevard would be retained.
State Park Drive Interchange	HOV-13	The existing northbound cloverleaf on-ramp free-right turn would be changed to a signalized right turn.
		The existing northbound off-ramp terminus would be modified to form, together with the realigned northbound on-ramp terminus, the south leg of a signalized intersection with State Park Drive.
		The northbound and southbound off-ramps would be widened to two exit lanes.
		The existing on-ramps would be widened to accommodate HOV bypass lanes.
		State Park Drive would be widened within the Tier I project limits to add turn lanes and a through lane in each direction.
		The State Park Drive bridge over Route 1 would be replaced with a longer, wider bridge to accommodate a new through-lane in each direction on State Park Drive and the new HOV lanes on Route 1.
		Sidewalk would be added along eastbound State Park Drive within the Tier I project limits; the sidewalk along westbound State Park Drive would be retained.
Park Avenue Interchange	HOV-10	The existing diamond interchange ramp design would be retained and ramps would be widened.
		The northbound and southbound off-ramps would be widened to two exit lanes.
		The existing on-ramps would be widened to accommodate HOV bypass lanes.
		Park Avenue would be widened within the Tier I project limits to add turn lanes.
		The two Route 1 bridges over Park Avenue would be replaced with one, wider structure to accommodate the new HOV lanes on Route 1.
		Sidewalk would be added within the Tier I project limits along westbound Park Avenue; the sidewalk along eastbound Park Avenue would be retained.

Table 1-5: Interchange Improvements and Reconfigurations
Tier I Corridor HOV Lane Alternative

Route 1 Interchange Location	Project Plan Sheet No.[1]	Tier I Corridor HOV Lane Alternative Features
Bay Avenue/ Porter Street and 41st Avenue Interchanges	HOV-7	Improvements at the Bay Avenue/Porter Street and 41st Avenue interchanges would be designed so that these two interchanges would work as a single interchange connected by a collector/frontage road running between the interchanges.
		The freeway ramps would be reconstructed to form less-skewed intersections with Bay Avenue/Porter Street.
		The existing southbound Route 1 off-ramp to Bay Avenue/Porter Street would be eliminated. Southbound traffic bound for Bay Avenue/Porter Street would exit at the 41st Avenue two-lane off-ramp and continue on a new southbound collector/frontage road to Bay Avenue/Porter Street.
		The existing two-lane on-ramp from Porter Street to northbound Route 1 would be modified to become a northbound collector/frontage road serving traffic bound for 41st Avenue or northbound Route 1.
		Northbound traffic exiting Route 1 would either bear right to intersect with Porter Street and continue north, or stay left and continue on a new structure over Porter Street, join the northbound collector/frontage road, and end at a new signalized intersection at 41st Avenue.
		At 41st Avenue, southbound on- and off-ramps would be eliminated and replaced with a diagonal off-ramp and a collector/frontage road serving traffic bound for Bay Avenue/Porter Street or southbound Route 1. The new ramp and collector/frontage road would form a signalized intersection with 41st Avenue.
		At 41st Avenue, the northbound on-ramps would be realigned.
		New on-ramps would include HOV bypass lanes.
		41st Avenue would be widened within the Tier I project limits to add turn lanes and eastbound though lanes over Route 1.
		Bay Avenue/Porter Street would be widened to add right-turn lanes at the on-ramps.
		A new bridge over Soquel Creek and Soquel Wharf Road would be constructed for the new southbound collector/frontage road from 41st Avenue to Bay Avenue/Porter Street.
		The 41st Avenue bridge over Route 1 would be replaced with a longer, wider bridge to accommodate the new eastbound through lane and turn lanes on 41st Avenue, and the new HOV lanes on Route 1. Northbound and southbound Class I bike paths would be constructed between 41st Avenue and Bay Avenue/Porter Street on either side of the new collector/frontage roads, respectively.
Soquel Avenue/ Drive Interchange	HOV-3	The northbound off-ramp would be realigned to a signalized 90-degree intersection with Soquel Drive. The existing access to Commercial Way would be eliminated.
		The westbound Soquel Drive on-ramp to northbound Route 1 would be modified to eliminate the free right-turn access.
		The existing northbound loop on-ramp from eastbound Soquel Avenue would be realigned and its free-right terminus would become a signalized 90-degree intersection.
		A new, wider southbound diagonal off-ramp that adds turn lanes at its terminus and a new loop on-ramp would form the north leg of a signalized intersection at Soquel Avenue.

Table 1-5: Interchange Improvements and Reconfigurations
Tier I Corridor HOV Lane Alternative

Route 1 Interchange Location	Project Plan Sheet No.[1]	Tier I Corridor HOV Lane Alternative Features
		The existing southbound hook on-ramp would be widened to add an HOV bypass lane and realigned to be made standard.
		The northbound and southbound off-ramps would be widened to two exit lanes.
		All new on-ramps would include HOV bypass lanes.
		Soquel Avenue within the Tier I project limits would be widened to add an eastbound through lane and turn lanes.
		Salisbury Lane would be shifted eastward to form an intersection with the realigned northbound off-ramp and loop on-ramp.
		The Soquel Drive bridge over Route 1 would be replaced with a longer, wider bridge to add an eastbound through lane and a turn lane to Soquel Drive and accommodate the new HOV lanes on Route 1.
		The culvert at Arana Gulch would be extended underneath the widened Route 1 and new southbound off-ramp.
		Sidewalk would be added along eastbound Soquel Drive within the Tier I (and Tier II) project limits; the sidewalk along westbound Soquel Drive would be retained.
Morrissey Boulevard Interchange	HOV-1	The southbound exit would be realigned to terminate at a new signalized intersection with Morrissey Boulevard.
		The existing southbound on-ramp would be eliminated and replaced with a new, wider diagonal ramp with a signalized terminus.
		The existing southbound off- and on-ramp at Elk Street would be eliminated.
		The existing northbound loop on-ramp would be eliminated, as would access to Rooney Street from this northbound loop.
		The northbound off-ramp would be widened to two exit lanes.
		New on-ramps would include HOV bypass lanes.
		Morrissey Boulevard is being replaced with a wider bridge to add an eastbound through lane and turn lanes, and realigned to form a straight line between its intersections with Fairmont Avenue and Rooney Street.
		The Morrissey Boulevard bridge is being replaced with a longer, wider bridge to accommodate a new eastbound through lane and turn lanes on Morrissey Boulevard and new HOV lanes on Route 1.
		Sidewalk would be added along eastbound Morrissey Boulevard within the Tier I project limits; the sidewalk along westbound Morrissey Boulevard would be retained.
Transit-Related Facilities	NA	Both on-ramps and both off-ramps at the reconfigured Park Avenue interchange include options for bus pads and bus shelters.
		Ramps and collectors at the Bay Avenue/Porter Street and 41st Avenue interchanges include options for bus pads and shelters.

[1] Project plan sheets are provided in Appendix G of the EIR/EA.

Transit Supportive Planning and Design

The Tier I Corridor HOV Lane Alternative would not preclude the development of the following features from being added in the future to facilitate freeway-oriented transit services and operations:

- The reconfigured Park Avenue and Bay Avenue/Porter Street/41st Avenue interchanges would allow for future bus pads and bus stop shelters to be constructed as part of a separate project.
- Future park-and-ride lots are under consideration by RTC at the Larkin Valley Road/San Andreas Road and 41st Avenue interchanges, to be coordinated with the bus facilities as part of a future project.

The aforementioned features are not part of the proposed project and would be subject to future environmental clearance. The proposed Tier I project is simply taking into consideration potential future transit projects as a collaborative planning effort.

New Pedestrian/Bicycle Overcrossings

The proposed pedestrian/bicycle overcrossings are discussed above in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section.

Tier I Corridor TSM Alternative

The Tier I Corridor TSM Alternative was formulated to provide Route 1 improvements that would partially address the purpose and need, and could be achieved at lower cost and with fewer impacts than the Tier I Corridor HOV Lane Alternative. TSM strategies typically consist of improvements that can benefit the operations of existing facilities without increasing the number of through lanes.

As discussed in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section, the Tier I Corridor TSM Alternative proposes to add auxiliary lanes, ramp metering and HOV on-ramp bypass lanes; improve existing nonstandard geometric elements at various ramps; and incorporate other TSM elements, such as changeable message signs, closed circuit television, microwave detection systems, and vehicle detection systems. In short, the TSM Alternative shares many of the Tier I Corridor HOV Lane Alternative features, except HOV lanes would not be constructed along the mainline and the Soquel Drive interchange would be the only interchange reconfigured. Plan drawings depicting the TSM Alternative are presented in Appendix H of the EIR/EA, Figures TSM-1 through TSM-20. An overview of the major features of the TSM Alternative is provided in Figure 1-4 and in plan view in Appendix H of the EIR/EA.

Auxiliary Lanes

The majority of auxiliary lane improvements are discussed above in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section. In addition, the TSM

Alternative would have both a southbound and northbound auxiliary lane between State Park Drive and Park Avenue — improvements that are not included in the HOV Lane Alternative.

Interchange Improvements

Improvements to interchanges proposed under the Tier I Corridor TSM Alternative include the following:

- The Soquel Avenue northbound off-ramp from Route 1 would be realigned and widened from one to two exit lanes for a distance of approximately 1,300 feet, widening to four lanes at its intersection with Soquel Drive. The northbound off-ramp/Commercial Way connection would be eliminated, and Commercial Way would become a cul-de-sac north of the realigned ramp. The intersection of the northbound off-ramp with Soquel Drive would be enlarged to achieve an acceptable level of service for the anticipated traffic volume.
- Improve existing nonstandard geometric elements at various ramps.
- Provide HOV bypass lanes on all ramps except northbound Morrissey Boulevard on-ramps.
- Add California Highway Patrol enforcement areas at on-ramps with HOV bypass lanes.

New Pedestrian/Bicycle Overcrossings

The proposed pedestrian/bicycle overcrossings are discussed above in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section.

Other Improvements

The details of the other improvements are included above in the Common Design Features of the Tier I Corridor HOV Lane and TSM Alternatives section.

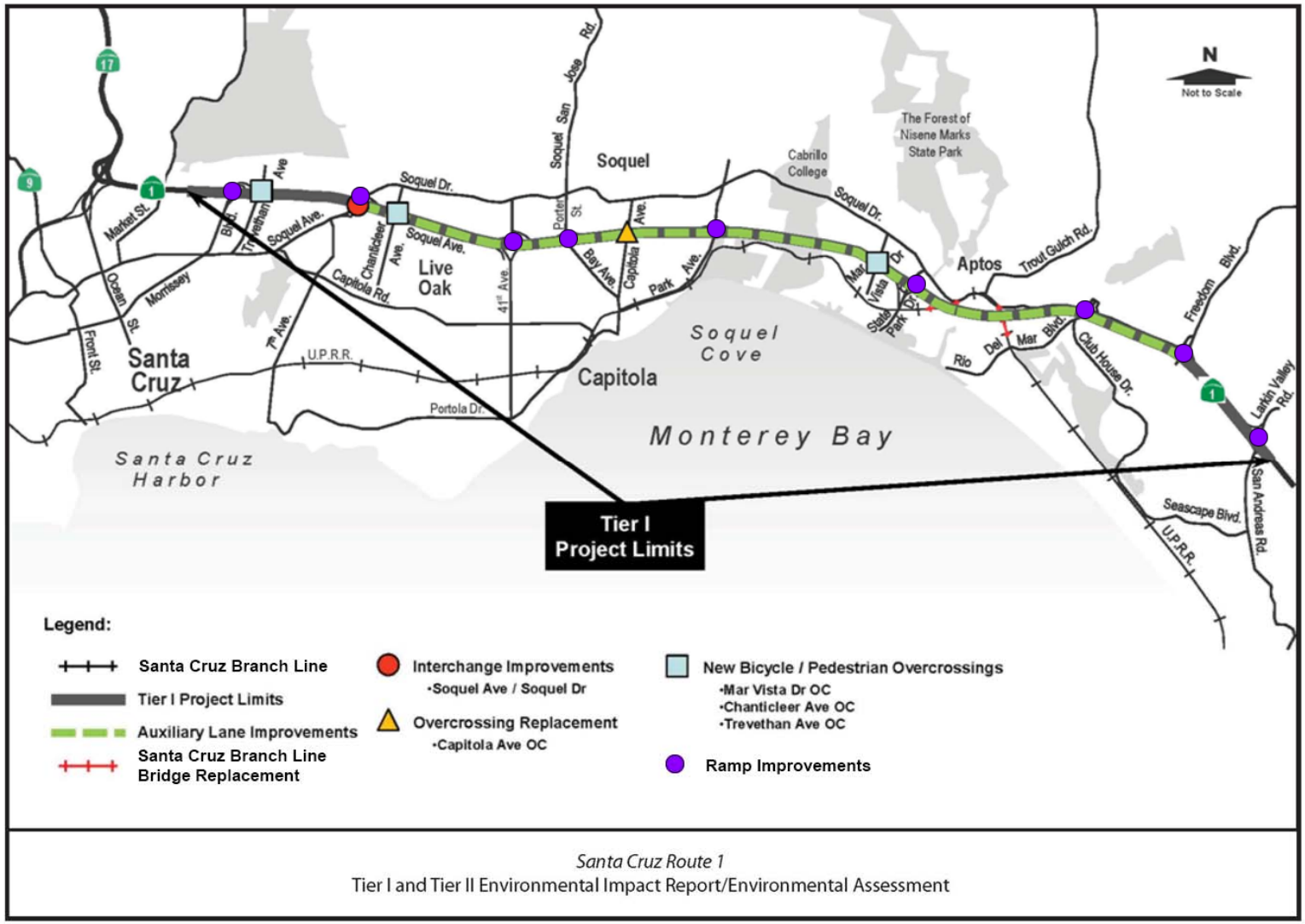


Figure 1-4: Tier I Corridor TSM Alternative – Project Features

Tier II Auxiliary Lane Alternative

The Tier II Auxiliary Lane Alternative would construct northbound and southbound auxiliary lanes on Route 1 from 41st Avenue to Soquel Drive and make other improvements, as discussed below. Figure 1-5 shows features of the Auxiliary Lane Alternative, and Appendix I of the EIR/EA provides a plan view of the proposed Tier II project. To construct the Auxiliary Lane Alternative, right-of-way would be acquired along Soquel Avenue west of Chanticleer Avenue and at the Chanticleer Avenue cul-de-sac north of Route 1 to accommodate the bicycle/pedestrian overcrossing.

Auxiliary Lanes

The Tier II Auxiliary Lane Alternative proposes to widen Route 1 by adding an auxiliary lane in both the northbound and southbound directions between the 41st Avenue and Soquel Avenue/Drive interchanges. The total roadway widening would be approximately 1.4 miles in length. Southbound, the auxiliary lane would begin at the existing Soquel Avenue on-ramp and end at the existing off-ramp to 41st Avenue. Northbound, the auxiliary lane would begin just south of the 41st Avenue overcrossing, at the existing loop on-ramp from northbound 41st Avenue. North of the overcrossing, the on-ramp from 41st Avenue to northbound Route 1 would merge with the new auxiliary lane, approximately 1,000 feet downstream from the loop ramp.

The new auxiliary lanes would be 12 feet wide. In the southbound direction, the width needed for the new lane would be added in the median, and the median barrier would be shifted approximately 5 feet toward the northbound side of the freeway to make room for the new lane and a standard 10-foot-wide shoulder. Where the new southbound lane meets the existing ramps, outside shoulder widening would occur to achieve standard 10-foot-wide shoulders. In the northbound direction, the Tier II project proposes to pave a 10-foot-wide median shoulder and widen to the outside to add the 12-foot-wide auxiliary lane and a new 10–foot-wide shoulder.

As part of the widening in the northbound direction, the Tier II project proposes to repair an existing pavement failure in the outside lane and shoulder by improving the pavement section, installing a retaining wall and, if necessary, replacing the underlying County-owned sanitary sewer line crossing Route 1. A new concrete median battier would also be constructed.

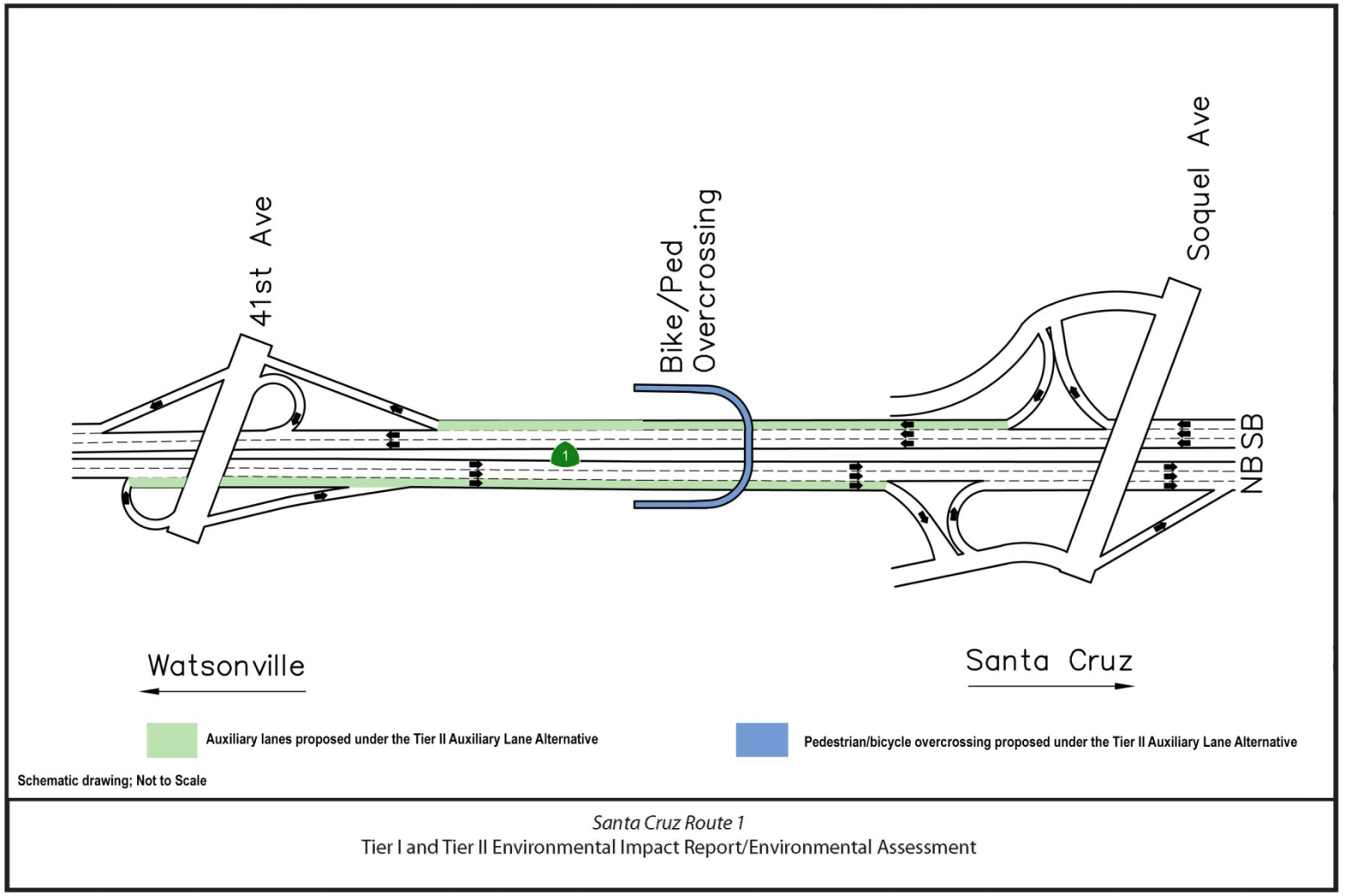


Figure 1-5: Tier II Auxiliary Lane Alternative – Project Features

Pedestrian/Bicycle Overcrossing

A new horseshoe-shaped pedestrian overcrossing is proposed over Route 1 at Chanticleer Avenue.[1] The overcrossing would vary in width from 14 feet along the ramps to 16 feet around the curves. Ramps from Chanticleer Avenue up to the overcrossing would be at approximately a 5 percent grade. Up to where the overcrossing exceeds approximately 10 feet in height, the ramp would be built on
retained fill; beyond that point, the bridge would rest on columns along the north right-of-way of Route 1, in the Route 1 median, behind the curb between Route 1 and Soquel Avenue, and along the south side of Soquel Avenue. The design of the ramps and bridge would include architectural texture or other aesthetic treatment. (See Section 2.16 for a visual simulation of the proposed Chanticleer Avenue pedestrian/bicycle overcrossing.)

In addition, a new 360-foot-long by 6-foot-wide sidewalk would be constructed along the south side of Soquel Avenue, starting at Chanticleer Avenue. The sidewalk would be separated from the street by a 4-foot-wide strip.

Retaining Walls

Retaining walls would be constructed as part of the roadway widening, with four separate walls: three on the north side of Route 1 and one on the south side. One of the retaining walls would start after the 41st Avenue on-ramp and extend approximately 150 feet; two other retaining walls on the northbound side would be 375 and 408 feet. On the southbound side, a 350-foot-long wall would be constructed along the highway mainline and Soquel Avenue, over the Rodeo Gulch culvert.

Three of the walls would be located to allow widening for an additional mainline lane on Route 1 in each direction in the future. The wall proposed along the northbound on-ramp at 41st Avenue would have to be demolished and replaced if the highway were to be widened in the future. Two of the walls would span Rodeo Creek Gulch, where there is an existing 9-foot arch concrete culvert, and one would be constructed within a narrow jurisdictional wetland area on the northbound side of Route 1, adjacent to a 39-inch culvert crossing.

No Build Alternative

The No Build Alternative offers a basis for comparing the effects of the Tier I Corridor Alternatives and the Tier II Auxiliary Lane Alternative with doing none of the proposed improvements. The No Build Alternative assumes there would be no major construction on Route 1 through the Tier I project limits other than currently planned and programmed improvements and continued routine maintenance. The following planned and programmed

[1] The overcrossing at Chanticleer is included in both the Tier I and Tier II Projects. The Tier I program of improvements encompasses the current Tier II Auxiliary Lane Project, which has been identified as the first phase of the overall program of improvements.

improvements included in the No Build Alternative are contained in the 2010 Regional Transportation Plan:

- Construction of auxiliary lanes between the Soquel Drive and Morrissey Boulevard interchanges for the Soquel to Morrissey Auxiliary Lanes Project; construction completed in December 2013.
- Replacement of the La Fonda Avenue overcrossing of Route 1, included as part of the Soquel to Morrissey Auxiliary Lanes project; construction completed in 2013.
- Reconstruction of bridges and addition of a merge lane in each direction between Highway 17 and the Morrissey/La Fonda area for the Highway 1/17 Merge Lanes Project; construction completed in 2008.
- Installation of median barrier on Route 1 from Freedom Boulevard to Rio Del Mar Boulevard.

Improvements of roadways and roadsides on Rio Del Mar Boulevard from Esplanade to Route 1, which includes the addition of bike lanes, transit turnouts, left-turn pockets, merge lanes, and intersection improvements. Roadwork includes major rehabilitation and ongoing maintenance. If the No Build Alternative is selected, it is highly likely that other improvements could be expected in the future.

STORM WATER DATA INFORMATION

1. Project Description

The California Department of Transportation, in cooperation with the Federal Highway Administration and the Santa Cruz County Regional Transportation Commission, proposes to improve State Route 1 (Route 1) in Santa Cruz County for a distance of approximately 8.9 miles, from approximately 0.4 miles south of the San Andreas-Larkin Valley Road Interchange through the Morrissey Boulevard Interchange.

This State Route 1 High Occupancy Vehicle (HOV) Lane Widening Project (Project) uses a "tiered" approach to its environmental documentation. Tiering is a staged approach that addresses broad programs and issues related to the entire corridor in the Tier I analysis. As specific projects within the corridor are ready for implementation, impacts of that action are evaluated in subsequent Tier II studies. The tiered process supports decision making on issues that are ripe for decision and provides a means to preserve those decisions. The Tier I portion of the project documentation provides fact-based analyses that supports informed decision making on the 8.9-mile corridor and discloses issues associated with the selection of a Tier I Corridor alternative. Identification of a Tier I Corridor alternative will not result directly in construction; however, it will provide the basis for decision makers to select a program of transportation improvements within the corridor.

The Tier II portion of the environmental documentation examines a project-level Auxiliary Lane Alternative and a No-Build Alternative. The Tier II corridor segment is within the project limits of the Tier I corridor and would represent the first implementation phase of transportation improvements for the 8.9-mile corridor. As mentioned above, all Tier II corridor projects will be subject to separate environmental review.

Tier I Project: HOV Lane Alternative

The proposed Tier I Project limits begin on the southerly end of the Larkin Valley Road/San Andreas Road interchange and extend to the northerly end at the Morrissey Boulevard interchange, between Route 1 post miles R7.24 and 16.13 in Santa Cruz County. The three Tier I alternatives currently under consideration are the High Occupancy Vehicle Lane Alternative, the Transportation System Management Alternative, and the No-Build Alternative.

The High Occupancy Vehicle Lane Alternative would widen the existing four-lane highway to a six-lane facility by adding a High Occupancy Vehicle lane next to the median in both the northbound and southbound directions. Along the southern portion of the project, the existing median generally is wide enough to add the new High Occupancy Vehicle lanes within the existing right-of-way. A mandatory standard median width (22 feet) would be used through most of the corridor, north of Freedom Boulevard. Where existing frontage roads would be impacted, non-standard inside shoulder widths of 5 feet are proposed to reduce right-of-way requirements and impacts. Such non-standard design features will require design exceptions when they are part of Tier II project. In some locations, widening would extend outside the existing state right-of-way.

The High Occupancy Vehicle Lane Alternative would modify or reconstruct all nine interchanges within the project limits to improve merging operations and ramp geometrics, lengthen acceleration and deceleration lanes, and improve sight distances. The Bay Avenue/Porter Street and 41st Avenue interchanges would be modified to operate as one interchange with a frontage road connecting the two interchanges. Where feasible, design deficiencies on existing ramps would be corrected to meet current design standards. Ramp metering and High Occupancy Vehicle bypass lanes would be provided on all Route 1 on-ramps. The High Occupancy Vehicle Lane Alternative would include auxiliary lanes between interchange ramps and Transportation Operations System electronic equipment, such as changeable message signs, closed-circuit television, microwave detection systems and vehicle detection systems as also described under the Transportation System Management Alternative – with the exception that an auxiliary lane would not be constructed northbound between State Park Drive and Park Avenue.

Bridge structures and the Capitola Avenue Overcrossing would be modified or replaced to accommodate the new High Occupancy Vehicle lanes. New and widened highway crossing structures would include shoulder and sidewalk facilities to accommodate pedestrians and bicycles. The High Occupancy Vehicle Lane Alternative would include two new pedestrian/bicycle overcrossings of Route 1. The existing Santa Cruz Branch Rail Line structures would be replaced, not relocated or raised, to minimize environmental impacts. The Route 1 bridge over Aptos Creek would be widened on the outside to accommodate the new High Occupancy Vehicle lanes.

Retaining walls would be constructed to minimize right-of-way acquisition and reduce or avoid environmental impacts. At locations where frontage roads are adjacent to Route 1, concrete barriers would be constructed to separate the two facilities and minimize right-of-way acquisition. The project also would include demolition and disposal, excavation, borrow and fill, sound walls, right-of-way acquisition, and temporary easements.

Tier I Project: TSM Alternative

The Transportation System Management Alternative proposes to add ramp metering and construct High Occupancy Vehicle bypass lanes on existing interchange on-ramps, improve existing nonstandard geometric elements at various ramps, and add auxiliary lanes along the mainline between major interchange pairs within the project limits, as described below and summarized under Common Design Features of the Build Alternatives.

It would not construct High Occupancy Vehicle lanes or any additional through lanes on the mainline.

The common design features of the Build Alternatives section describes other features included in the Transportation System Management Alternative.

Tier I Project: No-Build Alternative

The No-Build Alternative offers a basis of comparison with the Transportation System Management and High Occupancy Vehicle Lane Alternatives in the future analysis year of 2035. It would not address the project purpose and need. It assumes no major construction on Route 1

through the project limits other than currently planned and programmed improvements and continued routine maintenance. Planned and programmed improvements included in the No-Build Alternative are the following improvements contained in the 2010 Regional Transportation Plan:

- Installation of median barrier on Route 1 from Freedom Boulevard to Rio Del Mar Boulevard.
- Construction of auxiliary lanes between the Soquel Avenue-Soquel Drive and Morrissey Boulevard interchanges (EA 05-0F6500, completed May 2013).
- Replacement of the La Fonda Avenue overcrossing of Route 1, included as part of the Soquel-Morrissey Auxiliary Lanes project.

Also included in the No-Build Alternative are a number of locally-sponsored projects for improving the local arterial network and constructing or improving bicycle lanes.

Tier II Project

The Tier II Project is located on Route 1 between 41st Avenue and Soquel Avenue, between Route 1 post miles 13.5 and 14.9 in Santa Cruz County. The Tier II project purpose matches that of the Santa Cruz County Route 1 High Occupancy Vehicle project, that is, reducing congestion and encouraging use of alternative transportation modes as a means to increase system capacity, except that encouraging carpooling is not a part of the Tier II project purpose.

- Auxiliary Lanes

It is proposed to widen Route 1 by adding an auxiliary lane to both the northbound and southbound sides between the 41st Avenue and Soquel Drive interchanges. The total roadway widening would be approximately 1.2 miles in length. Southbound, the auxiliary lane would begin at the existing Soquel Drive on-ramp, and end at the existing off-ramp at 41st Avenue. Northbound, the auxiliary lane would begin just south of the 41st Avenue overcrossing, at the existing loop on-ramp to northbound 41st Avenue. West of the overcrossing, the on-ramp from southbound 41st Avenue to northbound Route 1 would merge with the new auxiliary lane, approximately 1,000 feet downstream from its beginning at the bottom of the loop ramp.

As part of the widening in the northbound direction, the project proposes to repair the pavement failure in the outside lane and shoulder by improving the pavement section, installing a retaining wall, and if necessary, replacing the underlying county-owned sanitary sewer.

- Pedestrian Features

A new horseshoe-shaped pedestrian overcrossing at Chanticleer Avenue is proposed, and approximately 400 feet of sidewalk would be constructed along the south side of Soquel Avenue, starting at Chanticleer Avenue.

- Retaining Walls

Retaining walls would be constructed as part of the roadway widening, with a total of four separate walls: three on the northbound side of the highway and one on the southbound side. Three of the walls would be located to allow widening for a future lane on the highway, in both directions. The wall proposed along the northbound on-ramp at 41st Avenue would require

demolition in the event the highway was widened in the future. Two of the walls would span Rodeo Creek Gulch, where there is an existing 9 foot arch concrete culvert, and one would be constructed within a narrow jurisdictional area on the northbound side of Route 1, adjacent to a 39 inch culvert crossing.

- Right-of-Way

Right-of-way would be acquired along Soquel Avenue west of Chanticleer Avenue and at the Chanticleer Avenue cul-de-sac north of the highway, along with temporary construction easements on both sides of Route 1 near the proposed overcrossing.

Table 1 lists the disturbed soil area (DSA), existing, added and total impervious areas for the Tier I and Tier II Projects. The DSA was calculated by adding the cut and fill areas, reconstruction of pavement, and any potential construction staging areas and access needs.

Table 1. DSA and Impervious Area

Project Alternative	DSA	Existing Impervious Area	Added Impervious Area	Total Impervious Area after Construction
Tier I: HOV	250 ac (101 ha)	124.7 ac (50.5 ha)	63.5 ac (25.7 ha)	188.2 ac (76.2 ha)
Tier I: TSM	101 ac (41 ha)		21.8 ac (8.8 ha)	146.5 ac (59.3 ha)
Tier II Project	18.5 ac	35 ac	4.9 ac	39.9 ac

The Project is located in the two Municipal Separate Storm Sewer Systems (MS4s). Those areas within the City of Santa Cruz are located within the City of Santa Cruz MS4 and all other areas are within the combined Santa Cruz County and City of Capitola MS4.

2. Define Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

The Project is within the jurisdiction of the Region 3, Central Coast Regional Water Quality Control Board (RWQCB).

Hydrologic Units (HU)

The Project limits are bounded by the Larkin Valley Road/San Andreas Road Interchange to the south and by the Morrissey Boulevard interchange to the north. The Hydrologic Units (HU) covered within this reach are Pajaro River (HU 305) and Big Basin (HU 304). The Hydrologic Sub-Areas (HSA) covered within this reach are an undefined HSA in Watsonville (305.10), Aptos-Soquel (304.13), and San Lorenzo (304.12) HSAs in Santa Cruz.

Receiving Water Bodies

Sixteen waterways and two lagoons are the direct receiving water bodies for Route 1 along this reach: Valencia Channel, Valencia Lagoon, Valencia Creek, Aptos Creek, Ord Gulch, Borregas Creek, Pot Belly Creek, Tannery Gulch, an unnamed tributary to Tannery Gulch, Nobel Creek, Soquel Creek, Soquel Lagoon, Rodeo Creek Gulch, Arana Gulch, the tributary to Arana Gulch at Station 175+98, the tributary to Arana Gulch at Station 177+92, the tributary to Arana Gulch at Station 183+01, and an unnamed water of the U.S. at Station 49+65. A vicinity map is included in the attachments of this report that identifies the locations of the water body crossings.

All waterways listed above are the direct receiving water bodies for the Tier I Project alternatives. Only Soquel Creek, Rodeo Creek Gulch, and Arana Gulch are the direct receiving water bodies for the Tier II Project.

Soquel Lagoon is an artificial lagoon created by the City of Capitola. It was constructed by building a sand bar to the ocean at the outlet of Soquel Creek. Both this lagoon and Aptos Creek are under the City of Capitola's management. The Soquel Lagoon is designated as a California's Critical Coastal Area (CCA) by the California Coastal Commission.

2010 Clean Water Act 303(d) List

Table 2 lists the five direct receiving water bodies listed on the *2010 State Water Resource Control Board (SWRCB) Clean Water Act (CWA) Section 303(d) list for Water Quality Limited Segments*.

Table 2. Water Bodies on the 303(d) List

Water Body Name	Pollutant	Source
Valencia Creek	Pathogens	Source Unknown
	Sedimentation/Siltation	Agriculture, Construction/Land Development
Aptos Creek	Pathogens	Collection System Failure, Natural Sources, Onsite Wastewater Systems (Septic Tanks), Pasture Grazing-Riparian and/or Upland, Urban Runoff/Storm Sewers
	Sedimentation/Siltation	Disturbed Sites (Land Development), Channel Erosion
Soquel Lagoon	Pathogens	Urban Runoff/Storm Sewers, Collection System Failure, Transient Encampments, Onsite Wastewater Systems (Septic Tanks), Pasture Grazing-Riparian and/or Upland
	Sedimentation/Siltation	Construction/Land Development
Soquel Creek	Enterococcus	Collection System Failure, Natural Sources, Transient Encampments, Urban Runoff/Storm Sewers
	Escherichia coli (E. coli)	Collection System Failure, Natural Sources, Onsite Wastewater Systems (Septic Tanks), Transient Encampments, Urban Runoff/Storm Sewers
	Fecal Coliform	Collection System Failure, Natural Sources, Onsite Wastewater Systems (Septic Tanks), Transient Encampments, Urban Runoff/Storm Sewers
	Turbidity	Source Unknown
Rodeo Creek Gulch	Turbidity	Source Unknown
	pH	Source Unknown

Source: SWRCB, 2010

Total Maximum Daily Load (TMDL)

A combined TMDL for pathogens has been established for Aptos and Valencia creeks, and a separate TMDL for pathogens has been established for Soquel Creek. Table 3 lists the approval dates for these TMDLs. Soquel Lagoon and Soquel Creek have an estimated TMDL completion date of 2011 for pathogens. Valencia Creek and Aptos Creek have an estimated TMDL completion date of 2011 for pathogens, and should not be delisted from the 303(d) list.

Table 3. Pathogen TMDL Approval Dates

Water Body	Regional Water Quality Control Board Approval Date	State Water Resources Control Board Approval Date	California Office of Administrative Law Approval Date	US EPA Approval Date
Aptos/Valencia creeks	May 8, 2009	August 3, 2010	October 29, 2010	January 20, 2011
Soquel Lagoon	May 8, 2009	July 6, 2010	September 15, 2010	November 17, 2010

Source: SWRCB, 2010

The 303(d) list shows a proposed TMDL completion date for sedimentation/siltation for Aptos Creek, Valencia Creek, and Soquel Lagoon of 2021, a proposed TMDL completion date for turbidity for Soquel Creek and Rodeo Creek Gulch of 2021, and a proposed TMDL completion date for pH for Rodeo Creek Gulch of 2021. Currently, no information is available on the RWQCB website for the status of these TMDLs.

High Risk Areas

The District Work Plan does not identify any drinking water reservoirs or recharge facilities within or near the Project area.

Beneficial Uses

The RWQCB *Basin Plan* (Water Quality Control Plan for the Central Coastal Basin 2011) provides the following beneficial uses for the Project's direct receiving water bodies:

- Valencia Lagoon – Water contact recreation (REC-1), non-contact water recreation (REC-2), wildlife habitat (WILD), warm freshwater habitat (WARM), spawning, reproduction and or/early development (SPWN), rare, threatened or endangered species (RARE), commercial and sport fishing (COMM)
- Valencia Creek – Municipal and domestic supply (MUN), groundwater recharge (GWR), REC-1, REC-2, WILD, cold freshwater habitat (COLD), migration of aquatic organisms (MIGR), SPWN, COMM
- Aptos Creek – MUN, Agricultural Supply (AGR), Industrial Process Supply (IND), GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, preservation of biological habitats of special significance (BIOL), estuarine habitat (EST), freshwater replenishment (FRESH), COMM
- Soquel Creek – MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, BIOL, FRESH, COMM
- Soquel Lagoon – REC-1, REC-2, WILD, COLD, MIGR, SWPN, RARE, EST, COMM
- Rodeo Creek Gulch – MUN, AGR, IND, GWR, REC-1, REC-2, WILD, COLD, SPWN, FRESH, COMM
- Arana Gulch – MUN, GWR, REC-1, REC-2, WILD, COLD, MIGR, SPWN, RARE, FRESH, COMM

All other Project receiving water bodies do not have designated beneficial uses; however, the *Basin Plan* states that, "Surface water bodies within the Region that do not have beneficial uses designated for them in Table 2-1 [of the *Basin Plan*] are assigned the following designations: municipal and domestic water supply [and] protection of both recreation and aquatic life."

Local Agencies

There are no specific requirements from local agencies known at this phase. Both MS4s within the Project have *Storm Water Management Programs* with temporary and permanent stormwater requirements and standards. While all work is anticipated to be within Caltrans R/W, these local requirements would be considered for any potential impacts to areas outside of Caltrans R/W.

Climate

Santa Cruz County has a Mediterranean climate with low humidity and sunshine approximately 300 days a year. The general climate pattern in the Project area is characterized by relatively stable temperatures year round. The average temperature is between 50ºF to 65ºF (10ºC and 18ºC). In the southern part of the Project area and in the segment of Route 1 near the northern

end, the mean annual precipitation is between 25 to 28 in. (64 cm and 71 cm). The part of the Project area near Aptos has a mean annual precipitation of 29 in. (74 cm).

Based on the Caltrans *Storm Water Management Plan,* there is an increased chance of rain events occurring between October 15 and April 15.

Topography

The Project area between San Andreas Road and Rio Del Mar Boulevard ranges in elevation from 20 to 400 ft (6.1 m to 121.9 m). The part of the Project area within the limits of Aptos ranges in elevation from 100 to 800 ft (30.5 m to 243.8 m), and the area between Aptos and the north end of the Project is within an elevation range of 20 to 900 ft (6.1 m to 274.3 m). The segment of Route 1 near the northern end of the Project limits is near coastal terraces, with some parts of the Project limits on the lower slopes of the Santa Cruz Mountains.

Soil Characteristics

A Geologic and Seismic Section report was prepared for the Project. Table 4 summarizes the underlying native soil units and their impact from drainage and permeability. The Geologic and Seismic Section report concluded that the upper soil zone appears to have been prepared during construction activities. The existing highway might have been constructed with the native upper soil. The upper pavement section consists of imported material (base and sub-base). Soils in the Project area are mainly loam sand to sandy loam. The permeability (hydraulic conductivity) of the area is moderately high to high and runoff is very slow to high.

Erosion Potential

The Geologic and Seismic Section report also included erosion and sedimentation evaluations for the Project. Based on the evaluated soil units from Table 4, there are two types of soil units that have high runoff potential. These are Baywood loamy sand (105, 106) and Zayante coarse sand (182). The evaluation of soil units also revealed a high erosion hazard for Baywood loamy sand (105, 106). Drainage features for the soils in the Project area were classified as poorly drained to excessively drained, and the erosion hazard is moderately low to high. Log of test borings (LOTBs) that were evaluated are submerged cohesionless subsoils and were classified as primarily medium dense to very dense. Liquefaction susceptibility was low in the majority of the Project area, except for two locations: the Park Avenue undercrossing (UC) and Bay Area Avenue UC, where loose sands were encountered.

Table 4. Soil Units, Permeability, Drainage, Runoff, Erosion Hazard, and Hydrologic Soil Groups (HSGs)

Soil Unit	Map Unit Name	Surface texture	Permeability	Slope (%)	Drainage	Runoff	Erosion Hazard	HSG
105 106	Baywood loamy sand	Loamy sand	High	2-15 15–30	Excessively drained	High	High	A
114	Ben Lomond - Felton	Sandy loam	High	30-50	Well drained	Moderately slow	Moderately low	B
116	Bonny Doon loam	Loam	Moderately high	5–30	Excessively drained	Slow	Low	Not Found
124	Danville loam	Loam	High	0-2	Well drained	Slow	Low	Not Found
129 130	Elder sandy loam	Sandy loam	Moderately high	0-2 2-9	Well drained	Moderately slow	Moderately low	Not Found
133 134 135 136	Elkhorn sandy loam	Sandy loam	High	2-9 9-15 15-30 30-50	Well drained	Moderately slow	Moderately low	B
143	Lompico-Felton complex	Loam	High	30-50	Well drained	Moderately slow	Moderately low	B
161 162	Pinto loam	Loam	Moderately high	0-2 2-9	Moderately well drained	Slow	Low	C
170 171	Soquel loam	Loam	Moderately high	0-2 2-9	Moderately well drained	Moderately slow	Moderately low	B
174	Tierra Watsonville Complex	Sandy loam	Moderately high	15-30	Moderately well drained	Very slow	Moderately low	Not Found
176 177 178 179	Watsonville loam	Loam	Moderately high	2-9 9-15 15-30 30-50	Poorly drained	Very slow	Moderately low	Not Found
182	Zayante coarse sand	Coarse sand	High	9-15	Excessively drained	High	Low	A

Source: Geologic and Seismic Section, 2008

Groundwater Information

The Geologic and Seismic Section report provides groundwater information based on the as-built logs of test borings and is summarized in Table 5. Based on the groundwater findings, there are two locations within the study limits that are characterized by groundwater depths that would make media filters and infiltration devices infeasible treatment options: the Freedom Boulevard/Rob Roy Junction overcrossing and the Morrissey Avenue overcrossing. Media filters and infiltration devices both require at least a 10 ft (3.1 m) clearance between the groundwater elevation and the bottom of the treatment device. Further borings would be performed during the design phase to evaluate groundwater depths beyond these areas.

Table 5. Groundwater Conditions

Bridge / Structure	Subsoil Condition	Groundwater Depth below existing ground surface	
		(ft)	(m)
San Andreas Road/Larkin Valley Road undercrossing	10 to 30 ft (3 to 9 m) thick surficial deposits, overlying with very dense clayey/silty sand	Not encountered	Not encountered
Freedom Boulevard/Rob Roy Junction overcrossing	20 ft (6 m) of loose to dense silty/clayey sand overlying with dense gravelly sand	3 to 20 ft	0.9 to 6.1 m
Rio Del Mar Boulevard overcrossing	27 ft (8 m) of dense to very dense silty sand overlying with dense gravelly sand	Not encountered	Not encountered
State Park Drive overcrossing	25 to 40 ft (8 to 12 m) of loose to dense silty/clayey sand	Not encountered	Not encountered
Park Avenue undercrossing	50 ft (15 m) of dense to very dense clayey sand overlying with very dense silty sand with cemented layer	41 to 54 ft	12.5 to 16.5 m
Bay Avenue undercrossing	15 ft (5 m) of stiff to very stiff silty/sandy clay overlying with loose to very dense silty/clayey/gravelly sand	23 to 26 ft	7.0 to 7.9 m
Soquel Creek Bridge	Stiff to very stiff sandy/silty clay imbedded with dense to very dense silty/gravelly sand	19 to 40 ft	5.8 to 12 m
41st Avenue overcrossing	25 ft (8 m) of medium dense to dense silty sand overlying with very dense sand	29 to 31 ft	8.8 to 9.4 m
Morrissey Avenue overcrossing	Dense to very dense silty sand	1 ft	0.3 m

Note: The as-built LOTBs for North Aptos undercrossing, Aptos Creek bridge, Capitola Avenue overcrossing, Soquel Drive overcrossing, and La Fonda Avenue overcrossing were not available.

Source: Geologic and Seismic Section, 2008

Hazardous Waste Material

There is potential for Aerially Deposited Lead (ADL) contamination. ADL plans, details and specifications for the handling of ADL contaminated soils would be developed during the design phase. An Initial Site Assessment (ISA) was performed by Parsons in late 2006 to early 2007.

The study footprint included areas 1 mi (1.6 km) on either side of the center line and beyond the northern and southern Project limits.

Out of 110 potential hazardous waste sites, three sites are within or adjacent to the Project limits; these are shown in Table 6. These three sites will be reassessed if it is determined that groundwater was affected by any release of hazardous contaminants and that the Project's activities may be affected by these contaminants.

Table 6. Summary of Known Hazardous Materials Sites

Map Location	Address	City	Site Name	Lists	Substance	Status
Hazardous Waste Sites within Proposed Right-of-Way: HOV Lane Alternative						
12	2435 41st Avenue	Santa Cruz	San Lorenzo Lumber Co	-HAZNET -LUST -Cortese	Waste oil and mixed oil, unspecified solvent mixture waste, and gasoline (soil only)	Recycler Case closed
13	836 Bay Avenue	Capitola	AJ's Fuel Market Exxon Station 7-3604	-LUST -SWEEPS -UST -RCRA--SQG -FINDS -HIST UST -Cortese	Gasoline (other groundwater affected), premium unleaded and waste oil, small quantity generator, regular gasoline, and waste oil	Post remedial action monitoring. No violations found
4	619 San Juan Avenue	Santa Cruz	McLean, Robertson and Rosa	-Cortese	Additional information was not available through RWQCB, California EPA, or DTSC	
Hazardous Waste Sites within Proposed Right-of-Way: TSM Alternative						
There are no properties of concern located within the proposed right-of-way for the TSM Alternative.						

A limited site investigation from the Soquel Avenue interchange to the Morrissey Boulevard interchange was completed and documented by GEOCON Consultants in the *Limited Site Investigation Report* (October, 2010). Although this investigation was not completed within the Tier II Project limits, the investigation results were assumed to also be relevant at the Tier II Project site because of its close proximity. This assumption is consistent with the Environmental Document.

A total of 77 soil samples were collected from 19 soil borings, and a total of 44 soil samples were collected from 11 retaining wall borings. The borings ranged in maximum depth from 4.5 ft (1.4 m) to 16 ft (4.9 m); groundwater was not encountered during the site investigation. Soils along the Route 1 southbound shoulder were classified as hazardous from the surface to a depth of 1.5 ft (0.5 m), and non-hazardous between depths 1.5 ft (0.5 m) to 4.5 ft (1.4 m). Along the Route 1 northbound shoulder, soils were classified as hazardous from the surface to a depth of 4 ft (1.2 m), and non-hazardous between 4 ft (1.2 m) and 4.5 ft (1.4 m). Groundwater is not expected to be affected by the hazardous contaminants because it was not encountered during the site investigation, and is assumed to be beneath the layer of hazardous materials. Disturbance of

the hazardous materials during construction activities may affect the water quality of the receiving water bodies.

Construction General Permit

In accordance with National Pollutant Discharge Elimination System (NPDES) regulations to minimize the potential effects of construction runoff on receiving water body quality, the State requires that any construction activity affecting 1 acre or more must obtain coverage under the "NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities" (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWG), or Construction General Permit (CGP). Permit applicants are required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement best management practices (BMPs) to reduce construction effects on receiving water quality.

Because the construction dates for the Tier I Project is unknown at this time, the risk assessment was not evaluated for the Tier I Project. The risk assessment will be determined at a later date when more information is available. Due to the length of the Tier II Project and because there are multiple receiving water bodies, multiple risk assessments were completed based on the Project planning watersheds. Table 7 lists the planning watersheds and risk factors used to determine the risk levels for the Tier II Project. A map of the planning watersheds is included in the attachments. The planning watersheds in the Tier II Project limits span from Soquel Point to the Mouth of San Lorenzo

Table 7. Risk Assessment by Planning Watershed-Tier II Project

Planning watershed	R	K	LS	Sediment Risk	Receiving Water Risk	Risk Level
Soquel Point	98.68	0.32	1.51	Medium	High	2
Mouth of San Lorenzo			1.59	Medium	High	2

The sediment risk factor is determined from the product of the rainfall runoff erosivity factor (R), the soil erodibility factor (K), and the length-slope factor (LS). The R factor was determined from the United States Environmental Protection Agency's "Rainfall Erosivity Factor Calculator," and the K and LS factors were determined from the Caltrans Water Quality Planning Tool. The sediment risk is medium for both planning watersheds in the Tier II Project because the product of the R, K, and LS factors is greater than 15 but less than 75.

The receiving water risk can be classified as low or high. The receiving water risks are confirmed by examining whether the Project's receiving water bodies are on the 303(d) list for sedimentation/siltation or have the beneficial uses of COLD, SPWN and MIGR. Rodeo Creek Gulch and Soquel Creek are on the 303(d) list for sedimentation, and Soquel Creek and Arana Gulch also have the beneficial uses of COLD, SPWN and MIGR. Therefore, the receiving water risk is classified as high.

A more detailed risk assessment will be completed during the design phase of the Project. The requirements for Risk Level 2 and Risk Level 3 projects are presented in Attachment D and E of the CGP, respectively. Section 6 of this report discusses the temporary construction site BMP measures considered for this Project.

Measures for Avoiding or Reducing Potential Storm Water Impacts

The horizontal and vertical profiles of the roads at the Project site were constrained by the existing freeway alignment and commercial/residential buildings adjacent to the R/W; therefore, the Project could not be relocated or realigned. However, the Project scope was revised to reduce or avoid impacts to environmentally sensitive areas (ESAs), thereby reducing the potential for storm water impacts.

In addition, cut and fill areas were minimized and retaining walls were specified to reduce steepness of slopes and avoid ESAs.

Areas in which slopes are steeper than 1:4 (V:H) would require an advisory design exception and approval from the District Landscape Architect. All work in creeks and waterways would be scheduled per regulatory requirements. Maintenance pullouts would be considered for the Project, and side slopes would be specified to be as flat as possible to allow for ease of maintenance.

Concentrated flows would be collected into stabilized drains and channels. Benches or terraces on high cut and fill slopes would be proposed whenever feasible to reduce concentrated flows discharging over steep slopes.

Existing Treatment Best Management Practices and Right-of-Way

Four treatment BMPs within the project limits were installed as part of the Soquel to Morrissey Auxiliary Lane project (see Table 8).

Table 8. Existing Treatment BMPs

Begin PM	End PM	Type Treatment BMP	Side	Origin Project
15.059	15.173	Bio-Strip	Lt	05-0F6504
15.427	15.503	Bio-Strip	Rt	05-0F6504
15.671	15.730	Bio-Swale	Rt	05-0F6504
15.705	15.729	Bio-Swale	Rt	05-0F6504

If R/W is being acquired for the Project, suitable R/W should also be acquired for treatment BMP placement. Permanent access easements might also be needed for access to treatment BMPs for workers' safety.

The Tier I Project HOV Lane Alternative would require acquisition of R/W from the following areas: vacant land parcels, residential single and multi-family parcels, and commercial and industrial parcels. This alternative would also require temporary easements and other parcels. There are several restrictions for acquiring additional R/W for treatment BMPs within the Tier I Project limits; these include ESAs adjacent to these areas and R/W costs.

The Tier I Project TSM Alternative would require acquisition of R/W from the following areas: vacant land parcels, residential single and multi-family parcels, and commercial and industrial parcels. It would also require temporary easements and other parcels.

For the Tier II Project, R/W would be acquired along Soquel Avenue west of Chanticleer Avenue and at the Chanticleer Avenue cul-de-sac north of the highway, along with temporary construction easements on both sides of Route 1 near the proposed overcrossing. The Tier II Project would not require acquisition of additional R/W for treatment BMPs.

3. Regional Water Quality Control Board Agreements

There are currently no negotiated understandings and/or agreements with the Region 3, Central Coast RWQCB at this time. Communication with the RWQCB would be coordinated through the Regional Storm Water Coordinator.

Under Section 401 of the federal Clean Water Act, projects involving impacts to waters of the U.S., including wetlands, require certification from the RWQCB. This Project's goal is to minimize impacts to these ESAs. Due to the close proximity of the existing highway to these ESAs, some impacts would be unavoidable.

Permits from the following agencies are anticipated. Some of the agencies that issue these permits have differing jurisdiction over all or specific parts of the Project, depending on the resources present at any one location along each Project segment. Therefore, specific permit jurisdiction and requirements would be determined at the time applications are prepared or sought.

- California Department of Fish and Wildlife (1602 Permit)
- Region 3, Central Coast RWQCB (401 Water Quality Certificate)
- U.S. Army Corps of Engineers (404 Permit)
- California Coastal Commission (Local Coastal Program Permit)
- Caltrans (Notice of Intent)
- Dewatering Permit
- City of Santa Cruz (General Permit)
- National Oceanic and Atmospheric Administration Biological Opinion (for Fisheries)

4. Describe Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow

With an increase in impervious area from widening the existing roadway, there would also be an increase in the volume of downstream flow from the roadway. In order to prevent downstream erosion, various measures such as sediment control or design pollution prevention BMPs would be implemented to mitigate potential velocity increases, stabilize slopes, and minimize erosion potential.

Hydromodification mitigation measures are not yet required for this Project; however, Caltrans' Municipal Separate Storm Sewer Systems (MS4) permit (order No. 99-06 DWQ), adopted in September 2012, has provisions for hydromodification consideration. The MS4 permit sets the threshold at 10,000 ft^2 of additional impervious area (see Pages 46 and 47 of the draft NPDES Tentative Order).

In addition, the Region 3, Central Coast RWQCB is currently working with the local MS4s to develop a joint effort hydromodification and Low Impact Development management plan. To ensure storm water runoff from this Project minimizes downstream effects and provides water quality benefits, the drainage and storm water design would include efforts to maintain pre-construction storm water discharge flows to the maximum extent practicable. These efforts include metering or detaining flows to pre-construction rates prior to discharge to a receiving water body or to an MS4 system. By implanting these design measures, permanent water quality impacts are not anticipated to be significant.

Design pollution prevention BMPs to be considered for this Project include flared end sections and energy dissipation devices such as rock slope protection, which would be provided at culvert outlets to reduce velocities and prevent scour. Any disturbed areas in channels where it is feasible for vegetation to grow shall be re-vegetated to minimize the sediment loading potential.

The preliminary sample infiltration calculations using the T-1 Infiltration Tool are included in the attachments. Detailed calculations and the design of the biofiltration strips would be completed during the design phase. The T-1 Infiltration Tool would also be utilized in the design phase to examine whether the post-construction hydrographs are meeting the pre-construction hydrographs. Detention/underground storage would be considered only if the T-1 Infiltration Tool shows that post-construction flows still do not meet pre-construction flows after amending the Project soils.

Table 9 and Table 10 list the direct receiving water bodies and compare the existing watershed areas to the amount of impervious area created by the Tier I and Tier II Projects, respectively. These analyses only consider the increase in impervious areas and do not factor in the soil types within the watershed.

Table 9. Comparison of Receiving Water Bodies between TSM and HOV Lane Alternatives in Tier I Project

Crossing	Increased Impervious Area from Tier I Project				Overall Watershed Area (ac)	Overall Watershed Area (ha)	Percentage Increase in Overall Watershed Area	
	HOV Lane (ac)	HOV Lane (ha)	TSM (ac)	TSM (ha)			HOV Lane	TSM
Unnamed water of the U.S.	0	0	0	0	Not available		Not calculated	Not calculated
Valencia Channel	9.19	3.72	1.77	0.72	Not available		Not calculated	Not calculated
Valencia Creek	3.40	1.38	0.44	0.18	4,106	1,662	0.08%	0.01%
Aptos Creek	10.56	4.27	5.32	2.15	15,360	6,216	0.07%	0.03%
Ord Gulch	1.89	0.76	1.11	0.45	156	63	1.21%	0.71%
Pot Belly Creek	0.86	0.35	0.61	0.25	82	33	1.05%	0.75%
Borregas Creek	1.37	0.55	0.99	0.40	116	47	1.18%	0.85%
Tannery Gulch	1.73	0.70	0.83	0.33	797	323	0.22%	0.10%
Unnamed tributary to Tannery Gulch	1.86	0.75	0.49	0.20	146	59	1.28%	0.34%
Nobel Creek	5.90	2.39	1.71	0.69	614	248	0.96%	0.28%
Soquel Creek	13.79	5.58	2.27	0.92	27,520	11,137	0.05%	0.01%
Rodeo Creek Gulch	2.39	0.97	1.35	0.55	1,572	636	0.15%	0.09%
Arana Gulch	6.30	2.55	4.49	1.82	2,239	906	0.28%	0.20%
Tributary to Arana Gulch at Sta 175+98	0.38	0.15	0.15	0.06	71	29	0.53%	0.21%
Tributary to Arana Gulch at Sta 177+92	0.70	0.29	0.24	0.10	113	46	0.62%	0.21%
Tributary to Arana Gulch at Sta 183+01	3.00	1.22	0.00	0.00	Not available		Not calculated	Not calculated

Table 10. Receiving Water Bodies in Tier II Project

Location	Increased Impervious Area from Tier II Project (mi^2)	Existing Watershed Area (mi^2)	Percentage Increase in Overall Watershed Area (%)
Soquel Creek	0.0019	43	0.005
Rodeo Creek Gulch	0.0029	2.5	0.12
Arana Gulch	0.0028	3.5	0.08

Slope/Surface Protection Systems

Existing slopes within the Project limits (along Route 1) vary from flat to steep. Based on the preliminary typical cross sections, slopes are either 1:4 (V:H) or 1:2 (V:H). 1:2 (V:H) slopes are mostly concentrated in the San Andreas Road/Larkin Valley Road and Route 1 interchange to the southeast of Route 1. However, these side slopes vary throughout the Project. Steep slopes near the bridges are not accessible to maintenance crews. Based on field observations, these slopes are covered with bare soil and large rocks with some vegetation, gullies, and rills. Slope protection systems may be considered for these steep areas. Flatter slope areas are currently vegetated and in good condition. In general most slopes are stabilized and have vegetation on them. The Erosion Control Plans, to be developed during the design phase, would address slope stabilization in more detail.

Where feasible, the Project would propose to flatten the existing steep cut and fill slopes located along the Project limits from the existing edge of pavement to existing R/W. Sound walls and/or retaining walls, and benches or terraces are proposed in very steep areas. Existing slopes are proposed to be rounded at select locations. In other areas, surface protection systems would be implemented, such as erosion control or the addition of hard surfaces by slope paving.

All disturbed areas that would remain unpaved would be re-vegetated (with the exception of shoulder backing) with permanent erosion control measures. These measures would be detailed during the design phase and may include hydroseeding with a native seed mixture, mulch, tackifier, and compost. During construction, temporary erosion control measures or construction site BMPs would be implemented to protect disturbed soil areas and minimize or prevent erosion. Permanent erosion control consists of establishment of permanent cover to stabilize disturbed or exposed areas after construction is completed. Vegetated surfaces and plantings would help to provide permanent slope protection.

The selection of permanent erosion control measures should depend on soil steepness and soil conditions. In general flat areas would require less permanent erosion control whereas steep areas would require a more extensive deployment of permanent erosion control measures. The application rate and percent soil binder should be increased as the slope increases. It should be noted that it could be difficult to establish vegetation on steep slopes. Some soil types (e.g. coarse sandy infertile soils on cut slopes) are also difficult to vegetate.

The Project site would be evaluated to determine appropriate vegetation and planting strategies. The length of time for permanent vegetation to be established would also be determined.

Slope paving may be specified under bridges to protect these slopes from discharges from bridge column drains. These areas generally do not get exposed to sunlight; therefore, vegetation would not readily grow at these locations.

Concentrated Flow Conveyance Systems

Concentrated flow conveyance systems such as ditches, berms, dikes, swales, overside drains, flared end sections, and outlet protection/velocity dissipation devices may be designed to intercept and divert surface flows and convey these flows or discharge with minimal soil erosion. Dikes would route the water to existing and proposed drainage inlets. Outlet protection/velocity dissipation BMPs may be placed at all outlets of drainage systems. Placing outlet

protection/velocity dissipation systems would help control erosion at outlets and would maintain side slopes. Specific locations of these concentration flow conveyance systems will be evaluated during the design phase.

Preservation of Existing Vegetation

Preservation of existing vegetation involves the identification and protection of desirable vegetation that provides erosion and sediment control benefits. All vegetation to be retained would be coordinated with the environmental planners, biologists, and landscape architects working on the Project. All areas to be preserved will be delineated on the Project plans, which would be developed during the design phase. According to a wetlands assessment study, there are wetland areas and other waters of the U.S. within the Project limits (Morro Group, Inc., June 2007). These wetlands areas are ESAs and should be protected. Coordination with the District Environmental and Construction departments would be made to determine the limits of work in order to preserve existing vegetation to the maximum extent practicable.

Consideration of the Project changes to increase preservation or avoid critical areas such as floodplains, wetlands, problem soils, and steep slopes shall be performed in order to protect ESAs. Table 11 and Table 12 list the jurisdictional wetlands and other waters within the Tier I Project limits for the HOV alternative and the TSM Alternative, respectively. Table 13 lists the jurisdictional wetlands and other waters within the Tier II Project limits. Additional mitigation proposed to address the permanent impacts to jurisdictional areas from the Tier II Project is discussed in the *Wetland Assessment Report*.

Table 11. Jurisdictional Areas in the BSA- HOV Alternative under Tier I Project

Site No.	Jurisdictional Area (WITHIN COASTAL ZONE)		ACOE Jurisdiction				Impacts to CCC/CDFG Jurisdiction[1]	
			Impacts to Wetlands		Impacts to Other Waters			
			Acre	Sq. Meter	Acre	Sq. Meter	Acre	Sq. Meter
1a, 1b	Valencia Channel and Lagoon	Permanent	0	0			0	0
		Temporary	0	0			0	0
2a	Valencia Creek roadside ditches	Permanent			0.03	128	0.03	128
		Temporary			0.00	0	0.00	0
2b	Valencia Creek/ Aptos Creek	Permanent	0.15	592			1.38	5,592
		Temporary	0.02	67			0.26	1,048
3	Ord Gulch	Permanent	0.09	378	0.01	50	1.50	6,058
		Temporary	0	0	0	0	0.06	246
4	Borregas Creek	Permanent	0	0			0.03	127
		Temporary	0	0			0.04	166
5	Potbelly Creek	Permanent	0	0			0.04	175
		Temporary	0	0			0.01	30
6	Tannery Gulch	Permanent	0	0			0	0
		Temporary	0	0			0	0
7	Tannery Gulch Tributary	Permanent						
		Temporary						
8	Monterey Avenue /Nobel Creek	Permanent	0.00	5	0	0	0.24	983
		Temporary	0.01	56	0	0	0.09	368
SUBTOTAL			*0.27*	*1,098*	*0.04*	*178*	*3.69*	*14,921*

Site No.	Jurisdictional Area (OUTSIDE COASTAL ZONE)		ACOE Jurisdiction				Impacts to CDFG Jurisdiction[2]	
			Impacts to Wetlands		Impacts to Other Waters			
			Acre	Sq. Meter	Acre	Sq. Meter	Acre	Sq. Meter
6	Tannery Gulch	Permanent	0	0			0	0
		Temporary	0	0			0	0
8	Monterey Avenue /Nobel Creek	Permanent			0	0	0	0
		Temporary			0	0	0	0
9	Soquel Creek	Permanent	0.30	1,228			1.01	4,086
		Temporary	0.07	301			0.21	831
10a	Rodeo Gulch	Permanent	0	0			0.15	596
		Temporary	0	0			0.08	308
10b	Soquel Drive-Inn roadside ditch	Permanent			0.04	179	0.04	179
		Temporary			0.04	166	0.04	166
11	Arana Gulch	Permanent	0.20	797			3.34	13,517
		Temporary	0.12	469			0.36	1,473
12	La Fonda Road Shoulder	Permanent	0.04	163				
		Temporary	0.00	0				
13	Arana Gulch Tributary	Permanent			0.07	288	1.22	4,938
		Temporary			0.06	241	0.26	1,057
SUBTOTAL			*0.73*	*2,958*	*0.22*	*874*	*6.71*	*27,151*

ACOE Jurisdiction – Impact Totals		1.00	4,056	0.26	1,052		
CDFG Jurisdiction – Impact Total						10.40	42,072
CCC Jurisdiction – Impact Total						3.69	14,921

[1] *CDFG/CCC jurisdiction includes ACOE areas.*

[2] *CDFG jurisdiction includes ACOE areas.*

Source: SWCA, 2010

Table 12. Jurisdictional Areas in the BSA- TSM Alternative under Tier I Project

Site No.	Jurisdictional Area (WITHIN COASTAL ZONE)		ACOE Jurisdiction				Impacts to CCC/CDFG Jurisdiction[1]	
			Impacts to Wetlands		Impacts to Other Waters			
			Acre	Sq. Meter	Acre	Sq. Meter	Acre	Sq. Meter
1a, 1b	Valencia Channel and Lagoon	Permanent	0	0			0	0
		Temporary	0.00	14			0.00	14
2a	Valencia Creek roadside ditches	Permanent			0.02	65	0.02	65
		Temporary			0.00	1	0.00	1
2b	Valencia Creek/ Aptos Creek	Permanent	0.05	190			0.31	1,257
		Temporary	0.02	92			0.22	904
3	Ord Gulch	Permanent	0.09	378	0.06	251	1.56	6,296
		Temporary	0.00	0	0.00	0	0.06	236
4	Borregas Creek	Permanent	0	0			0.06	241
		Temporary	0	0			0.01	56
5	Potbelly Creek	Permanent	0	0			0.07	274
		Temporary	0	0			0.04	165
6	Tannery Gulch	Permanent	0	0			0	0
		Temporary	0	0			0	0
7	Tannery Gulch Tributary	Permanent						
		Temporary						
8	Monterey Avenue /Nobel Creek	Permanent	0	0	0	0	0.18	712
		Temporary	0.00	0	0	0	0.00	12
SUBTOTAL			*0.17*	*674*	*0.08*	*317*	*2.53*	*10,233*

Site No.	Jurisdictional Area (OUTSIDE COASTAL ZONE)		ACOE Jurisdiction				Impacts to CDFG Jurisdiction[2]	
			Impacts to Wetlands		Impacts to Other Waters			
			Acre	Sq. Meter	Acre	Sq. Meter	Acre	Sq. Meter
6	Tannery Gulch	Permanent	0	0			0	0
		Temporary	0	0			0	0
8	Monterey Avenue /Nobel Creek	Permanent			0	0	0.01	21
		Temporary			0	0	0	0
9	Soquel Creek	Permanent	0.06	242			0.27	1,091
		Temporary	0.01	39			0.03	113
10a	Rodeo Gulch	Permanent	0	0			0.11	443
		Temporary	0	0			0.00	0
10b	Soquel Drive-Inn roadside ditch	Permanent			0.01	56	0.01	56
		Temporary			0.02	95	0.02	95
11	Arana Gulch	Permanent	0.00	6			0.47	1,883
		Temporary	0.00	20			0.33	1,351
12	La fonda Road Shoulder	Permanent	0.03	133				
		Temporary	0.00	0				
13	Arana Gulch Tributary	Permanent			0.01	32	0.51	2,070
		Temporary			0.00	7	0.24	986
SUBTOTAL			*0.11*	*440*	*0.05*	*190*	*2.00*	*8,109*
ACOE Jurisdiction – Impact Totals			0.28	1,114	0.13	507		
CDFG Jurisdiction – Impact Total							4.53	18,342
CCC Jurisdiction – Impact Total							2.53	10,233

[1] *CDFG/CCC jurisdiction includes ACOE areas.*

[2] *CDFG jurisdiction includes ACOE areas.*

Source: SWCA, 2010

Table 13. Jurisdictional Areas in the BSA- Tier II Project

Site No.	Jurisdictional Area (Outside Coastal Zone)	Impacts to CDFW Jurisdiction	
		Permanent (ac)	Temporary (ac)
10a	Rodeo Gulch	0.13	0.09
10b	Soquel Drive-In roadside Ditch	0.02	0.06
CDFW Jurisdiction- Impact Totals		0.15	0.15

Source: Nolte Vertical Five, 2010

5. Describe Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy

This Project is considering treatment BMPs because it is a major reconstruction Project that directly or indirectly discharges to a surface water body and creates more than 1 ac (0.4 ha) of impervious surfaces.

The original treatment BMP strategy for this Project was developed according to the procedures presented in the July 2010 *Project Planning and Design Guide* (PPDG) with May 2012 updates. Based on these versions of the PPDG, the treatment BMP strategy was to consider treatment based on Targeted Design Constituents (TDCs). The TDC for Valencia Creek, Aptos Creek and Soquel Lagoon is sediment; Soquel Lagoon had the additional TDC of phosphorus (as nutrients). The treatment strategy for the receiving water bodies with no TDC was based on general purpose pollutant removal. The preferred treatment devices from these analyses were infiltration devices, Austin sand filters, and biofiltration strips.

The July 2010 PPDG provides updated guidance for the determination of preferred BMPs based on the estimated ability of a BMP to infiltrate the water quality volume (WQV). The PPDG recommends the use of biofiltration devices that can potentially infiltrate 90% of the WQV; if biofiltration devices are estimated to infiltrate less than 90% of the WQV, then infiltration devices should be evaluated. If infiltration devices are estimated to infiltrate less than 90% of the WQV, then earthen BMPs (detention devices and Austin sand filters) should be evaluated for the percentage of WQV infiltrated. The preferred BMP devices for this Project would be biofiltration devices or infiltration devices (if the device infiltrates over 90% of the WQV); otherwise, "BMP Selection Matrix A" should be used. Sample infiltration calculations are included in the attachments based on general soil properties; detailed calculations for all BMPs would be completed during the design phase once detailed borings and geotechnical studies are completed.

Potential treatment BMP locations are limited due to the following site conditions: ESAs, Archeological/Architectural Areas of Potential Effect, steep slopes, and retaining/sound wall considerations. As such, the treatment of all newly created impervious areas is not currently feasible without further design efforts; further detailed drainage and storm water design efforts would be made during the design phase to achieve the required treatment of impervious area.

For the Tier I HOV Lane Alternative, it is estimated that an area of 24 ac (9.8 ha) would be treated. Of the added impervious area, 63.5 ac (25.7 ha), the percentage of WQV/Water Quality Flow (WQF) proposed to be treated is 38%. Because this Tier I Project may result in the creation of more than 50% of the existing impervious area, this Tier I Project may be subject to further District requirements to treat all existing and additional impervious areas. If this Tier I Project is required to consider treatment of all existing and added impervious areas, then further drainage and storm water efforts would be made during the design phase once more detailed roadway and geotechnical information is available.

For the Tier I TSM Alternative, it is estimated that an area of 21 ac (8.5 ha) would be treated. The TSM Alternative proposes to treat 96% of WQV/WQF of the added impervious area, 22 ac (8.8 ha).

The Tier II Project proposes to add 4.9 ac of impervious area. For the Tier II Project, it is estimated that an area of 4.7 ac would be treated. The Tier II Project proposes to treat 95% of WQV/WQF of the added impervious area. The Tier II Project would maximize treatment.

Potential park and ride lot facilities would be addressed with appropriate treatment BMPs in the PS&E phase of the Project. The treatment BMP locations for both alternatives in Tier I Project and for Tier II Project are summarized in the following sections.

Biofiltration Swales/Strips

Based on the preliminary sample infiltration calculations, which are included in the attachments, compost amended biofiltration strips are estimated to infiltrate over 90% of the WQV and would be the preferred BMP. Due to the limiting site conditions previously mentioned, runoff in many areas would be conveyed, so biofiltration strips cannot be installed at all locations. Detailed calculations and the design of the biofiltration strips would be completed during the design phase. Table 14 lists the biofiltration strip locations for the Tier I HOV Lane Alternative, Table 15 lists the biofiltration strip locations for the Tier I TSM Alternative, and Table 16 lists the biofiltration strip locations for the Tier II Project.

The preliminary infiltration calculations, included in the attachments, estimate that biofiltration swales using native or compost amended soils would not infiltrate over 90% of the WQV. Efforts to design biofiltration swales with the ability to infiltrate over 90% of the WQV would be made during the design phase. Biofiltration devices would be the preferred treatment device at all feasible locations due to the low construction cost and ease of maintenance; however, at this phase, all feasible treatment devices should be considered based on the percentage infiltrated criteria. Based on "BMP Selection Matrix A," other BMP devices, such as Austin sand filters, detention devices, or infiltration devices would be preferred over biofiltration swales.

Table 14. Proposed Biofiltration Strips- HOV Lane Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
HOV-11	SB Route 1 on-ramp from EB State Park Drive Interchange	Lt	97+20 - 98+50	10.5	16,307	1,515
HOV-13	NB Route 1 south of Borregas Gulch	Rt	108+60 - 109+30	11.2	12,938	1,202
HOV-14	NB Route 1 south of Pot Belly Creek	Rt	113+55 - 114+40	11.5	12,766	1,186
HOV-15	NB Route 1 on-ramps from Park Avenue	Rt	123+73 - 124+66	12.1-12.2	13,875	1,289
HOV-22	NB Route 1 south of Soquel Avenue Interchange	Rt	165+00 - 167+00	14.7-14.8	20,064	1,864
HOV-22	SB Route 1 at Soquel Avenue Interchange	Lt	168+00 - 168+20	14.9	10,419	968
HOV-22	SB Route 1 on-ramp from Soquel	Lt	167+70 - 168+00	14.8	9,332	867
HOV-23	SB Route 1 south of La Fonda Avenue	Lt	171+70 - 173+50	15.1-15.2	42,722	3,969
HOV-25	NB Route 1 at Pacheco Avenue off-ramp	Rt	181+00 - 182+20	15.7	40,214	3,736
HOV-25	NB Route 1 near Morrissey Boulevard Interchange	Rt	181+66 - 182+43	15.7-15.8	36,048	3,349

Table 15. Proposed Biofiltration Strips- TSM Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
TSM-3	NB Route 1 at Freedom Boulevard Interchange	Rt	62+20 - 63+00	8.3	9,192	854
TSM-3	NB Route 1 at Freedom Boulevard Interchange	Rt	63+25 - 63+50	8.4	11,313	1,051
TSM-3 & 4	SB Off-ramp at Freedom Boulevard Interchange	Lt	64+00 - 67+00	8.4-8.6	30,526	2,836
TSM-4	NB Route 1 north of Freedom Boulevard Interchange	Rt	67+10 - 70+40	8.6-8.8	66,144	6,145
TSM-8	SB Route 1 on-ramp from EB State Park Drive Interchange	Lt	97+20 - 98+00	10.5	20,139	1,871
TSM-8	SB Route 1 at State Park Interchange	Lt	99+10 - 100+70	10.6-10.7	23,358	2,170
TSM-18	NB Route 1 south of Soquel Avenue Interchange	Rt	166+02 - 166+62	14.7-14.8	9,451	878
TSM-20	NB Route 1 North Parkway CT POC	Rt	179+16 - 182+27	15.6-15.8	34,907	3,243
TSM-20	NB Route 1 at Pacheco Avenue off-ramp	Rt	181+80 - 182+20	15.7	9,257	860
TSM-20	NB Route 1 at Morrissey Blvd. Interchange	Rt	183+80 - 184+10	15.9	26,565	2,468

Table 16. Proposed Biofiltration Strips- Tier II Project

Sheet	Location	Left or Right	Approximate Station (ft)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)
T2-2	NB Route 1	Rt	524+00 - 525+50	14.35-14.38	9,772
T2-3	NB Route 1 south of Soquel Avenue Interchange	Rt	545+00 - 546+80	14.75-14.78	7,901

Dry Weather Diversion

Dry weather flows are not anticipated to be generated from this Project, and so dry weather diversions are not required for this Project.

Infiltration Devices

Infiltration devices should be designed to infiltrate the entire WQV volume, and if feasible, should be sized to infiltrate the design storm event. Preliminary sample calculations for the sizing of infiltration devices to meet the WQV infiltration criteria are included in the attachments of this report. Further geotechnical studies at the specific infiltration device locations should be completed to determine the actual infiltration rates of the native soils to ensure Caltrans criteria for infiltration are met. Detailed infiltration device design calculations and details would be developed during the design phase.

Proposed locations for infiltration trenches and basins for the HOV Lane Alternative are listed in Table 17 and Table 19, and proposed locations for infiltration trenches and basins for the TSM Alternative are listed in Table 18 and Table 20. No infiltration trenches or infiltration basins were proposed for the Tier II Project.

Table 17. Proposed Infiltration Trenches- HOV Lane Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
HOV-1 & HOV-2	SB Route 1 south of San Andreas Road/Larkin Valley Road Interchange	Lt	44+61 - 45+81	R7.4-R7.5	26,877	2,497
HOV-5	NB Route 1 at Freedom Boulevard Interchange	Rt	62+20 - 63+10	8.3	8,525	792
HOV-5	NB Route 1 at Freedom Boulevard Interchange	Rt	63+30 - 63+60	8.4	22,615	2,101
HOV-5	SB Off-ramp at Freedom Boulevard Interchange	Lt	63+80 - 64+00	8.4	9,881	918
HOV-6	SB Off-ramp at Freedom Boulevard Interchange	Lt	68+60 - 72+30	8.7-8.9	80,040	7,436
HOV-7	NB Route 1 Off-ramp	Rt	74+10 - 75+50	9.0-9.1	26,124	2,427
HOV-7	NB Rio Del Mar On-ramp	Rt	76+00 - 76+20	9.1	7,007	651
HOV-7	NB Rio Del Mar Off-ramp	Rt	76+40 - 76+60	9.2	5,705	530
HOV- 8	SB Route 1 north of Rio Del Mar Boulevard Interchange	Lt	81+38 - 83+83	9.5-9.6	57,447	5,337
HOV-11	SB Route 1 off-ramp gore area	Lt	99+20 - 100+60	10.6-10.7	28,417	2,640
HOV-11 & 12	NB Route 1 north of State Park Drive Interchange	Rt	101+40 - 104+15	10.7-10.9	59,750	5,551

Table 18. Proposed Infiltration Trenches- TSM Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
TSM-5	NB Route 1 at Rio Del Mar Boulevard Interchange	Rt	74+75 - 75+75	9.1	63,905	5,937
TSM-6	NB Route 1 north of Rio Del Mar Boulevard Interchange	Rt	80+00 - 83+50	9.4-9.6	67,490	6,270
TSM-6	SB Route 1 north of Rio Del Mar Boulevard Interchange	Lt	80+34 - 82+21	9.4-9.5	48,621	4,517
TSM-8	SB Route 1 off-ramp to WB State Park Drive	Lt	98+70 - 99+55	10.6	30,935	2,874
TSM-18 & 19	SB Route 1 south of La Fonda Avenue	Lt	171+75 - 173+50	15.1-15.2	38,546	3,581

Table 19. Proposed Infiltration Basins- HOV Lane Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
HOV-2	SB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Lt	48+10 - 48+50	R7.6	12,637	1,174
HOV-2	NB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Rt	49+50 - 50+50	R7.7	86,230	8,011
HOV-2	NB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Rt	50+50 - 51+50	R7.8	61,699	5,732
HOV-5	SB On-ramp at Freedom Boulevard Interchange	Lt	63+20 - 63+40	8.4	11,894	1,105
HOV-7	NB Route 1 at Rio Del Mar Boulevard Interchange	Rt	74+75 - 75+85	9.1	21,905	2,035
HOV-11	NB Route 1 at State Park Interchange	Rt	96+40 - 97+70	10.4-10.5	38,535	3,580

Table 20. Proposed Infiltration Basins- TSM Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
TSM-1	SB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Lt	48+50	R7.65	12,734	1,183
TSM-1	NB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Rt	50+00	R7.74	90,600	8,417
TSM-2	NB Route 1 at San Andreas Road/Larkin Valley Road Interchange	Rt	51+00	R7.80	69,578	6,464
TSM-8	NB Route 1 at State Park Interchange	Rt	96+40 - 97+65	10.4-10.5	38,255	3,554
TSM-18	SB Route 1 at Soquel Avenue Interchange	Lt	167+50 - 168+00	14.8-14.9	3,929	365
TSM-18	SB Route 1 at Soquel Avenue interchange	Lt	167+50 - 168+00	14.8-14.9	8,127	755

Detention Basins

Detention basins are feasible for this Project; however, based on "BMP Selection Matrix A," Austin sand filters would be preferred over detention basins. In areas where detention devices could be placed, Austin sand filters could also be utilized, and so no areas for detention devices are currently available. Further drainage and storm water efforts during the design phase should be conducted to determine if any additional areas for detention basins can be proposed.

Gross Solids Removal Devices (GSRDs)

GSRDs are not required for this Project because none of the receiving water bodies are on the 303(d) list for trash.

Traction Sand Traps

Traction sand is not used within the Project limits; therefore, traction sand traps are not required for this Project.

Media Filters

Austin sand filters are identified by "BMP Selection Matrix A" as being the preferred treatment BMP if biofiltration and infiltration devices are determined to infiltrate less than 90% of the WQV. Preliminary sample calculations indicate that Austin sand filters are feasible for this Project. Detailed device design calculations and details would be developed during the design phase. Table 21 lists the Austin sand filter locations for the Tier I HOV Lane Alternative and Table 22 lists the Austin sand filter locations for the Tier I TSM Alternative. Table 23 lists the Austin sand filter locations for the Tier II Project.

The Santa Cruz County Mosquito and Vector Control Department was contacted in April 2007; the vector agency stated that permanent standing water could lead to health issues, so treatment BMPs that require permanent standing water are not feasible for this Project. Although a vector-proof Delaware sand filter could be designed, the use of them requires further communication and concurrence from the local vector control agencies and should generally be avoided where there are concerns about vector control. For this reason, they are not recommended for use at this phase.

Table 21. Proposed Austin Sand Filters- HOV Lane Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
HOV-11	NB Route 1 at State Park Interchange	Rt	97+50 - 98+50	10.5	40,074	3,723
HOV-11	SB Route 1 Off-ramp gore area	Lt	97+80 - 98+80	10.5	36,005	3,345
HOV-11	SB Route 1 On-ramp from WB State Park Drive Interchange	Lt	98+50 - 99+25	10.6	28,557	2,653
HOV-19	NB Route 1 at 41st Avenue Interchange	Rt	147+50 - 148+00	13.6	21,151	1,965
HOV-19	NB Route 1 off-ramp to 41st Avenue	Rt	146+10 - 147+55	13.5-13.6	28,384	2,637
HOV-19	SB Route 1 at 41st Avenue Interchange	Lt	148+20 - 150+80	13.6-13.8	43,971	4,085
HOV-19	SB Route 1 off-ramp to 41st Avenue	Lt	148+25 - 149+50	13.6-13.7	28,783	2,674
HOV-19	SB Route 1 On-ramp from 41st Avenue	Lt	146+50 - 147+80	13.5-13.6	26,285	2,442

Table 22. Proposed Austin Sand Filters- TSM Alternative in Tier I Project

Sheet	Location	Left or Right	Approximate Station (m)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)	Preliminary Calculations of Impervious Area Treated (m^2)
TSM-8	NB Route 1 at State Park Interchange	Rt	97+55 - 98+15	10.5	45,865	4,261
TSM-8	SB Route 1 on-ramp from WB State Park Drive Interchange	Lt	99+00 - 100+60	10.6-10.7	34,907	3,243
TSM-15	NB Route 1 at 41st Avenue Interchange	Rt	146+50 - 147+33	13.5-13.6	29,138	2,707
TSM-15	SB Route 1 at 41st Avenue Interchange	Rt	146+60 - 147+80	13.5-13.6	14,747	1,370
TSM-15	NB Route 1 off-ramp to 41st Avenue	Rt	147+60	13.6	14,628	1,359
TSM-15	SB Route 1 off-ramp to 41st Avenue	Lt	148+50	13.7	12,368	1,149
TSM-15 & 16	SB Route 1 at 41st Avenue Interchange	Lt	149+00 - 150+60	13.7-13.8	54,896	5,100

Table 23. Proposed Austin Sand Filters- Tier II Project

Sheet	Location	Left or Right	Approximate Station (ft)	Approximate Post Mile	Preliminary Calculations of Impervious Area Treated (ft^2)
T2-1	NB Route 1 at 41st Avenue Interchange	Rt	485+00	13.61	16,797
T2-1	SB Route 1 at 41st Avenue Interchange	Lt	486+50 - 488+50	13.6-13.7	15,807
T2-1	SB Route 1 off-ramp to 41st Avenue	Lt	488+80 - 492+00	13.7	11,585

Multi-Chambered Treatment Trains (MCTTs)

MCTTs require permanent standing water and are thereby not feasible for this Project.

Wet Basins

Wet basins require permanent standing water and are thereby not feasible for this Project.

6. Describe Proposed Temporary Construction Site BMPs to be used on Project

As presented in Section 2 of this report, this Project is classified as having both Risk Level 2 and Risk Level 3 areas. This section describes the construction site BMP approach for this Project. The final construction site BMPs and associated checklists would be completed and submitted during the design phase.

Construction related work for the Tier I Project is anticipated to span approximately 10 years. The Tier I Project would have a disturbed soil area of 250 ac (101 ha) for the HOV Lane Alternative or 101 ac (41 ha) for the TSM Alternative. The Tier II Project has a disturbed soil area of 20 ac (8 ha) for the build alternative, and construction related work is anticipated to span approximately two years, from June 2015 to June 2017. Coordination efforts would be made with Caltrans' Construction Storm Water Coordinator to obtain concurrence with the selection of construction site BMPs. An estimate of the construction site BMP costs is shown in the Storm Water BMP Cost Summary, included in the appendices of this report.

Storm Water Pollution Prevention Plan

A SWPPP must be prepared prior to the start of construction. The SWPPP includes the development of a Construction Site Monitoring Program that presents procedures and methods related to visual monitoring; in addition, it provides sampling and analysis plans for non-visible pollutants, sediment and turbidity, pH, receiving waters, and bioassessment (if required).

Rain Event Action Plan

Rain Event Action Plans (REAPs) are required to be prepared for Risk Level 2 and Risk Level 3 projects. The number of REAPs anticipated for this Project is shown in the attachments. The quantities for REAPs are based on precipitation data from a National Oceanic and Atmospheric Administration station in Santa Cruz.

Storm Water Sampling and Analysis

Storm water sampling is required at all discharge locations for this Project. Numeric Action Levels are applicable to Risk Level 2 and Risk Level 3 areas, and Numeric Effluent Limitations are applicable to Risk Level 3 areas. The required specifications would be prepared during the design phase and included in the Project Special Provisions.

The Tier I Project may be required to incorporate bioassessment monitoring for impaired receiving waters within Risk Level 3 areas with a disturbed soil area greater than 30 acres. If required, bioassessment monitoring would be performed both upstream and downstream of the impacted area before and after construction.

Construction Site BMP Strategy

The Temporary Construction Site BMP strategy for this Project consists of the following:

- Soil stabilization measures
- Sediment control measures
- Tracking control
- Non-stormwater management measures
- General - Job site management

Soil stabilization and sediment control consists of placing linear sediment barriers such as large sediment barriers at the toe of all excavation and embankment slopes. Slope interruption devices such as fiber rolls should be installed, and soil stabilizer should be hydraulically applied. Wherever possible, early implementation of permanent erosion control seeding or landscape planting should be performed.

Storm drain inlet protection shall be deployed throughout the Project.

Within the Project limits, riparian and wetland areas adjacent to water bodies, as well as vegetation or other ESAs that need to be protected during construction, should be designated as ESAs. These areas shall be protected with temporary high visibility fencing.

The Project includes bridge widening or replacement over creeks. Some of these creeks are perennial and may require dewatering operations or temporary creek diversions during construction to protect water quality. The need for a separate dewatering permit from the RWQCB would be evaluated during the design phase. Perennial waterways within the Project limits include Soquel Creek, Rodeo Creek Gulch, Aptos Creek, and Valencia Creek. Dewatering for retaining wall footings or pilings may also be necessary for deep excavations.

The installation of active treatment systems at sites identified in the Initial Site Assessment as potential areas of contamination should be further analyzed during the design phase. An active treatment system may be required if these locations have any potential impacts to surface water or groundwater quality.

There is potential for wind erosion impacts; thus, it is anticipated that several areas would need stabilized construction entrances and scheduled street sweeping to avoid off-site tracking of sediment.

Concrete work is anticipated for this Project and shall be managed through the use of temporary concrete washout bins.

Various waste management, materials handling, and other housekeeping BMPs shall be used throughout the duration of the Project. Stockpiles of various kinds are anticipated and shall be maintained with the appropriate BMPs.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet stenciling is anticipated to be required for this Project because inlets would be placed in areas accessible to pedestrians and bicycle traffic. The stenciling would be designed in accordance with Caltrans standard plans and specifications. The final placement and quantities for drain inlet stenciling would be provided during the design phase of the Project.

REQUIRED ATTACHMENTS

- Vicinity Map (Figure 2)
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

SUPPLEMENTAL ATTACHMENTS

- Location Map (Figure 1)
- Storm Water BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1-5 (Design Pollution Prevention BMPs)
- Checklists T-1, Parts 1, 2, 4 and 8 (Treatment BMPs)
- Calculations related to BMPs
- Plans showing BMP deployment
- Tier II Project Location in Relation to the Tier I Project

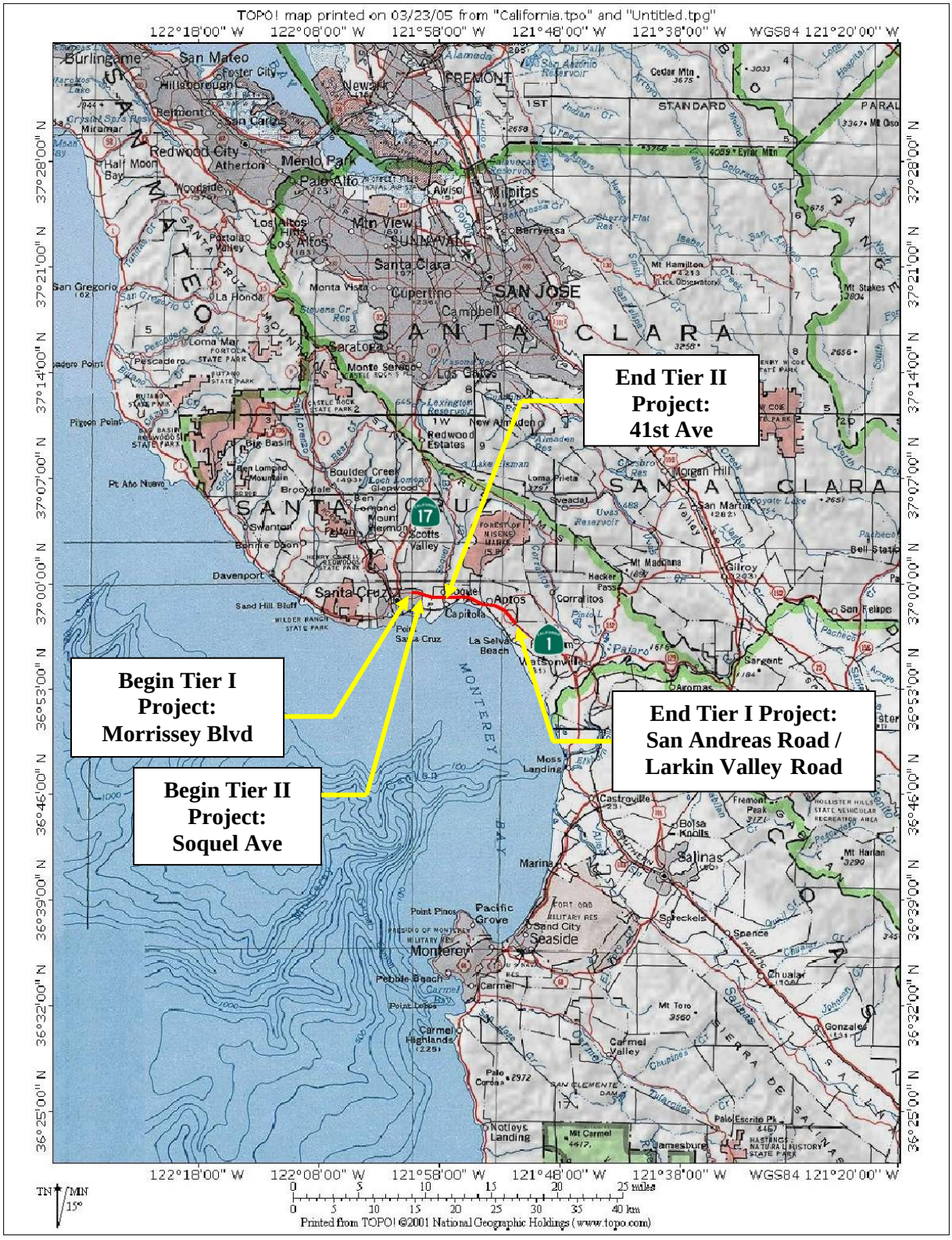


Figure 1. Location Map

Source: USGS

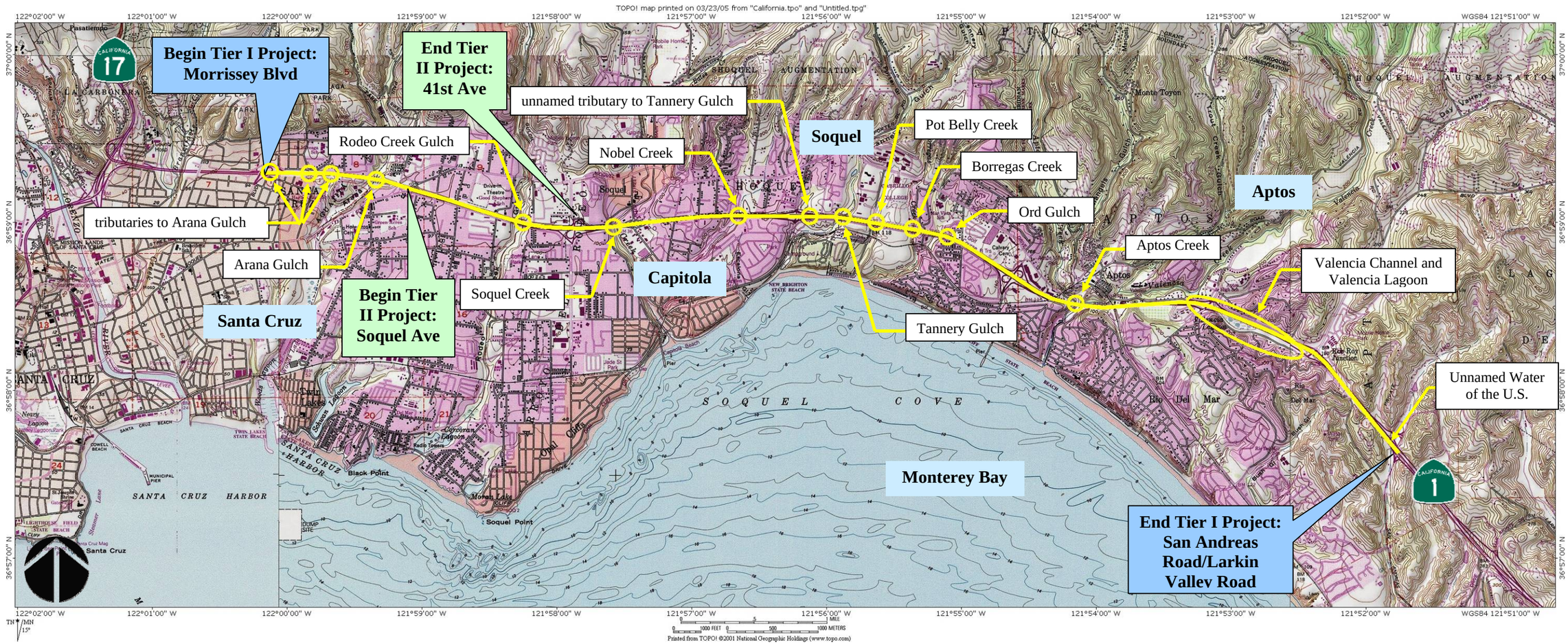


Figure 2. Vicinity Map and Waterway Crossings

Source: USGS

DATE: September 2011

Project ID (or EA): 05000000230 (05-0C7300)

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. _____ *(Dist./Reg. SW Coordinator initials*) If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(City of Santa Cruz; County of Santa Cruz and City of Capitola)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?			If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. *(Net Increase New Impervious Surface)* *Tier I: HOV Alternative: 63.5 ac (25.7 ha)* *Tier I: TSM Alternative: 21.8 ac (8.8 ha)* *Tier II Project: 4.9 ac*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

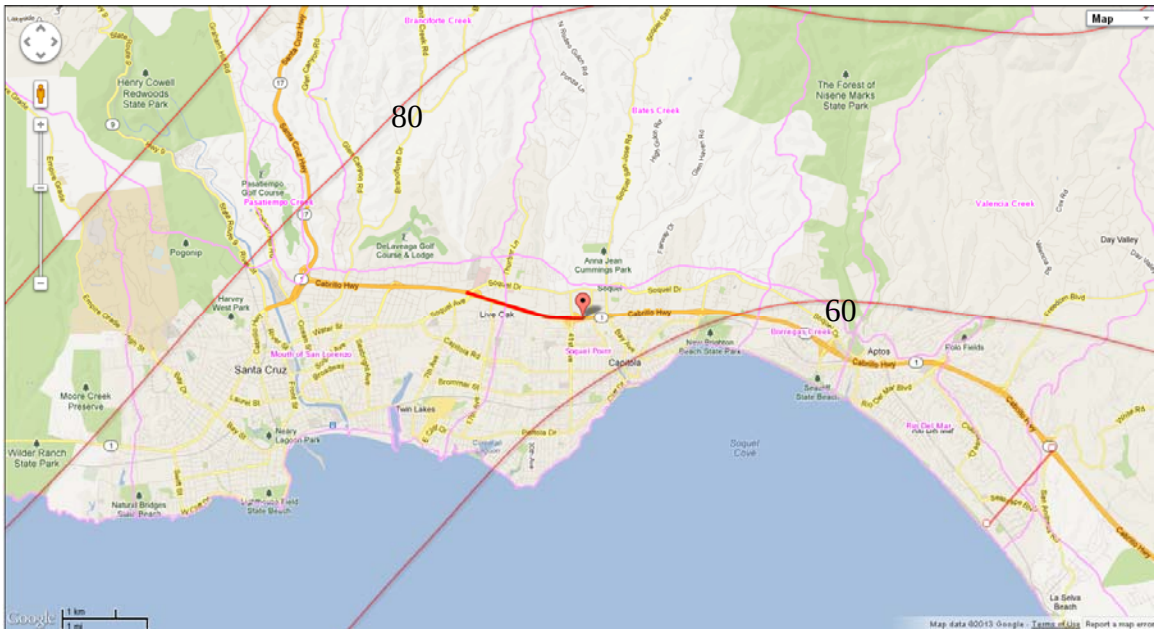
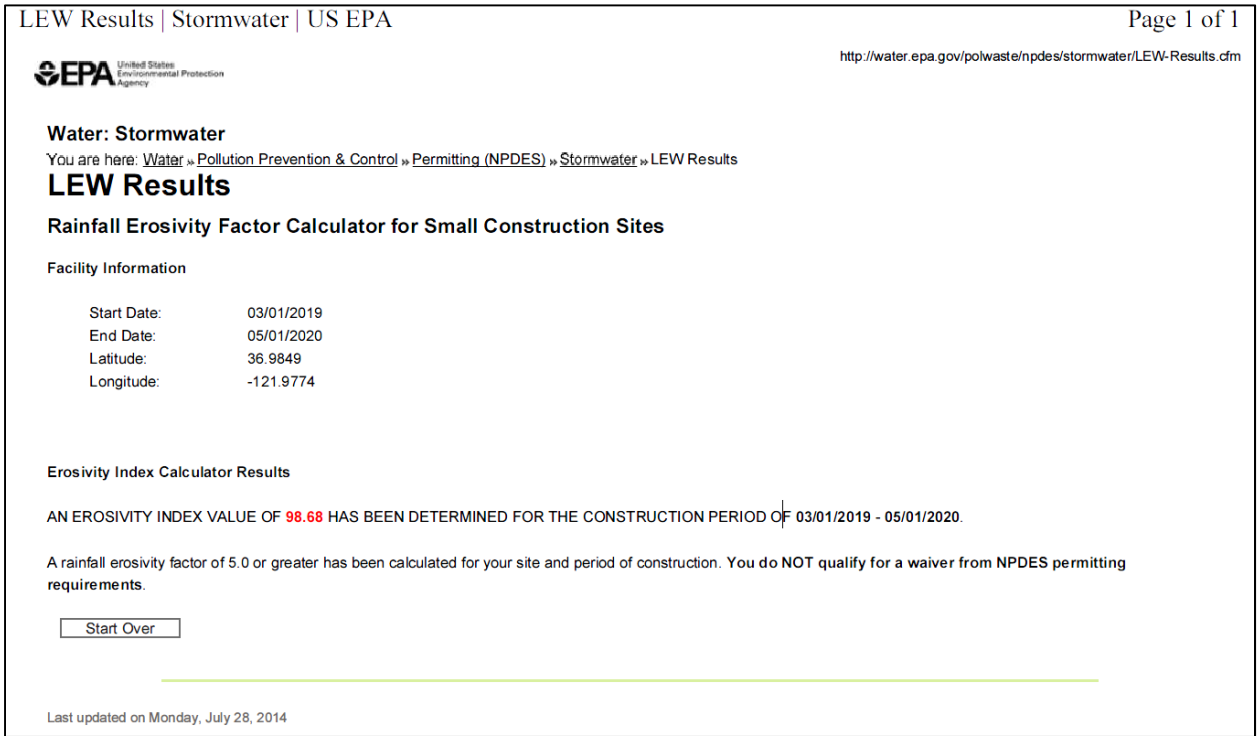


Figure 3. California Isoerodent Map - Tier II Project

Source: California Department of Transportation



LEW Results | Stormwater | US EPA Page 1 of 1

http://water.epa.gov/polwaste/npdes/stormwater/LEW-Results.cfm

EPA United States Environmental Protection Agency

Water: Stormwater

You are here: Water » Pollution Prevention & Control » Permitting (NPDES) » Stormwater » LEW Results

LEW Results

Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Start Date:	03/01/2019
End Date:	05/01/2020
Latitude:	36.9849
Longitude:	-121.9774

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 98.68 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 03/01/2019 - 05/01/2020.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do NOT qualify for a waiver from NPDES permitting requirements.**

Start Over

Last updated on Monday, July 28, 2014

Figure 4. Rainfall Erosivity Factor Calculator - Tier II Project

Source: US Environmental Protection Agency

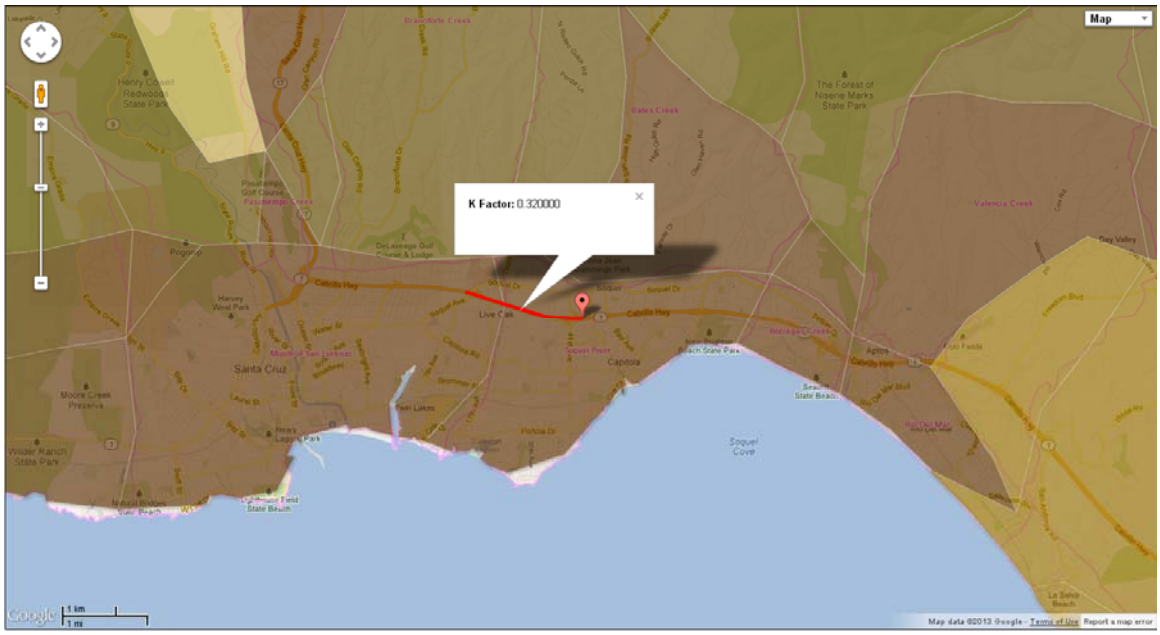


Figure 5. K Factor - Tier II Project

Source: California Department of Transportation

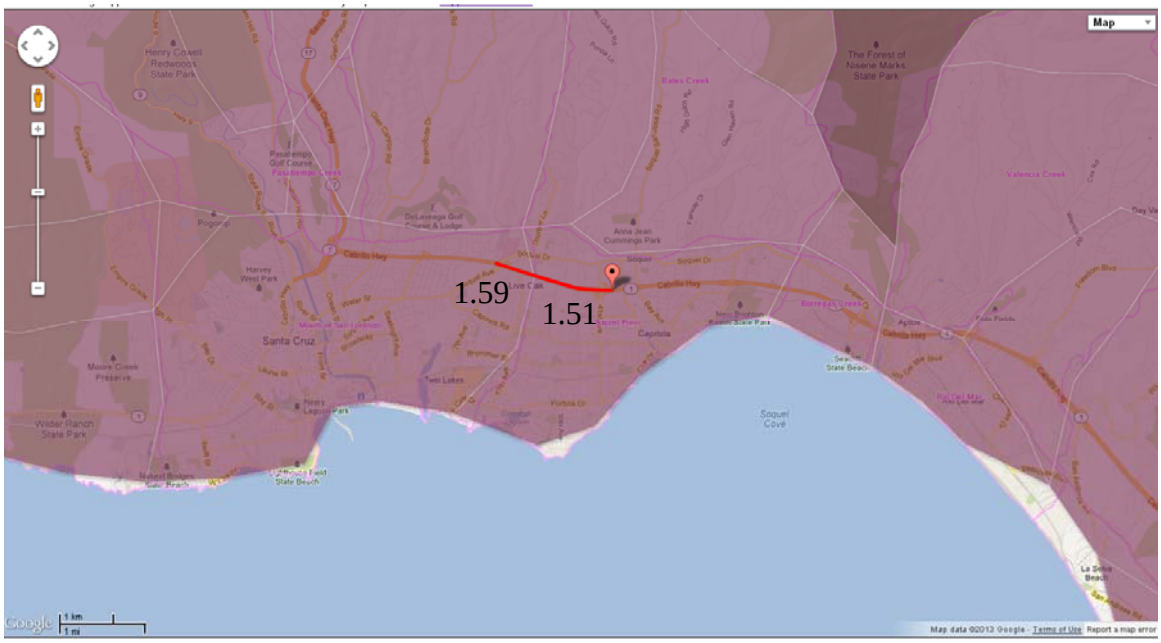


Figure 6. LS Factor - Tier II Project

Source: California Department of Transportation

WATER BODY NAME	WBID	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION
Arana Gulch	CAR304120511999022213371 1	Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)
		Chlorpyrifos	Pesticides	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
Rodeo Creek Gulch	CAR304130142002012413124 2	Turbidity	Sediment	List on 303(d) list (TMDL required list)
		pH	Miscellaneous	List on 303(d) list (TMDL required list)
Soquel Creek	CAR304130142002012414525 8	Enterococcus	Pathogens	List on 303(d) list (TMDL required list)
		Enterococcus	Pathogens	List on 303(d) list (TMDL required list)
		Enterococcus	Pathogens	List on 303(d) list (TMDL required list)
		Enterococcus	Pathogens	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Escherichia coli (E. coli)	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
		Fecal Coliform	Pathogens	List on 303(d) list (TMDL required list)
		Turbidity	Sediment	List on 303(d) list (TMDL required list)

Figure 7. Receiving Water Risk - Tier II Project

Source: State Water Resources Control Board

Storm Water BMP Cost Summary

THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Project Name:	**Highway 1 HOV Lane Widening (Tier I Project: HOV Alternative)**
District:	**05**
County:	**SCR**
Route:	**01**
Limits:	**KP R11.64/25.96 (PM R7.24/16.13)**
Project ID (or EA):	**05000000230 (05-0C7300)**

1.0 DPP BMPs

Total Construction Cost	Assumed Cost		
$377,000,000	1.00%	SUBTOTAL	$ 3,770,000

2.0 Treatment BMPs

Total Construction Cost	Assumed Cost		
$377,000,000	2.00%	SUBTOTAL	$ 7,540,000

3.0 Prepare SWPPP (or WCPC)

Total Construction Cost	Cost per Table F-6		
$377,000,000	$88,000	SUBTOTAL	$ 88,000

RQM Value (if SWPPP is required):	**$82,000**

4.0 Construction Site BMPs

Total Construction Cost	1.25% per Table F-3		
$377,000,000	1.25%	SUBTOTAL	$ 4,712,500

5.0 Rain Event Action Plan

Each	Unit Cost		
459	$500	SUBTOTAL	$ 229,500

6.0 Stormwater Monitoring

Project Risk Level	SWM Cost (PPDG Appen F)		
2 & 3	$1,225,000	SUBTOTAL	$ 1,225,000

7.0 Storm Water Annual Report

Each	Unit Cost		
12	$2,000	SUBTOTAL	$ 24,000

TOTAL COST FOR STORM WATER BMPs	$ 17,589,000

Storm Water BMP Cost Summary

THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Project Name:	**Highway 1 HOV Lane Widening (Tier I Project: TSM Alternative)**
District:	**05**
County:	**SCR**
Route:	**01**
Limits:	**KP R11.64/25.96 (PM R7.24/16.13)**
Project ID (or EA):	**05000000230 (05-0C7300)**

1.0 DPP BMPs

Total Construction Cost	Assumed Cost		
$207,000,000	**1.00%**	**SUBTOTAL**	$ 2,070,000

2.0 Treatment BMPs

Total Construction Cost	Assumed Cost		
$207,000,000	**2.00%**	**SUBTOTAL**	$ 4,140,000

3.0 Prepare SWPPP (or WCPC)

Total Construction Cost	Cost per Table F-6		
$207,000,000	**$88,000**	**SUBTOTAL**	$ 88,000

RQM Value (if SWPPP is required): **$82,000**

4.0 Construction Site BMPs

Total Construction Cost	1.25% per Table F-3		
$207,000,000	**1.25%**	**SUBTOTAL**	$ 2,587,500

5.0 Rain Event Action Plan

Each	Unit Cost		
459	**$500**	**SUBTOTAL**	$ 229,500

6.0 Stormwater Monitoring

Project Risk Level	SWM Cost (PPDG Appen F)		
2 & 3	**$1,225,000**	**SUBTOTAL**	$ 1,225,000

7.0 Storm Water Annual Report

Each	Unit Cost		
12	**$2,000**	**SUBTOTAL**	$ 24,000

TOTAL COST FOR STORM WATER BMPs	$ 10,364,000

Tier I Project

Routine Quarterly Monitoring

120	months	/	3		+	1			41	inspections
16	discharges*	+	4	additional discharges					20	discharges
	*equals receiving water bodies								$ 100	/hour
								Total	$ 82,000	

Prepare Storm Water Pollution Prevention Plan

Prepare SWPPP Base Cost									$ 6,000	
Routine Quarterly Monitoring Cost									$ 82,000	
								Total	$ 88,000	

REAP (Storms Generating ? 0.10 inches)

44.7	rainy days/year	x	10	years					447	days
44.7	rainy days/year	x	3	subsequent months	÷	12	subsequent months/year		11	days
									459	days
									459	REAPs

Storm Water Monitoring Cost

M Value (based on assumed 2 x discharge points)									5	
24.1	rainy days/year	x	10	years					241	days
24.1	rainy days/year	x	0	subsequent months	÷	12	subsequent months/year		0	days
									241	days
Daily Cost to perform sampling and analysis									$ 1,000	
Equipment Maintenance Cost									$ 4,000	
									$ 1,225,000	

Storm Water Annual Report

12	years	12	SWA Reports

Storm Water BMP Cost Summary

THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Project Name:	**Highway 1 HOV Lane Widening (Tier II Project)**
District:	**05**
County:	**SCR**
Route:	**01**
Limits:	**KP 21.8/24.0 (PM 13.5/14.9)**
Project ID (or EA):	**05000000230 (05-0C7300)**

1.0 DPP BMPs

Total Construction Cost	Assumed Cost			
$17,400,000	**1.00%**	**SUBTOTAL**	$	174,000

2.0 Treatment BMPs

Total Construction Cost	Assumed Cost			
$17,400,000	**2.00%**	**SUBTOTAL**	$	348,000

3.0 Prepare SWPPP (or WCPC)

Total Construction Cost	Cost per Table F-6			
$17,400,000	**$16,800**	**SUBTOTAL**	$	16,800

RQM Value (if SWPPP is required):	**$10,800**

4.0 Construction Site BMPs

Total Construction Cost	1.25% per Table F-3			
$17,400,000	**1.25%**	**SUBTOTAL**	$	217,500

5.0 Rain Event Action Plan

Each	Unit Cost			
101	**$500**	**SUBTOTAL**	$	50,500

6.0 Stormwater Monitoring

Project Risk Level	SWM Cost (PPDG Appen F)			
2 & 3	**$154,200**	**SUBTOTAL**	$	154,200

7.0 Storm Water Annual Report

Each	Unit Cost			
4	**$2,000**	**SUBTOTAL**	$	8,000

TOTAL COST FOR STORM WATER BMPs	$	969,000

Tier II Project:										
Routine Quarterly Monitoring										
24	months	/	3		+	1			9	inspections
8	discharges*	+	4	additional discharges					12	discharges
	*equals receiving water bodies								$ 100	/hour
								Total	$ 10,800	
Prepare Storm Water Pollution Prevention Plan										
Prepare SWPPP Base Cost									$ 6,000	
Routine Quarterly Monitoring Cost									$ 10,800	
								Total	$ 16,800	
REAP	**(Storms Generating ≥ 0.10 inches)**									
44.7	rainy days/year	x	2	years					89	days
44.7	rainy days/year	x	3	subsequent months	÷	12	subsequent months/year		11	days
									101	days
									101	REAPs
Storm Water Monitoring Cost										
M Value (based on assumed 2 x discharge points)									3	
24.1	rainy days/year	x	2	years					48	days
24.1	rainy days/year	x	0	subsequent months	÷	12	subsequent months/year		0	days
									49	days
Daily Cost to perform sampling and analysis									$ 1,000	
Equipment Maintenance Cost									$ 2,400	
									$ 154,200	
Storm Water Annual Report										
4	years							4	SWA Reports	

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: SANTA CRUZ, CA **COOP ID: 047916**

Climate Division: CA 4 **NWS Call Sign:** **Elevation: 130 Feet** **Lat: 36°59N** **Lon: 121°59W**

Precipitation (inches)

	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount									
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution									
Month	Mean	Median	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	6.49	6.46	6.91	1982	5	17.56	1995	.32	1976	10.4	8.1	4.2	2.2	.50	.92	1.77	2.66	3.65	4.80	6.16	7.89	10.28	14.30	18.27
Feb	6.15	5.50	4.65	1950	4	18.63	1998	.29	1997	10.4	7.6	4.1	2.0	.53	.95	1.77	2.63	3.56	4.63	5.90	7.49	9.69	13.37	16.98
Mar	4.78	4.22	3.56	1974	28	15.16	1983	.05	1988	10.7	7.6	3.6	1.3	.46	.81	1.46	2.13	2.85	3.66	4.63	5.83	7.48	10.23	12.92
Apr	1.97	1.59	3.46	1953	27	6.05	1982	.05	1973	5.8	3.9	1.2	.5	.14	.26	.51	.78	1.08	1.44	1.86	2.39	3.14	4.40	5.64
May	.70	.22	1.48	1957	18	4.11	1990	.00+	1992	3.0	1.5	.4	.2	.00	.00	.01	.06	.14	.27	.46	.74	1.17	1.99	2.86
Jun	.18	.12	.98	1995	16	1.54	1995	.00+	1996	1.5	.5	.1	.0	.00	.00	.00	.00	.04	.09	.14	.22	.33	.51	.69
Jul	.14	.00	2.51	1974	9	2.89	1974	.00+	2000	.5	.2	.1	@	.00	.00	.00	.00	.00	.00	.00	.00	.03	.34	.85
Aug	.11	.00	.55	1968	19	1.25	1976	.00+	1998	.7	.3	.0	.0	.00	.00	.00	.00	.00	.00	.00	.03	.13	.36	.64
Sep	.41	.13	2.71	1959	18	2.00	1983	.00+	1996	1.9	.9	.3	.1	.00	.00	.00	.00	.03	.12	.26	.44	.72	1.23	1.75
Oct	1.44	.93	3.00	1984	17	4.84	2000	.00+	1995	3.7	2.3	.9	.4	.00	.06	.24	.45	.68	.97	1.31	1.75	2.37	3.44	4.50
Nov	4.08	3.58	4.13	1996	17	11.06	1984	.05	1986	7.4	5.6	2.9	1.3	.15	.34	.78	1.30	1.93	2.69	3.63	4.87	6.63	9.69	12.77
Dec	4.22	3.79	4.51	1955	6	13.74	1996	.05	1989	8.8	6.2	2.8	1.3	.41	.72	1.29	1.88	2.52	3.24	4.09	5.15	6.61	9.03	11.40
Ann	30.67	27.58	6.91	Jan 1982	5	18.63	Feb 1998	.00+	Jul 2000	64.8	44.7	20.6	9.3	14.51	17.17	20.83	23.78	26.52	29.27	32.19	35.54	39.73	46.06	51.74

\+ Also occurred on an earlier date(s)
\# Denotes amounts of a trace
@ Denotes mean number of days greater than 0 but less than .05
** Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals
(2) Derived from station's available digital record: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

208-B

Checklist SW-1, Site Data Sources

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) :Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• United States Geological Survey. *California: Seamless U.S.G.S. Topographic Maps* [CDROM, Version 2.6.8, 2001, Part Number: 113-100-004]. National Geographic Holdings, Inc.	2001
Hydraulic	
• California State University Sacramento, Office of Water Programs, Water Quality Planning Tool. Available on website at: http://www.water-programs.com/wqpt.htm	Access Date: March 2011
Soils	
• Preliminary Geotechnical Information (Foundation Type Selection) for Structures, from Parikh Consultants, Inc.	June 2005
• USDA-NRCS, Soil Survey: Santa Cruz <http://soils.usda.gov/survey>	Accessed March 2011
Climatic	
• California Department of Transportation. *Statewide Storm Water Management Plan.*	May 2003
Water Quality	
• California's Critical Coastal Areas, State of the CCAs Report, Soquel Lagoon (CCA #36), http://www.coastal.ca.gov/nps/Web/cca_pdf/centcoastpdf/CCA36SoquelLagoon.pdf	2 June 2006
• Central Coast Regional Water Quality Control Board, 2006 CWA Section 303(d) List of Water Quality Limited Segments, http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/r3_final 202dlist.pdf	Approved by U.S. EPA: 28 June 2007
• Central Coast RWQCB. Basin Plan. Beneficial Uses. Table 2-1. Identified Uses of Inland Surface Waters. Available on website at: http://www.swrcb.ca.gov/rwqcb3/publications_forms/publications/basin_plan/chapter_2/figs/table_2_1.doc	Access Date: March 2011
• California Department of Transportation. *District 5 Work Plan.* CTSW-RT-09-182.42.1	April 1, 2009
• State Water Resources Control Board. *NPDES General Permit for Storm Water Discharges associated with Construction and Land Disturbance Activities.* Order No. 200-0009-DWQ,	Effective: July 1, 2010

NPDES No. CAS000002.	
Other Data Categories	
• Caltrans. *Project Planning and Design Guide*. CTSW-RT-10-254.03	July 2010 with May 2012 updates
• Caltrans. *Construction Site BMP Manual*	March 2003
• Route 1 Profile at SB Inside ETW. SRP-1 through SRP-13.	9 February 2006
• County of Santa Cruz Mosquito and Vector Control. Telephone conversation with Paul Binding, District Manager.	23 April 2007
• Caltrans. "Construction General Permit Info" http://sv08arcgis/CGP2009/	Accessed: March 2011

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) :Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

The following questions provide a guide to collecting critical information relevant to project storm water quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6. Determine if a 401 certification will be required.	☒Complete	☐NA
7. List rainy season dates.	☒Complete	☐NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10. Determine contaminated soils within the project area.	☒Complete	☐NA
11. Determine the total disturbed soil area of the project.	☒Complete	☐NA
12. Describe the topography of the project site.	☒Complete	☐NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☒Complete	☐NA
15. Determine if a right-of-way certification is required.	☒Complete	☐NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☒Complete	☐NA
17. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19. Evaluate the presence of dry weather flow.	☒Complete	☐NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☒Yes	☐No	☐NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☐Yes	☒No	☐NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☒Yes	☐No	☐NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☒Yes	☐No	☐NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes (TBD)	☐No	☐NA

Design Pollution Prevention BMPs

Checklist DPP-1, Part 1

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Consideration of Design Pollution Prevention BMPs

Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]

Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

Slope/Surface Protection Systems

Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
Will cross drains be modified?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

Preservation of Existing Vegetation

It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs

Checklist DPP-1, Part 2

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Downstream Effects Related to Potentially Increased Flow

Note: Checklist to be completed during the design phases.

1.	Review total paved area and reduce to the maximum extent practicable.	☒Complete
2.	Review channel lining materials and design for stream bank erosion control.	☒Complete
	(a) See Chapters 860 and 870 of the HDM.	☐Complete
	(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	☐Complete
3.	Include, where appropriate, energy dissipation devices at culvert outlets.	☐Complete
4.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☐Complete
5.	Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges.	☐Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 3

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Slope / Surface Protection Systems

Note: Checklist to be completed during the design phases.

1.	What are the proposed areas of cut and fill? (attach plan or map)	☒Complete
2.	Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows?	☒Yes ☐No
3.	Were slopes rounded and/or shaped to reduce concentrated flow?	☒Yes ☐No
4.	Were concentrated flows collected in stabilized drains or channels?	☒Yes ☐No
5.	Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)? If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.	☒Yes ☐No
6.	Are new or disturbed slopes > 2:1 (h:v)? If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 2:1 (h:v).	☐Yes ☒No

Estimate the net new impervious area that will result from this project. ☒Complete

Tier I: HOV Alternative: 63.5 ac (25.7 ha) *TSM Alternative: 21.8 ac (8.8 ha)*

Tier II: 4.9 ac

VEGETATED SURFACES

1.	Identify existing vegetation.	☒Complete
2.	Evaluate site to determine soil types, appropriate vegetation and planting strategies.	☒Complete
3.	How long will it take for permanent vegetation to establish?	☐Complete
4.	Minimize overland and concentrated flow depths and velocities.	☐Complete

HARD SURFACES

1.	Are hard surfaces required?	☒Yes ☐No
	If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations.	☒Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☐Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 4

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Concentrated Flow Conveyance Systems

Note: Checklist to be completed during the design phases.

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, and 835, and Chapter 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☐Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 4:1 h:v. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☐Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 5

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Preservation of Existing Vegetation

Note: Checklist to be completed during the design phases.

1.	Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation.	☒Complete
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☐Yes ☐No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☒Complete
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	☒Yes ☐No
5.	Are all areas to be preserved delineated on the plans?	☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Consideration of Treatment BMPs

Note: At this phase only one Checklist T-1, Part 1 is completed for the entire Project. If necessary, multiple checklists would be used during the design phase when more detailed information becomes available.

Preliminary sample infiltration calculations are included in the attachments of the report.

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed. Questions 14 through 16 should be answered after all subwatershed (drainages) are considered using this checklist.

1. Is the project in a watershed with prescriptive TMDL treatment BMP requirements in an adopted TMDL implementation plan? ☐Yes ☒No

   If Yes, consult the District/Regional Storm Water Coordinator to determine whether the T-1 checklist should be used to propose alternative BMPs because the prescribed BMPs may not be feasible or other BMPs may be more cost-effective. Special documentation and regulatory response may be necessary.

2. Dry Weather Flow Diversion
   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No
   (b) Is a sanitary sewer located on or near the site? ☒Yes ☐No

   If Yes to both 2 (a) and (b), continue to (c). If No to either, skip to question 3.

   (c) Is connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☐Yes ☐No
   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☐No

   If Yes was answered to all of these questions consider ***Dry Weather Flow Diversion***, complete and attach **Part 3** of this checklist

3. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☐Yes ☒No

If Yes, consider ***Gross Solids Removal Devices (GSRDs)***, complete and attach **Part 6** of this checklist. Note: Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter. Before considering GSRDs for stand-alone installation or in sequence with other BMPs, consult with District/Regional NPDES Storm Water Coordinator to determine whether Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins should be considered instead of GSRDs to meet litter/trash TMDL.

4. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year? ☐Yes ☒No

   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist.

5. Maximizing Biofiltration Strips and Swales

   Objectives:

   1) Quantify infiltration from biofiltration alone

   2) Identify highly infiltrating biofiltration (i.e. > 90%) and skip further BMP consideration.

   3) Identify whether amendments can substantially improve infiltration.

   (a) Have biofiltration strips and swales been designed for runoff from all project areas, including sheet flow and concentrated flow conveyance? If no, document justification in Section 5 of the SWDR. ☐Yes ☒No

   (b) Based on site conditions, estimate what percentage of the WQV[1] can be infiltrated. When calculating the WQV, use a 12-hour drawdown for Type A and B soils, a 24-hour drawdown for Type C soils, and a 48-hour drawdown for Type D soils. ☒Complete

   _X_ < 20%
   ___ 20 % - 50%
   ___ 50% - 90%
   ___ > 90%

   (c) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☒No

[1] A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm

(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils[2]). ☒Yes ☐No

If Yes, consider including soil amendments; increasing the infiltration ranking allows more flexibility in the selection of BMPs (strips and swales will show performance comparable to other BMPs). Record the new infiltration estimate below:

___ < 20% (skip to 6)
_X_ 20 % - 50% (skip to 6) – for biofiltration swales ☒Complete
___ 50% - 90% (skip to 6)
_X_ >90% – for biofiltration strips

(e) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☒Yes ☒No
(Yes for biofiltration strips, No for biofiltration swales)

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPES Municipal Stormwater Permit[3]). If Yes proceed to question 13. ☐Yes ☒No

7. Estimating Infiltration for BMP Combinations

Objectives:

1) Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.

2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices

(a) Has concentrated infiltration (i.e., via earthen basins or earthen filters) been prohibited? Consult your District/Regional Storm Water Coordinator and/or environmental documents. ☐Yes ☒No

If No proceed to 7 (b); if Yes skip to question 8 and do not consider earthen basin-type BMPs

(b) Assess infiltration of an infiltration BMP that is used in conjunction with biofiltration. Include infiltration losses from biofiltration, if biofiltration is feasible. ☒Complete

(use 24 hr WQV)

___ < 20% (do not consider this BMP combination)
___ 20% - 50%
___ 50% - 90%
_X_ >90%

Is at least 90 percent infiltration estimated? If Yes proceed to 13. If No proceed to 7(c). (For select areas only, see Table 17-Table 20) ☒Yes ☐No

[2] Type D soils are not expected where amendments are incorporated
[3] See pages 39 and 40 of the Fact Sheets for the CGP.
http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

All other areas – continue to 7(c)

(c) Assess infiltration of biofiltration with combinations with remaining approved earthen BMPs using water quality volumes based on the drain time of those BMPs. This assessment will be used in subsequent BMP selection matrices.

Earthen Detention Basin (use 48 hr WQV)	Earthen Austin SF (use 48 hr WQV)
___ < 20%	___ < 20%
___ 20% - 50%	___ 20% - 50%
_X_ > 50%	_X_ > 50%

☐ Complete

Continue to Question 8

8. Identifying BMPs based on the Target Design Constituents

(a) Does the project discharge to a water body that has been placed on the 303-d list or has had a TMDL adopted? If "No," use Matrix A to select BMPs, consider designing to treat 100% of the WQV, then skip to question 12. ☒ Yes ☐ No

If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply below)?

☒ sediments	☐ copper (dissolved or total)
☒ phosphorus (as nutrients)	☐ lead (dissolved or total)
☐ nitrogen	☐ zinc (dissolved or total)
	☐ general metals (dissolved or total)[4]

(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9. ☒ Yes ☐ No

[4] General metals include cadmium, nickel, chromium, and other trace metals. Note that selenium and arsenic are not metals. Mercury is a metal, but is considered later during BMP selection, under Question 12 below.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Strip: HRT > 5 Austin filter (concrete) Austin filter (earthen) Delaware filter MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Swale MCTT Wet basin	Austin filter (concrete) Delaware filter MCTT Wet basin
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

9. Treating both Metals and Nutrients.

   Is copper, lead, zinc, or general metals *AND* nitrogen or phosphorous a TDC? If Yes use Matrix D to select BMPs, then skip to question 12. Otherwise, proceed to question 10. ☐Yes ☐No

10. Treating Only Metals.

    Are copper, lead, zinc, or general metals listed TDCs? If Yes use Matrix B below to select BMPs, and skip to question 12. Otherwise, proceed to question 11. ☐Yes ☐No

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	MCTT Wet basin Austin filter (earthen) Austin filter (concrete) Delaware filter	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Biofiltration Strip Biofiltration Swale Wet basin
Tier 2	Strip: HRT > 5 Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

11. Treating Only Nutrients.

    Are nitrogen and/or phosphorus listed TDCs? If "Yes," use Matrix C to select BMPs. If "No", please check your answer to 8(a). At this point one of the matrices should have been used for BMP selection for the TDC in question, unless no BMPs are feasible. ☐Yes ☐No

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Austin filter (earthen) Austin filter (concrete) Delaware filter**	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Wet basin Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale Wet basin	Austin filter (concrete) Delaware filter Wet basin
* Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			
** Delaware filters would be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.			

BMP Selection Matrix D: Any metal, plus phosphorous and / or nitrogen are the TDCs			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Wet basin* Austin filter (earthen) Austin filter (concrete) Delaware filter**	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches***	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches*** Biofiltration Strip Biofiltration Swale
Tier 2	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
* The wet basin should only be considered for phosphorus			
** In cases where earthen BMPs can infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.			
*** Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

12. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for mercury or low dissolved oxygen? ☐Yes ☒No

    If Yes contact the District/Regional NPDES Storm Water Coordinator to determine if standing water in a Delaware filter, wet basin, or MCTT would be a risk to downstream water quality.

13. After completing the above, identify and attach the checklists shown below for every Treatment BMP under consideration. (use one checklist every time the BMP is considered for a different drainage within the project) ☒Complete

    __X__ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
    ____ Dry Weather Diversion: Checklist T-1, Part 3
    __X__ Infiltration Devices: Checklist T-1, Part 4
    ____ Detention Devices: Checklist T-1, Part 5
    ____ GSRDs: Checklist T-1, Part 6
    ____ Traction Sand Traps: Checklist T-1, Part 7
    __X__ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    ____ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    ____ Wet Basins: Checklist T-1, Part 10

14. Estimate what percentage of WQV (or WQF, depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): 100% ☒Complete

    (a) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

15. Estimate what percentage of the net WQV (for all new impervious surfaces within the project) that will be treated by the preferred treatment BMP(s): ☒Complete
    Tier I: 38% (HOV Alternative); 96% (TSM Alternative); Tier II: 95% (Build Alternative)

16. Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval. ☐Complete

    Detailed cost estimate to be completed during the design phase.

Treatment BMPs

Checklist T-1, Part 2

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? ☒Yes ☐No

   If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐Yes ☒No
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres ☐Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

Note: Checklist to be completed during the design phases.

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☐No

2. Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.) ☐Yes ☐No

3.	Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)*	☐ Yes	☐ No
4.	Is the maximum length of a biofiltration strip ≤ 300 ft? *	☐ Yes	☐ No
5.	Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of Maintenance? *	☐ Yes	☐ No
6.	Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? **	☐ Yes	☐ No
7.	Is the biofiltration strip sized as long as possible in the direction of flow? **	☐ Yes	☐ No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☐ Yes	☐ No

Treatment BMPs

Checklist T-1, Part 4

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Infiltration Devices

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐ Yes	☒ No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐ Yes	☒ No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐ Yes	☒ No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐ Yes	☒ No
5.	Is site located over a previously identified contaminated groundwater plume?	☐ Yes	☒ No
	If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
6.	(a) Does site have groundwater within 10 ft of basin invert?	☐ Yes	☒ No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr?	☐ Yes	☐ No
	If "Yes" to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.		
7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If "Yes", continue to Design Elements sections. If "No", continue to Question 8.	☒ Yes	☐ No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 9.	☐ Yes	☐ No
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐ Complete	

Design Elements – Infiltration Basin

Note: Checklist to be completed during the design phases.

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐ Yes	☐ No
2.	Has an overflow spillway with scour protection been provided? *	☐ Yes	☐ No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) *	☐ Yes	☐ No
4.	Can access be placed to the invert of the Infiltration Basin? *	☐ Yes	☐ No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.3.1)? *	☐ Yes	☐ No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☐ Yes	☐ No
7.	Can vegetation be established in the Infiltration Basin? **	☐ Yes	☐ No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☐ Yes	☐ No
9.	Can a gravity-fed Maintenance Drain be placed? **	☐ Yes	☐ No

Design Elements – Infiltration Trench

Note: Checklist to be completed during the design phases.

* **Required** Design Element – (see definition above)

** **Recommended** Design Element – (see definition above)

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐ Yes	☐ No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A or B? *	☐ Yes	☐ No
3.	Is the volume of the Infiltration Trench equal to at least the 2.85x the WQV, while maintaining a drawdown time of ≤ 96 hours? It is recommended to use a drawdown time between 40 and 48 hours. (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet], unless the District/Regional NPDES Storm Water Coordinator will allow a volume between 2,830 ft^3 and 4,356 ft^3 to be considered.) *	☐ Yes	☐ No
4.	Is the depth of the Infiltration Trench ≤ 13 ft? *	☐ Yes	☐ No
5.	Can an observation well be placed in the trench? *	☐ Yes	☐ No
6.	Can access be provided to the Infiltration Trench? *	☐ Yes	☐ No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using vegetation)? *	☐ Yes	☐ No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **	☐ Yes	☐ No
9.	Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **	☐ Yes	☐ No

Treatment BMPs

Checklist T-1, Part 8

Prepared by: WRECO Date: September 2011 District-Co-Route: 05-SCR-01

KP (PM) : Tier I: R11.64/25.96 (7.24/16.13); Tier II: 21.8/24.0 (13.5/14.9)

Project ID (or EA): 05000000230 (05-0C7300)

RWQCB: Central Coast (Region 3)

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No
2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No
3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater? ☒Yes ☐No
4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No

   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Design Elements – Austin Sand Filter

Note: Checklist to be completed during the design phases.

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Is the drawdown time of the 2nd chamber 24 hours? *	☐Yes ☐No
2.	Is access for Maintenance vehicles provided to the Austin Sand Filter? *	☐Yes ☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☐Yes ☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? **	☐Yes ☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes ☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9.	☐Yes ☐No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * If No, design with an impermeable liner.	☐Yes ☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? *	☐Yes ☐No
9.	Is maximum depth ≤ 13 ft below ground surface? *	☐Yes ☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes ☐No

Calculations Related to BMPs

WQV Infiltrated Using the Free-Flow BMP Infiltration Tool

This page presents the results of infiltration with and without ammendment from the infiltration tool. It also provides a summary of the inputs for reference.

PROJECT INFORMATION

Project	Highway 1 HOV Lane Widening - HOV Alternative 05000000230 (05-0C7300)
Station	97+20 to 98+50
Free-Flow BMP type	Strip vs Swale

INPUT	**Strip**	**Swale**	
Native or fill (underlying) HSG soil type	A	A	
Density of water	1	1	g/cm3
Bulk density	1.9	1.9	g/cm3
Specific gravity of soil particles	2.73	2.73	
Depth of incorporation, below FG	18	18	in
Unit basin storage volume from Basin Sizer, where C=1.0	0.64	0.64	in
Drawdown time used in Basin Sizer	12	12	hr
Rainfall rate from Basin Sizer "Caltrans Water Quality Flows"	0.22	0.22	in/hr
Contributing drainage area	16307	16307	ft2
Contributing drainage area runoff coefficient	0.9	0.9	
BMP area: strip area or swale invert area	1950	500	ft2
Infiltration rate of native soil or fill	1	1	in/hr
Pervious area for non-amended infiltration (may be different than BMP area)	1950.00	500.00	ft2
Bulk density (of compost)	0.50	0.50	g/cm3
Specific gravity of compost particles	0.80	0.80	
Depth of placement	4	4	in
Final bulk density	1.56	1.56	g/cm3

RESULT: Native Soil or Fill	**Strip**	**Swale**
C factor for downstream BMP with no amendment	0.47	0.85
Portion of WQV from net new impervious that is infiltrated with native soil or	**47%**	**12%**

RESULTS: Amended Soil	**Strip**	**Swale**
C factor for downstream BMP after amendment	0.00	0.58
Portion of WQV from net new impervious area that is infiltrated with	**100%**	**40%**

WQV Infiltrated Using the Free-Flow BMP Infiltration Tool

This page presents the results of infiltration with and without ammendment from the infiltration tool. It also provides a summary of the inputs for reference.

PROJECT INFORMATION

Project	Highway 1 HOV Lane Widening - TSM Alternative 05000000230 (05-0C7300)
Station	62+20 to 63+00
Free-Flow BMP type	Strip vs Swale

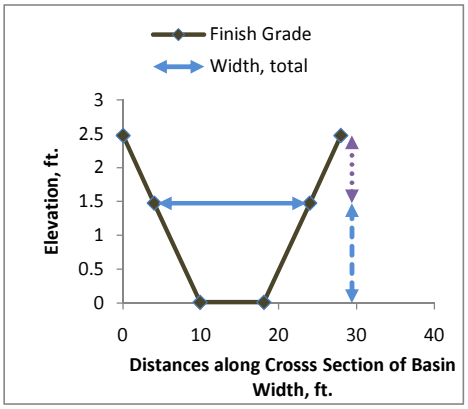
INPUT	**Strip**	**Swale**	
Native or fill (underlying) HSG soil type	A	A	
Density of water	1	1	g/cm3
Bulk density	1.9	1.9	g/cm3
Specific gravity of soil particles	2.73	2.73	
Depth of incorporation, below FG	18	18	in
Unit basin storage volume from Basin Sizer, where C=1.0	0.64	0.64	in
Drawdown time used in Basin Sizer	12	12	hr
Rainfall rate from Basin Sizer "Caltrans Water Quality Flows"	0.22	0.22	in/hr
Contributing drainage area	9192	9192	ft2
Contributing drainage area runoff coefficient	0.9	0.9	
BMP area: strip area or swale invert area	1200	500	ft2
Infiltration rate of native soil or fill	1	1	in/hr
Pervious area for non-amended infiltration (may be different than BMP area)	1200.00	500.00	ft2
Bulk density (of compost)	0.50	0.50	g/cm3
Specific gravity of compost particles	0.80	0.80	
Depth of placement	4	4	in
Final bulk density	1.56	1.56	g/cm3

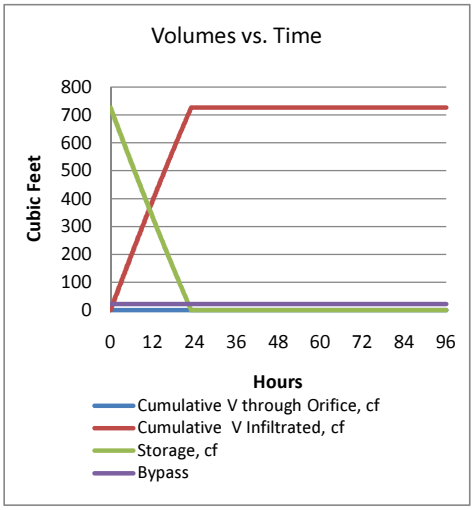
RESULT: Native Soil or Fill	**Strip**	**Swale**
C factor for downstream BMP with no amendment	0.42	0.74
Portion of WQV from net new impervious that is infiltrated with native soil or	**51%**	**21%**

RESULTS: Amended Soil	**Strip**	**Swale**
C factor for downstream BMP after amendment	0.00	0.28
Portion of WQV from net new impervious area that is infiltrated with	**100%**	**71%**

WQV Infiltrated Using the Basin Infiltration Tool

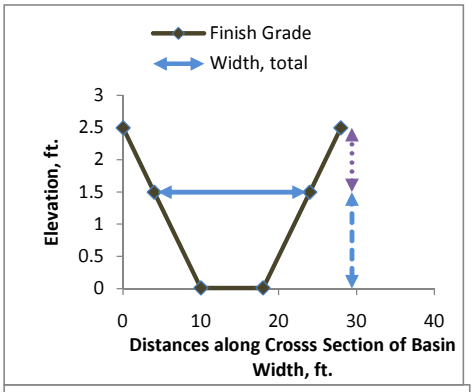
PROJECT INFORMATION		
	Highway 1 HOV Lane Widening -	
Project Name	HOV Alt	
Station	48+10 to 48+50	
SITE CHARACTERISTICS		
Unit Basin Storage Volume (Basin Sizer)	0.79	in
Drawdown time (Basins Sizer)	24	hr
Runoff coefficient for CDA to the basin	0.9	
Duration of rain fall	0.01	hr
Contributing drainage area (CDA) to basin	12636	ft2
BMP area/contributing area	6%	
Edge of Pavement Information		
Runoff coefficient at edge of pavement	0.9	
CDA at edge of pavement	12636	ft2
BASIN CHARACTERISTICS		
Target basin capture volume	749	ft3
Length, basin (at WQV water surface)	40	ft
Width, total (at WQV water surface)	20	ft
Area, total (at WQV water surface)	800	ft2
Side Slope	4	none
Geometry based volume	726	cf
Maximum Water Level	1.47	ft
Length, invert	28.20	ft
Width, invert	8.20	ft
Area, invert	231	ft2
SOIL CHARACTERISTICS		
Invert soil infiltration rate	1.5	in/hr
Side slope soil infiltration rate	0.1	in/hr
ORIFICE CHARACTERISTICS		
Orifice height above the invert	0.00	ft
Orifice coefficient, C	0.6	
Orifice diameter	**0**	in
Orifice area	0.00	ft2

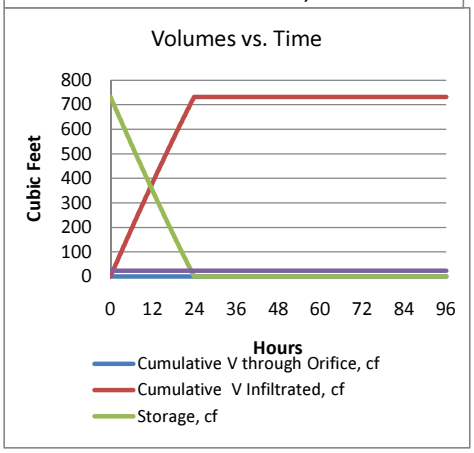




RESULTS	
infiltration basins	
Drawdown time	24 hours
WQV Infiltrated	**97.0%**

WQV Infiltrated Using the Basin Infiltration Tool





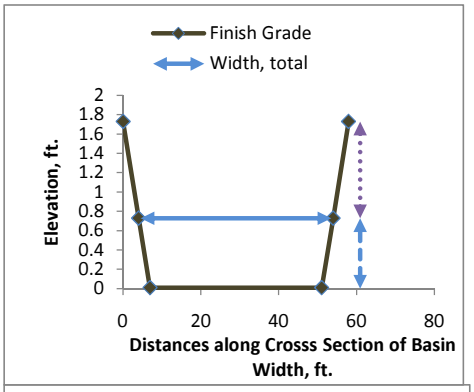
PROJECT INFORMATION

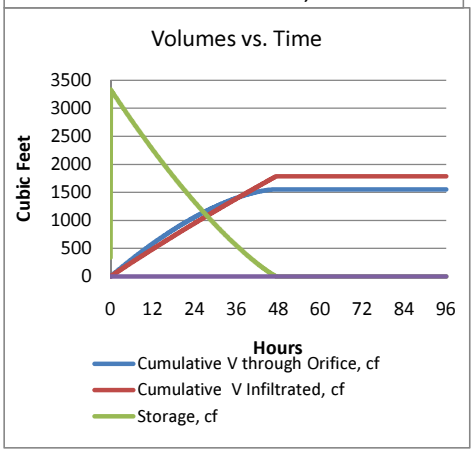
	Highway 1 HOV Lane Widening -	
Project Name	TSM Alt	
Station	48+50	
SITE CHARACTERISTICS		
Unit Basin Storage Volume (Basin Sizer)	0.79	in
Drawdown time (Basins Sizer)	24	hr
Runoff coefficient for CDA to the basin	0.9	
Duration of rain fall	0.01	hr
Contributing drainage area (CDA) to basin	12734	ft2
BMP area/contributing area	6%	
BASIN CHARACTERISTICS		
Target basin capture volume	754	ft3
Length, basin (at WQV water surface)	40	ft
Width, total (at WQV water surface)	20	ft
Area, total (at WQV water surface)	800	ft2
Side Slope	4	none
Geometry based volume	732	cf
Maximum Water Level	1.50	ft
Length, invert	28.01	ft
Width, invert	8.01	ft
Area, invert	224	ft2
SOIL CHARACTERISTICS		
Invert soil infiltration rate	1.5	in/hr
Side slope soil infiltration rate	0.1	in/hr
ORIFICE CHARACTERISTICS		
Orifice height above the invert	0.00	ft
Orifice coefficient, C	0.6	
Orifice diameter	0	in
Orifice area	0.00	ft2

RESULTS	
infiltration basins	
Drawdown time	24 hours
WQV Infiltrated	**97.0%**

WQV Infiltrated Using the Basin Infiltration Tool

PROJECT INFORMATION	
Project Name	Highway 1 HOV Lane Widening - HOV Alt
Station	97+50 to 98+50
SITE CHARACTERISTICS	
Unit Basin Storage Volume (Basin Sizer)	1.11 in
Drawdown time (Basins Sizer)	48 hr
Runoff coefficient for CDA to the basin	0.9
Duration of rain fall	0.01 hr
Contributing drainage area (CDA) to basin	40074 ft2
BMP area/contributing area	12%
BASIN CHARACTERISTICS	
Target basin capture volume	3336 ft3
Length, basin (at WQV water surface)	100 ft
Width, total (at WQV water surface)	50 ft
Area, total (at WQV water surface)	5000 ft2
Side Slope	4 none
Geometry based volume	3336 cf
Maximum Water Level	0.73 ft
Length, invert	94.16 ft
Width, invert	44.16 ft
Area, invert	4159 ft2
SOIL CHARACTERISTICS	
Invert soil infiltration rate	0.1 in/hr
Side slope soil infiltration rate	0.1 in/hr
ORIFICE CHARACTERISTICS	
Orifice height above the invert	0.00 ft
Orifice coefficient, C	0.6
Orifice diameter	**13/16** in
Orifice area	0.00 ft2

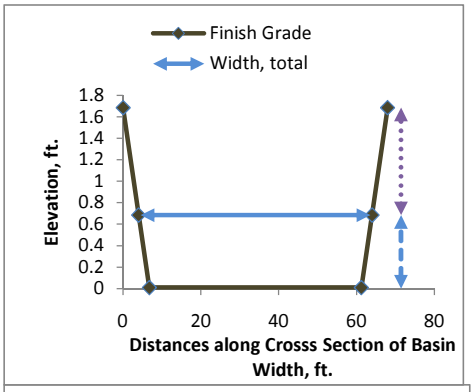


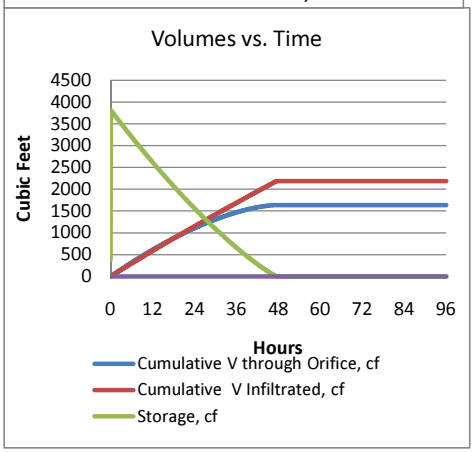


RESULTS	
Type: detention basin or austin sand filter	
Drawdown time	48 hours
WQV Infiltrated	**53.5%**

WQV Infiltrated Using the Basin Infiltration Tool

PROJECT INFORMATION	
Project Name	Highway 1 HOV Lane Widening - TSM Alt
Station	97+55 to 98+15
SITE CHARACTERISTICS	
Unit Basin Storage Volume (Basin Sizer)	1.11 in
Drawdown time (Basins Sizer)	48 hr
Runoff coefficient for CDA to the basin	0.9
Duration of rain fall	0.01 hr
Contributing drainage area (CDA) to basin	45865 ft2
BMP area/contributing area	13%
BASIN CHARACTERISTICS	
Target basin capture volume	3818 ft3
Length, basin (at WQV water surface)	100 ft
Width, total (at WQV water surface)	60 ft
Area, total (at WQV water surface)	6000 ft2
Side Slope	4 none
Geometry based volume	3818 cf
Maximum Water Level	0.69 ft
Length, invert	94.52 ft
Width, invert	54.52 ft
Area, invert	5153 ft2
SOIL CHARACTERISTICS	
Invert soil infiltration rate	0.1 in/hr
Side slope soil infiltration rate	0.1 in/hr
ORIFICE CHARACTERISTICS	
Orifice height above the invert	0.00 ft
Orifice coefficient, C	0.6
Orifice diameter	**14/16** in
Orifice area	0.00 ft2





RESULTS	
Type: detention basin or austin sand filter	
Drawdown time	48 hours
WQV Infiltrated	**57.3%**

Plans Showing BMP Deployment
Tier I Project: HOV Alternative

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		1	26

REGISTERED CIVIL ENGINEER

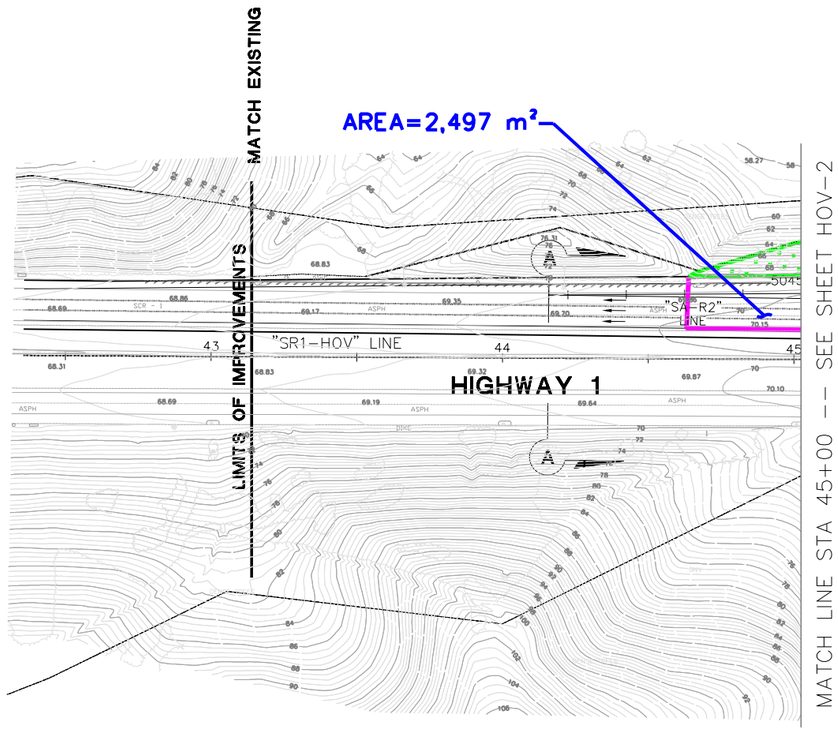
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

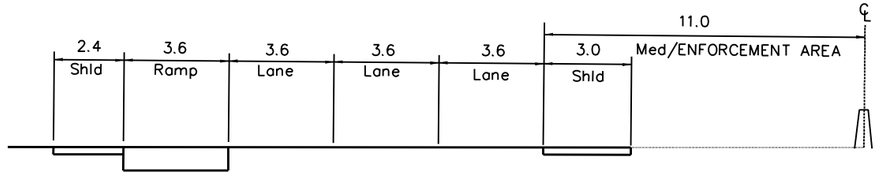
LEGEND

- WETLANDS
- EXISTING STRUCTURE
- STRUCTURE WIDENING/NEW STRUCTURE
- LIMITS OF MAINLINE WIDENING
- APPROXIMATE LOCATION OF WETLANDS JURISDICTION OUTSIDE PROJECT APE
- PERIMETER OF WETLANDS JURISDICTION
- ORDINARY HIGH WATER MARK (OHWM)
- SOUNDWALL (PRELIMINARY)
- RETAINING WALL (LOCATED AT EP)
- OFFSET CONCRETE BARRIER
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOCAL RIGHT-OF-WAY
- PARCEL LINE
- STORM CULVERT
- EXISTING EDGE OF PAVEMENT (SHOWN WHERE WIDENING OCCURS)
- ACCESS CONTROL
- -C- -C- -C- CUT LINE
- --- F --- FILL LINE
- GUTTER
- EXISTING PAVEMENT TO BE REMOVED
- PROPOSED TREATMENT BEST MANAGEMENT PRACTICE (BMP) LOCATIONS. REFER TO STORM WATER DATA REPORT FOR TREATMENT BMP TYPE
- BMP WATERSHED



GENERAL NOTES:

1. ALL EXISTING BIKE LANES AND BIKE PATHS WILL BE MAINTAINED IN PLACE, UNLESS OTHERWISE NOTED.
2. LOCATIONS OF HOV ENFORCEMENT AREAS ARE AS FOLLOWS:
   - 4.2 m MEDIAN SHOULDER FROM STA 43+09.86 TO 65+09.55. SEE SHEETS HOV-1 TO HOV-5
   - BI-DIRECTIONAL ENFORCEMENT AREA FROM STA 109+00 TO STA 116+50. SEE SHEETS HOV-13 AND HOV-14.
   - BI-DIRECTIONAL ENFORCEMENT AREA FROM STA 155+00 TO STA 162+50. SEE SHEETS HOV-20 AND HOV-21.
3. FREE RIGHT TURNS TO BE ELIMINATED AT INTERCHANGES WITH BIKE LANES, OR DESIGNATED AS A BICYCLE ROUTE OR SAFE ROUTE TO SCHOOL, PENDING OPERATIONS ANALYSIS.
4. SECTION SHOWN ON PLANS ARE FOR LANE CONFIGURATION PURPOSE ONLY. FOR TYPICAL SECTION, SEE ATTACHMENT B.
5. LEGEND AND ABBREVIATIONS ARE SHOWN FOR ALL HOV LAYOUT SHEETS.
6. AT OVERCROSSING BENT LOCATIONS, SEE "LOCALIZED MEDIAN WIDENING" DETAIL SHEET HOV-26.
7. ALL CURB RETURNS WHERE SIDEWALKS ARE PRESENT WILL HAVE CURB RAMPS.
8. ALL R/W LINES THAT ARE ACCESS CONTROLLED SHALL HAVE WALLS OR FENCING.



SECTION A-A
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-1

DESIGN OVERSIGHT | CALCULATED/DESIGNED BY | CHECKED BY | DATE | REVISED BY | DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

e:\o1, EXMA, PRMA, TBCT, Weidel 10-23-04, exis, PRPN_Reduced, prope83

LAST REVISION | DATE PLOTTED => 11/7/12 | TIME PLOTTED => 2:39:19 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV01.DWG

CU | EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		2	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

Caltrans Metric

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

MATCH LINE STA 45+00 -- SEE SHEET HOV-1

MATCH LINE STA 52+50 -- SEE SHEET HOV-3

SAN ANDREAS RD.

HIGHWAY 1

LARKIN VALLEY RD.

"SA-R2" LINE

"SA-R3" LINE

"SR1 HOV" LINE

AREA=1,174 m²

AREA=2,497 m²

AREA=5,474 m²

AREA=2,537 m²

AREA=5,732 m²

R=1000.00

5046+00

5047+00

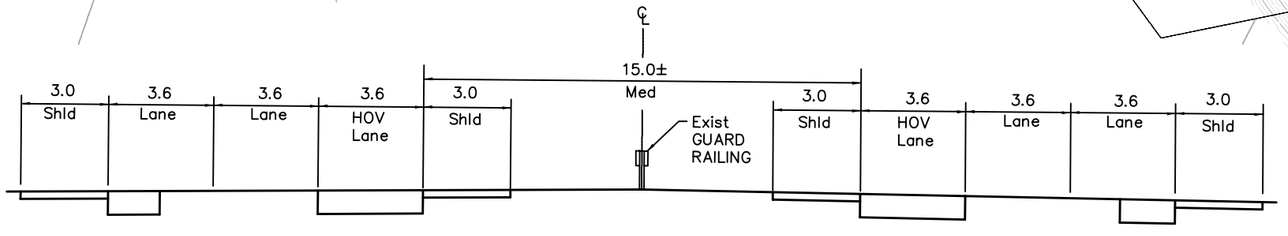
5048+00

5049+00

5050+00

5051+00

CONFORM



SECTION B–B
NO SCALE

("SR1–HOV" MAIN LINE CONFIGURATION ONLY)

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–2

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU

EA

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 2:49:06 PM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		3	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

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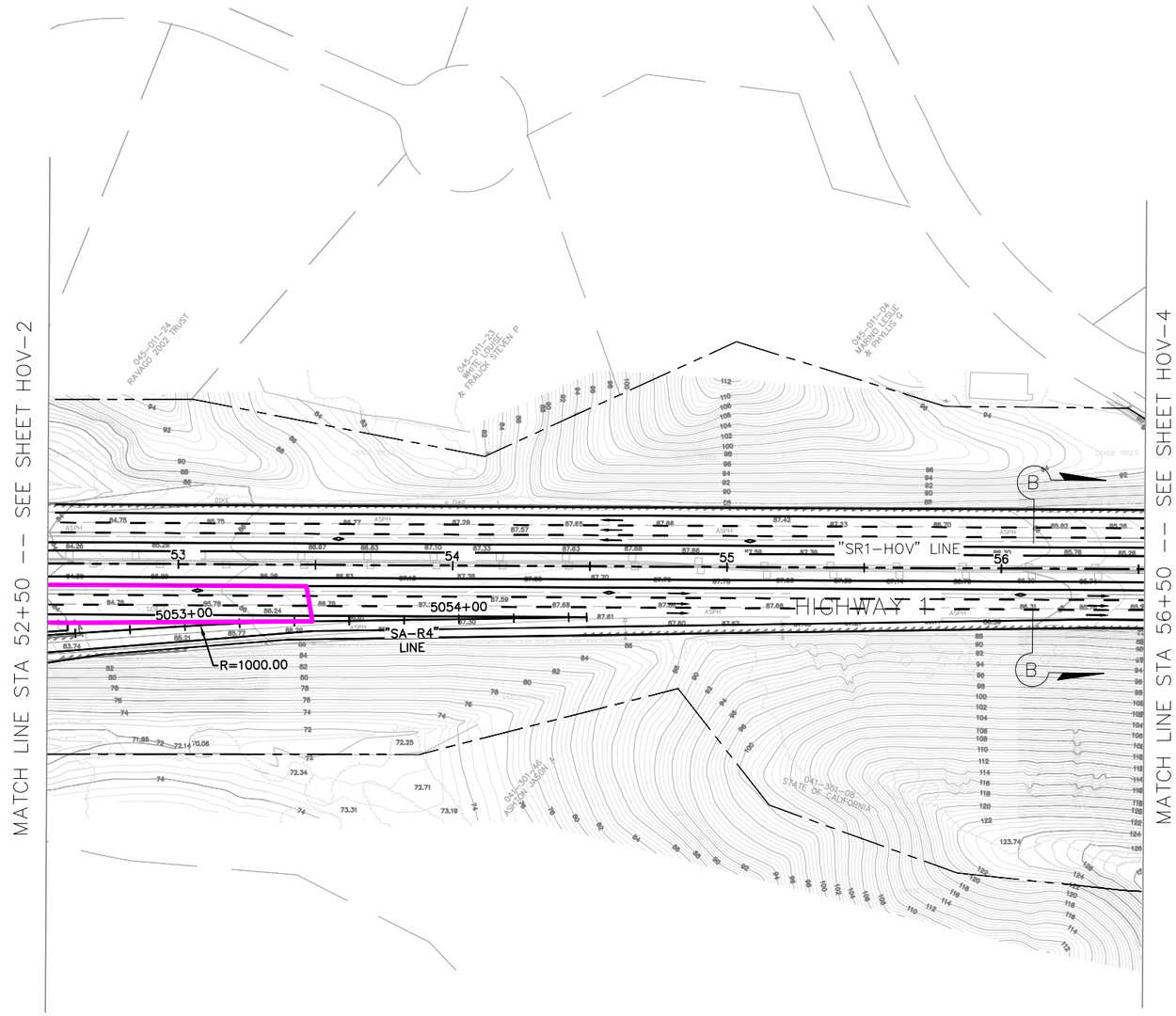
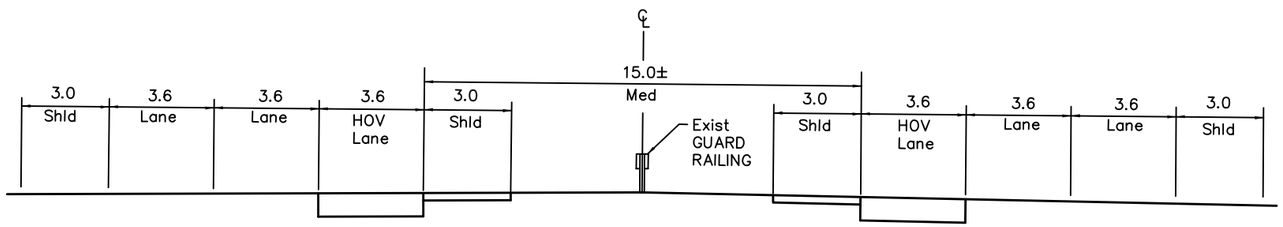
WALNUT CREEK, CA 94596





SECTION B–B
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–3

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV03.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ext01, EXMA, PRMA, TBCT, Wetdet 10-25-04, ext0, PRPN_Reduced, prop63

DATE	REVISED BY
	DATE REVISED
	CALCULATED/ DESIGNED BY
	CHECKED BY

LAST REVISION DATE PLOTTED => 11/7/12 TIME PLOTTED => 3:16:05 PM

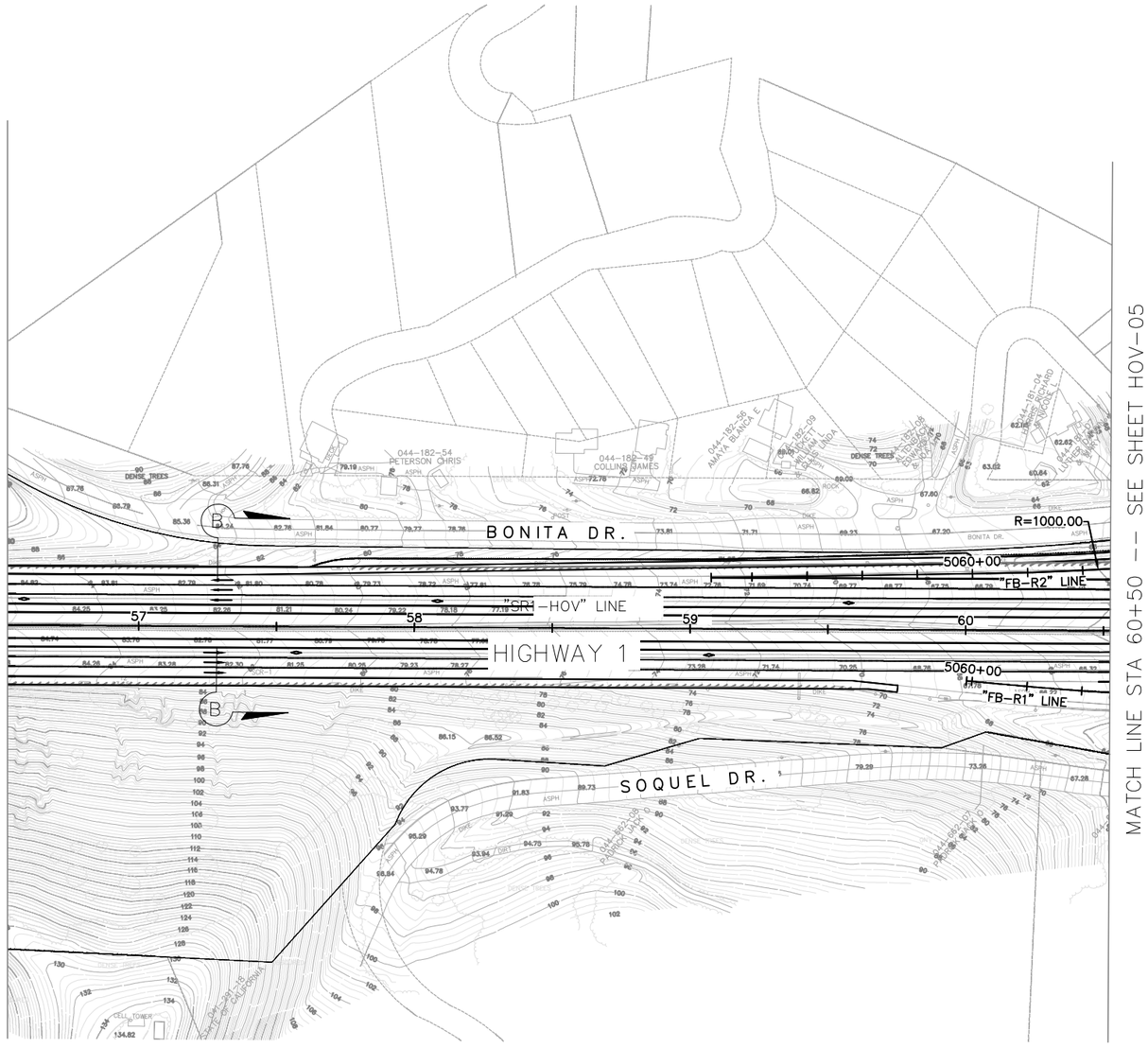
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		4	26

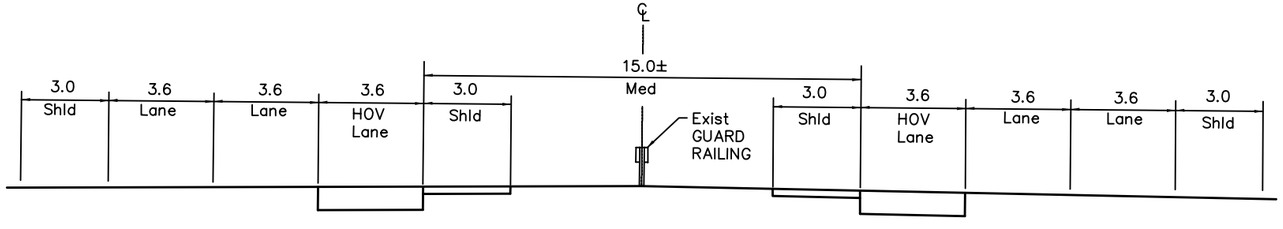
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION B–B
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–4

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV04.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:18:20 PM

ext01, EXMA, PRMA, TBCT, Weidel 10-25-04, ext0, PRPN_Reduced, prop65

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		5	26

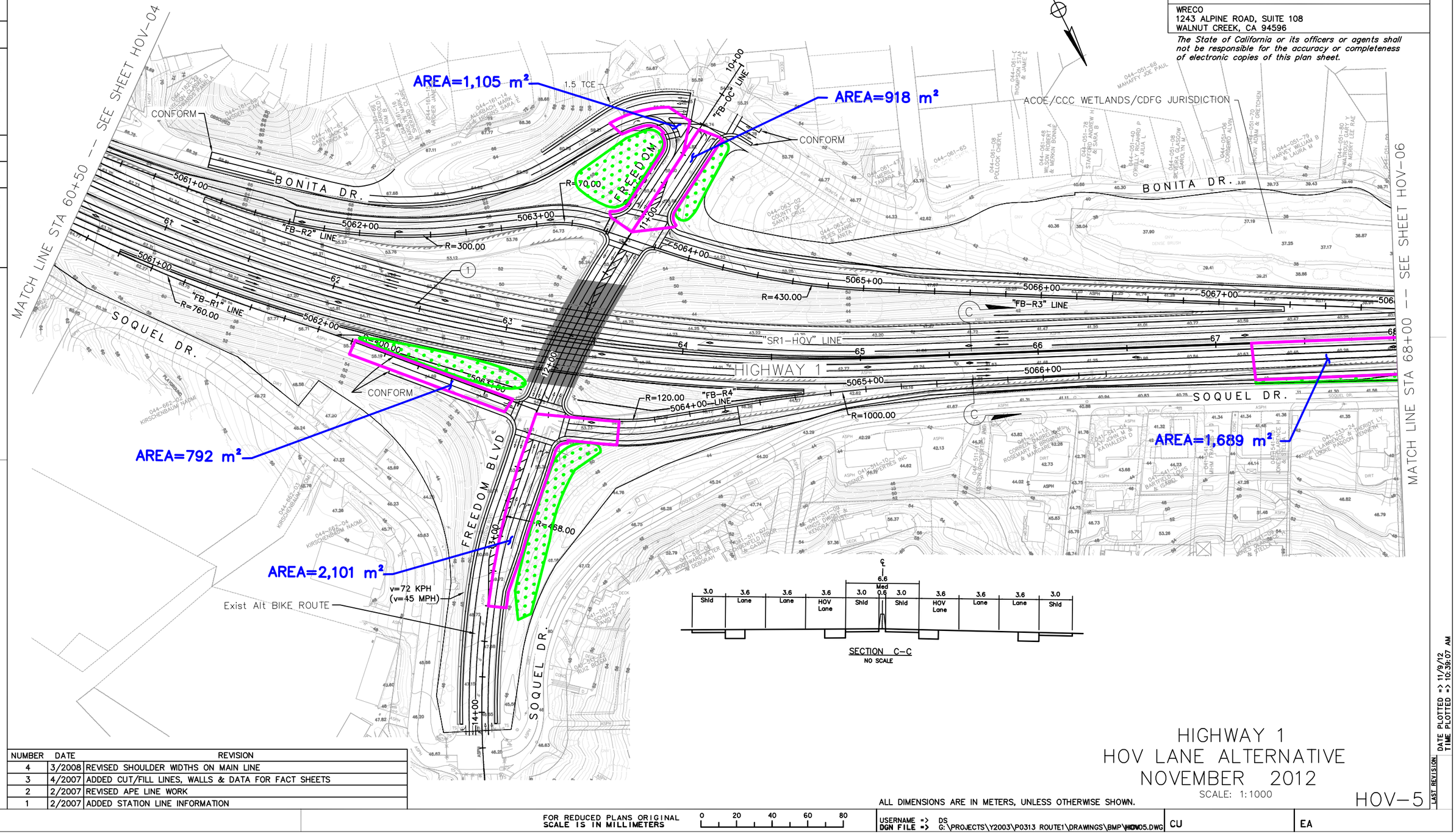
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
NO	R	Δ	T	L
①	1000.00	26°47'35"	238.170	467.628



SECTION C–C
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–5

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV05.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

axlo1, EXMA, PRMA, TBGT, Weidel 10-25-04, axlo, PRPN_Reduced, prope83

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

LAST REVISION

DATE PLOTTED => 11/9/12
TIME PLOTTED => 10:39:07 AM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		6	26

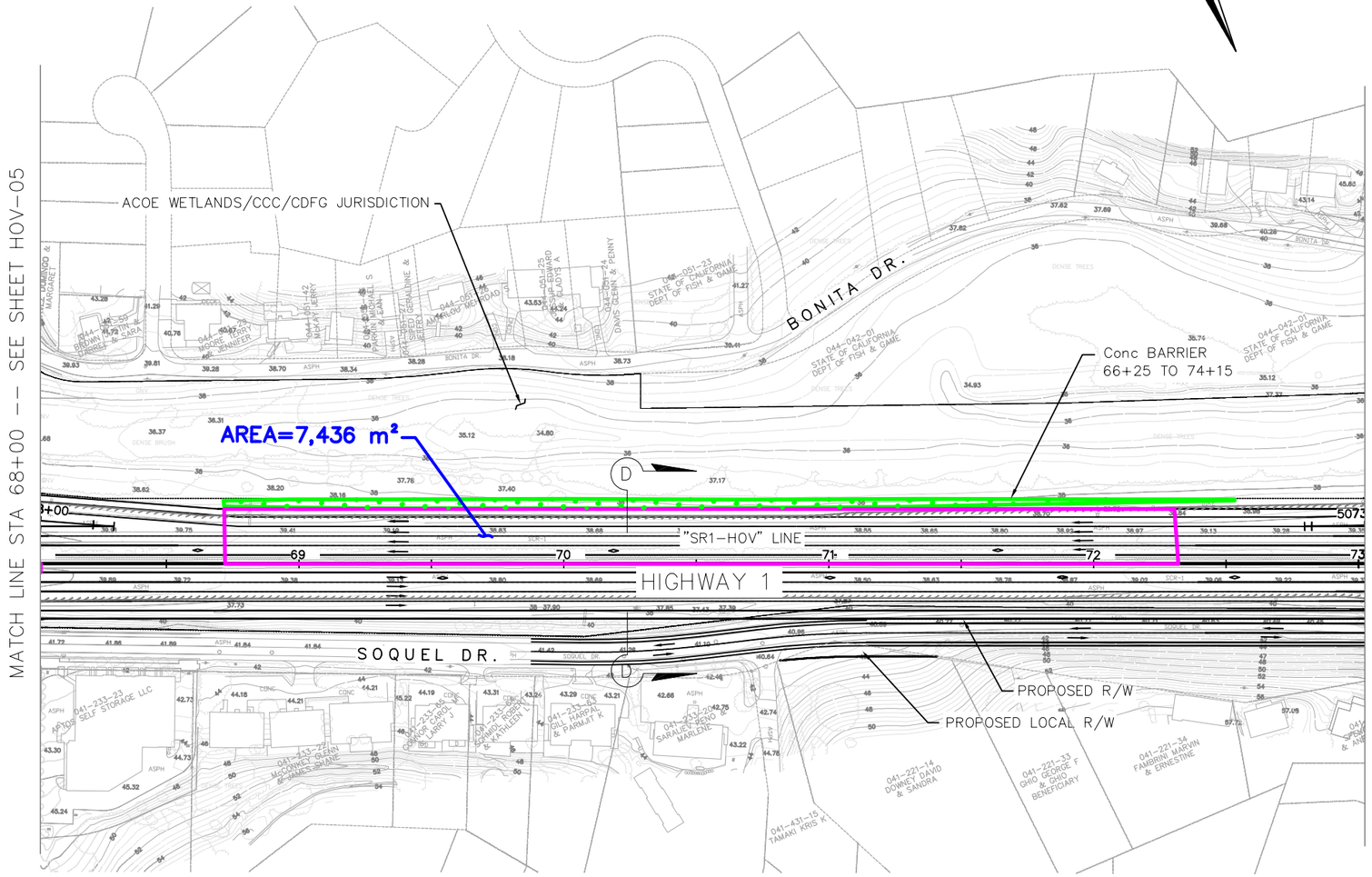
REGISTERED CIVIL ENGINEER

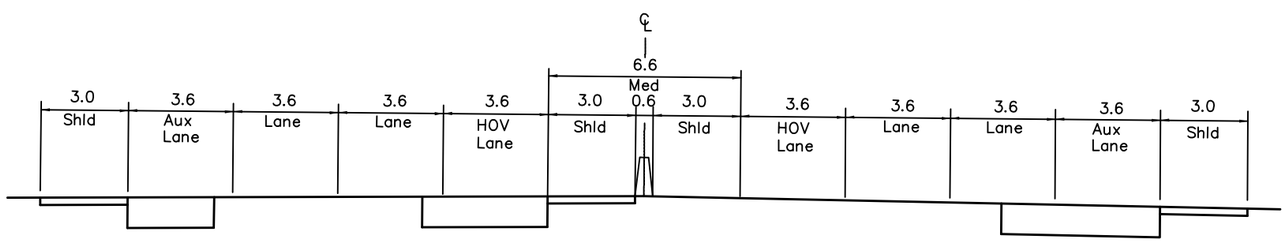
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

Caltrans Metric





SECTION D–D
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-6

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:22:10 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV06.DWG

CU

EA

extol, EDMA, PRMA, TBCT, Watski 10-25-04, auto, PRPN_Reduced, prop63

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		7	26

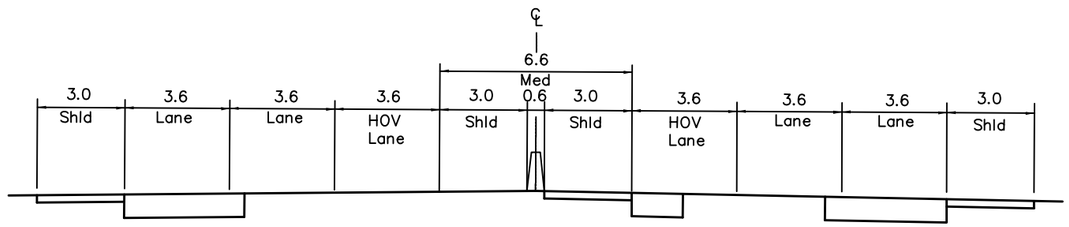
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

Caltrans Metric



SECTION C–C
NO SCALE

CURVE TABLE				
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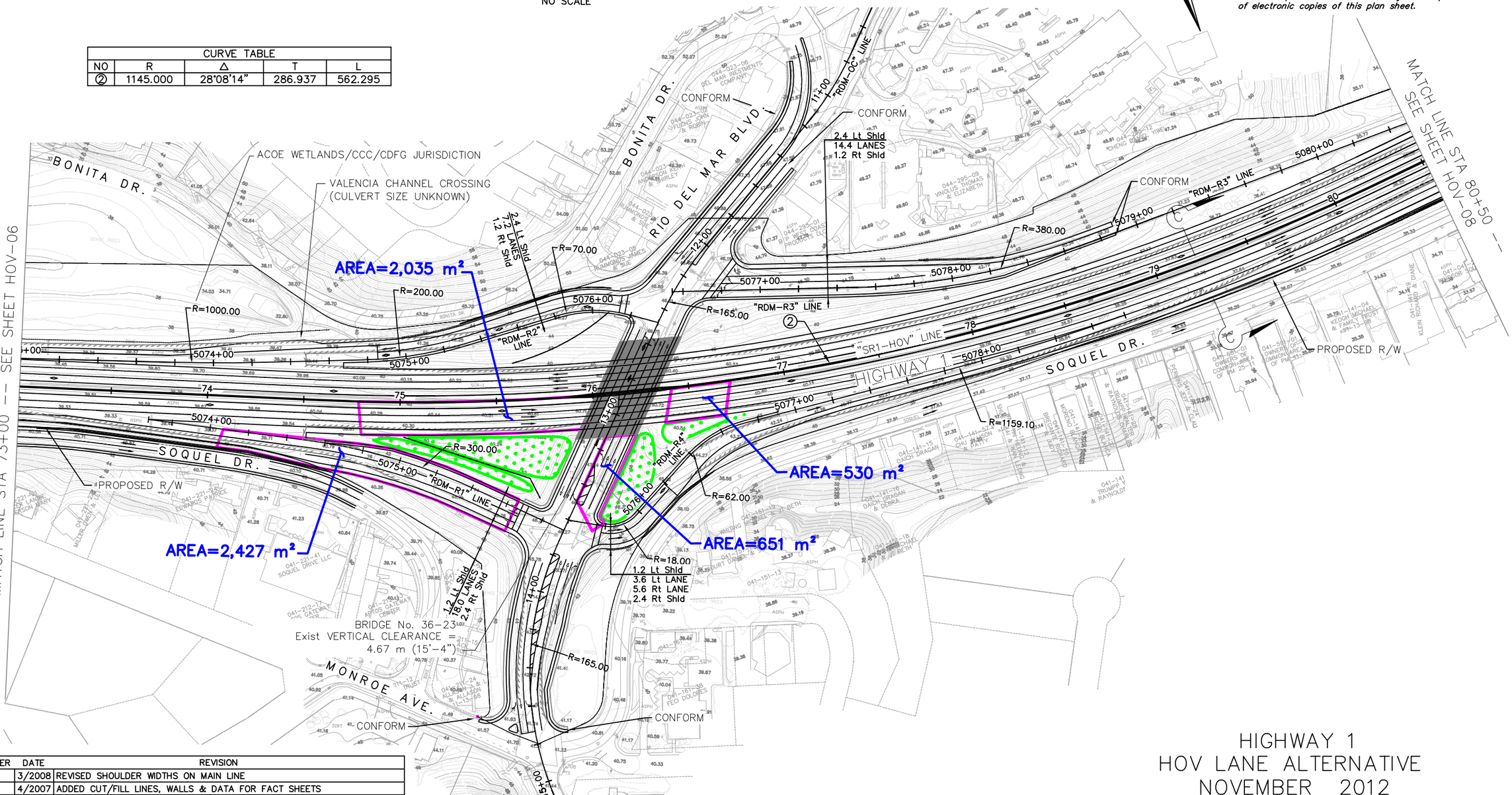


NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV–7

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV07.DWG

CU

EA

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:23:58 PM

LAST REVISION

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

exto1, EVAA, PRAA, TBCT, Wetdet 10-25-04, exto, PRPN_Reduced, prope83

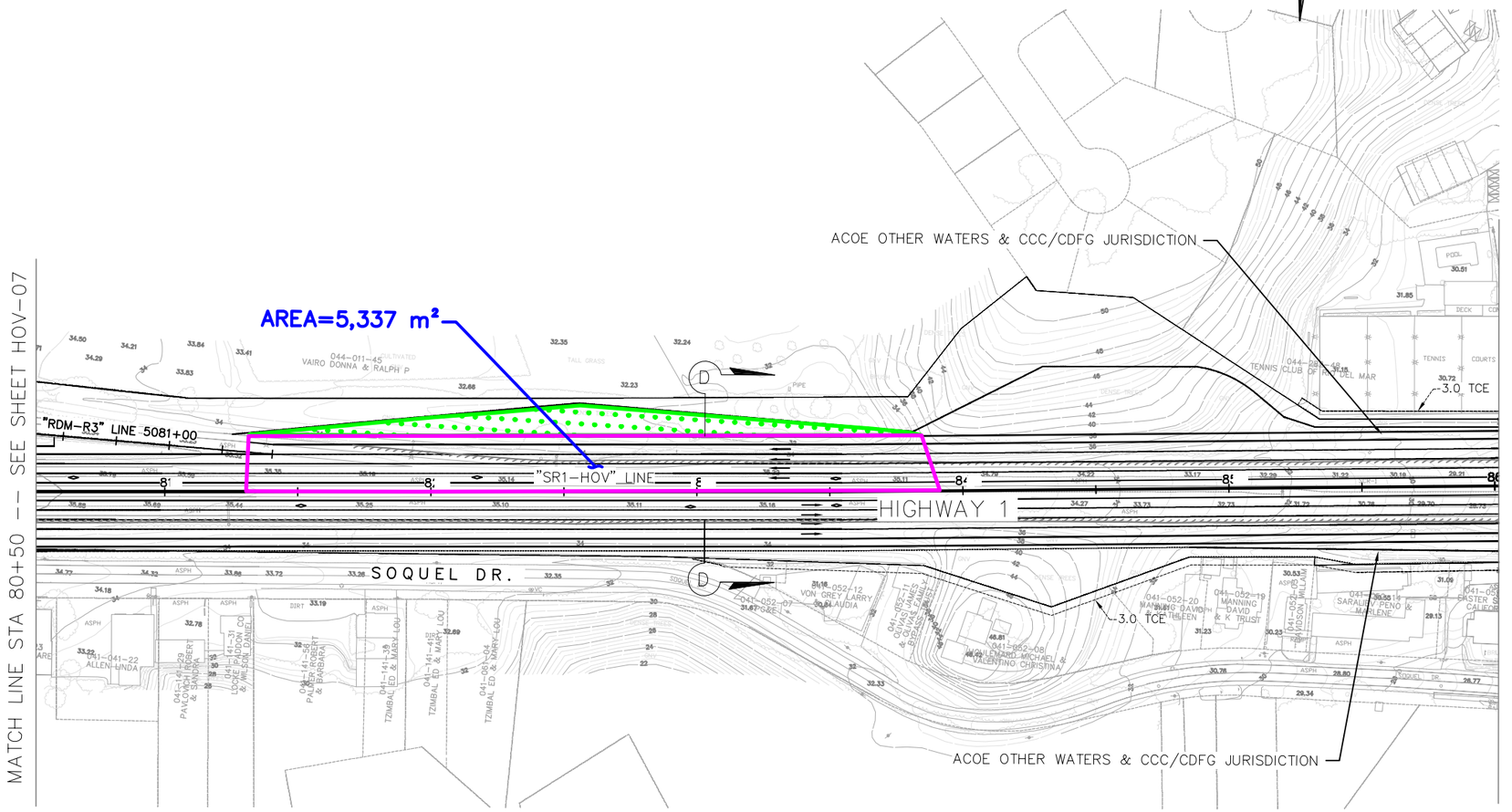
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		8	26

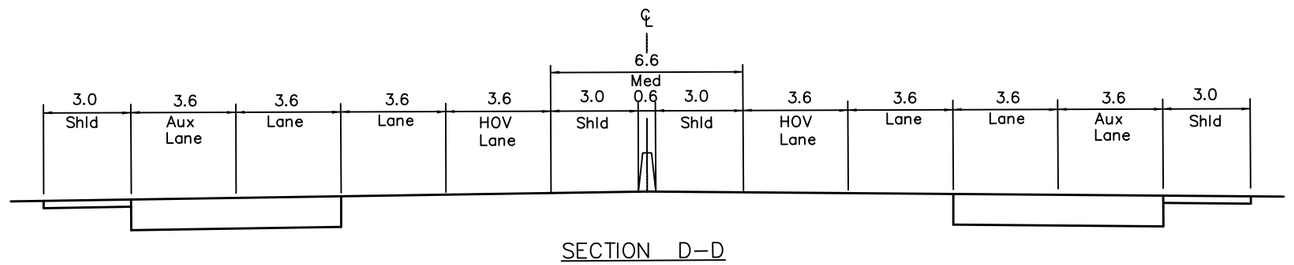
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION D-D
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-8

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOWO8.DWG

CU

EA

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ext01, EXMA, PRMA, TBC7, Wed Jul 10-25-04, ext0, PRPN_Reduced, prop83

LAST REVISION DATE PLOTTED => 11/7/12
TIME PLOTTED => 4:40:55 PM

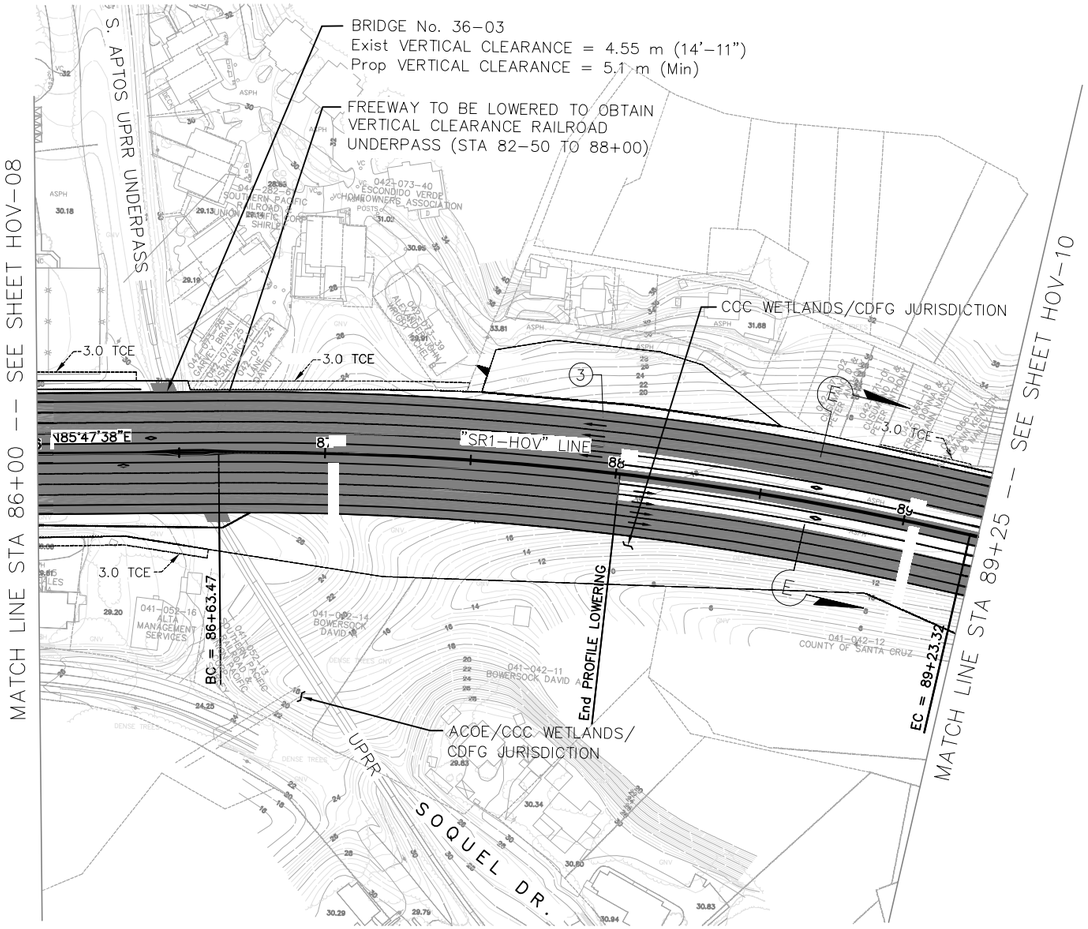
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		9	26

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



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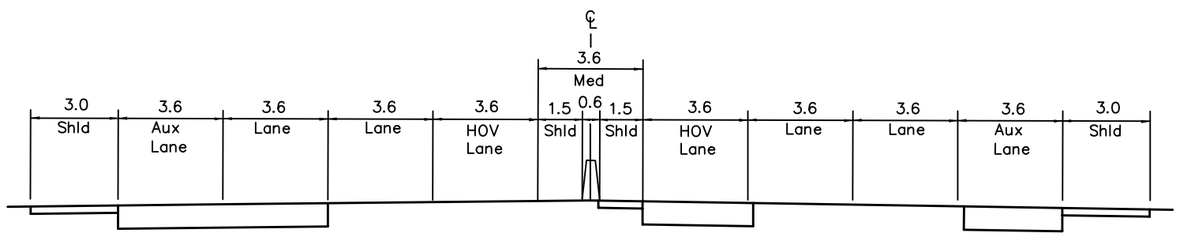

SECTION E-E
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-9

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV09.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:28:32 PM

exto1, EXMA, PRMA, TBGT, Weidel 10-25-04, exto, PRPH_Reduced, prpe83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		10	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
NO	R	Δ	T	L
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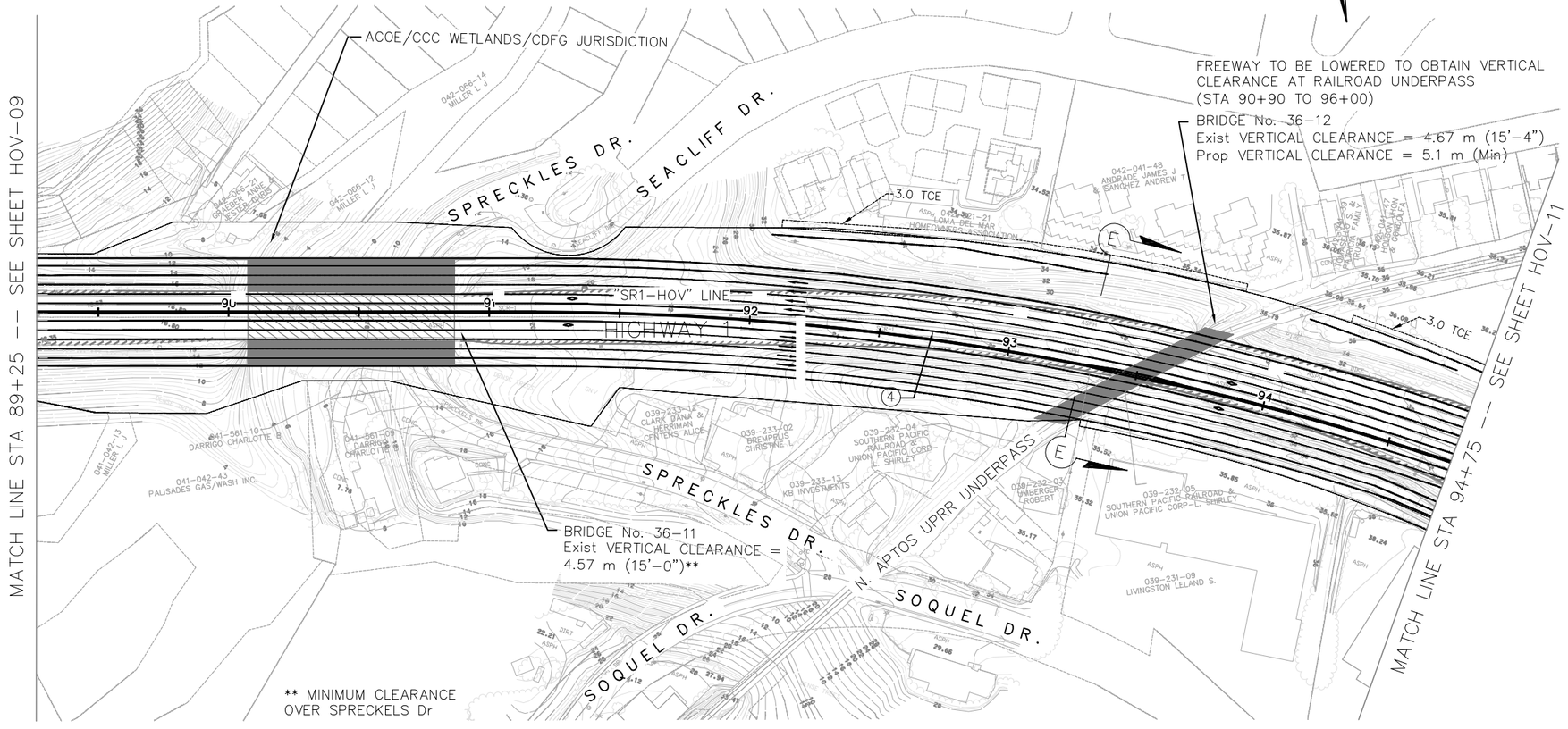

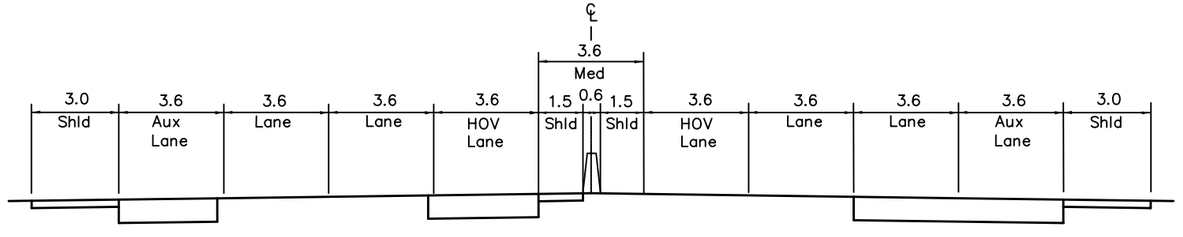

SECTION E-E
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-10

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV10.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE	REVISED BY
	DATE REVISED

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:30:19 PM

axto1, EAMA, PRMA, TBCT, Wetdet 10-25-04, axto, PRPH_Reduced, prop83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		11	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER P. METZGER — No. 40947 — Exp. 3-31-09 — CIVIL — STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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DESIGN OVERSIGHT

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

EXM4, TBCT, Wetdel 10-25-04, exto, prope83, prma, exto5, exto6

MATCH LINE STA 94+75 -- SEE SHEET HOV-10

MATCH LINE STA 102+25 -- SEE SHEET HOV-12

HIGHWAY 1

STATE PARK DR.

McGREGOR DR

OLD DOMINION CT.

CONFORM

Exist BIKE LANE

2.4 Lt Shld
7.2 LANES
1.2 Rt Shld

2.4 Lt Shld
4.9 Lt LANE
3.6 Rt LANE
1.2 Rt Shld

1.2 Lt Shld
3.6 Lt LANE
5.2 Rt LANE
2.4 Rt Shld

1.2 Lt Shld
7.2 LANES
2.4 Rt Shld

2.4 Lt Shld
LANES
2.4 Rt Shld

3.0 TCE

3.0 DCE

PROPOSED R/W

"SR1-HOV" LINE

"SPD-R2" LINE

"SPD-L3" LINE

"SPD-L1" LINE

"SPD-R4" LINE

"SPD-OC" LINE

"SPD-R1" LINE

AREA=2,653 m²

AREA=1,515 m²

AREA=3,345 m²

AREA=2,209 m²

AREA=1,371 m²

AREA=3,7231 m²

AREA=3,345 m²

BRIDGE No. 36-28
Exist VERTICAL CLEARANCE =
4.90 m (16'-1")

v=40 KPH
(v=25 MPH)

v=55 KPH

R=1369.00 R=1000.00 R=70.00 R=1086.00 R=100.00 R=45.00 R=16.40 R=210.00 R=1000.00 R=47.00 R=120.00 R=1000.00

CURVE TABLE				
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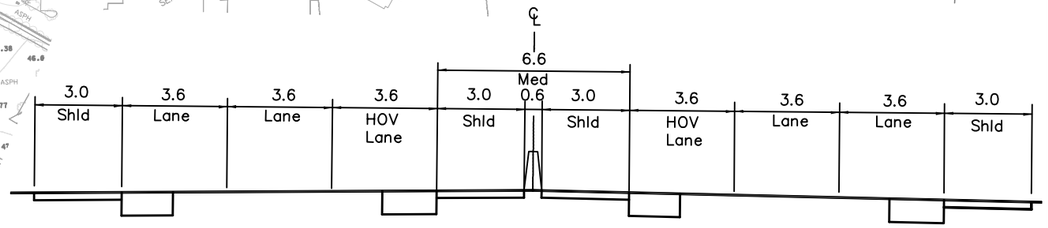
④	976.00	24°41'12"	213.576	420.524

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION



SECTION C-C
NO SCALE

("SR1-HOV" MAIN LINE CONFIGURATION ONLY)

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-11

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV11.DWG

CU

EA

LAST REVISION DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:34:46 PM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		12	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
NO	R	Δ	T	L
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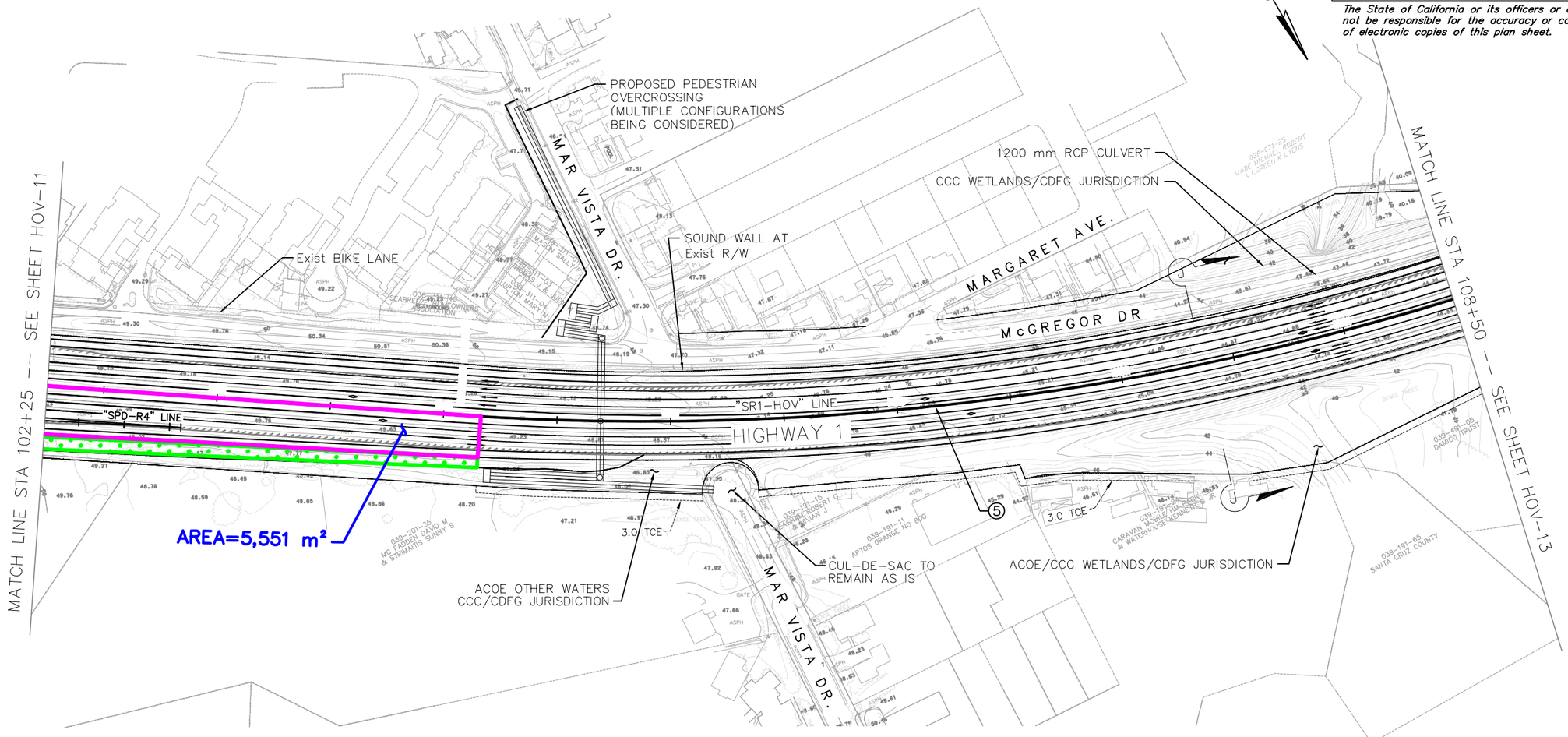

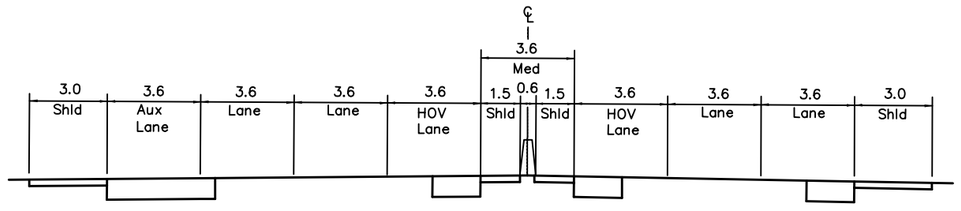

SECTION J–J
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–12

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV12.DWG

CU

EA

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:46:10 PM

LAST REVISION

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

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DATE REVISED BY

DATE REVISED

ext01, EXMA, PRMA, TBCT, Wetdet 10-25-04, exto, PRPN_Reduced, prope83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		13	26

REGISTERED CIVIL ENGINEER

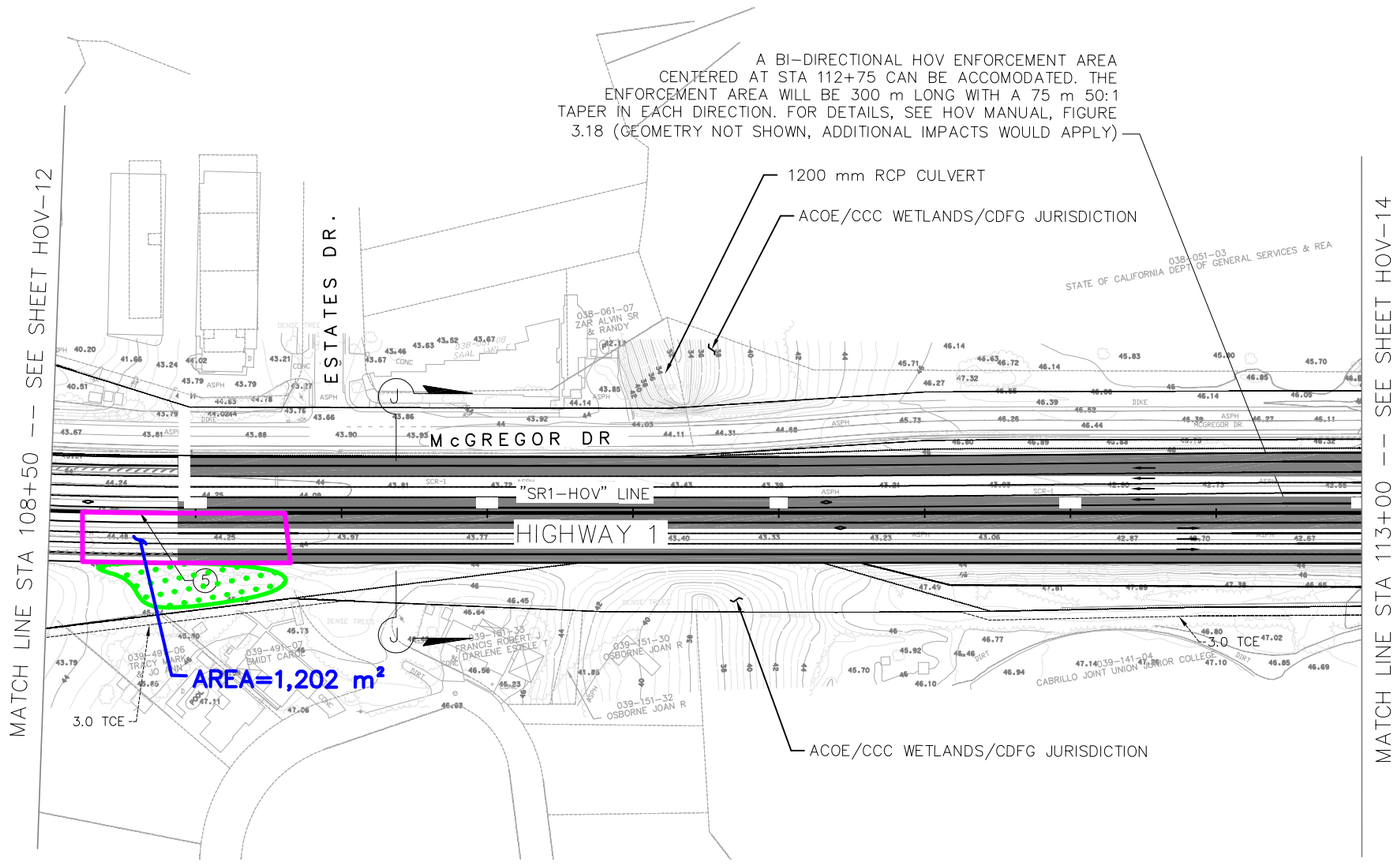
PLANS APPROVAL DATE

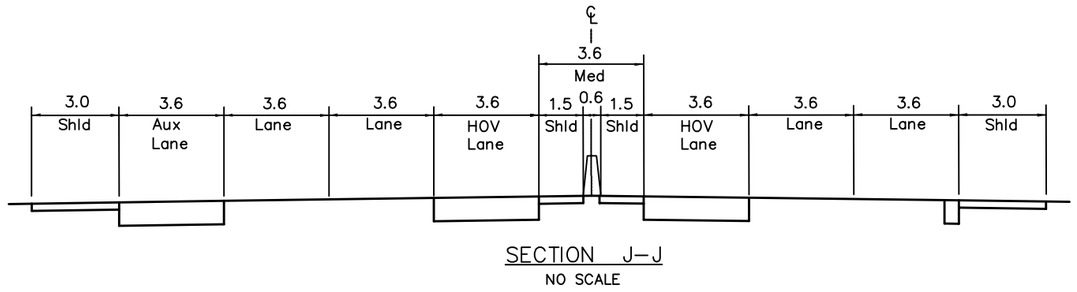
REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
NO	R	Δ	T	L
⑤	1200.000	23°20'30"	247.871	488.866

A BI-DIRECTIONAL HOV ENFORCEMENT AREA CENTERED AT STA 112+75 CAN BE ACCOMODATED. THE ENFORCEMENT AREA WILL BE 300 m LONG WITH A 75 m 50:1 TAPER IN EACH DIRECTION. FOR DETAILS, SEE HOV MANUAL, FIGURE 3.18 (GEOMETRY NOT SHOWN, ADDITIONAL IMPACTS WOULD APPLY)





SECTION J-J
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-13

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV13.DWG

CU

EA

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:48:17 PM

LAST REVISION

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

exto1, EMMA, PRMA, TBCT, Weldel 10-25-04, exto, PRPN_Reduced, prope83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		14	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
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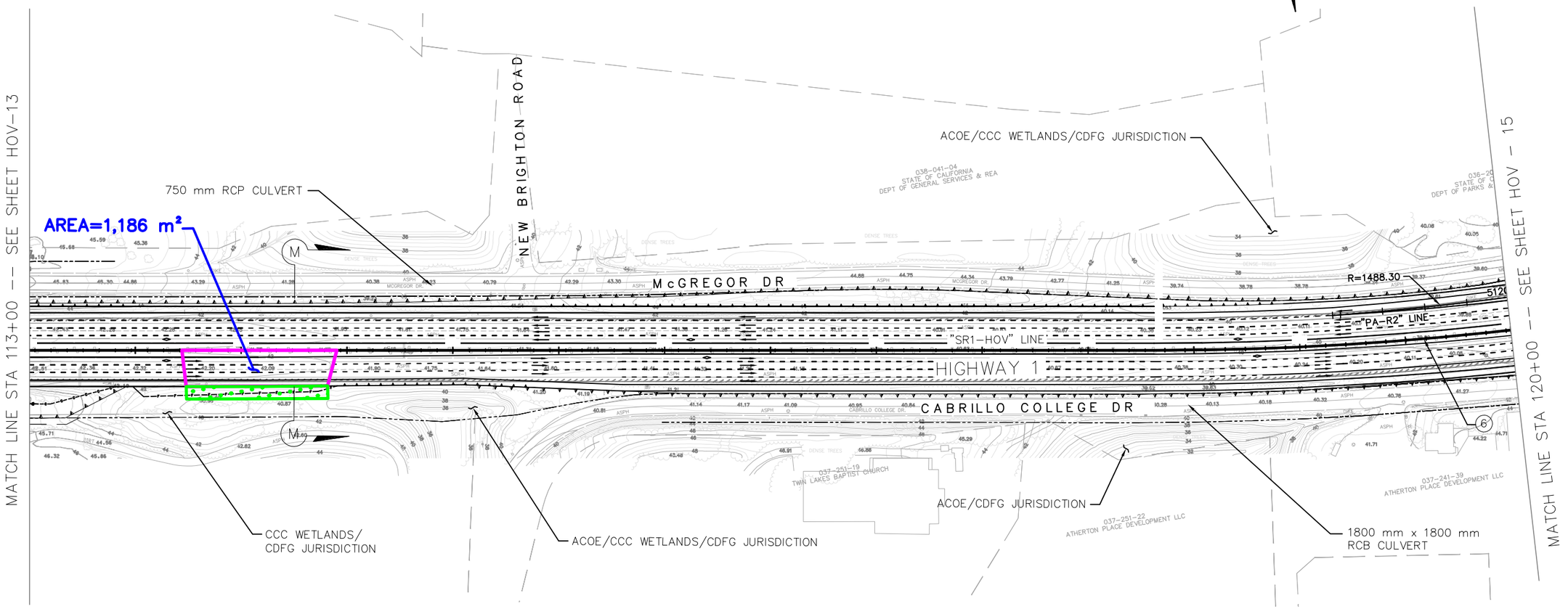

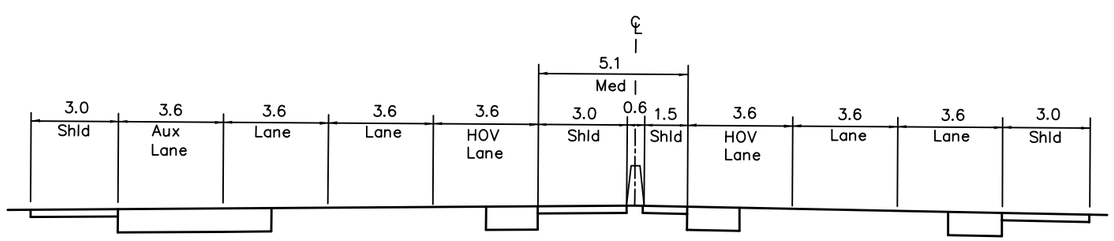

SECTION M–M
NO SCALE

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–14

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV14.DWG

CU

EA

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:49:50 PM

LAST REVISION

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CALCULATED/ DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

ext01, EMMA, PRMA, TRCT, WebM 10-25-04, axis, PRPN_Reduced, prope83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		15	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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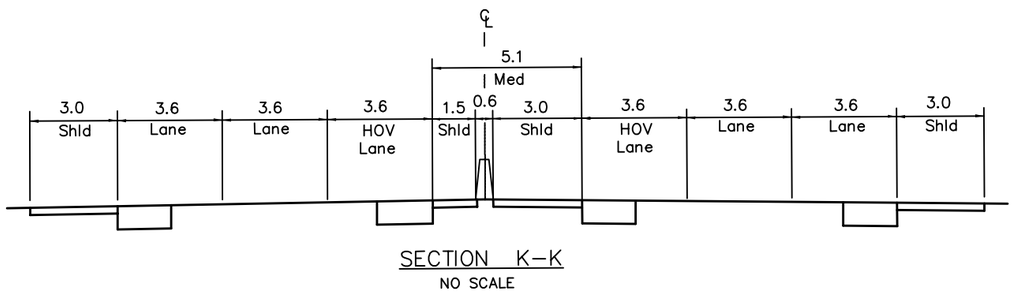
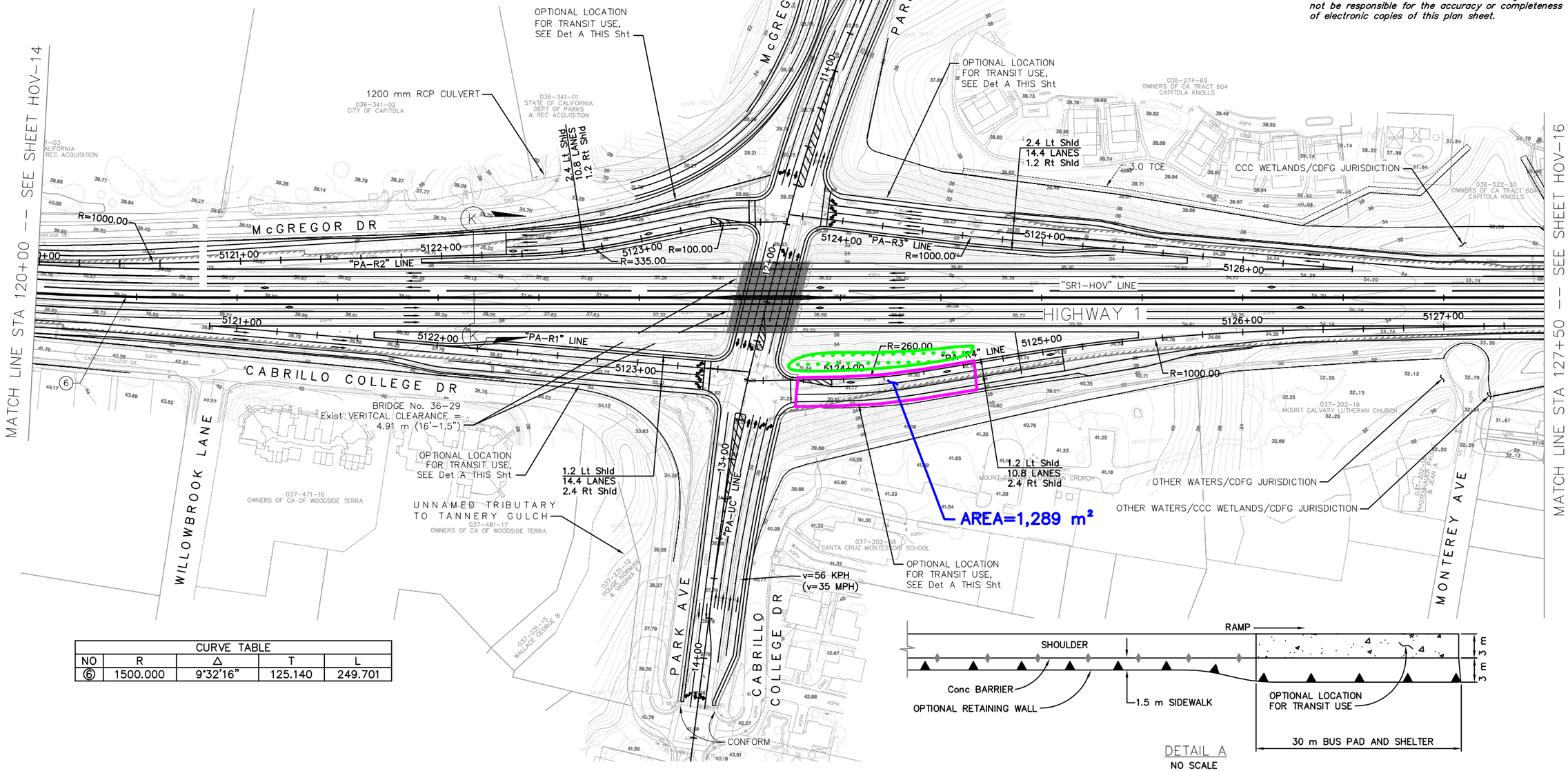
Caltrans Metric



SECTION K–K
NO SCALE



CURVE TABLE				
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DETAIL A
NO SCALE

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–15

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

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CHECKED BY
DATE REVISED BY
DATE REVISED

exto1, EXMA, PRMA, TBCT, Weida 10-25-04, exto, PRPN_Reduced, prop65

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV15.DWG

CU

EA

LAST REVISION
DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:52:17 PM

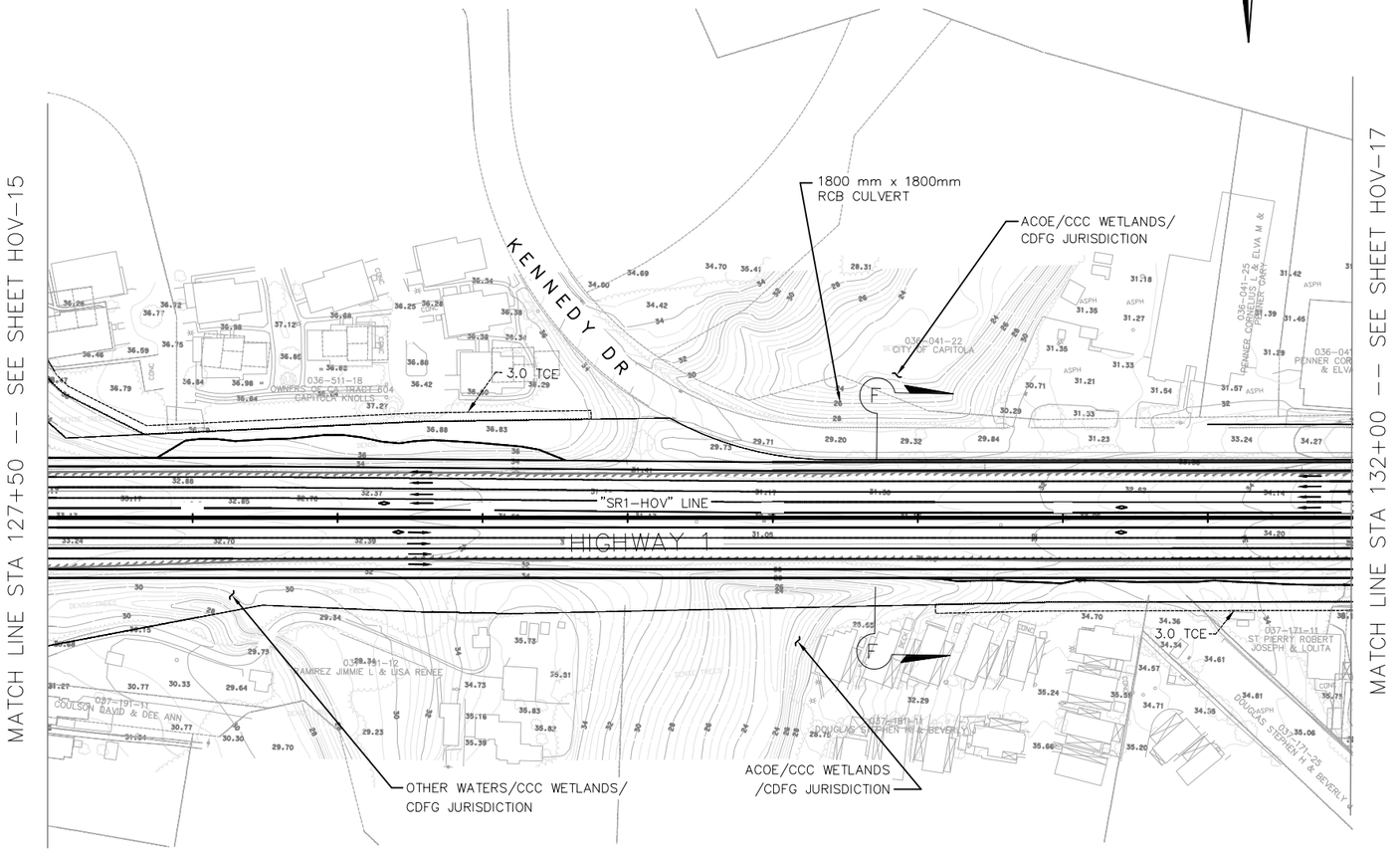
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		16	26

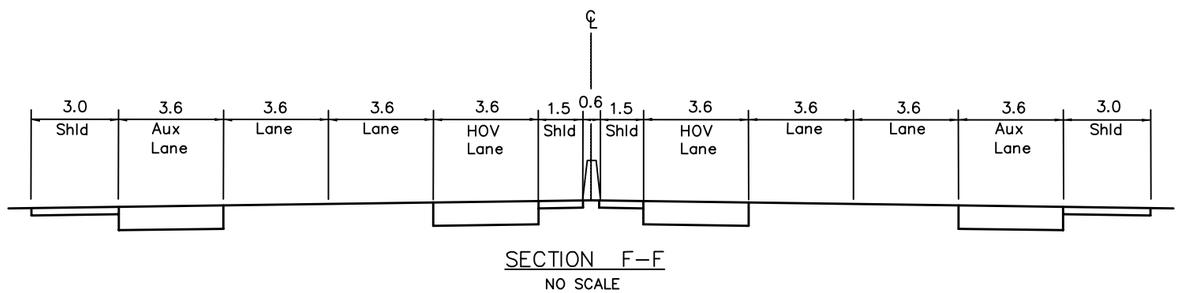
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER P. METZGER
No. 40947
Exp. 3-31-09
CIVIL
STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION F-F
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-16

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV16.DWG

CU

EA

LAST REVISION
DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:54:41 PM

DESIGN OVERSIGHT

CALCULATED/ DESIGNED BY

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DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

exto1, EXMA, PRMA, TBCI, Wetdel 10-25-04, exto, PRPN_Reduced, prope83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		17	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
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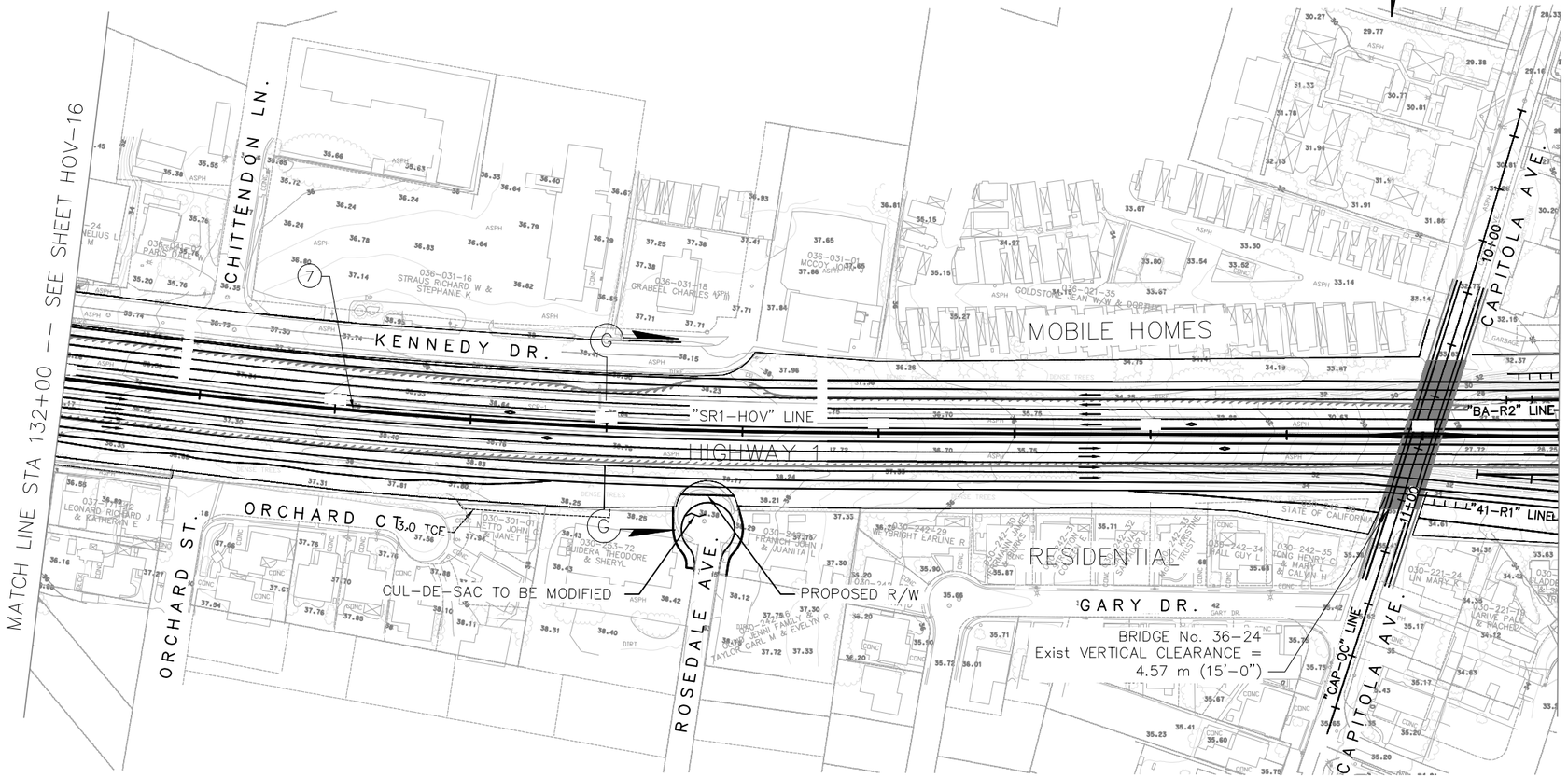

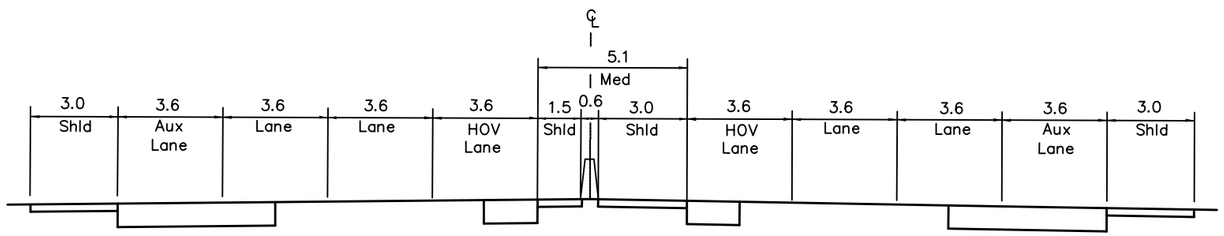

SECTION G-G
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-17

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV17.DWG

CU

EA

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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CHECKED BY

DATE	REVISED BY	DATE REVISED

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 3:57:09 PM

exto1, EXMA, PRMA, TBCT, WeldW 10-25-04, exto, PRPN_Reduced, prop483

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		18	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

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WALNUT CREEK, CA 94596

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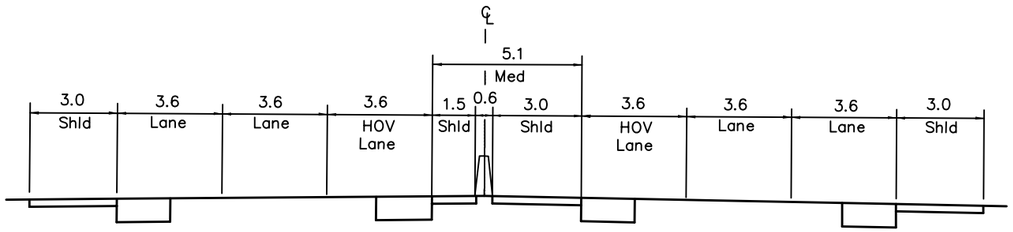
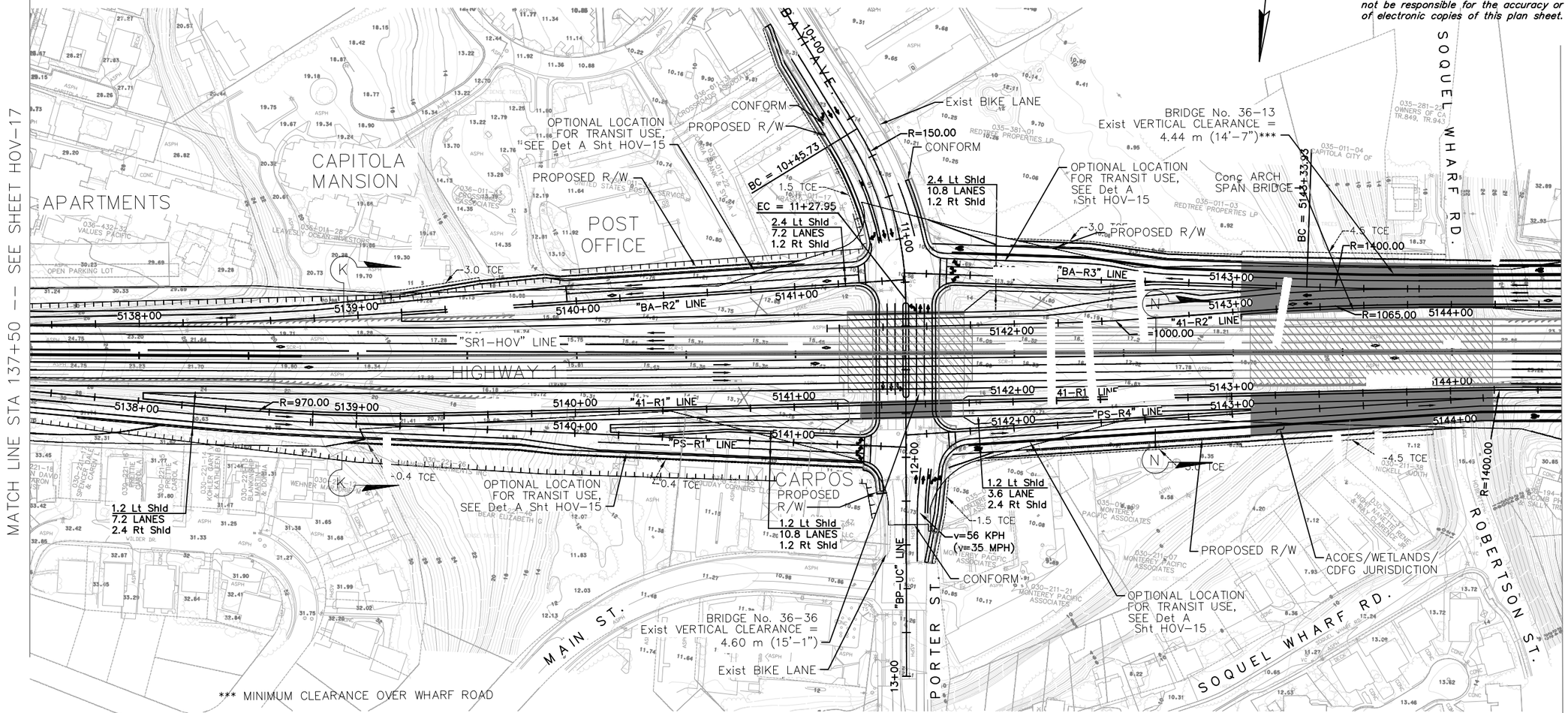
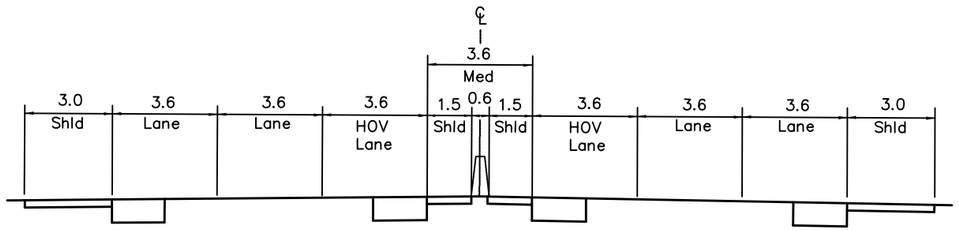
Caltrans Metric



SECTION K–K
NO SCALE





SECTION N–N
NO SCALE

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–18

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV18.DWG

CU

EA

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 4:00:32 PM

ex1o1, EXMA, PRMA, TBCT, Weidel 10-25-04, ex4o, PRPN_Reduced, prop83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		19	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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CURVE TABLE				
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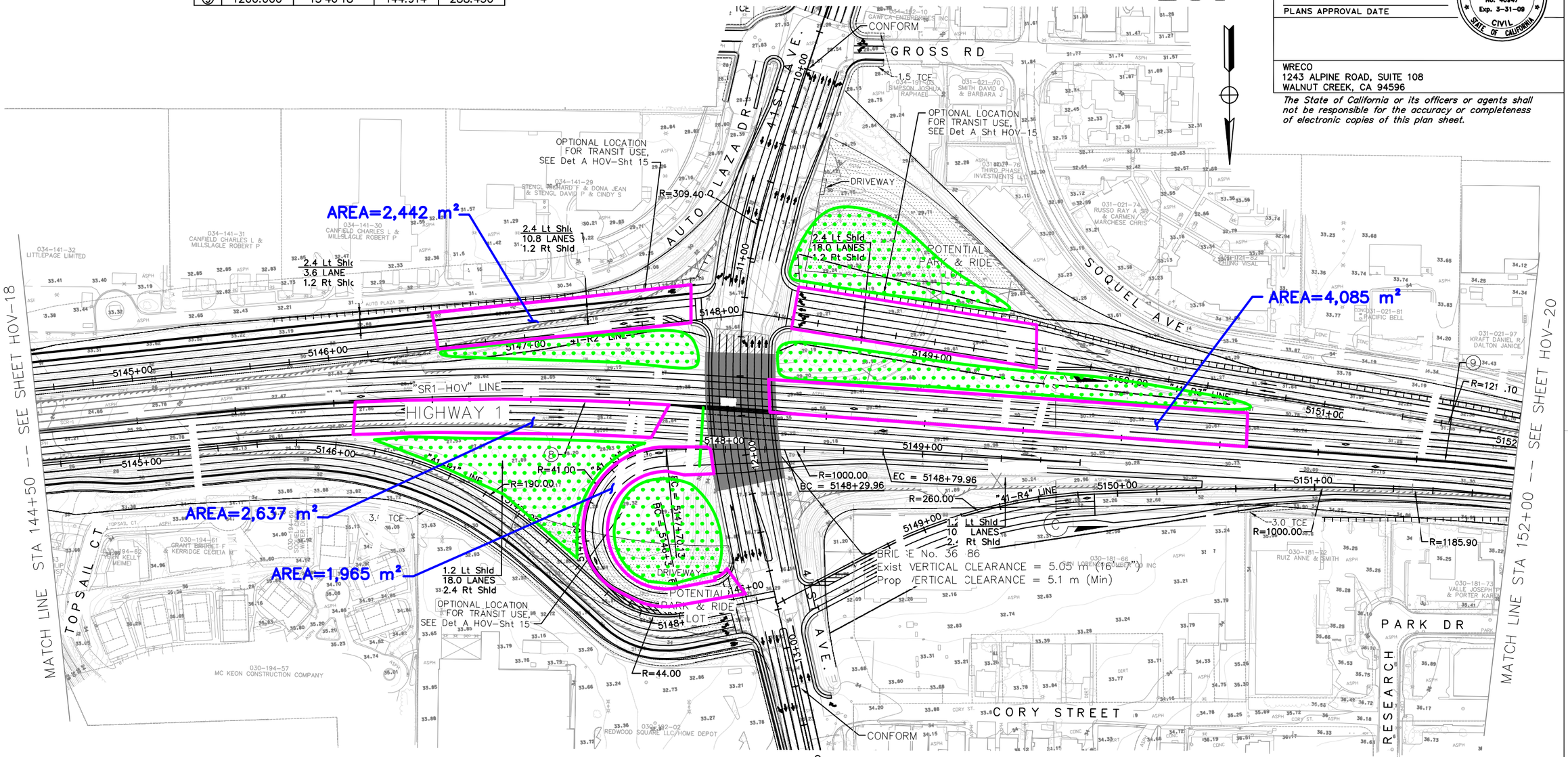
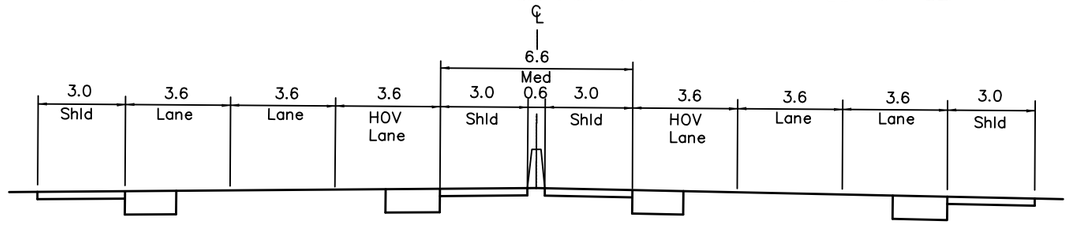
⑨	1200.000	13°46'18"	144.914	288.430





("SR1–HOV" MAIN LINE CONFIGURATION ONLY)

SECTION C–C
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–19

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV19.DWG

CU

EA

LAST REVISION

DATE PLOTTED => 11/7/12
TIME PLOTTED => 4:07:19 PM

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CALCULATED/ DESIGNED BY
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DATE REVISED BY
DATE REVISED

ex1o1, EXMA, PRMA, TBCT, Weidel 10-25-04, ex1o, PRPN_Reduced, prop83

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		20	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — CHRISTOPHER P. METZGER — No. 40947 — Exp. 3-31-09 — CIVIL — STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

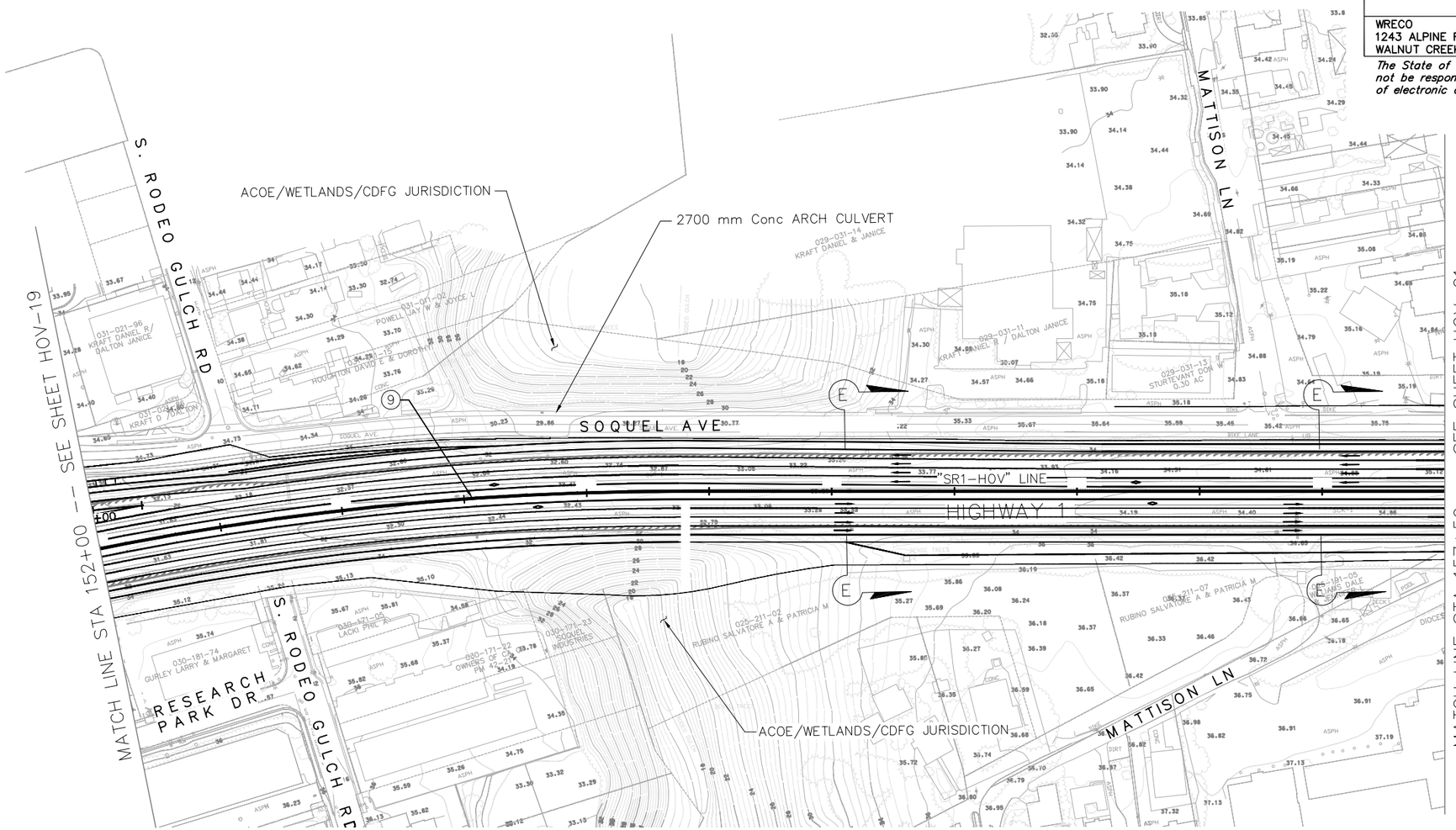
DATE	REVISED BY	DATE REVISED
CALCULATED/ DESIGNED BY		
CHECKED BY		

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ext:1, EXM, PRM, TBCT, Wetdet 10-25-04, ext:0, PRPN_Reduced, prope83



CURVE TABLE				
NO	R	Δ	T	L
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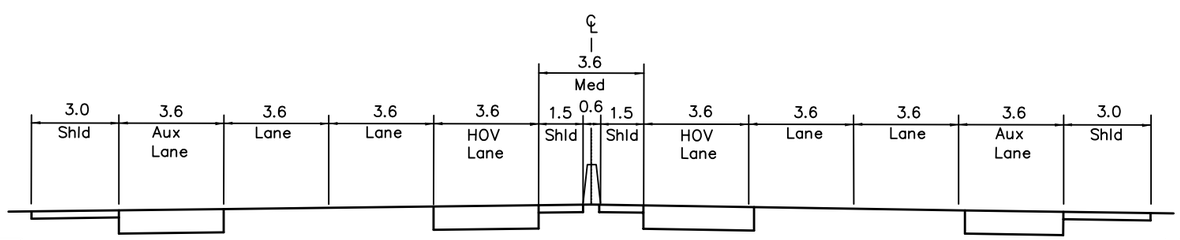


SECTION E-E
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-20

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV20.DWG

CU

EA

LAST REVISION — DATE PLOTTED => 11/7/12 TIME PLOTTED => 4:10:03 PM

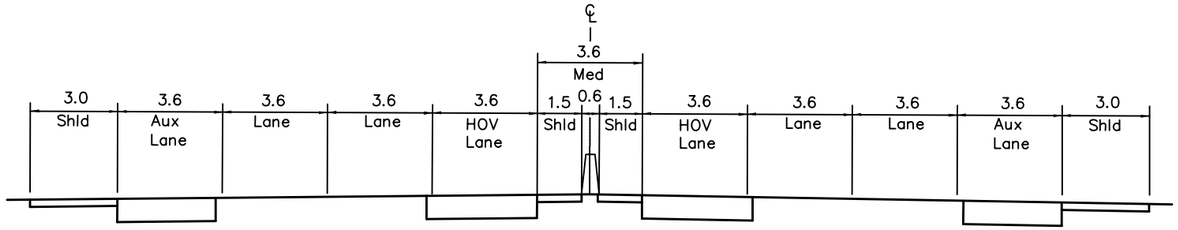
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		21	26

REGISTERED CIVIL ENGINEER

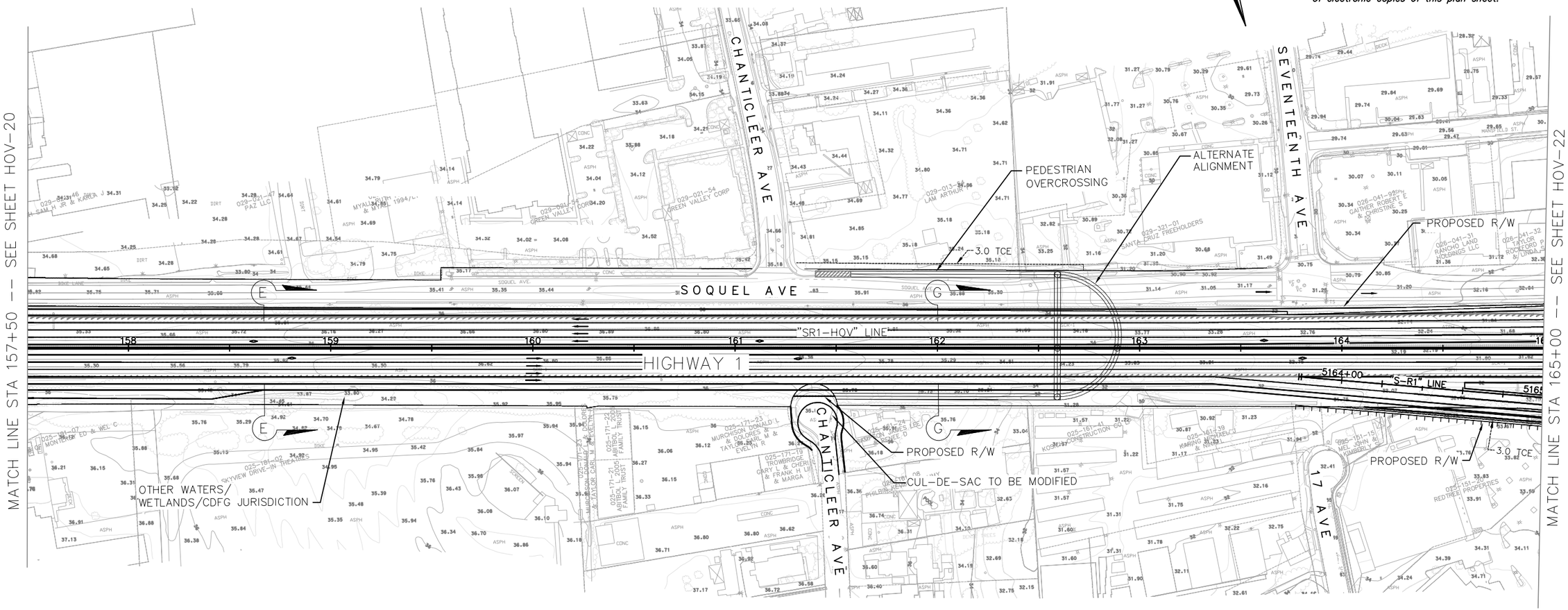
PLANS APPROVAL DATE

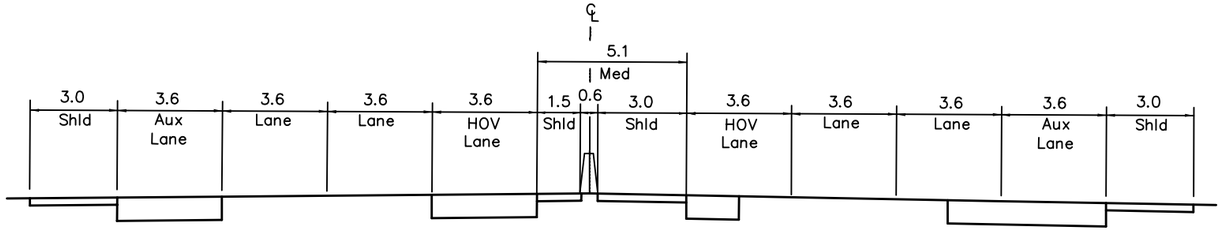
REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



SECTION E–E
NO SCALE





SECTION G–G
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV–21

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV21.DWG

CU

EA

LAST REVISION
DATE PLOTTED => 11/7/12
TIME PLOTTED => 4:45:42 PM

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CALCULATED/ DESIGNED BY
CHECKED BY

DATE REVISED BY
DATE REVISED

axlo1, EXMA, PRMA, TBCT, Weidel 10-25-04, axlo, PRPH_Reduced, prope83

CURVE TABLE				
NO	R	Δ	T	L
⑩	1500.00	9°20'00"	122.443	244.344

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		22	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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MATCH LINE STA 165+00 -- SEE SHEET HOV-21

MATCH LINE STA 172+00 -- SEE SHEET HOV-23

PAUL MINNIE AVE.

SOQUEL AVE

SOQUEL DR.

HIGHWAY 1

COMMERCIAL WAY

FARLAND WY

AREA=867 m²

AREA=1,864 m²

AREA=968 m²

PROPOSED R/W

CONFORM

2.4 Lt Shld
5.6 Lt LANE
3.6 Rt LANE
1.2 Rt Shld

2.4 Lt Shld
18.0 LANES
1.2 Rt Shld

2.4 Lt Shld
4.9 Lt LANE
3.6 Rt LANE
1.2 Rt Shld

1.2 Lt Shld
14.4 LANES
2.4 Rt Shld

1.2 Lt Shld
3.6 LANES
2.4 Rt Shld

1.2 Lt Shld
7.2 LANES
2.4 Rt Shld

V=56 KPH
(V=35 MPH)

LIMIT OF WORK

WORK TO BE COMPLETED UNDER 04-0K4104 PROJECT

1800 mm Conc ARCH CULVERT

BRIDGE No. 36-64
Exist VERTICAL CLEARANCE = 4.57 m (15'-0")
Prop VERTICAL CLEARANCE = 5.1 m (Min)

ACOE/WETLANDS/
CDFG JURISDICTION

3.0 TCE

1.0 TCE

EAST BIKE LANE

"SR1-HOV" LINE

"S-R4" LINE

"S-L2" LINE

"S-R3" LINE

"S-L3" LINE

"S-OC" LINE

R=1000.00

R=150.00

R=40.00

R=49.63

R=260.00

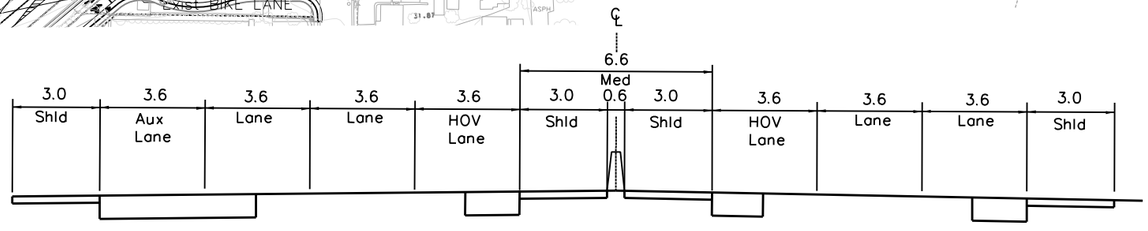
R=2000.00

EC=5165+95.61

BC=5167+09.06

EC=5167+73.41

BC=5168+50.06



("SR1-HOV" MAIN LINE CONFIGURATION ONLY)

SECTION H-H
NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-22

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DATE	REVISED BY	DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

exist. EMMA, PRMA, TBCT, Weidel 10-23-04, exist. PRPN_Reduced, prop83

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV22.DWG

CU

EA

LAST REVISION

DATE PLOTTED => 8/20/07
TIME PLOTTED => 3:04:14 PM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		23	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
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WALNUT CREEK, CA 94596

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Caltrans Metric

CURVE TABLE

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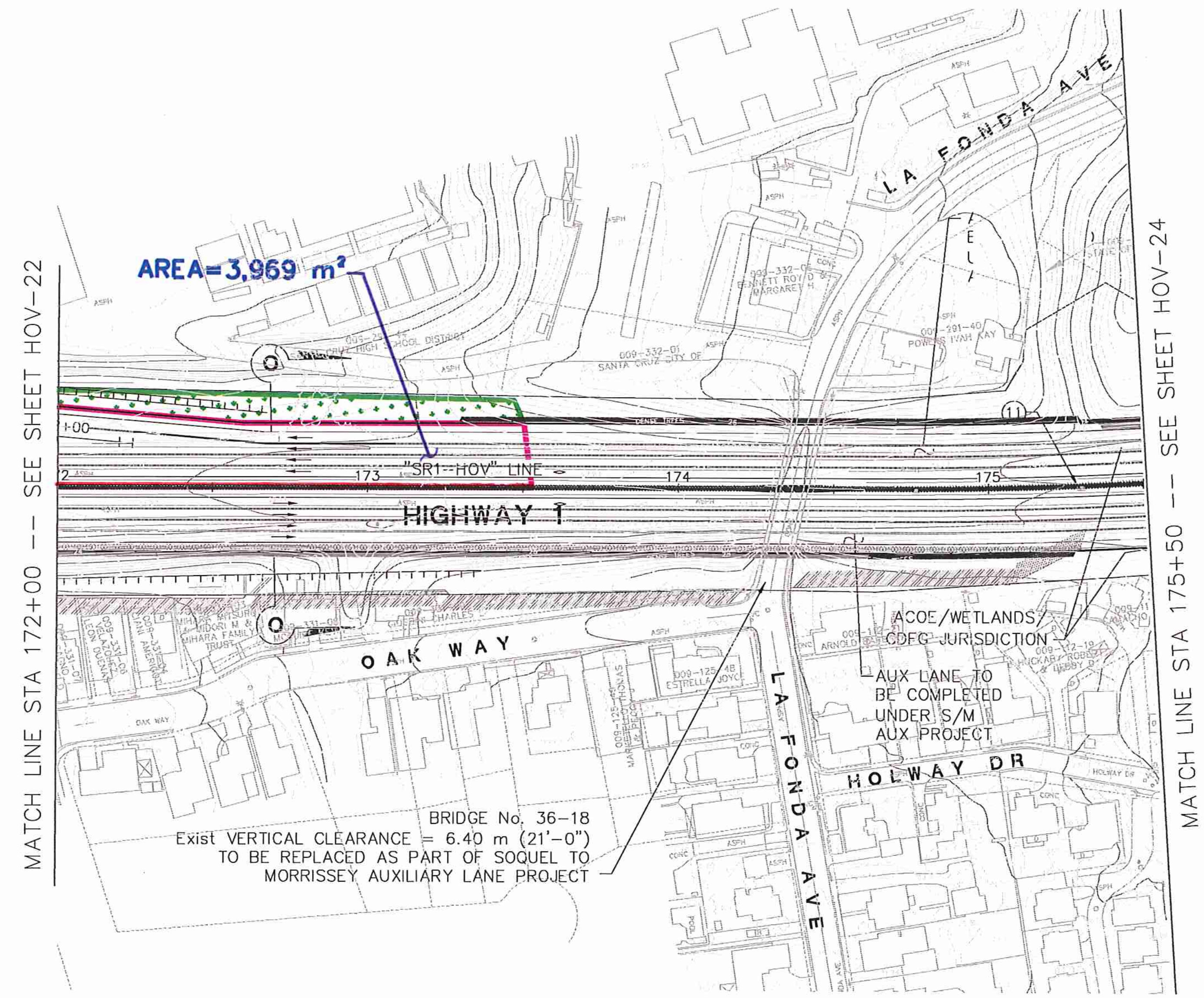

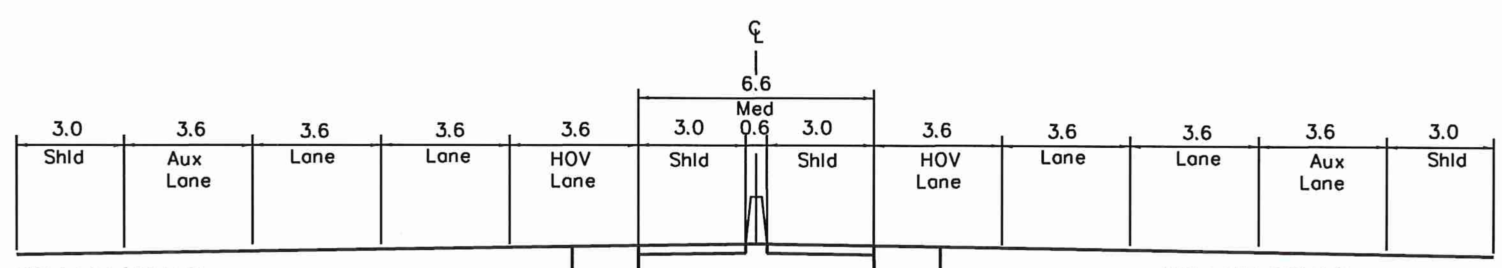

SECTION O-O

NO SCALE

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN OVERSIGHT | CALCULATED/DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-23

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV23.DWG

CU | EA

LAST REVISION | DATE PLOTTED => 10/25/12 | TIME PLOTTED => 3:47:43 PM

CURVE TABLE				
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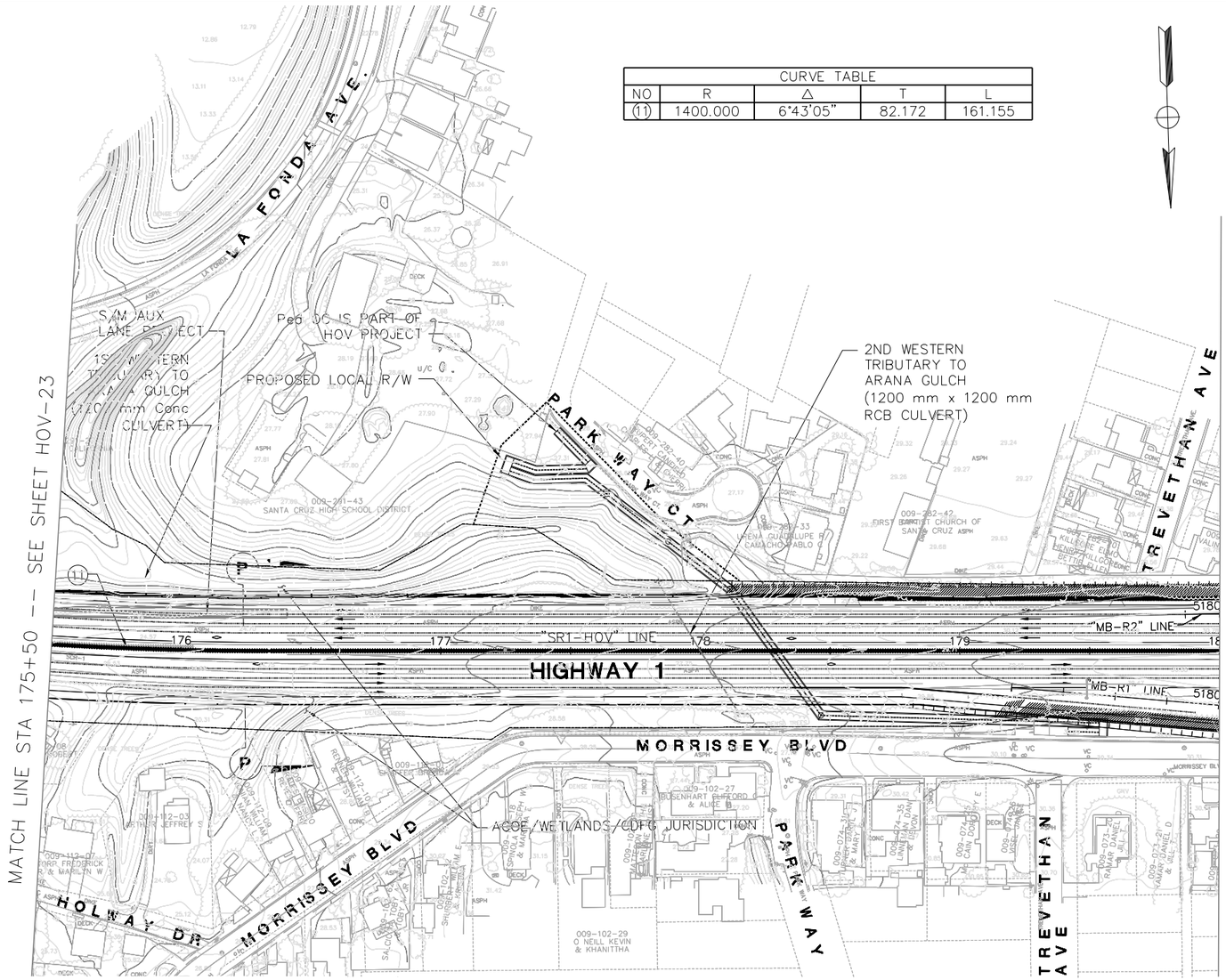
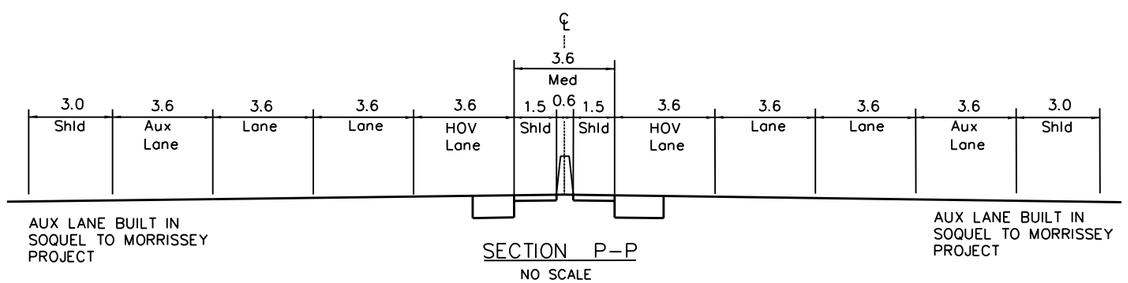




SECTION P–P
NO SCALE

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		24	26

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

HOV-24

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV24.DWG

CU

EA

DATE PLOTTED => 10/25/12
TIME PLOTTED => 4:16:09 PM

LAST REVISION

DESIGN OVERSIGHT

CALCULATED/ DESIGNED BY

CHECKED BY

DATE

REVISED BY

DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

e:\o1, EJMA, PRMA, TBCT, Weidel 10-25-04, enlo, PRPN_Reduced, prope53

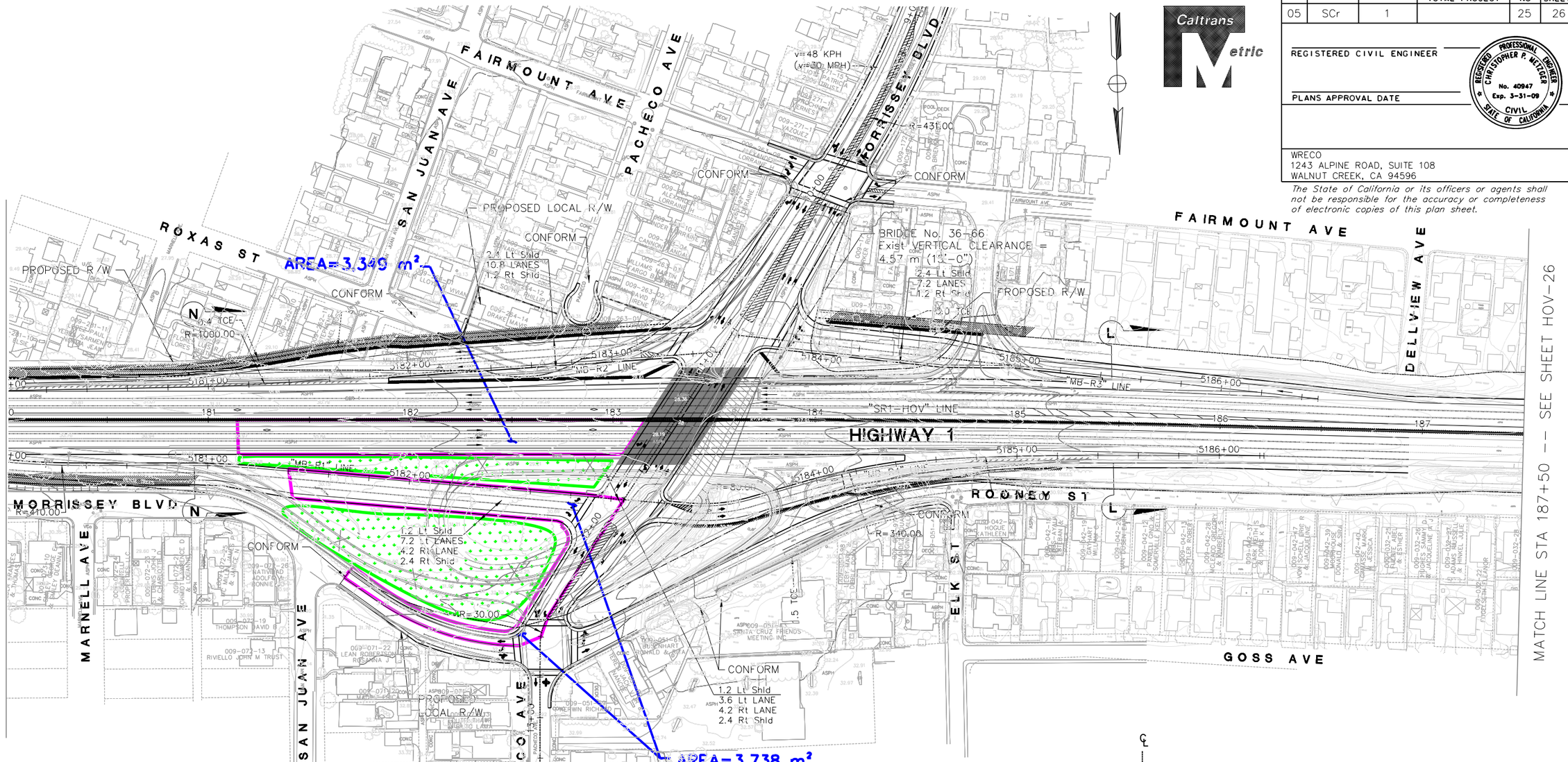
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		25	26

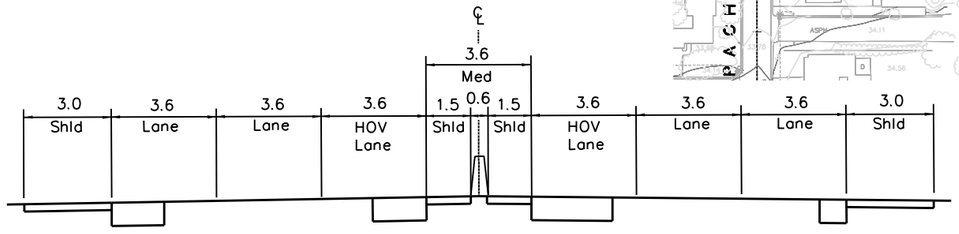
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

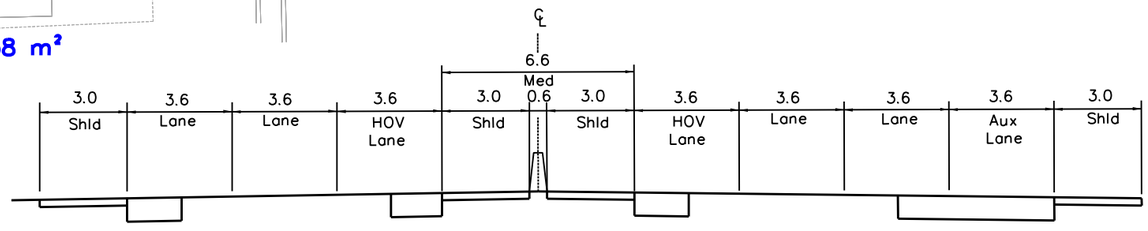
REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER P. METZGER No. 40947 Exp. 3-31-09 CIVIL STATE OF CALIFORNIA

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION N-N
NO SCALE



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NUMBER	DATE	REVISION
4	3/2008	REVISED SHOULDER WIDTHS ON MAIN LINE
3	4/2007	ADDED CUT/FILL LINES, WALLS & DATA FOR FACT SHEETS
2	2/2007	REVISED APE LINE WORK
1	2/2007	ADDED STATION LINE INFORMATION

HIGHWAY 1
HOV LANE ALTERNATIVE
NOVEMBER 2012

SCALE: 1:1000

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HOV-25

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

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CHECKED BY

DATE | REVISED BY | DATE REVISED

LAST REVISION
DATE PLOTTED => 10/25/12
TIME PLOTTED => 4:08:11 PM

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DS
DGN FILE => G:\PROJECTS\Y2003\P0313 ROUTE1\DRAWINGS\BMP\HOV25.DWG

CU

EA

e:\ol, EXHA, PRHA, TBCT, Weidel 10-25-04, enlo, PRPN_Reduced, prop83

Plans Showing BMP Deployment
Tier I Project: TSM Alternative

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		1	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

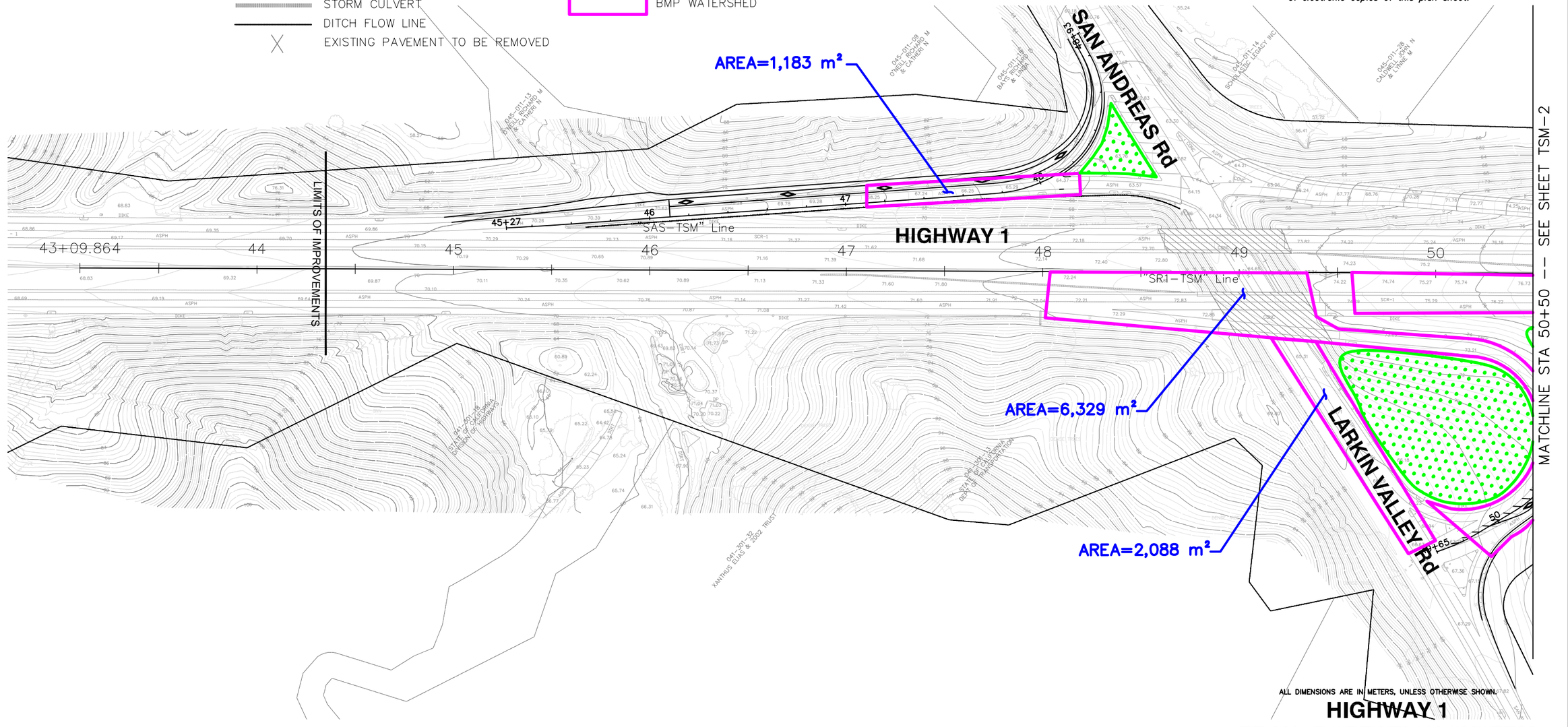
WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

LEGEND

- WETLANDS
- APPROXIMATE LOCATION OF WETLANDS JURISDICTION OUTSIDE PROJECT APE PERIMETER OF WETLANDS JURISDICTION
- ORDINARY HIGH WATER MARK (OHWM)
- SOUNDWALL (PRELIMINARY)
- RETAINING WALL
- CONCRETE BARRIER
- EXISTING RIGHT-OF-WAY
- LOCAL PROPERTY LINE
- PARCEL LINE
- STORM CULVERT
- DITCH FLOW LINE
- EXISTING PAVEMENT TO BE REMOVED
- STRUCTURE WIDENING/ NEW STRUCTURE
- CUT LINE
- FILL LINE
- PROPOSED WIDENING
- S/M AUX LANE PROJECT (PRELIMINARY 4-07)
- EXISTING STRUCTURE
- PROPOSED TREATMENT BEST MANAGEMENT PRACTICE (BMP) LOCATIONS. REFER TO STORM WATER DATA REPORT FOR TREATMENT BMP TYPE
- BMP WATERSHED

ABBREVIATION

LDT LANE DROP TRANSITION



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-1

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE REVISED BY | DATE REVISED

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USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION

DATE PLOTTED =>
TIME PLOTTED =>

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		2	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

DESIGN OVERSIGHT

CALCULATED/ DESIGNED BY

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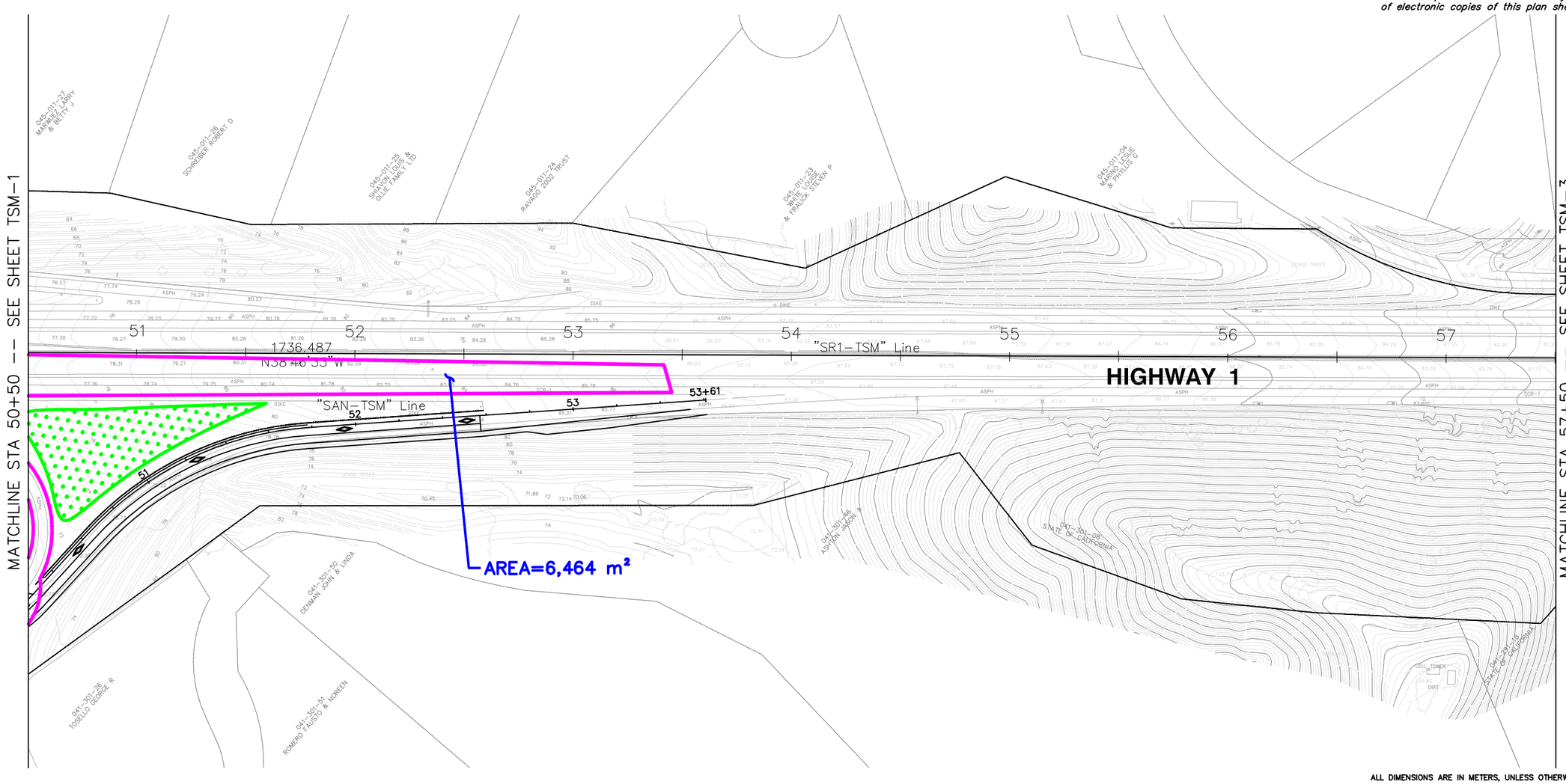
DATE REVISED BY

DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-2

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION

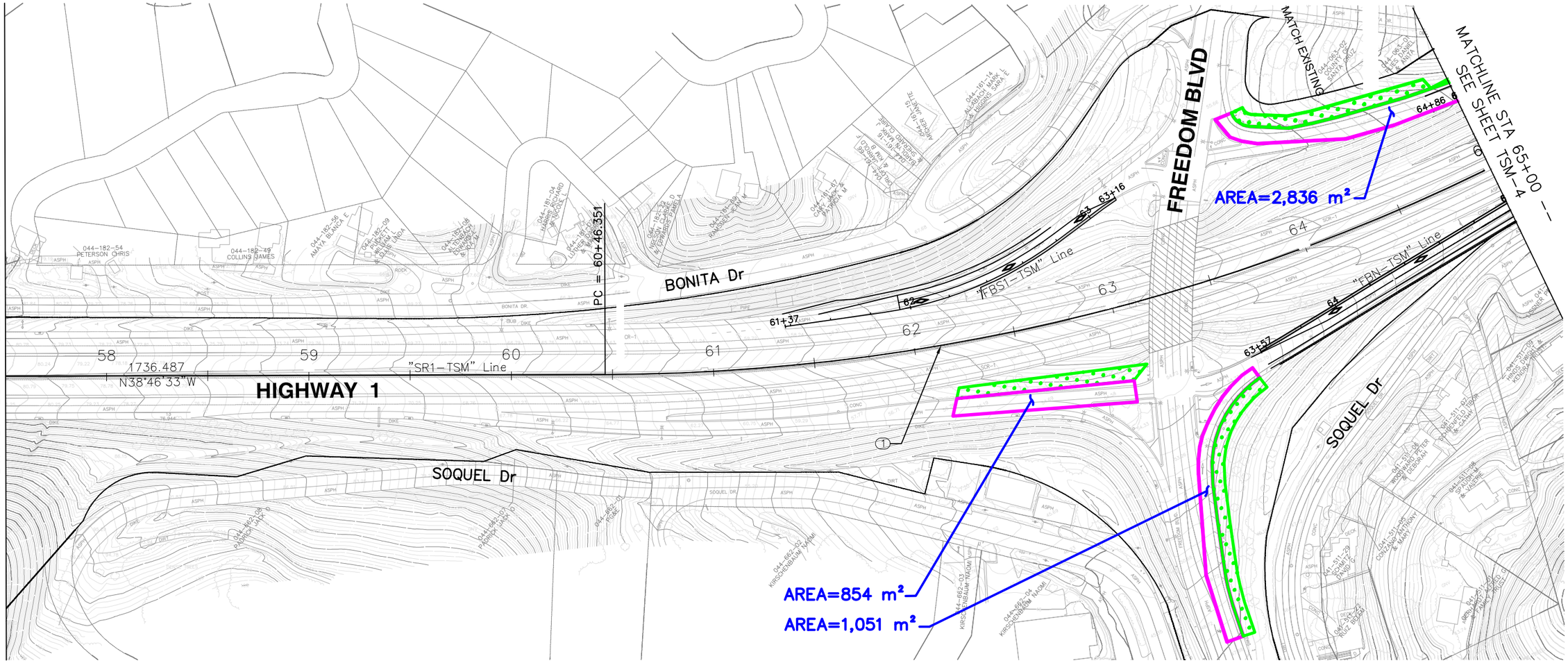
DATE PLOTTED =>
TIME PLOTTED =>

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		3	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



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NUMBER	DATE	REVISION
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5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-3

DESIGN OVERSIGHT

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DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

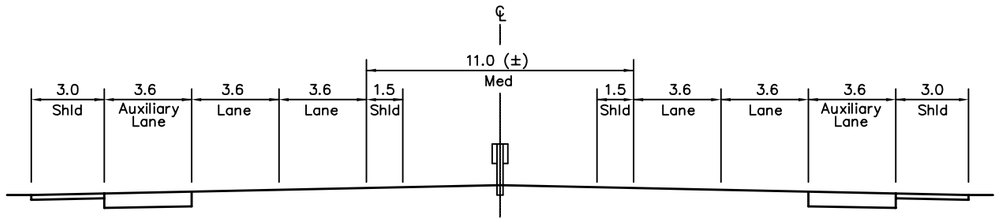
USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION

DATE PLOTTED =>
TIME PLOTTED =>



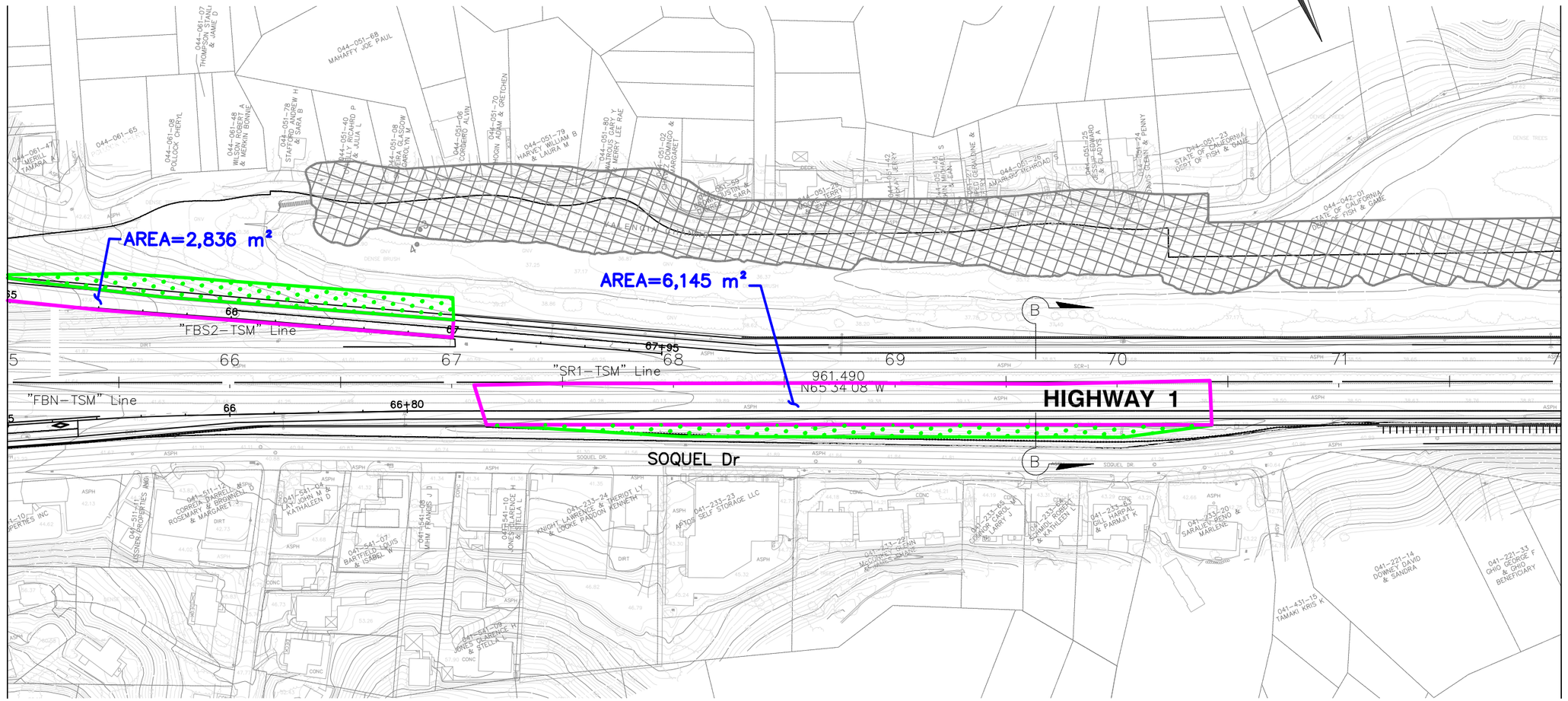
SECTION B–B
SCALE N.T.S.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		4	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-4

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE REVISED BY | DATE REVISED

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DESIGN OVERSIGHT

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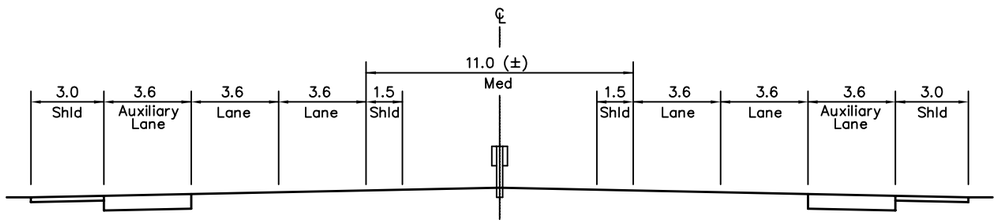
FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU | EA

LAST REVISION | DATE PLOTTED => TIME PLOTTED =>



SECTION B–B
SCALE N.T.S.

CURVE TABLE				
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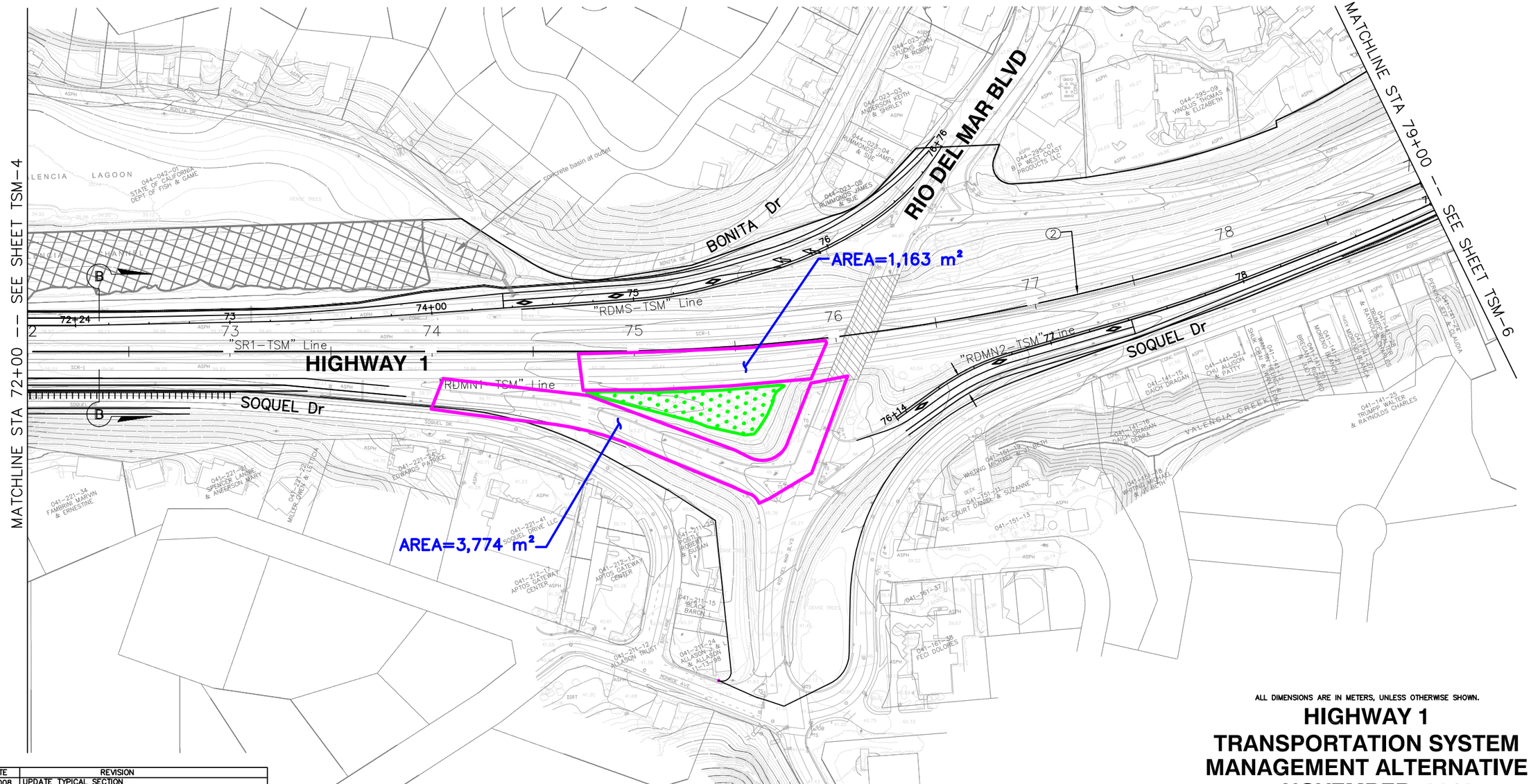
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		5	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-5

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE | REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY

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DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION | DATE PLOTTED => | TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DGN FILE =>

CU

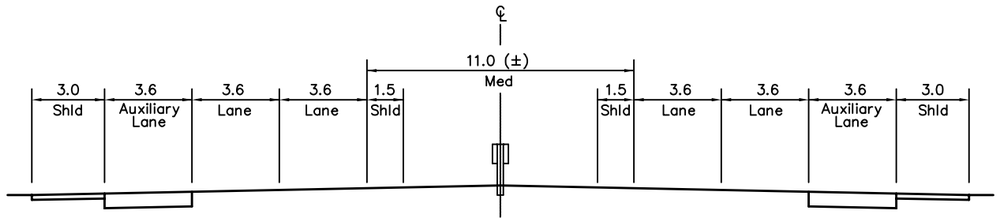
EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		6	20

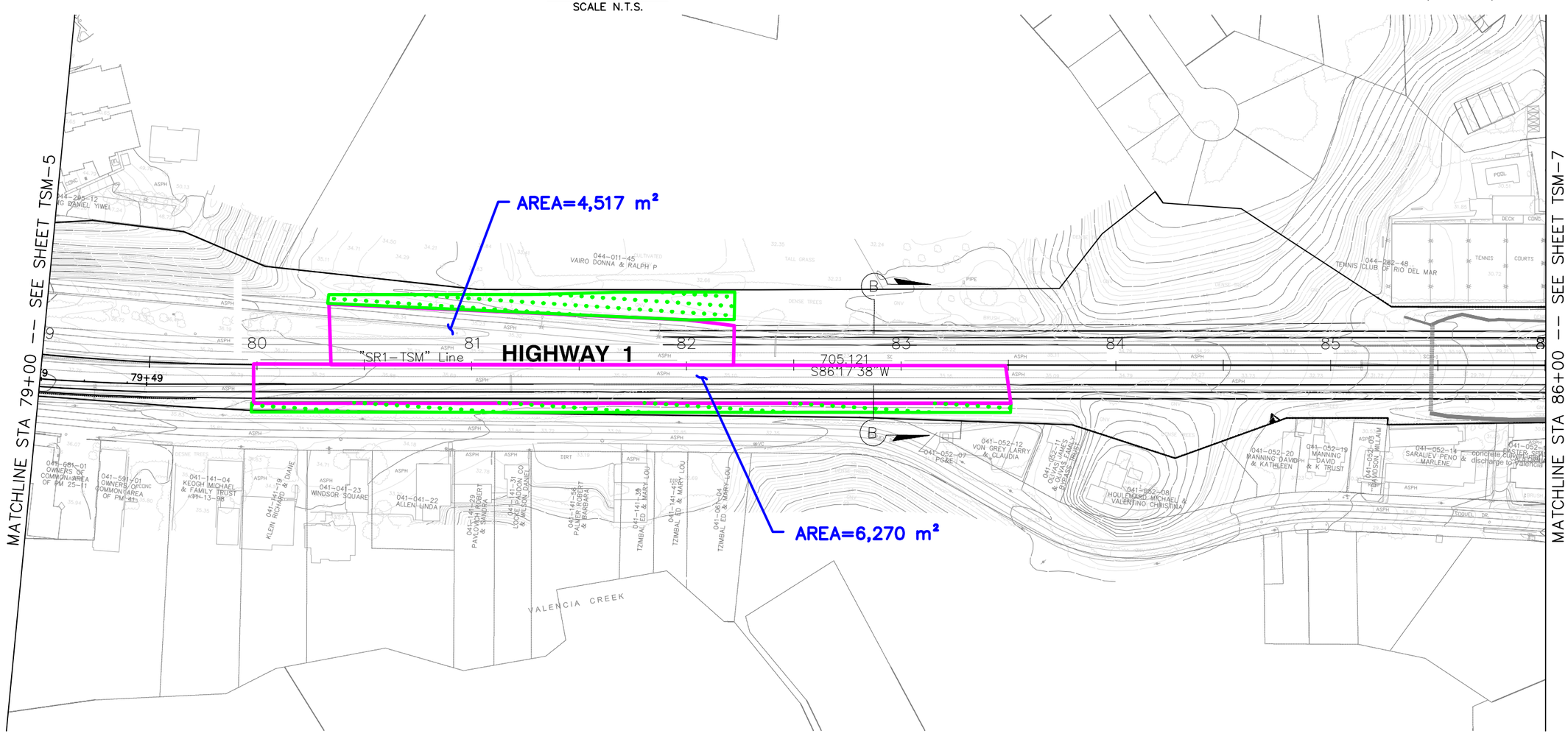
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



SECTION B–B
SCALE N.T.S.



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-6

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CALCULATED/ DESIGNED BY
CHECKED BY
DATE REVISED BY
DATE REVISED

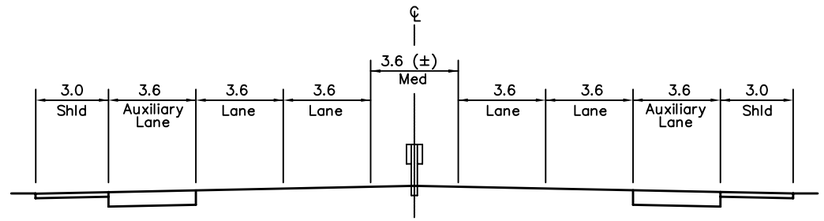
FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>



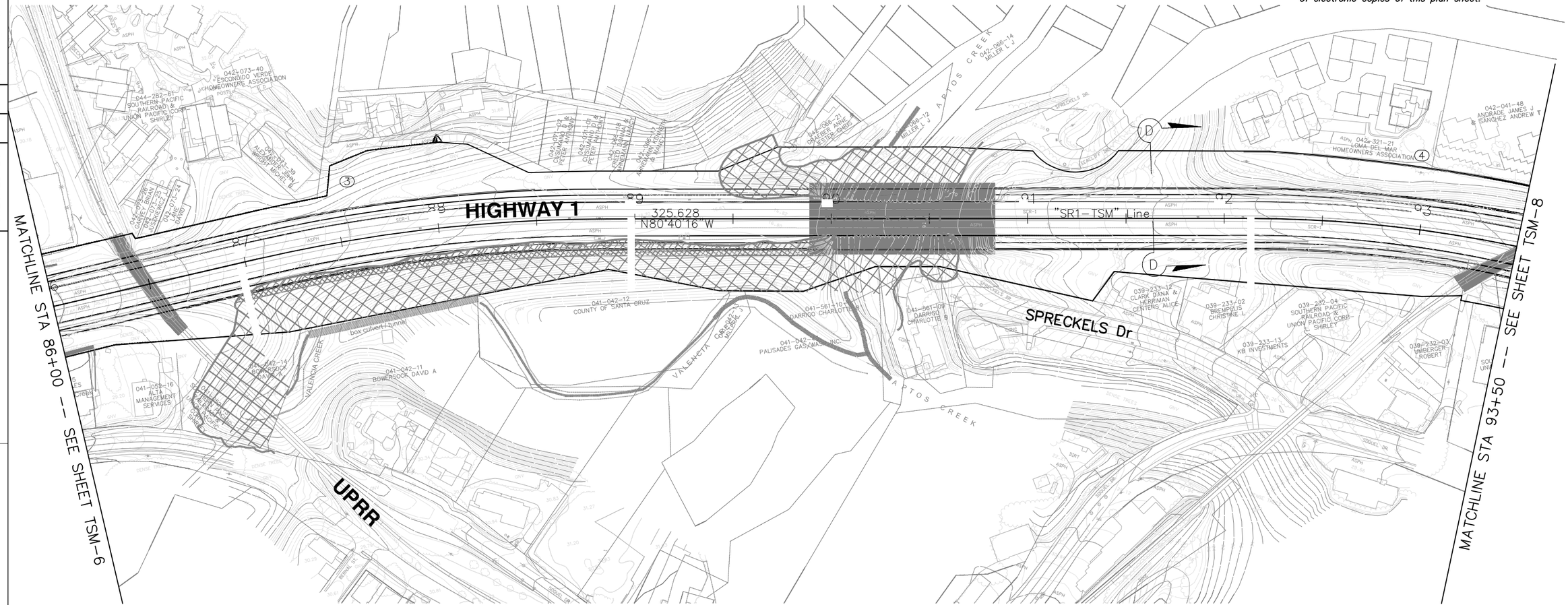
SECTION D–D
SCALE N.T.S.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		7	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



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④	665	24°41'12"	145.521	286.525

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-7

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE REVISED BY
DATE REVISED
CALCULATED/ DESIGNED BY
CHECKED BY
DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

CURVE TABLE				
NO	R	Δ	T	L
④	665	24°41'12"	145.521	286.525

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		8	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

AREA=2,874 m²

AREA=3,243 m²

AREA=1,871 m²

AREA=2,170 m²

AREA=2,162 m²

AREA=1,392 m²

AREA=4,261 m²

UPRR

"SPS1–TSM" LINE

"SR1–TSM" Lin

"SPS2–TSM" LINE

HIGHWAY 1

"SPN1–TSM" LINE

"SPN2–TSM" LINE

903.811

N55°59'04"W

STATE PARK DR

OLD DOMINION

MATCHLINE STA 93+50 – – SEE SHEET TSM–7

MATCHLINE STA 101+00 – – SEE SHEET TSM–9

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-8

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
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1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

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DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION

DATE PLOTTED =>

TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

CURVE TABLE				
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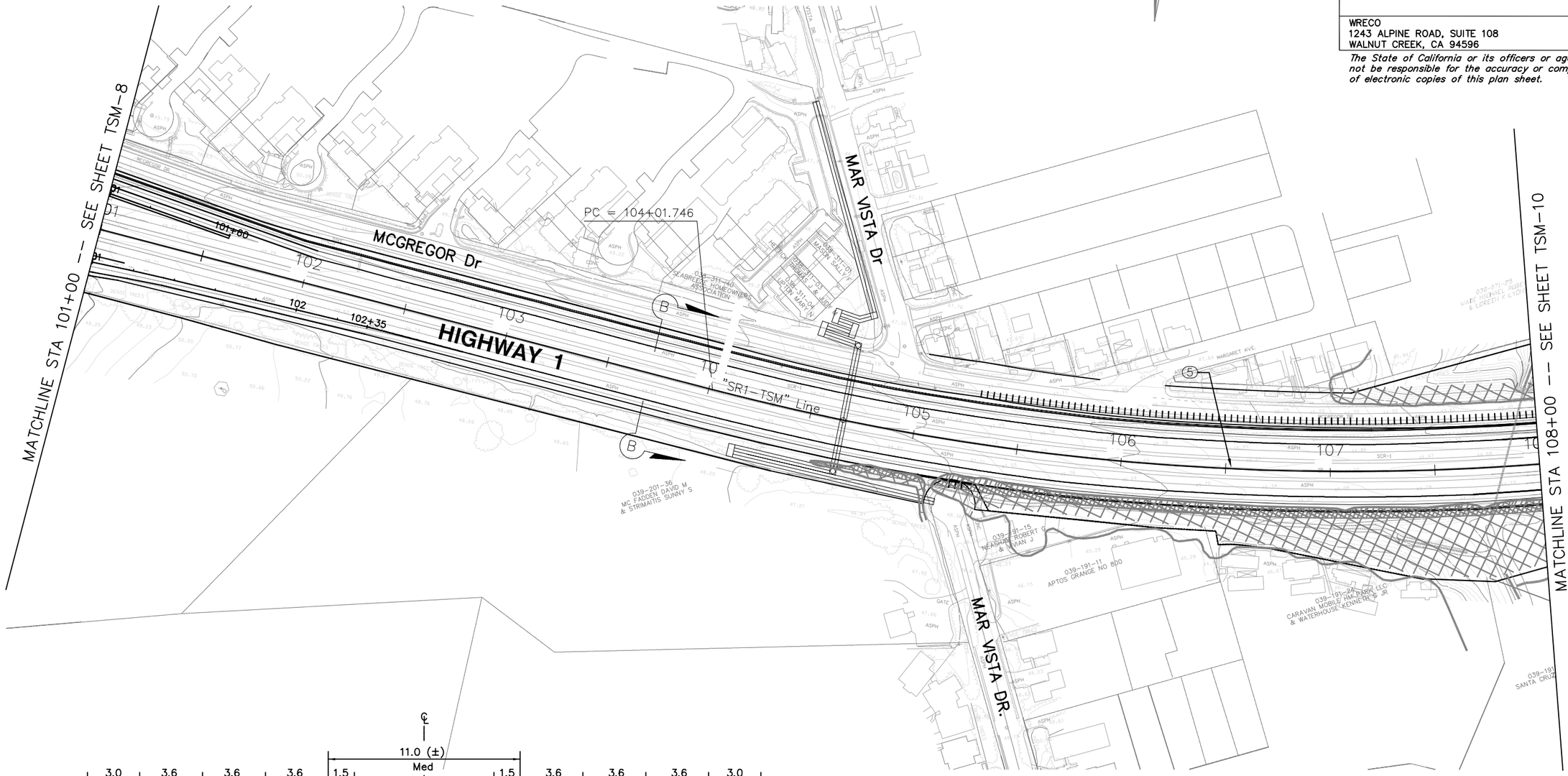

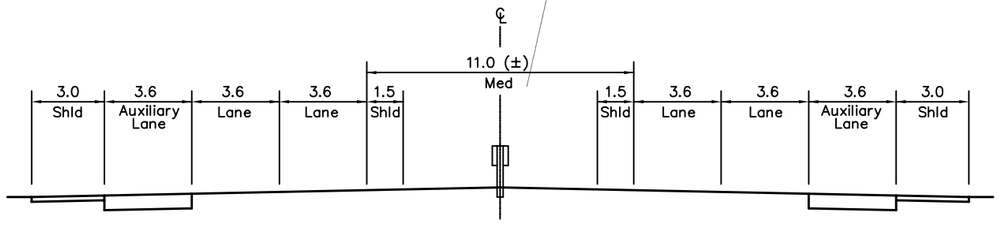

SECTION B–B
SCALE N.T.S.

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		9	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-9

DATE REVISED BY
DATE REVISED

CALCULATED/ DESIGNED BY
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION

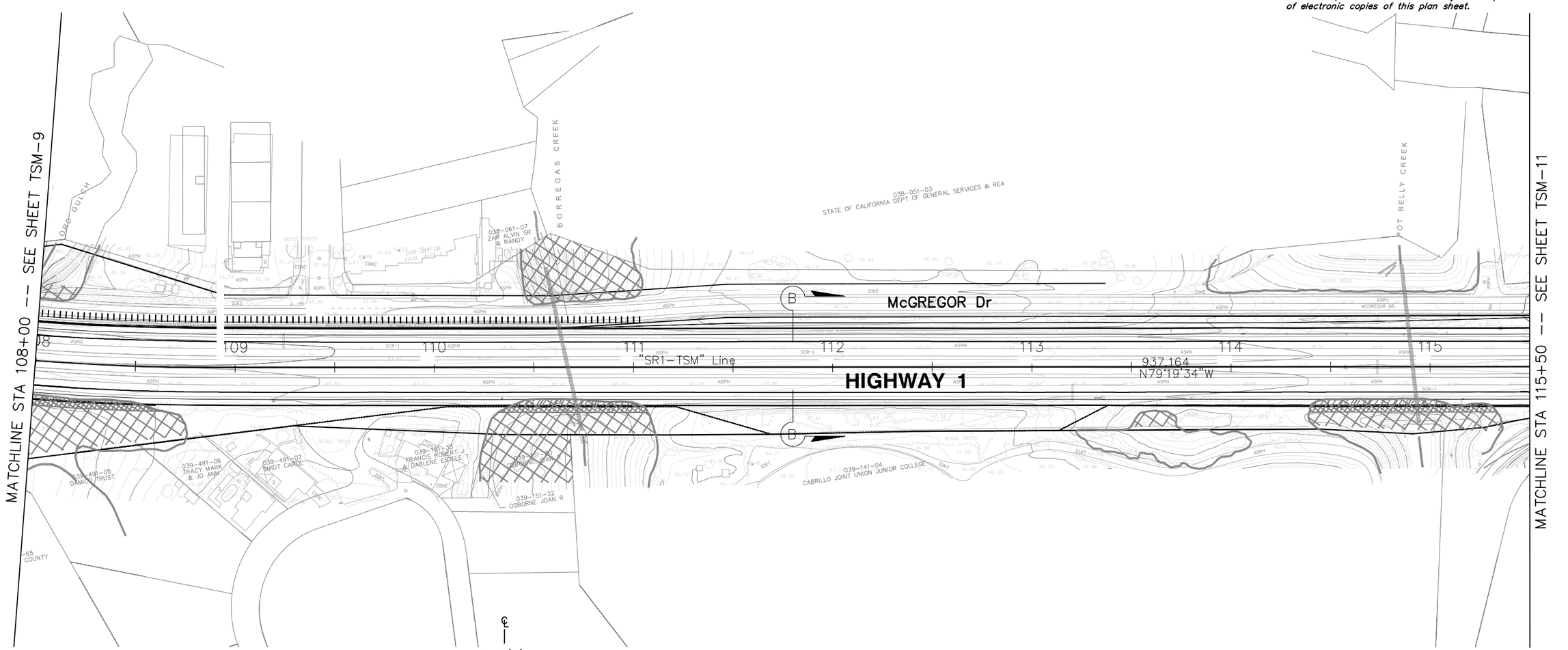
DATE PLOTTED =>
TIME PLOTTED =>

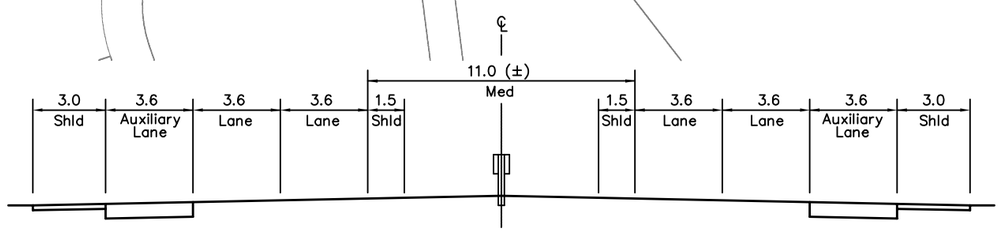
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		10	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION B–B
SCALE N.T.S.

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
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1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-10

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

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	DATE REVISED

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CHECKED BY

LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		11	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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CURVE TABLE				
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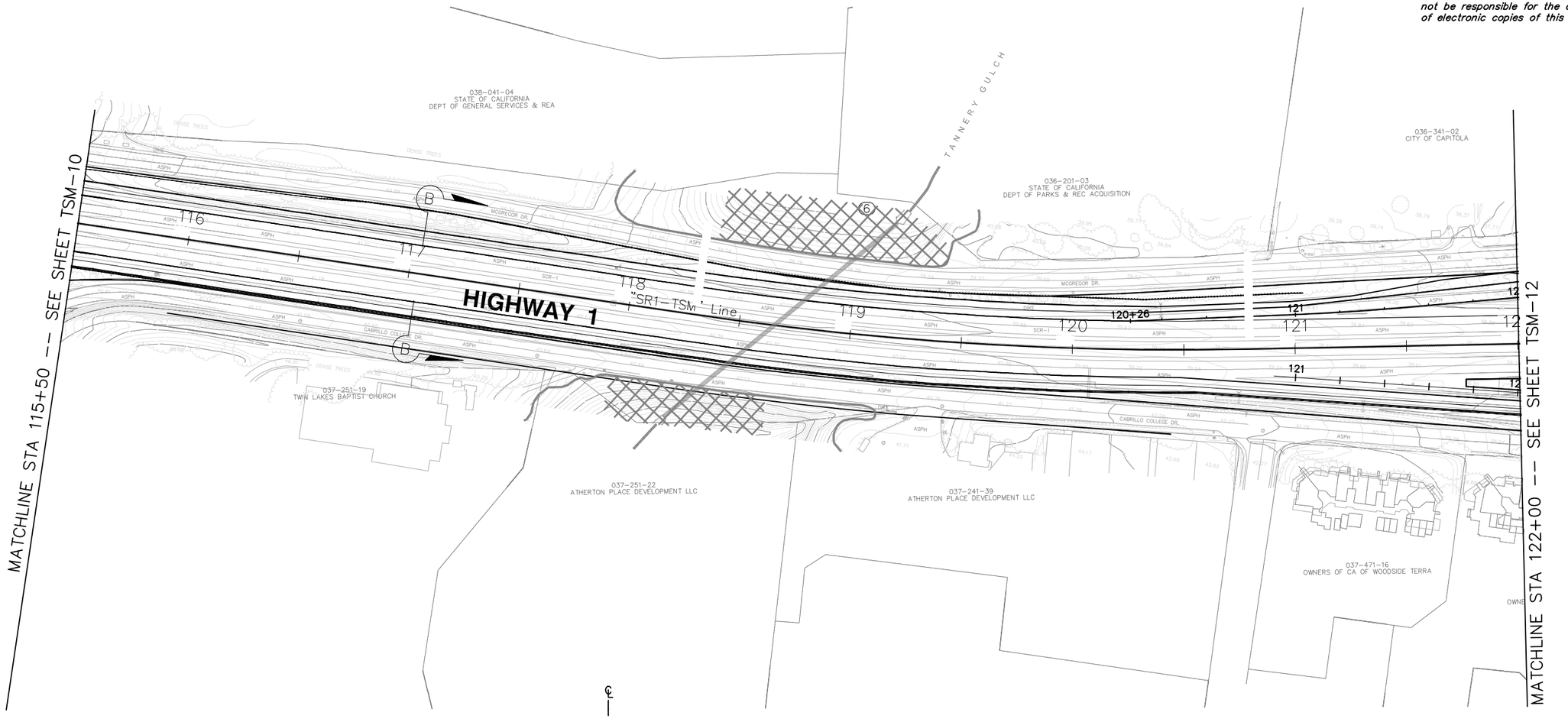

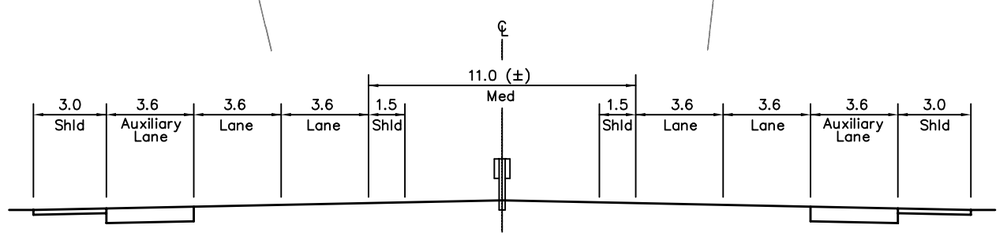

SECTION B–B
SCALE N.T.S.

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
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2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-11

DATE REVISED BY | DATE REVISED
CALCULATED/ DESIGNED BY | CHECKED BY
DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => | TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DGN FILE =>

CU

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		12	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DATE	REVISED BY	DATE REVISED

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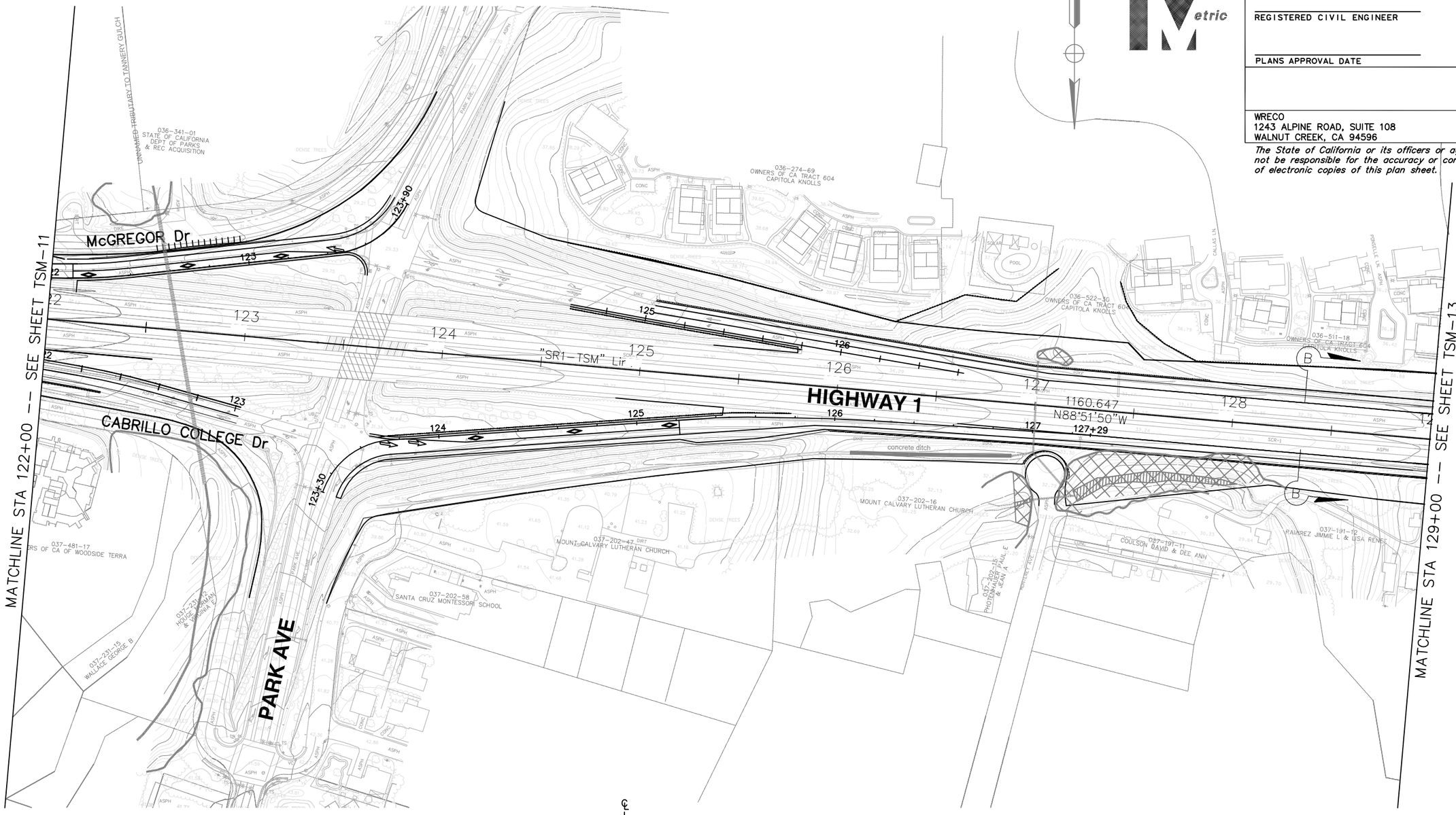

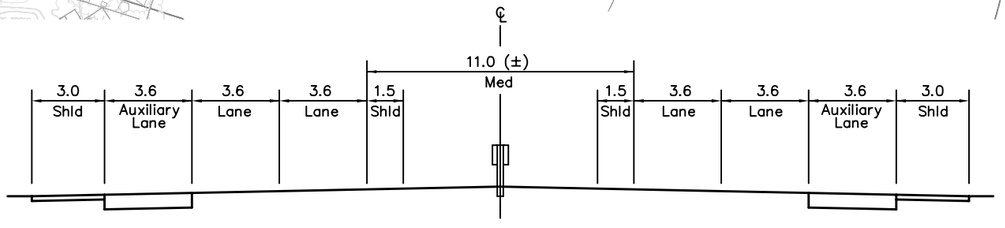

SECTION B–B
SCALE N.T.S.

NUMBER	DATE	REVISION
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1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-12

LAST REVISION

DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

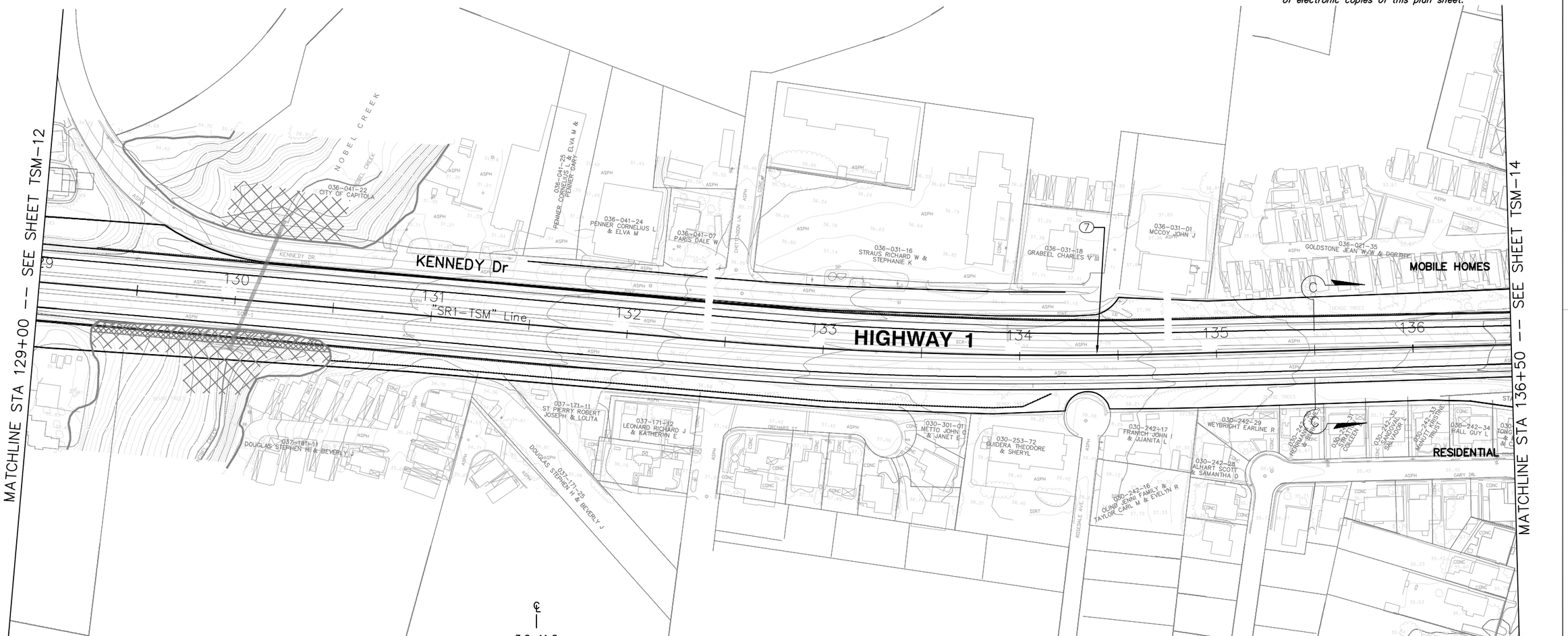
CURVE TABLE				
NO	R	Δ	T	L
⑦	2100	6°32'35"	120.040	239.819

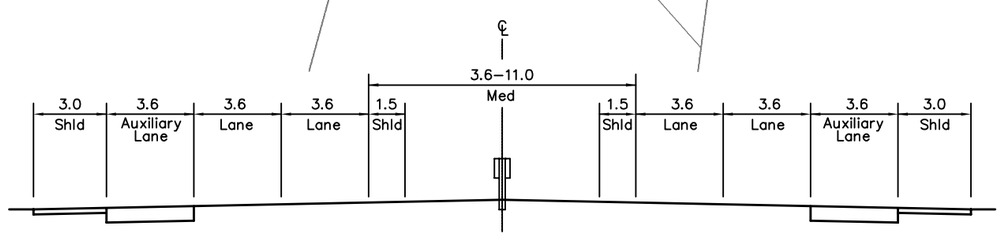
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		13	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION C-C
SCALE N.T.S.

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
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1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-13

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

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	CHECKED BY	

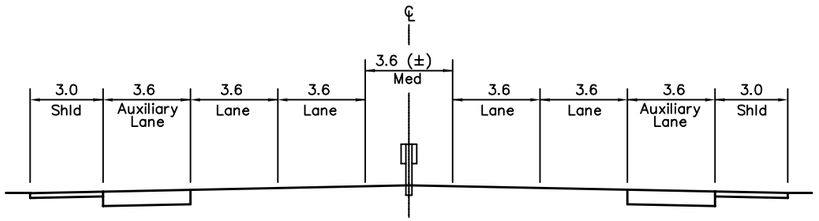
LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA



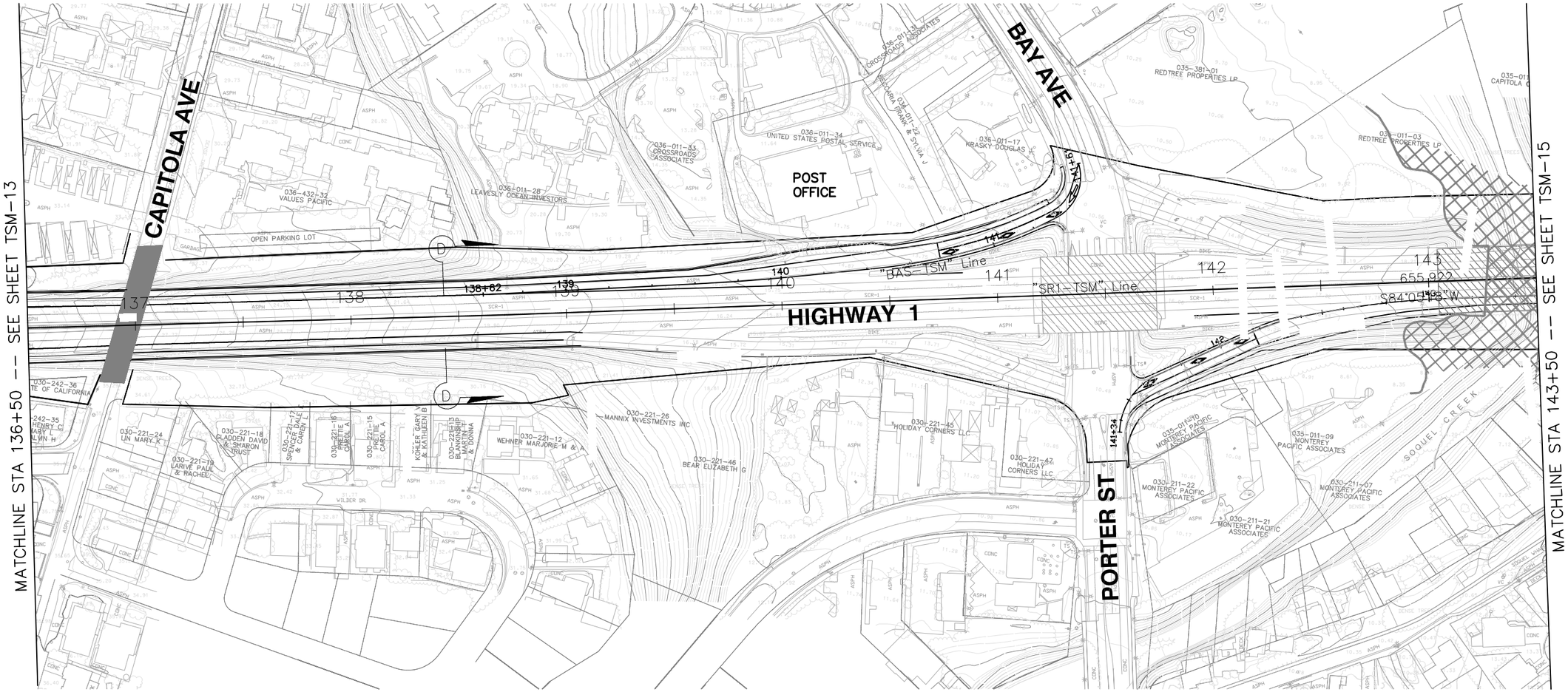
SECTION D–D
SCALE N.T.S.

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		14	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-14

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
2	10/2006	ADDED CUT FILL LINES, RETAINGS WALLS, ETC
1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE | REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY

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DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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USERNAME =>
DGN FILE =>

CU

EA

LAST REVISION

DATE PLOTTED =>
TIME PLOTTED =>

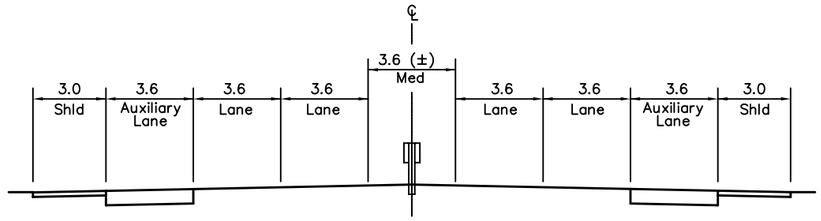
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		15	20

REGISTERED CIVIL ENGINEER

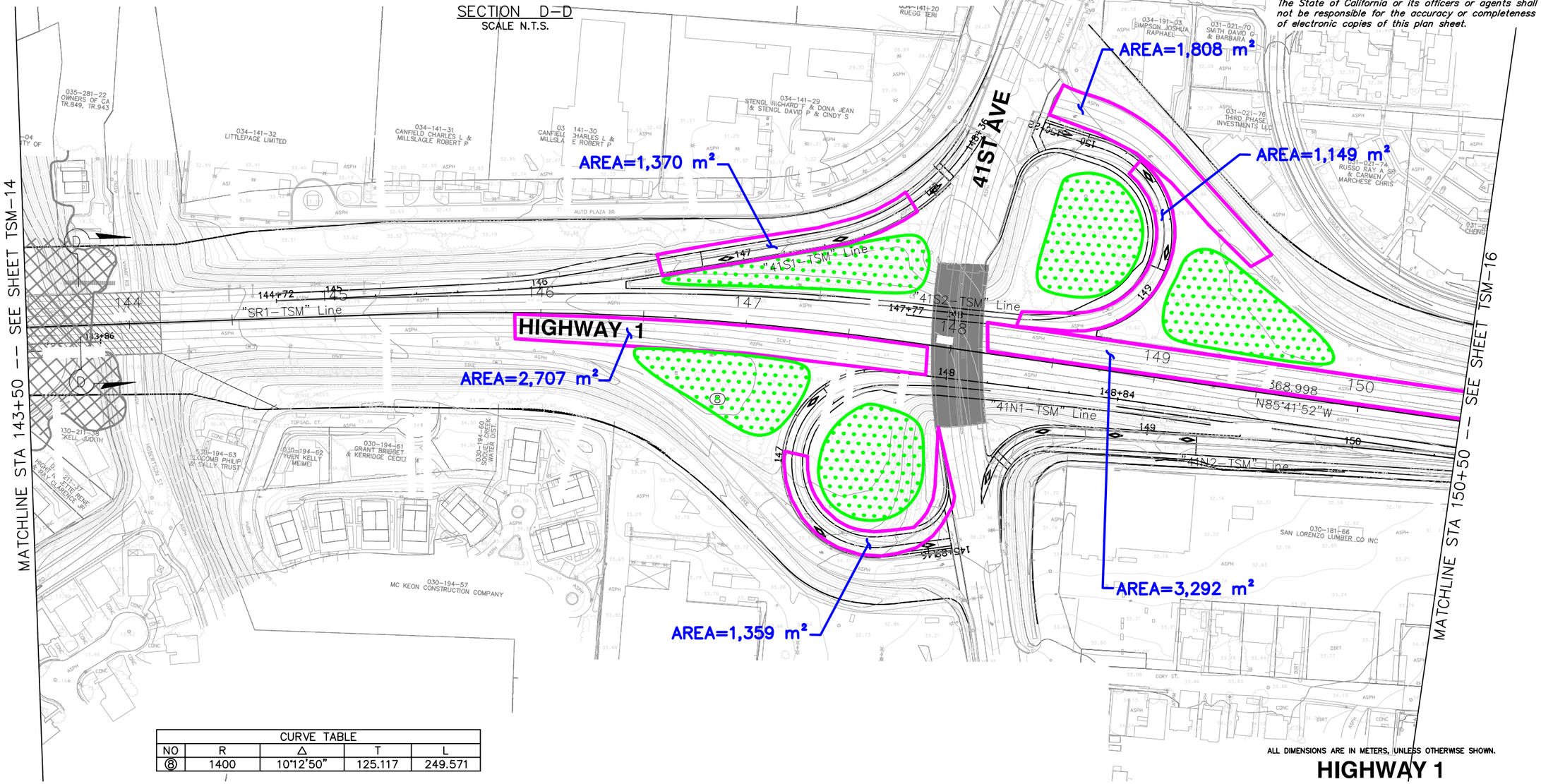
PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

Caltrans Metric



SECTION D–D
SCALE N.T.S.



CURVE TABLE				
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ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-15

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
3	12/2006	ADDED SOUNDWALLS, ROW, ETC
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DATE REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION | DATE PLOTTED => | TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DGN FILE =>

CU

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		16	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
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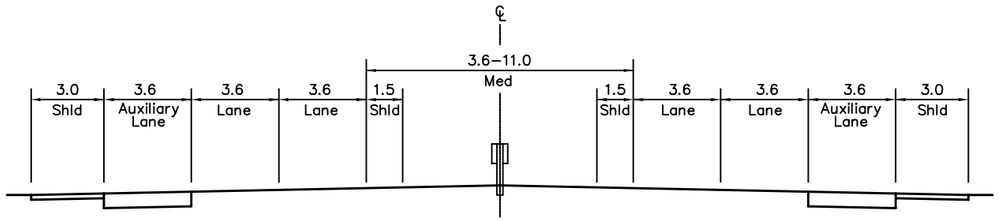
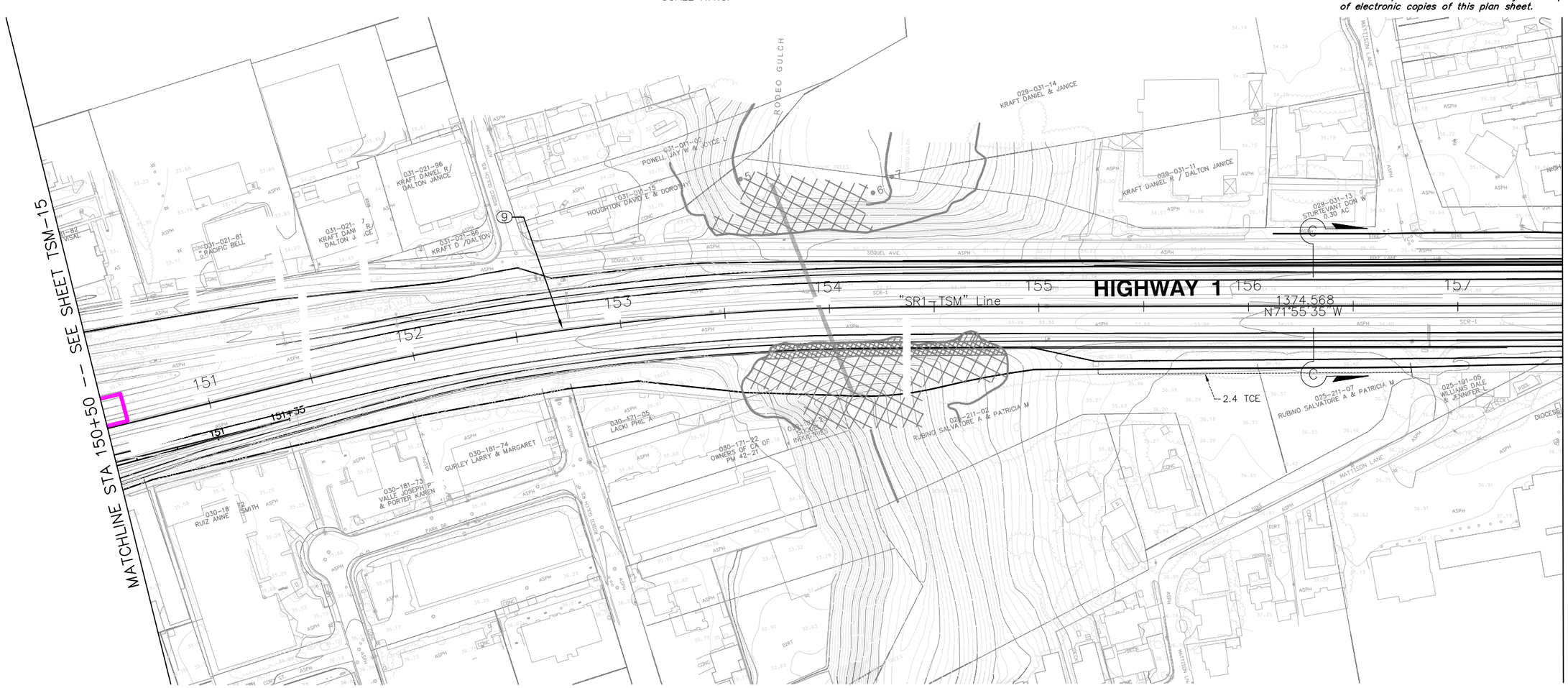
WALNUT CREEK, CA 94596



SECTION C–C
SCALE N.T.S.



CURVE TABLE				
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NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
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ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-16

DESIGN OVERSIGHT
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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CALCULATED/ DESIGNED BY		
CHECKED BY		

LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

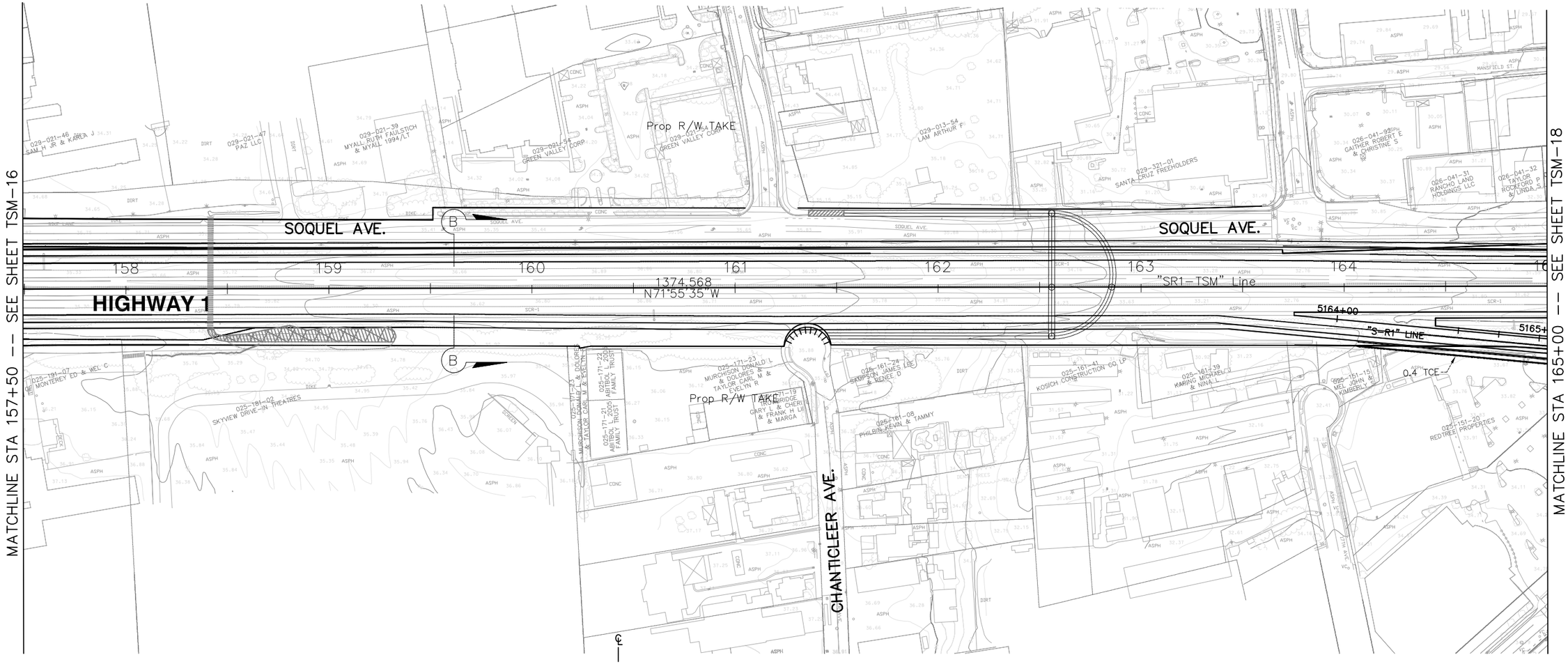
EA

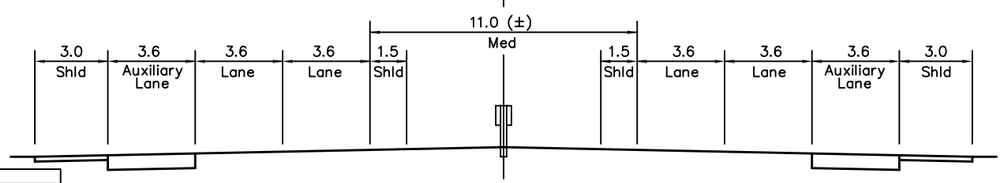
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		17	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596





SECTION B–B
SCALE N.T.S.

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
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ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-17

DATE REVISED BY

DATE REVISED

CALCULATED/ DESIGNED BY

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DESIGN OVERSIGHT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION

DATE PLOTTED =>

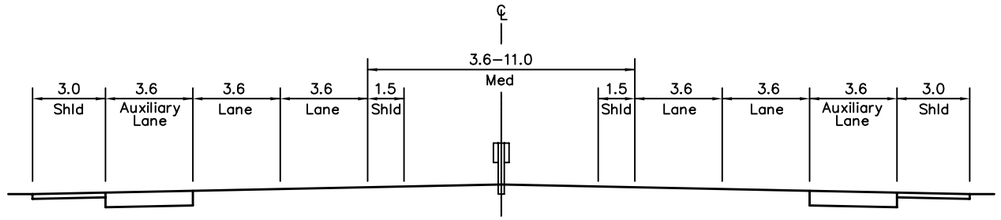
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA



SECTION C–C
SCALE N.T.S.

CURVE TABLE				
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Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		18	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

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DATE REVISED BY DATE REVISED
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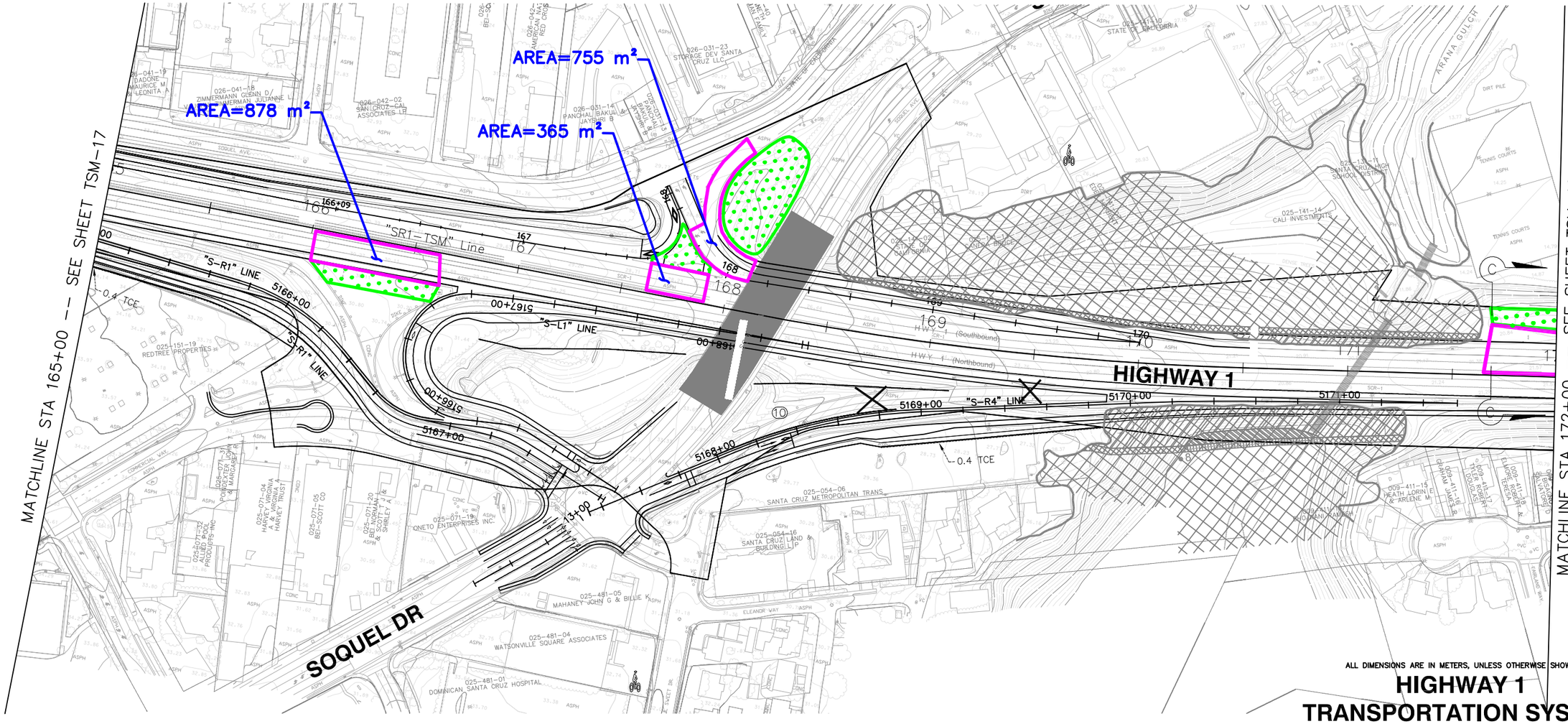
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans



NUMBER	DATE	REVISION
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ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-18

LAST REVISION
DATE PLOTTED =>
TIME PLOTTED =>

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME =>
DGN FILE =>

CU

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		19	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596

CURVE TABLE				
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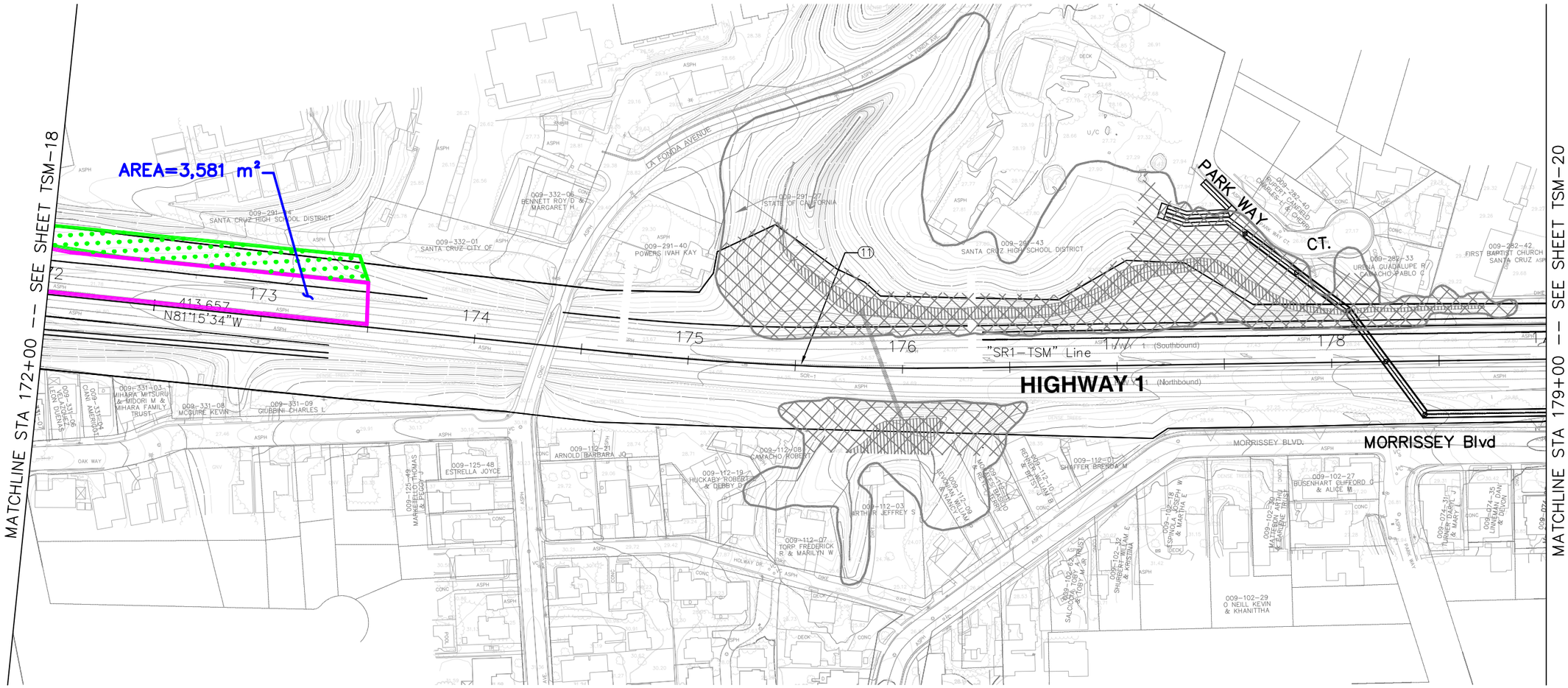

ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-19

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
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DATE | REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY | CHECKED BY

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => DGN FILE =>

CU | EA

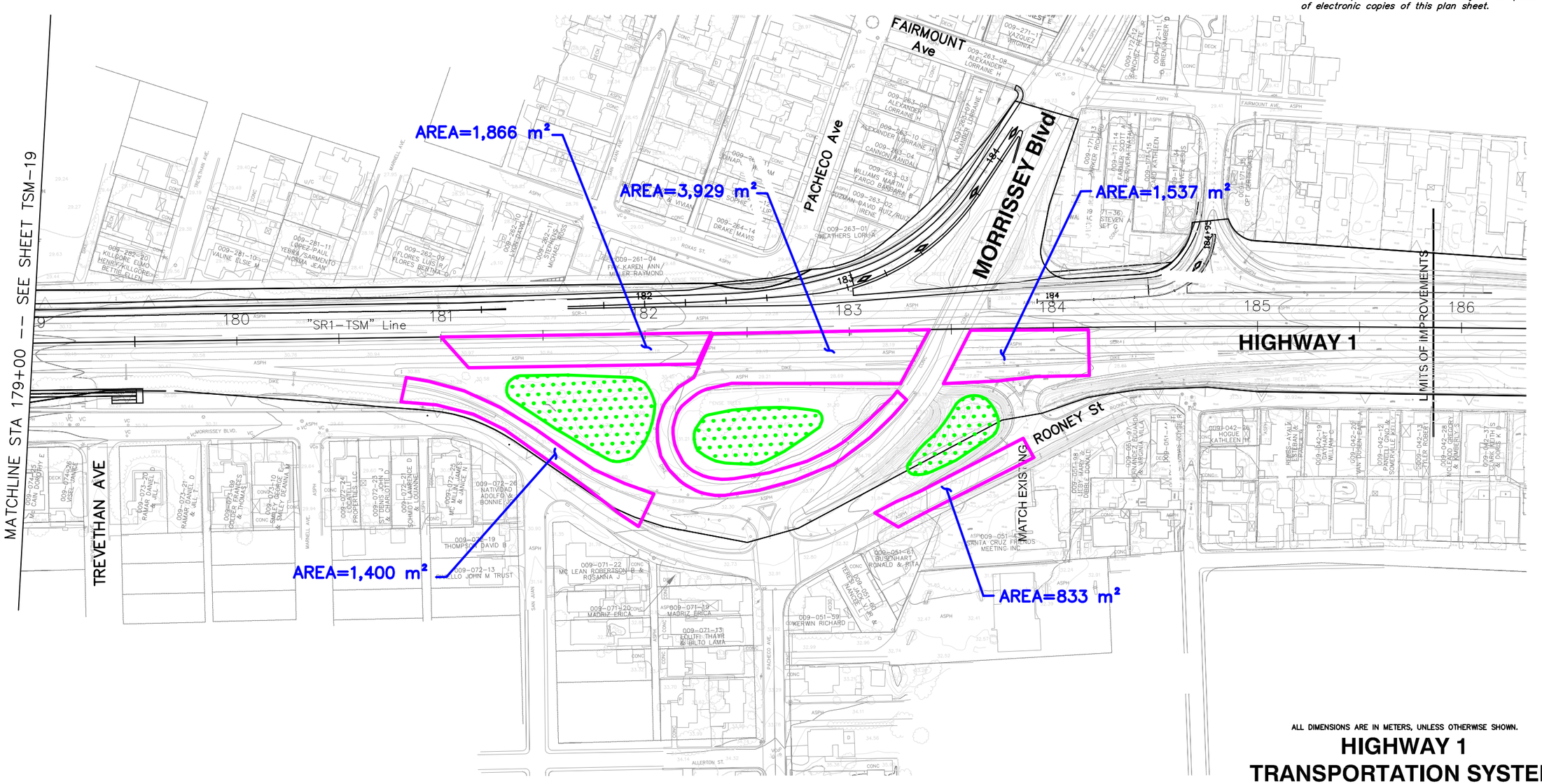
LAST REVISION | DATE PLOTTED => TIME PLOTTED =>

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
05	SCr	1		20	20

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

WRECO
1243 ALPINE ROAD, SUITE 108
WALNUT CREEK, CA 94596



ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.

HIGHWAY 1
TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE
NOVEMBER 2012

SCALE 1:1000

TSM-20

NUMBER	DATE	REVISION
6	4/2008	UPDATE TYPICAL SECTION
5	8/2007	ADDED GEOMETRIC INFORMATION CALLOUTS
4	4/2007	ADDED S/M AUX GEOM. SHEETS 18, 19 & 20
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1	8/2006	PDT MEETING AUX LANE RECOMMENDATIONS

DATE REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT

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Caltrans

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USERNAME =>
DGN FILE =>

CU | EA

LAST REVISION | DATE PLOTTED => TIME PLOTTED =>

Plans Showing BMP Deployment
Tier II Project

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SCr	1			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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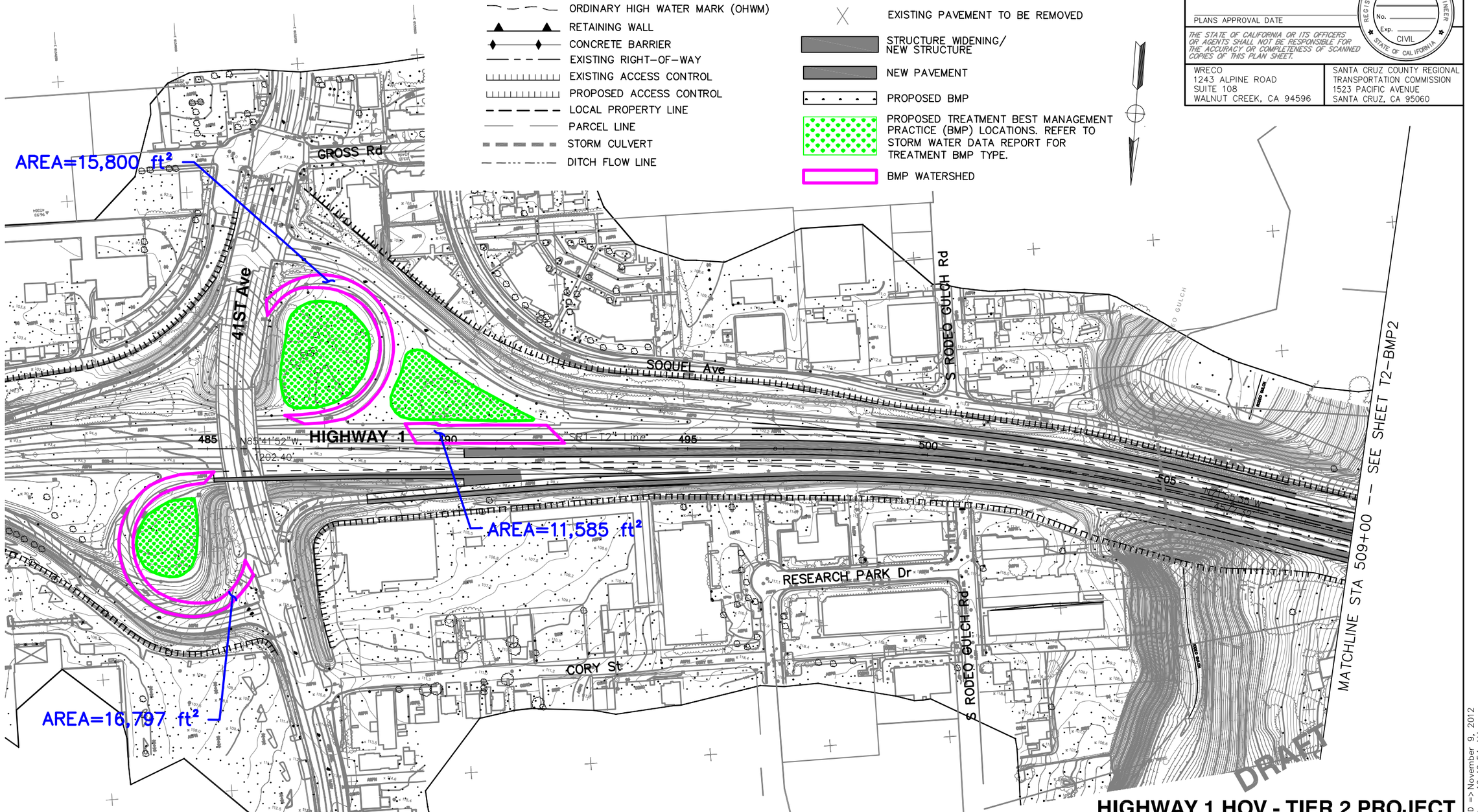
WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

SANTA CRUZ COUNTY REGIONAL
TRANSPORTATION COMMISSION
1523 PACIFIC AVENUE
SANTA CRUZ, CA 95060

LEGEND

- WETLANDS JURISDICTION
- APPROXIMATE LOCATION OF WETLANDS JURISDICTION OUTSIDE PROJECT APE
- PERIMETER OF WETLANDS JURISDICTION
- ORDINARY HIGH WATER MARK (OHWM)
- RETAINING WALL
- CONCRETE BARRIER
- EXISTING RIGHT-OF-WAY
- EXISTING ACCESS CONTROL
- PROPOSED ACCESS CONTROL
- LOCAL PROPERTY LINE
- PARCEL LINE
- STORM CULVERT
- DITCH FLOW LINE
- CUT LINE
- FILL LINE
- S(No.) SOUND WALL NUMBER
- EXISTING PAVEMENT TO BE REMOVED
- STRUCTURE WIDENING/ NEW STRUCTURE
- NEW PAVEMENT
- PROPOSED BMP
- PROPOSED TREATMENT BEST MANAGEMENT PRACTICE (BMP) LOCATIONS. REFER TO STORM WATER DATA REPORT FOR TREATMENT BMP TYPE.
- BMP WATERSHED



CURVE TABLE				
No.	R	△	T	L
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HIGHWAY 1 HOV - TIER 2 PROJECT
22' MEDIAN, 5' OFFSET
POTENTIAL DRAINAGE IMPACT AREAS
NOVEMBER 2012

SCALE 1:100

T2-BMP1

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION xxx

DATE PLOTTED => November 9, 2012
TIME PLOTTED => 10:49:54 AM

PATH => g:\projects\y2003\p0313 route1\drawings\tier 2 bmp

BORDER LAST REVISED 7/2/2010

USERNAME => mei du
DGN FILE => t2-1

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT xxx

xxxx

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SCr	1			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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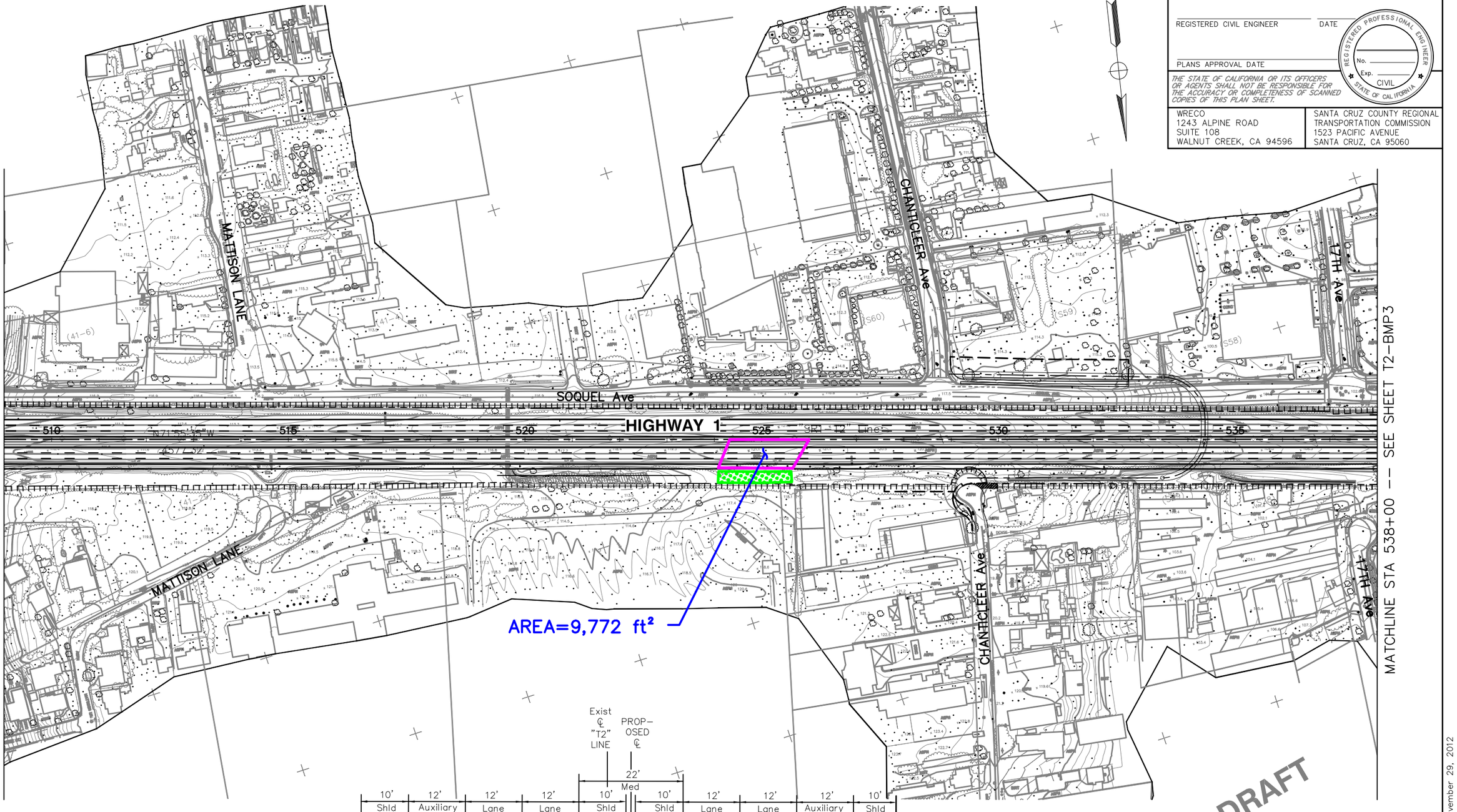
SUITE 108
WALNUT CREEK, CA 94596

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION
1523 PACIFIC AVENUE
SANTA CRUZ, CA 95060



SECTION A-A
NO SCALE

DRAFT

HIGHWAY 1 HOV - TIER 2 PROJECT
22' MEDIAN, 5' OFFSET
POTENTIAL DRAINAGE IMPACT AREAS
NOVEMBER 2012

SCALE 1:100

T2-BMP2

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CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

PATH => g:\projects\yz000\pu313 route1\drawings\tier 2 bmp

BORDER LAST REVISED 7/2/2010 | USERNAME => mei du | RELATIVE BORDER SCALE 0 1 2 3 | UNIT xxx | xxxx

LAST REVISION | DATE PLOTTED => November 29, 2012

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SCr	1			

REGISTERED CIVIL ENGINEER DATE

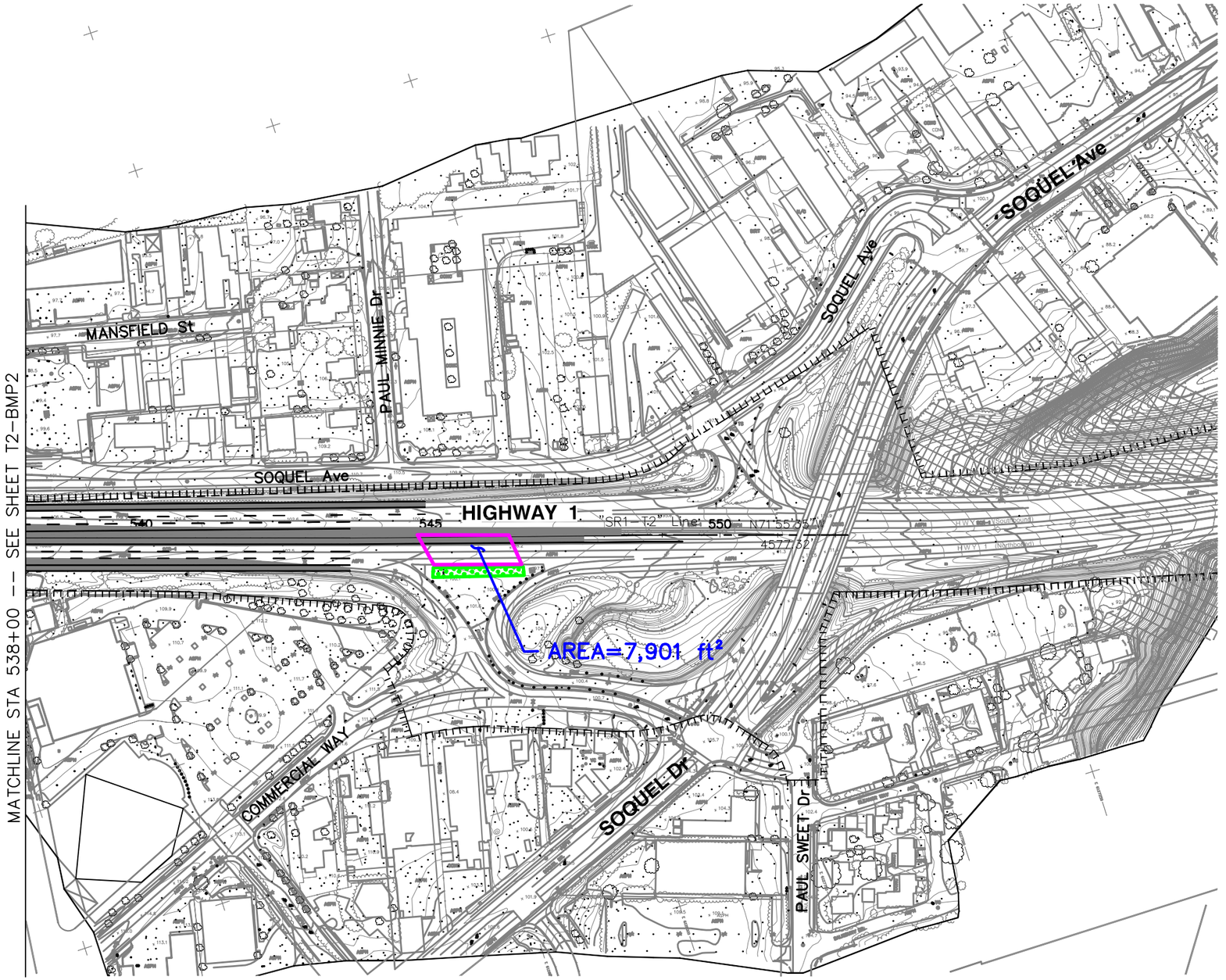
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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.

WRECO
1243 ALPINE ROAD
SUITE 108
WALNUT CREEK, CA 94596

SANTA CRUZ COUNTY REGIONAL TRANSPORTATION COMMISSION
1523 PACIFIC AVENUE
SANTA CRUZ, CA 95060



DRAFT

HIGHWAY 1 HOV - TIER 2 PROJECT
22' MEDIAN, 5' OFFSET
POTENTIAL DRAINAGE IMPACT AREAS
NOVEMBER 2012

SCALE 1:100

T2-BMP3

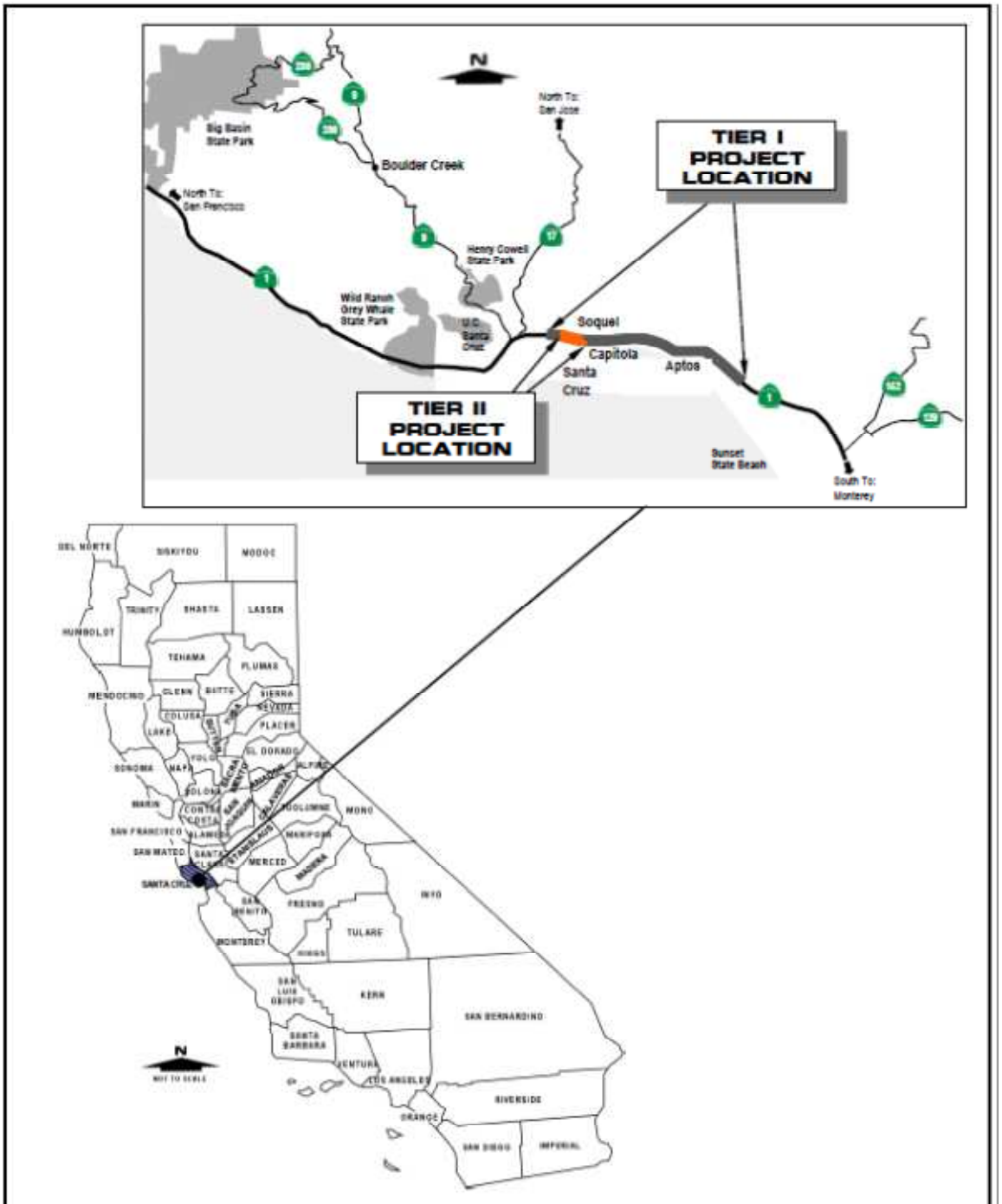
LAST REVISION XXX
DATE PLOTTED => November 9, 2012
TIME PLOTTED => 10:57:07 AM

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

PATH => g:\projects\y2003\p0313 route1\drawings\tier 2 bmp

BORDER LAST REVISED 7/2/2010 | USERNAME => mei du | DGN FILE => t2-3 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT xxx | xxxx

Tier II Project Location in Relation to the Tier I Project



Tier I/ Tier II Environmental Impact Report/Environmental Assessment Highway I High Occupancy Vehicle Lane Project

PROJECT LOCATION